We're making our biggest deal on the famous Handi-Counter® 3000 — the world's finest hand-held multifunction counter.

- 10Hz - 3GHz
- Maximized Sensitivity
- 16 segment RF signal bargraph
- 4 extremely fast gate times
- 256 times faster than other hand-held counters
- Frequency, period, ratio, time interval, average & prescale
- 10 digit LCD readability even in bright sunlight
- Hold switch locks in measurements fast

Regularly $375...Now $259

Deal ends December 31, 1992
No trade-ins or Dealer discounts

OPTIONS
TCXO ± 2ppm .................................................. $100.
BLB30 Back light & two step audible signal level indicator .... $75.
CC30 Carry Case .............................................. $15.
TA100S Telescoping Whip Antenna ......................... $12.

FACTORY DIRECT ORDER LINE 1-800-327-5912
305-771-2050 - FAX 305-771-2052
5821 NE 14th Ave., Ft. Lauderdale, FL 33334
5% Ship/handling (Max $10) U.S. & Canada.
15% outside continental U.S. Visa & Master Card accepted
Earthquake Prediction
By Vince Migliore

Variations in radio waves and the earth's magnetic field are two of several promising approaches to earthquake prediction to which radio hobbyists may be able to make a contribution. In commemoration of the California earthquake of October 1989, MT takes a look at the current state of earthquake prediction technology, and also asks the question: Would you be prepared to monitor the situation if it happened today?

Radio Interoceanica
By Ken MacHarg

Five years ago, the small community of Santa Rosa, Ecuador, was devastated by a major earthquake, which also knocked out HCRI, the shortwave station that held the community together. Ken MacHarg of HCJB takes us along to visit this small station in the heart of Ecuador.

WWV: It’s About Time!
By Wayne Heinen

Due to budget and staff restrictions, WWV, America's time standard station in Colorado, can no longer accommodate visitors. But by special arrangement, MT sneaked a peek, so that we could bring you this photo tour.

COVER: Divisadero Street in the Marina district suffered some of the worst damage in 1989's October quake. "At street level, you could walk right into the second floor window of an apartment, knowing someone might be trapped below," says photographer Randall Lee, Fire Information Officer for the California Department of Forestry and Fire Protection.
Monitoring the 900 MHz Cordless Phones
By Jack Sullivan

When a lightning strike knocked out both his cordless phones, Jack Sullivan turned misfortune into an opportunity. He purchased two of the new 900 MHz models—the Panasonic KX-T9000 and the VTech Tropez 900DX—and tested them against one another. Here are his findings.

The Day the Martians Landed
By Don Moore

You would have thought that anyone would have sense enough to avoid a repeat of “War of the Worlds” after what happened when Orson Welles’ broadcast the radio drama on Halloween, 1938. Well, one station didn’t—to their great regret.

And Much More ...

October’s issue is packed with information on monitoring and on products. Besides the reviews listed on the cover, “Antenna Topics” takes a quick look at Elnec’s antenna design software. But first, Clem Small asks the question, “What makes a good antenna, anyway?”

Shortwave and scanner listeners alike will want to read the “Scanner Equipment” column this month. If you thought the benefits of a new Grove Spectrum Display unit were beyond your means, you’ll be very interested in this announcement and description of the new Grove Spectrum Display.

How do you interest a non-listener in your radio hobby?! The deflating “That’s nice, dear,” is something we’ve all encountered. To combat such apathetic responses try the ideas in this month’s “Beginner’s Corner.” Or maybe you can catch their attention by the scanner activity to be found during hunting season, as described in the “Scanning Report.”

There’s something for everyone in this issue of Monitoring Times, so let’s get to it!
MT and the Mails

October marks the third, and probably the final, month of our experimental protective cover for MT, and I must say, the responses to it have been mixed! The yeas and nays are fairly evenly divided among the 540 responses received. The “Yes! Yes! Yes! Yes!” from Michigan is balanced by the “No, nyet, nein, never, negative, no way, no how!” from Virginia.

Two recurring comments were heard from both those who voted for a protective cover and those who voted against it: first, a concern for conservation, and second, the desire for better protection by a polybag.

We echo the desire not to be wasteful. (That’s why Grove “used” the space for advertising!) We practice recycling both here at the office and in our homes. Yes, using recycled paper for the protective cover is certainly an option, but it should be pointed out that you also have an option—that of not recycling the cover, but the entire issue (except perhaps the glossy cover).

A biodegradable polybag would provide the most complete protection for the magazine, we agree. The problem is, the polybag costs 10 cents per issue, or $1.20 per year—twice the cost of the heavy paper. Multiply that amount by the number of mailed subscriptions, and it adds up to more than MT can absorb.

It does seem clear, however, that the protective cover is not going to “cover” all instances of misuse. Take one reader in Pennsylvania, for example, who says, “My magazines are as much as a month late, very much dog-eared, and in a few cases articles have been neatly cut out!” Several others noted that their MTs appeared to have been “pre-read!”

Without a definitive response in favor of the protective cover, we will probably opt against it and continue to study other avenues. We are gratified by the number of responses from our readers, and take that as an indication that you appreciate being asked!

Since it appears that only a few magazines receive the worst treatment each month, we will gladly continue to replace those issues upon request. Although total cost to us of each “free” replacement is $2.00, replacing damaged issues still seems to be the most effective solution for everyone concerned.

Marching to a Different Drum

While I’m at it... we occasionally get inquiries about the lateness of MT’s scheduled delivery. Monitoring Times is consistently mailed out ten days before the month on its cover. Most people receive their issue in three to seven days, just before the first of the month. We don’t replace a “lost” issue until the 10th of the month.

Why don’t we just mail the magazine 15-20 days before the date of issue so everyone can be assured of receiving it before the start of the month?

Well, we could... Perhaps the original reasoning had to do with our beginnings as a bi-monthly and the desire to be current as long as possible. But think about it; the date on the magazine is really irrelevant to the freshness of the information in its pages. That’s determined by how much time passes between composition by the writers and the day you hold the magazine in your hands. We do our best to make sure our news is as timely as possible in a monthly publication; backing up the deadlines wouldn’t make the information any more recent.

“What frequency goes with this antenna? An enquiring reader wants to know.”

Monitoring in the World of Disney

BH of Massachusetts joined the camera-toting masses vacationing at Disney World, but underneath his light jacket he had tucked away his Bearcat 200XLT scanner, which he discreetly monitored with walkman style “earbuds.”

Our anonymous hobbyist had already programmed into his scanner about 15 different 460 MHz repeater frequencies for the park which were audible from his hotel room. In the parking lot he found several more.
“Talk about staying ahead of people! The information on the frequencies was absolutely invaluable when it came to finding a good spot to sit and watch the attractions.”

However, BH says, “After searching every available band that my scanner could access, I came up with no clue as to what frequency(s) are used to transmit the soundtracks to the floats. Do any readers know the frequency(s) and transmitter location(s)? I would have figured VHF as the antennas on the floats at the Magic Kingdom appear to be quarter wave.”

BH got to monitor some minor excitement from the fire department and security personnel when a fireworks shell landed on the roof of an MGM attraction. Better yet, he was forewarned to avoid “Thunder Mountain” because of a planned “malfunction”—preferential treatment for Jimmy and Rosalyn Carter. Don’t you think BH felt smug when Carter’s picture appeared in the Orlando paper the next morning?!

Bad Press for “Technocreeps”

Thanks to our stalwart readers, we have received clippings and reports of Monitoring Times making the news in at least seven newspapers around the country, including Alaska. But the press isn’t generally complimentary.

As David Williams of Louisiana says, ‘I’ve been called ‘Daddy’ by my little boy, ‘Darling,’ by my wife and some unmentionables by my coworkers at Westinghouse. But now I’m referred to as a ‘technocreeper’! Get real! If somebody has something to say that does not need to be overheard, they need to get a secure means of communications.”

David was responding to a quote from Norman Black of the Cellular Telecommunications Industry Association who said, “We are talking about a bunch of technocreep who are eavesdropping and violating our privacy in the name of a hobby.”

One Associated Press article which was widely circulated made the first mention I’ve seen in a long time of the House bill which would prohibit manufacture of cellular-capable receivers. Is this why Mr. Black upped the emotional content of his comments? Is the Senate vote finally coming up? So far the Senate has not included that legislation in their version of the FCC Appropriations Bill, but the CTIA knows the privacy issue is easily exploited.

What can you do? Write your senator and write a letter to the editor when you see such distortions in your newspaper. A couple of readers suggested MT should issue a newsletter to the media. Help set the record straight and tell the media the good side of the radio hobby.

Inside Information

John Moran of Tempe, Arizona, enjoyed August’s “Ringside at the Runway” article, and adds these experiences: “Every week I commute between Phoenix and Los Angeles. The people at Delta know that by using my scanner I can give them advance information on any anticipated inbound or outbound delays.

“On the Phoenix Airport, the roof of Terminal 3 (eight stories high) provides a nice location for airline monitoring or photography. T-3 and T-4 are right next to the tower so you can get great photos of the tower also.

“At Los Angeles International (LAX) there are several good viewing and monitoring locations. The Theme Room Restaurant in the center of the terminal complex provides a nice view of both the north and south complexes. Especially at night, you can see the planes seem to fall out of the sky as they turn on their landing lights and prepare for the approach.”

Imperial Highway runs along the airport’s southern boundary with a panoramic view, or you can park for free at Imperial Terminal and get close-up views of aircraft as they taxi by.

“During the LA riots, the approach controllers at the LAX traffic control facility had to try to keep planes approaching LAX away from the riot areas. Usually LAX uses runway 24 and 25. However, at night (midnight-7am) they have opposite direction traffic for noise abatement. During the riots, when it was reported that shots were fired at aircraft, the controllers quickly moved all traffic out over the ocean using the opposite direction scheme. This resulted in some delays as aircraft were told to circle until they could be worked into the pattern.”

The Quiet on the Western Front

While on the subject of the LA riots, the lack of communications on National Guard frequencies was noted by several monitors. Jeff Haverlah of Humble, Texas, came across a partial explanation in an article by National Guardman Robert McGlashan in Reason magazine. The article says, “The police radio was rarely silent, but our military radio was extremely quiet. Field units used the military channels to establish contact upon arriving at a new location or to report that something was going on. Calls over the military radio took the highest priority. If... it was important enough to call us, it meant that trouble could erupt and someone could get hurt or killed.”

This practice agrees with what Brian Webb of Los Angeles also monitored. “I heard a small amount of military communications. Much of what I heard appeared to be military technicians setting up communication equipment and performing radio checks. After an hour or so, I didn’t hear anything from the military.”

However, while in Koreatown, Brian pursued the question with a National Guardsman named Hunter. “He said that their portable radios had a low transmitter power output. His group

Continued on page 97
What does the new 1993 World Radio TV Handbook have to offer to you?

- High frequency broadcasting reception conditions.
- Over 80 pages listing the long and medium wave stations throughout the world.
- Nearly 30 pages listing all the shortwave stations with addresses and names of key personnel.
- Annual review of shortwave receivers.
- Hour-by-hour guide to broadcasts in English.
- Country-by-country listings of long, medium, and shortwave broadcasters by frequency, time and language.
- Special "How to use the WRTH" section -- in English, French, German, and Spanish.
- Completely revised maps with the current geopolitical boundaries and principal transmitter sites.

ORDER NOW - SAVE OVER 20%!

Grove Enterprises, Inc.
1-800-438-8155
140 Dog Branch Road
Brasstown, NC 28902-0098

* Free shipping in the United States only.

PAYMENT WILL BE PROCESSED AT TIME OF ORDER. For foreign surface mail add $5 (Canada) or $10 (Europe); foreign air mail add $5.50 (Canada) or $20 (Europe).
"Ungodly" Gays

The Lambda Amateur Radio club, a group of gay and lesbian radio operators that is currently suing the American Radio Relay League (ARRL) for the right to advertise in QST, has taken an unexpected hit from 73 magazine. Publisher Dr. Wayne Green has cancelled their classified ad in his magazine. Green also reportedly criticized the group saying that "Suers belong in the sewer."

He also added that "I've come to the conclusion that homosexuality is ungodly and... on a par with any other birth defect."

Lambda president Jim Kelly, KK3K, was outraged saying that "Our days of doing as we're told by bigots are over!" The gay radio group's ad still runs in CQ magazine.

"Ungodly" Women?

It's another positive step, say officials from the government of Afghanistan: female broadcasters have been banned from TV. The change came after demands by some radical Mujahedin elders. Until the complaints were received, women were allowed to present the news so long as a scarf covered their hair and neck.

Dianagate

After holding the story for two years, the London Sun finally revealed the existence of tapes which appear to contain conversations between Princess Diana and a man, possibly James Gilby, a marketing consultant for Lotus Cars.

The two radio hobbyists who taped the calls and then sold them to the Sun were taking quite a risk: Listening to a conversation transmitted by any post or public communications system is illegal by the Wireless and Telegraphy Act of 1949, and divulging it to a third party is likewise illegal (as it also is in the United States).

In the United Kingdom, you can only legally listen to broadcast radio stations, TV stations (for which you need a license), CB radio, and amateur radio. Listening to anything else (i.e., marine transmissions, air traffic communications, etc.) is illegal unless you are licensed to do so.

Even possessing a scanner having an unauthorized frequency programmed into memory can be enough to get a conviction against you, whether you were caught while listening or not, says English contributor Paul Greenwood. Greenwood found it rather astonishing that there appeared to be no plans to penalize the hobbyists (called "hams" in the English papers) who taped the conversations.

Bob Grove was called by the British media to confirm the technology involved in such intercepts—(the hobbyist who made the first tape used an ICOM R700 "spy radio")—and to inquire about similar activity in the U.S.

Flashback/Changes

Shortwave listeners in the late 1960s could easily hear the droning, anti-imperialist rhetoric of the hard-line Radio Moscow. Spin the dial and they could listen to Vietnam's Hanoi Hama attempting to demoralize U.S. troops in southeast Asia.

Boy, have things changed! A station broadcasting in Vietnamese and calling itself the "Voice of Freedom" has been using old Radio Moscow World Service transmitters. Funding for the station comes from private individuals in the United States.

All's Fair in Love and War...

A former Palm Beach condominium manager is facing wiretapping charges for allegedly trying to put a homemade tap on the building's telephone lines. According to the Palm Beach Post, investigators arrested 49 year old Philip Paul Hockman after they discovered that he wired a tape recorder to his own phone line so he could listen to conversations between his wife and his girlfriend's husband.

Hockman maintains that he didn't do anything wrong since it was his own phone line that he tapped and because he purchased all of the materials at a local Radio Shack.

However, when a Southern Bell investigator went to the condo, court records indicate that Hockman reportedly gave a condo employee $2,000 and instructions to destroy a box containing five cassette tapes and a handgun.

Hockman is free on $1,000 bond.

Roving Wiretaps Approved

A federal appeals court has given its approval for roving wiretaps, saying that they are a reasonable response to criminals who use several phones to avoid detection. The decision makes the Ninth U.S. Circuit Court of Appeals in San Francisco the highest level court to uphold the 1986 law that allowed the moving taps.

But according to Associated Press, it won't be the last. A lawyer in the case promises to appeal saying that the ruling gives the U.S. Constitution "another whack on the jaw."

Radio Recovery

"It might be a little boring, but we don't have to worry about advertisers or ratings," Army Sgt. Steve Malnar, told the Orlando Sentinel. Malnar is a military broadcast journalist who is helping to provide a steady stream of information to hurricane victims in Homestead, Florida. The make-shift 400-watt AM station, Radio Recovery, broadcasts over a 30-mile radius from a tent pitched in a parking lot.

Getting out relief information has been a major problem in a town without electrical power. In addition to providing the AM station, 12,000 inexpensive, battery-operated radios are being distributed by the Army so that the population can pick up the broadcasts.

A day's broadcast might include such news items as agency phone numbers, the location of a food drop, and encouragement for people to use the showers and toilets at the tent cities. Radio Recovery broadcasts in English, Spanish and Creole, and is reported to be adding a Guatemalan dialect.

The station broadcasts on 1610 kHz; if its 400 watts are boosted to 1,000 as planned, there is a chance you might hear it. If you do, reports may be sent to: SPC Steven Malnar, Radio Recovery, Federal Emergency Management Agency, Field Office 955, 36th and LeJeune, Bldg. 11, P.O. Box 4022, Room 3427, Miami, FL 33159-4022.

In a related story from the Associated Press, relief worker Herbert Engelmann was declared clinically dead after being struck by lightning. Engelmann, an amateur radio operator, Navy medic, and worker with the handicapped, was helping direct an Army helicopter loaded with food and supplies at the time he was struck.

Food, Folks and Fun

If you liked listening to your local fast food restaurant on your scanner, you're going to love listening to your local hospital.

The same technology that allows scanner listeners to hear such things as "I'll take a burger, small fries and a chocolate shake" may now allow them to hear "Mr. Miller in cardiac arrest."
COMMUNICATIONS

Instead of using hospital intercoms, nurses can now wear headset/microphone combinations that will give them instant, hands-free access to the central desk and the assistance they need instead of having to find and fumble with an intercom.

The system is now being tested at Rush-Presbyterian-St. Luke’s Medical Center in Chicago and the Ochsner Foundation hospital in New Orleans. Frequencies were not specified.

Ding-Dong, WJZZ Calling...

Bob Tilden hears the news 24-hours a day—through his electric door chime. The only way he can sleep is to turn down the volume on the chimes. It’s hard to hear the door now but it doesn’t matter. No one ever wants to come back.

Tilden is one of a number of Oak Park, Illinois, residents who are living in what the Free Press called “Radio Hell.” Radio Hell is a location less than a mile from an 800 foot radio tower that carries four FM stations.

Eighteen of the residents are so fed up with the problem that they have filed suit against the owners of the tower and the FM stations. They are seeking $180,000 in damages plus a solution to the problem and a health study.

Nhoj Douglas, an audio consultant, says he’s never seen interference like that found at Bob Tilden’s apartment. He says that he measured strong radio signals on cold-water pipes on the basement floor. “These people are living in a very dense radio frequency field.”

Down They Come

According to the National Underwriter, insurance companies are becoming increasingly concerned about vandalism against communications towers. In February, a tower owned by the Christian Broadcasting Company and located in Edgerton, Ohio, was felled. Two additional television towers, both within a 15 mile radius of the one in Edgerton, also dropped that same week.

Vandals also destroyed an AM tower in North Carolina and a cellular phone tower in Illinois. Damages ranged from $120,000 to $300,000 to potentially millions of dollars.

According to one underwriter, it’s the owners of the towers that are under attack, not the equipment itself. In other instances, however, it appears as though environmental activists may have been involved.

“Towers are especially vulnerable to vandalism because they are usually erected in isolated locations,” insurers agree.

Eighth Wonder

It won’t be long before Poland will once again be able to lay claim to its place in history as home of the world’s tallest structure—a radio tower. The mast for Polish Radio’s longwave transmitter will reportedly be 646 meters tall and—at this point—will be constructed by a Polish firm. The original tower, located in Konstantynow, fell over last year.

The Dangers of Ham Radio

It’s a tough job but somebody’s got to do it. For 47 years, amateur radio operator Czeslaw Myślowski spent his life and his family’s fortune trying to make contact with UFOs. Then it happened. On August 25th, police switchboards (in Poland) lit up with over 250 reports of a strange object in the sky. The object, described as looking something like the Grove SW-100, supposedly hovered over the radio operator’s house for about 10 minutes, then zig-zagged into the sky and disappeared—along with Myślowski.

Police Captain Henryk Pazera stopped short of saying that the old man was abducted by space aliens. But he grudgingly acknowledged that the evidence does seem to point in that direction. “If you think I’m going to come right out and say it, you’re crazy,” said Captain Henryk.

The story of ham radio operator Czeslaw Myślowski came from a recent issue of the Weekly World News. We made up the part about the UFO looking like a Grove SW-100.

Thanks to: Dave Alpert, New York, New York; G. Keene Anderson, Orlando, FL; Don Beningfield, Garland, Texas; Jack Blum, Cities, Washington; Brian Catheart, West Palm Beach, Florida; Ogal Crews, Alexandria, Virginia; J. J. Freeman, Norfolk, Virginia; Paul Greenwood, Berkshire, England; Matt Gribas, Grand Rapids, Michigan; Wayne Heinen, Aurora, Colorado; Russ Hill, Oak Park, Michigan; Thomas McKeon, Indianapolis, Indiana; Vince Migliore, Santa Clara, California; Ricardo Molinar, Ft. Lee, New Jersey; Jim Pogue, Memphis, TN; Doug Robertson, Oxford, California; R. Rogers, Vancouver, British Columbia; William Sellers, Capshaw, Alabama; Joe Weidhaas, St. Louis, Missouri; the BBC Monitoring Service, the U.S. Federal Communications Service, the W5YI Report. Communications is written and edited by Larry Miller from material supplied by readers like you. Thanks.
Earthquake Prediction

Is Science Narrowing the Gap?

Story by Vince T. Migliore
Photos of October 1989 earthquake by Randall Lee

A magnitude seven earthquake releases about the same amount of energy as a one megaton nuclear bomb. Such powerful forces don't just appear magically, but rather accumulate over a long period of time by the movement of Earth's tectonic plates. The build-up and triggering of this energy, it would seem, should be capable of detection by scientific instruments. Seismologists have been frustrated, however, in their attempts to find a dependable short-term predictor of earthquakes, relying instead on 30-year probabilities based in large part on past history.

Now, some exciting new developments hold out the promise of reliable forecasting of large earthquakes anywhere from three hours to three weeks prior to an event. Equally interesting is the fact that these new techniques can be duplicated by back-yard geophysical monitoring devices easily built by electronic experimenters.

The modern science of earthquake prediction started soon after the Loma Prieta earthquake in California in October 1989, when a team headed by Anthony Fraser-Smith (STAR Lab, Stanford, CA) released a report of large increases of noise and transients in the ultra-low frequency (ULF) range of the magnetic spectrum (DC to 3 Hz). In fact, the Fraser-Smith study found a distinct pattern of increased noise from .05 to 10 Hz. "The system recorded anomalous magnetic activity beginning over a month before the quake, and continuing until the moment of the quake."

The Fraser-Smith study was momentous not so much for its documentation of magnetic events associated with earthquakes, but because, finally, the goddess of Western Science was able to capture signals just seven kilometers from the epicenter, thereby confirming the not-so-revered research coming out of Russia and Japan.

Earthquake Prediction Conference

Earthquake prediction goes back to at least ancient Greece when Aristotle and Pliny the Elder warned of coming quakes through such signs as birds not flying and tainted wells. The Chinese have a long folk history, and some recent successes, in earthquake prediction based on animal behavior. This is well documented in the classic, When the Snakes Awake, by Helmut Tributsch (MIT Press, 1982).

As scientific inquiry advanced through the electronics age, researchers were afforded powerful new tools to examine some of the legends and anecdotes regarding earthquakes. As mentioned, Russian, Japanese and some European researchers were already looking at the electromagnetic spectrum for quake precursors, but the subject was not given the nod of approval by U.S. investigators.

After Loma Prieta and the report by the Stanford team, the momentum was on the side of the unorthodox researchers. In June of this year, the United States Geological Survey (USGS — the agency responsible for earthquake prediction), quietly called a conference on this emerging new field of seismology. Begrudgingly entitled "Electromagnetic Precursors to Earthquakes: Fact or Fiction?" the workshop was by-invitation only to about 40 scientists and was organized by Dr. Stephen Park of the University of California at Riverside.

A delegate from the National Science Foundation (NSF), cosponsor of the conference, was

Deceptively upright buildings were often discovered to have collapsed one level, like an accordian. Military police from the Presidio and Ft. Ord prevented looting and sight-seeing. One MP, a Sgt. Buford Jackson, carried a PRO34 scanner and often heard of trouble spots long before hearing over the military handle talkie.
Called "antenna event" may be "August emphasis." Labs, Reno. and over prior research, researchers successfully predicted the it they want statistics, and look. They want statistics that can prove the "reliability measure," "They want statistics that can prove the "innovative researchers, however, rated the "few miles from the Lake Arrowhead meeting, raising the hope that "officially, one of the "team is a "effort plans into "low radio operators of increased noise and static all the way up to the high frequency bands prior to past seismic events. Seismic Triggers. Engineers and fire marshalls inspected and condemned buildings judged in danger of collapse. at the meeting, raising the hope that the NSF or the USGS would help fund further research in this field. The innovative researchers, however, rated the attitude of the funding decision-makers as anywhere from "hostile" to "playing devil's advocate" to the ideas presented. On the other hand, the continuing activity in southern California may tip the scales toward sponsoring experiments aimed at electromagnetic monitoring. "They want statistics that show a high correlation—a 90% reliability measure," complains Elizabeth Rauscher, one of the participants, "but the weather bureau is lucky if they reach 50% reliability, and look at the funding they get! But, it they want statistics, I'll give it to them. I think I can prove my point." During this conference, ironically, one of the researchers successfully predicted the 7.5 shaker that was to occur in Yuca Valley on June 28, 1992, just a few miles from the Lake Arrowhead conference site. Jack Dea, of the Naval Command, Control and Ocean Surveillance Center in San Diego noted a number of ULF transients prior to that quake. Dea uses a method developed over a decade period by Elizabeth Rauscher and William Van Bise of Electromagnetic Signal Labs, Reno, Nevada. The Rauscher-Bise method looks at transients in the .01 to 20 Hz range, with particular emphasis on the 3 to 4 Hz region. They claim detecting the signals is a science, but that interpretation is a real art form. Officially, they do not give quake predictions but privately they did foretell a 4.7 Yuca Valley aftershock in mid-August 1992, and they let slip that another major event may be on the horizon for California if there is a large solar flare. Other attendees explored different areas. A team of Greek scientists reported finding slow changes in ground potential prior to a quake—by simply measuring the voltage of a longwire antenna at ground level. This "VAN method" is described in a book just out by Haroun Tagiezef, called Earthquake Prediction, McGraw-Hill, 1992. Friedemann Freund of NASA Ames Research Center spoke about measuring certain charged particles prior to quakes. Several Japanese investigators looking at higher frequencies in the electromagnetic spectrum were also invited to the conference. Their efforts focused on radio emissions around 8kHz. Sausalito scientist Joe Tate, also an attendee, claims radio frequency transients have been detected prior to quakes across a broad spectrum from about 10 kHz up to 100 kHz. This brings to mind the many and persistent reports from ham radio operators of increased noise and static all the way up to the high frequency bands prior to past seismic events. Engineers and fire marshalls inspected and condemned buildings judged in danger of collapse. at the meeting, raising the hope that the NSF or the USGS would help fund further research in this field. The innovative researchers, however, rated the attitude of the funding decision-makers as anywhere from "hostile" to "playing devil's advocate" to the ideas presented. On the other hand, the continuing activity in southern California may tip the scales toward sponsoring experiments aimed at electromagnetic monitoring. "They want statistics that show a high correlation—a 90% reliability measure," complains Elizabeth Rauscher, one of the participants, "but the weather bureau is lucky if they reach 50% reliability, and look at the funding they get! But, it they want statistics, I'll give it to them. I think I can prove my point." During this conference, ironically, one of the researchers successfully predicted the 7.5 shaker that was to occur in Yuca Valley on June 28, 1992, just a few miles from the Lake Arrowhead conference site. Jack Dea, of the Naval Command, Control and Ocean Surveillance Center in San Diego noted a number of ULF transients prior to that quake. Dea uses a method developed over a decade period by Elizabeth Rauscher and William Van Bise of Electromagnetic Signal Labs, Reno, Nevada. The Rauscher-Bise method looks at transients in the .01 to 20 Hz range, with particular emphasis on the 3 to 4 Hz region. They claim detecting the signals is a science, but that interpretation is a real art form. Officially, they do not give quake predictions but privately they did foretell a 4.7 Yuca Valley aftershock in mid-August 1992, and they let slip that another major event may be on the horizon for California if there is a large solar flare. Other attendees explored different areas. A team of Greek scientists reported finding slow changes in ground potential prior to a quake—by simply measuring the voltage of a longwire antenna at ground level. This "VAN method" is described in a book just out by Haroun Tagiezef, called Earthquake Prediction, McGraw-Hill, 1992. Friedemann Freund of NASA Ames Research Center spoke about measuring certain charged particles prior to quakes. Several Japanese investigators looking at higher frequencies in the electromagnetic spectrum were also invited to the conference. Their efforts focused on radio emissions around 8kHz. Sausalito scientist Joe Tate, also an attendee, claims radio frequency transients have been detected prior to quakes across a broad spectrum from about 10 kHz up to 100 kHz. This brings to mind the many and persistent reports from ham radio operators of increased noise and static all the way up to the high frequency bands prior to past seismic events. Seismic Triggers. The June quake prediction conference had the effect of at least opening the door to the tracking of magnetic and electromagnetic anomalies as earthquake precursors. These non-traditional indicators, though, are just the tip of the iceberg. Off the record, several workshop participants (and many who were not invited) relate stories and suspicions of even more broad-ranging inter-connections with other disciplines. These other processes may also provide clues to forces that trigger earthquakes. Briefly, since they are less well studied and more controversial, the other areas of interest in quake prediction are as follows: 1. Magnetism. The Earth's geo-magnetic field extends far out into space and is influenced by the solar wind. Oscillations in this field have been associated with quakes. For a report on a Russian monitoring system see "Stalking LF Variations in Earth's Magnetic Field," by William Worthington, Evaluation Engineering, January 1991. 2. Atmospheric. Radio wave propagation may be linked to earthquakes. The ionospheric layer responsible for radio wave skips is influenced by solar flares and the diurnal rotation. There are times when radio propagation experiences a sudden drop or sudden enhancement of signals that may be correlated to earthquakes. Several amateur radio operators are using worldwide beacons to measure changes in propagation. The role of solar flares in earthquakes was pioneered by Patrick Huyghe, "Earthquakes: the Solar Connection," Science Digest, October 1982. 3. Gravity. Studies of solar, lunar and planetary tidal forces acting on the earth have been linked to quakes. Quake prognosticator Jim ... 1992. Friedemann Freund of NASA Ames Research Center spoke about measuring certain charged particles prior to quakes. Several Japanese investigators looking at higher frequencies in the electromagnetic spectrum were also invited to the conference. Their efforts focused on radio emissions around 8kHz. Sausalito scientist Joe Tate, also an attendee, claims radio frequency transients have been detected prior to quakes across a broad spectrum from about 10 kHz up to 100 kHz. This brings to mind the many and persistent reports from ham radio operators of increased noise and static all the way up to the high frequency bands prior to past seismic events. Seismic Triggers. The June quake prediction conference had the effect of at least opening the door to the tracking of magnetic and electromagnetic anomalies as earthquake precursors. These non-traditional indicators, though, are just the tip of the iceberg. Off the record, several workshop participants (and many who were not invited) relate stories and suspicions of even more broad-ranging inter-connections with other disciplines. These other processes may also provide clues to forces that trigger earthquakes. Briefly, since they are less well studied and more controversial, the other areas of interest in quake prediction are as follows: 1. Magnetism. The Earth's geo-magnetic field extends far out into space and is influenced by the solar wind. Oscillations in this field have been associated with quakes. For a report on a Russian monitoring system see "Stalking LF Variations in Earth's Magnetic Field," by William Worthington, Evaluation Engineering, January 1991. 2. Atmospheric. Radio wave propagation may be linked to earthquakes. The ionospheric layer responsible for radio wave skips is influenced by solar flares and the diurnal rotation. There are times when radio propagation experiences a sudden drop or sudden enhancement of signals that may be correlated to earthquakes. Several amateur radio operators are using worldwide beacons to measure changes in propagation. The role of solar flares in earthquakes was pioneered by Patrick Huyghe, "Earthquakes: the Solar Connection," Science Digest, October 1982. 3. Gravity. Studies of solar, lunar and planetary tidal forces acting on the earth have been linked to quakes. Quake prognosticator Jim ...
Monitoring the Seismic Radio Network

The US Geological Survey (USGS) in conjunction with a number of state universities maintains an elaborate network of seismic detectors across the country. These are remotely monitored via VHF-FM telemetry.

To escape interference, frequency assignments are often on splinter channels (162.596875, 166.421875 MHz, etc.) or in less densely populated portions of the spectrum (217.960, 217.545 MHz, etc.).

Such channels are easily identified by their continuous complex tone. Not a pure pitch like mobile telephone on-hook tones, seismic detectors typically emit a combination of three tones which indicate east/west, north/south and up/down movements of the earth’s crust.

Technically-inclined experimenters who would like a packet of information and schematic diagrams of demulators for these seismic transmissions may send $5 to Monitoring Times Reprints, PO Box 98, Brasstown, NC 28902.

We also recommend the Seismic Precursor Net listed above.

RESOURCES

- Geo-Monitor newsletter. Contents include monthly earthquake listings and maps, tracking lost pet ads, solar activity, news events and literature review. Each month includes a simple, low-cost home-built device that may be useful in earthquake prediction. Subscription price is $24.00 for 12 issues (USA) and $30.00 for overseas airmail. Write Geo-Monitor, #400, 65 Washington Street, Santa Clara, CA 95050. Phone: (408) 749-6770. Back issues are $2.00 each. Sample projects include the following: Pendulum seismometer - Vol.2, #3, August '92. Magnetic transient detector Vol.2, #1, May '92. Radio propagation studies Vol.2, #4, April '92.

- Public Seismic Network. This group was founded on the idea of linking backyard seismographs to a USGS computer network. It has evolved into a wellspring of information for amateur scientists and professionals alike. Lots of fantastic share-ware and interesting dialog Systems. Op Steve Hammond: voice (408) 365-9830; BBS Pasadena (818) 797-0536; BBS Menlo Park (415) 327-1517; BBS San Jose (408) 226-0675. All are in California, using 2400 baud, 8 none-1.


- Seismic Precursor Net. The literature they send out contains a thorough description of their activities, addresses for further information, schematics and plans for seismic sensing devices, and photocopies of related magazine articles. Also available are plans for quake detectors and decoding transmissions from USGS seismometers. Send $10 to S.P.N. Keith Higgins, P.O. Box 306, Lakewood, CA 90714-0306.

Figure 1.
Operation of the Reed Switch Magnetic Disturbance Detector.

The steel bolt brings the magnetic field from a permanent magnet into the vicinity of the Reed switch. The bolt is adjusted up to the threshold of tripping the switch. A disturbance in the Earth’s geomagnetic field triggers the switch, closing the circuit to an output device, such as a buzzer.

Reset circuit not shown.

Berkland, of Santa Clara County, California, uses high tides and the influence of the moon as part of his formula to predict quake "windows."

4. Geophysical. A wide variety of physical measurements may be helpful in predicting quakes. These include well water levels and temperature, release of gases and chemicals, ground resistivity, and weather patterns. Most such measures are accepted as valid by seismologists, and instruments to record these changes are in place in Parkfield, California, where the USGS expects a quake soon.

5. Psychics and Sensitive. The recent discovery of magnetic particles in the human brain follows similar findings in birds and mammals, and may lend some credence to human "psychic" predictions. Animal and marine behavior is also credited with quake forecasting by some.

Amateur Scientists

Earthquakes are relatively rare events, so monitoring of natural geophysical events to determine which ones are valuable in quake prediction can be a frustrating and time consuming occupation. Meanwhile, open-minded scientists generally don’t have the resources nor the blessing of the bureaucracy to investigate some of the more controversial theories. This is a situation begging for the involvement of amateur scientists. There are quite a few simple-to-build experiments that can make profound contributions to quake prediction, the stepchild of the establishment.

To mention just a few: monitoring of radio beacons for sudden changes in propagation; tracking solar flares and lost pet ads; using a ULF converter to sample noise in the 10 to 100 kHz region and feeding the output to a strip chart recorder; and detecting and logging oscillations in the Earth’s magnetic field.

Such projects gain value exponentially when they are conducted simultaneously with other tinkerers. To this end, I have been trying to create a forum for amateur experiments related to earthquakes. This forum takes the form of the Geo-Monitor newsletter (see sidebar). If you are terminally curious, would like to share ideas, or participate in some novel experiments, please send $2.00 for a sample issue.

One of the devices we use is a Reed switch magnetic field disturbance detector (Figure 1). For about $40 this simple detector gives the same results as a professional magnetic receiver and data acquisition system—namely an alarm when there is a wobble in the Earth’s magnetic field. The alarm went off three times one morning at exactly the same time as the alarm of another researcher eight miles away. Another time it sounded when there were two small earthquakes (2.0 and 2.7) in Hollister, California, about 40 miles away. This doesn’t mean the invention is a foolproof prediction instrument, but it does show that simple instruments can measure geophysical events that may be related to earthquakes, and that more research is needed.

Amateur radio operators and science experimenters have made tremendous contributions to the body of human knowledge. We may be on the threshold of momentous discoveries in the lifesaving ability to predict earthquakes. We have a great opportunity not only to learn about, but to participate in an exciting new science.

Vince T. Migliore is a technical writer and researcher. He is editor of the Geo-Monitor newsletter, which is dedicated to earthquake prediction, amateur geophysical monitoring and earth mysteries.

Randall Lee is Fire Information Officer for the California Department of Forestry.
Being Prepared: Equipment

By Barnaby J. O'Leary

It's Tuesday, October 17, 1989, 5:03 pm at Candlestick Park, and I'm working the World Series as a systems technician in the Pacific Bell Broadcast Services Group (video and audio transmission). In just 60 seconds, my life and the lives of 58,000 others at the 'Stick, not to mention the lives of many other northern Californians, will never be the same.

The clock inches toward 5:04 pm. As the players are being introduced on the field, a strange thing happens. There appears to be applause at an inappropriate time. It's not applause. Just then, the floor begins to vibrate and the whole stadium jumps and sways for the longest 15 seconds of my 51 years. It's 5:04 pm and terra firma has turned to jello. The San Andreas Fault has just fractured!

Electric power came and went, then went for good. My sole source of radio information was a Sony FM Walkman. I turned from 88 to 108 MHz and found virtually nothing. Little by little, stations with emergency generators came back on air, but much to my amazement, most had automated programming and were of no help. I have never felt so helpless! Never again will I be without a proper emergency communication package.

Here are the contents of the package I've carried ever since:

- One Bearcat BC-200XLT Scanner with Metro West Battery Pack
- Three standard BP-200 battery packs
- One Sony ICF PRO-80 handheld 150 kHz to 108 MHz LW, MW, SW, FM
- Three BP23 Nicad packs
- One Alkaline pack
- Various adaptors
- Two 4-packs AA cells
- One AM/FM Walkman
- One 50-ft roll antenna wire

All this is contained in a small camera bag by Tamrac, 9" W x 7" H x 7" D. The front pocket contains an AIWA AM/FM Walkman, and the top lid pocket contains frequency data sheets and a calculator (which if it were a data organizer, could also contain frequencies and phone numbers). A neat package.

The Acid Test

In March of 1992, after returning from a chat with a neighbor, I entered my home to find I had no AC power. It would be a long time coming. My ICOM-R71A and Realistic* PRO-2005 had been done in.

It's at times like this that the creative juices start to flow. My antenna farm was still intact. The R71A has two shortwave trap antennas at right angles plus a sloping 66 ft. Windom antenna running diagonal to the other two. These three feed an MFJ-1704 antenna switch, the output of which feeds the R71A.

I simply removed the feed to the R71A and with UHF-TNC adaptors, attached my Sony ICF PRO-80. Never has so small a radio been mated with such an antenna farm! Conclusion: The Sony PRO-80 is one fine mini-might. Later, I heard clearly the South Pacific, Australia, New Zealand, etc.

Next, I needed to replace the PRO-2005. It, too, has an antenna farm, consisting of one Diamond D-130J discone plus one Archer multi-band vertical antenna with ground plane. Both feed an MFJ CS-1X2 coaxial switch, the output of which feeds the 2005. I simply removed the coax feeding the PRO-2005 and attached it to the Bearcat 200XLT. Although 55 miles north of San Francisco, this combination produced a Bearcat 200XLT with very sensitive ears!

Back to Shortwave

While rummaging around for flashlights and batteries, I came across my old Sony 2001 under much dust. Had I removed the batteries before storage? Fortunately, I had. I had also accumulated over the past year, on sale, a variety of batteries for my lair. In popped three D-cells and old 2001 came to life. With a vertical antenna of just 46 inches, I was pleasantly surprised by its sensitivity, although at times selectivity was a bit loose.

Feeling totally in control of my situation, I kicked back with some Armenian finger food.
Afterthoughts

I won’t have a gas generator because of fuel shortage problems. However, if I had a 12 volt battery under float charge, my PRO-2005 could be powered directly and so could my R71A with an optional card.

In the end, I am quite pleased with the performance of my magic camera bag. It is never out of my sight.

KNSD-TV Channel 39 San Diego.
Ku band uplink truck can broadcast live from anywhere the truck can go. Communications also include cellular phones, business band UHF radios and numerous scanners.

Getting Involved

It was the annual Field Day for amateur radio clubs all over the United States and Canada when another earthquake struck Southern California. Bob Fraser of Cohasset, Massachusetts, sent in a clipping from the Patriot Ledger by reporter Shirley Leonard.

"Operators test their ability to make contact with other amateur radio operators during emergencies such as hurricanes and earthquakes. The schedule called for the drill to end at noon Sunday. But in Southern California, the test ended when the ground began to shake early Sunday morning," she said.

"The chatter from radio operators in the area went dead almost immediately. Abandoning the drill, they began passing along emergency information." "They went from practice to reality real fast," said Rick Turner, a member of the Whitman Amateur Radio Club.

"It’s typical of California," Fred Roog of Brockton said. "They go for special effects. They went all the way."

(lavosh) and a glass of Chardonnay (this is California).

The following morning after breakfast, I checked all the radios. All but one worked—my 2001. I exercised the battery normal jack, no luck. Next I removed the batteries and measured their voltages. The first two were 1.45 volts, but the last was near zero. Then I felt the ooze of a leaking leakproof battery. This battery was replaced after cleaning the battery case. The lesson to be learned here is keep a ready supply of batteries, but rotate the supply so as to have a fresh supply on hand.

Being Prepared: Frequencies

By Todd D. Dokey

Last spring’s earthquake in Humboldt County, California, may be old news, but it's not old to those who are still recovering from the devastation. Such natural disasters always beg the question: What could I do to be better prepared and to help those around me?

During the Oakland Hills fire last fall, I was glad to have been prepared to cover the emergency. I looked into my computer files and pulled up all the relevant frequencies (more than I could really handle) and was able to listen to events as they happened.

This kind of preparation had always felt adequate until the Humboldt earthquake, after which I decided that listening was not enough. It reminded me of the last great San Francisco earthquake. In 1989 I had good connections through a long distance phone company and spent that first night in three-way calls to San Francisco connecting friends with worried family members. For some reason the company I worked for was able to get through in that first night.

This time I felt somehow unable to help. Not only did I not know anyone in Humboldt—I could not communicate what I heard from OES (Office of Emergency Services) or the Red Cross. I found myself becoming angry with the news agencies for not taking the small amount of time it would have taken to put together a standby network among affiliate stations in order to handle emergencies. No one seemed to have the basic information handling skills that I had at my disposal for monitoring.

Is this a sign that I am getting older?—that I consider these skills to be simple and obvious, when they really may not be to others? This realization is forcing me to change what I do with respect to monitoring. I decided it is time to become involved in amateur radio. I have been around ham radio for more years than I care to admit, but I never took the time to get the ham license, even though I have an aging First Class license.

It bears repeating that we must prepare for the unexpected, even if our only goal is to remain informed. So with that, I will dig into my databanks and come up with frequencies relevant to the task in preparation for "the next time."

<table>
<thead>
<tr>
<th>Humboldt County Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHERIFF</strong></td>
</tr>
<tr>
<td>154.740</td>
</tr>
<tr>
<td>154.920</td>
</tr>
<tr>
<td>155.070</td>
</tr>
<tr>
<td>155.850</td>
</tr>
<tr>
<td>155.475</td>
</tr>
<tr>
<td>45.600</td>
</tr>
<tr>
<td>453.000</td>
</tr>
<tr>
<td>155.700</td>
</tr>
</tbody>
</table>

**RED CROSS** | **CHP** | **STATE WIDE MINES/GEOLGY**

| 47.600 | 42.240 | Emerg. Mags. Seismic monitoring |
| 47.420 | 42.540 |
| 155.280 | 159.300 | 217.500 |
| 155.540 | 151.355 | 218.000 |
| 155.955 |

**CALIFORNIA OES**

**CESRS**

**D&C** | **Statewide** | **CALCORS** | **USE/1** | **FIRE**

| 154.980 | 156.075 | 7.480 | 154.160 |
| 153.755 | 7.802 | 154.220 |
| 5.140 | 33.980 |
| 2.419 |
| 2.422 |
| 2.812 |
| 2.804 |
| 2.326 |
| 5.195 |
| 7.805 |

**SECURE = State Emergency Capability Using Radio Effectively.**
NEW From The United Kingdom... LOWE HF 150

LOWE HF 150

At last! A high quality receiver at an affordable price. This Little Giant will hold its own against those Big Guys, some costing twice as much. Simplicity makes the HF 150 easy to operate. Superb audio enhances the HF 150's performance. State-of-the-art features offer: Synchro Detection, 60 programmable memories, Pre-Amp for whip antenna and optional Keyboard entry. Don't let size fool you. This truly is "Real Radio".

GATEWAY TO THE WORLD

LOWE HF 225

Same high quality construction and reception. Rated 4 Stars by Passport. Larry Magne. Many features of the higher cost radios.

- Frequency 30kHz - 30 MHz
- Multimode, AM, SSB, CW
- Optional AM Synchro & FM
- 30 Memory Channels
- Filter for all Modes
- Passport White Paper Available. #RD19 FOR $5.50

HF 225 INTRODUCTORY PRICE $749.95.
HF 235 ALSO AVAILABLE, CALL FOR PRICING

SONY M770V

- Turn your scanner into a logger. No time gaps
- Record all the action, listen later
- Time/date/digital record/play on LCD
- Ext. audio In/Out, built-in mic.
- Audio auto start/stop
- 2.4 x 5 x 1.14" 7.4 oz.

list $119.95 EEB $99.95

SCANNER SALE

FAIRMATE

HP2000 5-1300MHz $379.95

BECARAT

BC100XLT VHF/UHF $199.95
BC200XLT VHF/UHF/800 $239.95
BC760XLT VHF/UHF/800 $269.95
BC800XLT VHF/UHF/800 $249.95

Electronic Equipment Bank
323 Mill Street N.E.
Vienna, VA 22180

ORDERS: 800-368-3270
Local Tech: 703-938-3350
FAX: 703-938-6911

NOW SOLD & SERVICED BY EEB

Baby Ruth

High Quality Receiver

- Frequency 30kHz - 30MHz
- Multimode, AM, LSB, USB
- AM Synchro, ASU, ASL, ASF, ASD
- Bandwidth 7kHz & 2.5kHz
- Tuning Step A Fine 8Hz
- Optional Keyboard
- 60 Memories (FREQ & MODE)
- 3 ANT INPUT, 600 BAL, 30 OHM COAX and HIZ (WHIP)
- Built In Speaker, EXT. Jack & Record OUT
- Case, All Metal Light Alloy
- SIZE 7.3" W x 3.2" H x 6.3"D WEIGHT 2.9 LBS.
- OPTIONS:
  - 120V ADAPTER
  - TELESCOPE WHIP
  - KEYPAD
  - CARRYING STRAP
  - BABY RUTH Included

HF150 INTRO PRICE $599.95 (LIST $699)
CALL, FAX OR WRITE FOR DETAILED FLYER!

SONY'S NEWEST

ICFSW55 $369.95
ICFSW77 $499.95
ICFSW7600 $219.95
ICFSW800 $129.95

SPECIAL LIMITED STOCK

ICFSW1S $CALL
PRO80 $CALL

SPECIAL PURCHASE

GRUNDIG SATELLITE 500

FREE Instructional Video and Dust Cover

SW 1.6-30MHz LW, AM, FM
- 42 Memory Synchro AM Detection
- AM, FM, LSB, USB
- Best Audio of any Portable
- Alpha/Numeral Station ID Memory
- 120/220VAC/13VDC/4 "D" Cell (opt. Nicad)
- National ad up to $699.95
NOW on Limited SALE $399.95

ICOM SIMPLY THE BEST!

NEW R7100 25-2000MHz
900 Memories AM/FM/FM/SSB, Clock, Recorder Control, many specs same as R7000. Much improved sensitivity. Only 9.5x3.7x9.4" 13 lbs.

ICOM List $1497 EEB $1269

ICR7000 List $1431 EEB $1199
ICR71A List $1204 EEB $1019
ICR72A List $1103 EEB $939.95
ICR9000 List $5581 EEB $4975
ICR100 List $721 EEB $619.95

NOW EEB PRICED at only $499.95

NEW LOW-NOISE, Pre-Amp
NOW Up To 25% OFF

- Improve your scanner performance
- Low noise GaAs, FET
- Hi-quality surface mt.
- ICOM/M75 24-2150MHz
- Gain -6+20dB, Band select
- Switch full, 108-185 & 225-1500MHz.
- ICOM Auto Switch 5W HT Power
- ICOM Fixed Gain 25-1300MHz (2) AA
- ICOM/M75 9V batt or ext. 12VDC

M50 $99.95 $74.95
M75 $119.95 $99.95
M100 $149.95 $119.95

ICOM R1

ICOM R1 World's smallest scanner!
.1 to 1300MHz, no gaps
AM, FM, FMW, 100 memories.
Only 1.9x4.0x1.4 9.9 ozs.
Listen to shortwave, local AM/FM, Police, Airband, Amateurs, TV sound. ALL 800MHz!

The World of Radio in Your Hand!
ICOM LIST WAS $625
NOW EEB PRICED at only $499.95

- Sorry No COD's
- FREE Catalog in U.S.
- Money's not included
- Prices subject to change
- Returns subject to 20% restock fee
Radio Interoceanica

Solid Friendships from a Shaky Past

Story and photos by Kenneth D. MacHarg

In the heart of Ecuador, where the Andes mountains meet the jungle, there is a small radio station with affectionate ties to Canada’s Ontario DX Association.

In 1987, a terrible earthquake struck the region around Santa Rosa, killing up to 4,000 people, destroying almost all homes in the area, knocking out the trans-Ecuadorian pipeline costing the country billions of dollars in international trade, and turning radio station HCRI—Radio Interoceanica—into a pile of rubble.

Reports over HCJB’s DX Partyline shared the plight of these hard working people with the world and brought concerned response from compassionate people in many countries.

Among those with an interest were the members of the Ontario DX Association (ODXA) who responded with a generous contribution to help rebuild the area’s only radio facility.

To drive out of the mountains and into the gently rolling valley where Radio Interoceanica is today, one would hardly know that such a disaster had struck only five years ago. Other than scars on the steep mountainsides where landslides occurred following the “terremoto,” most reconstruction is finished. The oil pipeline snakes through the lush green valleys between majestic mountains and along rushing mountain rivers to the small settlement of Santa Rosa.

In the middle of the pueblo stands the attractive new building housing this station which ties the community together. Congenial manager, Byron Medina, is proud of the new facility which he says is the only voice available on local bands to the thousands of people in this remote part of the Napo province.

Radio Interoceanica’s shortwave transmitter is a rebuilt RCA medium wave transmitter with 1,000 watts.

The station is owned by the Swedish Covenant church and has received extensive funding from the Swedish government which views its educational broadcasts as an educational and developmental project. (Church-state rules evidently don’t apply to Swedish government expenditures as they do to U.S. government funds). Government funds from Sweden were also used to help build HCJB’s new hospital at Shell, Ecuador.

Today, Radio Interoceanica emphasizes health concerns, education, science, agriculture and other developmental topics throughout its broadcast day. Señor Medina says that, as the only local station, Radio Interoceanica places news at the top of its priority list, developing newscasts throughout the day from items in one of Quito’s daily newspapers, and using HCJB’s Spanish newscasts as another source. The station also carries soccer and other sporting events from HCJB which it receives via a shortwave receiver in its studios.

Christian broadcasts are also important to this religious station. Each Sunday, a full worship service in the Indian language Quechua is broadcast especially for those living in remote mountain valleys where no churches exist. Byron Medina says that when Radio Interoceanica removed those Sunday morning services from the shortwave schedule a year ago, the station was flooded with letters from listeners asking that they be
All commercials and spots are on reel-to-reel tape. Here the operator cues one such message in the main control.

reinstated. He mentioned one entire small town without a church or pastor who gather together each Sunday morning to worship via radio.

Daily Quechua broadcasts are offered from 6:15-7:00 am local time, with the remainder of the day given to Spanish. Indian dialect hours are expanded on Sunday.

The attractive studio building (which ODAXA funds helped to reconstruct) houses two complete studios, either of which can be used as the master control. Between the two control rooms a larger studio can be used for musical presentations or group discussions. The station does not use cart machines so common in North American stations, but each “spot” is on reel to reel tape which must be manually cued for every use. Manager Medina and his family live in a second floor apartment in the building. Other offices of the mission are located in an adjacent building.

Currently, Radio Interoceanica transmits on shortwave on 4940 kHz from 1100-1500 UTC and again from 2000-0200 UTC. Their FM frequency (96.3) is utilized from 1100-0200 UTC, with the shortwave transmitter simulcasting the FM programming. On Sunday, the shortwave transmitter remains on all day.

Prior to 1987, the station also broadcast on mediumwave. However, according to missionary engineer Olaf Hegmuir, local reception of AM was difficult, if not impossible, because the surrounding mountains blocked the signal. So Olaf took the old 1,000 watt mediumwave RCA transmitter and rebuilt it for shortwave. He says

Outside of their new studios in Santa Rosa, Ecuador, Radio Interoceanica general manager Byron Medina (left) greets John Beck, International Program Director of HCJB.
he is pleased with its performance. Besides reaching the local population tucked away in remote mountain or jungle villages, the station also reaches an international audience as attested by letters received from listeners in Costa Rica, Japan, Colombia, Venezuela, the United States and parts of Europe.

A transmitter site two blocks from the studio building was virtually undamaged by the 1987 earthquake. The two AM towers still stand, one being used for the FM antenna. For shortwave, Olaf has built two lazy H simple dipoles on either side of the AM array to send the signal straight up, allowing it to cover the region like an umbrella.

Byron Medina speaks proudly of the 18 hours per day of programming which his small staff of four produces. He recognizes that Radio Interoceanica is a vital link to reach the people of this rugged province with health information, educational information, and the latest news. He also speaks positively about the response of area residents to the Christian message carried by the station’s transmitters.

Radio Interoceanica appreciates letters from listeners in far away places. While it may take time for the beleaguered staff to get a confirmation letter off, Byron says that all correspondence is answered eventually. Those writing to the station would be advised, if possible, to correspond in Spanish. The station address is Radio Interoceanica, Santa Rosa, Canton el Chaco, Provincia de Napo, Ecuador.

Byron and Olaf both speak of their appreciation for those who responded to the needs of the people in their area following the disaster of 1987. Olaf mentions the special tie to radio listeners in Canada who cared enough to help out a small station in South America.

Looking from the main control room through the center studio on into the second control and tape library.

Various feed lines for the shortwave antennas spread out on either side of the old AM array. AM was taken off the air after the earthquake in 1987 because surrounding mountains blocked the signal. Today the station uses FM and shortwave.

The station’s old medium wave antenna (a dipole) stands about two blocks away from the studios. The FM antenna is on the closest tower, with two shortwave dipoles on either side.
**Communications Electronics Inc.**

**Emergency Operations Center** has expanded to our new two acre facility and World Headquarters. Because of our growth, CEI is now your one stop source for emergency response equipment. When you have a command, control or communications need, essential emergency supplies can be rush ordered by CEI. As always, for over twenty three years, we're ready, willing and able to help. For 1992, we're introducing new products from Uniden, Shinwa, ICOM, Ranger Communications Inc., Grundig, Sangean, Magnavox and RELM.

**NEW! Shinwa SR001-B**

List price $799.95/CE price $479.95/SPECIAL Continuous coverage from 25,000 through 999,995 MHz. If you're looking for an excellent synthesized scanner designed for mobile marine use, the new Shinwa SR001 scanner offers features never before offered at such a low price. When you purchase this wide band coverage, CEI, you get a two-way infrared wireless remote control that lets you control your scanner from over 20 feet away. Selectable frequency steps of 50.0/10.0/12.5/20.0/25.0/ 50.0 or 100.0 kHz are available. Dual antenna inputs terminating in an "N"-type and "BNC" connections are provided. Other features include 200 memory channels grouped in 10 bands of 20 channels, easy to read multi color LCD display, lithium battery for memory back-up, 35 channel per second high speed scanning, priority, timer and even an alarm to alert you to transmissions on your choice of one special frequency. We also include a mobile mounting bracket. The SR001 can be used for base station use with the purchase of the ACS-B 12 volt DC power supply for only $34.95 each. A great sounding external speaker, the SPE-B is available for only $24.95.

**Shinwa Pocket Pagers**

The fire department hazardous materials response teams and police department SWAT crews can use this mobile scanner to transmit and receive high quality audio. The SR001 can tune to any frequency within a specified frequency range, it's also possible to write frequencies of received stations automatically into memory. In addition, unwanted frequencies can be skipped. Order (CBC72B-1) battery rapid charger for $99.95 and a BP64-1,000 ma, battery pack for $74.95.

**ICOM ICR1-B**

List price $799.95/CE price $529.95/SPECIAL Continuous coverage from 100 kHz through 1,300 MHz. The ICOM ICR1 keeps you in touch with the world when you're on the go. The palm size ICR1 is equipped with AM, FM and wide FM modes to fully answer your monitoring needs. With 100 memory channels and a dual frequency selection system, you get a top-class communications receiver. Not only can you retrieve 200 memory channels only through scan searches or by entering canals within a specified frequency range, it's also possible to write frequencies of received stations automatically into memory. In addition, unwanted frequencies can be skipped. Order (CBC72-B) battery rapid charger for $99.95 and a BP64-1,000 ma, battery pack for $74.95.

**ICOM ICR100-B**

List price $799.95/CE price $579.95/SPECIAL Continuous coverage from 100 kHz through 1,300 MHz. Now you can bring a wider world of broadcasting, VHF air and marine bands, emergency services and many more communications into your vehicle. ICOM's advanced ICR100 fully covers all the stations worth hearing with up to 100 memory channels and a multitude of features.

---

**Scanners/CB/Radar**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRO310-D</td>
<td>Uniden 40 Ch. Portable Mobile CB</td>
<td>$72.95</td>
</tr>
<tr>
<td>PRO390-D</td>
<td>Uniden 40 Ch. Remote mount CB</td>
<td>$99.95</td>
</tr>
<tr>
<td>GRANT-D</td>
<td>Uniden 40 channel SSB CB mobile</td>
<td>$152.95</td>
</tr>
<tr>
<td>WASHINGTON-D</td>
<td>Uniden 40 Ch. SSB CB base</td>
<td>$229.95</td>
</tr>
<tr>
<td>PC66A</td>
<td>Uniden 40 Ch. Mobile CB</td>
<td>$78.95</td>
</tr>
<tr>
<td>PRO510-DX</td>
<td>Uniden 40 Ch. Mobile CB</td>
<td>$39.95</td>
</tr>
<tr>
<td>PRO525-E</td>
<td>Uniden 60 Ch. Mobile CB</td>
<td>$99.95</td>
</tr>
<tr>
<td>PRO535-E</td>
<td>Uniden 80 Ch. Mobile CB</td>
<td>$69.95</td>
</tr>
<tr>
<td>PRO565-E</td>
<td>Uniden 80 Ch. weather CB Mobile</td>
<td>$78.95</td>
</tr>
<tr>
<td>PRO575-E</td>
<td>Uniden 80 Ch. weather CB Mobile</td>
<td>$147.95</td>
</tr>
</tbody>
</table>

**Uniden Radar Detectors**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD3000XZ</td>
<td>Uniden 3 band suction mount radar</td>
<td>$129.95</td>
</tr>
<tr>
<td>RD200XZ</td>
<td>Uniden 2 band radar detector</td>
<td>$109.95</td>
</tr>
<tr>
<td>RD50XZ</td>
<td>Uniden 2 band radar detector</td>
<td>$64.95</td>
</tr>
<tr>
<td>CAR-E</td>
<td>5 band credit card size radar detector</td>
<td>$99.95</td>
</tr>
<tr>
<td>RD2XL</td>
<td>Uniden &quot;micro&quot; size radar detector</td>
<td>$69.95</td>
</tr>
<tr>
<td>RD27Z</td>
<td>Uniden visor mount radar detector</td>
<td>$39.95</td>
</tr>
</tbody>
</table>

**Cobra Radars**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 PLUS-B</td>
<td>Cobra CB radio</td>
<td>$36.95</td>
</tr>
<tr>
<td>18RV-B</td>
<td>Cobra CB radio</td>
<td>$54.95</td>
</tr>
<tr>
<td>41PLUS-B</td>
<td>Cobra CB radio</td>
<td>$72.95</td>
</tr>
<tr>
<td>79L-TB</td>
<td>Cobra remote control</td>
<td>$44.95</td>
</tr>
<tr>
<td>19TL-D</td>
<td>Cobra Classic series CB</td>
<td>$44.95</td>
</tr>
<tr>
<td>21TL-D</td>
<td>Cobra Classic series CB</td>
<td>$69.95</td>
</tr>
<tr>
<td>29L-D</td>
<td>Cobra Classic series CB</td>
<td>$109.95</td>
</tr>
<tr>
<td>146TL-D</td>
<td>Cobra AM/SSB/SB</td>
<td>$129.95</td>
</tr>
<tr>
<td>146GTL-D</td>
<td>Cobra AM/SSB/SB</td>
<td>$145.95</td>
</tr>
<tr>
<td>90L-D</td>
<td>Cobra Base station</td>
<td>$69.95</td>
</tr>
<tr>
<td>142GTL-D</td>
<td>Cobra AM/SSB Base station</td>
<td>$196.95</td>
</tr>
<tr>
<td>200GTL-D</td>
<td>Cobra Deluxe M/RSSB Base station</td>
<td>$379.95</td>
</tr>
</tbody>
</table>

**COBRA Radar Detectors**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD3163-B</td>
<td>Cobra 3 band radar detector</td>
<td>$109.95</td>
</tr>
<tr>
<td>RD3175-B</td>
<td>Cobra 3 band radar detector</td>
<td>$129.95</td>
</tr>
<tr>
<td>RD3193-B</td>
<td>Cobra 3 band radar detector</td>
<td>$199.95</td>
</tr>
<tr>
<td>RD3181-B</td>
<td>Cobra 3 band radar detector</td>
<td>$139.95</td>
</tr>
</tbody>
</table>

**Bearcat 200XT-B**

List price $509.95/CE price $239.95/SPECIAL

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 band</td>
<td>200 Ch.</td>
<td>$399.95</td>
</tr>
<tr>
<td>40 Channel</td>
<td>Nothing excluded</td>
<td>$199.95</td>
</tr>
<tr>
<td>Bands</td>
<td>29-94, 115-160 MHz</td>
<td>$109.95</td>
</tr>
<tr>
<td>If you do not need the 800 MHz, band, order the Bearcat 201XT-B</td>
<td>$64.95</td>
<td></td>
</tr>
</tbody>
</table>

**Magnavox Satellite Phone**

CE price $48,880.00/Special order - allow 45 days for delivery.

[التهمة] In the action because... CNN had a satellite telephone. When a disaster such as an earthquake or a hurricane strikes your community and communication systems are damaged beyond repair, on current telephone communications, just like CNN did using your Magnavox Phone. Unmanned communication satellites are in geostationary orbits. The basic voice and data communications between your satellite phone and fixed earth stations. In most instances, telephone calls are dialed directly once you have selected the satellite serving your location. No matter where you are a direct satellite call is possible. The Magnavox satellite phone automatically selects the Land Earth Station (LES) nearest the destination of your call. The caller places a call as easy as using a standard telephone. Dual line operation permits contacting two parties. The telephone number to be used to route calls to one of the external parties, the phone number is not fixed, and can be changed any time. For information call 313-966-8888. Fax anytime, day or night. Order from Communications Electronics Inc. today.

**With Confidence**

Michigan residents please add 4% sales tax or supply your tax ID number. Written purchase orders are accepted from approved government agencies and most well rated firms at a 10% surcharge for net 30 billing. All sales are subject to availability and prices, and terms and specifications are subject to change without notice. All prices are in U.S. dollars. Out of stock items will be placed on backorder automatically or equivalent product substituted unless CEI is instructed differently. Shipments are F.O.B. CEI warehouse in Ann Arbor, Michigan. No COD's. Not responsible for typographical errors.

When writing to Communications Electronics Inc. P.O. Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add $15.00 per radio for U. P. S. ground shipping and handling in the continental U.S.A. For Canada, Puerto Rico, Hawaii, Alaska, or APO/FPO use California/fed state sales tax. Add 8% sales tax for international U. S. rates. If you have a Discover, Visa, American Express or MasterCard, you may call and place a credit card order. 5% surcharge for billing to American Express. For credit card orders call toll-free: 1-800-771-5200. For information call 313-966-8888. Fax anytime, day or night. Order from Communications Electronics Inc. today.

**Trailer**

| Date | Reference Number | Price
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11/1/91</td>
<td>#A11291B</td>
<td>$99.95</td>
</tr>
</tbody>
</table>

**Communications Electronics Inc.**

**Emergency Operations Center**

P.O. Box 1045, Ann Arbor, Michigan 48106-1045 U.S.A.

For orders call 313-966-8888 or FAX 313-663-8888.
After a long delay, the new cordless telephones operating in the 902-928 MHz band have begun to arrive in the stores. What do they offer in the way of features and challenges for their users and the monitoring enthusiast?

Monitoring the New 900 MHz Cordless Phones

By Jack Sullivan

I first became aware of these new phones through a brief mention by Bin Mauldin in the *RCMA Journal* nearly two years ago. When I lost both of my 46/49 MHz cordless phones following a direct lightning strike on my home last summer, I decided to wait for the new phones to arrive before investing in replacements. I became a frequent visitor to local electronics stores and scanned the electronic equipment ads in newspapers daily, but uncovered nothing for the new band. Finally, a ham friend mentioned that he had recently looked at one in a local department store and that it appeared to offer a number of interesting features. Within a few days I visited the store and checked out the selection.

Two different units were available: the Panasonic KX-T9000, with 30 channels, and the VTech Tropez DX900, with 20 channels. Both operated in the “900 MHz” spectrum and both were advertised to offer extended range over current 46/49 MHz sets. Both units offered similar operating functions, such as digital security codes, intercom, hold and remote signaling.

The Panasonic instruction book made no mention of exactly how their unit worked. The Tropez instruction book described digital voice modulation and signal encryption, or scrambling, for enhanced security from interception by scanner users. Both units were priced in the $300-400 range, though the Panasonic’s list price was $150 higher than that of the Tropez. Intrigued, I decided to put both these pricey pieces of new technology through their paces! (The Code-A-Phone 900 MHz cordless phone was not available for my testing.)

**Panasonic KX-T9000**

My first surprise with the Panasonic phone came when I turned on the handset after its nickel-cadmium battery pack had been given an overnight charge. Tuning my ICOM R-7000 through the 902-928 MHz band, I quickly found the dial tone on a strong but conventional narrow band FM carrier being transmitted from the transponder (base unit) at 902.1 MHz. (This is the first 100 kHz channel up from the bottom of the band.) The handset carrier was found a few seconds later on 926.1, 24 MHz higher.

The large frequency difference between the handset and transponder is determined by the design requirements of the duplexer circuit in the transponder that allows the handset signal to be received simultaneously with the transponder’s outgoing signal through the same antenna without interference. This mixing of the two signals also allows both sides of a telephone conversation to be heard on 902.1 MHz, like the 46 MHz transponder signals of older cordless phones.

Monitoring the handset frequency detected an initial digital burst which is sent when the handset is activated to make a call. Once this burst is received, the transponder comes on the air with the dial tone or incoming telephone call. The advertised one million different security codes are apparently present in the unit and cannot be changed by the user.

The 30-channel scanning capability advertised for the KX-T9000 is also an automatic function that cannot be activated or controlled by the user. When the handset is turned on, it listens for a signal on 902.1 MHz. Since this signal would not be present from the handset’s own transponder until after the digital burst is sent, the phone assumes that this is interference from another set. The handset changes the digital burst and thereby signals the transponder to switch to the next programmed channel along with itself.

This process is repeated until a clear channel is found. Such a mechanism should minimize most of the interunit interference that can be expected in a situation where a number of KX-T9000s are operating in close proximity. It would have been a nice touch to have designed the KX-T9000 to “wake up” on a different channel of the 30 available each time it was used, but apparently the engineers at Matsushita, Panasonic’s parent company, felt otherwise.

Another surprise with the Panasonic was the choice of 902.1 MHz as the default transponder frequency. From an engineering point of view, using the first 100 kHz channel available in this band seems to make a lot of sense. Looking at the Amateur Radio Relay League’s band plan for the 902-928 MHz spectrum, however, we see that 902.1 MHz happens to be the nationwide calling frequency for this amateur radio band! Hams share this band with low power home entertainment and industrial devices such as cordless telephones and wireless computer data terminals. Users of this band all share it and no one is protected from interference from anyone else! Especially during the VHF contests that are held several times yearly, this channel is frequently used and monitored by amateurs nationwide.

902.1 MHz, which is tunable by many widecoverage scanners and receivers should become an interesting frequency to monitor for increased activity in the future! The potential exists for significant interference to both cordless phones users and to ham operators in this band, especially in densely populated areas. (Ham use of 902.1 is primarily single sideband modulation.)

Lacking a frequency generator capable of producing a signal at 902.1 MHz, it was not possible for me to test the KX-T9000’s frequency scanning function in order to measure the frequency of the other 29 channel pairs programmed into this equipment. Matsushita would not supply me with a service manual for the KX-T9000. It can be assumed that, since the handsets operate in the 2 MHz between 926.1 and 927.9 MHz, the
transponders operate in the corresponding 2 MHz between 902.1 and 903.9 MHz. Channel spacing would be approximately 60 kHz.

Audio quality with the Panasonic was excellent. Taking the handset with me on a local drive quickly produced my second surprise: the unit’s range was only about 100 yards, or about the same as what can be obtained with a 46/49 MHz cordless phone. This isn’t bad considering the 1 watt or less power levels being used and the stubby 4-inch whip antennas on both the transponder and handset, but it certainly doesn’t match up with the “extended range” claim found in ads for this unit.

**VTech Tropez 900DX**

Several pleasant surprises were discovered while checking out the Tropez900DX. The manual is clear about the use of digital technology (as opposed to the analog technology used in the Panasonic.) The manual also mentions a type of scrambling used between handset and base for increased security from interception. The manual also describes a novel security code system: each time the handset is turned on by removing it from its cradle in the transponder, a random security code is chosen automatically from 65,000 possibilities. The manual further gives the frequency bands for operation as 925.5-927.4 MHz for the handset and 905.6-907.5 MHz for the transponder. I programmed each of these bands into the search memories of my R-7000 and picked up my freshly charged Tropez handset.

The first sweeps through these band segments found nothing familiar! No conventional radio carriers were on the air, despite the fact that I was listening to the dial tone. Tuning manually with the squelch “open,” however, weak but distinct broadband “hash” peaks were found at 926.275 MHz for the handset and 906.375 MHz for the transponder. This broadband digital RF “hash” sounds very different from a receiver’s usual squelch noise. Because of the wide bandwidth of these digital signals, the transmitter power is spread over a greater bandwidth and the signal itself becomes much more spread out and thus less conspicuous. Even though I could hear the dial tone clearly in the handset’s earphone, only a constant “hash” of digital data came from the receiver’s speaker.

Before describing other features of the Tropez, it is important to understand some of the basic principals behind the digital technology used in this set. Figure 1 shows an analog voice waveform. The vertical lines indicate the instants when the analog-digital (A/D) converter chip samples the amplitude of the voice signal and converts that information into a stream of digital numbers made up of 1s and 0s, or bits.

The Tropez sends this data stream to a second chip where the scrambling, or encryption, takes place. Here the bits are rearranged in a specific repeating pattern, or algorithm, by a chip known as a shift register. The encrypted stream of digital bits is then used to modulate the transmitter with on/off pulses that make up the “hash” sound. The same circuitry operates in reverse to convert the encrypted digital bits received by the receiver into clear voice.

The wide bandwidth of the Tropez digital signal is the result of the analog-digital modulation process. To digitally encode a voice signal, it is necessary to sample it at a rate at least twice as fast as the highest frequency of the voice signal. In the case of voice range signals, this maximum frequency is usually assumed to be 3 kHz. Figure 2A shows a conventional analog voice signal. The 3 kHz maximum frequency is both added and subtracted to the center, or carrier, frequency, to create a signal that has a total bandwidth of 6 kHz. Figure 2B shows the same signal converted into digital form. The 6 kHz sampling rate of the XID circuit creates a final signal 12 kHz wide, or twice that of the analog signal. The height of the two curves, which represents amplitude or signal strength, is shown reduced in the digital case to reflect the fact that the same power as in the analog case is now spread over twice the bandwidth, making the digital signal sounds weaker.

The Tropez uses basically the same system as the Panasonic for minimizing interference. The handset listens for its default transponder signal when it is turned on. If nothing is heard, a digital burst activates the transponder and you are connected to the phone line. If a signal is heard, both the handset and transponder switch to a preprogrammed alternate (20 are available in the Tropez.)

Again, lacking a signal generator, I was unable to confirm the frequencies of the other 19 channel pairs for the Tropez. VTech advertises that the Tropez will change frequency if interference occurs, even in mid-call. They apparently use a 100 kHz spacing between channels. Like Panasonic, VTech doesn’t provide service manuals for their equipment.

Like the Panasonic, the Tropez may “wake up” on the same default channel pair every time in the absence of interfering signals. Lacking a spectrum analyzer, this was difficult to confirm. Different frequencies were observed during different tests of the Tropez with my R-7000. There also seemed to be two RF peaks at the same time, 50 KHz apart. Making the matter less clear was the fact that my frequency counter displayed a frequency lower than the “hash” peaks that could be tuned by ear on the R-7000.

I speculated that perhaps the Tropez uses two or more channels simultaneously. Interference to either channel could then be readily detected by counting errors occurring in the compared digital bit streams. A digital command would then signal...
that sounds of not quite next one

Interestingly, about at signal 100% the

Figure

Analog Voice Waveform Being Digitally Sampled

Digitized Voice Sample

Scrambled Bit Stream

Feature was found during examination of the RF output of the transponder. When the handset is removed from the transponder, it is “polled” every 13 seconds by a burst of digital RF from the transponder. The handset sends back a digital RF burst less frequently. When either unit stops receiving these bursts, the alarm tones are programmed to alert the user. (Like the Tropez that was tested by the staff of Popular Electronics recently, this feature did not operate as advertised during my brief maximum range test. It did, however, work when I unplugged the transponder during a lightning storm. The Tropez handset “bleeped” at me every 45 seconds or so, informing me that it could no longer hear the transponder’s polling signal.) This out-of-range function works only after a delay of some seconds, so calls might be missed in some cases.

The Tropez and Panasonic did not interact or interfere with each other when operated with the handsets and transponders less than a foot apart from each other. The narrower frequency difference between the handset and transponder in the

Tropez (19.9 MHz) may also indicate significantly less interference between digital signals as reflected in the design of the Tropez’s duplexer circuit.

Conclusions and Monitoring Techniques

You can expect activity to increase in the indicated segments of the 902-928 MHz band as purchases pick up. The general lack of technical knowledge by most consumers and department store salesmen, a “myth” of relative security with cordless phones on this “new” band, and the inevitable interference and conflict with the amateur radio operators and owners of new high tech 900 MHz toys such as wireless VCRs should provide some entertaining listening!

A major difference concerning the “900 MHz” band is apparent from my examination of these two phones. While in the 46/49 MHz band the FCC allocated precisely defined channels for cordless phone operation, the entire 902-928 MHz band is available for equipment designers to use as they see fit (within certain limits such as maximum power). Just about anything can be expected to show up anywhere in this band, including the output signals from the handsets and transponders of both existing and future cordless phones. Searching between 902 and 928 MHz will probably become an interesting pastime for many scanner owners!

Standard scanners and receivers like the ICOM R-7000/9000 that cover this frequency band should be more than adequate. Probably the most critical component of your receiving setup will be the antenna/feedline combination. (MAX System has announced a new 902-928 MHz ground plane—their “900 System”—with an N connector. Tom Bernie, their proprietor, recently sent me one of these units. It works very well! Check their ad in this issue of MT.) Any distance between the receiver and antenna beyond a few feet will require the use of solid or double shield “hard line” or coaxial cable to minimize losses at these high frequencies.

The Tropez presents a unique situation. It may be possible to decipher these transmissions using another Tropez handset as a receiver/decodes, but the complex nature of the communications between the handset and transponder suggests not. It would be necessary at a minimum to modify the Tropez handset to disable its transmitter and allow only reception (thus preventing the monitoring handset from possibly interfering with the other Tropez and causing it to change channels).

Even though the Tropez is secure from casual eavesdroppers with conventional receiving equipment, assuming that no one will ever overhear one of your calls on this phone would be a mistake. Federal agencies and others who have

Figure 2: Analog vs. Digital Voice Signals
a real interest in what you do in the privacy of your own home have probably already received from the FCC the encryption algorithm and operating frequencies of the Tropez and have developed and deployed the hardware needed to “break” the Tropez system. As the courts have uniformly considered cordless phone transmissions to be fair game for interception and possible prosecution, a good rule of thumb is to never say anything over any type of communications equipment that you would not want to hear broadcast from a loudspeaker in the center of Washington, DC!

What can be expected next in the 900 MHz cordless phone race? A lot, if the plans of companies such as Cincinnati Microwave and Cobra are fulfilled and their units become available later this year. Both will employ “spread spectrum,” a term used for a communications privacy system originally developed by the military services. In spread spectrum, the handset and transponder operate under microprocessor control and rapidly hop together from frequency to frequency in a seemingly random but coordinated sequence (a “pseudo-random sequence”) with the phone’s users being unaware of this high-tech electronic activity. An eavesdropper with a scanner or receiver would hear only occasional bursts of noise as he tuned around this band. The Cobra will utilize 100 preset channels to hop among. (The FCC requires that equipment designers use at least 50 channels for this purpose.)

Which modulation technique they will use is not clear from early information, but even conventional FM would be almost impossible to eavesdrop on when spread spectrum is used. The Cincinnati Microwave “Escort” unit will employ digital modulation and other sophisticated techniques.

Approval for release of these units has been apparently delayed by the FCC, even though the technical requirements for “frequency hopping” RF devices are already published by the FCC. This may be giving the FCC time to pass along the frequencies, frequency hopping algorithms and other key information to other federal agencies like FBI, DEA, etc. It has long been known that another federal agency—the National Security Agency which is responsible for breaking codes as well as eavesdropping on just about anyone they want to—has dragged its feet for years on releasing key elements of spread spectrum technology. You have to assume that they have their reasons. Some may find it disturbing to learn that, even in the Land of the Free, the people in charge want to make very sure that you cannot hide your communications from them.

More interesting and exciting developments can be expected to appear in the “900 MHz” band, so why not get in on the ground floor and tune in to something new!
As we approach the town of Wellington, Colorado, just north of the city of Fort Collins and head north on I-25, a rather large antenna farm becomes visible off to the west. Turning west on the county road we are soon at a driveway sporting a metal sign: “National Institute of Standards & Technology, Frequency-Time Broadcast Service Radio Stations WWVB - WWV.” We follow the dirt road another half mile before arriving at the station buildings and antennas.

WWV occupies 390 acres on the plains just to the east of the foothills which lead to the Rocky Mountains. Director Jim Maxton greets us at the WWVB building, which houses the 13 kW transmitters for WWVB along with some of the timing equipment.

Calculating the Time

Our tour starts with a basic overview of how WWV arrives at the correct time. This process is a lot more complicated than one might think. Each morning a reading is taken from the GPS (Global Positioning System) navigation satellite and is compared to a small cesium clock in Boulder, Colorado. Simultaneously, the same operation is performed at the Fort Collins transmitter site on one of their reference clocks. These readings measure the differences between the reference clocks. Using a complicated mathematical formula, the difference between the WWV reference clock and UTC is then determined.

At one time a system called the line ten transfer system was used. In this older system, a reading was taken on the leading edge of the tenth line of a particular TV station’s horizontal sweep. This was done simultaneously in Boulder and Fort Collins, and the differences between the leading edge of the horizontal sweep was compared to the pulse of the clocks in both locations. This gave the difference between the two clocks in Boulder and Fort Collins which then could be used to calculate the difference between the reference clocks and UTC.

The new GPS antenna is a helical enclosed in a small plastic bubble at the top of a mast on the WWVB building. The Yagi that was used in

WWV/WWVB Director Jim Maxton in front of the WWVB building.
the line 10 system is still mounted below it.

As we enter the WWVB building, the first equipment we’re shown is the GPS receiver and the associated microprocessor that takes the readings and records the difference between the WWV reference clocks and UTC. The comparator system selects the reference clock that is closest to UTC and has that on line. The best reference was running about 12 micro seconds fast according to the printout that Mr. Maxton ran for us. “However, that does not mean that we’re transmitting 12 microseconds off. We enter corrections to the timing system so that we are transmitting the correct time.”

A Tour of the Buildings

The two transmission facilities are basically identical. But before we head down to the WWV building, a few things of interest are noted at the WWVB building. There is a sign on the door to the clock and RF Oscillator room: “Please, No Nylon Jackets.” Jim explains, “Some of the equipment in this room is rather sensitive to static electricity. That’s why the sign and the fact that the room is totally shielded to keep stray RF out.”

The transmitters used at WWVB are affectionately known as “Blue” and “Gray” for their unique paint jobs. These were originally old military transmitters that were stripped down and converted to run on 60 kHz.

We take the car down to the WWV building because of the 35 mph winds that are blowing. Upon entering the building, we are greeted by technician Matthew Deutch and Charles Snider, the other technician, who is busy in the repair shop.

Matthew stops us at the clock and oscillator room. This is known as the “Screen Room” because it is shielded from all outside RF. Here there are racks with three identical sets of clocks. These are the ones that “time” WWV. Matthew explains, “We are currently running our most stable clock. The others are constantly being compared so that we know that we are putting out the proper time.”

He continues, “The cesium clocks put out a steady 5 MHz signal. This signal is multiplied or
divided by 'Time Code Generators' in order to provide the proper RF frequency for each of the transmitters—2.5, 5, 10, 15 and 20 MHz—that WWV operates on. The audio tones and the time ticks are all derived from the cesium clocks. The time code generators control all of the audio portion—the tones, time ticks and time announcements."

The voice message console is where the voice recordings are made. The weather announcements, geo-alerts and all other announcements are phoned in and recorded on the appropriate tape. The time code generator knows what minute it is and switches on the appropriate tape. During the 18th minute, we all get to hear the A Index, K Index and solar flux which are used to predict propagation.

It was a surprise to find the old drum recorder with the voice of Don Elliott Heald still operating at the time of our tour. The new time code generators that were installed about a year ago have the new digitized voices that you hear. Many people are unhappy with the new voice of the digitized system. Jim Maxton assures us that another new voice is going to be used and the digitized messages will be rerecorded by an announcer named John Doyle. After being treated to a preview, we agree that Mr Doyle’s voice will be very pleasant to hear over WWV.

The mention of WWV going to Daylight time a month earlier than they should have (see "Communications," May '92 MT) was due to an error in programming of the new Time Code Generators. "It was an error in entry. Unfortunately, there is no display of the program that's currently running," was Director Maxton’s comment.

Next we view the WWV transmitters. Each frequency has one on-line and one standby transmitter. The new on-line transmitters run Class C operation, while the old transmitters ran Class AB. The more efficient Class C transmitters really help out the electric bill. Prior to their use, WWV ran an average of $10,000 a month for electricity; now the bill is around $7000. The transmitters are in a hallway that completely surrounds the shop. Outside of that hallway is another hallway. This allows access to the rear of the transmitters for repair. A full color schematic diagram of the transmitter’s circuitry hangs on the wall.

Through the second hallway we are led to the power distribution area. This is also where the backup generator is located. If power fails, WWV and WWVB will continue to broadcast, as both have separate backup generators.

A View of the Farm

Now we turn to the “antenna farm” for WWV. Each transmitter feeds a separate 1/4 wave vertical antenna. WWV employs two...
wideband backup towers for the five frequencies.

Walking out the rear of the building, we climb a small flight of stairs to an observation platform. There we get a good view of all seven of the towers that are used, as well as the feed lines that are mounted a foot off the ground.

WWVB has a large top loaded antenna system consisting of four towers in a diamond formation and a backup of the same size. This is best seen from the road.

Walking back through the WWV facility, we spy the QSL board in the front hall. This board sports ham and SWL cards from signal receptions around the world.

We express our thanks for MT's specially-arranged tour of WWV. Sadly, WWV and WWVB are unable to accommodate tours due to the lack of personnel. They do, however, have a publication which is available for the asking that explains about WWV, WWVB, WWVH and the services that they provide. The chart in our sidebar is from the book and shows a WWV “Hour” and a WWV “Minute.” Their address is in the middle of the “Hour.” When writing, request NIST Special Publication 432, and let them know that you enjoyed MT’s special tour of the station.

Wayne Heinen is a veteran radio hobbyist who serves on the Board of Directors of the National Radio Club, is licensed amateur radio operator NOPOH and is Police Beat editor for the National Scanning Report.

The drum recorder with the voice of Don Elliott Heald was seeing its last days at the time of our visit.

There was an on-line transmitter and a back-up for each frequency—2.5, 5, 10 and 20 MHz. Pictured is the on-line transmitter for 20 MHz.

MONITORING TIMES

October 1992 25
Remember when the Martians invaded? Of course!—it was back in Grandpa’s time. We hear about it every Halloween. On October 30, 1938, Orson Wells presented a dramatization of “War of the Worlds” on the CBS network. Wells’ Martians landed near Princeton, New Jersey, and proceeded to wreak havoc on the surrounding countryside.

Well, maybe there weren’t really any Martians, but the broadcast certainly created havoc across the country. Millions of Americans tuned in after the opening credits and thought the invasion was for real. As police stations were swamped with phone calls, many city-dwelling Americans jumped in the family car and took off for the safety of the country. Others went off in search of a priest to give a final confession. At New York City’s naval base, shore leaves were canceled and sailors were called back to their ships. In short, panic seized the entire nation.

How could Grandpa have been so dense as to actually believe that Martians really had landed? And now every year we wave it about for the world to see—look, everyone, at how we got fooled in 1938! It’s sort of a blemish on the national IQ.

Well, fortunately we’re not the only ones to get bowled over by imaginary Martians. Just eleven years later it happened again, south of the equator, in Quito, Ecuador. The Ecuadorians got taken in just as bad as Grandpa did, but their reaction was, well, a little bit stronger.

The Martians Land

Nestled at the foot of Mount Pichincha, in a fertile Andean valley, Quito has always been as peaceful as a city could be. When the 1940s came along, Quito may have lagged behind the rest of the world in some things, but communications was not one of them. In downtown Quito, next door to the Ministry of Communication, was the three-story Comercio building. This was headquarters for Quito’s premier newspaper, El Comercio which was respected throughout Latin America. Also in the same building was Radio Quito, owned by the newspaper, and the most popular radio station in the city.

In February 1949, Leonardo Paez, the art (program) director of Radio Quito and Eduardo Alcaraz, the station’s dramatic director, were looking for something new and exciting to do on the air. Something that would really draw attention to Radio Quito. They had heard of Orson Wells’ famous “War of the Worlds” program, and that seemed to have just the level of excitement they needed.

A script was drawn up and actors and sound effects were arranged for. Paez and Alcaraz saw no need to tell station management about their plans. It was just another drama production. Finally, on Saturday, February 12, 1949, everything was ready to go.

As usual, listeners in Quito and surrounding towns tuned in to Radio Quito’s evening newscast, which was followed by the nightly music program. Suddenly, an announcer broke in mid-song, “Here is an urgent piece of late news!” He then gave a long and frightening description of how Martians had landed twenty miles south of the city, near Latacunga. Latacunga had already been destroyed and the aliens were approaching Quito in the shape of a cloud. A few minutes later came another announcement: “The air base of Mariscal Sucre has been taken by the enemy and it is being destroyed. There are many dead and wounded. It’s being wiped out!”

The broadcast now took on an eerily real, as different actors stepped up to the microphone, some chosen for their ability to sound like well-known public officials. First, the “Minister of the Interior” arrived, and urged citizens to stay calm to help “organize the defense and evacuation of the city.”

Next, it was the “mayor” of Quito’s turn: “People of Quito, let us defend our city. Our
women and children must go out into the surrounding heights to leave the
men free for action and combat." Then a priest begged for mercy from God
as a recording of Quito church bells ringing in alarm was played in the
background.

The prayer was interrupted for a telephoned report from an announcer
at the top of Quito's tallest building. He described a monster surrounded
by fire and smoke coming towards the city. More reports were telephoned
from residents of the nearby village of Cotocallao, which was now under
attack.

Panic in the Streets

By this point, the population of Quito was in panic. The city's streets
filled as thousands fled their homes, many wearing their pajamas. The noise
in the streets was the first inkling Radio Quito had of what they had done.
An announcer came on and revealed that the broadcast was entirely
fictional. Station staff members, many trusted voices, "frantically" pleaded
for calm in the city.

Radio Quito's appeals did nothing to calm the mobs in the street. In
fact, hearing that the whole thing was a hoax angered people even more.
From all directions, thousands converged on the El Comercio building and
began stoning it. About 100 people were in the building when the riot began.
Most were able to escape the mob through a back door, but some were
forced to flee to the third floor. The police and army were called to come
put down the riot, but they were already busy. They were on their way to
Cotocallao to battle the Martians.

More rioters arrived. Some brought gasoline, others had crumpled
copies of the El Comercio newspaper. Gasoline was used to fuel the fire
as dozens of burning El Comercios were thrown at the building. Soon, the
building was engulfed in a mass of flames which began spreading to nearby
buildings. Several dozen people were still trapped on the third floor. Some
leapt from windows to escape the flames. Others tried forming a human
chain to climb down, but the chain broke and most crashed to the pavement.

Finally, the police and army arrived, but it was only with tanks and
massive doses of tear gas that the crowds cleared, making room for the fire
trucks. The fire was put out before it caused extensive damage to nearby
buildings, but it was too late for the El Comercio building. Only the front
was left standing. The presses, radio equipment, and the newspaper and
radio station files were destroyed, leaving $350,000 in damage, an astro-
nomical sum in 1949.

More tragic was the human cost. Twenty people died in the fire, or
trying to escape it. Fifteen more were injured.

Radio Quito Rebuilds

The next day, the staffs of El Comercio and Radio Quito began picking
up the pieces, except for Paez and Alcaraz, who were indicted. Other Quito
and Guayaquil newspapers offered their presses so that the newspaper
could continue printing. Gradually, the paper and the radio station were
rebuilt, and they regained their positions as the most respected media in
Quito.

Apparently neither wants to remember the most memorable event in
their past, however. In a 1980 article on the 40th anniversary of Radio
Quito, El Comercio didn't include a single sentence about the Martian
broadcast.

Today, Radio Quito is a not-too-difficult catch on 4920 kHz in the sixty
meter band. It can be heard most evenings until 0400 sign-off, and mornings
after 1000 sign-on. Programming is mainly news and sports, with occa-
sional radio dramas. But, don't expect to hear any science fiction. Radio
Quito stopped doing that sort of thing a long time ago.


**Shortwave Broadcasting**

**Glenn Hauser**

Box 1684-MT

Enid, OK 73702

All times UTC; all freqs kHz

**ALASKA** From Sept. 27, KNLS in English plans to use 7365 at 0800, 7355 at 1300 (ADXN)


**ARMENIA** Radio Yerevan has daily coverage of Azeri genocide of Armenians in Karabagh, and of valiant defense of those isolated 150,000 Armenians, 0230 in Armenian, 0240 into English; one hour later presumably from Sept. 27. (Helen Takessian, Tucson, AZ) The night I checked, English from 0244 on 15580 but announced only 13645, 11675, 11790. Usually different for winter (gh)

**AUSTRALIA** Print-Handicapped stations have moved below 1600, but replaced by others—now’s the time to get them before North American stations fill up band (gh) Royal Newcastle Hospital, NSW on 1629, often just music, but Wed. and Fri. relayed NC1233 at 0800-0810 including local news 0805 (Ian Stanley, Vic., ADXN)

**AUSTRIA** We’ve pressed R. Austria International to shift morning broadcast from 1130 to 1230 when it would propagate further into North America on the 15 MHz band, like Finland which is so reliable on 15400. Half our wish for the W-92 season from Sept. 27, now 1230 but still on 13700, including SW Panorama on Sunday, but it’s no longer at 0630 Monday via Canada 6015; added at 2330 Sunday on 9870, 13730 for Latin America; Monday 0330 on 13730, 9875 North, 9870 Latin. Remaining times to other targets are Sunday 1330 on 17730, 15450, 1630 on 11780. The six-month conflict with WYFR at 0330 on 9870 should be resolved by move to 9775; 9870 resumes end of March (gh)

**BRAZIL** R. Guia, 6000 and 11785, heard from 0337 to closing at 0405 also on 5280 (Guillermo Carrera, Chile, Radio Nederland Radio-Enlace)

**CANADA** RCI is replacing three obsolete 250 kW transmitters at Sackville with new ones costing $6.2 million, one a year starting 1993 (Montreal Times via Jim Elgee, DX Ontario) Relay arrangements probably helped get this approved (David Clark, DXO ed.) One RCI transmitter failed in mid-August, so several frequencies were dropped (BBCM) Padula misunderstood our QSL policy—though strict, proxy QSLs are not disallowed (Paul Ormandy, New Zealand DX Radio League, World of Radio) Larry King added CFRB, 1010, Toronto to his affiliates in late August; probably doesn’t even know this also puts him on CFRX, 6070 (Tim Hendel, FL) Original plan was to pick up the repeat only after 0606 UTC (Laurence Palter, Ont., Usenet via George Thurman) But confirmed live at 0306, maybe a help if you can’t find him on AM, though Germany 6075 is a problem (gh)

**CHINA** Effective Oct. 1, Radio Beijing will be renamed China Radio International, CRI (R. Beijing in Hindi via BBCM) To be believed when heard in English, as previous announced plans did not take place (gh) Guizhou PBS, Guiyang, has English lesson daily 0530-0600 on 7275, 3260 (BBCM)

**COLOMBIA** R. Nacional in USB back on 17862.8 varying to 17865.5 at 2200 (Wolfgang Bueschel, Germany) Radio Las Lajas, at famous canyon pilgrimage town Ipiplae on the Ecuadorian border, heard at 0252 with RCN net. ID on 5800, 5th harmonic of 1160 (Yimber H. Gaviria, Popayan, HCJB DX Partyline)

**COSTA RICA** The Haitian Creole program on Radio for Peace International, Saturdays 2000 repeated 8 and 16 hours later, is called Radio Neg Marron, literally “black and brown,” for all Haitians (Tim Hendel, Miami, FL) Neg Marron means black flight, e.g. where slaves escaped. Sponsored by Rocklanders for Democracy, a group in that southeast New York county (RFPI) How many Haitians can contact them via the announced fax number, 914-358-4924? RFPI found on 7385 in addition to 7375 (Hendel) It’s the 21465 transmitter moved here in the 0000-0800 period only due to jamming of 7375. New 30-kW transmitter still under construction, 7-1/2 x 4 x 8’; should put whopping signal into North America, improve by three to four S-units with 6-element cubical quad on 45-meter tower in a month or two; 7375 and 7385 may swap AM and USB depending on interference (James Latham, RFPI Mailbag) Other frequencies are 15030, 13630-USB; World of Radio times: Sunday 2300, Monday 0700, Tuesday 1900, Wednesday 0300, 1100, Friday 2000, Saturday 0400, 1200, 1800, Sunday 0200, 1000. Some could change for fourth quarter. See also USA

**CROATIA** Hrvatski Radio on 6511 at 0130 rap music plus 6210, perhaps ex-5085 not heard (Hans Johnson, MD, Fine Tuning)

**CUBA** RHC in English to North America at 0000-0500 on 11950, 0500-0700 on 9550; also USB nightly 0000-0200 on 13660. Another SSB transmitter is being refurbished, perhaps for winter nights in the 7.3-7.6 MHz band. I’m trying to start an SWL net, Sundays 1200-1300 on 14340 (Arnie Coro, CO2KK, RHC DXers Unlimited) Also USB in Spanish to Europe 2100-2300 on 13660 (RHC En Contacto) Coro claimed “rumbling” on 11970 was “malicious interference,” but any ten-year-old could recognize that distorted mess as a defective transmitter, the same now heard on 15230 from 1300 in Spanish (Ernie Behr, Ont., W.O.R.)

(non) La Voz del CID, R. Camilo Cienfuegos, uses 6305 at 0420-1200 including Voices of internal resistance daily at 0310-0320, news from Spanish-language Miami stations at 1100-1130; and on 9940 at 0208-1415, hour-long news at 1600, 0000. R. Antonio Macco service uses 11940 at 1208-2315, 7340 at 2230-1200 (BBCM)

**CZECHO** At least for the summer, the external SW site Litomyshl in Bohemia and Moravia used 17725, 13715, 6055; and between 2300 and 0430, 7345; see SLOVAKIA

**ECUADOR** While the 21455 SSB transmitter obtained from the Swiss PIT has continued, HCJB has been refitting the other one formerly on 25950, both now duplexed to single antenna, uninteruped 4-band rhombic, bi-directional toward Europe/South Pacific, 10 kW each with 30% carrier insertion. Tested 17535 in August, 17490 in September, may be regular from November (Rich McVicar, HCJB DX Partyline) On Tuesdays, Happiness Is travels around Ecuador, sometimes other countries, e.g. UTC Wednesdays 0100, 0300, 0530 (HCJB Program Notes) Radio Nacional Espejo, Quito, long on 5000v and previously 4635 as announced, has finally been heard on officially assigned frequency shown on letterhead, 4880 (McVicar, DXPL) Radio Paz y Bien reactivated on 4819.78 at 0950 Sept. 1 (Hans Johnson, MD)

**GUAM** Typhoon Omar with winds up to 150 mph caused no staff injuries; KTWR transmitter building flooded and water damage to generators (Chuck Roswell, TWR Bonaire) KSDA also lost power and generator was out for repairs (Horlock, KSDA, via George Thurman, W.O.R.) Both stations back on (Arthur Cushen, RNFN)

**GUINEA** Rdf. Nationale uses 9650, 7125, 6155, 4910 at 0557-0805 Monday-Saturday, 0800-1230 Sunday, 1215-2400 daily in French. Maninka, Sousou, Pular; English news irregular at 1845-1855; previously on 15310, 4833, all varying 1-3 kHz; IDs include R. Conkary, R. Guinea (BBCM) 7125 and third harmonic 21375 heard after 2300; 21375 also at 0600-0800, 1500-2300+ (Harald Kuhl, Funk, via W. Bueschel, Germany)
IRAN (non) V of the Mujahedin of Iranian Baluchestan, believed from Iraq at 1258 to 1455 on 11970 (BBCM)

IRAQ Baghdad on new 4930 ex-4750 until 2326 (Brian Alexander, PA, W.O.R.)

(non) News Centre of Free Iraq (Arabic: Markaz Akhbar al-Iraq al-Hurr) used 11945 at 2200-2353, believed same as on 15190 in March, connected to V. of Iraqi People (BBCM) Voice of Rebellious Iraq in Arabic: Saiw al-'Ir al-Tha' ir; Kurdish: Dangi Iraqi Shurashgar. Supports Iran-sponsored Shiite Supreme Assembly under Muhammad Baqir al-Hakim, in Arabic; some times and frequencies vary: 0330-0600, 1130-1400, 1630-1900 on 8150 and 7090, varying 8000-8200 and 7050-7100; one hour later during winter time (BBCM)

ISRAEL Kol-Israel already shifted one hour later Sept. 6 with the end of DST; until November 1, English: 0500-0515 on 11588; 1100-1130 on 17545; 1400-1425 Sunday-Thursday on 17590, 17575, 15640, 15590, 11605, 11587; 1800-1815 on 17575, 15640, 11675, 11605, 11587; 2000-2030 on 17575, 15640, 11675, 11605, 11587, 9435; 2230-2300 same except 11603 (IBA) During marginal reception, we had trouble understanding other announcers, but the clear voice of Ben Daffen came through with no problem for DX Corner, the last few minutes. If the bottom line is being heard and understood, they should have Ben do more announcing (gh) Arabic home service at 1900-2100 on unlisted 7813.45 USB, peaking around 2030, feeder? (Karl Leist, Munich, Germany) Now scheduled 0400-2215 on 5900, 5915, 9815, 15480, perhaps also 15095.

JAPAN Radio Japan still won’t put Media Roundup on when Sackville can relay it, and the Sunday 2130 air via Gabon shifted from 11735 to 11925. From Sept. 7, the Skelton, Britain relay Sunday at 2330 drops 6025 and 6160 for 6050 and 6125. Try the UTC Sunday 0300 airing first on 17810 which sometimes makes it; 1530 on 11865 direct supposed to continue at least through October. Skelton relays in the morning from 11925.

KOREA NORTH R. Pyongyang with Stalinist choral singing in Japanese on 26240, 19680, 1930-2025, 1960 and 2000-2030, same text and weird song every day (Ernie Behr, Ont., World of Radio) So it’s like an info-mercials, must be great source of foreign exchange for RM! (gh) RMWS program schedule expiring Sept. 26 showed regional programs which may continue: Focus on Asia & the Pacific, Mon.-Fri. 2100-2130, Sat-Tue. 0000-0030, 0500-0530, 0800-0830, 1200-1230, 1500-1530. Africa As We See It, daily 0530-0600, 1530-1600, 1830-1900 (via Gigi Lytle, TX, DXDL) Amend R. Vostok schedule in September to show it silent on Saturdays. And its 7210 carries R. Stantsiya Tikhii Ocean at 0715-0800 (Yoshinori Kato, R. Japan Media Roundup)

SAINT HELENA To promote tourism, Radio St. Helena will make an annual shortwave broadcast. This year R. St. Helena Day is Friday, Oct. 23, at 2000-2100 and 2220-2300 on 11092 SSB. Listeners worldwide are invited to call Tony Leo during the transmission, dial direct to +290-4654. Reports are invited, for QSL card and informative letter, reply postage highly appreciated. Time is GMT, London 0500-0530, 0800-0830, 1200-1230, 1500-1530. For further info about St. Helena, contact South Atlantic Travel & Trade, Box 6013, S-600 06 Nørkoeping, Sweden (Jan Tuner, SATT, who visited St. Helena earlier this year, DXDL) Slight variation in details, 11092.5, and 2020-2100, 2220-2300, phone 290-4669; both transmissions live with same content except for overseas calls (Jenny Tuner, daughter, visiting HCJB DXPL)

SEYCHELLES FEBA's Sept.-Oct. schedule shows English to South Asia at 1505-1555 (Sunday 1555) on 11710; separate international Network program also 400S to South Asia. Monday-Saturday 1500-1600 on 9810, 15330 (World of Radio)

SHRI LANKA See last month; the TWR SW frequency registered is 6035 (Victor Goonetilleke, ibid., RMWN)

SLOVAKIA At least for summer, RCI transmissions from the two sites here were: Velke Kostialany on 9810, 9580, 9505 whenever used, on Wednesdays starting Sept. 30 (Andy Sennitt, SW Echo via Baxter)

NEW ZEALAND RNZI schedule effective Oct. 4: 1650-1849 on 9675, 1850-2138 on 15120 both Sunday-Friday; 2139-0658 on 17770, 0659-1207 on 9700 both daily; 1208-1649 on 9510 occasionally (Adrian Sainsbury, RNZI) Calling Picartain, Friday 0430 to appear Sept. 25, and four weeks later, Oct. 23, etc. Around the World with Rudi Hill the following weeks, prepeated Tuesdays 0930, assuming no timeshifts.

NOVAIR Foreign Ministry has decided to withdraw funding of R. Norway International next year (Edwin Southwell, U.K., DX Listening Digest) Financing for weekend English broadcasts is under review, could lose it. Better write in support to: Radio Norway International, NRK, N-0340 Oslo 3, Norway (Bob Thomas, CT, DXLD) Write to the Embassy for best results (RMWN)

PAPUA NEW GUINEA Radio Gulf, 3245, has English news at 1110, regular at least weekdays (David Norcross, Guam)

RUSSIA AWR schedule showing English at 1600 on 9775 is a misprint, still 15125 (Wolfgang Bueschel, Germany) R. Aum Shinrikyo, very bizarre religious program in broken English heard on most RMWS frequencies at 0430 and 2030, same text and weird song every day (Ernie Behr, Ont., World of Radio) So it’s like an info-mercials, must be great source of foreign exchange for RM! (gh) RMWS program schedule expiring Sept. 26 showed regional programs which may continue: Focus on Asia & the Pacific, Mon.-Fri. 2100-2130, Sat-Tue. 0000-0030, 0500-0530, 0800-0830, 1200-1230, 1500-1530. Africa As We See It, daily 0530-0600, 1530-1600, 1830-1900 (via Gigi Lytle, TX, DXDL) Amend R. Vostok schedule in September to show it silent on Saturdays. And its 7210 carries R. Stantsiya Tikhii Ocean at 0715-0800 (Yoshinori Kato, R. Japan Media Roundup)

MONITORING TIMES October 1992
SOMALIA The original Radio Mogadishu is inactive on shortwave. The opposition Radio Mogadishu varies 6956-6972 on AM, or 9425-9535 on USB plus carrier, at 0400-0500 (Fri., 0600), 1000-1100, 1400-1430, 1600-1900, mostly in Somali except 1730 news in Arabic, 1830 news in English (BBCM).


SPAIN SFR in English to Africa 1900-2000 on 9675, Europe now 2100-2200 on 6125 (via Edwin Southwell, UK).

SUDAN National Unity Radio, nominal 9535, but heard on 9190 or 9170 at 1300-1700 including English news 1500-1515; very erratic, sometimes R. Omdurman instead, is on lower frequencies to shadow Radio SPLA, which started using 9170 at 1300, later monitored at 0500-0600, 1100-1200, 1300-1400 on 9170 or 9190, in Arabic, Sudanese colloquial Arabic, local languages; except for opening announcements, no more English heard (BBCM) R. Omdurman also on 9190 in English at 1800-1900, including Introduction to Sudan, Thursday 1823; You and Your Health, Friday (Southwell, UK, W.O.R.) Also 2125-2200 in Arabic, strong parallel 7200 weak, later also from 0248 (Brian Alexander, PA, W.O.R.).

SWAZILAND Swazi Radio has dropped "Commercial" from its name, since it's now paid religion only; address is now P.O. Box 5572, Rivonia 2128, RSA, 9750 is inactive, but 6155 operates Mon.-Fri. 2030-2300, Sat. 1700-2000, Sun. 0500-0600, 1700-2045. Using same facility is R. Cidade, ex-R. Paralelo 27, by Communities Broadcasting Services, Doornfontein: Mon.-Fri. 0700-1000 in Portuguese, Sat. 0600-0900 Italian, 0900-1200 Port., 1200-1700 Port. and Eng.; Sun. 1100-1200 Greek, 1200-1500 Port. (Maarten van Delilt, RSA, DXLD).

TAIWAN From Sept. 27 to Mar. 28, WYFR relays VOFC in English: 0200-0300 11740, 0200-0400 9680, 9590, 0700-0800 9590, 2200-2300 11915, 9850. WYFR programs over VOFC: English 1302-1502 11550; Hindi 1502-1602 11550; Mandarin 1102-1602 5275, 9280; 2100-2400 6300, 2100-2300 9280, 2200-2200 9595, 2200-2400 9465, 2300-2400 11550; Russian 1505-1705 9555 (WYFR).

TURKEY State Meteorological Station from 0400 on 6900, also on 10422 USB, feeder? (Ivan Cholakov, Bulgaria, HCJB DXPL) V. of Turkey programs after News, Review of Turkish Press: Mon., Last Week, Turkish Moslem Republic, Reform, Renewals in Turkey, Tue., Ataturk, Turkish Album, Wed., Letter Box, The Great Adventure, Thu. The Hittites, What's Up in Turkey?, Fri., Turkish Instruments, Countries and Turkologists, Sat., Outlook, DX/Economic Panorama, Anatolia Step by Step, Sun., Another Spot in Turkey, Blue Voyage. As usual, frequency schedule shown effective Sept. 6 to Nov. 1, ignoring their usual one-hour time shift around Sept. 27 due to end of DST, which we here assume: Europe 2100-2200 9445, 2300-2400 11885, Mideast, 2300-2400 7185, SW Asia, 1330-1400 9675, NE America, 2300-2400 and 0400-0500 9445.

UKRAINE Program for fishermen airs Mondays 0600 from Simferopol' on 17600, best on 11630 (Ivan Cholakov, Bulgaria, HCJB DXPL) One hour later now? English at 0000 on new 11250 and many others (B. Alexander, PA, W.O.R.).

USA Besides ham nets on 14325, 14300, 14275, 14268, etc., and WWL, clear channel 870; we could monitor Hurricane Andrew approach and aftermath on SWBC, thanks to Jeff White who kept R. Miami International on the air with battery power, uninterrupted phone connection to very remote transmitter at WRNO, New Orleans. He filled Miami Live breaks between Cuban exile programs around 0030-0100, 0145-0200 weekdays on 7355 with Spanish and English updates on the situation, relays of Y-100 simulcasting WTVJ, ch. 4. WRNO lost only a few hours of airtime when winds were highest there. RMI's own transmitter undamaged, still in storage. WYFR seemingly unaffected. RMI also handles Cuban American National Foundation program via WHRI on jammed 9495; this appeared at 0210 on 12160 instead of 7315, but very degraded audio via phone. Then RMI changed its weekday sked to 0200-0300 on 7355, 0300-0500 on 7395 (World of Radio) WSB 750 Atlanta relayed Miami sister station WIOD during hurricane (Mike Schulsinger, OH).

WFLA, Tampa, expects worldwide coverage during favorable conditions on 25870 NB FM with its 24-hour ebruising system via Motorola repeater transmitter using 75 watts or less, 5/8 wavelength whip, groundplane, 20' above ground (Alan Roberts, PO, W.O.R. and DXLD).

WJCR's second transmitter from Kentucky started on 7460, then switched to 7464, 7465 (Tim Gueguen, Sask., John Norfolk, OK) Because Nellig AFB asserted non-interference provision on 7460 (Bob Weller, FCC) WJCR plans 13595 and 17525 next (George McClintock, TN) Heard on Sunday evening with Bro. Lester Roloff, dead a decade (Fred Waterer, DX Ontario) First Alternative is a scientology-sponsored program now on WCWR, opposing psychiatry (Tim Gueguen, Sask.) 0600-0700 Wed. to Sun.; also new is The Hour of the Time, Mon. 0500-0600 on 7435, which began by reading the Constitution (Adam Lock, WCWR).

KJES, New Mexico, was absent in August from 9510 after a lightning strike burning out at least the coaxial feedline (W.O.R.) Finally returned Sept. 2, also with new morning broadcast until 1600 on 11715, but gone again until Labor Day; English at 1400, co-channel VOA (W.O.R.). Typical of former HCJB transmitters, KVOH, Los Angeles, 17775 put S9 spur on 17800, still equal level with VOA after it opened at 1800 (gh, OK) World of Radio, your columnist's weekly half hour via WCWR and WRNO: Friday 2115 on 15690, Saturday 2200 on 15420, UTC Sunday 0200 on 7355, 0305 on 7435, 2030 on 15420, 2200 (temporarily?) on 15690, Monday 2045 on 15690, Tuesday 0630 on 7435; besides possible permanent changes, all these shift one UTC hour later Oct. 25. See also COSTA RICA.

Monitoradio producer Ken Bader and host Dale Willman were put on paid leave after refusing to air an apology for a report on AIDS prevention which mentioned cucumbers and condoms, after many CS church members objected (L.A. Times via Dennis Gibson) The church censored TV news (John Hart, former Monitor TV anchor, Sept. Columbia Journalism Review).

CSWMS Letterbox host John Parret announces he is leaving; will miss him (David Coursey, TX) Weekend Herald religious programs have added many languages: English, French, German, Spanish, Portuguese, Russian, Czech, Norwegian, Danish, Dutch, Swedish, Italian, Greek, Indonesian, Chinese (BBCM) Some are weekly or twice a month, very complex schedule (ADON) Surprised they took so long to do this, as the newspaper long had multi-lingual column.

Bill Clinton supports creation of a Radio Free Asia (Clinton ad in N.Y. Times via Bill Westenhaver) VOA unable to get Bush to commit against RFA. He knows outstanding California Asian-Americans could cost him a lot more than alienating old pals in Beijing (Evans & Novak in N.Y. Post via Bob Colyward).

Vanuatu R. Vanuatu on 3945 from sign-on 1855 until 1905 fade, and 7260 from 0625 to abrupt closing 0700 (David Norcross, Guam).

VIETNAM (non) Primary name of private clandestine from Moscow, V. of Freedom, is Radio Irina, for Irina Zisman, the former R. Moscow announcer who speaks and operates it. Hanoi threatened to expel Russians from Cam Ran Bay naval base if it's not stopped. Believed funded by Restoration Party under chairman Tran Quoc Bao. In Vietnamese, Tieng Noi Tu Do (BBCM) See last month until the next, 73 de Gien!
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.

0015 UTC on 15330
BULGARIA: Radio Sofia. Cultural Scene program emphasizing the national arts. (Bill Gross, Cohasset, MA) Radio Moscow relay heard on 15290 kHz at 0150 UTC. The Jazz Show with Carl Nugorev. (Robert Tucker, Savannah, GA) (Richard Jackson, Kansas City, MO)

0034 UTC on 12040
UKRAINE: Radio Ukraine Intl. Ukraine style music to ID. Listener's letters and folk music. Station noted on 15125 kHz at 2105, with news, IDs and feature on Ukrainian film industry. Radio Yerevan's Ukrainian relay heard at 11675 kHz at 0249. Presumed Armenian language with IDs, music, and news. (Tucker, GA) (Jackson, MO)

0233 UTC on 9590
ALBANIA: Radio Tirana. News followed by Albanian press review. Feature on Korabi valley history since 1940. Station ID 0256 into Albanian folk music. (Tucker, GA) (Joe Boone, Hodge, LA)

0255 UTC on 15235
LIBYA: Voice of Great Homeland. Arabic. Good signal quality observed on parallel 15415/15435 kHz. Traditional Arabic music to international newscast. (Richard Krasna, Highland Park, NJ)

0312 UTC on 15325
JAPAN: Radio Japan. Parallels 1710 kHz fair. Closing news headlines. Station ID/frequency-meter band sked. (Max Blackwell, St. Louis, MO)

0317 UTC on 9680
UNITED STATES: Voice of Free China via WYFR. No parallels noted tonight. Discussion on Taiwan's Youth Corps on leading college campus. Clubs include drama and audio visual fields. (Bagwell, MO)

0336 UTC on 7490
UNITED STATES: WJCR. Religious station with contemporary vocals. Station ID/frequency, and station phone number. Kentucky address for QSLs. (Upton, KY) (427 884 USA) Featured music from the Cathedral Quartet. Reported parallel 15660 kHz not heard. (Van Horn, LA) (Krasna, NJ)

0410 UTC on 7510
UNITED STATES: KTNB. Discussion on genetic engineering and bio ethics with relation to the future of America's morality. (Van Horn, LA)

0418 UTC on 4976
UGANDA: Radio Uganda. Weak signal on several subsequent nights. Deep voice male with newscast and public service announcements. Native African and pop tunes, audible past 0435. A real tough one, hopefully improving by DX season! (Frank Hillion, Charleston, SC) (GVH)

0422 UTC on 4910

0435 UTC on 11550
TUNISIA: RDTV-Tunisienne. Fair signal for Arabic readings. No audible signals on parallels 12005/7475/6755/21535 kHz. "Water dripper" interference intermittently during ID. Frequency/quote, pop music, and African news topics. Turn out at 0505. (GVH)

0517 UTC on 4915

0518 UTC on 4815
BURKINA FASO: Radio Burkina. French. Brief tone, 0531 to 0533. Interval signal on bellows tone to ID. Musical national theme, to balaton rhythm. Station ID/frequency/quote to African music. Talk with signal dropping by 0545, native African drums to final fade out by 0545. (Davis, AL)

0534 UTC on 5025
BENIN: ORTB-Parakou. French. High static as male announcer duet talks. USB interference during public service topics. African music, ID, and feature to tune-out at 0550. (Sam Wright, Biloxi, MS)

0559 UTC on 5995
MALI: RDTV du Mali. French. Guitar interval signal to 0600. Morning greeting and ID. Exceptional signal for frequency schedule. Also pops and local items. Parallel 4783 weaker, no signal of 4835/7285 kHz. ID, local Mali time check to lengthy conversation. Tune out 0642 with signal slightly decreased. (Wright, MS)

0625 UTC on 4845

1000 UTC on 17545
ISRAEL: Kol Israel. English news and features to 0300. Audible later on 17575 kHz at 1900 with Calling All Listeners. (Krasna, NJ) (Bob Fraser, Cohasset, MA) Additional Kol Israel noted at 2130 on 17575 kHz/2135 on 15640 kHz. (Tucker, GA) (Jerry Williams, Tampa, FL)

1044 UTC on 3200
PAPUA NEW GUINEA: Papua Territory-Radio Central. Pipigin. Very weak signal for announcements reading text. Additional PNG's heard include: Admiralty Islands-Radio Manus on 3315 kHz at 1046, New Britain-Radio East New Britain on 3385 kHz at 1050. Papua Territory-NBC on 4930 at 1055. The later station also logged as late at 1145 in English. Details included IDs and texts on PNG's government and plans for economic reforms. (Dusine Hadley, St. Petersburg, FL)

1052 UTC on 4753.5
INDONESIA: Sulawesi-Radio Republik Indo-Ujung Pandang, Indonesian. Pop and easy-listening vocals to melody interval signal at 1100. Station ID to announcer/ duets' newscast. Cultural type feature to gamelan music style. Station audible to 1110. irian Jaya-Radio Republik Indo-Wamena heard with fair signal on 4866.5kHz at 1135. Pop Indo vocals to ID and newscast at 1200. Programming audible to fade out at 1210. (GVH)

1120 UTC on 4645.10
BOLIVIA: Radio Fides. Quechua/Aymara. Text sounding like a religious sermon to 1126. Chorus hymn. "Buenos dias" morning greeting, local items and Bolivian melodies. Station ID and announcer's chat. (Hadley, FL)

1800 UTC on 15256
BRAZIL: Rádio Brasileiros. National news, and report on Brazil's auto industry. Great Brazilian music. (Philip Davies, S. Wales, UK)

1800 UTC on 13680
IRAQ: Radio Iraq Intl. English/Arabic/Spanish. Parallel noted on 15210 kHz, with VOA and Radio Algiers interference. National anthem to Holy Koran. News commentary to Arabic music. Arabic service at 1550. North American service on 15300 kHz. 0100-0300 appears to be irregular. (Stephen J. Price, Conemaugh, PA) Station logged on 15340 at 0310 in Arabic. Koran at tune-in, to talk and music on 5650.16 at 0200. (Larry Van Horn, New Orleans, LA)

1858 UTC on 15325
CANADA: Radio Canada Intl. Special broadcast to Canadian peacekeeping troops in what was Yugoslavia, produced with Canadian Forces Network. SCI news and program produced by CFN. Military news and a song sung by a Canadian peacekeeper in Vukovar, Croatia. (Tucker, GA)

1930 UTC on 7200
YUGOSLAVIA: Radio Yugoslavia. National news and commentary. Interview with a representative from United Nations. Report followed on the UN forces at the Sarajevo Airport. (Davies, UK)

2011 UTC on 13620
KUWAIT: Radio Kuwait. Program feature, Islam-The Religion of Truth, Right and Justice. Discussion, Arabic music to ID, news headlines. Station sign-off, ID and national anthem at 2059. (Tucker, GA) (Hadley, FL)

2120 UTC on 11880
C.I.S. (Confederation of Independent States). Red Star. English/Russian. Reference. Music bridge to English news. Golos Rossii tentatively ID'd on 15315 kHz at 0004. Russian news under Spanish station. Radio Gold also heard on 11800 kHz at 1915. (Davies, UK) (Hadley, FL)

2150 UTC on 9745
BAHRAIN: Radio Bahrain. Arab. Weak signaled chat to Arabic music. Key 2155. Program feature with musical bridge intro. Covered by HCBJ on 5700. (Scott L. Martin, Omaha, NE)

2155 UTC on 26229
ARGENTINA: Radio Nacional. Two Spanish announcers with chat and sports commentary. Surprised at this testing frequency! (GVH)

2220 UTC on 12085
SYRIA: Radio Damascus. Arabic. Fair signal ID, news and features. Parallel 15095 kHz weaker. (Krasna, NJ) (Williams, FL)

2250 UTC on 6005
CANADA: CFRC. CBC news on Yugoslavia and Somalia. ID noted as, "this is CFRC shortwave. Montreal." First time I have heard this ID; usually it is CFRC or now CICF. (Fraser, MA)

2310 UTC on 6115.8
COLOMBIA: La Voz de Llanos. Spanish. Latin pop to station ID at 2315. Good signal quality. Two additional Colombian's. La Voz de Guaviare heard in Spanish on 6035.2 and 2340. Sports commentary to ID break, amid VOA interference. Caracol heard on 5075 at 0420. Multiple IDs and news. (David Gasque, Orangeburg, SC)

2338 UTC on 11710
CUBA: Radio Moscow relay. Music and program on the traditions of Russian Orthodox Church's Assumption Day. Radio Havana heard on 11970 kHz at 0000. (Tucker, GA) (Martin, NE)

2356 UTC on 6300.04
A Visit to Canada

One of the reasons I really look forward each year to going to the MT convention is that I get to see some great friends. One such bunch hails from our neighbor to the north: Canada. I always look forward to seeing Robert Evans, Eric Sillick and Ian Low and sharing a banquet table with them. So in honor of these great folks and all our friends to the north, this month we feature the Canadian Armed Forces.

Canada's air, ground and naval services have been merged into one military force called the Canadian Armed Forces since 1968. You will see me refer to this organization as CANFORCE or Canadian Forces.

Before 1968, the services were all separate: The Canadian Army was permanently organized in 1871, the Royal Canadian Navy in 1910, and the Royal Canadian Air Force in 1924. Canadian military forces fought in both World War I, World War II and the Korean War. Canadian Forces also serve on various United Nations peacekeeping forces.

The chief of the defense staff commands the Canadian Armed Forces. The chief is responsible to the Minister of National Defense, a member of the Prime Minister's cabinet.

The Canadian Armed Forces has five commands:

The Air Command supervises the military forces that defend Canada from air attack. It also cooperates with United States military forces in defending North America. In addition, the Air Command provides air transportation and aircraft training for other commands in the Canadian Armed Forces.

The Canadian Forces Communication Command maintains, manages and operates strategic communications for the Canadian Armed Forces. It also serves the federal and provincial governments of Canada in emergency situations.

The Canadian Forces Europe, stationed in Germany, serve as part of the forces of the North Atlantic Treaty Organization (NATO). This command consists of land and air forces.

The Maritime Command operates Naval forces on the Atlantic and Pacific coasts to defend Canada against sea attack. It also helps support NATO forces against submarine warfare. In addition, the Maritime Command controls aircraft used in naval operations.

The Mobile Command stands ready to move combat land and air forces to any part of Canada or overseas on short notice. It also trains other Canadian troops for mobile operations.

Big Mac

Probably the most visible evidence of Canadian Forces in the Utility Bands is MACS (Canadian Military Aeronautical Communications System). This service is provided for non-tactical air-ground communications and may be used for position reporting, weather information, and search and rescue.

MACS aeronautical stations have a point-to-point relay capability which is also supported for message traffic by a teletype network. Position reports and traffic destined for any location may be relayed by any MACS station.

The major MACS stations include: Lahr, Germany (VEG); Edmonton, AB, Canada (VXA); Trenton, ON, Canada (CHR); and St. John’s, NF, Canada (CJX). Notice that one long-time resident on this network is missing—Halifax. The latest information I have from official Canadian sources indicates that this station is no longer on the air.

The MACS is primarily intended to handle Canadian Military Flights, but it will make its facilities available for any allied military flight. Since the United States Air Force has bases in Canada and utilizes special flight training corridors in Northern Ontario as well as other parts of the country, MACS handles a lot of traffic for the United States Air Force. US military aircraft in Canadian airspace can be heard making phone patches to such stations as Discard, Format and Raymond 21.

### Table 1: MACS Weather Broadcast Schedule

<table>
<thead>
<tr>
<th>Aeronautical Station</th>
<th>Voice Callsign, Frequency/Schedule</th>
<th>Mode</th>
<th>Time of Broadcast</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lahr Military, VEG</td>
<td>13231 kHz 0800-2000 5690 kHz 2000-0800</td>
<td>USB Voice Only</td>
<td>H+16</td>
<td>Broadcast Forecast and ActualConditions for: Lahr(EDAN), Baden-Soeppingen(EDAL), Frankfurt(EDDF), Stuttgart(EDDS), Gatwick(EGKK), and Prestwick (EGPK).</td>
</tr>
<tr>
<td>Edmonton Military, VXA</td>
<td>15035 kHz 1200-2300 6753 kHz 2300-1200</td>
<td>USB Voice Only</td>
<td>H+20</td>
<td>Broadcast Actuals for: Namaka(YED), Vancouver(YVR), Winnipeg(YWG). Comox(YQQ), Cold Lake(YOD), Calgary Intl(YCD). On even hours only they add: Resolute Bay(YRB), Cambridge Bay(YCB), Churchill(YQQ), Yellowknife(YZF), Whitehorse(YYX) and Thule AFB.</td>
</tr>
<tr>
<td>Trenton Military, CHR</td>
<td>15035 kHz 1000-0100 6753 kHz 2300-1200</td>
<td>USB Voice Only</td>
<td>H+30</td>
<td>Broadcast Actuals and Forecast for: Trenton (YTR), Ottawa (YOW), Toronto/L.B. Pearson Intl(YZZ), Quebec City(YQB), Bagotville(YBG), North Bay(YBB).</td>
</tr>
<tr>
<td>St. John's Military, CJX</td>
<td>15035 kHz 1200-2300 6753 kHz</td>
<td>USB Voice Only</td>
<td>H+40</td>
<td>Broadcast Actuals and Forecast for: Chatham(YCH), Greenwood(YZK), Shearwater(YAW), Gander(YQX), Goose Bay(YRP). Additional actuals only are broadcast for: St. John's (YJT), Sydney(YQY), Halifax(YHZ), Yarmouth (YQI), Brunswick, ME (KNH2), Stephenville(YJT).</td>
</tr>
</tbody>
</table>

**Mode**

- USB: Voice Only
- Voice: Actuals and Forecasting

**Time of Broadcast**

- H+16: 1 hour 16 minutes
- H+20: 1 hour 20 minutes
- H+30: 1 hour 30 minutes
- H+40: 1 hour 40 minutes
- H24: 24 hours
Table 2: MACS Frequencies

<table>
<thead>
<tr>
<th>Service</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lahr Military</td>
<td>3092 4704 5595 5690 6705 9006 11209 11233 13231 13257 15031 18012</td>
</tr>
<tr>
<td>Edmonton Military</td>
<td>3046(DIA) 3092 4704 5718 6705 6746 *6753 8999 9006 11209 11214 11233 11255 11271 13221 13254 13257 15031 15035 17995 18012 18027</td>
</tr>
<tr>
<td>Trenton Military</td>
<td>3046(DIA) 3092 4704 5718 6705 6746 *6753 8999 9006 11209 11214 11233 11255 11271 13221 13257 15031 15035 17995 18012 18027</td>
</tr>
<tr>
<td>St. John's Military</td>
<td>3092 3151 4704 4749 4752 5718 6693(D1G) 6705 6746 *6753 9006 9010 11209 11233 13221 13254 13257 15031 *15035 17995</td>
</tr>
</tbody>
</table>

* indicates an exclusive weather broadcast frequency that is not monitored for traffic.

The MACS HF radio communication system provides several basic services. Facilities are available at each MACS aeronautical station to provide official phone service to any Canadian or allied air base. Weather information and forecasts are also broadcast by these stations. Table 1 is the complete schedule and content of these broadcasts from each of the MACS stations in the network. Search and Rescue co-ordination centers are located in Victoria, Edmonton, Trenton and Halifax. The Canadian Search and Rescue frequency is 5718 kHz. The Table 2 is a list of Canadian MACS communication frequencies and known designators. Additions to this list and any discrete frequencies are always appreciated and welcomed.

More from Canadian Cold Country

One Canadian radio service for which I receive many requests for information is CFARS (Canadian Forces Amateur Radio Service)—the Canadian equivalent to the US military MARS system. Like MARS, the CFAR service provides a radio link for Canadians in CANFORCE deployed away from home. Expect to hear lots of phone patches. CFARS also provides backup communications support during emergencies, as does MARS.

CFARS stations can be divided into three different types: Military stations, Coast Guard stations, and Affiliated stations.

Military stations operate from military bases or vessels. CFARS callsigns associated with these stations tend to start with "CIW" followed by one or two digits for fixed military stations. Maritime Command vessels also use the "CIW" followed by four digits. Pacific vessels digits start with a "2," and Atlantic vessels start with an "8."

Robert Ing notes in the second edition of his book, Canadian Military Radio Frequency Guide, that some military stations previously without CFARS capability (particularly overseas) tend to add the single digit "9" to their military tactical callsign once they add CFARS capability.

Interestingly, Ing also notes that the "CHI" prefix is used by some, but not all, militia stations and "CIC"/"CIP" and "CIS" are used by some, but not all, specialist military stations.

Some Canadian Coast Guard vessels carry a CFAR capability. They will be heard using the "CIW" prefix, then four digits preceded by a "0." Affiliated CFARS stations are operated by licensed Canadian Amateur Radio Operators. These stations use the "CIW" prefix followed by three digits.

CFARS callsigns with the prefix CIW, which are assigned to land stations (those that are followed by one to three digits), always use the first digit to identify the general geographic location of the station. This coding of CFARS callsigns are related to areas in Canada as indicated below:

- CIW1: Yukon and the Northwest Territories (1-3 digits)
- CIW2: British Columbia (1-3 digits) & Pacific Maritime Command Vessels (4 digits)
- CIW3: Alberta (1-3 digits)
- CIW4: Saskatchewan (1-3 digits)
- CIW5: Manitoba (1-3 digits)
- CIW6: Ontario (1-3 digits)
- CIW7: Quebec (1-3 digits)
- CIW8: Maritime Provinces (1-3 digits) & Atlantic Maritime Command Vessels (4 digits)
- CIW9: Canadian Forces Germany, Overseas & Canadian Coast Guard Vessels (4 digits)

The main operating time for CFARS activities seems to be around 1400 - 2300 UTC. There are still other times that activity will be heard on CFARS frequencies, so be sure to check them often.

Here is the latest list of CFARS frequencies and designators:

<table>
<thead>
<tr>
<th>Callsign</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIW1</td>
<td>4022.0</td>
</tr>
<tr>
<td>CIW2</td>
<td>6905.0</td>
</tr>
<tr>
<td>CIW3</td>
<td>13970.0</td>
</tr>
<tr>
<td>CIW4</td>
<td>13971.0</td>
</tr>
<tr>
<td>CIW5</td>
<td>13972.5</td>
</tr>
<tr>
<td>CIW6</td>
<td>13973.5</td>
</tr>
<tr>
<td>CIW7</td>
<td>13974.5</td>
</tr>
<tr>
<td>CIW8</td>
<td>13975.0</td>
</tr>
</tbody>
</table>

Many thanks to Robert Ing for some of the background material presented in this column on CFAR. I understand Robert has now published a third edition of the book I mentioned previously and, while I haven’t seen a copy yet, his work is generally reliable. The new edition is available from Grove Enterprises in Brastown.

New ARQ-S4 Frequency?

Let’s move now to the southern hemisphere and another report from Robert Hall in South Africa. In March of this year, Hall logged two FAX transmissions daily at 1200 and 1225 UTC from SAAM Molodezhnaya on 18488.4 kHz USB. The signals were strong and produced good FAX copy on the printer, but since April only RTTY transmissions have been heard on this frequency (actually, 18490.2 kHz in the ICOM RTTY mode).

On the M-7000 only the ARQ-S4 mode gives a perfect tune with all the correct LED’s showing, but the screen display is difficult to interpret. Robert sees lots of “XOC” and an alpha-numeric pattern with no indication of origin. The transmissions have been at the same times as the former SAAM FAX transmissions, which suggest that the signals are coming from SAAM Molodezhnaya. My question is, “Do the Russkies have ARQ-S4?” Any ideas on this from anyone?

In closing...

Well that’s this month’s column. Gayle and I are looking forward to meeting with those of you attending the UTE forums I will be conducting this year. On Friday night is “Who’s Who in the Spectrum” followed by “Professional Monitoring Techniques." I hope you’ll make plans to attend this special session on equipment and procedures used by the professionals. Saturday brings the Beginner UTE forum, and Sunday will be “Monitoring the Military” and the Experts panel. I hope you will be able to attend at least one of these talks and I look forward to meeting each and everyone of you. Best of DX and see you all in 30.
Utility World

Utility Loggings
Abbreviations used in this column

AF Air Force
AFTN (Brown-MA)
Telecommunications Network
AM Amplitude Modulation
AMVER Vessel Rescue System
ANSA Agenzia Nazionale Stampa
APS Agera Press Service
ARO-E3 Single channel ARQ data mode
ARQ-M2 Multiplex ARQ data system
AWS Air Weather Service
CANFORCE Canadian Forces
Cat Category
CCG Coast Guard
CGC Coast Guard Cutter
COMSTA Communications Station
CQ General call for any station
CW Continuous Wave or Morse Code
DE Dutch for 'From'
FACS FAC Aircraft Control and Surveillance Facility
FAX Facsimile
FEMA Federal Emergency Management Agency
FF French Forces
ID Identification

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

117.4 DCF37-Offenbach Meteo, Germany, with FAX charts at 0024.0 (Ary Boender-Hr Spkenisse, The Netherlands)
129.5 SQA212-Warsaw Meteo, Poland, with 50 baud RTTY weather at 0019.0 (Boender-Nethe-lands)
134.2 DCF54-Offenbach Meteo, Germany, with FAX charts at 1000.0 (Boender-Nethe-lands)
3235.0 RSR71-Minsk Meteo, Belorussia, with weather charts using FAX at 1430.0 (Ian Mason-Scotland)
3714.0 Interpol Brussels with SITOR-A marker and scrambled messages. (Boender-Nethe-lands)
3855.0 DDH3-Deutsche Wetterdienst with FAX charts showing ice conditions and wave predictions at 2130.0 (Boender-Nethe-lands)
4277.0 ZLW-Wellington radio, New Zealand, with DE CW chart at 0924.0 (Dix-NY)
4641.0 English female 3/2-digit number station in AM at 0024.0 (Thur) in parallel at 5405.0. (Tom Mazamek-Maxwell, OH)
4777.5 IMBS1-Rome Meteo, Italy, with FAX charts at 2255.0 (Boender-Nethe-land)
5320.0 NNM80-CG Hampton Roads, VA, working CGC Point Herron in USB at 2316.0 NIK-COMSTA Boston International Ice Patrol with reports in CW at 0116.0 USCG Group Cape May working CGC Alert in USB at 2206.0 (Mark Janack-Summit NJ)
5355.0 RND77-Moscow Meteo, Russia, with FAX charts at 2155.0 (Boender-Nethe-lands)
5417.0 Spanish female 5-digit number station at AM at 0300.0 (Fr). (Mazamek-OH)
5680.0 CGC Tamaroa working Group Woods Hole regarding broken down fishing vessel in USB at 0745. Outcast 303 working Goose Military in USB at 0732. (Henry Brown-E Falmouth, MA) This is an international search and rescue channel-Larry.
5692.0 CG 6011 working Traverse City Air with tight ops in USB at 0335.0 (Brown-MA)
5696.0 F3W working COMSTA Boston in USB, was assigned frequency 3-3 Echo-7 at 1241.0 (Brown-MA)
5718.0 Rescue 55 working Trenton Military in USB at 1608 enroute search mission. (Brown-MA)
5730.0 Old Dutch AF, Mazatlan-City using W3C marker at 2344.0 (Dix-NY)
5762.0 Spanish female 5-digit number station in AM at 0600(Sat). (Mazamek-OH)
5870.0 CAR-Navy COMSTA Key West, FL, with CW QM marker at 0038.0 (Janack-NJ)
5907.5 US Fish & Wildlife Service Refuge Headquarters in Soldotna, AK, working a field party in LSB at 1637. (Gerald R. Brockman-Kenai, AK)
6232.0 AAFR working AACK with position reports in USB at 0012.0 (Russ Hill-Oak Park, MI)
6496.0 CFH-CANFORCE Halifax, NS, with coded RTTY weather at 1125.0 (Janack-NJ)
6693.0 CANFORCE 2436 working warship "Fraser" in USB at 0944.0 CANFORCE 2405 working Trenton and St. John military. Aircraft preparing to land on the warship "Preserver" in USB at 0324.0 (Brown-MA)
6798.0 Spanish female 5-digit number station in AM at 0500.0 (Fri). (Mazamek-OH)
6812.0 Andrews working SAM 26000 & 33000 for traffic in USB at 1947.0 (Hill-MI)
6825.0 Spanish female 5-digit number station in AM at 0300.0 (Wed). (Mazamek-OH)
6840.0 Spanish female 4-digit number station in AM at 0230 daily. (Mazamek-OH)
6925.0 Spanish female 5-digit number station in AM at 0420.0 (Fri). (Mazamek-OH)
7597.0 AJE-USAF AWS Crouithton, England, with FAX icing forecast for cat 2 aircraft at 2050.0 (Boender-Nethe-lands)
7655.0 English female 32-digit number station in AM at 2100.0 Daily. (Mazamek-OH)
7846.0 Spanish female 5-digit number station in AM at 0700.0 (Tues). (Mazamek-OH)
7915.0 CMM23-MAP Rabatil, Morocco, with Spanish RTTY news at 1816.0 (Mazanec-Scotland)
7953.0 CFW-Vancouver Telecom, BC, Canada, working radiotelephone patches with various groups in USB at 1545.0 (Brookman-AK)
7959.0 9BC22-IRNA Tehran, Iran, with English RTTY news parade to 0840.0 at 2011.0 (Mazanec-Scotland)
8040.0 KMI-San Francisco (Dixon) Radio, CA, with SITOR-B test tape at 0130.0 (Steve Garber-Ap, AZ)
8137.0 Spanish female 5-digit number station in AM at 0500.0 (Wed). (Mazamek-OH)
8331.0 GYA-US Navy London, England, FAX broadcast with surface weather and wind charts at 2025.0 (Boender-Nethe-lands)
8465.0 SYN2-Israeli Mossad number station in AM at 2231.0 (Dix-NY)
8478.0 VIX-Australi-an Naval radio, Canberra, with CW QM marker at 0824.0 (Dix-NY)
8534.0 WLO-Mobile Radio, AL, with SITOR-B weather broadcast at 1345.0 (Garber-AZ)
8542.0 PXN-Jakarta Radio, Indonesia, with CW QM marker at 1014.0 (Dix-NY)
8610.0 XSN4-7-Guangzhou Radio, China, with CW QM marker at 0952.0 (Wed). (Mazanec-OH)
8686.0 PKA-Sabaug Radio, Indonesia, with CW QM marker at 1335.0 (Aya Kaneko-Nagoya-City, Japan) Welcome to the column Aya, please report often-Larry.
8691.3 XST-Quingdao Radio, China, with CW QM marker at 1005.0 (Dix-NY)
8694.0 PKM-Buting Radio, Indonesia, with CW QM marker at 0930.0 (Kaneko-Jp)
8698.0 FUPB-Noumea Radio, New Caledonia, with CW QM marker at 0947.0 (Dix-NY)
8771.0 Seabreeze (FACS FAC Pensacola) calling Baker Boy. Discussing "Footst 1" plus other callsigns in USB at 2216.0 (Brown-MA)
8967.0 Reach 70031 (C-141) working Hickam Metro (Letterman) via Hickam at 0948 in USB. Reach 59398 (C-141) working Dover Metro via Thule AB, Greenland, in USB at 2342.0 Old Salt Center working McClellan in USB at 0244.0 (Brown-MA)
8964.0 CG Rescue 2122 working Miami Ops regarding ditched aircr-boat aircraft off of Cape Canaveral in USB at 0215.0 (Brown-MA) Kodak working CG7130 in USB at 2259.0 R9D Tac Y and H2Z Tac 1 working CAMAPSAC San Francisco to report flight ops and position in USB at 0257.0 (Chris Hulse-Eugene, OR) USCG San Juan working CG713 in USB at 0024.0 (Dix-NY)
8993.0 Reach 67949 working Hilda via MacDill phone patch in USB at 0029.0 (Brown-MA)
9006.0 CANFORCE 2244 working Ottawa Ops via Edmonton Military phone patch in USB at 0047.0 Mentioned CANFORCE 1. (Brown-MA)
9023.0 Spar 65 working Lajes with phone patch to unknown station in USB at 0300.0 (Brown-MA) Chalice Charlie working Guardian in USB at 1625.0 (Steve Gill-Garberville, CA)
9120.8 Undisclosed station transmitting 6-digit numbers in CW at 2235.0 (Dix-NY) Probably WGY-912 Mt. Weather, Barrie, VA FAX station-Larry.
9340.0 RCH40-Tashkent Meteo, Uzbek, with weather FAX charts at 1930.0 (Boender-Nethe-lands)
9382.0 AOK-US Navy Rota, Spain, with FAX nags charts at 2020.0 (Boender-Nethe-lands)
10493.7 RFUJ-JF-Port Bouet, Ivory Coast, with FAX RTTY news heard at 1920.0 (Mason-Scotland)
10600.0 XVN37-VNA Hanoi, Vietnam, with French RTTY news heard at 1536.0 (Mason-Scotland)
Jama 69 (Tail No.01266/C -130) working MacDill with phone patch to Spanish female number

Snoop 20 calling Skybird with CO CW marker

JJC

XSG- Shanghai Radio, China, with CO CW marker

NNNOCQZ -USS

NNNONUW-

RY

SUU9-Cairo Meteo, Egypt, with RTTY weather messages at 1346. (Hall-RSA)

LUMB-PTT Lumumbasha, Zaire, with SITOR-A ID at 1220. (Hall-RSA)

JMH5-Tokyo Meteo, Japan, with FAX weather charts at 1615. (Pettengill-OK)

HB2O-MFA Berne, Switzerland, with RTTY press news in French and German at 1225. (Hall-RSA)

LOR-Puerto Belgrano Naval, Argentina, with ID and 5-letter groups using RTTY at 1230. (Hall-RSA)

Unid station with perfect tune to ARQ-S5, with the letter K dominant at 1240. (Hall-RSA)

RZS9-Tashkent, Uzbek, with FAX weather chart at 1330. (Hall-RSA)

Unid station sending RTTY RY test tape at 0245. (Greg Gilbert-Marietta, GA) This is probably CLP1-Mirrex Havana, Cuba, Greg Lary.

JMSG-Tokyo Meteo with RTTY weather codes at 1540. (Hall-RSA)

UBKS- Soviet ship RTMS Sokrat working Kaliningrad using RTTY at 1255. (Hall-RSA)

OUUG-Soviet ship Primorsk Bereg working Kaliningrad using RTTY at 1412. (Hall-RSA)

UTY-Soviet ship RTMS Yastrebovo working Kaliningrad using RTTY at 1415. (Hall-RSA)

HEC05-Berne Radio, Switzerland, with channel and frequency into using SITOR-B at 1255. (Hall-RSA)

FFT92-St. Lys Radio, France, working m/v Myteora in SITOR-A at 1245. (Hall-RSA)

LGG0/LW-Rogaland, Norway, with CW channel/frequency information at 1645. (Hall-RSA)

PPO-Olinda radio, Brazil, with CO CW marker at 1600. (Garber-AZ) Same at 1657. (Hall-RSA)

JMH5-Tokyo Meteo with FAX weather chart, fair to 1010. (Hall-RSA)

JCT-Choshi radio, Japan, with RTTY news in Russian dialect at 1557. (Hall-RSA)

JMG6-Tokyo Meteo with RTTY weather cocdes at 1610. (Hall-RSA)

English female number station heard in AM at 1505. (Hall-RSA)

This QSL comes to us courtesy of Donald Michael Choleva of Euclid, OH.
Open Season to Scanners

In many areas across the United States, the month of October marks the beginning of hunting season. Here in Pennsylvania, Small Game Season (rabbit, pheasant and squirrel) will open during the last week of October. The season lasts for approximately five weeks and is immediately followed by a two week deer season.

Last year, during the first day of deer season, nearly one million hunters invaded the woods of Pennsylvania. Throughout the day there were reports of accidental shootings, sprained ankles, broken bones and lost hunters. If your state has a regulated hunting season, the month of October will probably contain at least one key hunting event.

Scanning the opening day of hunting season can be very exciting. Your first goal will be to determine the exact dates. You can write a letter to your State Game Commission, or a more informal approach is to visit your local sporting goods store. The proprietor probably has the dates memorized and will be happy to recite them. In some states, sporting good stores are permitted to sell state hunting licenses. Included with the sale of each license is a rules and regulations pocket guide that contains a yearly schedule of hunting events. Depending on your state, the guide may be free or purchased for a few dollars.

After you’ve marked the hunting dates on your calendar, it’s time to prepare your scanning frequencies. The wildlife enforcement frequencies for your state can be located in Police Call. If your state permits hunting in State Parks or National Forests, you’ll need to dedicate a bank of frequencies to these interests as well.

During the entire hunting season, the local police and state police frequencies will be affected by the arrival of hunters into small, rural towns. Hotels will be filled to capacity, restaurants will be crowded, and gas station patrons may need to wait in line. The hospital, ambulance and Medevac frequencies will also be active. Some of the mishaps that you’ll monitor will be broken bones, lacerations and heart attacks. Lost hunter reports usually occur about an hour or two before sunset. A search for a lost hunter can involve hundreds of volunteers and may include helicopters and rescue teams.

Road blocks are common during the first few days of a regulated hunting season. State Wildlife officers and State Police will stop all vehicles and look for illegally killed game. If there is a road block in your area, scan the local FBI frequencies as well. During a regulated hunting season, federal agents look for poachers who are killing game to sell overseas.

Although hunting ends at sunset, the scanning action can continue well into the night. During large game season (deer, bear, elk, etc.), many states will use “decoys” to capture illegal hunters. The decoys are fake replicas of big game animals. The purpose of the decoy program is capture poachers who hunt primarily at night. The area around the decoy is staked out by Wildlife Officers and State Police. When the poacher attempts to kill the animal, the officers move in to make the arrest.

Although I’ve placed the emphasis on the fall hunting season, the same rules apply to the spring fishing season. In the mountains of Pennsylvania during the month of April, the opening day of trout season attracts thousands of anglers to streams and lakes. Scanning the fishing season is no different than scanning hunting season. The same rules apply and many of the hunting frequencies will also be active during fishing season.

As you prepare to monitor your hunting and/or fishing season, remember that the opening day will draw the largest crowds. Hunter participation and the scanning action will begin to wind down through

The Scanning Report

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

The first day of hunting or fishing season will attract large crowds. To catch the action in your neck-of-the-woods, check out the Scanning Report.

the second and third day. By the fourth day, the scanning action will probably have reached a low point. But don’t get discouraged. Hunters and fisherman will once again invade the area during the weekends. It is a predictable cycle that will remain constant throughout the season.

Catching your share of the scanning action on opening day and throughout the season is easy. You don’t need a license, and you can keep as many frequencies as your heart desires. To be successful, you’ll need to do your homework and plan ahead. Happy hunting, er, scanning!

Treasure Hunt

Hurry! This is your last chance to win a frequency counter from Optoelectronics. I’ve got one 2600H and one model 3000.

Both models feature super sensitivity, 10 digit LCD display, 16 segment bargraph and a hold button that locks the detected frequency on display. The top-of-the-line 3000 covers frequencies from 10 Hertz to 2.4 Gigahertz. The winner of the 2600H, which covers 1 MHz to 2.4 GHz, will also receive a nicad battery pack and AC charger adapter.

The bargraph is a 16 segment display that reacts to signal strength. As the signal becomes stronger, the bargraph displays additional segments. Generally, if three segments are showing, there is a signal present that can be measured. With a little practice, the bargraph can be used to guide the user to the strongest point of the transmitted signal.

After you catch the frequency, press the hold button and the 2600H and 3000 will “freeze” the display. In the past, you only had a few seconds to memorize the captured frequency. The hold button retains the frequency in the LCD until you decide to release it.

Here are the clues:
1. What is the toll free phone number for Optoelectronics?
2. The frequency of a garage door opener can be captured with a frequency counter. True or False?
4. The Uniden/Bearcat 800XLT must be modified to monitor between 870 and 890 megahertz. True or False?
5. In what year did Ronald Reagan restrict the release of federal frequency lists?

Send your answers to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902. Please observe the following rules: 1) FAX entries will not be accepted. 2) All entries must be mailed separately. 3) The use of postcards is encouraged.

Frequency Exchange

We begin with a visit to Hawaii. As we taxi to the airline ramp, pull out your scanner radio and punch in the following frequencies:
129,000 Cargo handling ramp 155,310 Hawaii Police
154,695 Hawaii Police 155,610 Hawaii Police
154,740 Hawaii Police 155,685 Waikiki Police
154,785 Hawaii Police 155,820 Life Guards
154,830 Hawaii Police 157,150 Coast Guard
154,995 Game Wardens Rescue Ops
155,130 Pearl City Police 460,700 Aloha Airlines ramp
155,190 Honolulu Police 460,725 United Airlines ramp

The above information was supplied and confirmed by R. Souza, of Maui, Hawaii.

Returning to the mainland, our next stop is Louisville, Nebraska. Mike Dillion lives near Offutt Air Force Base, and here are his favorite frequencies:

40.170 Special Investigations 154.010 Offutt fire net
40.190 Special Investigations 163.315 Offutt civil engineering
49.700 Ordnance Disposal 163.485 Offutt security police
121.700 Offutt ground control 163.510 Offutt law enforcement
126.200 Offutt Tower 163.560 Offutt mobile controller
135.350 Offutt GCA approach 236.600 Offutt tower
138.325 Offutt pagers 275.800 Offutt ground control
140.400 Airborne control 311.000 Offutt command post
142.125 IBR network 312.000 Offutt command post
143.825 NECAP alert secondary
148.035 CC Net 342.500 Pilot to metro
149.050 Offutt ramp control 348.400 Offutt tower
149.235 Transportation dispatch 372.200 Pilot to dispatch
149.500 Wing commander 413.200 Offutt base operations
150.025 Offutt motor pool FM net
150.195 Offutt Medical net 413.300 Offutt snow control
150.285 Offutt fire and crash 413.450 Crew alerts

Mike's complete list also contains frequencies for Eppley Airfield, Lincoln Municipal Airport and Nebraska Air National Guard. Two landing diagrams for Lincoln Airport and Offutt AFB are included with the list. To receive the free list & diagrams, send a #10 SASE to the Frequency Exchange, Nebraska List, P.O. Box 98, Brassington, NC 28902.

Are you ready for a boat ride? The Coast Guard Air Station in Traverse City, Michigan, has confirmed the following frequencies:

156.800 Distress
156.300 Interception communications
156.600 Port operations
156.650 Bridge to bridge
157.050 Coast Guard working
157.100 Coast Guard working
157.150 Coast Guard working
157.075 Marine Environment operations
157.175 Coast Guard Auxiliary

The above frequencies were taken from a Coast Guard letter addressed to Darwin McDonald, of Madison Heights, Michigan.

If you're tired of flying and boating, let's visit Tucson, Arizona. A scanner buff who has asked to be called Mr. "B", has provided the new 800 megahertz frequencies for Tucson.

856.10 856.20 857.10 858.10 859.10 860.10 861.10
862.10 863.10 864.10 865.10 857.20 858.20 859.20
860.20 861.20 862.20 863.20

According to David Mitchell, the Radio Shack store in Clinton, Missouri, has invited us to stop in and sample their frequency list.

42.32 Highway Patrol 155.475 Mutual Aid
151.07 Highway Department 155.73 Sheriff statewide
151.37 Park Systems 155.76 St. Clair Sheriff
154.28 Fire-mutual aid 155.91 Clinton Tac #2

GUIDE TO FACSIMILE STATIONS
12th edition • 416 pages • $ 35 or DM 50

The recording of FAX stations on longwave and shortwave and the reception of meteorological satellites are fascinating fields of radio monitoring. Powerful equipment and inexpensive personal computer programs connect a radio receiver directly to a laser or ink-jet printer. Satellite pictures and weather charts can now be recorded automatically in top quality.

The new edition of our FAX GUIDE contains the usual up-to-date frequency lists and precise transmission schedules, including those of all US Air Force, US Coast Guard and US Navy stations worldwide. It informs you about new FAX converters and computer programs on the market. The most comprehensive international survey of the "products" of weather satellites and FAX stations from all the over the world is included: 358 sample charts and pictures were recorded in 1991 and 1992! Here are that special charts for aeronautical and maritime navigation, the agriculture and the military, barographic soundings, climatological analyses, and long-term forecasts, which are available nowhere else.

Additional chapters cover
- Exact schedules - to the minute! - of 90 FAX stations, and of meteorological satellites GMS (Japan), GEOS (USA), and METEOSAT (Europe).

Further publications available are Guide to Utility Stations (10th edition), Radioteletype Code Manual (11th edition) and Air and Meteor Code Manual (12th edition). We have published our international radio books for 25 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

Do you want to get the total information immediately? For the special price of $ 165 / DM 245 (you save $ 32 / DM 40) you will receive all our manuals and supplements (altogether more than 1700 pages!) plus our Cassette Tape Recording of Modulation Types.

Our prices include airmail postage to anywhere in the world. Payment can be by DM or check (no credit cards please). Dealer inquiries welcome - discount rates and pro forma invoices on request. Please mail your order to:

Klingenfuss Publications
Hagenloer Str. 14
D-7400 Tuebingen
Germany
Tel. 01149 7071 62830

154.34 Clinton Fire 158.190 R.E.A. electric
154.565 Wendy's order window 158.745 St. Clair Rescue

Our next stop is Whitesboro, New York. Whitesboro is the home town of Fred Latus, Jr., and when Fred turns on his scanner, he listens to the following frequencies:

155.955 Mohawk Valley Community College security
461.075 Baseball Hall of Fame in Cooperstown
464.200 Sangertown Square security
464.925 Riverside Mall security
453.400 Oneida Prison
453.475 Mohawk Prison
453.975 Midstate Prison
460.275 Mohawk Prison
460.225 Oneida Prison
465.225 Oneida Prison
465.275 Mohawk Prison
464.975 Utica College security

Fred's complete list includes frequencies for the New York State Police and Griffiss Air Force Base. To receive the complete list, send two dollars to the Frequency Exchange, New York List, P.O. Box 98, Brassington, NC 28902.

If anyone in the group needs medical attention, check out Dan Fern's medical frequencies for Waukesha, Milwaukee.

45.580 Flight for Life Base
123.050 Flight for Life Helicopter
154.540 Kettle Moraine Ambulance
155.235 Curtis Ambulance Service
462.675 Cross Ambulance Service
462.950 Milwaukee Co. Ambulance/hospital
462.975 Milwaukee Co. Ambulance/hospital

MONITORING TIMES October 1992 37
463.000 Hospital to Paramedics F-1
463.025 Hospital to Paramedics F-2
463.050 Hospital to Paramedics F-3
463.075 Hospital to Paramedics F-4
463.100 Hospital to Paramedics F-5
463.125 Hospital to Paramedics F-6
463.150 Hospital to Paramedics F-7
463.175 Hospital to Paramedics F-8
463.425 Bell Ambulance Service
464.450 Superior Central Ambulance Company
464.475 Parachute Ambulance Company
468.000 Paramedics to Hospital F-1
468.025 Paramedics to Hospital F-2
468.050 Paramedics to Hospital F-3
468.075 Paramedics to Hospital F-4
468.100 Paramedics to Hospital F-5
468.125 Paramedics to Hospital F-6
468.150 Paramedics to Hospital F-7
468.175 Paramedics to Hospital F-8

Don also included a few railroad frequencies. And since we've already experienced a plane and boat ride, it seemed appropriate to end this month’s Frequency Exchange with a ride on the rails:

- 161.295 WIS Central LTD (Road)
- 161.520 Soo Line (Road)
- 160.770 Soo Line (Road)
- 160.890 Chicago & North Western (Road)
- 160.455 Chicago & North Western (Maintenance)
- 160.040 Chicago & North Western (Road)
- 160.575 Chicago & North Western (Yard)
- 161.430 Soo Line (Yard)
- 161.550 Soo Line (Yard)
- 160.920 Soo Line (Yard)
- 160.75 WIS & Southern (Road)
- 161.145 WIS & Southern (Road)

To invite the Frequency Exchange to your home town, simply send in a list of your favorite frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. Typewritten lists are preferred, but we'll accept handwritten lists that are neat and legible.

Inside Photo Radar

Regardless of the manufacturer, photo radar units share common characteristics. The main unit is a low-powered, stationary radar that operates on the K- or Ka-band. Mounted in a small van, truck or sport utility vehicle, the unit is parked along the road with the radar aimed out the back. When a vehicle exceeding the speed enters the beam, a motor-driven 35mm camera snaps a photo. Since the radar beam is narrow and short—50 feet or less—radar detectors are of little use.

A polarization filter on the camera reduces windshield glare, and provides a clear shot of the driver’s face. In states where vehicles do not display front license plates, a second camera positioned in the front of the van snaps a photo of the rear license plate. On cloudy days or at night, a powerful flash illuminates the vehicle. A red filter is placed over the flash at night to prevent blinding the violator.

Another variation of photo radar is an unattended pole mounted unit that has been tested by the Michigan State Police. Loaded with an 800 frame roll of film, the radar operates 24 hours a day. The same technology applies to “red light” cameras. The unit photographs drivers who run red lights in high accident areas. Red light cameras may also be used to monitor railroad crossings with histories of fatal accidents.

Send your photo radar information or copy of your photo radar ticket to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

Cellular Snoops

The FBI is worried that digital cellular phones have no provisions for wiretapping. It seems that criminals can use the new digital phones with total security—free from any possible surveillance.

The Bush administration views advances in communications as a threat to the fight against drugs, terrorism, kidnappers and white collar crime, and they are seeking legislation to ban equipment that cannot be monitored.

Okay, gang—I’m scratching my head on this one. If the Bush Administration wants to monitor the airwaves, why don’t they start by eliminating the Electronic Communications Privacy Act? As most of you already know, the ECPA has made cellular monitoring illegal.

It seems fairly simple. Eliminate the ECPA and invite scanner buffs to provide their local police with recorded cellular conversations regarding illegal activities.

Cellular Etiquette

There are about one million cellular phones in use on the streets of Japan. With so many phones in use on a daily basis, the Japanese have developed a set of cellular phone manners.

“Use of portable telephones at your seat may be a disturbance to other passengers, so please use the vestibule even if it is inconvenient,” runs the message that greets riders aboard Japan’s bullet trains.

In many of Tokyo’s restaurants, diners are firmly asked to leave their tables to conduct urgent phone business. And although cellular phone owners pay from $700 to $1,500 up front and $100 dollars a month for the privilege of carrying a cellular phone, nearly everyone has been observing etiquette. Which is more than I can say for American users. By the way, have you been annoyed by someone using a portable cellular phone? If so, drop a short note to the Scanning Report, P.O. Box 98, Brasstown, N.C. 28902.

Smile, You’re in MT

Here’s an excellent opportunity to feature your listening post in the pages of MT. Your monitoring shack will be seen around the world by thousands of fellow scanner buffs. Photographs should be good quality, 35mm color prints. And don’t be bashful—put yourself in the picture!

Be sure to personalize your entry with a brief statement about your background and other interesting information. For example: How did you get involved in scanning? How old were you when you started to scan? What was the most exciting radio transmission that you monitored?

Send your photos to the Scanning Report Reader Profile, P.O. Box 98, Brasstown, NC 28902. Sorry, photos cannot be returned.
**UNIDEN BEARCAT**

**Model: BC-205XLT**

- **Price:** $99.99
- **Digital Programmable, 10 Channels:**
- **Features:**
  - Weather, Police, Fire/Emergency, Aircraft, Marine, and more.
  - 10 Channels, 50 Memory Files, 10 Banks of Memory.
  - One Touch Memory Programming, External Antenna Jack.
- **Dimensions:**
  - 4 1/4" x 6 1/2" x 1 3/8"
  - Weight: 1 1/4 lbs

**Programmable Channels:**
- 10 programmable channels, one touch memory programming, external antenna jack. (Special package deal includes all above.prices.)

**Digital Memory: Sapphire Special!**
- **Price:** $39.99
- **Digital Memory: Sapphire Special!**

**UNIDEN BEARCAT**

**Model: BC-400XTL**

- **Price:** $159.99
- **Digital Handheld Scanner:**
- **Features:**
  - 100 Channel Digital Programmable Handheld Scanner.
- **Dimensions:**
  - 5 1/4" x 3 1/4" x 1 7/8"
  - Weight: 16 oz

**UNIDEN BEARCAT**

**Model: BC-950 XL**

- **Price:** $249.99
- **Digital Programmable 100 Channel Scanner:**

**SANGEAN ATS-803A SHORT WAVE RECEIVER**

- **Price:** $169.99
- **Digital Tuner:**
- **Features:**
  - AM/FM/LW and 12 shortwave bands plus FM stereo.
- **Dimensions:**
  - 7 1/2" x 9" x 3 1/2"

**BEARCAT BC-147XTL CHANNEL SCANNER**

- **Price:** $99.99
- **Digital Scanning:**
- **Features:**
  - Programmable, digital, 16 channels, one touch memory programming, external antenna jack.
That’s nice Dear.

As you are reading these words we are probably in the midst of the Monitoring Times Convention. Those of you that are here in Atlanta, be sure to stop by the Beginner’s Forums and say hello. To the rest of you, you are missed and we will be looking for you next year.

I think the thing that I enjoy most about going to radio people get-togethers is the chance to meet folks of all ages who love the monitoring hobby. I especially get a kick out of meeting folks who have been involved with listening over a span of generations. Conventions bring out folks that go back to the days when tube technology was young. Just think of the exciting things to come in the future of today’s young beginners who started out in the days of integrated circuits.

Okay, Uncle Skip, you’re psyched. Where’s the column?

I was trying to think of a subject that spans the life experiences of all radio monitors and connects beginners with old timers.

Well, if it was a snake it would have bit me! No matter how long you have been in the hobby, no matter what type of listening turns you on—SWL, ucie, scanners, medium or long wave—each and every one of us has had this experience or some variation on the theme.

You’re sitting at your listening post during a normal night of DXing, casually spinning the dials. The noise level is low and all is right with the world.

Then something happens... All of a sudden, an extremely rare station is heard—you know, one of those contacts most “expert” DXers can only tell folks about. Your tape recorder is rolling and you have a dead solid copy ID and more than enough program information to make a good QSL report. You cannot be denied! You have the tape to back up the logging. Your name will be legend throughout the pages of your club publication. The editors at Monitoring Times will write WOW!!! next to your name. You have every reason to be proud.

Then something else happens... You run out of your radio sanctuary to tell your mother, father, spouse, significant other, child, neighbor or perfect stranger of this peak DX experience. This event which will come to define you and your relation to the hobby. Then this important person in your life utters words guaranteed to take the wind out of the sails of the most dedicated DXer. Did you ever notice that they NEVER look you in the eye when they say... “That’s nice, Dear”?

THAT’S NICE DEAR! You have just set the radio monitoring world on its ear and all they can say is THAT’S NICE DEAR!

Face it folks, no matter if you are a beginner or an old hand, our excitement and enthusiasm for radio monitoring is often misunderstood by those closest to us. Unless you married someone bitten by the DX bug or spawned children that can be prided away from the Nintendo game, your pursuit of radio monitoring will go largely unnoticed by those around you.

What’s the Point, Uncle Skip?

The point is that it does not need to be that way. Listening to the internal service of Radio Freedonia (in Freedonian) may not get our family and friends to look away from The Home Shopping Club, but there are things on the radio that could get their attention. A quick perusal of ongoing radio programming is sure to turn up a few tidbits of information that those normally uninterested friends and family could find useful or entertaining. To that end, therefore, Uncle Skip’s Monitoring Station and Bathroom Remodeling Service brings you...

UNCLE SKIP’S GUIDE TO
"TURN YOUR HEAD"
LISTENING FOR NON-LISTENERS

It makes no difference what flavor of radio monitoring turns you on; you should be able to turn up a few subjects that could interest folks you hold near and dear. The key is to think about the kind of information people normally seek from television and local radio. News, weather, time, current events and local interest subjects can all be used by a radio monitor to get a rise out of the relatives.

What Can I Do About the Weather?

For starters, you can listen to it. Scanner users have a real jump on the rest of us, thanks to the NOAA (National Oceanic and Atmospheric Administration) Weather Radio Service. By listening to it on frequencies between 162.40 and 162.55 MHz, you will be able to delight those hanging on your every word with up-to-the-minute local and regional weather forecasts.

But why stop there? If your scanner covers the common military frequencies, punch up 255.4, 272.7 and 342.5 MHz and see if you can get flight weather from your local military base.

Shortwave monitors need not get their collective noses out of joint. NOAA operates a National Weather Service frequency at 7880 kHz as well. Tune it in from time to time as you are passing out of the 41 meter band.

Medium wave monitors can apply their knowledge of local and regional frequencies to dial up conditions in nearby spots to help with family trips. It may be clear and sunny at home but a quick listen to a station at the shore might indicate that it is raining. I have known several broadcast band listeners who became very adept at judging the location of nearby thunderstorms by the intensity of the static crashes on the AM band. Old Uncle Skip cannot recommend this practice because I remain quite shy of lightning and I would not want anyone turned into a crispy critter just to impress the family.

Hey, kids, what time is it?

Even the best time pieces are off by a few seconds from time to time. You can use your radio skills to keep your family clocks on the beam. Simply dial up WWV, Fort Collins, Colorado, at 2500, 5000, 10000, 15000 and 20000 kHz to give your non-radio oriented relatives up to the second accuracy.

If WWV turns out to be a bit hard to hear you can also give a listen to CHU, Ottawa, Canada, at 3330, 7335 and 14670 kHz. There are dozens of time signal frequencies but these tend to be the easiest to hear. Scanner users would do well to monitor local police, fire and EMS frequencies as they often give time checks, usually at shift changes.
Lots of News is Good News

Every month the MT Monitoring Team goes to great lengths to bring you "Newsline," an up to date guide to news broadcasts on the shortwave bands. Tracking breaking news stories has always been a skill that can be appreciated by non-radio monitoring types. If you are still in school, you should be able to dazzle your teachers by quoting news sources from the countries you are studying in your history, geography or social studies classes. Some SWLs even got their names in their local newspapers for tracking the recent Gulf War.

If you want to use news monitoring to get your relations excited, you may need to do a little research. For instance, maybe Aunt Leon's folks came from Germany: you could keep her amused for hours with anecdotes gleaned from news shows from "the old country."

Medium waves can use the same technique on another plane. Let's say Aunt Emma is from the state next door: dedicated listening to local stations from her old stomping grounds might give you some topics for discussion around the dinner table.

For local news, a trip to the scanner is once again in order. Local radio and television stations have operating frequencies (usually in the 450 - 455 MHz area) where they discuss and develop local news broadcasts. You can often get the story behind the story including details left out of the "sound bites" that eventually make it to the evening news. Traffic reporters also operate in this band, usually feeding signals from their aircraft to local radio stations. Since your local FM outlet might only give a traffic report every fifteen minutes or so, would it not be better to catch the chopper on your scanner without waiting for a feed to your favorite station?

Far Out Listening

If you really want to impress the non-listeners in your neck of the woods you have to think big. Space may be the final frontier for those Star Trek types, but it is a frontier that radio monitors can dabble in at will. If you are looking for something that will get the kids away from the TV, nothing works quite as well as listening to the SPACE SHUTTLE. Now before you go reaching for your wallet to build a special shuttle tracking station, relax, take a deep breath and listen to Old Uncle Skip. WE GOT US A GIMMICK, FOLKS!

Actually, "gimmick" is an unfair word for the excellent work the folks at NASA do for radio hobbyists. Several NASA facilities have Amateur Radio stations that rebroadcast the space shuttle's audio link whenever we have a bird in orbit. W3NAN at the Goddard Space Flight Center in Greenbelt, MD, transmits on 3860 and 7185 kHz (LSB) and 14295, 21395 and 28650 kHz (USB). W5RRR at the Johnson Space Center, Houston, TX, can be heard on 3840 kHz (LSB) and 14280 kHz (USB). W6VIO at the Jet Propulsion Laboratories, Pasadena, CA, operates on 3840 kHz (LSB) and 21280 kHz (USB). So the next time you are in orbit, you can get your friends and family away from reruns of Star Trek and let them hear the real thing.

If you are a bit more adventurous and your house is under the flight path of a shuttle mission, tune in 2966.8 MHz. You just might hear the crew without the help of NASA.

Sleep Baby Sleep

It may seem a silly application for a serious radio, but your scanner can be put to use as a second baby monitor receiver. Wireless baby monitors operate in the 49.83-49.85 MHz region. When Number Two Son was still crib bound I could keep one ear on him while down in my basement office. Your spouse will appreciate this additional effort at parenting on your part. Remember, this month we are not talking about great DXing. We are talking about impressing the troops.

Knowledge is Power

Many beginners get so caught up in the hunt for new stations that they don’t take time to really listen to the programs of the stations they are logging. Stop and smell the signals, Compadre! Most shortwave programs are written with the express purpose of teaching you something. Go beyond the news programs and you will learn a great deal about the world around you. All this information can be imparted in positive ways to those non-monitoring folks around you, too.

Scanner folks can get a different feel for the business at hand by sitting on a frequency for a while. Try monitoring just the police and fire in one town for an evening. You begin to get a feeling for the periods of no activity punctuated by brief moments of intense stress and crisis. It is a great way to gain respect for folks in the uniformed helping professions.

Now Look What You've Started!

Don’t be too surprised if your efforts to share your hobby in creative ways creates a convert or two. Even if you are a beginner, you can help someone along in the greatest hobby in the world! One of the best things you can do is to show them a few issues of MT.
Chasing Mantas, Pulsars and Senior Citizens

In last month’s Fed File we examined some of the adventures one can have in being an active federal, utility or military monitor. Since then, many of you have sent in stories on how monitoring has brought intrigue and adventure into your lives. Some of those stories we will have to tell in future issues, but many monitors agree that one of the most intriguing subjects to come across our receivers has been the secret “black” stealth aircraft that have been roaming across our skies.

It seems that many military monitors have been listening in on these strange and secret goings on. Some have become active investigative “stealth chasers” and have added greatly to the available information on the subject of stealth. This month we will try to put together some of the pieces of the puzzle, and see if they add up to a picture of these enigmatic aircraft.

**TR-3A Black Manta**

Although Monitoring Times revealed the existence of the TR-3A Black Manta tactical reconnaissance aircraft several months ago, it still remains a closely guarded secret. This triangular shaped aircraft is said to be a Northrop Aviation project based on their THAP (Tactical High Altitude Penetrator) studies of the 1980’s. The TR-3A has reportedly been sighted flying near Beale AFB, California; Edwards AFB, California; on the Tonopah test range and Nellis AFB in Nevada. Other recent sightings have placed the aircraft flying near Holloman AFB, New Mexico; Barstow, California; near a Lockheed facility and on the Meltro bombing range near Cannon AFB, New Mexico.

It looks like the wraps will be taken off the TR-3A soon, as the present administration has hinted that it might reveal some information on certain “black” projects close to election time.

**Fast Movers**

In addition to the TR-3A, the evidence indicates that the Air Force is also testing (or has already operational) several aircraft capable of high-speed performance. One is rumored to be operating out of the secret Groom Lake flight test facility located on the huge Nellis AFB range complex. This is possibly the highly publicized but very secret “Aurora” project aircraft.

The Aurora project is speculated to be a methane-fueled, hypersonic, Mach 6 replacement for the retired SR-71 Blackbird. Evidence also suggests that the aircraft has been flying night training missions over Antelope Valley, California; Atlanta, Georgia; and Machrihanish, Scotland.

The hypersonic aircraft operating over California have left tell-tale evidence. USGS...
seismic sensors on Catalina Island detected the sonic booms marking their passage. The sonic booms also awakened many California residents who, being a bit earthquake wary, became alarmed when their house started to shake during the early hours of the morning. On more than one occasion, the seismic sensors indicated the presence of not one but two hypersonic aircraft passing over California and towards the general direction of Groom Lake, Nevada.

Since then the "Aurora Project" aircraft has been the subject of many national and international newspaper and magazine stories. Because of this unwanted publicity, sources say that the "Aurora Project" has had its name changed to the "Senior Citizen" project—the key word being "Senior," which means that the aircraft is a USAF operation. Stealth chasers will recall that the F-17A was developed under the "Senior" project heading.

Other secret project names that have shown up on Congressional budget documents include, HAVETRUMP, HAVE FLAG, (DARPA projects), COPPER COAST, SEEK AXEL, SEEK SPINNER, THEME CASTLE, CONSTANT PISCES CONSTANT HELP, SENIOR YEAR, and FOREST GREEN.

**Even Faster Movers!**

Recently, an even faster aircraft with a unique propulsion method has been reported by many to be zooming over the skies of the U.S., and has even been seen by your Federal File editor. The aircraft is easily identifiable by its unique contrail that resembles a "string of pearls" or "donuts on a rope." It is theorized that the strange contrails are produced by an aircraft operating a PDWE (Pulse Detonation Wave Engine) being developed by Pratt & Whitney. This unique design can propel an aircraft or missile to extreme speeds and altitudes.

My own encounter with one of these "Pulser" aircraft happened on a bright and sunny day in March. I was talking on the phone when my windows began to shake and a deep reverberation was felt throughout the house. I quickly hung up the phone and rushed outside. Looking up to see what the source of all the racket was, I was surprised to observe a high flying aircraft leaving behind the now well-known "donuts on a rope" contrail.

I rushed inside and grabbed my camera. By the time I had returned outside, the aircraft was already disappearing over the horizon; however, the contrail still hung in the air. I took several pictures and hastily retreated to my monitoring post.

I turned up the volume of my Pro-2004 which was programmed with all known UHF military frequencies for the area. The scanner stopped on 288,000 (an AFSAFCOM frequency) and digitally encrypted speech could be heard. The transmission lasted about three minutes and ended abruptly.

After developing the photos I decided to seek verification of what I had photographed by contacting Aviation Week and Space Technology magazine's engineering editor, Bill Scott. Mr. Scott has been following and reporting on "black" technology and is the author of a book on the subject, The B-2 Story. He looked at the photos and listened to my descriptions of the aircraft and the pulsing noise it generated and determined that it was most likely a PDWE aircraft.

The photos and a related story ran in the May 11th issue of AW&ST under the title "New Evidence Bolsters Reports of Secret High-Speed Aircraft." It seems that the photos were the first hard evidence that PDWE aircraft existed and they confirmed many rumors that the Air Force is either testing or is close to fielding an operational "Pulser" aircraft.

Since then, "Pulser" aircraft and their unique contrails have been spotted over the Great Lakes; Portland, Oregon; Almagordo, New Mexico (White Sands Missile Range) and Denver, Colorado. Military monitors also have reported radio transmissions possibly involving these secret aircraft. If you believe you have observed one of Uncle Sam's flying wonders or have intercepted radio communications possibly involving them, don't forget to send your reports in to the Federal File!

**Mailbag**

**Military Confusion**

Several readers wrote in and said they were confused about some of the recent changes in the Air Force's structure. The new commands are Air Combat Command, Air Mobility Command and Strategic Command. Air Combat Command consists of the Air Force's conventional and tactical aircraft. Air Mobility Command is basically the same as the old Military Airlift Command, minus some of its support aircraft and tankers which are shared with ACC and Strategic Command. STRATCOM (Strategic Command) consolidates all of the Air Force's and Navy's nuclear forces—including nuclear-carrying B-52s, B-1 B's, B-2As, intercontinental nuclear missiles and sea-going nukes.

Photo of "donuts on a rope" contrail produced by "Pulser" aircraft taken over Amarillo, March 23.
Everything You Always Wanted To Know About ACARS!

Have you ever been idly scanning through the VHF acro band and heard some really weird sounds on 129.125 and/or 131.550? Those, my friends, are frequencies over which the data link known as ACARS transmits. What is ACARS?

First of all, the word itself is an acronym for Aircraft Addressing and Reporting System. ACARS is used by commercial airline pilots (as well as some executive jet operations) for relaying certain types of information to their company without having to use a voice channel. Utilizing ACARS, information can be uplinked to an aircraft by company dispatch as well as downlinked by a pilot to his company operations. Unfortunately, the ACARS system is only operational on VHF. For technical reasons, it was unable to be adapted for HF use.

Now imagine monitoring the following transmission on your scanner:

"SUPERAIRWAYS FLIGHT 51 CALLING CHICAGO OPERATIONS ON 130.500."

"This is Superairways Operations, go ahead Flight 51."

"SUPERAIRWAYS 51 WAS OUT OF THE GATE AT ORD AT 1401 AND OFF (THE GROUND) AT 1415. WE WERE ON (THE GROUND) AT ST. LOUIS AT 1525 AND IN (THE GATE) AT 1538. OUT ST. LOUIS AT 1655, OFF AT 1700. DELAY DUE TO WAIT FOR LATE CONNECTING PASSENGERS. FUEL ON BOARD IS 28.0. ETA LAS VEGAS AT 1910."

"Roger, Flight 51: out of Ord at 1401, off at 1415; on at St. Louis at 1525 and in at 1538. Out St. Louis at 1655, off at 1700. Delay due to wait for late connecting passengers. Fuel on board is 28.0. Estimating Las Vegas at 1900. Have a good flight!"

"THAT'S AFFIRMATIVE, CHICAGO. GOOD DAY."

That transmission could be handled by ACARS compressed into only 1/3 of a second. However, as short as the transmission is, if it were sent by voice, it would chew up anywhere from 20 to 60 seconds of VHF radio time. More time may be involved if the pilot has to stand by while another flight is talking to their company on that particular frequency, or if he has to switch to another one, etc.

Voice transmissions—or "contacts" as they're called by ARINC—add up to many thousands per month. But impressive as those figures may sound, they've decreased tremendously in the last 17 or so years since the advent of the ACARS data link system.

ACARS was developed and implemented for the aviation industry by ARINC (Aeronautical Radio, Inc.) in the mid-1970's. The most obvious impact of the system on the airline carriers' air-ground communications was the reduction in voice communications—and thereby in the manpower involved in handling those transmissions.

One of the factors making this system so effective is that there are only a couple of frequencies used by the whole network to up-and-down link approximately eight million messages per month. Another factor to be considered is that ACARS is compatible both with radio equipment presently in use and that being designed for the next generation of aircraft.

Keep in mind, however, that since there will always be a need for some voice communications in certain situations, the ACARS System will not totally replace them. It is best utilized for the passage of routine intelligence which can be gathered and downlinked automatically without need for flight deck crew intervention. This results in less saturation of the other frequencies in the 128.825-132.000 range, freeing them for voice contacts when the necessity arises.

An aircraft equipped with ACARS is rigged with sensing devices that can send data back to a ground station when the aircraft has performed certain maneuvers, such as pushing back from the gate, taking off, landing, and arriving at the gate again either at its destination or at an intermediary stop in between. These routine maneuvers are known as OOOI (pronounced 'oo-ee'), because of the first letter of each maneuver involved—Out, QIF, On, and In!

Simply stated, ACARS is an air-ground communications network which enables an aircraft to function as a mobile terminal connected to modern airlines command and control (C3 in airline parlance) and management systems. The information which is collected is transmitted from the aircraft via a data link radio channel to ACARS ground radio stations. It is then relayed via the ground stations to a central computer processor where the data is conveyed into airline interoperable messages, through the ARINC Electronic Switching System, which is also known as the ESS.

There are 3 major elements of the ACARS Network:

1. The Airborne Subsystem, which consists of
   MONITORING TIMES

2. The ARINC ground subsystem—consisting of the ACARS VHF Remote Networks, the ACARS Front-end Processor System (AFEPS), and the ARINC Electronic Switching System.

3. The Air Carrier C3 (Command and Control) and Management Subsystems which include the ground-based flight operations, maintenance centers, dispatch offices, etc., of the carriers who use the ACARS system.

On the flight deck, the Control Unit is the feature which provides interface with ACARS. It facilitates the entry of text elements of departure, ETA reports and the addresses (telephone numbers) of parties on the ground with whom the crew may desire voice communications, and other data. The display unit can be used as a scratch pad in the data entry mode and for the call-up presentation of radio frequencies, stored OOOI times, flight numbers and UTC. System status and ground-to-air voice signalling are also annunciated.

Digital display units are also utilized for receiving messages. The older-type printer units, which were in use when ACARS first appeared, are not much in evidence anymore. They had a propensity for going haywire and spewing paper all over the flight deck.

Here is a partial list of the numerous applications in which ACARS is used to transmit and receive data:

- Winds Aloft Observations (on so-eqipped aircraft).
- Dispatch and Weather Update messages
- ETA (Estimated Time of Arrival) Updates
- Takeoff Thrust

Simplifying the job of the crew and freeing up VHF frequencies is the object of ACARS. Photo of US Air cockpit by Harry Baughn.
Position Reports

We've received quite a few letters from readers asking about position reports lately. We aim to please, so let's take a look at them.

When you tune into frequencies on the HF aero bands, at least 60% of the transmissions heard will concern enroute position reports. Why are position reports necessary? Well, as we've said in previous articles, Air Traffic Control cannot work flights on oceanic routes due to the limitations of radar. However, since aircraft still have to stay on predetermined, established flight paths no matter where they may be flying, operators of ground stations, such as ARINC, take reports from pilots relating to their position and other factors and in turn, relay them to ATC. One purpose of these reports is to achieve proper separation of aircraft traffic.

Position reports generally include the following information:

- Airline or military identification & flight number (tail number if it's a private aircraft)
- Present position
- Flight level
- The next two positions and estimated times
- Air Temperature
- Wind Direction and Velocity
- Ride conditions (smooth, bumpy, turbulent, etc.)
- Fuel remaining
- SELCAL letters (and sometimes request for SELCAL check)
- MACH number

Also, quite often you may hear a pilot asking the radio operator to request a different flight level from ATC, due to weather or other factors.

The ground station radio operator will read back the pilot's report and give him a SELCAL check if requested. The operator then relays the report to the proper ATC facility. When ATC receives these reports relayed by an enroute ground station, they will then know where a particular flight is in relation to other air traffic. At that time, they will either grant a pilot's request for another flight level, or deny it due to conflicting traffic.

What are those strange names you hear the pilot mentioning in his report? Those are waypoints on the route he is flying. Close to land, the waypoints are named (e.g., CHAMP, LEARS, POGGO, etc.); out to sea, latitude and longitude are utilized for positions (e.g., "over 35° North 40° West at 2100" and so forth).

If an aircraft is approaching land, the radio operator will relay to a flight an ATC transponder "squawk" to be used when the aircraft is in radar contact with an air traffic control facility.

Incidentally, I do have a complete listing of all named waypoints used in the Atlantic & Caribbean Oceanic areas. If anyone would like a copy, send a business-sized SASE to me at the Brasstown address and I'll forward one to you.

Readers Corner

Laura Quarantiello (California) asked who and what was Lima (Peru) Radio. She had heard them working quite a few American Airlines flights on 11306 as well as 17937.

To answer your question, Laura, American Airlines bought the now defunct Eastern Airlines' South American routes several years ago, and in doing so, they also bought the services of the LDCOC station that Eastern had used for many years—Lima Radio. In addition to the frequencies mentioned above, Lima also uses 8879 and 5535.

Bill Battles (New Hampshire) tells us that MAC flights are now named "REACH" flights under the new Air Force reorganization. He also says he monitored New York ARINC one morning recently, testing what the radio operator called "Link Plus." Judging from the transmissions he heard, Bill thinks it may be a new satellite relay for HF voice communications. He said that he would let us know as soon as he heard more about this new system.

That's all for now. Next time, we'll talk about microbursts and windshear, and other aeror-related subjects. Until then, 73 and out.

Monitoring Times

October 1992
below 500 kHz

LORAN at 50

Have you ever found that perfect fishing spot only to forget its exact location on your next outing? Fortunately, there's an electronic solution to this dilemma and many other navigation woes—it's called LORAN (Long Range Radio Navigation) and all the action takes place on the longwaves.

This month marks 50 proud years of LORAN operation. The LORAN story began before World War II when the military, realizing the need for more precise navigation, began studying several possible options. The National Defense Research Committee (NDRC) was formed in 1939 with the purpose of developing a suitable system. RADAR was brand new at the time and showed great promise for short distances. However, a system was needed to satisfy the needs of long range navigation that could be used not only to plot one's position, but also to chart a course to a given destination.

The basic concept of LORAN (which is still used today) measures the small, but significant time differences in received pulses from three or more land-based transmitter sites. A LORAN receiver analyzes the data and computes the latitude, longitude, range and compass bearing of the receiving station. Accuracy of the early LORAN system was about one mile, which was very impressive in its day.

LORAN was not always at its current frequency of 100 kHz. Several frequencies, including microwave, were tested in the early days of the program. A frequency range was finally selected between 1 and 2 MHz, just above the AM broadcast band. The first two experimental stations went on the air in March 1941. They were housed at two unused lifeboat stations in Delaware and New York.

After these successful experiments, the first LORAN system (LORAN-A) was put into active service in October 1942. The Coast Guard took over full operation of the system in January 1943, and oversees its operation to this day.

### Table 1. Beacon Loggings

<table>
<thead>
<tr>
<th>Freq</th>
<th>ID</th>
<th>Location</th>
<th>Reporter</th>
</tr>
</thead>
<tbody>
<tr>
<td>194</td>
<td>TUK</td>
<td>Nantucket, MA</td>
<td>P. R. (NY)</td>
</tr>
<tr>
<td>204</td>
<td>GB</td>
<td>Buffalo, NY</td>
<td>M.C. (NY)</td>
</tr>
<tr>
<td>221</td>
<td>HM</td>
<td>Hamilton, ONT</td>
<td>M.C. (NY)</td>
</tr>
<tr>
<td>230</td>
<td>BU</td>
<td>Columbus, OH</td>
<td>M.C. (NY)</td>
</tr>
<tr>
<td>254</td>
<td>SPK</td>
<td>Sparks, NV</td>
<td>D.T. (CA)</td>
</tr>
<tr>
<td>314</td>
<td>KAL</td>
<td>Calumet, IL</td>
<td>C. H. (IN)</td>
</tr>
<tr>
<td>335</td>
<td>PIN</td>
<td>Winamac, IN</td>
<td>C. H. (IN)</td>
</tr>
<tr>
<td>338</td>
<td>DE</td>
<td>Detroit, MI</td>
<td>C. H. (IN)</td>
</tr>
<tr>
<td>342</td>
<td>HY</td>
<td>Hyannis, MA</td>
<td>P. R. (NY)</td>
</tr>
<tr>
<td>344</td>
<td>AVN</td>
<td>Avon, NY</td>
<td>M.C. (NY)</td>
</tr>
<tr>
<td>359</td>
<td>BO</td>
<td>Booe, ID</td>
<td>D.T. (CA)</td>
</tr>
<tr>
<td>362</td>
<td>FM</td>
<td>Falmouth, MA</td>
<td>P. R. (NY)</td>
</tr>
<tr>
<td>371</td>
<td>AZ</td>
<td>Kalamazoo, MI</td>
<td>C. H. (IN)</td>
</tr>
<tr>
<td>374</td>
<td>ESG</td>
<td>Escondido, CA</td>
<td>D.T. (CA)</td>
</tr>
<tr>
<td>378</td>
<td>CPM</td>
<td>Compton, CA</td>
<td>D.T. (CA)</td>
</tr>
<tr>
<td>382</td>
<td>SRS</td>
<td>Slurges, MI</td>
<td>C. H. (IN)</td>
</tr>
<tr>
<td>391</td>
<td>CPB</td>
<td>Culver, IN</td>
<td>C. H. (IN)</td>
</tr>
<tr>
<td>400</td>
<td>RO</td>
<td>Rochester, NY</td>
<td>P. R. (NY)</td>
</tr>
<tr>
<td>411</td>
<td>RD</td>
<td>Redmond, OR</td>
<td>D.T. (CA)</td>
</tr>
</tbody>
</table>

The 1 to 2 MHz frequency range was used for many years until a series of refinements led to LORAN C in 1957. LORAN-C was put on 100 kHz because of the improved propagation stability afforded by the longwaves. In 1983, LORAN-C became the only U.S. based system, and LORAN-A was discontinued altogether.

The frequency change to 100 kHz was cause for celebration in the ham radio community. For many years, the hams had to follow a complicated list of FCC restrictions to avoid causing interference to LORAN when using 160 Meters (1.8-2.0 MHz). The restrictions included strict power limitations and "quiet hours" depending on one’s location.

**LORAN Today**

The present-day 100 kHz LORAN operates 24 hours a day and boasts an accuracy of better than 600 feet under good conditions. You can also use the system to return to the same spot again with an accuracy of about 100 feet. Its signals are audible over most of the U.S. but are strongest near coastal areas where the transmitters are located. LORAN is also used in many other parts of the world under authority of the Coast Guard.

Once considered a luxury that few civilians could afford, a LORAN unit is now well within the reach of most recreational boaters and can be found practically anywhere boat stores or decent marine catalog. If you want to hear what the signals sound like, just tune to 100 kHz (+/- 20 kHz) with your LF receiver. You can’t miss their wideband clicking sounds if you live near any of the U.S. coasts.

Congratulations to those early inventors of LORAN and also to the U.S. Coast Guard.

Happy birthday LORAN! My thanks to the Radionavigation Bulletin for helpful information used to compile this story.

While we’re dusting off the history books, I’d like to share an interesting piece that Mike Csontos of Lima, NY, sent in. It’s a vintage frequency list for all types of military craft. Mike asks for any information as to why this list may have been in effect. My best guess is the late 1920’s or very early 30’s, since the list refers to both spark and CW modes. The use of spark transmission began fading rapidly in the mid 1920’s and by the ’30’s it was virtually obsolete, with CW becoming the mainstay. Any other guesses out there?

**Mailbag**

- Thanks to reader Al Underwood of Silver Springs, NY, we have a mystery to share. Al has noticed a very strong carrier with no ID appearing on 197.3 kHz at various times of the day. Using his Yaesu FRG-8800 and an L-201 preamp, the signal has been heard at 30dB over S9.

  The strange thing about it is the slight warbling note heard on the carrier. It seems unlikely that this is a new beacon because of the oddball frequency being used. Beacons are virtually always on a whole frequency (i.e. 197.0, 198.0, 205.0 kHz and so on). Attempts at direction finding have placed it at roughly 45 degrees from Al’s upstate NY location. If any readers wish to take a stab at what this signal may be, we welcome all guesses.

  - Reader John Horton in Havana, IL, wrote to say that he’s recently discovered the thrill of longwave DXing and enjoys the column very much. An avid scanner and aviation buff, John recently stumbled onto LF while using his new Sony Air-8 handheld receiver. He found that while the VHF VOR stations had very limited range, LF beacons could be heard for many miles around. He reports: "From my home in Havana, I can hear SP (382 kHz) in Springfield, AAA (329 kHz) in Lincoln, ZYJ (251 kHz) in Macon and PI (356 kHz) in Peoria—all while using the Air-8's internal antenna."

  John also reported hearing ZBB (396 kHz) in Bobini, Bahamas, one odd night. Welcome aboard John; your intercepts are always appreciated here at MF. This month’s loggings are courtesy of the following readers: Michael Csontos (Lima, NY), Don Tomkinson (Huntington Beach, CA), Charles Hohenstein (South Bend, IN) and Paul Remington (E. Rochester, NY). See you next month!
NOW HEAR THIS!

FINALLY!
High-Powered Sound from your HT.

- 12 DB of Audio Gain
- 3.5 inch Oval Speaker
- Automatic Shut-Off
- Internal NiCad Charger
- External Power
- 5-15 VDC

Model HTS-2 NEW FEATURES
- Tape Trigger® (automatic logging)
- Auto Polarity Switch
- Input Level Adjustment
- Even Lower Battery Drain

$29.95

Naval electronics inc.
5417 Jet View Circle, Tampa, Florida 33634
Phone: (813) 885-6091 Telex: 289-237 (NAVU UR)
Fax: (813) 885-3786

High Performance 800MHz
FREE CELLULAR FREQUENCY CHARTS!

MAX 800 GROUND PLANE
- Absolutely the best reception... 10 times better!!!
- Astounding results outside using our RG6 cable
- Mount directly on base or hand-held scanner

Base scanner adapter - $15.00
Hand-held scanner adapter - $12.00
50 ft RG-6 cable assembly - $35.00

Max Cellular Mag Mount - mobile 800 scanner antenna - $29.95
The Stinger - compact 800 MHz hand scanner antenna - $7.95
Loop Yagi - highly directional 13dB gain (3ft boom) - $75.00

Only $19.95

Cordless and Baby Monitors
FREE CORDLESS FREQUENCY CHARTS!

MAX 46-49 MHz DIPOLE
- The very best cordless phone and baby monitor antenna
- Hear conversations for miles around - don't miss anything!
- Install inside or outside
- Includes 50ft RG58 - BNC

Only $49.95

Max System. Antennas and Accessories
1-800-487-7539 ORDERS ONLY
508-768-7486 FAX
508-281-8892 INFO
SASE for free Catalog

146/220/440/GMRS GP 25.95
Telescopic Whip 12.95
Telescopic GP 29.95
146/220 Mag Mount 29.95
146/440 Mag Mount 29.95
BNC Mag Mount 12.95
Custom Ground Plane 39.95
Telescopic Mag Mount 29.95

The ALL-NEW Realistic® PRO-43

Specifications and Features:
Frequency ranges: 30-50, 118-174, 220-512 and 806-999.9875 MHz (less cellular)
Scan Rate: 25 channels per second
Search Rate: 50 channel per second
Search Steps: 5, 12.5 or 25 kHz
Delay: programmable, 2 second
Memory: 200 channels in 10 banks plus one extra monitor bank for search frequencies
Display: Multi-function, edge-lit LCD
Power: 6 AA cells (NiCads or Alkalines)**/AC power supply**/9 VDC
Antenna: Rubber flex antenna with a BNC base
Dimensions: 2-3/4"W x 5-3/4"H x 1-5/8"D
Weight: approximately 9 ounces

Realistic® has done it again! The PRO-43 handheld scanner is taking over! Now that the Pro-37 has been discontinued, it is time for a new legend to be born, the PRO-43. This new potent portable offers incredible features and a reasonable price. Order today and receive the PRO-43 for only $299.95 (Retail is $349!)

ORDER SCN17
ONLY $299.95!*
* Plus $6 UPS Shipping
** Not included

Realistic® is a registered trademark of the Tandy Corporation.
Good Sounds In Bad Axe

Every morning at about 4 am, Jack Thomas rolls out of bed and prepares for another day acting as a human alarm clock. Jack is the morning personality and chief engineer of WLEW, Bad Axe, Michigan. Farmers and other early risers depend on his voice to begin their day, bringing the world into their homes. Just as the sun appears in the east, Jack broadcasts on 1340 AM.

WLEW serves three counties in Eastern Michigan. If you look at the state on a map it resembles an open hand. Bad Axe is the largest city in the area known as the Thumb. Thousands of acres of beautiful, flat farmlands surround this little city. You will often see a deer prance through the meadows and corn fields.

Many people are now employed in service industries that support the surrounding farms, but agrarian concerns continue to dominate. Over the years, WLEW’s audience has become quite diverse.

Jack Thomas tries to create a show that everyone can enjoy. “You have to shoot broadly. Kids listen, Mom and Dad listen, and Grandma and Grandpa, too!” The morning show tradition has continued since 1950 when WLEW first signed on. Hundreds of disk jockies produce morning shows across the country, but few convey the warmth and insight into their communities that Jack Thomas does.

Jack’s on-air ritual begins at six in the morning. The show begins with a newscast by Craig Routzahn. Craig’s precise, low-key delivery of the latest news, sports, weather and farm prices is efficient and soothing. When Craig is done, Jack plays mellow inspirational music until 6:30 am, another WLEW tradition. The morning show continues until 9 am with program elements airing exactly according to plan.

When asked why his show is designed in precise segments, he replies “that’s the way it’s always been, and people expect to hear things at the same time every day. If you change the order, you’ll knock everyone off schedule.”

The WLEW morning show is like poetry in motion. Jack addresses his listeners like a group of old friends, which they are. “There are a lot more people listening early in the morning than you’d imagine. Go to the “Seven-Eleven” at five in the morning, and you’ll see them getting coffee. There are lots of 7 am shifts here, too. You never know who’s listening.”

Comfortably dressed, Jack sits before his microphone as the Bad Axe town crier, sipping a cup of coffee. Birthday and anniversary announcements are essential information to his listeners. Obituaries are important, too. “The whole town will stop to hear who died.”

If a school bus breaks down, Thomas can notify all of Bad Axe, and many surrounding towns, in an instant. Few homes are without his voice. Jack peppers local event announcements with a plethora of information from United Press International’s computer news service and The Michigan News Network. Country music is the show’s backbone, and Jack squeezes in a song when he can.

Success has come to WLEW through endless devotion to their service area. “We may be the only station nearby, but we have a lot of competition,” Craig notes. “Local news is essential to our survival. We compete with all-news WWJ from Detroit and WJR. Both of them put a good signal into this area. There is an all-news station in Bay City. Local news keeps us competitive.”

Routzahn dedicates his life to excellent local news coverage. Police, fire departments, and emergency support groups are queried at least four times a day, and a phone-in hot line for listeners to report breaking news keeps WLEW of the pulse of Michigan’s Thumb region. Craig constantly monitors local emergency frequencies on a Regency scanner in the WLEW newsroom.

Another program drawing huge audiences is the WLEW “Ladies Line” on the air from 1 to 2 pm daily. If you are looking to sell, buy or swap something, WLEW will announce your merchandise free for all to hear. When the swapfest ends, the microphones are turned over to the public as an open forum for the rest of the hour. You’ll feel like you are in the Bad Axe town square!

Commercial advertisers also realize the station’s ability to deliver a message. Half a dozen sales people constantly canvas the area happily gathering accounts. With excellent management and marketing, WLEW enjoys enduring financial success.

Travel around Huron County and you’ll often see WLEW’s remote trailer complete with a vertical VHF Yagi towering above it. A 161 MHz Marty transmitter brings the sounds of football and basketball games, local festivals, and remotes from advertiser’s stores back to the studios for all to enjoy. No major event is overlooked by the WLEW Country Cruiser!

Using a state-of-the-art Harris SX-1 transmitter, WLEW broadcasts with one kilowatt during the day “with a directional pattern that sort of looks like a Girl Scout emblem,” says Jack. Their signals heads north toward Lake Huron, protecting stations to the southwest and southeast. WLEW shares 1340 kHz with seven other stations in Michigan alone! At night, they drop their power to 560 watts with an omni-directional pattern. An Orban Optimod-AM audio processor keeps their sound crisp and clear.

Sister station WLEW-FM features an adult contemporary format provided on tape by Concept Productions of San Francisco, complete with announcers’ voices. The announcers are recorded on a separate tape allowing local talents to substitute their patter when they like. Ear catching jingles by TM Productions give the station a slick, exciting sound.

With 50,000 watts ERP, WLEW-FM dominates the dial over an enormous area. The FM side caters to 21 to 35 year olds, using Optimod-FM processing and the range enhancing FMX system. The FM format is simulcast on WLEW-AM from 11:30 pm until Jack signs on in the morning.

When the microphones are turned over to G.A. Taggett at 9 am, Jack attends to engineering chores around the little white building on Michigan Route 53. “About six additions have been
added since the station first went on the air," Jack notes. We can only wonder how much Jack has added to lives of the people who listen to him every morning.

**Bits 'N' Pieces**

The man who made Top 40 radio an art form has passed away. Rick Sklar honed WABC New York into the most popular radio station in North America in the 1960s and 1970s. He joined WABC as their Program Director in 1962 and developed a sound we all lived by. Sklar's team of disk jockeys was unsurpassed: Harry Harrison, Ron Lundy, Chuck Leonard, Dan Ingram, "Cousin Brucie" Morrow, and "Bob-A-Loo" Lewis set the standard for America's rock 'n' roll radio. The sound was fast and exciting, sprinkled with shotgun jingles and distinctive DJ personalities. If you tuned into WABC, Sklar insured you would always hear a hit, "Musicradio 77" was the station that hundreds of stations copied, but could never duplicate.

His career with ABC continued until 1977. Sklar also served as Adjunct Professor at St. John's University and authored an autobiography: "Rocking America: How the All-Hit Radio Stations Took Over America." At the time of his death, Sklar was vice president of the Interrep Radio Store, a consulting firm creating a liaison between radio stations and advertising firms. American radio would not have been the same without him.

**Mailbag**

American Bandscan historian and *MT* reader Michael Csontos sends in another fascinating question. Michael discovered an old letter that originated at WLW, Cincinnati, Ohio in 1934. Originally operated by The Crosley Radio Corporation as an incentive for the public to buy their radios, WLW operated with half a million watts on 700 kHz, becoming a nationwide superstation over 50 years ago. Michael wanted to know when WLW raised its power from 50 kilowatts, and how long the half-megawatt operations continued.

According to the engineering staff at WLW, the FCC granted authorization to Powel Crosley, Jr. for superpower operation on April 17, 1934. Daily broadcasts continued into 1939 when the decision was made to drop back to 50 kilowatts. During World War II, WLW would occasionally increase power back to 500,000 watts to announce submarine maneuvers in the middle of the night. It is hard to say when the last broadcast was made on WLW's big guns, but it was sometime in the mid 1940s.

**New Station Grants**

The *M Street Journal* directs us to the frequencies where new broadcasters will appear soon: Guadalou, CA 100.5; Basalt, CO 106.1; East Lyme, CT 98.7; Tavernier, FL 96.9; Bolingbrook, GA 102.1; Greenville, GA 95.7; Seelyville, IN 95.9; Belle Plaine, IA 95.5; Decorah, IA 88.7; Danville, KY 88.1; Philpot, KY 94.7; Marlette, MI 92.5; Chester, NE 88.9; Lincoln, NE 88.5; Endwell, NY 107.5; Wrightsville Beach, NC 93.7; Benton, TN 93.1; Coalmont, TN 104.7; Austin, TX 91.7; St. George, UT 95.9; Marion, VA 103.5; Wilson Creek, WA 103.3; Yakima, WA 90.3; and La Crosse, WI 106.3.

**For Sale**

An unusual non-commercial AM station is being offered in North Carolina for $200,000. WLLN in Lillington operates with 5,000 watts days and 49 watts at night using a three-tower directional antenna array. All station equipment is included, along with 10 acres of real estate. If you would like to broadcast on 1370 kHz, call Dr. O. Talmade Spence at 919-892-9322.

Colorado is calling you! KRRU in Pueblo is a one kilowatt daytime AM station using 1480 kHz. It's being offered to the highest bidder over $99,000. Facilities include a directional antenna, and good terms can be provided for the right buyer. Contact G.Erway at 4211 North Elizabeth Street, Pueblo, CO 81008 for details.

**International Bandscan**

Broadcasting in the United Kingdom continues to expand in leaps and bounds. The Radio Authority plans to advertise licenses for five new regional FM superstations serving the areas of Central Scotland, Northeast England, Northwest England, the West Midlands, and the Severn Estuary in the near future. These new stations will offer formats that differ from the ones currently on the air, and existing station owners can only apply if they give up the licenses they hold now. Unused frequencies from 105 to 108 MHz will not be made available until 1996. Three new London AM stations are also being planned using 990, 1152 and 1458 kHz. An East London ethnic station, and additional services for Liverpool, Birmingham, Leeds, Edinburgh and Dundee will appear soon as well.

The new national network, "Classic FM," is about to begin regular operations on frequencies between 100 and 102 MHz nationwide. Their test transmissions have been quite unusual consisting mostly of bird songs, along with an occasional test tone. All eleven transmitters will use circular polarization and the RDS data/fm system. This information courtesy of the British DX Club. Well, it's time for a spot of tea, so until next month, happy trails!
MT’s Easy Guide to Satellite TV Monitoring

One of the less pleasant aspects of life at the end of this century is the automated receptionist. The premise is that a bank of sophisticated electronics is more efficient at routing calls than a real human being who could use a job.

I know what you’re thinking: “This is starting to sound like ‘Uncle Skip!’” But wait, stay with me on this. So, let’s apply this concept to this month’s column and see if it works any better in the printed media. Why waste your time reading through material you already know? This special guide you can route yourself to the information you really need!

Here’s how it works: If you’re interested in getting started in satellite television (TVRO), go to Section #1 and read to the end of this column. If you already have a TVRO system but didn’t know there was anything else to receive on it besides HBO and ESPN, go to Section #2. If you’re already listening to SCPC and downloading wire services go to Section #3. Go now!

Section #1: Getting Started

As with shortwave listening, monitoring the domestic broadcast satellites can be as simple or as complicated, cheap or expensive as you like. Setting up a TVRO system is not difficult.

If you’re not entirely familiar with this subject it’s a good idea to start with a little reading. To find out about the wide range of information on the subject, order my Satellite Television Sourcebook from Grove Enterprises which includes the latest update on TVRO information. This book is about to go out of print, and a new edition is unlikely by 1993.

The single most thorough treatment of the subject is found in Mark Long’s World Satellite Almanac. This exhaustive 1,116 page 8-1/2” x 11” format book is not cheap ($100), but you will find yourself referring to it over and over for years to come. Last month, Mark Long published the 1993 World Satellite Annual which is a supplement to the Almanac. To order these or other publications write or call: MLE, Inc., P.O. Box 159, Winter Beach, FL 32971, 305-767-4687 or FAX: 305-767-6067.

Now that you’ve got a basic foundation on the subject, you should start looking for hardware. The best way to buy TVRO gear is via mail order. Local dealers are fine, when they’re competent, but since you’re doing the installation yourself you can save a lot of money by going to the mail order firms. Call the following companies for catalogs: DBS Satellite Television, 800-DBS-0046 (US); SATMAN, 800-247-4391 (US); or Skyvision, Inc., 800-543-3625 (US) 218-739-5231 (MN). These three will load your mailbox up with enough material on TVRO gear to give you a good idea of what there is, what it costs and how to install it all.

Section #2: Enjoying Your TVRO System

Just as with those who bought a shortwave radio to listen to the BBC news, many have bought satellite systems to watch cable TV fare. How surprised many viewers are when they move their dish off the main cable birds and start exploring the many facets of satellite delivered information and entertainment.

Publications

There are some 35 domestic broadcast satellites in the C and Ku bands which represents hundreds of channels of interesting viewing or listening. But you can’t know where you are without a map and the best map available is called the Satellite Channel Chart which is published by Westsat Communications.

This 32-page publication comes out once every two months and is the most comprehensive list of every channel of every satellite in our portion of the Clarke Belt. Audio subcarriers and SCPC transmissions are all detailed. This is not the publication for the casual TVRO viewer but it is indispensable for serious enthusiasts.

A year subscription via first class mail in the U.S., Canada and Mexico is $65. International airmail subscriptions to the rest of the world are $75. California residents add $5.36 for sales tax. For a sample copy, send your request with a couple of dollars to cover postage to Westsat Communications, P.O. Box 434, Pleasanton, CA 94566 or call them at 510-846-7200.

Understanding how all the various types of transmissions are sent and received is made simple in one easily read book: The Hidden Signals on Satellite TV by Tom Harrington. This book offers a method of learning about audio subcarriers, SCPC, networking, teletext and much more. Hidden Signals is loaded with block diagrams, photos and other supporting graphics which make it easy to understand. The book is $19.95 plus $3 shipping from Universal Electronics, Inc., 4555 Groves Rd., Suite 13, Columbus, OH 43232, 800-241-8171; or from Grove Enterprises.

Periodicals

There are many books with much technical information on all aspects of satellite technology but the above suggestions are a great place to start. In addition, you should consider subscribing to a periodical or two concerning on-going developments in the industry. My favorites are TVRO Dealer and Satellite Retailer, both of which are industry trade journals which may or may not be available to the average consumer. Still it’s worth looking into subscriptions.

TVRO Dealer is a monthly published by Fortune Communications, 140 South Fortuna Blvd., Fortuna, CA 95540, 707-725-1185 for $18 a year. Satellite Retailer is another monthly, this one from Triple D Publications, 1300 S. Dekalb St., Shelby, NC 28156 or call 704-482-9673. Subscriptions to qualified persons are $16.06 per year.

The Hardware Connection

So much for reading material. Now on to the hardware. Once you have a complete satellite system installed, you can start adding accessories which make your purchase worth even more. The first of these is a SCPC receiver.

Last month’s column dealt at length with the nature of Single Channel Per Carrier transmissions in general and the SCPC-100 in particular. In addition to the SCPC-100, there is the Heil SC-1. Both are excellent choices in receiving these types of transmissions. The SCPC-100 is available from Universal Electronics, Inc., 4555 Groves Rd., Suite 13, Columbus, OH 43232 or call 614-866-1201. The Heil SC-1 is available from Heil Sound Ltd., 2 Heil Dr., Marissa, IL 62257 or call 618-295-3606.

One of the best all-time values in TVRO is the X*Press Information Service. Briefly, you get most of the world’s great press services, tons of domestic news, sports from SportsTicker, National Weather Service, Knight-Ridder Financial Information and more. All you need is an InfoCipher 1500R data receiver. The receiver plugs into the data port of your IRD and interfaces with your computer. Once the supporting software is loaded and your subscription is authorized, your computer becomes a 24 hour per day news service in the home. A one year subscription is $56. For more information on this service call 800-7PC-NEWS.
The Computer Connection

There are many TVRO enthusiasts in this country who exchange information on a daily basis via various bulletin boards and home computer services. The TVRO Echo on FIDONET is one such place.

Each month, Frank Kennedy (co-moderator on the net) posts an eight page listing of TVRO related magazines, books, satellite delivered audio and video programs, and electronically based magazines. In addition, public access groups are also listed along with virtually every BBS involving TVRO in the country. If you have a computer and are interested in getting started in this hobby, this is a pretty good place to start.

Section 3: The International Factor

Satellite reception is, by the nature of the transmissions, limited to only that portion of the Earth which is covered by the "footprint" of the satellite. In the case of "spot beams," the energy of the transponder is narrowly focused and covers a relatively small area. By contrast, a "global beam" is one which covers a little more than 40 percent of the Earth in one footprint. The signal is greatly reduced from that which is spot beamed, but reception possibilities are greatly extended. That makes satellite DXing a reality. How far away can satellite reception be achieved? What equipment is needed? What can be done to increase reception?

For international reception, larger dishes are in order (16 feet and up), circularly polarized feeds are necessary, and it's good to have the best LNB on the feed horn you can afford. It's also not a bad idea to have a PAL format TV set. All of these materials are readily available.

An excellent publication covering the international aspects of TVRO in Europe is from the UK and is called The Transponder. Published 24 times a year, a subscription is $75/year. Write: P.O. Box 112, Crewe Cheshire, England CW2 7DS.

Transponder Notes

- Digital Planet, the digitally transmitted multi-format satellite delivered music service, has ceased transmitting. Sluggish cable industry and failed injection of badly needed operating funds finished it off. Reportedly, the service had 3,000 retail subscribers. On a cheerier note, Digital Music Express claims to have reached the 50,000 subscriber mark after nine months. This service, which has yet to announce plans to include TVRO systems in their service, is found on F4, 19.

- A report in various trade journals says that Moscow's Independent Broadcasting Company and Turner Broadcasting system are to launch the first independent TV station in that city.

- An Indiana court has struck down an anti-dish local ordinance. Many local governments have not allowed the constitution to get in the way of their ability to infringe on the basic rights of Americans' free speech. Only the courts stand between us and the sinister collusion of government and business.

Fortunately for our democracy, the courts have continued to side with the individual. If your local government is impeding your access to the Clarke Belt, help is on the way. Call either the American Satellite Television Alliance (ASTA), 16 Broadway, Valhalla, NY 10595, 914-997-8192, fax 914-948-6217, or the Satellite Broadcasting and Communications Association of America (SBCA), 225 Reinekers Lane, Suite 600, Alexandria, VA 22314, 703-549-6990, fax 703-549-7640.

Both of these organizations have zoning manuals available at a reasonable cost which are designed to help you or your lawyer reach an accord with the various local powers-that-be.

- A report in Broadcasting magazine indicates that PBS is in the process of testing digital video compression systems built by AT&T, General Instrument (GI) and Scientific-Atlanta (S-A). One of these systems will apparently be selected and used in future satellite transmissions of PBS signals to its affiliate stations. The move to compression video is said to be timed to occur along with PBS' move to Telstar 401.

According to the World Satellite Almanac, PBS will have one C band and five Ku band transponders aboard T401 and will begin transmitting from this bird in July of 1993. This satellite, built by AT&T, will feature 48 channels (24 C and 24 Ku) with a power output to be controlled by ground operation depending on the use of the channel. C band channels could operate as high as 20 watts, and Ku could put out as much as 120 watts in the high power mode. The unspoken question in all this is: "Where does it leave the TVRO viewer?" It's possible that the lone C band feed will be a generic national feed to back up any possible Ku compression problems.

TBS' Turner and MT's Reitz meet in Atlanta. The question is: "Which is the cardboard cut-out?" You can meet Ted, too, atop the long escalator on the CNN tour when you're at the MT convention.
Keeping it Interesting

Do you find it easy to get into an operating rut? We do the same thing over and over, like chasing DX, looking for awards or contesting, or joining the same old net time after time. No matter what it may be, doing the same thing can get quite boring.

So, if you are getting a bit jaded with hamming, it may be time to look at alternate activities. Getting into some new facet of our hobby usually requires some time in research. Fortunately, there are volumes available on almost any aspect of ham radio. (If not, then maybe you can write the volume!) Reading is the best way to learn, and all of the ham magazines have departments for the more popular endeavors. I suggest reading two books to begin with: *The ARRL Handbook* and *The ARRL Operating Manual*. If after reading these tomes you do not experience any interest in another branch of hamming, perhaps it is time to look for a new hobby.

Here are a couple of other ham radio activities that are definitely not run-of-the-mill.

Intergalactic Information Exchange Network

"The Intergalactic Information Exchange network is a nonprofit group of ham radio operators helping to bring about a new age on the earth using ham radio to exchange all extraterrestrial communications transcribed in print, from various newsletters and magazines to audio tapes given to us regularly on donation. Our purpose is to allow shortwave listeners to learn by hearing the channeled information on tape via ham radio, and to allow other ham radio operators to join us in open discussion or contribute information they might have related to E.T. communications, close encounters, crop circles, news updates, spacecraft sighting reports etc.

"We have two net controllers who are in charge of our net—N1JVN Ken and KA1DYE Tom. We operate on the 80 meter band on frequency 3930 MHz LSB on Thursday nights from 8 pm to 11:30 pm (EDT). We need and will gladly use all E.T. communication in print or audio tape from various channelings that are taking place. We provide our service free on the ham bands as intergalactic commanders involved in communication on the planet Earth. If your spirit moves you, please send your channeled tapes, publications, and so on to: N1JVN Ken, c/o Intergalactic Informational Exchange Net, P.O. Box 617, Southbury, CT 06488.

"We also provide the same information on the CB radio channel 40 LSB from 8 pm to 11:30 pm EDT on Monday nights, which is open to all with SSB equipment."

OK, so maybe you think this is a weird idea, but it should be interesting, and who knows—it could change the way you think about such things! Certainly it would be a welcome change from the DX net you've been hanging out with on Thursdays, or from talking to good ole Homer on two meter FM for the 37 thousandth time. Try it, you might like it.

I Like this Idea!

A radio ham in Souderton, Pennsylvania, Robert Wilderman, (no call given) has started a net called PLA/NET. This net deals with our planet and the environmental problems facing it. There are three nets operating, one in the USA, another in Europe, and the third in the Pacific area. Unfortunately, the information received here did not quote frequencies or times.

Robert hopes to develop a workbook and curriculum to go with the network so schools can engage children in the experiments being conducted by members of the net. His plan is to link children in the classroom with environmental experts around the world via ham radio. This would allow our youth to learn first hand about problems of deforestation, acid rain, and ozone depletion, to name a few.

I think this idea is fantastic and I'd like to see it succeed. This is a truly creative and worthwhile use of our hobby. I have attempted to obtain more details on this net, but have come up empty handed. Should you have any information, please contact me at P.O. Box 98, Brasstown, NC 28902, so we can get the information to all of our readers and help make this effort a success.

Selective Calling

No doubt you have other hobbies besides ham radio, and would enjoy chatting with other hams with similar interests.

Over the years, various types of nets have sprung up for some special interest or another and then have died away. Nets dwindle out because most of us have lives outside ham radio, and cannot be on a net at a given time every day, week or month.

One possible solution to this problem is to have calling frequencies on the various bands. That is, if you are interested in a certain subject (say photography), simply get on frequencies popular with other photography buffs and call "CQ photo."

It would be wise to have calling frequencies on all bands from 160 to at least 2 meters. Specific frequencies might not be necessary if a band 10 or 20 kHz wide is used. After initiating a QSO, you could then move to wherever you wished. Something like this could really generate a lot of friendships and promote information exchange on other subjects besides ham radio.

There is no reason more than one interest group could not hang out on a given set of frequencies; the ham bands are wide enough to accommodate several, as long as you know where the various pastimes are grouped.

Is there any interest in this among *MT* readers? Let me know and if there is, I will put out a list of calling frequencies every so often, and we'll see if some of the ham magazines will cooperate with the effort.

That's all for now. A sharp-eyed reader caught a typo from the July column: a dipole has a theoretical gain of approximately 2.2 over an isotropic source and not 1.2 as stated. Keep things interesting, gang, and we'll see ya next month with something different.

73 de Ike, N3IK
Ham DX Tips

This is a dynamic month for ham DX. During the annual CQ World Wide DX SSB contest the 24th and 25th, you can log many rare countries and special callsigns. Look for DXpeditions to start mid-month or earlier. An excellent way to keep up with these special operations is to check the International DX Association's information net on 14236 kHz SSB daily at 2330 UTC. These folks not only keep up with the latest DXpeditions, but pass along QSL info. In the meantime, try for these DX challenges:

**Balerical Islands** Stanley C. Ingram, (Box 89, Santa Eulalia del Rio, Ibiza, Baleric Islands, Spain) EA6/ZY, has been found on 30 meter CW operating between 10101 and 10109 kHz Saturdays around 2230 UTC. **Egypt** Mohamed (P.O. Box 1616, Alexandria, Egypt), SU2MT, is found daily between 21280 and 21285 kHz at 1800 UTC.

**Gambia** Hams here were granted use of the "new" (as they are still referred to) WARC bands of 30 meters (10100-10150 kHz CW and RTTY on the high end of the band), 17 meters (18068 to 18110 kHz CW, 18100 to 18110 kHz RTTY and SSB between 18110 and 181268 kHz), and 12 meters (24890 to 24930 kHz CW, 24920 to 24930 kHz RTTY, 24930 to 24990 kHz SSB) on a trial basis using a maximum of 100 watts. So start looking for those C5 prefixed stations on those bands. **Italy** Though he sailed for Spain, Christopher Columbus was born in Italy. To celebrate the 500th anniversary of Columbus' first voyage to the Western Hemisphere, The Radio Amateurs of Genova are offering "The Christophero Columbus Award." They will have special events stations IQ2CC (Milan where Columbus lived for a while) and IQ1CC (from his birthplace, Genova) every weekend during the "award week" (which started 1 September and continues through 31 December 1992). You get one point for each Italian station logged, three points if the station is located in Genova, and five points if you log one of the special events stations. Available to SWL's as well as licensed amateurs, you need the following number of points to qualify: Italians 50, elsewhere in Europe 30, the rest of the world 10 points. There is a catch, though; one of your loggings MUST be either IQ1CC or IQ2CC! To handle the costs of printing, mailing and processing the awards applications, there is a fee of either $5 US, 10 IRC's, 35 French Francs, 10 Deutsch Marks or Swiss Francs, 5 British Pounds, or 100 Italian Lire, whichever is easier for you to send. Mail the fee and a certified copy of your log data (it can be certified by either two licensed amateurs, a radio club official or a Notary Public) to: ARI Award Manager, Via Scarlatti 31, 10214 Milano, Italy. **Moldova** Operating from this former Soviet Republic and now independent country is RO4OA who keeps regular schedules on 18000 kHz to 14020 kHz CW at 0030 UTC and on 14210 kHz SSB at 0330 UTC most days. Send your reports to his QSL manager: SP9HWN, Wojciech Drwal, ul Maja 29, 42-500 Bedzin, Poland. **Mozambique** C9RJ is newly assigned to the US Embassy here and on weekends offers this rare country to CW fans on 14040 kHz at 0530 UTC and SSB fans on 21720 kHz starting at 1615 UTC. His QSL manager is: W8GJO, Paul R. West, Rt 1 Box 140-42, Bunker Hill, WV 25413. **Peru** It is not too often that we get a tip for a station in this country and a RTTY operation is even more rare, but OA4BB (bow is Humberto E. Catter D Argentine, Calle 3A, Los Alamos de Monterrico, Surco, Lima, Peru) has been showing up at 0500 UTC on 14085 to 14090 kHz RTTY. **St. Helena** Chuck Chalmers (P.O. Box 126, St. Helena Island, South Atlantic) is ZD7CRC. Chuck provides one of the more interesting loggings on amateur radio as he will tell you about the island and himself whenever possible. **Sierra Leone** 9L1JC (QSL to Jerry Cooper, 211 Meadowlak Dr., Seguin, TX 78155 USA) is working the US embassy here and appears on 14170 kHz SSB at 2330 UTC and 21225 kHz SSB at 1900 UTC some days. **United Nations HQ in New York** During their lunch hour (1600-1700 UTC) weekdays, when they can, employees here operate the amateur radio club station 4U1UN on RTTY 14085 to 14090 kHz or SSB around 14230 kHz SSB. On weekends, 4U1UN can be found on or near the same frequencies starting at 0200 UTC. **Uzbek** Another former Soviet Republic that is now an independent country. U9ZAA (whose QSL Manager is K9FD, Mervyn D. Schweigert, Rt. 2 Box 138-A, Red Bud, IL 62278) has been offering this one on 21265 kHz SSB or 21335 kHz (in the GW3CDP DX net) starting at 1600 UTC. **World Bank** Located in Washington, DC, and often in the news, is an amateur radio club station, 4U1WB, that operates from here Fridays at 1330 UTC around 14185 kHz SSB +/- 5 kHz due to interference. If you log this one, send your QSL request to KK4HD, Paul J. Van Der Ellic, 4900 Bradford Dr., Annandale, VA 22003.

Hope you are able to log many new stations and countries in the contest mentioned above (the amateurs will be exchanging their signal reports as well as "CQ zones"—the world is divided into 40 such zones).
A few prominent FCC busts of United States pirate stations have generated big news during the past year. In contrast, an anonymous Canadian MT reader writes in this month to note the curious fact that during the last decade, the Canadian Department of Telecommunications has never conducted a highly publicized bust of a hobby pirate shortwave station in Canada. This DOC inactivity has contrasted sharply with the FCC’s occasional overt attacks on USA pirates.

The Department of Communications does have the capacity to close down unlicensed stations, and it has done so this year. MT reader Glen Pearce of Winnipeg, Manitoba, forwards a copy of a Winnipeg Sun article on the DOC’s late May confiscation of six pirate television transmitters operated by Life Broadcasting. The pirate TV stations featured relays of Trinity Broadcasting Network religious programming.

Gerald Desroches of the DOC Ottawa office said that the TV relays had ignored written May 8 warnings to cease unlicensed broadcasting. Two silenced transmitters operated in the Winnipeg area. The other four were in Saskatchewan (Saskatoon and Shawonon) and Alberta (Medicine Hat and Three Hills).

Ken Groaning of Life Broadcasting characterized these busts as religious persecution. However, Desroches of the DOC replied that some of the stations had been transmitting pirate HBO entertainment programming. Under provisions of the Canadian Radio Telecommunications Act, the stations could be fined between $5,000 and $10,000 for each day of unlicensed operation. The DOC is clearly not toothless!

**Radio USA vs. FCC**

We covered the war between Radio USA and the FCC’s Laurel, Maryland, field office in MT’s August and September issues. The struggle continues. On July 2 the FCC issued a $17,500 Notice of Monetary Forfeiture to alleged station operator Andrew R. Yoder of Chambersburg, Pennsylvania. Yoder quickly fired off a response to the FCC. He denied responsibility for Radio USA’s pirate transmissions, disputed the FCC’s evidence, and failed to pay the fine. Yoder contends that he is being harassed by the FCC because of his prominent position as an author and publisher in the pirate radio listening hobby.

Meanwhile, MT received a Press Release from host Mr. Blue Sky of Radio USA. Mr. Sky says that the station “has not been busted, caught, overrun, mutilated, devastated or man-handled by the FCC.” As this month’s loggings indicate, the station has been active after the Yoder incident with the FCC on 41 meter frequencies, and in the 21460-21510 kHz range of the 13 meter band. Mr. Blue Sky reports that over 900 station QSL’s have been mailed to DXers in 46 states and six countries. He promises that QSL #1,000 will be a full data verie on the back of a Radio USA t-shirt.

**Clandestine Activity**

A large amount of big pirate news last month forced us to hold over lots of good clandestine material. Plenty of interesting items have arrived in Brastown:

- **MT reader Terry Provance of Zanesville, Ohio, received a nice full data QSL from the Voice of the Broad Masses of Eritrea. It lists an address for reports c/o Information Department, P.O. Box 872, Asmara, Eritrea, Ethiopia.** The station notes that its broadcasts are produced in the local Afar Tigugna language.
- **Radio Muhabura**, the radio voice of the Rwandan Patriotic Front, has rarely been reported by North American listeners during its two year existence. However, the BBCMS found them operating during the summer on 6340 or 6400 kHz with a normal schedule of 0415-0515, 1000-1100, and 1715-1815. African propagation always improves during fall and winter months, so you may want to check this one out.
- **Hans Johnson of Columbia, Maryland, looked for the Algerian relay of La Voz de la Resistencia de Chile on 15215 kHz at 0200.** He instead found **La Voz de Chile Libre** co-channel with an Arabic program from Algeria. It is possible that this was a mixing product at the transmitter site. But, it may be that the Chilean clandestine could have a new ID and/or a new location.
- English programming is rare from Middle East clandestines, but there is one prominent exception. I regularly hear **Iran’s Flag of Freedom Radio**’s sign on just before 0330 on three parallel 25 meter frequencies: 15100, 15565, and 15640 kHz. They give a brief ID in English and other languages at the beginning of each broadcast. Circumstantial evidence has piled up over the years in support of a theory that the station is a CIA operation via Egyptian transmitters that is financed by your tax dollars.
- **Radio Patria Libre**’s powerful anti-Colombian 15045 kHz channel has been silent lately, but many (including your columnist) still hear them regularly on 5890 kHz. Their evening schedule runs between 0330-0100.

**The National Alliance**

In August we analyzed the quasi-clandestine National Vanguard Radio, which still blasts in via a WRNO 7355 kHz relay on UTC Sundays at 0100. MT’s Glenn Hauser reminds us that National Vanguard Radio originally had a sixteen week run over WWC’r’s transmitter before it moved to its current WRNO home. Both Vanguard and the long-running Voice of Tomorrow are associated with a fascist group called the National Alliance.

The National Alliance has emerged in a context outside shortwave radio. During the summer academic quarter, dozens of Nazi posters containing the National Alliance logo suddenly plastered the campus of Kent State University in Kent, Ohio. The KSU administration ripped them all down on the pretext that the National Alliance is not an official college organization. The situation generated widespread press coverage in northern Ohio. So, National Vanguard Radio and the West Virginia fascist bookstore that it promotes on WRNO are not the only activities of the National Alliance group.

**Europirate Info Sources**

Veteran MT reporter Martin Lester of the United Kingdom relays the unfortunate news that the excellent quarterly FRQ Database Free Radio Directory of Europirate station schedules and addresses has suspended publication. Martin also says that WKNR-West and North Kent Radio has been extremely active lately. It uses 3945 kHz at 1800-0600 beginning on UTC Saturday. On UTC Sundays it is found on 6400 kHz between 1000-1300, but it sometimes tests during these hours on 9960 kHz.

Others sources exist for current Europirate information, and MT reader Eric Suter of Sutherland, Virginia, forwards a copy of a good one. The Pirate Chat bulletin features detailed coverage of longwave, medium wave, shortwave, FM and satellite pirate stations based in Europe. A North American pirate loggings column is a nice additional touch. Sample copies are available for one pound sterling or $2 US c/o 21 Green Park, Bath, Avon, England BA1 1HZ.

Some Europirate stations distribute their own newsletters. MT contributor John Hollowell of Port Republic, Maryland, sends one in from Peter Hills of Radio Waves International, heard regularly during weekends on 7473 and 11401 kHz. They seem to have a very loose affiliation with Australian pirate Radio G’Day, which also uses 11401 kHz. In Fine Tuning, expert DXer Jerry Berg of Lexington, Massachusetts, reports that he has actually QSL’d Radio G’Day! RWI welcomes correspondence through P.O. Box 130, 92504, Rueil, Cedex, France. MT reader “Frank” of Vanues, France, sends in logs of RWI and dozens of other active Europirates.

Another nice set of materials arrived in Brastown direct from Radio Dublin, which has resumed shortwave activity on slightly variable
He Man says Kristin Kaye — not!

6910 kHz from a 300 watt transmitter. They can be heard on our side of the Atlantic under good conditions. Dublin says that their 25 year history certifies them as Ireland’s longest running independent radio station. It uses a simple postal address of Radio Dublin Ltd., Dublin 8, Ireland. Remember, when writing to Europirates you should enclose $1.00 US for return postage.

Pirates Still There

Veteran MT contributor David Alpert of ABC News in New York forwards a summary of an Associated Press story about USA pirates filed over AP Network News. The story included an interview with John Young of the FCC staff, who said that a “government crackdown” had “nipped (pirate activity) in the bud” before it got “out of control” like the CB band.

The AP story featured audio clips from WBLO and the Voice of Communism, neither of which has been active during the last couple of years. Despite a small handful of high profile FCC busts and Young’s remarks over AP, logs from MT readers this month indicate that plenty of North American pirates are still active.

Regular MT contributor Dave Gasque of Orangeburg, South Carolina, sends in a useful tip for pirate operators. Many DXers (including Dave) sometimes have trouble fishing pirate station identifications out of the mud because of weak signals, interference, and static. In addition, the clarity of speech by some station announcers is rather muddled by sloppy diction or sub-par transmitter modulation. Dave suggests that slow and frequent station ID’s be quite helpful under these circumstances, and that call letters spelled out phonetically can be a real plus. How about it, stations?

Maildrop addresses used by pirates reported this month include P.O. Box 452, Wellsville, NY 14895; P.O. Box 109, Blue Ridge Summit, PA 17214; 770 Sycamore Avenue, #J-193, Vista CA 92083; P.O. Box 25302, Pittsburgh, PA 15242; and P.O. Box 293, Merlin, Ontario NOP 1W0.

What We Are Hearing

I look forward to seeing many of you in Atlanta at the October MT convention!

Anarchy One: 7415 at 0330. Captain Anarchy mixes rock music with advocacy of radical political change in the USA. Addr: Vista. (Skip Harwood, Beale AFB, CA)

CSIC: 7413 at 0200. Pirate Rambo’s Canadian pirate, easily identified by its Psycho Chicken interval signal, remains quite active with rock, commentary, and relays of other pirates. Addr: Blue Ridge Summit. (Holowell, MD)

Down East Radio: 7413 at 0245. New pirates emerge all the time; this one’s initial tests featured rock music programming. Addr: Blue Ridge Summit. (George Zeller, Cleveland, OH)

EBO Radio: 7415 at 0245. This rock music station reacted in July from the Boundary Street Country Club in Farmgore, SC, but host Uncle Billy says that they first transmitted from a Marine military base in 1974. Michael’s first pirate! Addr: Wellsville. (Pat Murphy, Chesapeake, VA and Michael Seheny, Reading, PA)

KIWI: 7415 at 1230. Actually a veteran New Zealand pirate, this one has been relayed recently in North America via WSKY, according to a phone call direct from Oceania! Addr: Wellsville for WSKY. (Greg Lytle, Lubbock, TX)

KMB: 15049 at 0015. Phil Muzik’s veteran pirate, the shortwave service of the California Marijuana Cooperative, has returned with its very slick productions on both 19 and 41 meters. Addr: Wellsville. (Alan Masuya, Winona, MN and Bob Confino, Douglassville, PA)

He Men Radio: Larry Gotts of Richfield, PA, received the QSL pictured this month from He Man, but Larry is puzzled by the slashed “KK” symbol. This reflects He Man’s running feud with host Kristin Kaye of WWCR’s “Signals” DX program. Addr: Blue Ridge Summit.

Radio Anarchy- 4816 at 0500. Not to be confused with either the Voice of Anarchy or Anarchy One, this one recently programmed flute music. It announces plans for continued 60 meter transmissions on frequencies like 4760 kHz. Addr: Blue Ridge Summit. (Harwood, WA)

Red DC: 7416 at 2315. The leftist shows on this one have used the Los Angeles riots as ammunition for scathing election year criticism of George Bush. Addr: none, but still verifies log reports in AXE. (Masuya, MN)

Radio USA: 7413 at 0230, 7415 at 0145, etc. Despite the FCC bust discussed in three consecutive MT issues, Mr. Blue Sky remains active with punk rock, parody sketches and ads for station T-shirts. Addr: Wellsville. (Schmel, PA, and Hollowell, MD)

RKNA: 7415 at 0230. The old geezer announcer mixes rock and cowboy music with parody ads. Although they have been widely heard, most DXers report weak signals from them. Dennis, first pirate! Addr: Wellsville. (Rev. Dennis Myhard, Demott, AR)

Voice of “Bob”- 7414 at 0215. The Church of the Subgenius programs a professionally produced parody of fundamentalist preachers, with sermon topics like: “Did you know that Jesus smoked Chesterfield?” Addr: Wellsville. (Mark Seiden, FL; Confino, PA)

Voice of the Night- 7415 at 0330. Lad’s fadish irresponsibility continues; he intentionally jammed every ID announcement on a midsummer WMAD broadcast. Addr: Pittsburgh. (Provence, OH)

WARR: 7415 at 0345. Dr. Lobotomy has announced plans to supplement his 41 meter rock music transmissions with relays of other pirates on medium waves and 49 meter frequencies. Addr: Wellsville. (Robert Thomas, Bridgeport, CT)

WCCYC: 7415 at 0230. The World’s Craziest Young Children’s pirate mixes their rock music shows with random monologs. Addr: Blue Ridge Summit and Martin. (Murphy, VA)

WEED: 7415 at 0445. This pro-marijuana rock music station remains fairly active from an announced location in the Great Southwest. Addr: still none; useless solicits reports via radio DX programs. (Harwood, CA)

WMAD: 7415 at 0300. Hosts Al Jaffe and Midnight Rider combine rock music with humorous parody ads for firms like Kamikaze Airline. Their interval signal is “Three Days” by Jane’s Addiction. Addr: Wellsville. (Seheny, PA, and direct from the station)

WVOL: Voice of the Leon at 7415 at 0315. Captain Willie broadcasts rock and comedy, although Michael says that he suffers jamming interference from the Voice of the Night. WVOL occasionally features a free ad for MT1 (Seheny, PA)

NOW YOU’RE TALKING!

The Code-Free Ham License is Here

Enjoy all Amateur Radio privileges above 30 MHz without having to pass a code test. All you have to do is pass a 55-question exam on basic radio and the FCC regulations. ARRL’s new book, Now You’re Talking makes understanding what is required on the test a snap! And there are exams given all over the country every weekend.

Just think how much fun you’ll have communicating through repeaters, enjoy Sporadic E skip and worldwide communications on six meters when conditions are right. There’s satellite communication and you can even talk to Astronauts and Cosmonauts in orbit. Enjoy friendly local communication both direct and through repeaters. Help with disaster drills and the real thing! Sound like fun? It is! Order your copy of Now You’re Talking below:

Enclosed is $19 plus $4 for shipping (a total of $23) or charge $23 to my ( ) VISA ( ) Mastercard ( ) American Express

Signature

Acct. No. __________________________

Good from __________ Expires __________

Name ________________________________

Address ______________________________

City __________________ State ______ Zip ______

The American Radio Relay League

225 Main Street NEWINGTON, CT 06111

The American Radio Relay League
55
Now you can have programmable tone/digital squelch on the popular Radio Shack Pro 2004, 5, 6 receivers. The TCF-4 is also available with 760/950 series receivers.

- You can program in up to ten tones or digital codes in any combination on any or all channels.
- Carrier squelch can be put on any channel.
- Connections between Finder/User and Receiver are very simple. A modular telephone jack (RJ 45) is on each unit with a short cable between them.
- The Finder/User is ruggedly built and can be run on 12V DC for mobile applications. A wall adapter is supplied for 110V applications.
- Internal memory back-up battery retains your program for a thousand hours in the event of a power loss.
- Front panel programming for ease of operation.
- Three year warranty on the Finder/User.
- Price $329.95 + $30.00 installation. VISA or MasterCard accepted.

FOR MORE INFORMATION CONTACT:

MEASUREMENTS DIVISION
AUTOMATED INDUSTRIAL ELECTRONICS CORP.
141 GRANITE ST. P.O. BOX 70 BATESBURG, S.C. 29006 1-800-397-9256 FAX (803)532-9258

1992 Popular Communications Communications Guide

The most up-to-date buyer’s guide for communications equipment—from communications receivers and scanners, to CB radio and amateur transceivers is here! Complete with articles by experts in the communications field, including Dexter, Kneittel, Helms, Gysi, Orr, Zeller, Margolis and many more, the 1992 Communications Guide is the book you’ve been waiting for—Here’s what’s inside:

An introduction to the fascinating world of communications monitoring with: illustrated articles on scanning, utility monitoring, antenna selection and construction, pirate radio, QSLing and much MORE!

AS AN ADDED BONUS, noted ham Fred Maia, WS5Y1 tells just how easy it is to get your HAM LICENSE. In plain English, Maia explains ham radio and how YOU can become a licensed ham. In addition, a product listing with PHOTOS of amateur radio transceivers for use by Technician class licensed hams is included . . .

The Brand NEW 1992 Communications Guide includes the latest communications products on the market WITH detailed specifications and photos to make your buying decision easier. We’ve included shortwave receivers, scanners (BOTH base and handheld) and accessories to make your monitoring post complete.

IT’S ALL YOURS FOR JUST $4.95 (please add $2.50 shipping and handling; $3.50 foreign).
National Scanning Report is America's fastest-growing scanning magazine. That's because every issue of National Scanning Report offers the latest in:

* Law Enforcement Communications
* Fire and Rescue
* Emergency Medical
* Listening Tips
* Frequency Lists
* New Products
* Aeronautical
* Railroad
* Federal
* Much More!

From first alarm to final clean up, National Scanning Report is crammed with up-to-date information written by and for the pros. National Scanning Report is your #1 guide to the scannerbands.

Order your subscription today: $17.50 gets you one year (six issues) plus a free custom frequency print-out for your county and more.

VGA, the top-of-the-line in personal computer graphics, now blazes into the amateur radio market in the all-new Universal M-8000. With stunning color, lightning character display and dazzling features, the M-8000 puts professional quality into your communications position. More than just a pretty picture, the M-8000 offers both old and new decoding modes including: RTTY, packet, ASCII, FDM, FEC-TOR, ARQ-TOR, Morse, WEFAX, and Piccolo. And because of its built in microprocessor, no PC is necessary.

ORDER: DEM6

Accessories:
KIT01 - 19" Rack Panel Mounting Kit - $19.95
The Piccolist

Now that Piccolo is available on the Universal M8000, I decided to include my "Piccolist" in this month's issue. I started compiling it without the aid of a decoder about four years ago. Even though I wasn't able to read the traffic, the musical tones were easy to spot and I knew someday a decoder would be available.

After building my own box about two years ago, many of the unknowns that were identified. Since then, many frequencies have become inactive, but ones like 14.827 or 10.235 operate just about every night. The following is an example of traffic.

DE MSS
YOU BE 555555.S
HERE TO PAL
TA A KK

Apparently MSS (operator's initials "TA") is giving his "PAL" a signal report of 55555's. This type of message is usually hand sent on the "OW" (order wire) channel. The OW usually sends the idle character which can be identified by the alternating tone numbers 5 and 6.

Many unknown frequencies were added to the list during Desert Storm that have not been heard from since! One unknown not on the list was sent in by Dave Wilson. He tunes to 18.331 in the early mornings and copies almost continuous traffic.

I also listed frequencies for the old Mark III system (still active in the evenings on 14,862 kHz) and the French Coquelet on 7,434 kHz. All 117 frequencies are separated into two databases that I can scan using the Datacom Software and an Icon R71A. I highly recommend the concept of keeping two databases because you can scan the known frequencies and periodically check the unknown's activity. It takes too long to scan all 117 and on any given night I listen to only two to four frequencies. I'm sure if there's a band opening, several more will "pop-up"!

With the M8000's ability to copy just about any mode, I thought that I could copy any signal out there until I came across 10,285.5 kHz. It uses 425 Hz shift but I wasn't able to sync up to it in any mode. It sounds very much like ARQ-E3, but the idle or data LED wouldn't light up! Drop me line if you can figure this one out.

On the other hand, I had no problem getting in sync with 10,524.2 using 425 Hz shift and ARQ-E3 running 192 bps. I had to sit on that one for several hours until I copied RFLI, Far de France, Martinique. That's typical of ARQ reception: It takes the right equipment and a lot of patience.

NNN

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Call</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>11700.00</td>
<td>MKD</td>
<td>Cyprus to MUH8</td>
</tr>
<tr>
<td>11750.00</td>
<td>MKD</td>
<td>Cyprus to MUH8</td>
</tr>
<tr>
<td>11800.00</td>
<td>MKD</td>
<td>Cyprus to MUH8</td>
</tr>
<tr>
<td>11850.00</td>
<td>MKD</td>
<td>Cyprus to MUH8</td>
</tr>
<tr>
<td>11900.00</td>
<td>MKD</td>
<td>Cyprus to MUH8</td>
</tr>
<tr>
<td>11950.00</td>
<td>MKD</td>
<td>Cyprus to MUH8</td>
</tr>
<tr>
<td>12000.00</td>
<td>MKD</td>
<td>Cyprus to MUH8</td>
</tr>
<tr>
<td>12050.00</td>
<td>MKD</td>
<td>Cyprus to MUH8</td>
</tr>
</tbody>
</table>

The Piccolist

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Call</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>16205.00</td>
<td>MKK</td>
<td>London to MTs Falkland</td>
</tr>
<tr>
<td>16233.00</td>
<td>MKK</td>
<td>Akrotiri to MUH8</td>
</tr>
<tr>
<td>16254.00</td>
<td>MKK</td>
<td>Belize to MUH8</td>
</tr>
<tr>
<td>16275.00</td>
<td>MKK</td>
<td>Belize to MKK London</td>
</tr>
<tr>
<td>16291.00</td>
<td>MKK</td>
<td>Belize to MKK London</td>
</tr>
<tr>
<td>16320.00</td>
<td>MKK</td>
<td>Belize to MKK London</td>
</tr>
<tr>
<td>16334.00</td>
<td>MKK</td>
<td>Belize to MKK London</td>
</tr>
<tr>
<td>16340.00</td>
<td>MKK</td>
<td>Belize to MKK London</td>
</tr>
<tr>
<td>16390.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>16824.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>16842.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>17445.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>17459.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>17507.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>17515.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18057.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18178.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18420.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18476.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18482.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18512.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18525.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18642.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18700.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18750.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18799.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>18941.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20005.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20165.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20195.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20196.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20197.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20198.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20199.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20200.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20201.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20202.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20203.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20204.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20205.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20206.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20207.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20208.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20209.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20210.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20211.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20212.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20213.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20214.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20215.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20216.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20217.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20218.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20219.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20220.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20221.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20222.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20223.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20224.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20225.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20226.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20227.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20228.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20229.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20230.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20231.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20232.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
<tr>
<td>20233.00</td>
<td>MKK</td>
<td>Belize to MTS Falkland</td>
</tr>
</tbody>
</table>

MONITORING TIMES
Looking for some QSL tips? Radio Netherlands is offering a booklet, free of charge, Writing Useful Reception Reports. General Hints, The Backward Secret to the SIO Code, and Latin American DXing are a few topics covered. Send for your copy to, P.O. Box 444, 1200 JJ Hilversum, Netherlands.

Radio Havana Cuba is asking DXers to send their reports to the attention of their Correspondence Dept, P.O. Box 6240, Havana.

If you’re after a QSL from VOA’s Botswana Relay, try sending your report to the “Botswana QSL Desk.” After a rocky start, QSLs for this new relay site are being widely received. Send your reports to; Voice of America, Washington, DC 20547.

BULGARIA
Radio Sofia, 9700 kHz. Full data color scenery card, unsigned. Station stickers, and program schedules included. Received in 163 days for an English report. Station address: 4 Dragans Tsankov Blvd., Sofia, Bulgaria. (Doug Merkel, St. Louis, MO)

CANADA
CHU, 7335 kHz. Partial data Sanford Fleming card, unsigned. Received in 21 days for an English report. Station address: National Research Council, Ottawa, ONT, Canada KIA OR6. (Richard Redmon, Vancouver, WA)

Halifax Coast Guard Radio-VCS, 6513 kHz. Full data 4-view photo of station complex, verified by Robert N. Ward-Radio Operator. Received for an English utility report, mint stamps (returned), and address label. Station address: Ketch Harbour, Halifax County, Nova Scotia, Canada BOJ1XO. (Mike Hardesty, Jacksonville, NC)

CHINA
Radio Beijing, 9770 kHz. Full data color scenery card, unsigned. Program schedule, stickers, and The Monitor magazine. Received in 14 days for an English report. Station address: Beijing 100866, China. (Loyd Van Horn, New Orleans, LA)

CZECHOSLOVAKIA
Radio Prague, 5920/7345 kHz. Full data color scenery card, verified with initials. Station sticker, schedule, and station brochure included. Received in 14/16 days for an English report. Station address: Vino hradiska 12, 1209 Prague 2, Czechoslovakia. (Ernest T. Bagley, S. Portland, ME) (Nicholas P. Adams, Pt. Murray, NJ)

EL SALVADOR
Radio Venceremos, 6750 kHz. Full data “Certificado de Sintonia” card, verified by Arturo Ocampo. My prepared card with partial data returned with QSL. Station address: c/o El Salvador Media Project, 335 West 38th St, New York, NY 10018. European address: SRV Press Bureau, Scharnhorststr. 6, 5000 Koln 60, Germany. The station requests U.S. $1 for return postage instead of IRCs. (Hardster, NC) Thanks Mike, I’m still chasing this QSL! (GVH)

INDONESIA
Sumatra/Radio Republik Indo-Bengkulu, 3265 kHz. Full data Indonesian letter and card, verified by Dr. Hamdan Syahbeni. Two station decals included. Received for an Indonesian report. Station address: Stasiun Regional I Bengkulu, Jalan Letjen. S. Parman 25, Kotak Pos 13 Kawah. (Hardster, NC)

KUWAIT
Radio Kuwait, 15505 kHz. Full data blue QSL folder, verified by Ali N. Jaffar-Chief of Frequency Management. Station information and frequency schedule included. Received in 87/93 days for an English report and 3 IRCs. Station address: P.O. Box 397, 13004, Safat, Kuwait. (Steven Cline, Indianapolis, IN) (Adams, NJ)

NEW ZEALAND
ZLO-Royal New Zealand Navy, 12718.5 kHz. Full data station letter, verified. Received in 26 days for an English utility report and two IRCs. Station address: Private Bag 1704, Waiouru, New Zealand. (Stanley Klementowicz, Torrance, CA)

ZKLF-New Zealand Meteorological Service, 16339.1 kHz. Full data personal letter, verified by M. Bale-Forecast Production Manager. Station FAX transmission schedule included. Received in 47 days for a copy of FAX report, and 2 IRCs (returned). Station address: National Forecast Production Manager, 30 Salamanca Rd., P.O. Box 722, Wellington 1, New Zealand. (Nagi Martin, Austria DX Club)

PAKISTAN
Pakistan Naval Radio-AQP, 13011 kHz. Full data lightpaper card, and cover letter, verified by Muhammad Azam Khan-Lt. Cmdr., MN, Staff Officer (SIG)-II. Received for an English utility report, mint stamps, and address label (both used). Station address: Directorate of Signals, Operations Division, Naval Headquarters, Islamabad, Pakistan. (Hardster, NC)

SHIP TRAFFIC
HMNZS CANTERBURY-ZMCR, 8213 kHz (Royal New Zealand Navy frigate F-421). Full data prepared QSL card stamped with the warship's data stamp, and friendly “good on yer mate” letter from S.N. Kaye-Radio Supervisor. Photo card of the ship included. Received in 15 months for an English utility report, one U.S. dollar, and a souvenir postcard. Ship address: c/o Overseas Branch, CPO Auckland, New Zealand. (Rick Albright, Merced, CA)

M/S KOELPINSEE-YSLM, 22018 kHz (Ex-East German container ship). Partial data prepared QSL card stamped with official ship's name, and color photo of ship. Verified by Gertud Wilde-Radio Officer. Received in 110 days for a German utility report, two U.S. dollars, and a souvenir postcard. Ship address: c/o Deutsche Seereederei, Ueberschaffen Postfach 188, 0-2500 Rostock, Germany. (Albright, CA)

US-S HOONE-NNOCZN Mars Station, 14470 kHz. Full data prepared QSL card verified by Kevin Myers-FIC1, Mars Operator. Received in two months for an English utility report, and a self-addressed-stamped-envelope. Ship address: FPO Miami, FL, 34093-1484. (Ed Rausch, Cedar Grove, NJ)

USCGC MATAGORDA-NAYM, 8984 kHz. Full data prepared QSL card verified by Lt. John Kaptinski CO. Business card and ship info included. Received in 10 days for an English utility report and a self-addressed-stamped-envelope. Ship address: 100 MacArthur Causeway, Miami Beach, FL 33139. (Rausch, NJ)

SEA CHALLENGER-JKHH, 15665 Mhz. (Car Carrier). Full data prepared QSL card verified by Radio Officer. Received in eight days for an English utility report and one U.S. dollar. Ship address: Kawasaki Kisen K.K. (‘K’ Lines), Hibiya Central Bldg. 2-9, 1 Chome, Nishi-Shinbashi, Minato-ku, Tokyo 105, Japan. (Hank Holbrook, Dunkirk, MD)

SATURN DIAMOND-3EWQ, 156.65 kHz. (Pure Car Carrier). Full data prepared QSL card verified by Radio Officer. Received in 73 days for an English utility report and a self-addressed-stamped-envelope and a U.S. dollar. Ship address: Chung Gai Ship Management Co., Ltd., Admiral Center Tower One, 31 St Floor, 18 Haircourt Road, Hong Kong. (Holbrook, MD)

UNITED STATES
PIRATE: Action Radio, 7415.6 kHz. Full data Rep of Nebraska letter, unsigned. ‘Bo Griz for President’ letter, and station info sheet. Received in 80 days for an English report, and three mint stamps. Station address: P.O. Box 452, Wellsville, NY 14895. (Hardster, NC) (Adams, NJ) (Frank Hilton, Charleston, SC)

WWV,15000 kHz. Full data WWV card, verified by John H. Milton-Informational card. Received in 14 days for an English report and mint stamp. Station address: 2000 East County Rd. # 58, Ft. Collins, CO 80524. WWVH, 15000 kHz. Full data color card, verified by Dean Okayama-Engineer in Charge. Received nice personal letter from veri signer, and station booklet. Received in 14 days for an English report and mint stamp (returned). Station address: P.O. Box 417, Kekaha, HI 96752. (Van Horn, LA)

VANUATU
Radio Vanuatu, 3945 kHz. Full data Slit Gong (Tam Tam) card verified. Received in 32 days for an English report, mint stamps, (not used), and a Guam souvenir postcard. Station address: P.O. Box 45, Port Vila, Rep. of Vanuatu. (David Norcross, Barrigada Hts, Guam)

This WWV QSL was submitted by Daniel Jacobs of Elizabeth, NJ. For more information on station WWV, see the feature article on page 22.

MONITORING TIMES
October 1992 59
1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Time) 4, 5, 6, or 7 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC; for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (8:30 PM Eastern, 5:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newswire" listing, which begins on the next page.

Occasionally program listings will be followed by "See X0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

- S: Sunday
- M: Monday
- T: Tuesday
- W: Wednesday
- H: Thursday
- F: Friday
- S: Saturday
- A: Saturday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

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

Of course, every station can't be heard all the time. To help you find the right frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

- am: The Americas
- me: Middle East
- na: North America
- as: Asia
- ca: Central America
- au: Australia
- sa: South America
- pa: Pacific
- eu: Europe
- va: various
- af: Africa
- do: domestic broadcast
- me: Middle East
- om: omnidirectional

Consult the propagation charts. To 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

Jamming of RFPI Continues: Radio for Peace International station manager James Latham announced on a recent mailbag segment that the station was still experiencing jamming on their frequency of 7375. He suggests listeners who encounter jamming on this frequency from the hours of 0000 to 0800 UTC try tuning up to 7385. The station plans to put an extra transmitter into use to help overcome what they believe to be malicious interference.

If you've never tuned in to RFPI, they have been known to broadcast some very controversial programming that at times has been highly critical of U.S. foreign and domestic policy. RFPI can be heard 24 hours on 15030, 13630 and 7375 kHz and from 1800 to 0000 UTC on 21465 kHz.

Technical Problems for Voice of Nigeria: In mid-August, Voice of Nigeria's West African Service was monitored on 7260 instead of the usual 7255. What at first was thought to be a possible test transmission was in fact a frequency punch-up error by the technical staff. With Nigeria off frequency, this revealed daily English language news from co-channel Radio Botswana at 0510 to 0520 UTC.

It seems puzzling that two stations broadcasting on the same continent at the same time would use the same frequency. For an easier shot at hearing Botswana in English, try the VOA's Moepeng Hill relay station on 7265 between 0300 and 0500 UTC.

Radio Free Europe, On or Off?: The chairman of the House Foreign Affairs Committee, Dante Fascell, has issued a statement supporting authorized transmissions by Radio Free Europe to war-torn Yugoslavia. Additional funding would be needed for the broadcasts.

The continuance of Radio Free Europe and Radio Liberty has been a subject of controversy. In August, a government advisory panel concluded that the broadcasts should be phased out. Malcolm Forbes, Jr. chairman of the Board for International Broadcasting, responded in an Associated Press article, "The myopia of this advisory commission about the events in Eastern Europe and the Soviet Union is simply astonishing."

Radio Yugoslavia is currently broadcasting to North America on 11870 kHz from 0030 to 0100 and again from 0130 to 0200 with fair to good reception.

English Language Listeners Please Respond: The future of English transmissions from Radio Norway International is uncertain since the Norwegian Foreign Ministry has decided to withdraw its support to foreign language programs for the coming year. This support had made it possible to double the number of transmissions in English from once to twice weekly. Radio Norway has been broadcasting a thirty minute program in English worldwide every Saturday and Sunday.

The Norwegian National Broadcasting Corporation is financed through license fees and does not consider it a prime task to broadcast to foreign audiences. Discussions about the future of the English transmissions is now taking place and NRI solicits your comments. Send to: Gundel Krauss Dahl, Radio Norway International, 0340 Oslo, Norway.

IRRS-Shortwave Test Broadcasts: During the summer, IRRS-Shortwave (Italian Radio Relay Service) broadcast programming especially intended for American audiences for the first time in several years. These broadcasts included items such as news from the UN and UNESCO, music, the weekly DX/mailbag program "Hello There," and religious programming.

If you have heard these transmissions or wish to write IRRS-Shortwave with your support, please send your reception report or comments to Anna Boschetti, NEXUS-International Broadcasting Association, P.O. Box 10980, 1-201120 Milano, Italy.

Thanks to David Datko, Steve Forest, Gundel Dahl and Anne Boschetti for this month's news items.
**November Deadline: October 2**

<table>
<thead>
<tr>
<th>Time</th>
<th>Station</th>
<th>Time</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000 UTC</td>
<td>Radio Moscow</td>
<td>0300 UTC</td>
<td>Radio Rome</td>
</tr>
<tr>
<td>0500 UTC</td>
<td>Radio China Int'l</td>
<td>0405 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>0600 UTC</td>
<td>Radio China Int'l</td>
<td>0410 UTC</td>
<td>Radio Beijing</td>
</tr>
<tr>
<td>0700 UTC</td>
<td>Radio China Int'l</td>
<td>0415 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>0800 UTC</td>
<td>Radio China Int'l</td>
<td>0420 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>0900 UTC</td>
<td>Radio China Int'l</td>
<td>0425 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1000 UTC</td>
<td>Radio China Int'l</td>
<td>0430 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1100 UTC</td>
<td>Radio China Int'l</td>
<td>0435 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1200 UTC</td>
<td>Radio China Int'l</td>
<td>0440 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1300 UTC</td>
<td>Radio China Int'l</td>
<td>0445 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1400 UTC</td>
<td>Radio China Int'l</td>
<td>0450 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1500 UTC</td>
<td>Radio China Int'l</td>
<td>0455 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1600 UTC</td>
<td>Radio China Int'l</td>
<td>0500 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1700 UTC</td>
<td>Radio China Int'l</td>
<td>0505 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1800 UTC</td>
<td>Radio China Int'l</td>
<td>0510 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>1900 UTC</td>
<td>Radio China Int'l</td>
<td>0515 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>2000 UTC</td>
<td>Radio China Int'l</td>
<td>0520 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>2100 UTC</td>
<td>Radio China Int'l</td>
<td>0525 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>2200 UTC</td>
<td>Radio China Int'l</td>
<td>0530 UTC</td>
<td>Radio Beijing*</td>
</tr>
<tr>
<td>2300 UTC</td>
<td>Radio China Int'l</td>
<td>0535 UTC</td>
<td>Radio Beijing*</td>
</tr>
</tbody>
</table>

"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.
<table>
<thead>
<tr>
<th>Time</th>
<th>Station</th>
<th>Language</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>0610 UTC</td>
<td>Voice of Malaysia</td>
<td>English</td>
<td>Malaysia</td>
</tr>
<tr>
<td>0630 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>0630 UTC</td>
<td>SBC Radio</td>
<td>English</td>
<td>Malaysia</td>
</tr>
<tr>
<td>0645 UTC</td>
<td>Voice of India</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>0655 UTC</td>
<td>Radio Korea</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>0700 UTC</td>
<td>BBC</td>
<td>English</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>0700 UTC</td>
<td>Christian Science Monitor</td>
<td>English</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>0715 UTC</td>
<td>Radio Havana Cuba</td>
<td>English</td>
<td>Cuba</td>
</tr>
<tr>
<td>0730 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>0745 UTC</td>
<td>Radio Pyongyang</td>
<td>English</td>
<td>South Korea</td>
</tr>
<tr>
<td>0755 UTC</td>
<td>Radio Rwanda</td>
<td>English</td>
<td>South Korea</td>
</tr>
<tr>
<td>0800 UTC</td>
<td>BBC</td>
<td>English</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>0800 UTC</td>
<td>Christian Science Monitor</td>
<td>English</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>0810 UTC</td>
<td>Voice of Malaysia</td>
<td>English</td>
<td>Malaysia</td>
</tr>
<tr>
<td>0830 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>0830 UTC</td>
<td>SBC Radio</td>
<td>English</td>
<td>Malaysia</td>
</tr>
<tr>
<td>0900 UTC</td>
<td>Voice of India</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>0900 UTC</td>
<td>Radio Korea</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>0915 UTC</td>
<td>Radio Beijing</td>
<td>English</td>
<td>South Korea</td>
</tr>
<tr>
<td>0930 UTC</td>
<td>Radio Korea (News Service)</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>0945 UTC</td>
<td>Radio Afghanistan</td>
<td>English</td>
<td>Afghanistan</td>
</tr>
<tr>
<td>0945 UTC</td>
<td>Radio France</td>
<td>English</td>
<td>France</td>
</tr>
<tr>
<td>0950 UTC</td>
<td>Radio Togo</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>0955 UTC</td>
<td>Radio Japan</td>
<td>English</td>
<td>Japan</td>
</tr>
<tr>
<td>1000 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>1010 UTC</td>
<td>Radio Beijing</td>
<td>English</td>
<td>South Korea</td>
</tr>
<tr>
<td>1030 UTC</td>
<td>Christian Science Monitor</td>
<td>English</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>1040 UTC</td>
<td>Voice of Greece</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>1055 UTC</td>
<td>Radio Korea</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>1100 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>1115 UTC</td>
<td>Radio Korea (News Service)</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>1125 UTC</td>
<td>Radio Ethiopia</td>
<td>English</td>
<td>Ethiopia</td>
</tr>
<tr>
<td>1130 UTC</td>
<td>Christian Science Monitor</td>
<td>English</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>1135 UTC</td>
<td>Radio Malaysia</td>
<td>English</td>
<td>Malaysia</td>
</tr>
<tr>
<td>1140 UTC</td>
<td>Radio Nepal</td>
<td>English</td>
<td>Nepal</td>
</tr>
<tr>
<td>1155 UTC</td>
<td>Radio Japan</td>
<td>English</td>
<td>Japan</td>
</tr>
<tr>
<td>1200 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>1210 UTC</td>
<td>Radio Beijing</td>
<td>English</td>
<td>South Korea</td>
</tr>
<tr>
<td>1220 UTC</td>
<td>Radio Korea</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>1230 UTC</td>
<td>Radio Korea</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>1245 UTC</td>
<td>Radio Malaysia</td>
<td>English</td>
<td>Malaysia</td>
</tr>
<tr>
<td>1255 UTC</td>
<td>Radio Malaysia</td>
<td>English</td>
<td>Malaysia</td>
</tr>
<tr>
<td>1300 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>1310 UTC</td>
<td>Radio Beijing</td>
<td>English</td>
<td>South Korea</td>
</tr>
<tr>
<td>1320 UTC</td>
<td>Radio Korea</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>1330 UTC</td>
<td>Radio Moscow</td>
<td>English</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>1335 UTC</td>
<td>Radio Nepal</td>
<td>English</td>
<td>Nepal</td>
</tr>
<tr>
<td>1340 UTC</td>
<td>Radio Afghanistan</td>
<td>English</td>
<td>Afghanistan</td>
</tr>
<tr>
<td>1345 UTC</td>
<td>Radio Beijing</td>
<td>English</td>
<td>South Korea</td>
</tr>
<tr>
<td>1355 UTC</td>
<td>Radio Korea</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>1400 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>1410 UTC</td>
<td>Radio Beijing</td>
<td>English</td>
<td>South Korea</td>
</tr>
<tr>
<td>1425 UTC</td>
<td>Radio Korea</td>
<td>English</td>
<td>Korea</td>
</tr>
<tr>
<td>1430 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>1445 UTC</td>
<td>Radio Beijing</td>
<td>English</td>
<td>South Korea</td>
</tr>
<tr>
<td>1455 UTC</td>
<td>All India Radio (News Service)</td>
<td>English</td>
<td>India</td>
</tr>
<tr>
<td>1500 UTC</td>
<td>Radio Korea</td>
<td>English</td>
<td>Korea</td>
</tr>
</tbody>
</table>
The IsoLoop 10-30 HF antenna is designed to work in limited space applications — apartments, condos, etc. Don't be deceived by its compact size (43" diameter) — it really works! Features include: Continuous coverage from 10 to 30 MHz; narrow bandwidth to suppress out-of-band signals; comes fully assembled (no mechanical joints); much more.

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

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

AEA-FAX is simply the best way to demodulate multi-level grey scale fax images received by your general coverage receiver. All necessary hardware and software is included in the package which also features: On-screen tuning "scope"; Autolist feature for unattended image capture and save-to-disk; "Daisy-chain" external RS-232 input allows AEA-FAX to share a COM port with a PK-232MBX or other Hayes-compatible device; up to 16 grey levels (VGA); also supports EGA, CGA and Hercules formats; prints to HP LaserJet or Epson compatible printers.
### English language shortwave guide

<table>
<thead>
<tr>
<th>Time</th>
<th>Broadcast Service</th>
<th>Frequency</th>
<th>Language</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700 UTC</td>
<td>Voice of Greece</td>
<td>1300 kHz</td>
<td>Greek</td>
<td>Greece</td>
</tr>
<tr>
<td>1840 UTC</td>
<td>Voice of America</td>
<td>1425 kHz</td>
<td>English</td>
<td>United States</td>
</tr>
<tr>
<td>1855 UTC</td>
<td>Voice of Indonesia</td>
<td>1460 kHz</td>
<td>Indonesian</td>
<td>Indonesia</td>
</tr>
<tr>
<td>1900 UTC</td>
<td>Voice of Nigeria</td>
<td>1500 kHz</td>
<td>English</td>
<td>Nigeria</td>
</tr>
<tr>
<td>1915 UTC</td>
<td>Voice of Greece</td>
<td>1540 kHz</td>
<td>Greek</td>
<td>Greece</td>
</tr>
<tr>
<td>1920 UTC</td>
<td>Voice of Greece</td>
<td>1545 kHz</td>
<td>Greek</td>
<td>Greece</td>
</tr>
<tr>
<td>1930 UTC</td>
<td>Voice of Greece</td>
<td>1550 kHz</td>
<td>Greek</td>
<td>Greece</td>
</tr>
<tr>
<td>1940 UTC</td>
<td>Voice of Greece</td>
<td>1600 kHz</td>
<td>Greek</td>
<td>Greece</td>
</tr>
<tr>
<td>1945 UTC</td>
<td>Voice of Greece</td>
<td>1610 kHz</td>
<td>Greek</td>
<td>Greece</td>
</tr>
<tr>
<td>2000 UTC</td>
<td>Voice of America</td>
<td>1700 kHz</td>
<td>English</td>
<td>United States</td>
</tr>
<tr>
<td>2030 UTC</td>
<td>Voice of America</td>
<td>1800 kHz</td>
<td>English</td>
<td>United States</td>
</tr>
<tr>
<td>2040 UTC</td>
<td>Voice of America</td>
<td>1900 kHz</td>
<td>English</td>
<td>United States</td>
</tr>
<tr>
<td>2050 UTC</td>
<td>Voice of America</td>
<td>2000 kHz</td>
<td>English</td>
<td>United States</td>
</tr>
<tr>
<td>2100 UTC</td>
<td>Voice of America</td>
<td>2100 kHz</td>
<td>English</td>
<td>United States</td>
</tr>
<tr>
<td>2125 UTC</td>
<td>Voice of America</td>
<td>2200 kHz</td>
<td>English</td>
<td>United States</td>
</tr>
<tr>
<td>2130 UTC</td>
<td>Voice of America</td>
<td>2300 kHz</td>
<td>English</td>
<td>United States</td>
</tr>
<tr>
<td>2200 UTC</td>
<td>Voice of America</td>
<td>2400 kHz</td>
<td>English</td>
<td>United States</td>
</tr>
</tbody>
</table>

*Note: The frequencies and languages listed are approximate and may vary.*
ELIMINATES SEARCHING, SCANNING, TUNING

INTERCEPTOR

INTERCEPT, DETECT & CAPTURE
Near Field Transmissions with
Optoelectronics' New
INTERCEPTOR™

NEW TECHNOLOGY
- Follows & Locks on even when frequency changes.
- Intercepts ALL FM Two-Way Transmissions without gaps in coverage.
- Does Not have to tune through RF Spectrum to find signals.

FCC Classified as Communication Test Instrument for:
- Deviation, FM, FMN
- Signaling Tones (CTCSS)
- Modulation Monitor
- Great for testing VHF, UHF & Cellular transmitters

A New Dimension in Recreational Monitoring – Intercept the Two-Way Communication that Surrounds You.
Increase Your RF Security.

Hand Held/Shirt Pocket Size

INTRODUCTORY OFFER
Interceptor™ R10 FM Communications
Interceptor (Includes NiCads, AC/Charger Adapter, Antenna, Earphone) $359.

OPTIONS
- Headphones (Lightweight personal headphones) $15.
- Antenna Pak 2 (Five assorted rubber duck antennas – save $32.) $99.
- TC200 Tone Counter (CTCSS signalling tones) $179.
- APS-104 (Extends RF detection distance 10x) $995.
- CF800 Cellular Band Pass Filter/Amplifier $299.

OPTOELECTRONICS
FACTORY DIRECT ORDER LINE 1-800-327-5912

305-771-2050 • FAX 305-771-2052 • 5821 NE 14th Ave., Ft. Lauderdale, FL 33334
5% Ship/Handling (Max$10.) U.S & Canada. 15% outside continental U.S. Visa & Master Card accepted
0000 UTC

FREQUENCIES

0000-0027 Czechoslovakia 7345na 9580na 11990na
0000-0030 Australia 15170va 15320va 17630as 17750na
0000-0030 Canada, RCI Montreal 5960am 9755am 13670am
0000-0030 aivar Croatia Radio via HRH 7315na 9465na
0000-0030 Iran, Islamic Republic 9022am 15260as 15315am
0000-0030 sm Norway 15165am
0000-0030 Swiss Radio Intl 6135na 9650na 9865na 12035na
0000-0030 United Kingdom, BBC London 5965as 5975na 6005af 6175na
0000-0030 Canadian Radio 6020na 6165na 9860as 11655as
0000-0045 Bulgaria, Radio Sofia 11660na 11720na 15330na
0000-0045 North Korea 11335na 13760na 15115na
0000-0050 Australia, ABC Brisbane 4920do 9660do
0000-0050 Australia, ABC Perth 9610do
0000-0050 Canada, CFCX Toronto 6070do
0000-0050 Canada, CFVP Calgary 6030do
0000-0050 Canada, CHNX Halifx 6120do
0000-0050 Canada, CKZU Vancouver 6160do
0000-0050 China, Radio Beijing 9770na 11775na
0000-0050 Cook Islands 11970do
0000-0050 Costa Rica, AWR 9725ca 98780ca
0000-0050 Costa Rica, RPP 7375na 13630na 15030na
0000-0050 Cuba, RHC Havana 11965am
0000-0050 Guam, KSDA Guam 15615as
0000-0050 India, All India Radio 9910as 11715as 11745as 15110as
0000-0050 Luxembourg, RTL 11760pa
0000-0050 Malaysia, RTM Radio 4 7295do
0000-0050 New Zealand, RNZI 17770pa
0000-0050 Philippines, FEBC Manila 15460as
0000-0050 Russia, Radio Moscow 11710va 11780va 11850va 12050va
0000-0050 Singapore, KTBN 15460va 15510va

SELECTION Programs

Sundays
0000 Radio Norway Intl: Norway Today. A magazine program on issues and people affecting modern-day Norway.
0005 Swiss Radio Intl: Grapevine. Listener letters and comments.
0018 Swiss Radio Intl: Swiss Shortwave Merry Go Round. Bob Thomann and Bob Zanetti present shortwave radio news and advice.
0030 BBC: The Ken Bruce Show. Ken Bruce plays pop music, past and present.

Mondays
0006 Christian Science Monitor (SE Asia): News Features And Interviews. In-depth news analyses, focusing on major international events.
0030 BBC: In Praise Of God. Christian religious services and meditations.

Tuesdays
0005 Swiss Radio Intl: Dateline. See M 0605.
0030 BBC: Panel Game. How's your science knowledge? Quiz yourself on "The Litmus Test."

Wednesday
0005 Swiss Radio Intl: Dateline. See M 0605.

The 1993 Guide to Shortwave Programs!

Updated this year with over 20,000 program listings from more than 100 worldwide broadcasters, you can now enjoy a complete 24-hour a day listing of English language shortwave programs! Order your copy today—only $15.95 plus $4 UPS!

Grove Enterprises
1-800-438-8155

NEW

October 1992

MONITORING TIMES

0000-0100 Ukraine, Kiev 7195eu 7250eu 9640eu 10344eu
0000-0100 USA, CSmonitor Boston 7395na 9650as 13760na 17555as
0000-0100 USA, CSmonitor Boston 1765as
0000-0100 USA, KJBN Salt Lake City 1590am
0000-0100 USA, KVOH Los Angeles 1775as
0000-0100 USA, WOA Washington 6130am 7405am 9550am 9775am
0000-0100 USA, WHRI Noblesville 7515am 9459am
0000-0100 USA, WJIB Red Lion, Penn 15145eu
0000-0100 USA, WJUR Upton, Kentucky 7490na
0000-0100 USA, WWRU New Orleans 1735am
0000-0100 USA, WWCR Nashville 7425na 12160na
0000-0100 USA, WYFR Oakmont, FL 5685as
0000-0100 Australia, Radio Australia 15320na 15365pa 15420pa 17360as
0000-0100 Austria, Radio Austria 17715as 17750as 17795as 17880as
0000-0100 Ecuador, HCJB Quito 9475am 15155am 21455am
0000-0100 Netherlands 6020na 6165na 9855na 11655as
0000-0100 Sri Lanka Broadcasting Corp. 9655as 9720na 15425as
0000-0100 United Kingdom, BBC London 5965as 5975na 6055a 6175a
0000-0100 Russia, Radio Moscow 11710va 11780va 11850va 12050va
0000-0100 Yugoslav Radio 1870am
0000-0100 Yugoslav Radio Beograd 11670a
0000-0100 South Korea World News 7275as
0000-0100 USA, KTBN Salt Lake City 5985am 9755am
0000-0100 New Zealand, RNZI 15145eu 15145as 15155as 17830as
0000-0100 Philippines, FEBC Manila 15460as
0000-0100 Vietnam, VOV 5010do 5052do 11940do
0000-0100 Australia, WWCR 7455am 12160am
0000-0100 Canada, CFVP Calgary 6030do
0000-0100 Canada, CHFX Halifx 6120do
0000-0100 Canada, CKZU Vancouver 6160do
0000-0100 China, Radio Beijing 9770na 11775na
0000-0100 Cook Islands 11970do
0000-0100 Costa Rica, AWR 9725ca 98780ca
0000-0100 Costa Rica, RPP 7375na 13630na 15030na
0000-0100 Cuba, RHC Havana 11965am
0000-0100 Guam, KSDA Guam 15615as
0000-0100 India, All India Radio 9910as 11715as 11745as 15110as
0000-0100 Luxembourg, RTL 11760pa
0000-0100 Malaysia, RTM Radio 4 7295do
0000-0100 New Zealand, RNZI 17770pa
0000-0100 Philippines, FEBC Manila 15460as
0000-0100 Russia, Radio Moscow 11710va 11780va 11850va 12050va
0000-0100 USA, KTBN Salt Lake City 5985am 9755am
0000-0100 New Zealand, RNZI 15145eu 15145as 15155as 17830as
0000-0100 Philippines, FEBC Manila 15460as
0000-0100 Russia, Radio Moscow 11710va 11780va 11850va 12050va
0000-0100 USA, KTBN Salt Lake City 5985am 9755am
0100 UTC

[9:00 PM EDT/6:00 PM PDT]

**FREQUENCIES**

<table>
<thead>
<tr>
<th>Time</th>
<th>Country</th>
<th>Frequency (kHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100-0115</td>
<td>India, All India Radio</td>
<td>9910a, 11715a, 11745a, 15110a</td>
</tr>
<tr>
<td>0100-0120</td>
<td>Italy, RAI, Rome</td>
<td>9575am, 11800am</td>
</tr>
<tr>
<td>0100-0125</td>
<td>Netherlands</td>
<td>6020am, 6165am, 9880am, 11665am</td>
</tr>
<tr>
<td>0100-0127</td>
<td>Czechoslovakia</td>
<td>11685am, 13700am</td>
</tr>
<tr>
<td>0100-0130</td>
<td>Canada, RCI Montreal</td>
<td>5950na, 7345am, 9580na</td>
</tr>
<tr>
<td>0100-0130</td>
<td>LBC, National Radio of Lebanon</td>
<td>7116am</td>
</tr>
<tr>
<td>0100-0130 sm</td>
<td>Norway</td>
<td>9615am</td>
</tr>
<tr>
<td>0100-0135</td>
<td>Sweden</td>
<td>9685am, 11720am</td>
</tr>
<tr>
<td>0100-0135</td>
<td>Uzbekistan, R. Tashkent</td>
<td>5930na, 5995as, 7120as, 7265as</td>
</tr>
<tr>
<td>0100-0140</td>
<td>Germany, Deutsche Welle</td>
<td>6040am, 6085am, 6145am, 8565am, 9700am, 11810am, 11865am, 13510am</td>
</tr>
<tr>
<td>0100-0159 sm</td>
<td>Canada, RCI Montreal</td>
<td>8535am, 9755am, 11645am, 11940am</td>
</tr>
<tr>
<td>0100-0159</td>
<td>Australia</td>
<td>13720am</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Australia, ABC Brisbane</td>
<td>15240pa, 15305pa, 15365pa, 17695as</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Australia, ABC Perth</td>
<td>17715pa, 17750as, 17795pa, 17805as</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Australia, ABC Canberra</td>
<td>21740pa, 21775as</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Australia, ABC Adelaide</td>
<td>4800do, 9600do</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Canada, CFCF Montreal</td>
<td>6025do</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Canada, CFRX Toronto</td>
<td>6070do</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Canada, CFVP Calgary</td>
<td>6050do</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Canada, CHNL Halifax</td>
<td>6150sd</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Canada, CKX2 Vancouver</td>
<td>6160do</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Cook Islands</td>
<td>11760pa</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Costa Rica, AFPR</td>
<td>7375na, 13650am</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Cuba, RHC Havana</td>
<td>11950am</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Ecuador, HCJB Guayaquil</td>
<td>9745am, 15155am, 21655am</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Indonesia, Voice of America</td>
<td>7125as, 9675as, 11752as, 11765as, 15195as, 17610as</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Japan NSK</td>
<td>5960am, 11640am</td>
</tr>
<tr>
<td>0100-0200</td>
<td>Luxembourg, RTL</td>
<td>15350va</td>
</tr>
<tr>
<td>0100-0200 smtwh</td>
<td>Malaysia, RTM Radio 4</td>
<td>7295bo</td>
</tr>
<tr>
<td>0100-0200 smtwh</td>
<td>Namibia SBC Corp, Windhoek</td>
<td>3290af</td>
</tr>
</tbody>
</table>

**SELECTED PROGRAMS**

**Sundays**

0100 | Radio Norway Int'l: Norway Today. See S 0000
0101 | BBC: Play Of The Week. This month's offerings: "Ubu Roi" (4th); "Double Cross" (11th, 18th); "The Shape Of The Table" (25th), starts at 0300 UTC
0109 | Deutsche Welle: Commentary. Opinion on current issues.
0117 | Deutsche Welle: Feature. "Mailbag," "Nickelodeon" listener requests for German music, or "Technical Tips For DXers."
0134 | Deutsche Welle: German By Radio. An advanced German language course for English speakers.

**Mondays**

0100 | Radio Norway Int'l: Norway Today. See S 0000
0101 | BBC: Feature/Drama. This month, hear "Tennessee" (5th); "Samuel Witch Hunt: 1692" (12th); "All My Hope" (19th), "In Their Element" (26th).
0106 | Christian Science Monitor (SE Asia): Encore. Re-runs of the best programs from the week just past.
0109 | Deutsche Welle: Commentary. See S 0109
0116 | Deutsche Welle: Living In Germany. A weekly look at the social scene in Germany.
0134 | Christian Science Monitor (SE Asia): Letterbox. Staff members respond to listener letters.
0134 | Deutsche Welle: Larry's Random Selection. Larry Wayne takes a look at Germany from the lighter side.
0145 | BBC: Feature. The life story of violinist Giuseppe Tartini is the subject of "The Devil's Trill" (through November 2nd).

**Tuesdays**

0105 | BBC: Outlook. See M 1405.

**Wednesdays**

0105 | BBC: Outlook. See M 1405.
0130 | BBC: Talks. Michael Rosen reads listener selections on "Poems By Post" (through December 23rd).
0134 | Christian Science Monitor: Letterbox. See M 0134.
0145 | BBC: Country Style. David Allan profiles the country music scene on both sides of the pond.

**Thursdays**

0105 | BBC: Outlook. See M 1405.

**Fridays**

0105 | BBC: Outlook. See M 1405.

**Saturdays**

0105 | BBC: Outlook. See M 1405.
0134 | Christian Science Monitor: Letterbox. See M 0134.
0145 | BBC: South Asia: South Asia Survey. See T 0145.
0145 | BBC: Global Concerns. An update on environmental issues.

**Sundays**

0100 | BBC: Outlook. See M 1405.
0130 | BBC: Talks. Michael Rosen reads listener selections on "Poems By Post" (through December 23rd).
0134 | Christian Science Monitor: Letterbox. See M 0134.
0145 | BBC: South Asia: South Asia Survey. See T 0145.
0145 | BBC: Global Concerns. An update on environmental issues.

**Saturdays**

0105 | BBC: Outlook. See M 1405.

**MONITORING TIMES**

October 1992
<table>
<thead>
<tr>
<th>FREQUENCIES</th>
<th>0200-0225</th>
<th>Netherlands 9860as 11655as 13702as</th>
</tr>
</thead>
<tbody>
<tr>
<td>0200-0230</td>
<td>mwhha</td>
<td>Kenya, Voice of                4935do</td>
</tr>
<tr>
<td>0200-0230</td>
<td>sm</td>
<td>Norway                           11930do</td>
</tr>
<tr>
<td>0200-0230</td>
<td>cfrb</td>
<td>Philippines, FEBQ Manila 15450as</td>
</tr>
<tr>
<td>0200-0230</td>
<td>srlk</td>
<td>Sri Lanka B'castng Corp. 605as</td>
</tr>
<tr>
<td>0200-0230</td>
<td>sw</td>
<td>Switzerland Radio Int'l 6135as</td>
</tr>
<tr>
<td>0200-0230</td>
<td>ukba</td>
<td>United Kingdom, BBC London     9025as</td>
</tr>
<tr>
<td>0200-0230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0200-0230</td>
<td>usa</td>
<td>USA, VOA Washington             5060as</td>
</tr>
<tr>
<td>0200-0230</td>
<td>gbde</td>
<td>Germany, Deutsche Welle        7285as</td>
</tr>
<tr>
<td>0200-0259</td>
<td>twr</td>
<td>Canada, RCI Montreal           8535as</td>
</tr>
<tr>
<td>0200-0300</td>
<td>twh</td>
<td>Argentina, RAE Buenos Aires     11710am</td>
</tr>
<tr>
<td>0200-0300</td>
<td>au</td>
<td>Australia                       15204as</td>
</tr>
<tr>
<td>0200-0300</td>
<td>abc</td>
<td>Australia, ABC Brisbane         4920do</td>
</tr>
<tr>
<td>0200-0300</td>
<td>abp</td>
<td>Australia, ABC Perth            607do</td>
</tr>
<tr>
<td>0200-0300</td>
<td>canad</td>
<td>Canada, CFCX Montreal           605do</td>
</tr>
<tr>
<td>0200-0300</td>
<td>canad</td>
<td>Canada, CFRIX Toronto           607do</td>
</tr>
<tr>
<td>0200-0300</td>
<td>canad</td>
<td>Canada, CFVP Calgary           6030do</td>
</tr>
<tr>
<td>0200-0300</td>
<td>canad</td>
<td>Canada, CHX North              6130do</td>
</tr>
<tr>
<td>0200-0300</td>
<td>canad</td>
<td>Canada, CKU Vancouver          8160do</td>
</tr>
<tr>
<td>0200-0300</td>
<td>canad</td>
<td>Canada, RCI Montreal           6035eu</td>
</tr>
<tr>
<td>0200-0300</td>
<td>cook</td>
<td>Cook Islands                    11760pa</td>
</tr>
<tr>
<td>0200-0300</td>
<td>cost</td>
<td>Costa Rica, RPR                7375na</td>
</tr>
<tr>
<td>0200-0300</td>
<td>cuba</td>
<td>Cuba, RHC Havana               1195na</td>
</tr>
<tr>
<td>0200-0300</td>
<td>ecuad</td>
<td>Ecuador, HCBQ Quito            9745am</td>
</tr>
<tr>
<td>0200-0300</td>
<td>egypt</td>
<td>Egypt, Radio Cairo             5940do</td>
</tr>
<tr>
<td>0200-0300</td>
<td>guam</td>
<td>Guam, KSDA Guam                 13720as</td>
</tr>
<tr>
<td>0200-0300</td>
<td>hung</td>
<td>Hungary, Radio Budapest         611na</td>
</tr>
<tr>
<td>0200-0300</td>
<td>lux</td>
<td>Luxembourg, RTL                15350va</td>
</tr>
<tr>
<td>0200-0300</td>
<td>mithwa</td>
<td>Malaysia, RTM Radio 4          7295do</td>
</tr>
<tr>
<td>0200-0300</td>
<td>namibia</td>
<td>Namibia SC Corp, Windhoek     3290am</td>
</tr>
</tbody>
</table>

**SELECTED PROGRAMS**

**Sundays**
- **0205** Swiss Radio Int'l: Grapevine. See S 0025.
- **0209** Deutsche Welle: Commentary. See S 0129.
- **0213** Deutsche Welle: Sports Report. The latest news from the world of sports.
- **0215** Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0016.
- **0219** Deutsche Welle: Mabng Asia. Musical requests and answers to listener questions.
- **0230** BBC: Feature. This month's selections: "The invaders' Legacy" (11th, 18th); "The Evangelicals" (through November 8th).

**Mondays**
- **0205** Swiss Radio Int'l: Feature. See S 0065.
- **0205** Christian Science Monitor (Africa, Middle East): News Features And Interviews. See M 0035.
- **0223** Deutsche Welle: European Journal. A review of major events in Europe, with interviews and analyses.

**MONITORING TIMES**

October 1992
**0300 UTC [11:00 PM EDT/8:00 PM PDT]**

### FREQUENCIES

<table>
<thead>
<tr>
<th>Time</th>
<th>Frequency</th>
<th>Country/Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>0300-0315</td>
<td>7305na</td>
<td>Vatican Radio</td>
</tr>
<tr>
<td>0300-0330</td>
<td>98605a</td>
<td>Netherlands</td>
</tr>
<tr>
<td>0300-0330</td>
<td>9530na</td>
<td>Czechoslovakia</td>
</tr>
<tr>
<td>0300-0330</td>
<td>9475na</td>
<td>Egypt, Radio Cairo</td>
</tr>
<tr>
<td>0300-0330</td>
<td>5960am</td>
<td>Japan NHK</td>
</tr>
<tr>
<td>0300-0330</td>
<td>177625am</td>
<td>Philippines, Manila</td>
</tr>
<tr>
<td>0300-0330</td>
<td>3255df</td>
<td>United Kingdom, BBC London</td>
</tr>
<tr>
<td>0300-0330</td>
<td>117505sa</td>
<td>United Kingdom, BBC London</td>
</tr>
<tr>
<td>0300-0330</td>
<td>59865e</td>
<td>USA, VOA Washington</td>
</tr>
<tr>
<td>0300-0350</td>
<td>6056na</td>
<td>Germany, Deutsche Welle</td>
</tr>
<tr>
<td>0300-0350</td>
<td>11410na</td>
<td>Australia</td>
</tr>
<tr>
<td>0300-0400</td>
<td>15420pa</td>
<td>Australia, ABC Brisbane</td>
</tr>
<tr>
<td>0300-0400</td>
<td>8950af</td>
<td>Bulgaria, Radio Sofia</td>
</tr>
<tr>
<td>0300-0400</td>
<td>9600na</td>
<td>China, Radio Beijing</td>
</tr>
<tr>
<td>0300-0400</td>
<td>7305na</td>
<td>Costa Rica, RFR</td>
</tr>
<tr>
<td>0300-0400</td>
<td>9754am</td>
<td>Ecuador, CHCJ Guayaquil</td>
</tr>
<tr>
<td>0300-0400</td>
<td>9505ca</td>
<td>Cuba, RHC Havana</td>
</tr>
<tr>
<td>0300-0400</td>
<td>11950am</td>
<td>Colombia, RCN Radio Cultural</td>
</tr>
<tr>
<td>0300-0400</td>
<td>9550na</td>
<td>Germany, Deutsche Welle</td>
</tr>
<tr>
<td>0300-0400</td>
<td>7305na</td>
<td>Costa Rica, TICF</td>
</tr>
<tr>
<td>0300-0400</td>
<td>9505ca</td>
<td>Cuba, RHC Havana</td>
</tr>
<tr>
<td>0300-0400</td>
<td>8650am</td>
<td>United Kingdom, BBC London</td>
</tr>
<tr>
<td>0300-0400</td>
<td>97700na</td>
<td>Costa Rica, TICF</td>
</tr>
<tr>
<td>0300-0400</td>
<td>11950am</td>
<td>Colombia, RCN Radio Cultural</td>
</tr>
</tbody>
</table>

### SELECTED PROGRAMS

#### Sundays

- **0309** Deutsche Welle: Commentary. See S 0109.
- **0315** BBC: Sports Roundup. See S 0315.
- **0316** Deutsche Welle: Living in Germany. See M 0116.
- **0317** Deutsche Welle: Feature. See S 0117.
- **0330** BBC: From Our Own Correspondent. Reporters comment on the background to the news.
- **0344** Deutsche Welle: German By Radio. See S 0134.
- **0355** BBC (Africa): Postmark Africa. Answers to any question under the sun.
- **0350** BBC: Write On... Listener letters, opinions, and questions.

#### Mondays

- **0306** Christian Science Monitor (Africa, Middle East): Encore. See M 0105.
- **0309** Deutsche Welle: Commentary. See S 0109.
- **0315** BBC: Sports Roundup. See S 0315.
- **0316** Deutsche Welle: Living in Germany. See M 0116.
- **0317** Deutsche Welle: Feature. See S 0117.
- **0334** Deutsche Welle: Christian Science Monitor (Middle East). Letterbox. See M 0134.
- **0335** Deutsche Welle: Larry’s Random Selection. See M 0134.
- **0335** BBC (Africa): Network Africa. Hitton Fyle and the team present information, personalities, and music.

### Tuesdays

- **0306** Christian Science Monitor: Home Forum. See M 2305.
- **0309** Deutsche Welle: European Journal. See M 0299.
- **0315** BBC: Sports Roundup. See S 0315.
- **0330** BBC: John Peel. Newly released albums and singles from the contemporary music scene.
- **0334** Deutsche Welle: Christian Science Monitor. Letterbox. See M 0134.
- **0334** Deutsche Welle: Economic Notebook. A look at the economic scene in Germany and around the world.
- **0335** BBC (Africa): Network Africa. See M 0335.
- **0347** Christian Science Monitor: Religious Article. See M 0147.

### Wednesdays

- **0306** Christian Science Monitor: Curtain Call. See S 2306.
- **0309** Deutsche Welle: European Journal. See M 0299.
- **0315** BBC: Sports Roundup. See S 0315.
- **0330** BBC: Discovery. An in-depth look at scientific research.
- **0334** Deutsche Welle: Christian Science Monitor. Letterbox. See M 0134.
- **0334** Deutsche Welle: Insight. See T 0134.
- **0335** BBC (Africa): Network Africa. See M 0335.
- **0347** Christian Science Monitor: Religious Article. See M 0147.

### Thursdays

- **0306** Christian Science Monitor: Kaleidoscope. See W 2306.
- **0309** Deutsche Welle: European Journal. See M 0299.
- **0315** BBC: Sports Roundup. See S 0315.
- **0330** BBC: Assignment. A weekly examination of topical issues, from Batman to bands.
- **0334** Christian Science Monitor: Letterbox. See M 0134.

### Fridays

- **0306** Christian Science Monitor: Arts Forum or Sportsworld. See S 2306.
- **0309** Deutsche Welle: European Journal. See M 0299.
- **0315** BBC: Sports Roundup. See S 0315.
- **0330** BBC: Focus On Faith. Comment and discussion on major issues in various religions.
- **0334** Christian Science Monitor: Letterbox. See M 0334.
- **0334** Deutsche Welle: Science And Technology. See M 0234.
- **0335** BBC (Africa): Network Africa. See M 0335.
- **0347** Christian Science Monitor: Religious Article. See M 0147.

### Saturdays

- **0309** Deutsche Welle: European Journal. See M 0299.
- **0315** BBC: Sports Roundup. See S 0315.
- **0334** Deutsche Welle: Through German Eyes. See S 1513.
- **0334** BBC (Africa): Quiz Of The Week. The Saturday edition of "Focus On Africa", with a radio game show.

### Monitoring Times

October 1992 69
0400 UTC

FREQUENCIES

0400-0415 Israel, Koli Israel 11568Am
0400-0435 Netherlands 6160na 9592na 9540na
0400-0437 Czechoslovakia 593na 7545na 9540na
0400-0430 Bonaria, TWR Bonaria 9535Am 11930Am 0400-0500 Russia, Radio Moscow 11675Va 11850Va 11885Na 11980Va
0400-0450 Canada, CCI Montreal 9565Am 11905Am 15275Me 15445Me
0400-0430 Romania 5935Na 9540na
0400-0450 Cuba, CRI Havana 11950Am 13701Am
0400-0430 Ecuador, HCJB Guayaquil 9745Am 15155M 21455M
0400-0450 Guatemala, Radio Cultural 3300do
0400-0430 sm Norway 9560na 11655M
0400-0430 Romania, R. Romana Int'l 5992M 6155M 9510M 9750M
0400-0430 Sri Lanka, B'cast Corp. 9720M 5152M
0400-0430 Swiss Radio Int'l 6135M 9665M 12035M 13655M
0400-0430 Tanzania 5965M 9665M 11905M
0400-0430 United Kingdom, BBC London 3255M 3955M 5979M 6180M
0400-0430 United Kingdom, BBC London 6005M 6155M 11750M 11955M
0400-0430 Germany, Deutsche Welle 6125M 9665M 11970M 11765M
0400-0430 North Korea 15185M 25205M 17855M
0400-0500 Australia 15240M 15865M 17630M 17715M
0400-0500 Australia, ABC Brisbane 17750M 17955M 21525M 21740M
0400-0500 Australia, ABC Perth 8915M
0400-0500 Canada, CFCX Montreal 6025M
0400-0500 Canada, CFRX Toronto 6070M
0400-0500 Canada, CFVP Calgary 6070M
0400-0500 Canada, CKNX Halifax 6120M
0400-0500 Canada, CCKZ Vancouver 6160M
0400-0500 China, Radio Beijing 11680M 11684Na
0400-0500 Cook Islands 11765M
0400-0500 Costa Rica, RVPI 7375M 13630M 15050M

0400-0500 Kenya, Voice of 4935Do 4935M
0400-0500 Luxembourg, RTL 15350M
0400-0500 Mstwm Malaysia, RTM Radio 4 7295D
0400-0500 Minwth Namibia BC, Windhoek 70270M 3290M
0400-0500 New Zealand, RNZ 17770M
0400-0500 Russia, Radio Moscow 11675Va 11850M 11885Ma 11980Va
0400-0500 Sierra Leone, SLS 3516Do 9695M
0400-0500 Singapore, SBCI 5100M 50520M 11940M
0400-0500 South Africa, Radio RSA 960M 9695M
0400-0500 South Africa, Radio Orange 3215M
0400-0500 USA, CSMonitor Boston 9455M 9840M 9870M 13760M
0400-0500 USA, WHIRI Naplesville 7315M 9435M
0400-0500 USA, WCRU Lpton, Kentucky 7490M
0400-0500 USA, WMILBrith, Penna. 9465M
0400-0500 USA, WRNO New Orleans 7959M
0400-0500 USA, WMCR Nashville 9700M 7435M
0400-0500 USA, WYFR Okeechobee, FL 9565M 9505M
0400-0500 Italy, RAI, Rome 7275M 9575M
0400-0500 Cuba, RHC Havana 1179M 11965M
0400-0500 Nigeria 9326D 4770M
0400-0500 South Africa, Radio Oranje 3215M
0400-0500 Sri Lanka, B'cast Corp. 9720M 15425M

SELECTED PROGRAMS

Sundays
0405 Swiss Radio Int'l: Grapevine. See S.0000.
0405 Deutsche Welle: Commentary. See S.0109.
0415 BBC: Leading African women singers (through Nov. 8th).
0418 Swiss Radio Int'l: Shoutwave Merry-Go-Round. See S.018.
0430 BBC (Europe): Europe This WeekEnd. News and features.
0430 BBC: Short Story. This month's selection: "A Gift For The Emperor Dwarf" (11th), "Monkeys" (18th), "Laugh For Me" (25th) (except 4th: Seeing Stars, astronomy).
0434 Deutsche Welle (Africa): People And Places.
0445 BBC: Talks. Ghosts around the UK feature in "Encounters With The Unknown" (through November 1st).

Mondays
0405 Swiss Radio Int'l: Feature. See S.005.
0405 CSM: Asia, Africa, Asia: News Features. See M.0005.
0405 Deutsche Welle: European Journal. See M.0005.
0415 Deutsche Welle: Network Africa. See M.0355.
0415 BBC: Health Matters. See T.0145.
0430 BBC (Europe): Europe Today. See M.0430.
0430 BBC: Off The Shelf. See M.0430.
0445 BBC: Talks. See M.2315.

Tuesdays
0405 Swiss Radio Int'l: Dateline. See M.0605.
0405 Christian Science Monitor: News Features. See M.005.
0405 Deutsche Welle: European Journal. See M.0209.
0415 BBC: Health Matters. See T.0145.
0430 BBC (Europe): Europe Today. See M.0430.
0430 BBC: Off The Shelf. See M.0430.
0445 BBC: From Our Own Correspondent. See S.0330.

Wednesdays
0405 Swiss Radio Int'l: Dateline. See M.0605.
0405 Christian Science Monitor: News Features. See M.005.
0405 Deutsche Welle: European Journal. See M.0209.
0415 BBC: Waveguide. Tips on how to hear the BBC better.
0435 BBC (Europe): Europe Today. See M.0430.
0435 BBC: Off The Shelf. See M.0430.
0445 BBC: Country Style. See W.0145.

Thursdays
0405 Swiss Radio Int'l: Dateline. See M.0605.
0405 Christian Science Monitor: News Features. See M.005.
0409 Deutsche Welle: European Journal. See M.0209.
0415 BBC: Africa. See M.0355.
0415 BBC: Waveguide. Tips on how to hear the BBC better.
0445 BBC: From Our Own Correspondent. See S.0330.

Saturdays
0405 Swiss Radio Int'l: Dateline. See M.0605.
0405 Deutsche Welle: European Journal. See M.0209.
0415 BBC (Africa): Midweek. Discussion of events from the week.
0415 BBC: Good Books (except 24th: A Month In The Country).
0445 Deutsche Welle: Panorama. See A.0223.
0445 BBC: Borders. See T.0434.
0445 Deutsche Welle: Man And Environment. See T.0234.
0445 BBC: Worldbrief. See F.2315.
# English language shortwave guide

## 0500 UTC

### FREQUENCIES

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Station</th>
<th>Language</th>
<th>Country/Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>0500-0510</td>
<td>Lesotho, Maseru</td>
<td>4800</td>
<td></td>
</tr>
<tr>
<td>0500-0510</td>
<td>Malawi Broadcasting Corp.</td>
<td>2910</td>
<td></td>
</tr>
<tr>
<td>0500-0515</td>
<td>Sri Lanka B' Casting Svc</td>
<td>9720</td>
<td></td>
</tr>
<tr>
<td>0500-0520</td>
<td>Cameroon CRTV Beau</td>
<td>39720</td>
<td></td>
</tr>
<tr>
<td>0500-0530</td>
<td>Swaziland, TWR Swaziland</td>
<td>5965</td>
<td></td>
</tr>
<tr>
<td>0500-0530</td>
<td>United Kingdom, BBC London</td>
<td>25355</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Australia</td>
<td>17155</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Australia, ABC Brisbane</td>
<td>4920</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Australia, ABC Perth</td>
<td>9610</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Canada, CBC Montreal</td>
<td>6000</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Canada, CBC Toronto</td>
<td>6070</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Canada, CFCV Calgary</td>
<td>6300</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Canada, CHNL Halifax</td>
<td>6130</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Canada, CKZU Vancouver</td>
<td>6160</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>China, Radio Beijing</td>
<td>11840</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Cook Islands</td>
<td>11760</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Costa Rica, RFI</td>
<td>7375</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Ecuador, HBCB/Quito</td>
<td>11925</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Eq Guinea, R East Africa</td>
<td>8585</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Italy, IRIS Milan, Italy</td>
<td>7125</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Japan NHK</td>
<td>11760</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Kenya, Voice of</td>
<td>4935</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Luxembourg, RTL</td>
<td>15350</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Malaysia, RTM Radio 4</td>
<td>7295</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Namibia BC Corp, Windhoek</td>
<td>3290</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>New Zealand, RNZI</td>
<td>17770</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Nigeria</td>
<td>33260</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Russia, Radio Moscow</td>
<td>11865</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Sierra Leone, SLBS</td>
<td>33160</td>
<td></td>
</tr>
<tr>
<td>0500-0540</td>
<td>Singapore, SBCI</td>
<td>50520</td>
<td></td>
</tr>
</tbody>
</table>

### SELECTED PROGRAMS

**Sundays**

- 0509 Deutsche Welle: Commentary. See S 0109.
- 0517 Deutsche Welle: Feature. See S 0117.
- 0534 Deutsche Welle: German By Radio. See S 0134.

**Mondays**

- 0509 Deutsche Welle: Commentary. See S 0109.
- 0516 Deutsche Welle: Living in Germany. See M 0116.
- 0534 Deutsche Welle: Germany. See M 0134.
- 0534 Deutsche Welle: Larry's Random Selection. See M 0134.

**Tuesdays**

- 0509 Deutsche Welle: European Journal. See M 0209.

**Wednesdays**

- 0506 Christian Science Monitor: Curtain Call. See T 0206.
- 0509 Deutsche Welle: European Journal. See M 0209.

**Thursdays**

- 0509 Deutsche Welle: European Journal. See M 0209.

**Fridays**

- 0509 Deutsche Welle: European Journal. See M 0209.

**Saturdays**

- 0509 Deutsche Welle: European Journal. See M 0209.
- 0534 Deutsche Welle: Through German Eyes. See S 1513.

### MONITORING TIMES

October 1992

71
0600 UTC

[2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

0600-0610 s Malawi Broadcasting Corp. 3381do
0600-0625 Cameron CRTV Yaounde 4850ko
0600-0625 Kenya, Voice of 4935do
0600-0630 Laos, National Radio of 7116as
0600-0630 Latvia, Radio Riga 5935eu
0600-0630 Swiss Radio Intl 15430af 17565af 21770af
0600-0630 United Kingdom, BBC London 3955eu 6180eu 6190af 6195eu
0600-0700 South Korea, Seoul 7275om 11810na 15170na
0600-0630 Swiss Radio Intl 7305eu 9410eu 9620eu 11760om 11940om 15230om 15285om 15360om 15420om 15505om 15570om 15635om 15710om 15775om 15840om 15905om 15970om
0600-0650 South Korea, Seoul 15310as 15420af 15580au
0600-0700 South Korea, Seoul 17790as 17835as 17865af 21470af
0600-0700 United Kingdom, BBC London 5975na 7150pa 9645au 15280as
0600-0630 Vatican Radio 15360af 15575as 21715as
0600-0700 Luxembourg, RTL 5975na 6180eu 6190af 6195eu
0600-0700 Switzerland, SWR 5975na 7150pa 9645au 15280as
0600-0700 varies Italy, IRRS Milan, Italy 7125om 15070va 15310as 15400af
0600-0700 Canada, CKZU Vancouver 6160do 0615-0630 South Korea World News 7550eu
0600-0700 Canada, CHNX Halifax 6130om 0609-0615 Vatican Radio 6245eu 6365eu 11940au
0600-0700 Canada, CFNY Toronto 6070om 0609-0615 Vatican Radio 6365eu 6460om 11940au
0600-0700 Canada, CFVP Calgary 6030om 0609-0615 Vatican Radio 6365eu 6460om 11940au
0600-0700 Canada, CHNN Halifax 6130om 0609-0615 Vatican Radio 6365eu 6460om 11940au
0600-0700 Canada, CKZU Vancouver 6160do 0609-0615 Vatican Radio 6365eu 6460om 11940au
0600-0700 Canada, CFCF Montreal 6050om 0609-0615 Vatican Radio 6365eu 6460om 11940au
0600-0700 Canada, CFXF Toronto 6070om 0609-0615 Vatican Radio 6365eu 6460om 11940au
0600-0700 Canada, CFVP Calgary 6030om 0609-0615 Vatican Radio 6365eu 6460om 11940au
0600-0700 Germany, Deutsche Welle 11760om 13910om 14265om 14335om 14345om 14400om
0600-0700 Germany, Deutsche Welle 11760om 13910om 14265om 14335om 14345om 14400om
0600-0630 North Korea 15180as 15230as
0600-0700 Australia 11720pa 15240pa 15320pa 15360pa
0600-0700 Australia 1760om 17715pa 17750pa 17795pa
0600-0700 Canada, CKZU Vancouver 6160do 0609-0615 Vatican Radio 6365eu 6460om 11940au
0600-0700 Cook isands 11760pa
0600-0700 Costa Rica, RFP 7375na 13630am 15030om
0600-0700 Cuba, RHC Havana 11760om
0600-0700 Erezion, Israel 6050om 0609-0615 Vatican Radio 6365eu 6460om 11940au
0600-0700 Ecuador, HJCB Quito 11920as 21455am
0600-0700 Eritrea, Radio Eritrea 9565af
0600-0700 Ghana, Radio 1, Accra 4935do 15205af
0600-0700 Ghana, Radio 2, Accra 3366om
0600-0700 Ghana, Radio 2, Accra 3366om
0600-0700 India, IIRRS Milan, Italy 7125eu
0600-0700 Lebanon, King of Hope 6280om
0600-0700 Luxembourg, RTL 15350va
0600-0700 Malaysia, RTM Radio 4 7295om
0600-0700 Malaysia, Voice of 6175om 9750om 15285om
0600-0700 Malawi, V. of the Media 9750om
0600-0700 New Zealand, RNZI 17770pa
0600-0700 New Zealand, ZLX 3935om
0600-0700 Nigeria 3366om 49900om 7255af
0600-0700 Russia, AWR Russia 11855as
0600-0700 Russia, Radio Moscow 9855om 11730om 11765om 11880om
0600-0700 Russia, Radio Moscow 9855om 11730om 11765om 11880om

SELECTED PROGRAMS

Sundays
0609 Deutsche Welle: Commentary. See S 0109.
0615 BBC: Letter From America. Alastair Cooke on the USA.
0616 Deutsche Welle: International Talking Point. See S 0419.
0630 BBC: Jazz For The Asking. Listener requests.
0634 Deutsche Welle: People And Places. See S 0434.

Mondays
0630 Swiss Radio Intl: DateLine. Analysis on world events and a closer look at the Swiss national fabric.
0636 CSM: News Features And Interviews. See M 0006.
0639 Deutsche Welle: European Journal. See M 0029.
0640 BBC: Rock’n’Pop Music. Hear the rhythm of Latin American dance music in "Dance Roots." "West Coast Sound" looks at California’s vibrant rock music scene (through November 3rd).
0635 BBC (Africa): Network Africa. See M 0335.

Wednesdays
0605 Swiss Radio Intl: DateLine. See M 0605.
0605 CSM: News Features And Interviews. See M 0006.
0606 Deutsche Welle: European Journal. See M 0029.
0615 BBC: The World Today. See M 1645.
0630 BBC: Meridian. Events in the world of the arts.
0635 BBC (Africa): Network Africa. See M 0335.

Thursdays
0605 Swiss Radio Intl: DateLine. See M 0605.
0605 CSM: News Features And Interviews. See M 0006.
0606 Deutsche Welle: European Journal. See M 0029.
0615 BBC: The World Today. See M 1645.
0635 BBC (Africa): Network Africa. See M 0335.

Fridays
0605 Swiss Radio Intl: DateLine. See M 0605.
0606 CSM: News Features And Interviews. See M 0006.
0609 Deutsche Welle: European Journal. See M 0029.
0615 BBC: The World Today. See M 1645.
0630 BBC: Meridian. See W 0330.
0635 BBC (Africa): Network Africa. See M 0335.

Saturdays
0605 BBC (Africa): Quiz Of The Week. See A 0335.
0605 Swiss Radio Intl: "Swiss Shortwave Merry Go Round. See S 0218.
0623 Deutsche Welle: Panorama. See A 0223.
0634 Deutsche Welle: Man And Environment. See T 0343.
MONITORING TIMES

October 1992

73
## Shortwave Guide

**0900 UTC**

### [5:00 AM EDT/2:00 AM PDT]

<table>
<thead>
<tr>
<th>0900-0905 s</th>
<th>Croatian Radio, Zagreb</th>
<th>7240eu</th>
<th>9830eu</th>
<th>21480eu</th>
</tr>
</thead>
<tbody>
<tr>
<td>0900-0905</td>
<td>Ghana, Radio 1, Accra</td>
<td>4915do</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0900-0905</td>
<td>Ghana, Radio 2, Accra</td>
<td>3566do</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0900-0910</td>
<td>Malawi Broadcasting Corp</td>
<td>5935do</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0909-0912 l</td>
<td>Guam, KTWG Guam</td>
<td>15200as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0909-0915</td>
<td>Lebanon, Radio Voice of</td>
<td>6550me</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0909-0915 l</td>
<td>Monte Carlo, TWR</td>
<td>9480eu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0909-0925 m</td>
<td>Belgium, BRT Brussels</td>
<td>9036eu</td>
<td>13675eu</td>
<td></td>
</tr>
<tr>
<td>0909-0925</td>
<td>Netherlands</td>
<td>9630pa</td>
<td>11895pa</td>
<td></td>
</tr>
<tr>
<td>0909-0930</td>
<td>Costa Rica, RFI</td>
<td>7375na</td>
<td>1500na</td>
<td></td>
</tr>
<tr>
<td>0909-0930</td>
<td>Guam, KTWG Guam</td>
<td>15200as</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0909-0930 m</td>
<td>New Zealand, ZLXA</td>
<td>9535do</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0909-0930</td>
<td>Swiss Radio Int'l</td>
<td>9530as</td>
<td>13685as</td>
<td>17670as</td>
</tr>
<tr>
<td>0909-0930 l</td>
<td>United Kingdom, BBC London</td>
<td>1170as</td>
<td>5975as</td>
<td>6045eu</td>
</tr>
<tr>
<td>0909-0935</td>
<td>6190as</td>
<td>6195as</td>
<td>94100eu</td>
<td>96600eu</td>
</tr>
<tr>
<td></td>
<td>9750eu</td>
<td>11760ms</td>
<td>11860as</td>
<td>11940as</td>
</tr>
<tr>
<td></td>
<td>15070as</td>
<td>15400af</td>
<td>17460as</td>
<td>17620as</td>
</tr>
<tr>
<td>0909-0940</td>
<td>Afghanistan, Kabul</td>
<td>9635as</td>
<td>59150eu</td>
<td>61750eu</td>
</tr>
<tr>
<td>0909-0945</td>
<td>61750as</td>
<td>94100eu</td>
<td>96600eu</td>
<td>9740as</td>
</tr>
<tr>
<td>0909-0950</td>
<td>11750as</td>
<td>11760me</td>
<td>11940as</td>
<td>12095as</td>
</tr>
<tr>
<td>0910-0915</td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td>0910-0920</td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Korea World News</td>
<td>9570am</td>
<td>13670am</td>
<td></td>
</tr>
</tbody>
</table>
The Best Shortwave You Can Buy Comes From Drake

The Drake R8 Communications Receiver...simply the best shortwave clarity and fidelity you'll find, outperforming receivers costing much, much more. Famous Drake technology gives you wide frequency coverage of all world bands and excellent dynamic range...in an uncluttered package with an ergonomic front panel, featuring keypad entry of functions.

For the best access to world events as they happen, buy yourself a Drake R8 shortwave receiver. Ask your dealer for more information, or contact a Drake sales office today at 1-800-568-3795 (1-800-LOVE-SWL).

The Drake Company, P.O. Box 3006, Miamisburg, OH 45343, USA Tel: 513-866-2421
Drake Canada, 655 The Queensway #16, Peterborough, Ontario K9J 7M1, Canada Tel: 705-742-3122


ALL NEW
1993 Guide To Shortwave Programs

"1993 Guide to Shortwave Programs" by Kannon Shanmugam

First published last year, the "1992 Guide To Shortwave Programs" quickly became a best seller. Critics called it "exhaustive," "impressive," and "the ultimate guide."

Now the "1993 Guide" promises to follow in its footsteps. Full of information for everyone from the most casual listener to the most avid hobbyist, the "Guide" has been completely revised and expanded. It includes a comprehensive listing of 20,000 English-language programs from 100 stations worldwide. The listing is divided into summer and winter sections for easy reference.

This year's edition includes a separate section listing DX programs for shortwave listeners, as well as an article by top monitoring expert Jim Frimmel. And a companion section of most-used frequencies ensures that the listeners can easily and quickly find the programs that they want to hear.

Produced by one of the leading experts in the field, the book will be updated right up to press time, using a state-of-the-art computer database.

Order BOK-43 NOW for Only $15.95!* 
* Plus $4 UPS Shipping

CALL TODAY FOR OUT CURRENT CATALOG!
**SELECTED PROGRAMS**

**Sundays**
- 1109 Deutsche Welle: Arts On The Air. Reports and interviews on cultural events and developments. See S 0030.
- 1130 BBC: The Ken Bruce Show. See S 0030.
- 1130 Deutsche Welle: German By Radio. See S 0034.

**Mondays**
- 1105 Swiss Radio Intl: Date line. See M 0605.
- 1109 Deutsche Welle: Newsline Cologne. A current affairs program with worldwide reports and a German press review. See M 0230.
- 1134 Deutsche Welle: Hello Africa. Musical requests and greetings to friends. See M 0147.

**Tuesdays**
- 1105 Swiss Radio Intl: Date line. See M 0605.
- 1109 Deutsche Welle: Newsline Cologne. See M 1109.

**Wednesdays**
- 1105 Swiss Radio Intl: Date line. See M 0605.
- 1106 Christian Science Monitor: Curtain Call. See T 2306.
- 1109 Deutsche Welle: Newsline Cologne. See M 1109.
- 1130 BBC: Meridian. See W 0630.
- 1134 Deutsche Welle: Hello Africa. See M 1134.

**Thursdays**
- 1105 Swiss Radio Intl: Date line. See M 0605.
- 1109 Deutsche Welle: Newsline Cologne. See M 1109.
- 1134 Deutsche Welle: Letterbox. See M 0134.

**Fridays**
- 1105 Swiss Radio Intl: Date line. See M 0605.
- 1109 Deutsche Welle: Newsline Cologne. See M 1109.
- 1130 BBC: Meridian. See W 0630.
- 1134 Deutsche Welle: Hello Africa. See M 1134.

**Satudays**
- 1118 Swiss Radio Intl: Swiss Shortwave Merry-Go-Round. See S 0018.
- 1130 BBC: Meridian. See W 0630.
- 1134 Deutsche Welle: Mailbag Africa. Listeners’ questions, music requests, and the club corner.
**SELECTED PROGRAMS**

**Sundays**
1231 BBC: Play Of The Week. See S 0101.

**Mondays**
1209 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
1215 BBC: Quiz. Robert Robinson hosts the final of the general-knowledge game show "Brain Of Britain" (?h); the winner takes on previous Brains in "Brain Of Brains" (12h); "Screenplay" is a movie quiz (through December 7th).

**Tuesdays**
1229 BBC: Words Of Faith. See M 1209.
1245 BBC: Multitrack 1: Top 20. See M 2300.

**Wednesdays**
1229 BBC: Words Of Faith. See M 1209.
1245 BBC: News Ideas. See M 1615.
1245 BBC: Talks. See M 1635.

**Thursdays**
1229 BBC: Words Of Faith. See M 1209.
1245 BBC: Multitrack 2. See W 2300.

**Fridays**
1229 BBC: Words Of Faith. See M 1209.
1245 BBC: Feature. This month, hear "Collages For Peace" (2nd); "La Serenissima" (9th); "Salem Witch Hunt: 1692" (16th); "Tutankhamen's Legacy" (23rd); "My One And Only (30th).

**Saturdays**
1229 BBC: Words Of Faith. See M 1209.
1245 BBC: Multitrack 3. See F 2330.

**MONITORING TIMES**
October 1992 77
1300 UTC

FREQUENCIES

1300-1315 South Korea, Seoul 9750na
1300-1320 Brazil, Radio Brasil 15445am
1300-1325 Belgium, BRT Brussels 17650am 21810na
1300-1325 Kenya, Voice of 4955do
1300-1325 Netherlands 9655eu
1300-1330 Afghanistan, Kabul 9635as
1300-1330 Bonaire, TWR Bonaire 11615am 15345am
1300-1330 mwhf Cameroon GR 1 Douala 9615as 9641as
1300-1330 Egypt, Radio Cairo 1759as
1300-1330 as Finland, YLE 15400as 17860na
1300-1330 Israel, Kol Israel 11550am 11605na 15590na 15640as
1300-1330 mtwhf Cameroon CRTV Douala 4795do
1300-1325 Kenya, Voice 1300-1315
1330-1340 Ghana, Radio 1 Accra 4915do
1330-1340 Ghana, Radio 2 Accra 7295as
1330-1340 Luxembourg, RTL 15350va

[9:00 AM EDT/6:00 AM PDT]

1300-1400 Malaysia, RTM Radio 4 7295do
1300-1400 Nigeria 49900as 7285do
1300-1400 Nigeria, Voice of 7255as
1300-1400 Papua New Guinea 48900as
1300-1400 Philippines, FESC Manila 11955as
1300-1400 Romania, R Romania Int'l 11940eu 15385eu 17720eu 17850eu
1300-1400 Russia, AMR Russia 1185as
1300-1400 Russia, Radio Moscow 7530as 9655na 9795na 9840na
1300-1400 Tanzania 11870va 11985na 11995na 12050na
1300-1400 Uganda, Phonic Puma 12055as 15485na 17670na 17830na
1300-1400 Sierra Leone, ILBS 33160as 59800as
1300-1400 Singapore, SBCI 50100as 55520as 11940do
1300-1400 South Africa, Roand 9635do
1300-1400 Sri Lanka, Easing Corp 6075as 9720as
1300-1400 Tanzania 5985as 9684as 11765as
1300-1400 USA, CSMonitor Boston 9425as 9455as 13625as 13760as
1300-1400 USA, KMS Anchor Point 11560as
1300-1400 USA, KTBN Salt Lake City 7510am
1300-1400 USA, WHRL Noblesville 9495as 11790as
1300-1400 USA, WJAC Upton, Kentucky 749as
1300-1400 USA, WWCR Nashvill 12160as 15890as
1300-1400 USA, WYFR Okcchebel, FL 590as 6015as 11550as
1300-1400 Lebanon, Radio Voice of 6549.5
1300-1400 Jordan 9560as
1300-1400 Jordan 9560as
1300-1400 Kenya, Voice of 9690as
1300-1400 South Korea World News 7275as 11740as
1300-1400 Canada, RCI Montreal 9535as 11795as
1300-1400 Austria, ORF Vienna 11780as 15450as
1300-1400 Cameroon CRTV Douala 4795do
1300-1400 Finland, YLE 15400as 17880as
1300-1400 Indonesia, Radio Republik 3850as 6070as
1300-1400 Last, National Radio of 7115as
1300-1400 Netherlands 17590as 17650as 21650as
1300-1400 UAE Radio, Dubai 13675eu 15200eu 15450as 21650as
1300-1400 United Kingdom, BBC London 9750as 6045eu 6160as 9495as
1300-1400 United Kingdom, BBC London 9750as 6045eu 6160as 9495as
1300-1400 United Kingdom, BBC London 9750as 6045eu 6160as 9495as
1300-1400 United Kingdom, BBC London 9750as 6045eu 6160as 9495as
1300-1400 United Kingdom, BBC London 9750as 6045eu 6160as 9495as
1300-1400 United Kingdom, BBC London 9750as 6045eu 6160as 9495as
1300-1400 USA, WOAC Washington 6110as 9760as 15150as 15425as
1300-1400 Uzbekistan, R.Tashkent 5965as 8540as 15470as 17745as
1300-1400 Vietnam, Voice of 98400as 12020as 15010as
1300-1400 Vatican Radio 11604as 15090us 17525as 21515as

MONITORING TIMES

SELECTED PROGRAMS

Sundays

Mondays
1305 Swiss Radio Int'l: Dateline. See M 0050.
1334 Christian Science Monitor: Letterbox. See M 0134.

Tuesdays
1305 Swiss Radio Int'l: Dateline. See M 0050.
1334 Christian Science Monitor: Letterbox. See M 0134.

Wednesdays
1305 Swiss Radio Int'l: Dateline. See M 0605.
1334 Christian Science Monitor: Letterbox. See M 0134.

Thursdays
1305 Swiss Radio Int'l: Dateline. See M 0605.
1306 Christian Science Monitor: Kaleidoscope. See W 2306.
1334 Christian Science Monitor: Letterbox. See M 0134.

Fridays
1305 Swiss Radio Int'l: Dateline. See M 0605.
1334 Christian Science Monitor: Letterbox. See M 0134.

Saturdays
1316 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.
### FREQUENCIES

<table>
<thead>
<tr>
<th>Time</th>
<th>Country/Service</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400-1410</td>
<td>Malawi B'cast Corp.</td>
<td>3391do</td>
</tr>
<tr>
<td>1400-1415</td>
<td>Vatican Radio</td>
<td>15390au</td>
</tr>
<tr>
<td>1400-1425</td>
<td>Netherlands</td>
<td>17589va</td>
</tr>
<tr>
<td>1400-1430</td>
<td>Cameroon CRTC Douala</td>
<td>4795do</td>
</tr>
<tr>
<td>1400-1430</td>
<td>Ecuador, HCJB Quito</td>
<td>11925am</td>
</tr>
<tr>
<td>1400-1430</td>
<td>Malaysia, RTM Kuching</td>
<td>495do</td>
</tr>
<tr>
<td>1400-1500</td>
<td>United Kingdom, BBC London: 6190af</td>
<td>6195af</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Luxembourg, RTL</td>
<td>9410eu</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Lebanon, King of Hope</td>
<td>9750eu</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Japan NHK</td>
<td>11750am</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Jordan</td>
<td>9505am</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Kenya, Voice of</td>
<td>4950do</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Luxembourg, RTL</td>
<td>9505am</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Malaysia, RTM Radio</td>
<td>9505am</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Malta, Voice of the Medit.</td>
<td>11925eu</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Nigeria</td>
<td>49900do</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Philippines, FESC Manila</td>
<td>11985as</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Russia, Radio Moscow</td>
<td>7370va</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Sierra Leone, SLBS</td>
<td>3316do</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Singapore, SBC1</td>
<td>5010do</td>
</tr>
<tr>
<td>1400-1500</td>
<td>South Africa Radio Oranje</td>
<td>963000</td>
</tr>
<tr>
<td>1400-1500</td>
<td>South Korea, Seoul</td>
<td>9570as</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Sri Lanka B'cast Corp.</td>
<td>6075as</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Tanzania</td>
<td>5985af</td>
</tr>
<tr>
<td>1400-1500</td>
<td>USA, CSMonitor Boston</td>
<td>9530as</td>
</tr>
<tr>
<td>1400-1500</td>
<td>USA, CSMonitor Boston</td>
<td>13710na</td>
</tr>
<tr>
<td>1400-1500</td>
<td>USA, KTBN Salt Lake City</td>
<td>7510na</td>
</tr>
<tr>
<td>1400-1500</td>
<td>USA, WHR Noblesville</td>
<td>94850na</td>
</tr>
<tr>
<td>1400-1500</td>
<td>USA, WJCR Linton, Kentucky</td>
<td>194000</td>
</tr>
<tr>
<td>1400-1500</td>
<td>USA, WWCR Nashville</td>
<td>15690am</td>
</tr>
<tr>
<td>1400-1500</td>
<td>USA, WFY Okeechobee, FL6015am</td>
<td>1150am</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Finland, JLY</td>
<td>6120va</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Nepal, Kathmandu</td>
<td>323000</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Canada, RCI Montreal</td>
<td>11935eu</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Bhutan Broadcasting Svc</td>
<td>502300</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Albania, Radio Tirana</td>
<td>7155eu</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Cameroon CRTC Douala</td>
<td>4795do</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Ecuador, HCJB Quito</td>
<td>11925am</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Iraq</td>
<td>15240as</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Myanmar, Voice of, Burma</td>
<td>593000</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Netherlands</td>
<td>989000</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Romania, Radio România</td>
<td>11750as</td>
</tr>
<tr>
<td>1400-1500</td>
<td>United Kingdom, BBC London: 6190af</td>
<td>6195af</td>
</tr>
<tr>
<td>1400-1500</td>
<td>Mongolia, Ulaanbaatar</td>
<td>7260as</td>
</tr>
<tr>
<td>1445-1500</td>
<td>United Kingdom, BBC London: 6190af</td>
<td>6195af</td>
</tr>
</tbody>
</table>

### SELECTED PROGRAMS

#### Sundays
- **1401** BBC: Feature. This month, Philip Bacon and Sarah Dickinson double-team interviewees in "About Face."
- **1405** Christian Science Monitor: Herald Of Christian Science
- **1430** BBC: Off The Shelf. See M 030.
- **1445** BBC: Feature. See M 0145.

#### Mondays
- **1400** BBC (East Asia): Dateline East Asia. The political and economic affairs of the Pacific rim.
- **1405** BBC: Outlook. See M 1405.
- **1406** Christian Science Monitor: News Features And Interviews. See M 0006.
- **1430** BBC: Off The Shelf. See M 0430.
- **1445** BBC: Talk. See S 0445.

#### Tuesdays
- **1403** BBC (East Asia): Dateline East Asia. See M 1403.
- **1405** BBC: Outlook. See M 1405.
- **1406** Christian Science Monitor: News Features And Interviews. See M 0006.
- **1430** BBC: Off The Shelf. See M 0430.
- **1445** BBC: Recording Of The Week. See M 0615.

#### Fridays
- **1400** BBC (East Asia): Dateline East Asia. See M 1400.
- **1405** BBC: Outlook. See M 1405.
- **1406** Christian Science Monitor: News Features And Interviews. See M 0006.
- **1430** BBC: Off The Shelf. See M 0430.
- **1445** BBC: Global Concerns. See F 0145.

#### Saturdays
- **1401** BBC: John Peel. See T 0330.
- **1430** BBC: Sportsworld. The latest soccer, cricket, tennis, golf, and more.
<table>
<thead>
<tr>
<th>FREQUENCIES</th>
<th>TIMES</th>
<th>PROGRAMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500-1515 smwha</td>
<td>1500-1530</td>
<td>Mongolia, Ulaanbaatar</td>
</tr>
<tr>
<td>1500-1525</td>
<td>1500-1515</td>
<td>Netherlands</td>
</tr>
<tr>
<td>1500-1530 mwhL</td>
<td>1515</td>
<td>Portugal</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Romania, R Romania (Int)</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Sweden</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Swiss Radio Int'l</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Tanzania</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>United Kingdom, BBC London</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Malaysia, RTM Radio 4</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Malta, V. of the Medit.</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Myanmar, Voice of, Burma</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Nigeria</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Nigeria, Voice of</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Philippines, FEBC Manila</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Russia, Radio Moscow</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Tanzania</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>United Kingdom, BBC London</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Malaysia, RTM Radio 4</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Malta, V. of the Medit.</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Myanmar, Voice of, Burma</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Nigeria</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Nigeria, Voice of</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Philippines, FEBC Manila</td>
</tr>
<tr>
<td>1500-1530</td>
<td>1500-1515</td>
<td>Russia, Radio Moscow</td>
</tr>
</tbody>
</table>

**SELECTED PROGRAMS**

**Sundays**
- 1509 Deutsche Welle: Religion And Society. News and developments concerning the world's major religions.
- 1513 Deutsche Welle: Through German Eyes. German journalists provide a perspective on world events.
- 1515 BBC: Concert Hall. Classical music from the world's great concert halls.
- 1534 Deutsche Welle: Pop From Germany. A look at the German pop music scene.

**Mondays**
- 1509 Deutsche Welle: Newsline Cologne. See M 1109.
- 1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
- 1534 Deutsche Welle: Insight. An in-depth feature, giving the background to political events and international developments.

**Wednesdays**
- 1506 Christian Science Monitor: Curtain Call. See T 2306.
- 1509 Deutsche Welle: Newsline Cologne. See M 1109.
- 1515 BBC: Talks. See M 0145.
- 1530 BBC: Comedy/Drama. The BBC's crack comedy team presents half-hour production (except 28th: Two Cheers For October, a humorous look back at the month just past).
- 1534 Deutsche Welle: Living In Germany. See M 0116.

**Thursdays**
- 1509 Deutsche Welle: Newsline Cologne. See M 1109.
- 1515 BBC: Africa. See M 1515.

**Fridays**
- 1509 Deutsche Welle: Newsline Cologne. See M 1109.
- 1515 BBC: Music Review. See H 2315.

**Saturdays**
- 1509 Deutsche Welle: Africa-Highlight. A weekly feature on an important topic concerning Africa.
- 1513 Deutsche Welle: Development Forum. Reports and interviews on projects and progress in Africa and Asia.
- 1515 BBC: Sportsworld. See A 1430.
- 1534 Deutsche Welle: Science And Technology. See M 0234.
**FREQUENCIES**

<table>
<thead>
<tr>
<th>Time</th>
<th>Frequency</th>
<th>Country</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600-1605</td>
<td>5010 do</td>
<td>Singapore, SBC1</td>
<td></td>
</tr>
<tr>
<td>1600-1610</td>
<td>4800 do</td>
<td>Lesotho, Maseru</td>
<td></td>
</tr>
<tr>
<td>1600-1610</td>
<td>3981 do</td>
<td>Malawi, B'casting Corp.</td>
<td></td>
</tr>
<tr>
<td>1600-1625</td>
<td>99805as</td>
<td>Netherlands</td>
<td></td>
</tr>
<tr>
<td>1600-1630</td>
<td>21685as</td>
<td>Canada, RCI Montreal</td>
<td></td>
</tr>
<tr>
<td>1600-1630</td>
<td>11395eu</td>
<td>Norway</td>
<td></td>
</tr>
<tr>
<td>1600-1650</td>
<td>11750af</td>
<td>Guam, KTWR Guam</td>
<td></td>
</tr>
<tr>
<td>1600-1650</td>
<td>9630 do</td>
<td>Australia</td>
<td></td>
</tr>
<tr>
<td>1600-1650</td>
<td>6052 do</td>
<td>Canada, CFCX Montreal</td>
<td></td>
</tr>
<tr>
<td>1600-1650</td>
<td>3672 do</td>
<td>Canada, CFRR Toronto</td>
<td></td>
</tr>
<tr>
<td>1600-1650</td>
<td>2030 do</td>
<td>Canada, CFVP Calgary</td>
<td></td>
</tr>
<tr>
<td>1600-1650</td>
<td>6130 do</td>
<td>Canada, CHNX Halifax</td>
<td></td>
</tr>
<tr>
<td>1600-1650</td>
<td>6160 do</td>
<td>Canada, CKXZ Vancouver</td>
<td></td>
</tr>
<tr>
<td>1600-1650</td>
<td>4130 do</td>
<td>China, Radio Beijing</td>
<td></td>
</tr>
<tr>
<td>1600-1670</td>
<td>15100af</td>
<td>Cook Islands</td>
<td></td>
</tr>
<tr>
<td>1600-1670</td>
<td>15130af</td>
<td>Costa Rica, RFI</td>
<td></td>
</tr>
<tr>
<td>1600-1670</td>
<td>15110af</td>
<td>France, RFI Paris</td>
<td></td>
</tr>
<tr>
<td>1600-1670</td>
<td>17600af</td>
<td>Ghana, Radio 1, Accra</td>
<td></td>
</tr>
<tr>
<td>1600-1670</td>
<td>17695af</td>
<td>Ghana, Radio 2, Accra</td>
<td></td>
</tr>
</tbody>
</table>

**SELECTED PROGRAMS**

<table>
<thead>
<tr>
<th>Time</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600-1630</td>
<td>USA, VOA Washington</td>
</tr>
<tr>
<td>1600-1630</td>
<td>Vietnam, Voice of China</td>
</tr>
<tr>
<td>1600-1630</td>
<td>Yemen</td>
</tr>
<tr>
<td>1600-1635</td>
<td>Guam, KTWR Guam</td>
</tr>
<tr>
<td>1600-1640</td>
<td>South Africa, Radio Orange</td>
</tr>
<tr>
<td>1600-1640</td>
<td>Vatican Radio</td>
</tr>
<tr>
<td>1600-1645</td>
<td>UAE Radio, Dubai</td>
</tr>
<tr>
<td>1600-1650</td>
<td>Germany, Deutsche Welle</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Australia</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Canada, CFCX Montreal</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Canada, CFRR Toronto</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Canada, CFVP Calgary</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Canada, CHNX Halifax</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Canada, CKXZ Vancouver</td>
</tr>
<tr>
<td>1600-1700</td>
<td>China, Radio Beijing</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Cook Islands</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Costa Rica, RFI</td>
</tr>
<tr>
<td>1600-1700</td>
<td>France, RFI Paris</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Ghana, Radio 1, Accra</td>
</tr>
<tr>
<td>1600-1700</td>
<td>Ghana, Radio 2, Accra</td>
</tr>
</tbody>
</table>

**MONITORING TIMES**

October 1992

**81**
## Shortwave Guide

**1700 UTC**

<table>
<thead>
<tr>
<th>Time</th>
<th>Frequency</th>
<th>Country</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700-1705</td>
<td>72950</td>
<td>Ghana</td>
<td>Radio 2, Accra</td>
</tr>
<tr>
<td>1700-1710</td>
<td>40000</td>
<td>Cameroon</td>
<td>CRTV Batoussa</td>
</tr>
<tr>
<td>1700-1715</td>
<td>11875</td>
<td>Israel</td>
<td>Kol Israel</td>
</tr>
<tr>
<td>1700-1728</td>
<td>59800</td>
<td>Sierra Leone</td>
<td>SLBS</td>
</tr>
<tr>
<td>1700-1730</td>
<td>72350</td>
<td>Canada, RC</td>
<td>Montreal</td>
</tr>
<tr>
<td>1700-1730</td>
<td>21545</td>
<td>United Kingdom</td>
<td>BBC London 15560</td>
</tr>
<tr>
<td>1700-1730</td>
<td>98550</td>
<td>Norway</td>
<td></td>
</tr>
<tr>
<td>1700-1730</td>
<td>97200</td>
<td>Sri Lanka</td>
<td>BCasing Corp.</td>
</tr>
<tr>
<td>1700-1730</td>
<td>32000</td>
<td>Switzerland</td>
<td>TWR Switzerland</td>
</tr>
<tr>
<td>1700-1730</td>
<td>12000</td>
<td>Switzerland</td>
<td>Int'l</td>
</tr>
<tr>
<td>1700-1730</td>
<td>15200</td>
<td>Ghana</td>
<td>Voice</td>
</tr>
<tr>
<td>1700-1730</td>
<td>17850</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>17470</td>
<td>Costa Rica</td>
<td>Radio Intl</td>
</tr>
<tr>
<td>1700-1730</td>
<td>15800</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>59770</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>60500</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>60500</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>79770</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>97770</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>79770</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>80500</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>80500</td>
<td>Ghana</td>
<td>Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>11920</td>
<td>India</td>
<td>All India Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>11920</td>
<td>India</td>
<td>All India Radio</td>
</tr>
<tr>
<td>1700-1730</td>
<td>15560</td>
<td>Madagascar</td>
<td>RTV Madagascar</td>
</tr>
</tbody>
</table>

**1800 UTC**

<table>
<thead>
<tr>
<th>Time</th>
<th>Frequency</th>
<th>Country</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800-1810</td>
<td>33400</td>
<td>Malaysia</td>
<td>BCasing Corp.</td>
</tr>
<tr>
<td>1800-1825</td>
<td>97750</td>
<td>Belgium</td>
<td>BR Brussels</td>
</tr>
<tr>
<td>1800-1825</td>
<td>21515</td>
<td>Netherlands</td>
<td></td>
</tr>
<tr>
<td>1800-1830</td>
<td>15280</td>
<td>Canada, RC</td>
<td>Montreal</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17820</td>
<td>Canada, RC</td>
<td>Montreal</td>
</tr>
<tr>
<td>1800-1830</td>
<td>47050</td>
<td>Brazil</td>
<td>Radiobras</td>
</tr>
<tr>
<td>1800-1830</td>
<td>47050</td>
<td>Brazil</td>
<td>Radio Int'l</td>
</tr>
<tr>
<td>1800-1830</td>
<td>96070</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15010</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>90000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>12000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15300</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15300</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17510</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>72000</td>
<td>Ireland</td>
<td>RTE Irish</td>
</tr>
<tr>
<td>1800-1830</td>
<td>11920</td>
<td>Italy</td>
<td>IRIS Milan, Italy</td>
</tr>
<tr>
<td>1800-1830</td>
<td>11920</td>
<td>Italy</td>
<td>IRIS Milan, Italy</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17510</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>90000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17510</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>90000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17510</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>90000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17510</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>90000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17510</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>90000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17510</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>90000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17510</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>90000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>17510</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>21560</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>90000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>1800-1830</td>
<td>15000</td>
<td>USA</td>
<td>Voice of America</td>
</tr>
</tbody>
</table>
### English Language

#### Shortwave Guide

**1800 UTC cont'd**

<table>
<thead>
<tr>
<th>Time Zone</th>
<th>Country</th>
<th>City</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900-1900</td>
<td>USA</td>
<td>WHRI</td>
<td>13760au</td>
</tr>
<tr>
<td>1900-1900</td>
<td>USA</td>
<td>WINB</td>
<td>15295eu</td>
</tr>
<tr>
<td>1900-1900</td>
<td>USA</td>
<td>WJCR</td>
<td>15295eu</td>
</tr>
<tr>
<td>1900-1900</td>
<td>USA</td>
<td>WMZX</td>
<td>9465eu</td>
</tr>
<tr>
<td>1900-1900</td>
<td>USA</td>
<td>WCRN</td>
<td>15690au</td>
</tr>
<tr>
<td>1900-1900</td>
<td>USA</td>
<td>WYFR</td>
<td>21500va</td>
</tr>
<tr>
<td>1915-1830</td>
<td>Lebanon</td>
<td>Radio</td>
<td>6550me</td>
</tr>
<tr>
<td>1915-1830</td>
<td>Bangladesh</td>
<td></td>
<td>12003as</td>
</tr>
<tr>
<td>1930-1950</td>
<td>Afghanistan, Kabul</td>
<td></td>
<td>9636au</td>
</tr>
<tr>
<td>1930-1950</td>
<td>Austria, ORF Vienna</td>
<td></td>
<td>5945eu</td>
</tr>
<tr>
<td>1930-1950</td>
<td>Canada, RCI Montreal</td>
<td></td>
<td>13670me</td>
</tr>
<tr>
<td>1945-1960</td>
<td>Finland, YLE</td>
<td></td>
<td>6120au</td>
</tr>
<tr>
<td>1945-1960</td>
<td>Iran, Islamic Republic</td>
<td></td>
<td>95033au</td>
</tr>
<tr>
<td>1945-1960</td>
<td>Netherlands</td>
<td></td>
<td>6020au</td>
</tr>
<tr>
<td>1945-1960</td>
<td>Sri Lanka Broadcasting Corp.</td>
<td></td>
<td>9720au</td>
</tr>
<tr>
<td>1945-1960</td>
<td>United Kingdom, BBC London</td>
<td></td>
<td>30355af</td>
</tr>
<tr>
<td>1945-1960</td>
<td>Yugoslavia</td>
<td></td>
<td>610au</td>
</tr>
<tr>
<td>1950-1970</td>
<td>Greece, Voice of</td>
<td></td>
<td>15630au</td>
</tr>
<tr>
<td>1950-1970</td>
<td>Guinea, RTV Conacry</td>
<td></td>
<td>4920au</td>
</tr>
<tr>
<td>1950-1970</td>
<td>Mali, RTV Mali</td>
<td></td>
<td>47835na</td>
</tr>
<tr>
<td>1950-1970</td>
<td>Swaziland, TWR Swaziland</td>
<td></td>
<td>3200au</td>
</tr>
<tr>
<td>1950-1970</td>
<td>New Zealand, RNZI</td>
<td></td>
<td>15120pa</td>
</tr>
</tbody>
</table>

#### 1900 UTC

<table>
<thead>
<tr>
<th>Time Zone</th>
<th>Country</th>
<th>City</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900-1915</td>
<td>Tanzania</td>
<td></td>
<td>5985au</td>
</tr>
<tr>
<td>1900-1920</td>
<td>Brazil, Radiobras</td>
<td></td>
<td>15265eu</td>
</tr>
<tr>
<td>1900-1925</td>
<td>Netherlands</td>
<td></td>
<td>6020au</td>
</tr>
<tr>
<td>1900-1925</td>
<td>Canada, RCI Montreal</td>
<td></td>
<td>13670me</td>
</tr>
<tr>
<td>1900-1930</td>
<td>Canada, RCI Montreal</td>
<td></td>
<td>13670me</td>
</tr>
<tr>
<td>1900-1930</td>
<td>Iran, Islamic Republic</td>
<td></td>
<td>9720au</td>
</tr>
<tr>
<td>1900-1930</td>
<td>Israel, Kol Israel</td>
<td></td>
<td>15755au</td>
</tr>
<tr>
<td>1900-1930</td>
<td>Ivory Coast, Abidjan</td>
<td></td>
<td>110au</td>
</tr>
<tr>
<td>1900-1930</td>
<td>Japan, NHK</td>
<td></td>
<td>9640au</td>
</tr>
<tr>
<td>1900-1930</td>
<td>Lebanon, King of Hope</td>
<td></td>
<td>11530au</td>
</tr>
<tr>
<td>1900-1930</td>
<td>Norway</td>
<td></td>
<td>17650au</td>
</tr>
<tr>
<td>1900-1935</td>
<td>United Kingdom, BBC London</td>
<td></td>
<td>15305au</td>
</tr>
<tr>
<td>1900-1935</td>
<td>Vietnam, Voice of</td>
<td></td>
<td>8460au</td>
</tr>
<tr>
<td>1900-1945</td>
<td>Cameroon, CRTV Yaounde</td>
<td></td>
<td>4850au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Germany, Deutsche Welle</td>
<td></td>
<td>1185au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Argentina,RAE BuenosAires</td>
<td></td>
<td>15345au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Australia</td>
<td></td>
<td>599au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Canada, CFCC Montreal</td>
<td></td>
<td>6050du</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Canada, CFRX Toronto</td>
<td></td>
<td>6070du</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Canada, CFVP Calgary</td>
<td></td>
<td>6030du</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Canada, CHFX Hamilton</td>
<td></td>
<td>6030du</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Canada, CKZY Vancouver</td>
<td></td>
<td>6100du</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Canada, RCI for UN Forces</td>
<td></td>
<td>599au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>China, Radio Beijing</td>
<td></td>
<td>9440au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Cook Islands</td>
<td></td>
<td>116au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Costa Rica, RFI</td>
<td></td>
<td>13630am</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Ecuador, HCBQ Quito</td>
<td></td>
<td>15270au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Ethiopia, Radiodiffusion</td>
<td></td>
<td>7190au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Ghana, B Casting Corp.</td>
<td></td>
<td>6130au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Ghana, Radio 1, Accra</td>
<td></td>
<td>4910au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Ghana, Radio 2, Accra</td>
<td></td>
<td>7295au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>India, All India Radio</td>
<td></td>
<td>7410au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Kenya, Voice of</td>
<td></td>
<td>4935au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Kuwait, Radio Kuwait</td>
<td></td>
<td>15260au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Luxemburg, RTL</td>
<td></td>
<td>1530au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Morocco, Rabat</td>
<td></td>
<td>110au</td>
</tr>
</tbody>
</table>

#### 1900 UTC cont'd

<table>
<thead>
<tr>
<th>Time Zone</th>
<th>Country</th>
<th>City</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900-1950</td>
<td>New Zealand, RNZI</td>
<td></td>
<td>15120pa</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Nigeria</td>
<td></td>
<td>3260du</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Nigeria, Voice of</td>
<td></td>
<td>7535au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Romania, R Romania Int'l</td>
<td></td>
<td>7145au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Russia, Radio Moscow</td>
<td></td>
<td>15305au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>South Korea World News</td>
<td></td>
<td>15090au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Sweden, Sveriges Radio</td>
<td></td>
<td>15090au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Switzerland, SWR Switzerland</td>
<td></td>
<td>17825au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>USA, CS Monitor Boston</td>
<td></td>
<td>17555au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>USA, KTBN Salt Lake City</td>
<td></td>
<td>15900am</td>
</tr>
<tr>
<td>1900-1950</td>
<td>USA, KYVO Los Angeles</td>
<td></td>
<td>17755au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>USA, VOA Washington</td>
<td></td>
<td>9700au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Vietnam, Voice of</td>
<td></td>
<td>9700au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Venezuela, TVN Caracas</td>
<td></td>
<td>15255au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Vietnam, Voice of</td>
<td></td>
<td>15255au</td>
</tr>
<tr>
<td>1900-1950</td>
<td>Switzerland, TWR Switzerland</td>
<td></td>
<td>12090au</td>
</tr>
</tbody>
</table>

This QSL from Radio Nederland was submitted by John Carson of Norman, OK.
<table>
<thead>
<tr>
<th>Time</th>
<th>Country</th>
<th>Frequency 1</th>
<th>Frequency 2</th>
<th>Frequency 3</th>
<th>Frequency 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 UTC</td>
<td>Kenya, Voice of</td>
<td>49350</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000 UTC</td>
<td>Malawi Broadcasting Corp.</td>
<td>37810</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000 UTC</td>
<td>Mongolia, Ulaanbaatar</td>
<td>11055</td>
<td>12015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000 UTC</td>
<td>Greece, Voice of</td>
<td>94500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2025</td>
<td>Polish Radio Warsaw</td>
<td>60950</td>
<td>61350</td>
<td>71450</td>
<td>72700</td>
</tr>
<tr>
<td>2000-2020</td>
<td>Bulgaria, Radio Sofia</td>
<td>117600</td>
<td>177600</td>
<td>178250</td>
<td></td>
</tr>
<tr>
<td>2000-2020</td>
<td>Netherlands</td>
<td>176000</td>
<td>215000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2020</td>
<td>Nigeria, Voice of</td>
<td>72550</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030 mtwhf</td>
<td>Switzerland, Radio</td>
<td>98040</td>
<td>98540</td>
<td>120350</td>
<td>136350</td>
</tr>
<tr>
<td>2000-2030</td>
<td>United Kingdom, BBC London3255af</td>
<td>39550</td>
<td>59750</td>
<td>60050</td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Portugal</td>
<td>117400</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Vatican Radio</td>
<td>96450</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>North Korea</td>
<td>65750</td>
<td>93450</td>
<td>96400</td>
<td>99770</td>
</tr>
<tr>
<td>2000-2030</td>
<td>Australia</td>
<td>59500</td>
<td>60600</td>
<td>60600</td>
<td>72400</td>
</tr>
<tr>
<td>2000-2030</td>
<td>China, Radio Beijing</td>
<td>41350</td>
<td>94400</td>
<td>99200</td>
<td>115000</td>
</tr>
<tr>
<td>2000-2030</td>
<td>Cook Islands</td>
<td>117600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Costa Rica, RPF</td>
<td>136300</td>
<td>153000</td>
<td>214650</td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Cuba, Radio Havana</td>
<td>153500</td>
<td>177500</td>
<td>178100</td>
<td></td>
</tr>
<tr>
<td>2000-2030 sa</td>
<td>Eq Guinea, R. East Africa</td>
<td>71900</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Ghana, Radio 1, Accra</td>
<td>49150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Ghana, Radio 2, Accra</td>
<td>72950</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>India, All India Radio</td>
<td>119500</td>
<td>150800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Indonesia, Voice of</td>
<td>71250</td>
<td>96750</td>
<td>117500</td>
<td>117850</td>
</tr>
<tr>
<td>2000-2030</td>
<td>Kuwait, Radio Kuwait</td>
<td>136000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Lebanon, King of Hope</td>
<td>62800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Luxembourg, RTL</td>
<td>153500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030 smtwhf</td>
<td>New Zealand, RNZI</td>
<td>151200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Nigeria</td>
<td>30350</td>
<td>49200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Russia, Radio Moscow</td>
<td>117600</td>
<td>184000</td>
<td>120500</td>
<td>136650</td>
</tr>
<tr>
<td>2000-2030</td>
<td>Saudi Arabia BS Csc</td>
<td>97050</td>
<td>97200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Sierra Leone, SLBS</td>
<td>31160</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Switzerland, TWR Swaziland</td>
<td>32000</td>
<td>32400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>USA, CSMonitor Boston</td>
<td>94550</td>
<td>136200</td>
<td>156600</td>
<td>175100</td>
</tr>
<tr>
<td>2000-2030</td>
<td>USA, KBTN Salt Lake City</td>
<td>155900</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>USA, KVCH Los Angeles</td>
<td>177750</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>USA, VOA Washington</td>
<td>60650</td>
<td>70000</td>
<td>97600</td>
<td>117100</td>
</tr>
<tr>
<td>2000-2030</td>
<td>Ukraine, Kiev, R.Romania (Int'l)</td>
<td>596600</td>
<td>71450</td>
<td>96000</td>
<td>97500</td>
</tr>
<tr>
<td>2000-2030</td>
<td>USA, WJCR Upton, Kentucky</td>
<td>47900</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>USA, WMLK Bethel, Penna</td>
<td>94650</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>USA, WRNO New Orleans</td>
<td>154200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>USA, WJCR Nashville</td>
<td>158800</td>
<td>175300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>USA, WYFR Okeechobee, FL</td>
<td>73850</td>
<td>155600</td>
<td>155800</td>
<td>177500</td>
</tr>
<tr>
<td>2000-2030</td>
<td>Syria, Radio Damascus</td>
<td>120850</td>
<td>150900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030 sa</td>
<td>Kenya, Voice of</td>
<td>49350</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Benin, Voice of the Rev.</td>
<td>48700</td>
<td>50250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2045</td>
<td>Italy, RAI, Rome</td>
<td>72550</td>
<td>95750</td>
<td>118000</td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Latvia, Radio Programme</td>
<td>59530</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Egypt, Radio Cairo</td>
<td>153750</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030 mh</td>
<td>Estonia, Tallinn</td>
<td>59050</td>
<td>95060</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Georgia, Radio Tbilisi</td>
<td>117500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Korea, Seoul</td>
<td>64800</td>
<td>75500</td>
<td>155700</td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Sweden</td>
<td>60650</td>
<td>96550</td>
<td>177300</td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>United Kingdom, BBC London9255af</td>
<td>39550</td>
<td>95750</td>
<td>60050</td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>Uganda</td>
<td>62000</td>
<td>61300</td>
<td>61900</td>
<td>61990</td>
</tr>
<tr>
<td>2000-2030</td>
<td>United Kingdom, BBC</td>
<td>71800</td>
<td>73200</td>
<td>94100</td>
<td>120350</td>
</tr>
<tr>
<td>2000-2030 mh</td>
<td>Vietnam, Voice of</td>
<td>98450</td>
<td>120000</td>
<td>150100</td>
<td></td>
</tr>
<tr>
<td>2000-2030</td>
<td>South Korea World News</td>
<td>59750</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

October 1992
2100 UTC cont'd

2130-2200
Ecuador, HGUB Quito 15270eu 17790eu 21455eu 21450eu
2130-2200
Israel, Kol Israel 11560eu 11605eu 15100na 15590eu
2130-2200
Kazakhstan, R. Alma Ata 13840ka 17575eu
2130-2200
Lebanon, King of Hope 26350me
2130-2200
Lithuania, Radio Vilnius 9675eu 9710eu
2130-2200
New Zealand, RNZ 17770pa
2130-2200
United Kingdom, BBC Falklands 13660sa
2130-2200
United Kingdom, BBC London 32550af 39550eu 59750ca 60050af
2145-2200
Bulgaria, Radio Sofia 11660na 11720am 15330eu
2145-2200
Cameroon CRTV Yaounde 48500da

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2210
Cameron CRTV Bafoussam 40000da
2200-2210
Syria, Radio Damascus 12085na 15995na
2200-2215
Cameroun CRTV Yaounde 48500na
2200-2218
Congo, RTV Congolaise 47550ea 59850da
2200-2225
Italy, RAI, Rome 97100as 11800as 15300as
2200-2230
Albania, Radio Tirana 97090na 118705pa
2200-2230
Canada, RCI Montreal 59600na 97550na 117605na 11905na
2200-2230
China, Radio Beijing 97400ea
2200-2230
Czechoslovakia 59300eu 60550da 73450ea 96050ea
2200-2230
Indonesia, Radio Republik 33850sa 48050da
2200-2230
Swiss Radio Int 96100as 98850na 120350na 155700sa
2200-2230
USA, KGEI San Francisco 15280sa
2200-2230
USA, VOA Washington 95300eu 119050me 119400me 152850me
2200-2245
Egypt, Radio Cairo 99300ea
2200-2245
USA, WINB Red Lion, Penn 151850ea 151950sa
2200-2300
Australia 11720pa 11840pa 137255as 15240pa
2200-2300
Bulgaria, Radio Sofia 15300pa 15350sa 17780pa
2200-2300
Canada, CFAX Montreal 60500da

2200-2300
Canada, CFRTX Toronto 60700da
2200-2300
Canada, CFVP Calgary 60300da
2200-2300
Canada, CHXN Halifax 61900na
2200-2300
Canada, CKOZ Vancouver 61600na
2200-2300
Cook Islands 117600da
2200-2300
Costa Rica, RFI 136300na 150300ca 214650am
2200-2300
Cuba, RHC Havana 96200na 119300va
2200-2300
Eq. Guinea, R. East Africa 71900da
2200-2300
Ghana, Radio 1, Accra 49150da
2200-2300
Ghana, Radio 2, Accra 72900na
2200-2300
India, All India Radio 74100ea 99100ea 99500ea 116200ea
2200-2300
Luxembourg, RTL 153500sa
2200-2300
Malaysia, RTM Radio 4 72900da
2200-2300
New Zealand, RNZ 17770pa
2200-2300
Nigeria 39260da 99900da
2200-2300
Russia, Radio Moscow 117100na 120500na 153500na 154000na
2200-2300
Taiwan, V. of Free China, All China Radio 177500ea 217200ua
2200-2300
Turkey, Voice of 94450na
2200-2300
UAE Radio Abu Dhabi 136500sa 150300na 178500na
2200-2300
United Kingdom, BBC London 59750na 61950sa 72350sa 94100ea
2200-2300
USA, CS Monitor Boston 94650na 136750na 154500sa 156650ea
2200-2300
USA, KTBW Salt Lake City 155900am
2200-2300
USA, VOA Washington 71020sa 977000na 117600na 151650am
2200-2300
USA, WHRI Noblesville 137600na 178450am
2200-2300
USA, WJCR Upton, Kentucky 75000sa 13600sa 174900na
2200-2300
USA, WRNO New Orleans 154200na
2200-2300
USA, WWCR Nashville 121600na 156900na
2200-2300
USA, WYFR Okeechobee, FL 217500ua 215250am
2200-2300
Switzerland 476500da
2200-2300
Switzerland 476500da
2200-2300
Sweden 60600na
2200-2300
USA, VOA Washington 85300ea 119005me 119600me 176650me
2200-2300
Greece, Voice of 116450ua
2245-2300
Armenia, Yerevan 119200am 120500ma 176600am
2245-2300
USA, WHB Red Lion, Penn. 151450ea
2245-2300
Vatican Radio 96000au 118300au 150900au

W. Young of Newark, DE, sent us this photo of his shack. His equipment includes a Yaesu FRG-7700, Panasonic RF-2200 and RF-2900, Gilfer M-1 Multi-Tuner, Sanyo Tape Recorder and a plain copper wire antenna inside the room.
2300 UTC

FREQUENCIES

2300-2305
Ghana, Radio 1, Accra
2300-2305
Ghana, Radio 2, Accra
2300-2315
Bulgaria, Radio Sofia
2300-2320
Canada, RCI Montreal
2300-2330
Lithuania, Radio Vilnius
2300-2330 as
Norway
2300-2330
United Kingdom, BBC London

[7:00 PM EDT/4:00 PM PDT]

2300-0000
Sierra Leone, SLBS
2300-0000
Singapore, BHC
2300-0000
South Africa, Radio Orion
2300-0000
Thailand
2300-0000
UAE, Radio Abu Dhabi
2300-0000
USA, CS Monitor Boston
2300-0000
USA, KTBN Salt Lake City
2300-0000
USA, VOA Washington
2300-0000
USA, WHRI Noblesville
2300-0000
USA, WKCR Red Lion, Penn.
2300-0000
USA, WJCR Winton, Ohio
2300-0000
USA, WJCR New Orleans
2300-0000
USA, WWCR Nashville
2300-0000
USA, KVON Los Angeles
2315-0000
Iraq, Radio Iraq INTL
2315-0000 as
Canada, RCI Montreal
2315-0000
Canada, RCI Montreal
2315-0000
a
Colombia, R Nacional
2315-0000
Iran, Islamic Republic
2315-0000 m
Sri Lanka Broadcasting
2330-0000
United Kingdom, BBC London
2330-0000
Vietnam, Voice of
2330-0000
Belgium, BRT Brussels
2330-035
Greece, Voice of

SELECTED PROGRAMS

Sundays
2300
2305
BBC: World Business Review. The previous week's news and upcoming events.
2315
BBC: Classics With Kay. No, not Tracey Ullman, but Brian Kay with his choice of classical music.

Mondays
2305
2306
2315
2330
BBC: Multitrack 1: Top 20. Tim Smith presents the smash singles on the UK pop music charts.
2334
Christian Science Monitor: Letterbox. See M 0134.
2347

Tuesdays
2305
2306
Christian Science Monitor: Curtain Call: Music and profiles of musicians.
2315
BBC: Concert Hall: See S 1515.
2334
Christian Science Monitor: Letterbox. See M 0134.
2347

Wednesdays
2305
2306
Christian Science Monitor: Kaleidoscope: In-depth news features.
2315
BBC: From Our Own Correspondent. See S 0350.
2330
BBC: Multitrack 2: Graham Bonnerman presents new pop records. Interviews, news, and contests.

Hugh Croskill presents Caribbean Report for the BBC.

2334
Christian Science Monitor: Letterbox. See M 0134.
2347

Thursdays
2305
2306
Christian Science Monitor: Arts Forum or Sportsforum: News from the world of arts or sports.
2315
2334
Christian Science Monitor: Letterbox. See M 0134.
2347

Fridays
2305
2306
2315
BBC: Wordbird: A rundown of the week's news headlines and developments.
2330
BBC: Multitrack 3: News and releases from the British alternative music scene.
2334
Christian Science Monitor: Letterbox. See M 0134.
2347

Satudays
2300
2305
BBC: Words Of Faith. See M 1209.
2306
2310
BBC: Book Choice. See W 0425.
2315
BBC: A Jolly Good Show. See T 1515.
Enter A World Of Excitement with a Subscription to Popular Electronics

Get the latest electronic technology and information monthly!

Now you can subscribe to the magazine that plugs you into the exciting world of electronics. With every issue of Popular Electronics you’ll find a wide variety of electronics projects you can build and enjoy.

Popular Electronics brings you informative new product and literature listings, feature articles on test equipment and tools—all designed to keep you tuned in to the latest developments in electronics. So if you love to build fascinating electronics, just fill out the subscription form below to subscribe to Popular Electronics…It’s a power-house of fun for the electronics enthusiast.

EXCITING MONTHLY FEATURES LIKE:

- CONSTRUCTION—Building projects from crystal sets to electronic roulette
- FEATURES—Educational training on digital electronics, Ohm’s Law, Antennas, Communications, Antique Radio, Simplified Theory
- HANDS-ON-REPORTS—User test comments on new and unusual consumer products
- SPECIAL COLUMNS—Think Tank, Circuit Circus, Computer Bits, DX Listening, Antique Radio, Amateur, Scanner Scene

PLUS: ALL OUR GREAT DEPARTMENTS!

You’ll get 12 exciting and informative issues of Popular Electronics for only $18.95. That’s a savings of $16.45 off the regular single copy price. Subscribe to Popular Electronics today! Just fill out the subscription order form below.

FOR FASTER SERVICE CALL TODAY
1-800-435-0715
(7:30AM-8:30PM)
EASTERN STANDARD TIME

Popular Electronics SUBSCRIPTION ORDER FORM

P.O. Box 338, Mt. Morris IL 61054

YES! I want to subscribe to Popular Electronics for 1 Full year (12 Issues) for only $18.95. That’s a savings of $16.45 off the newstand price.

Payment Enclosed ☐ Bill me later

Please charge my: ☐ Visa ☐ Mastercard

Acct. # ____________________________

Signature ____________________________

Exp. Date ____________________________

Please Print Below:

NAME ____________________________

ADDRESS ____________________________

CITY ____________________________ STATE ZIP

Allow 6 to 8 weeks for delivery of first issue. U.S. Funds only. In Canada add $6.68 postage. Includes GST. All Other Foreign add $7.50 postage.
Propagating conditions: Eastern United States

How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.
Propagation Conditions: Western United States

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.
Trouble in the Air

Certainly some of the most exciting monitoring experiences to be found on a radio come from the air—airplanes. Communications run the gamut from the daily drama of the to-and-fro at major metropolitan airports around the country to the life-and-death drama of a big Boeing 747 in trouble at 35,000 feet.

Laura Quantricello, editor of National Scanning Report’s “Scanning the Skies” column and herself a licensed pilot, has put together a complete guide to monitoring aeronautical communications. Called Airwaves, the big 8-1/2 x 11 inch book covers virtually every aspect of aeronautical monitoring, from take-off to landing. Every frequency range is explored and explained, terminology is de-mystified and there are quick tips on where to listen for the hottest action.

Airwaves: The Complete Guide to Aeronautical Communications is available from DX Radio Supply, P.O. Box 360, Wagontown, PA 19376; 215-273-7823; $17.95 plus $2 book rate or $3.50 UPS.

Successful QSLing

One of shortwave’s enduring classics, Secrets of Successful QSLing, is now in an updated 2nd edition. Secrets, which made available for the first time the personal library of tips and tricks from America’s foremost expert on QSLing, Gerry Dexter, is now bigger and packed with even more information.

Besides his own treasure trove of hints, in this edition Dexter has turned to other prominent QSL hunters for their insights. The stories are great. (Last issue’s most talked-about story was how one DXer, visiting a small station in Latin America, asked why the station didn’t QSL. After using the bathroom, he found out: unanswered reception reports were being used as toilet paper.)

Also included is a special chapter on preserving QSLs from Jerry Berg. Berg shares a number of pages of rare QSLs from the collection he curates on behalf of hobbyists.

Secrets of Successful QSLing is $12.95 plus $2 shipping from Tiare Publications, P.O. Box 493-MT, Lake Geneva, Wisconsin 53147.

Official NRC AM Radio Logbook

This is the time of year when the AM broadcast band comes into its own, and for fascinating DX few bands can beat it. This year, as in past years, the pros will be turning to the latest edition of the NRC AM Radio Logbook. Now in its 13th year, it contains up-to-the-minute information that’s specifically designed for anyone prowling the 540 to 1600 kHz range. Stations are first arranged by frequency with call letters listed alphabetically. Additional information, such as address, phone number, format, slogans, power, schedule and more, is included with each listing.

Additional tools for the DX arsenal include an exhaustive cross reference by city, a cross reference by state and a cross reference by call letters — all potent information in helping to identify that elusive station or just for casual listening. There’s even a section on AM stations with stereo capabilities and, for
QSL card collectors, a list of verification signers.

Others have tried to imitate the NRC AM Radio Log but the original is still, by far, the best. It continues to be the reference of choice of those who ply the AM broadcast band. You can get your copy by writing to the National Radio Club at their new address: Box 164-MT, Mannsville, New York 13661. The price is $19.95 postpaid.

Directory of Radio Talkers

Talk Shows and Hosts on Radio is a 200-page directory covering more than 700 locally produced and network radio talk shows in major markets and small towns across the country. It's designed, say its publishers, for "a wide range of radio professionals and personalities, advertisers and publicists, talk show junkies and casual radio listeners."

No doubt the book is an ambitious project and it is interesting. Arranged by state, it gives the city, call letters, address, show titles, topics, and more. There are also profiles of show hosts, although they often sound like they came directly from publicity releases. While all of this may indeed prove helpful — especially the cross reference by show topic — there are major oversights.

Looking through the Philadelphia, Pennsylvania, listing, I saw only WHYY, the public radio outlet, listed. Missing was 24-hour-a-day talk show FM'er WWDB and WIP sports talk. Also missing were the myriad Sunday morning and late night talkers carried by other stations in the market. A number of talk shows are listed under Puerto Rico but no reference to language is mentioned. Today, it is simply not wise to assume, no matter what the market, that English is the language in use.

Whiteford Press has a good idea that has real potential. And it's to be commended for doing its own research and not succumbing to the temptation to simply re-copy information from Broadcasting Yearbook. Talk Shows and Hosts on Radio by Annie and Donald Brewer retails for $24.95 from 806 Oakwood Blvd, Dept. MT, Dearborn, Michigan 48124.

TV on Your Computer

Imagine this: You’re working late one Monday night, hacking at the next issue of Monitoring Times. Sure, it’s the greatest job in the world. But you’d rather be watching the Eagles and the Steelers on the tube.

A company called Personal Computing Tools has the answer. With a single card that plugs into your PC/XT/AT and the stroke of a key, you can turn that nasty computer into a full feature TV capable of receiving 199 stations including VHF, UHF, cable and even a VCR. Fine tune the computer/TV for optimal viewing by adjusting the volume, brightness, contrast, tint and color, all from the PC keyboard.

Desktop TV is available from Personal Computing Tools, 550 Division Street, Department MT, Campbell, California 95008 or by calling 800-767-6728. The price is $395.

Personal Code Explorer

You use it with your personal computer. They call it "Personal Code." Manufactured by the Microcraft Corporation, Personal Code is a combination hardware/software package that allows you to read Morse code, RTTY, ASCII, SITOR/AMTOR, HF Packet and multi-level greyscale Fax signals to your computer screen. Other highlights include a real time on-screen oscilloscope and more.

Personal Code requires an 8 MHz or faster IBM compatible PC/XT/AT class computer (but will run at 4.77 MHz for all modes except packet and Fax.)

The package plugs into one of the serial COM ports on the computer and has a cable with a 1/8 inch (35 mm) plug that connects to your receiver's external speaker or headphone jack.

There are few things as exciting as seeing a "live" satellite image of the earth come to life on your computer screen or reading the latest world news as it scrolls by. Microcraft's Personal Code makes the experience possible and affordable. You can order yours for $129 plus $4 shipping and handling from P.O. Box 513-MT, Thiensville, Wisconsin 53092 or call 414-241-8144.

America's fastest growing monitoring hobby magazine! To subscribe just send the information below with your payment to Monitoring Times, P.O. Box 98, Brasstown, N.C. 28902.

U.S. (mailed second class*):

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Year</td>
<td>$19.95</td>
<td></td>
</tr>
<tr>
<td>2 Years</td>
<td>$30.00</td>
<td></td>
</tr>
<tr>
<td>3 Years</td>
<td>$56.00</td>
<td></td>
</tr>
</tbody>
</table>

* If you prefer first class mail in an envelope, add $25.00 per year (i.e., one year = $44.50)

Payment received by the 10th of the month will receive next month's issue. Current or back issues, when available, can be purchased for $4.50 each (includes 1st class mailing in U.S.)

Canada, Mexico and Overseas: (mailed in an envelope second class*)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Year</td>
<td>$29.50</td>
<td></td>
</tr>
<tr>
<td>2 Years</td>
<td>$55.00</td>
<td></td>
</tr>
<tr>
<td>3 Years</td>
<td>$79.50</td>
<td></td>
</tr>
</tbody>
</table>

* If you prefer air mail, please write for rates.

All foreign subscriptions must be paid by Visa, Mastercard, International Bank or Postal Money Order in U.S. funds.

NAME

ADDRESS

CITY STATE ZIP

   |   |   |
|---|---|---|
|   |   |   |

MONITORING TIMES

October 1992
Smart Controller for VHF/UHF

Commtronics Engineering has designed a scanner-computer interface for the Tandy/Realistic PRO-2004, PRO-2005 and PRO-2006 programmable VHF/UHF scanners that allows you to control them by computer. A 640k IBM PC/XT/AT/386/486 or clone with 9600-baud COM (serial) port and MSDOS 3.3 and up is required.

Some of the features of the HB-232 include autoprogram, which can download to the scanner up to 400 memory channels at a time from a database; autologger, which records new frequencies discovered by the scanner; an antiradio device; pull-down menus and more.

HB-232 is a kit including PC board and essential parts, program disk and detailed instructions available for $169.95 plus $5 shipping and handling. Allow 2-4 weeks for delivery.

You can get more information or order one by writing to Commtronics Engineering, P.O. Box 262478-MT, San Diego, CA 92196-2478 or call 619-578-9247 from 1:30 pm to 5:30 pm Pacific time.

Radio Frequency Interference

As our electronic society grows, so does electrical interference. Computers, small appliances, lighting systems, legal and illegal transmitters, thermostats...the list of offending devices seems endless.

But take heart; there is a cure for virtually every interference ailment. Some of them have to be stopped at the source (always the best), while others can be thwarted at the point of reception.

Lavishly illustrated and professionally written and printed, Radio Frequency Interference is the most comprehensive book presently available on the subject and includes vehicle noise suppression as well as home and office. A separate chapter on radio direction finding presents easy and effective projects for RDFing all frequency ranges.

Shielding, filter design and construction, chokes, noise locating and even legal discussions are presented for the alleviation of most types of unwelcome signal interference.

There is even a free "perk" available from the ARRL. Send $1 postage to the League's Technical Department Secretary and request the "RFI Tips," an excellent collection of reprints and lab notes for curing interference of all kinds.

Radio Frequency Interference is published by the American Radio Relay League (225 Main St., Newington, CT 06111) and is $15 plus $3 shipping from the ARRL, Grove Enterprises and other ARRL dealers.

DC Power Outlet

A nice source of DC power can be a real asset in the radio room, especially a multi-outlet source. MFJ has announced the introduction of their "deluxe" DC power outlet. It's called "deluxe" because it has a voltmeter, switch, and fuse plus eight 12-volt terminals. A heavy duty master power switch controls operations and a 15 amp fuse provides the protection. The price of the MFJ-1116 Deluxe DC Power Outlet is $44.95.

Get yours by calling 601-323-5869 or by writing to P.O. Box 494-MT, Mississippi State, Mississippi 39762.

DC Power Outlet #2

Another 12-volt power supply comes from Daiwa and is called the PS-50T. This 5 amp low-capacity power supply has a cigarette lighter plug and comes without a meter. It's an excellent 12-volt source for handheld scanners, mobile units and hand held transceivers. The PS-50T is rated at 13.8 volts, weighs 6 pounds and measures a mere 6 x 3 x 8 inches. Call Electronic Distributors at 703-938-6911 for the name of a dealer near you. Be sure and tell 'Em MT sent you!

The CB Radio Hacker's Guide

There has been a significant resurgence in interest in CB radio and those who love it are a growing, dedicated — and enterprising — bunch. Like shortwave and scanner listeners who are forever tweaking, testing and experimenting in order to get the most out of their radios, so are CBers.

The CB equivalent to Bill Cheek's wildly popular scanner modification handbooks, the CB Radio Hacker's Guide is perfect for peaking, tweaking and modifying some 200 AM and SSB CB radios.

Kevin Ross, the book's author, is a skilled and innovative CB technician. As the book's forward says, "countless CB rigs have crossed his service bench, arriving as wimps and leaving as King of the Band."

Information is presented in a way that even "all thumbs" operators can follow. Unlock hidden functions the factory never activated. Add all sorts of features and capabilities. Tweak existing circuits so that they perform at their maximum potential.

You can get your copy from CRB Research for $18.95 plus $3.50 shipping at P.O. Box 56-MT, Compack, New York 11725.

SW-100 Update

The new Grove SW-100 general coverage communications receiver has drawn considerable attention. A tentative production date has been moved from late October to December due to a number of improvements.

The SW-100 will include 1000 channels of memory, banked memory channels, autosearch, provision for optional mechanical filters, enhanced styling and a number of other features — all at no extra charge.

Grove Enterprises suggests that interested customers place their orders early; a delivery backlog is expected due to pre-production sales.
The Universal M8000 Decoder

I knew it was just a matter of time before Universal/Infotech would replace the M7000 and this time, they got it right! At first glance its facade bears a close resemblance to the M7000. In fact, both units measure approximately 16-3/8" wide, 3-1/2" high and 10-3/4" deep. But on a closer inspection, you can see that the M8000 uses a custom made keyboard with appropriately marked keys. I still find myself fumbling for the keyboard reference card on my older M7000, because I have forgotten which button changes the IOC.

Another improvement is the M8000 video interface, which requires a standard VGA monitor. I used a Goldstar GT3028 super VGA interfaced with .28 dot pitch (Sam’s Warehouse for $299.95). I also used my Hewlett Packard Desk Jet printer with an HP 22707E Epson FX-80 printer emulation cartridge. The printer can produce the same quality Fax printouts using the M7000 or M8000.

Out With the Old and In With the New

After disconnecting the M7000, hookup was easy. Except for the tuning scope and the "IN 2" jack, the M8000 uses same 1/4" audio connector. The "IN 2" jack requires a 1/4" stereo plug and provides audio to the dual diversity HF input and the digital paging audio. I had to make up a new tuning scope cable using a 15 pin sub-D connector. I then slipped the unit into the pigeon hole that had housed the M7000.

Seeing is Believing

I turned on the monitor and the M8000 and I couldn’t believe my eyes! It displayed a status line in color using high resolution graphics and characters. The screen was quite pleasant to the eyes and even without my glasses I had no problem reading the white text on a black background.

A window above the status line at the bottom center of the screen displays a spectrum analyzer similar to the one that is used in the Hamcom software. To the right of the window are five colorful, horizontal bargraph displays used for setting the audio level.

Hurrah for Piccolo!

Being a pioneer (the first hobbyist in the US to build equipment and copy Piccolo), I had to check out the reception! You simply press the mode button until you see PICCOLO in the status line. The M8000 displays the spectrum analyzer with six markers. Tune the receiver until the six piccolo tones are aligned to the markers. If your receiver tunes in 10 Hz steps, you can fine tune the filters in 1 Hz increments until the pips are dead on the markers.

I found that the MK SP LEDs speed up the tuning process by rocking the receiver dial until they both flash. If the channel is sending “idle” tones #5 and #6 you should align the pips to the two inner markers. By pressing the N/R and the tune button, the Piccolo signal will come into sync and you should be able to copy readable text. Like the ARQ modes, Piccolo is usually idle on the order wire channel and you may have to wait a while before you can copy any text.

Other modes that are carried over from the M7000 include ARQ-E, ARQ-E3, ARQ-S, FEC-A, FEC-S, SWED-ARQ and of course RTTY, ASCII, Packet and Fax. The unit can even copy digital paging, but I would recommend not using the POCSAG or GOLAY modes because you may violate the ECPA.

Fax Outshines Them All

With the high resolution monitor and the multiple grey scales, the M8000’s Fax mode outshines any unit on the market. I copied a few satellite photos that were rebroadcast on HF. The video display was fantastic—the clearest HF Fax photo I have seen to date.

The Universal M8000 Decoder retails for $1399.95 and is available from Universal Radio as well as other MT advertisers.

CELLULAR TELEPHONE MODIFICATION HANDBOOK

How are hackers making cellular phone calls for free?

- Techniques for decoding & changing cellular phones’ NAMS
- Where to buy programming devices
- The “roaming technique” scam!
- Chip supplier’s phone numbers
- Instructions on how to change phone numbers on all models
- Cellular phone manufacturer’s ESN codes

Complete Manual only $79.95
M.O. or C.O.D. to SPY Supply
7 Colby Court Suite 215, Bedford, NH 03110 (617) 327-7272

Sold for educational purposes only

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

Moving?

Send us notification of your new address as soon as possible so you won’t miss a single issue—or have your second class mail forwarded.

Monotoring Times October 1992 93
Grove SDU-100 Spectrum Display Unit

While attention has been focused on the new Grove SW-100 general coverage communications receiver, Grove Enterprises has been quietly developing a powerful new tool for signal intercept and monitoring.

The SDU-100 in conjunction with a companion CRT monitor turns any receiver or transceiver with an IF output jack (Icom R7000, R7100, Grove SW-100 and several others) into a spectrum analyzer. And, like the previously announced SW-100, the new SDU-100 is 100% American designed and manufactured.

A video display presents a visual image of a portion of the radio spectrum up to 10 MHz wide, showing signals present in real time. The "spikes" inform the user of the relative signal strengths and approximate frequencies of these off-frequency transmissions so that the listener can decide whether they are of interest, then quickly tune them in.

Spectrum analyzers are of enormous use to professional monitors; rather than wait for the slow search of a scanner to uncover new signals, often missing transmissions during the process, a spectrum analyzer immediately shows signal presence; a quick turn of the receiver’s tuning dial sets the target.

Countersurveillance teams, private investigators and federal law enforcement officers regard the spectrum analyzer as the leading weapon in detecting eavesdropping transmitters ("bugs").

Until now, spectrum analyzers were bulky, heavy, expensive and limited in their receiving capability. The Grove SDU-100, however, turns any quality receiver or transceiver which has an IF output jack into a powerful signal detection tool.

Connecting it up

The SDU-100 can be connected to any TTL monochrome monitor like the optional matching VID-100 9" CRT monitor. The SDU-100 itself requires 12-14 volts DC power so that it can be operated in a mobile or field environment. An AC adaptor is provided with the unit, and the VID-100 is AC powered (12 volt DC monitors are available).

The SDU-100 is configured to operate with a variety of receiver intermediate frequencies (IFs), including 8.8, 10.7, 21.4, 45 and 70 MHz. This must be specified at the time of order. An inexpensive plug-in module can be ordered later to change the IF if desired.

An RCA phono plug on the rear panel is used to connect to the IF output port of the host receiver.

Features and Specs

Three pushbutton “softkeys” permit instant selection of display characteristics; the choices are shown on the video screen along with the spectrum display. Most users will elect the auto mode; functions are automatically chosen for every span.

The span (width of spectrum displayed) can be selected from among 100, 200, 500 kHz and 1, 2, 5 or 10 MHz with a linearity (accuracy) of better than 10%. Data are digitally stored and refreshed constantly.

A 0 span selection places the SDU-100 into a time-domain (oscilloscope) mode, allowing the tuned signal to show its intensity over time (up to 5 seconds). This is handy for watching a moving target or for making comparative adjustments on an antenna or transmitter.

Two resolution bandwidths (5 and 30 kHz) and four sweep rates (0.1, 0.5, 2 and 6 seconds) are selectable manually if desired.

The signals are displayed in true logarithmic fashion, with 3 dB accuracy and over an 80 dB dynamic range. The vertical scale is calibrated both in S units and dB.

Input sensitivity is adjustable from -130 to -50 dBm, more than adequate for any receiver or transceiver.

The display is quite stable; a centering control is unnecessary. Should the factory-adjusted center frequency not match the receiver, a simple adjustment will correct the display. There is even a softkey procedure for centering if the receiver IF drifts, but its setting is lost when the unit is shut off.

The SDU-100 measures a compact 7-1/2" W x 1-1/2" H x 9" D, providing a matching footprint for the companion video monitor.

The screen trace has a slight "dot matrix" appearance due to its digitization, rather than the continuous smooth line of an analog CRT, but this is a small price to pay for the full features of this low cost spectrum display unit.

Demand for the Grove spectrum display system, due for release within the next 90 days, is expected to be heavy, both from the consumer and government markets. Reserve orders are being taken now.

The SDU-100 spectrum display sells for $499.95; the VID-100 monitor is $149.95. They may be purchased together for $599.95 plus shipping from Grove Enterprises (PO Box 98, Brasstown, NC 28902) and authorized Grove dealers.
Improve Your Scanning Coverage!

GRE America is proud to introduce a new family of products to enhance your scanning pleasure! First, GRE has designed the new Super Converter 9001 for base model scanners. The 9001 converts 810 MHz - 950 MHz down to 410 MHz - 550 MHz. The 9001 is the perfect alternative to buying a new, expensive scanner covering the 800 MHz band. Next, GRE announces the new Super Amplifier 3001 for base model scanners. The 3001 will increase gain by as much as 20 dB, and is engineered to help scanners with low sensitivity pull in weak signals. Both products use BNC connectors, (1) 9 volt battery and have an off/pass switch for returning to normal operation.

Let GRE Manufacture Your Radio Products!

GRE America, Inc. is a leading OEM developer and manufacturer of radio telecommunications products such as:
- Cordless Telephones
- CB & Marine Radios
- Spread Spectrum "engines"
- Remote Monitoring Systems

If you need a high quality, cost competitive, reliable manufacturer, GRE will provide you with a free production quotation.

For more information, please call GRE at (800) 233-5973. GRE is a subsidiary of General Research of Electronics, Inc.

GRE America, Inc.
425 Harbor Blvd., Belmont, California 94002
(415) 591-1400 Outside California: (800) 233-5973

ATTN: MOBILE SCANNER USERS

Introducing...

the

Realistic® PRO-2026

Realistic® is a registered trademark of the Tandy Corporation

Everyone that has used a mobile radio knows how difficult some can be to program while driving. A touch of the button starts an instant search of hundreds of Police, fire, aircraft, marine or weather channels in your location.

Built for Realistic® by Uniden, the PRO-2026 looks like the Bearcat 760XLT, but is intended for mobile use only (includes mounting bracket and 12 VDC cable). The 2026 includes 100 memory channels in 5 banks. The audio is clearly heard from a 3" bottom-mounted speaker, even in the noisiest of mobile environments. With high sensitivity, sharp selectivity and a compact design, this new mobile radio races into vehicles with ease. The BNC connector attaches easily to mobile antennas like the Grove ANT-4.

The 2026 has frequency ranges from 29-54, 108-174, 406-512 and 806-956 MHz (less cellular telephone). The scan speed is a respectable 14 channels per second and search speed runs by at 19 channels per second. Search increments are 5 kHz in the 29-54 and 137-174 MHz bands and 12.5 kHz elsewhere.

The PRO-2026 is now available from Grove for only $189.95*! Call today and hit the open road with your new mobile powerhouse.

Order SCN16 Today for only $189.95!*  
* Plus $7.50 UPS shipping

CALL TODAY FOR OUR CURRENT CATALOG!
magne tests

• DAK’s New Feature-Filled Portable
• Sangean Promises Ribeye Portable at Hamburger Price

How does Drew Kaplan do it?

That’s what people have been asking ever since DAK—named for its leader, Drew Alan Kaplan—released its first $50 digital portable, the MS-101. That was soon replaced by an improved model, the MS-101S, and already that model is apparently in the process of being dumped for $39.90, while supplies last.

If you’re looking for something digital in the rock-bottom price range, grab it. For, as we found out, DAK’s new $69.90 DMR-3000 digital portable is a worse performer than the cheaper ‘101S.

Incredible List of Features

At first glance, it’s hard to believe the ‘3000 is anything but the answer to a thrifty shortwave listener’s dream. Features abound: digital frequency display in XX.XXX MHz format, keypad tuning, up/down frequency slewing, 36 presets (18 for shortwave), rudimentary scanning, an alarm, sleep-off delay, a timer, illuminated display, two clocks, FM stereo through earphones and, just to make sure you can take it abroad, a 9/10 kHz adjustment for AM channel spacing. This receiver even looks good.

Incredible? You bet! There’s never before been a receiver with features such as this at anywhere near that price. And if this is not enough, the ‘3000 is straightforward to operate, and one performance variable—selectivity—is better than we’ve come to expect from a cheap radio.

So, how does Drew Kaplan do it? By sacrificing performance, and it’s some sacrifice.

Where are the Stations?

For starters, the set does not tune the 9350-9495, 13600-13800 and 15000-15095 kHz portions of the spectrum, where there are numerous juicy broadcasters chattering away.

Okay, for seventy bucks you don’t expect brass knobs and buttons that glow in the dark. But when you tune 9 MHz (the 31 meter band) and to some extent 11 MHz (the 25 meter band) you realize immediately there is something terribly wrong: Hardly any stations come in. Signals that are loud and clear on most other portables just aren’t heard, or are whispers buried in a whirlpool of circuit hiss. At night, when most people listen, the 9 MHz band at most points in the 11-year sunspot cycle is arguably the most active and important shortwave band. With that band hardly functional, 13 MHz not covered at all, and 11 MHz—another choice band—sputtering along, what you find is that you have a radio that’s able to strut its stuff at night only on the 6 and 7 MHz bands.

Fortunately, by day things improve, as performance in the 15, 17 and 21 MHz bands is quite reasonable. If the set covered all the bands, as it should, and did so as well as it does within the 6, 7, 15, 17 and 21 MHz bands, it would be a bargain, indeed. In these fortunate bands, the only significant flaw is in image rejection, which lets through a fair number of “ghost” signals—RTTY and the like—to bother the station you’re trying to hear. And dynamic range that is marginal, indeed.

“Station Stalker”
Antenna Accessory

In principle, DAK already has an answer—its optional “Station Stalker” active antenna accessory, another el cheapo at $29.90. Alas, we found it does little to bring moribund bands to life, but it does add to the complexity of operation and brings the price of the unit up to $100.

That’s within nose-rubbing distance of Radio Shack’s $119.95 DX-370 or the Sangean ATS 800, which are decidedly better performers.

Where Does DAK Go from Here?

What the future is for this radio is hard to say. On one hand, DAK’s initial MS-101 had significant drawbacks which were alleviated in its next incarnation. Quite possibly engineers will be ordered back to their drawing boards to produce an improved DMR-3000 in due course.

The other side of the coin is that DAK recently went into Chapter 11 creditor-protection status. And it shows. When we ordered our DMR-3000, we were explicitly told it was in stock and would be shipped immediately. Instead, weeks later we received a postcard telling us the product was on backorder. We got the radio eventually, but taking customers’ money under false pretenses and holding it to obtain a “free loan” is an odious practice. We mentioned this in an earlier issue of MT, and heard from some readers that they, too, have had similar experiences.

Can a firm that’s so clearly on the financial ropes come up with the funds to produce another model?

DAK has to be commended for hammering away at the notion that shortwave radios must have lofty price tags to be acceptable. Truth is, most shortwave radios have been overpriced for some time, now, with manufacturer’s profit margins well in excess of those found in most other areas of consumer electronics.

Prices, indeed, should come down. But not like this.

Up and Coming

A number of new portable and tabletop models are promised for the months ahead, but arguably the most interesting is Sangean’s forthcoming ATS-606. Sized for travel, it’s billed as being similar to their better sets, such as the ATS-808, but smaller—at half the price. Common sense tells us that somewhere there has to be a catch, but perhaps this will actually be the first true “traveler’s Volksradio.”

We’ll let you know.

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

October 1992

MONITORING TIMES
had a radio that appeared to be at least 20 years old. I asked him, "Is this Vietnam era?" 'Earlier than that' was his reply."

Brian's question reminded him that it was probably time to change the battery of his portable transceiver, and Brian encloses the picture.

Gene Hughes of Police Call muses that the riots proved how badly the city needed the new communications system twice turned down by LA voters. "Not enough frequencies, equipment, or personnel. Proper radio procedures were ignored. Overworked RTO's lost their cool and let frazied nerves show. But in spite of what happened, voters will turn the bonds down again. The voters should have been taken during the rioting."

**WWV and WWVH**

Peter Stawicki's question in August regarding the announcers for WWV and WWVH has aroused so much interest, we decided to publish MT's tour of the station while the subject is hot! But here are a few details Wayne Heinen didn't cover:

From Kent Graybill, Spokane, WA: The principal audio tones broadcast are 600 and 440 cycles-per-second. This is pretty important to every musician in the world because 440 cps is the international standard for A above middle C, at least in our Western 12-note scale. "A" notes are all an even number of cycles-per-second, i.e. 220, 440, 880, etc. Actually, there was no international standard until 1939. My guess is that's when WWV started broadcasting it, though I don't know that for sure.

From Herbert Newberry Jr., Mansfield, GA: Jane Barbe, the voice used on WWVH for years, is also used by Bell Telephone to provide digit-by-digit response when calling Information for a telephone number. Don Elliott Heard, for years the voice on WWV, also provided the voice of our local telephone time and weather here in central Georgia.

Herbert adds, "I put your magazine through several readings a month and its open to the 'Shortwave Guide' whenever the DX-440 is fired up. Very accurate. I also remove the propagation chart and post it next to the radio so I can quickly check conditions. It has saved time and let me DX where the DXing is best."

Not only do propagation charts help, but so do the solar index broadcasts by WWV/H at 18 minutes past each hour. Dave Rosenthal, who contributes to Radio Netherland's "Media Network," called to recommend a new users guide he helped put together to interpret that information. Its full name is "The Radio Frequency Users Guide to the SESC Geophysical Alert Broadcast." Request publication #ERLRSEL 80; Space Environmental Services Center, R/E/SE2, 235 Broadway, Boulder, CO 80303.

Dave also said the new voices used by WWV and WWVH are Eric Smith and Gretchen Stahl. Eric Smith must have been the interim voice who is being replaced by John Doyle, as explained in the feature article.

**Shorts**

Here are a few comments from other reader correspondence:

- From Bob Thomas, Bridgeport, CT: A panel discussion, call-in program on HCB discussing integrity, purpose, money campaigns, and styles of Christian religious broadcasting, mentioned Bob Grove's back page editorial on religious broadcasters and subsequent reader comments. Bob was called "an honest magazine publisher."
- From Ken Gardiner, Yorkshire, England: I should like to suggest that it would be a great help to us foreigners if advertisers and reviewers of books were to include overseas postage in their copy—as Tiare Publications already does.
- From Dale Wagner, Margate City, NJ: Sorry, but it's just not good editorial policy ("unethical") to put paid ads right next to editorial material praising the product for sale. Two recent occurrences are Max Antenna and PRO-43 in August MT.
- From Eric Walton, Vancouver, BC, Canada: Persons sending a self-addressed-stamped envelope to another country for a reply should ensure they either use stamps for the country concerned, or international reply coupons, or US currency.

**September Corrections**

An odd error was made in a quote from BBC Deputy Director David Witherow. He said that "We don't want the world service to neglect the cultural and high entertainment programs..." not "tabloid service" as was printed.

We are indebted to Edouard Provencher of Biddeford, Maine, for pointing out another mistake. We apologize for apparently reversing the captions under HCJB personnel John Adams and Rich McVicar "in the otherwise great article on being a short wave broadcaster by Ken MacHarg."

Thanks to all of you who have taken the time to send in your comments, clippings, ideas and opinions. Next month we'll catch up on some more letters, including some comments on providing publicity to pirate radio. Until then, may all your monitoring times be good ones!

Rachel Baughn
Editor
Coming Full Circle

If you have been following this column since its introduction last September you will remember we started with the concept of a "total monitoring environment"—a computer program from which you can perform any and all actions required in our hobby. When you combine the wide range of monitoring possibilities with the range of our individual interests, this is a tall order indeed. Perhaps that's what makes monitoring an ever-changing source of pleasure. Because of the personal nature of the hobby, I chuckle when another "expert" writes the definitive book on how exactly to enjoy monitoring. Perhaps what they really mean is how they enjoy the hobby. It is almost like a person writing a book on the best sandwich filling in the world and how it must be eaten to be enjoyed!

With all its combinations of technical potential, program media and personal preferences, monitoring is truly a movable feast. So how can we define this total environment? Well, some elements are basic to all monitoring: Control of the radio functions, decoding of various signal modes and storage of monitoring details for future use.

In the first few columns, we reviewed commercially available software which addressed this need. Then we looked at other sources of software and programs which, although not directly fitting into the total environment approach, added support information useful in monitoring. Responding to your requests, in last month's column we looked at our basic needs from the computer hardware (and budget) point of view. This month we come full circle with a review of 801HF—Receiver Control and Scanning System, VERSION 1.0. The title of 801HF pretty well defines its intended functions.

801HF, from Terzon Systems Inc., has its roots in another Terzon product, 801SCAN. 801SCAN was designed for the ICOM R7000 and R9000 VHF/UHF receivers. I remember seeing the advertising for this program because it was one of the first commercially available software packages. Their latest product, 801HF, extends the user interaction and methods developed for scanner monitoring to shortwave listening, hence the HF for high frequency. How does a product originally made for VHF/UHF monitoring work on HF? Let's see.

801HF requires an ICOM R71 with a UX-14 accessories board, an IBM PC compatible with at least 512K of ram and a serial (RS232) port, DOS 2.0 or later and either Terzon's or ICOM's RS-232 converter/interface. The program can run on any and all monitors. Those are the basic requirements. However, to take advantage of all of 801HF's potential, a second serial port in your computer, a hard drive and a digital signal decoder, such as a PK-232, are recommended.

Starting the program could not be simpler. Typing the name brings up a full function screen from which all features of the program can be accessed. All the information to use the program is at your fingertips without having to fumble with paper manuals. For those of us who use a spreadsheet such as Lotus, the screen is very familiar with the major commands positioned across the top of the screen and chosen via the left and right arrow keys. Below this "menu area" is a status window where monitoring information is displayed and controlled.

Finally, the lower half of the screen is referred to by Terzon as screen form and function-key legend area and is unique in its form and operation. Although the major functions, such as Exit, can either be chosen by the arrow keys or their highlighted letter, the receiver operational commands, such as scan rate, are selected via the Function or F keys. With ten F keys (F1 to F10), each expanded by the Shift and Alt keys, the possibilities explode to thirty possible combinations! But the people at Terzon have done a very fine job by building in all these features and making them easy to get to without having to memorize a dictionary of keystroke commands.

All the possible commands, including associated help screens for each of the commands and functions, are listed in this lower portion of the screen. Arranged in graph form with the function key number in the left hand column and the Shift, Alt and Normal across the top row, the way to access a feature is always right in front of your eyes. Find the feature you want to use, and then hold down the appropriate key (Shift, Alt or none). That column becomes highlighted on the screen. Then press the F key at the extreme left row of the desired feature, and you will be in that function or feature.

It's as easy as reading a bus or train schedule, but without the page flipping. At any time, with one exception, you can get back to this main screen by pressing the escape key, so you can experiment with all the keys without the fear that you will somehow be transported into uncharted and unrecoverable program territory. If you've been there with other programs (and probably met me there) don't worry when using 801HF; I couldn't make that happen, thank heavens and Terzon. The one screen that does not use the escape key to exit it—TermUnit—clearly states at the bottom of the screen what keys are used to return to the main screen.

Let's dig into some of these main commands to see how they are used. Many are self descriptive and require little explanation. EXIT exits the program and returns you to DOS. TermUnit displays the decoded output of your terminal unit, such as a PK-232. PARAMS is the command used to set ranges of receiver parameters, such as the range of frequency choices for scanning or searching and the range of scan delay times.

Notice I've said "ranges." A very convenient feature of 801HF is that the operator can choose parameters, such as his receiver's scanning frequency step, with one keystroke, "on-the-fly" from the main operating screen. No stopping your DX chasing and no paper playing keyboard actions are required, leaving you to concentrate on monitoring, NOT computer jockeying. This ease of changing receiver parameters is one of the most attractive features I found in 801HF and lacking in most similar programs. PARAMS is also used to set the program's time clock to the local time zone, and to set all interface parameters for the computer and the receiver.

If you are not sure of what is meant when asked to enter data by the program, pressing the F1 key usually brings up a short, but descriptive, help screen explaining what is required. This HELP features works very well and will allow you to be using 801HF quickly.
TEXT is used to convert word processor text files containing station data into frequency lists that 801HF reads, understands and uses to control your radio. The opposite is also possible; you may convert 801HF data that you have collected into readable word processor reports. I have tried these text-to-frequency conversions with other monitoring programs and found the process is rarely straightforward, requiring experimentation and time. 801HF is no exception, but the HELP function makes the task a bit easier than other programs.

The FIND command is used to sort through your “channels” and find matches to your request. For example, you can request it to find a given frequency, or a word in your channel description.

NotePad, another main command, invokes a text database organized by frequency and allows you to input 25 lines of text for each frequency with up to 500 frequencies per database. Very nice! This is one of the few programs which takes our handcuffs off by allowing more than just a few, cryptic characters (which later cannot be deciphered) to serve as a description of what we have monitored. 801HF allows the operator to generate a more useful and detailed station log. If the NotePad is placed in the auto mode, the NotePad details of any frequency on which searching/scanning steps will be displayed.

That leaves four main commands that we have not yet covered. These four are at the heart of the operation of 801HF. Are they simply and logically laid out? How are they used? What is our overall opinion of 801HF? And will Indiana Jones escape certain death? But as a famous newscaster says, what is the rest of the story? Stay tuned next month for the “rest of the story” on 801HF and an updated review of one of the pace setting standards in monitoring software. Which one? Read the first Computers and Radios column and you’ll know the answer before next month.

Feedback

Before we close this month I would like to thank you for the many letters I’ve received suggesting topics and expressing your satisfaction with the column. I did, however, receive a letter from a reader who was very critical of my comments in June concerning shareware and public domain, and of the column’s non-technical approach.

In reply, let me restate the current purpose of this column, which is to bring to our monitoring hobby a new dimension of computerization —what it can do, how it can help make monitoring more enjoyable, what software is available and how to use it. It is quite a trick to explain/teach any of the above while making the experience an enjoyable one.

In an emerging field like Computers and Radios, we all come with varying degrees of experience. One may be an expert DXer, but a novice on the computer. Another may be a beginner at both. I have an undergraduate degree in applied physics with a number of courses in computer programming and a doctorate in solid state physics (and did some formal teaching while earning it), plus twenty years of international industrial experience in computer-aided design of integrated circuits. Someone with a background like mine might not need a column like this one, but the novice can find computers, software and “computerese” to be enormously frustrating.

With this in mind, the editor and I decided to discuss things at a basic level; the more advanced could skim over what they didn’t require. I also decided I had a duty to my readers not only give them a generalized introduction to new topics or software, but also advise them of the areas that may give them trouble, since this is where most potential computer-aided hobbyists fall by the wayside and give up.

My general comments concerning shareware and public domain still stand, based on my experience with software on both sides of the commercial fence. There will always be diamonds in the rough; they should be sought out and enjoyed. But when it comes to programs currently available to the radio monitor, such diamonds are the exceptions, not the rule. Again, if chosen wisely they can be good value, but the beginner may find it a discouraging experiment.

On a more positive note, I would like to congratulate Stanley Mayo of Maine for winning the Message Catcher contest begun in May. The answers to the questions were: 1. My wife 2. Radio Control-Digital Decode-Database for control parameters and station details and 3. Baud Rate. Stanley, you will be enjoying the fruits of unattended listening with the Message Catcher from Radio Accessories very soon. Thanks to all the other entries. We will be starting another contest soon, so keep your stamps at the ready, and keep your letters and suggestions coming.

Technology, like life, is not a destination, but a journey. So here’s ‘til next time, when we’ll continue our journey.
Build a Simple Whistle Filter

If you’re an SWL DXer in the standard AM broadcast band, you have found it necessary to cope with 10-kHz whistles from strong adjacent stations. These heterodyne beat notes can be pretty ferocious when two strong AM stations are nearby and adjacent in frequency. A well designed AM receiver has sufficient selectivity to minimize the “whistle” problem, but receivers that are designed for true hi-fi reception on AM (acknowledging the bandwidth limitations imposed on AM broadcasters by the FCC) do not always have 10-kHz filters built in.

You can add your own notch filter in the audio section of your home-made or store-bought AM receiver. This article explains how to construct a simple op amp-notch filter that you can assemble on perf board or a home-made PC board in a couple of hours.

The Nature of the Circuit

Figure 1 contains the circuit diagram for a one-stage notch filter. This is called an RC (resistance-capacitance) active filter. The term “active” means simply that an operating voltage is required to make the circuit work. A passive filter, on the other hand, uses coils and capacitors and does not require an operating voltage. The active filter can have unity gain (1) or can be designed to yield a gain of 2 or 3 if desired. I prefer unity gain when my filters are to be used in a properly designed receiver circuit.

It is important that R1 and R2 in Figure 1 be closely matched in value for top performance. Likewise for C2 and C3. The resistors can be matched by means of your ohmmeter. If you don’t have an accurate instrument for measuring capacitance you may use silver mica or polystyrene capacitors for C2 and C3. These capacitors are usually very close to the marked values. Also, the Q (quality factor) of silver micas and polystyrene capacitors is high, and this is desirable in any type of filter. R3 enables you to shift the notch frequency to get it “on the nose.”

You will observe from the response curve shown in Figure 1 that a notch filter operates in the opposite manner from a peak or bandpass filter. Specifically, the notch filter rejects or blocks out a single frequency, whereas a bandpass filter peaks or enhances the response of a selected audio frequency. Hence, if the Figure 1 circuit is adjusted for 10 kHz it will practically eliminate that frequency while passing those frequencies above and below 10 kHz.

A low-cost 740 operational amplifier (op amp) is specified for U1. You may use any low-noise op amp that has the same pin arrangement. BI-FET op amps (those with FETs at the input, such as TLO-80s) are quieter devices and may produce less hiss noise in the audio channel of a receiver.

Figure 1: Schematic diagram for an RC active audio notch filter for removing heterodynes from the receiver output. R1, R2, C2 and C3 should be matched within 5% for best performance. R3 is used to vary the notch frequency. It is a linear-taper, panel-mounted carbon composition control. Polarized capacitors are electrolytic or tantalum, 16 or 25 volts.

Other Notch Filter Applications

The formula given in Figure 1 enables you to design the notch filter for any audio frequency you choose. For example, you may have a hi-fi system that has 60- or 120-Hz ac hum in the output. The filter can be tailored for those annoying hum frequencies and located in the early stages of your audio amplifier to eliminate hum. This is frequently done by designers of quality hi-fi equipment.

If you are a radio amateur who operates SSB or CW, a notch filter is almost mandatory for minimizing heterodines from nearby amateur stations. The filter will not remove SSB splatter or sideband energy, but if someone is operating AM near your frequency you can notch out his carrier. Likewise when someone tunes up (produces a steady carrier) near your frequency the filter is helpful for CW operators who have QRM problems from other CW stations that are close in frequency.

Better performance will result if you build two or three of the Figure 1 circuits and tie them together in cascade. This narrows the notch response curve and prevents the filter from removing desired audio frequencies near to the notch frequency. As shown, our circuit is capable of providing a notch depth of approximately 40 dB.

Construction Notes

Although we are working this month at audio frequency, it is important to keep all leads in the circuit as short and direct as practicable. Long leads tend to pick up unwanted ac hum. They may also cause the IC to self-oscillate at audio or radio frequencies.

An ideal foundation for this circuit would be double-sided PC board, with one side acting as a ground plane. The ground plane side would be connected to the ground foils on the etched side of the board. A single-sided PC board is okay if you keep the conductors short. You may also use perf board if the wiring is short and tidy.

I suggest that you build your notch filter in a small metal box. R3 can then be mounted on the box wall for easy access. Phone jacks may be used for the input and output terminals. Shielded audio cable can be used for patching the filter into your receiver audio circuit. This will require adding two phone jacks to the back of
your receiver. When the filter is not in use you can place a short audio cable across the two phone jacks on the receiver to complete the original receiver circuit. A third phono jack may be added to the receiver and filter box to permit borrowing +12 volts from the receiver for operating the filter. You may opt to install a 9-volt battery and an on-off switch in the filter box so that the unit has its own power supply.

Installation

All you need do to install the notch filter is open the circuit between two of the early audio stages (preamplifier section) and insert the filter. The Figure 1 circuit has input and output blocking capacitors. This eliminates the need to modify the receiver audio circuit. This circuit is not suitable for use at the headphone or speaker terminals of your receiver. The component values listed in Figure 1 are suitable for the range of audio frequencies with which you will most often be working.
High-Gain Power Amplifier for Low-Audio Projects

Last month we concocted a hot little low-noise, high gain preamplified microphone to use with a tape recorder. But what if you wanted to listen directly to a low-audio source such as this microphone or a crystal radio? This month’s project lays out a super-simple power amplifier that’s eminently suited for boosting any low-level audio signal up to monitoring levels! You might already have all the required parts!

The heart of this high-gain amplifier is the common 8-pin DIP integrated circuit, LM-386, readily available at Radio Shack and most electronics parts outlets. The LM-386 and its variant family members are used in a wide variety of consumer electronic items including handheld scanners. The LM-386 is a versatile power amplifier chip with output capability to 1-watt. The power supply can provide anywhere from 5 to 18 volts DC, with 6-14V ideal.

For ear-splitting audio, you need only a few common parts. If you’re going to make a portable headset to be used with last month’s preamplified mike, then I recommend one or two standard 9-V alkaline batteries (wired in parallel) for the power source. Most any DC adaptor can be used for fixed operations. You can even configure the amplifier to operate from a variety of sources—batteries, DC adaptors, automotive power, etc.—by using a switched phone jack! See the diagram and the parts list for details.

Construction of the amplifier is not at all critical or difficult. I’d recommend the use of an IC socket so that the inexpensive chip can be easily replaced if it ever blows up. The circuit can be built on a piece of perf board as small as desired, or you can dress it up into a chassis box with full sized switches, volume knobs and loads of input/output jacks to suit a variety of needs.

If you choose to integrate last month’s preamplified mike into the high-gain amplifier, there are two ways to go: (1) wire them directly together into a compact, tidy container, or, as I prefer, (2) keep the two units separate, and connect the output of the preamplified mike to a length of mini-coax cable with a phono plug on the end. Then, install a mating phono jack at the input of the amplifier! This allows a variety of inputs so you’re not limited to just a microphone.

Likewise, with the output, install a phono jack to accommodate a choice of speakers or earphones and/or output to other devices. As I said, the circuit is flexible and can be configured for dozens of applications. Think the project through and tailor it to suit your needs.

The Year of the Interface—Continues

In February I said 1992 was the Year of the Interface; in March I reviewed two possible candidates. Now there’s another new interface just announced: the HB-232 Scanner/Computer Interface, developed by Comtronics. It is designed to turn your PRO-2004, PRO-2005 or PRO-2006 scanner into a total monitoring system. The following is an overview of the HB-232’s most prominent features.

The HB-232 Scanner/Computer Interface connects between a PC/XT/AT/386/486 clone computer (512-k min) and a PRO-2004/5/6 scanner. A standard serial cable connects the HB-232 to the computer’s COM port. The HB-232 can be installed inside the scanner, or better yet, in a small project box, with a short cable and plug to mate with a receptacle mounted on the scanner. This latter method allows the HB-232 to be used with two or more scanners! The scanner is not appreciably modified either way: just some point-to-point wiring. Features and performance of the scanner aren’t sacrificed, altered or lost by the addition of the HB-232.

Here are some of the HB-232’s capabilities:

- Autoprograms into the scanner’s memory channels up to 400 frequencies in less than nine minutes, along with desired custom settings of DELAY, MODE and LOCK-OUT.
- Views and controls all 29 standard scanner keyboard functions from the computer. The monitor displays a facsimile of the scanner’s keyboard and its LCD display. Whatever appears in the scanner’s display at any given time is simultaneously displayed on the monitor. Press M on the computer keyboard for MANUAL; press S for SCAN; press P for PRGM, etc.
- AutoLogs details of every “event” seen by the scanner to a text file. When the AutoLog mode is set and SQUELCH breaks, the computer writes & appends a line to a text file that shows channel number or SEARCH Bank; frequency; MODE setting (NFM, AM or WFM); DELAY status (On or Off); LOCKOUT status; SEARCH increment (if applicable); Date; Start Time; and

---

**Parts List**

<table>
<thead>
<tr>
<th>Circuit</th>
<th>Symbol</th>
<th>Description</th>
<th>Radio Shack Catalog No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1,2</td>
<td></td>
<td>Optional 9-v alkaline batteries</td>
<td>23-555</td>
</tr>
<tr>
<td>C1</td>
<td></td>
<td>Capacitor, 10-uf/55vdc, electrolytic</td>
<td>277-1025</td>
</tr>
<tr>
<td>C2</td>
<td></td>
<td>Capacitor, 2.2-uf/35vdc, tantalum</td>
<td>272-1435</td>
</tr>
<tr>
<td>C3</td>
<td></td>
<td>Capacitor, 22-uf/55vdc, electrolytic</td>
<td>272-1026</td>
</tr>
<tr>
<td>C4</td>
<td></td>
<td>Capacitor, 0.05-uf/50vdc, mylar</td>
<td>272-1068</td>
</tr>
<tr>
<td>C5,6</td>
<td></td>
<td>Capacitor, 4.7-uf/16vdc, electrolytic</td>
<td>272-057</td>
</tr>
<tr>
<td>J1,2</td>
<td></td>
<td>Phone jack, 1/8&quot;, open circuit</td>
<td>274-251</td>
</tr>
<tr>
<td>J3</td>
<td></td>
<td>Phone jack, closed circuit (switched)</td>
<td>274-248</td>
</tr>
<tr>
<td>R1</td>
<td></td>
<td>Resistor, 10 ohms</td>
<td>271-1301</td>
</tr>
<tr>
<td>S1</td>
<td></td>
<td>Switch, SPST</td>
<td>any</td>
</tr>
<tr>
<td>VR1</td>
<td></td>
<td>Potentiometer, 100-k, large size trimmer size</td>
<td>271-1722 or 271-284</td>
</tr>
<tr>
<td>Misc</td>
<td></td>
<td>AC/DC Power Adaptors:</td>
<td>273-1455, -1651, -1652, -1650</td>
</tr>
</tbody>
</table>

* These items are optional depending on needs.

---

Bill Cheek
Duration of transmission. This text file is "comma-delimited" to make it exceptionally easy to load into almost any database manager for further processing & sorting as desired!

* When the scanner stops on an active frequency, an Anti-Birdie Function can compare that frequency to a file list of frequencies and instantly resume scanning or searching, if that frequency is on file. This feature is not limited to just "birdies"; any number of other undesired frequencies can go into the "birdie file," such as for pagers, computer data channels, continuous tones, encrypted signals, and other frequencies that you don't want the scanner to stop on or to AutoLog. There are even ways to automate the collection of undesired signals to add to the "birdie file."

The HB-232 also offers several ways to Search & Store, some without duplicating previously logged frequencies. A powerful, but easy to use, Script function provides the capability to customize and automate many otherwise laborious scanner operations. A special LookUp function displays a line of text to identify each scanner stop.

Four user-definable switches, controllable from the keyboard or through script, and five logic-status inputs are standard with the HB-232, to provide a variety of non-standard scanner operations and control. The user switches can control modifications and external circuits that may have been retrofitted to the scanner, such as extended memory blocks, automatic tape recorder switches, etc. The logic status inputs can trigger logical decision-making functions in the Script feature as well as test various processes or functions not otherwise visible or controllable by software.

A built-in text editor affords simple, easy editing of HB-232 data files. The HB-232 offers configurable menu positions for two user tools of choice, typically DOS utilities, to make interface life much easier.

The heart of the HB-232 is a microprocessor chip that's programmed by the computer when the HB-232 program is booted. This means there's no expensive, impossible-to-replicate firmware on the circuit board; just generic or readily available parts. The program and the microprocessor are the sole controllers of the HB-232, easily and economically upgradable by periodic revisions on disk. The "architecture" of the HB-232 may become open to bona-fide developers to encourage third-party support.

OK, so what's the catch? None really, unless maybe it's that the HB-232 comes as a kit of parts with a printed circuit board and a program disk at a cost of $169.95. Considering the detailed documentation and guided steps for the procedure, that's not much of a catch. See the sidebar for more info and source of the HB-232 Scanner/Computer Interface and other related companies.

### Sources

**Integrated circuits & electronic parts**
- Easy Tech, Inc.
  2917 Bayview Drive
  Fremont, CA 94538
  800-582-4044/FAX 800-582-1255
- Digi-Key
  Highway 32 South, P.O. Box 677
  Thief River Falls, MN 56701
  800-344-4539
- Jameco Electronics
  1355 Shoreway Road
  Belmont, CA 94002
  415-592-8097

**Information/Source of HB-232 Interface**
- Commtronics Engineering
  P.O. Box 262478
  San Diego, CA 92196-2478
  BBS & FAX Only: 6pm-1pm, PST
  (619) 578-9247

**Other Interfaces & Control Programs**
- Datametrics, Inc.
  2575 South Bayshore Dr., Suite 8-A
  Coconut Grove, FL 33133
- RW Systems
  P.O. Box 910043
  Escondido, CA 92191
- J&J Enterprises
  4001 Parkway Drive
  Bossier City, LA 71112
  (318) 631-3081/FAX (318) 631-3082

**Order Now**
Tiare Publications
P.O. Box 493
Lake Geneva, WI 53147

$ U.S. only.
Add $2.50 (foreign $3) plus $1 each additional book.
VISA/Mastercard welcome.
Catalog $1 (free with order).

**Name**

**Address**

**City**

**State**

**Zip**

**MONITORING TIMES**

October 1992 103
What Makes a Good Antenna?
Lots of Signal, Little Noise and Computer Programs

What factors make for a good antenna? Well, the basic requirements for a good shortwave receiving antenna are not necessarily identical to those for a good shortwave transmitting antenna. For optimum effectiveness in transmitting we need an antenna with a gain level and a radiation pattern that will combine to produce an adequately-high field intensity at the receiving site. In other words, one which has enough signal strength to be detectable above any kind of noise present at the receiver.

On the other hand, we want the receiving antenna to respond to incoming energy in a way that will produce a large signal-to-noise ratio, which means that the antenna furnishes the receiver with lots of the desired signal and very little received noise. Again this will take a certain amount of gain and an appropriate radiation (reception) pattern.

Although the requirements just stated above are different for a transmitting antenna than for a receiving antenna, both kinds of antennas are designed to satisfy the same goal: to furnish the receiver with a sufficiently high level of the desired signal to allow satisfactory reception of that signal over any noise that is present when the signal is being detected.

Antenna Reciprocity

Antennas are said to have “reciprocity” because each antenna functions identically in terms of such things as gain and directivity, regardless of whether it is used for receiving or for transmitting. Because of this reciprocity we sometimes hear it said that an antenna which is an effective antenna for transmitting on a two-way radio circuit is certain to be an effective receiving antenna on that same circuit. Although this intuitively sounds correct, it is not always so in practical situations. Let’s see why.

Notice that in fig. 1A there are two antennas (A1 and A2) and a noise source. The noise source could be any source of electrical noise such as electrical industrial machinery, a nearby thunderstorm, or even the signal from a station which you don’t want to receive. The radiation or reception pattern of each antenna, and of the noise source, is shown with each pattern centered on its antenna or source.

A1 and A2 are identical antennas, connected to identical shortwave stations. Notice that when antenna A1 is transmitting to antenna A2 we have good communication because A2 is well within A1’s radiation pattern (the circle with A1 at its center), and A2 is also outside the noise source’s radiation pattern. In other words, it looks as if sufficient signal will get from A1 to A2 for good reception, and that A2 will not receive excessive noise interference from the noise source.

Now consider the reverse signal path when A2 transmits and A1 receives. A1 is well within the radiation pattern of A2 and so it would appear that sufficient signal would be furnished from A2 to A1. And, because antenna reciprocity is a well-established principle, we would expect just that. However notice that the radiation (reception) pattern of A1 also includes a good portion of the radiation pattern of the noise source. This means that there will be significant reception of the interfering noise from the noise source and, if the noise signal is strong, the signal from A2 will be partially or perhaps completely masked.

Thus, even though A2 puts in a good level of signal field-strength to A1, reception is impaired by the noise and communication will be difficult or impossible. In this situation, despite the fact that there is reciprocity between A1 and A2, A1 makes a satisfactory transmitting antenna but an unsatisfactory receiving antenna.

We can remedy the problem caused by the noise source through the use of a directional antenna such as shown in fig. 1B. If the antenna A1 were a beam antenna with a directional radiation and reception pattern such as is shown in fig. 1B, it would be relatively unresponsive to signals from the noise source. This is illustrated in fig. 1B where antenna B1 is receiving signals from antenna B2. B1’s radiation pattern shows that it has very good responsiveness to signals from B2, and at the same time is relatively unresponsive to noise signals from the noise source. Thus the desired signal received from B2 will be relatively strong and will have little received noise with which to compete: reception will be good.

Coincidentally, this is a good place to point out that, if used for transmitting, antenna B1 will cause minimal interference to stations which are not in the direction of B2. Obviously then, whether you utilize an antenna for receiving or transmitting, you should consider whether its performance characteristics are appropriate to your specific application.

Designing or Evaluating Antennas on Your Own

It would be nice to be able to make a model of each antenna which interests you and then check out its performance. This would be a neat way to get the information you need in choosing an antenna for your particular application. Fortunately this approach is easier to do than you might think. There are a few antenna design-and-evaluation computer programs available which can help you do this.
To my knowledge, the only one which is full-featured, powerful and yet relatively easy to use is ELNEC. This program does require a bit of looking at the manual to get started (as any program will), but it is much less demanding and more user friendly in this respect than the other powerful programs of which I am aware.

ELNEC's menu allows you to evaluate both horizontal and vertical radiation and reception patterns (azimuth and elevation patterns), gain, feedpoint impedance, beamwidth, sidelobe level and angle, and a number of other factors which can help you select the antenna you need for your application. You can even superimpose multiple radiation patterns for comparison on a single graph.

You choose the orientation, length, and diameter of the conductors which make the antenna which you want to evaluate. You can add loading coils or similar components, set the antenna height above ground, and match the ground to the conditions similar to your home earth-ground. There are other features such as evaluation of phased arrays, and much more.

You can evaluate the antenna which you are designing and then change it and re-evaluate it to see what effect those changes have on its operation. A number of common antenna types, already "built" and ready to evaluate, can be called up from the menu. Once you have designed an antenna design you want to keep, you can save it on a computer disk or print it with your computer's printer.

ELNEC requires an IBM PC-compatible computer with at least 512k of RAM and a CGA, EGA, VGA, Hercules, or comparable adapter. It is available from Roy Lewallen, W7EL, P.O. Box 6658, Beaverton, OR, 97007. The price listed in my recent brochure is $49.00, postpaid. Specify if you want the coprocessor "ELNEC", or the non-coprocessor "ELNEC-N", and what type of disk you use (360k or 1.2M 5.25", or 720k 3.5"). For more information you can write Roy Lewallen at the above address or call him at 503-646-2885.

Radio Riddles

Last Month

Last month I asked you, "Why do people talk about a center-fed halfwave dipole as having an impedance of 72-ohms, when in practice we find such an antenna to have anywhere from 20 ohms to almost 100 ohms impedance?"

Well, antennas are described theoretically as if they are in free-space, far away from earth. In that condition this antenna does have 72-ohms center-fed impedance. But interaction with a real ground, as when you mount a dipole in your back yard, changes the antenna's impedance by an amount determined by the antenna's height above ground. Its impedance is often closer to 50-ohms than to 72-ohms. So, using 72-ohm feedline is often inappropriate for this "72-ohm" antenna! Fortunately the resulting mismatch has little practical effect on the antenna's use in most transmitting installations and essentially no effect on its use as a shortwave receiving antenna!

This Month

Noise, as it competes with a signal we want to hear, is an important consideration in radio reception. What are the sources of the various noises which give us trouble in reception? Hint: one of the sources is "out of this world!"

You'll find an answer to this month's riddle, and much more, in your next issue of Monitoring Times. 'Til then, Peace, DX, and 73.

M_T
Q. Where can I get printed reception forms like the sample in Gerry Dexter's first edition of Shortwave Listening with the Experts? (Ken Dowal, Austin, TX)

A. A package of such forms, including QSL requests, program schedule forms, memory channel registers and more is available for $12 including shipping from the author at Tiare Publications, P.O. Box 493, Geneva, WI 53147.

Q. Where can I get a 12 VDC (or other low voltage) timer that can be used to control a radio? (Frank Shoemaker, Erieville, NY 13061)

A. While AC program timers are readily available from many consumer appliance stores and can be used with AC operated radios, DC timers are not in consumer demand—and are hard to find.

After about an hour of long-distance telephoning around the country, we found one company which will be manufacturing such a device for under $100 in the near future. For information on a distributor in your area, contact Paragon Electric, 606 Parkway Boulevard, Two Rivers, WI 54241 or call them toll free at 800-732-8400.

Q. A recent MT article reported an FCC bust of “freebanders,” illegal radio operators who interfere with licensed services in the 26-26.95 and 27.42-28 MHz bands. Who are these licensees? (Warren Freasier, Corpus Christi, TX)


Q. What is the frequency range being used by GTE’s new “Tele-Go” wireless phone system now being test marketed in the Tampa Bay, Florida area? (Jim Connell, Sarasota, FL)

A. Telego is sharing cell site space—and 869-894 MHz cellular frequencies—with the cellular telephone industry. Their antennas are rigidly separate from existing cellular towers and are intended as part of their Personal Communications Services, not as a competitor to cellular.

The personal radiophones may be thought of as a limited-range call-forwarding system while the consumer is at the store, out for a walk, whatever. Like other mobile and portable radiotelephones, the system is not scrambled.

The $25 million project ties together Sarasota, Manatee, Hillsborough, Pinellas and Pasco Counties and some 3000 prospective participants are expected to be on line, toll free, by the end of 1993.

Q. Can anyone help me find the address of the company that made the “Hotshot Instant Access Dialer”? (R.H. McMinn, 10915 Bonavista Lane, Whittier, CA 90604)

A. Readers?

Q. I am confused by the conflicting monitoring laws. Can I listen to cellular phones, cordless phones, wireless baby monitors and air-to-ground telephones? (Scott Skurzewski, Cheektowaga, NY)

A. No, yes, yes, no. The Electronic Communications Privacy Act of 1986 prohibits the monitoring of any radiotelephone conversation that utilizes a common carrier (AT&T, etc.).

A separate law, Section 605/705 of the 1934 Communications Act, prohibits the divulgence to another person or the use for personal gain any information overheard on a transmission not intended for you.
DX Radio Tests

The International Radio Club of America (IRCA), is a club devoted to the hobby of hearing distant stations on the standard AM broadcast band. DX Monitor, the official publication of IRCA, 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 more information, or a sample issue of DX Monitor, write to: The International Radio Club of America (IRCA), 11300 Magnolia #43, Riverside, CA 92505, USA. Please enclose 1 U.S. dollar or 3 IRCs if you are requesting a sample issue.

These tests were arranged by J.D. Stephens for IRCA.

Tuesday, October 6, 1992: WCKB-780, Box 789, Dunn, NC 28335, will conduct a DX test from 5:30-6:00 am EDT. The test will include tones, voice ID’s and Morse code ID’s. Reception reports may be sent to: Mr. Ron Tart, General Manager.

Monday, October 12, 1992: KXOL-1320, 1730 Neptune Drive, Clinton, OK 73601, will conduct a DX test from 3:00-3:30 am EDT. The test will include March music, voice ID’s and Morse code ID’s. Reception reports may be sent to: Mr. Dennis Burton.

Monday, October 26, 1992: WLYN-1360, Lynn, MA, will conduct a DX test from 3:30-4:00 am EDT. The test will include Morse code, tones and voice ID’s. Our thanks to Mr. Michael Klein (NV1L) of DX Enterprises for the test. Mr. Klein requests that all reception reports be sent to: WLYN DX Test, c/o Personal Database Applications, 2626 Meadow Ridge Drive, Duluth, GA 30136-6037.
Club Circuit

Club Profiles

Canadian International DX Club

This year CIDX is celebrating its 30th anniversary. The club’s 300+ members are very active in promotion of the radio hobby. CIDX addresses all types of listening, although the main focus is on shortwave. Each year the various chapters across the country participate in numerous hamfests and flea markets.

In Montreal the club exhibits annually at the Montreal Hobby Show and also organizes the annual Canadian International Radio Festival. Two Montreal club members co-host and produce a weekly radio broadcast on CKUT FM Radio McGill, 90.3 MHz. The half-hour weekly programme is called the International Radio Report and has been on the air for four years. It is aired Sunday mornings at 10:30 Eastern.

The largest membership bases for CIDX are in the cities of Montreal, Edmonton, Vancouver, Winnipeg and Calgary. The Montreal chapter meets the second Tuesday of every month at the Centre St. Pierre, 1215 de Visitation St., Montreal.

The club is a member of ANARC. Unlike most other clubs, the monthly bulletin of the club—the Messenger—has no restrictions as to number of pages per column or per bulletin.

Although a Canadian club, membership is open to radio enthusiasts worldwide. Membership is $26 in Canada, $25 US in US, $35 Canadian elsewhere. Sample bulletins can be obtained for $2.00 from CIDX, 79 Kipps Street, Greenfield Park, Quebec, Canada J4V 3B1.

Radio Monitors of Maryland

This fast-growing club already boasts nearly 300 members, even though the first publication of its bulletin, Radio Monitors Newsletter of Maryland was as recent as December 1989. The club addresses anything in the realm of HF/UFV utilities—public safety, aeronautical, maritime, military, amateur, and wFax!

The group’s activities include meetings at editor Ron Bruckman’s home and other outings at least three times a year. The largest activity is in reader input to the newsletter, which the editor says “is plain and simple—it’s Homebrew!”

Membership of $15 includes the monthly newsletter, tours, and outings—including the food! Send an SASE to Ron Bruckman, P.O. Box 394, Hampstead, Maryland 21074 for more information.

Club Listings M - Z


MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 3rd St., West Chester, OH 45069-2212, (513) 777-2909. Cincinnati/Dayton area; Full spectrum SW and scanning.

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711. Worldwide, AM/FM. DX News 30 times yearly, sample for a 25 cent stamp.


North American SW Assoc.: Bob Brown, Executive Dr., 45 Wildflower Lane, Levittown, PA 19057. Worldwide; Shortwave broadcast only. The Journal.

Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities.


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, Sultanpur, Sheikhupura, 39355 Pakistan, Pakistan; SWBC.


Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749. Puna, HI; SW and MW.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland; SWBC, utility, HF/VHF/UFH utilities. Radio Monitors Newsletter of MD.

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Genl 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 a SASE.


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 City Scanner Club: Alan D. Glick, P.O. Box 23, Prosper St., Montrose, PA 18801. PA area; Scanning all bands.

Toledo Area Radio Enthusiasts: Ernie Deilinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur.

Let’s Start a Club:

David Williams, P.O. Box 174, Fort Payne, AL 35967. Interested in scanner and shortwave monitoring.
### SPECIAL EVENT CALENDAR

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Club/Contact Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 1</td>
<td>Houston, TX</td>
<td>SPECIAL OPERATION: KKSW 1500Z-2100Z to commemorate the 9th Annual Children's Christmas Card Parade. Operation on 7220, 18129, 21392, and 28392. QSL and SASE to KKSW, MD Anderson Hospital, Amateur Radio Volunteers, 1515 Holcombe Blvd., Houston, TX 77030-4085.</td>
</tr>
<tr>
<td>Oct 2-4</td>
<td>Atlanta, GA</td>
<td>1992 Monitoring Times Convention Location: Omni Hotel at CNN Center. $40 registration, $21.95 banquet. Walking for exhibits only for $5. See ad on page 5 for more details.</td>
</tr>
<tr>
<td>Oct 3-4</td>
<td>Boxboro, MA</td>
<td>SPECIAL OPERATION: WSWE, Western Illinois ARC celebrating Quincentenary of the European Discovery of America. 1400Z Oct 10 to 2400Z Oct 11 on general SSB and CW sub-bands, packet and 147.33 WSWE repeater. QSL and SASE: WARC, PO Box 5132, Quincy, IL 62256.</td>
</tr>
<tr>
<td>Oct 10</td>
<td>Columbus, IL</td>
<td>1992 Monitoring Times Convention Location: West Monroe, LA, ESPN and SASE to KSWE, MD Anderson Hospital, Amateur Radio Volunteers, 1515 Holcombe Blvd., Houston, TX 77030-4085.</td>
</tr>
<tr>
<td>Oct 18</td>
<td>Sanford, NC</td>
<td>CCARS Swapfest/George Batchelor, KD4FPZ, (919) 776-7584 Location: Lee Cty Fairgrounds, 7th Street.</td>
</tr>
<tr>
<td>Oct 18</td>
<td>Queens, NY</td>
<td>Hall of Science ARC Hamfest/Charles Becker, WA2JUJ, (516)694-3955 or Arnie Schiffman, WB2YXB, (718)343-0172. Location: NY Hall of Science parking lot, 47-01 111th Street. Opens at 9 am, admission by donation. Talk-in on 445.175 NB2A repeat 146.52 simplex.</td>
</tr>
<tr>
<td>Oct 31</td>
<td>Odessa, TX</td>
<td>1992 Odessa Hamfest/West Texas ARC, P.O. Box 7033 Location: Holiday Inn Convention Center, 6201 E. Highway 80 $7 admission, 8 am to 5 pm Sat; 8 am - 2 pm Sun.</td>
</tr>
<tr>
<td>Nov 1</td>
<td>Lawrenceville, GA</td>
<td>Computer Expo Hamfest '92/Allford Memorial Radio Club Hamfest Location: Gwinnett Cty Fairgrounds.</td>
</tr>
<tr>
<td>Nov 14</td>
<td>West Monroe, LA</td>
<td>Twin City Hams/Jimmy Ramsey, N5DAX 109 W. Fairway Drive, West Monroe, LA 71291</td>
</tr>
<tr>
<td>Nov 21-22</td>
<td>Tampa, FL</td>
<td>Florida State Convention/Pat Barbieri, WB1GZW 2225 Glen Dr., Safety Harbor, FL 34695.</td>
</tr>
</tbody>
</table>

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to: Monitoring Times Special Event Calendar P.O. Box 98 Brasstown, NC 28902-0098

---

### INDEX OF ADVERTISERS

<table>
<thead>
<tr>
<th>Advertiser</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Electronics Applications</td>
<td>63</td>
</tr>
<tr>
<td>AIE Corporation</td>
<td>56</td>
</tr>
<tr>
<td>Antique Radio Classified</td>
<td>43</td>
</tr>
<tr>
<td>ARRL</td>
<td>55</td>
</tr>
<tr>
<td>Ashton ITC</td>
<td>45</td>
</tr>
<tr>
<td>Cellular Security Group</td>
<td>47</td>
</tr>
<tr>
<td>Chilton Pacific</td>
<td>9</td>
</tr>
<tr>
<td>Commtronics</td>
<td>9</td>
</tr>
<tr>
<td>Communications Electronics</td>
<td>17</td>
</tr>
<tr>
<td>CQ Communications</td>
<td>56</td>
</tr>
<tr>
<td>Datametrics</td>
<td>101</td>
</tr>
<tr>
<td>Jacques d'Avignon</td>
<td>71</td>
</tr>
<tr>
<td>Delta Research</td>
<td>7</td>
</tr>
<tr>
<td>R.L. Drake Company</td>
<td>75</td>
</tr>
<tr>
<td>DX Radio Supply</td>
<td>45, 57</td>
</tr>
<tr>
<td>Electronic Equipment Bank (EEB)</td>
<td>13</td>
</tr>
<tr>
<td>Fort Worth Computers</td>
<td>99</td>
</tr>
<tr>
<td>Galaxy Electronics</td>
<td>21</td>
</tr>
<tr>
<td>GRE America</td>
<td>95</td>
</tr>
<tr>
<td>Grove Enterprises</td>
<td>5, 76-75, 95, 107</td>
</tr>
<tr>
<td>Glenn Hauser</td>
<td>29</td>
</tr>
<tr>
<td>Ham Companion</td>
<td>15</td>
</tr>
<tr>
<td>Hunterdon Aero Publishers</td>
<td>45</td>
</tr>
<tr>
<td>ICOM America</td>
<td>Cover IV</td>
</tr>
<tr>
<td>Intercepts Newsletter</td>
<td>43</td>
</tr>
<tr>
<td>J&amp;J Enterprises</td>
<td>97</td>
</tr>
<tr>
<td>Japan Radio Company</td>
<td>Cover III</td>
</tr>
<tr>
<td>KIWA</td>
<td>11</td>
</tr>
<tr>
<td>Klingenfuss</td>
<td>37</td>
</tr>
<tr>
<td>Lentini Communications</td>
<td>49</td>
</tr>
<tr>
<td>LJ Electronic Industries</td>
<td>11</td>
</tr>
<tr>
<td>MillSpec Communications</td>
<td>105</td>
</tr>
<tr>
<td>Monitoring Times</td>
<td>91</td>
</tr>
<tr>
<td>Motron Electronics</td>
<td>53</td>
</tr>
<tr>
<td>National Scanning Report</td>
<td>3</td>
</tr>
<tr>
<td>Naval Electronics</td>
<td>47</td>
</tr>
<tr>
<td>OPS Weatherfax</td>
<td>23</td>
</tr>
<tr>
<td>OptoElectronics</td>
<td>65, Cover II</td>
</tr>
<tr>
<td>Palomar Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Pioneer Data</td>
<td>49</td>
</tr>
<tr>
<td>Popular Electronics</td>
<td>87</td>
</tr>
<tr>
<td>QSL Prints</td>
<td>11</td>
</tr>
<tr>
<td>Radio Accessories</td>
<td>97</td>
</tr>
<tr>
<td>RDI White Papers</td>
<td>97</td>
</tr>
<tr>
<td>Satman</td>
<td>45</td>
</tr>
<tr>
<td>Scanner World</td>
<td>39</td>
</tr>
<tr>
<td>Skyvision</td>
<td>53</td>
</tr>
<tr>
<td>Software Systems Consulting</td>
<td>19, 105</td>
</tr>
<tr>
<td>Somerset Electronics</td>
<td>41</td>
</tr>
<tr>
<td>Spy Supply</td>
<td>93, 101</td>
</tr>
<tr>
<td>Tiare Publications</td>
<td>19, 103</td>
</tr>
<tr>
<td>TRS Consultants</td>
<td>3</td>
</tr>
<tr>
<td>Turbo Electronics</td>
<td>53</td>
</tr>
<tr>
<td>Universal Electronics</td>
<td>51</td>
</tr>
<tr>
<td>Universal Radio</td>
<td>101</td>
</tr>
<tr>
<td>V-Comm</td>
<td>99</td>
</tr>
<tr>
<td>World Com Technology</td>
<td>9</td>
</tr>
</tbody>
</table>

---

Tell the world you saw it in Monitoring Times! And tell them you read about it in Monitoring Times!
SURVEILLANCE, COUNTER SURVEILLANCE EQUIPMENT FOR SALE. WRITE SHERWOOD COMMUNICATIONS, BOX 535-G, SOUTHAMPTON, PA 18966 (215) 357-9065.

ICOM R-9000 with CRSl6000 $3750, 404-256-3618.

NEW ICOMS: H10 $425; U10 $440; H16 $515; U16 $525; A21 $495; M7 $279; 100 feet $993 with solder PL-259s $99; MC/VISA/AMEX; XPM Inc. Communications (512) 693-4999.

RADIO-SCANNER MODIFICATIONS Over 180 different models; $12 for three IBM 5.25" disks. J. Worthington, Box 1953, Eugene, OR 97401.

ACE/AOR AR2500. 1-1500 MHz. Mint. $300. (514) 739-9328.

SHORTWAVE PARADISE BBS now has the new Fall schedules available. Call our computer line now at 1-305-524-1035. We are a FREE BBS computer system!

ICOM ICR7000 RECEIVER with remote. Like new less than 6 months old $825. Will ship. Call Phillips (704) 982-6660.

AR1000 - 1000 channel handheld scanner covers 8-600, 805-1300 MHz complete, exc condition. Includes book by Harold Bornstein "Guide to the AR1000" $325. BEARCAT 300 complete, exc condition, $100. Rudy 708-358-1150.


KENWOOD R5000 with filter upgrades, mint condition, less than 50 hours use. Call 802-684-2520 after 8 pm.


WANTED: GRE SUPER CONVERTER "2" which receives 810-912 MHz on handheld scanners 602-584-7144.

LONG ISLAND SCANNER/SWL NET Tune in 147.210 every Thursday, 8:30 pm.

DRAKE R-8, mint, new 12/91, original box, manual, matching outboard speaker, $700, 510-754-8859 after 6 pm PST.

C64 and C128 programming and technical books and software. SASE for list. Lash, 2679 Glenwood Dyer Road, Lynwood, IL 60411.

FOR SALE: HAMMERLUND HQ-100A RECEIVER, $125 plus shipping. Mint! Jim B. Cooper Sr., PO Box 792, Brandon, MS 39043, 601-825-8108.

SELL UNIVERSAL M7000 updated 6.03. Data and time clock and manual, $725. 503-775-9621.

ICOM R-1 w/extended battery pack, case and extension speaker, $395; SONY AIR-8, $175. All mint condition. ARA VHF/UHF power antenna, $125. Send SASE for complete list. Darrel Charest, 3420 Trenary Lane, Colorado Springs, CO 80918, 719-528-1322.

10 Meter mobile amplifier, 100 W AM/FM, 200W SSB output. Brand new, $125. Write: G. Cochran, PO Box 13283, Roanoke, VA 24032.


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.
Huge 100 Page Catalog

- Shortwave Receivers
- Amateur Radio Gear
- Scanners
- RTTY & FAX Equipment
- Books & Accessories

Send $1 to Universal Radio
6030 Americana Pkwy, MT
Reynoldsburg, OH 43068
Tel. 614 866-4267

Programmable Tone Decoders
For Selective Listening

CTCSS: Model TS-32P ... $57.95
DTMF: Model DTO-1 ... 59.95
DCS: Model DCS-23 ... 59.95
2-TONE: Model SD-1000 ... 59.95

Call for free catalog of these and other tone signaling devices.
800-854-0547

Communications Specialists, Inc.
426 West Taft Avenue • Orange, CA 92665-2496
Local (714) 998-3021 • Fax (714) 974-3420

The Sounds of Natural VLF Radio

We have compiled a list of various stations transmitting a wide variety of naturally occurring VLF phenomena. Each of these frequencies is named after a notable person who discovered or worked with VLF phenomena. These stations are located all over the world and can be heard using a simple VLF receiver. Details of each station are given in the catalog.

Hand-Held Scanners!

MetroWest is your source for:

- Bearcat Hand-Helds
- Double-Life Battery Packs
- Drop-In Chargers
- Specialty Antennas
- Books & more

Send for our free catalog:
MetroWest, Inc.
237 S. Spring St.
LaGrange, IL 60521
(708) 344-3125
(300) 407-2723

Radio for Peace
International T-Shirts!

Blue, Green, Yellow design on White T-Shirt
$20.00 each plus $2.00 for shipping.

Radio for Peace
International Catalog

From Amplifiers to Zappers!
Over 350 Kits, Plans & Books
about Licensed/Unlicensed AM/FM/Cable Broadcasting.
Ham/CB/SW/AM/TV/Modem, surveillance, phone devices, software, MORE. Send $1.00!

PO Box 130-T
Paradise CA 95967

Interference Filters

Our specialty is eliminating Broadcast Band Interference from your receiver. Antenna and powerline filters stop broadcast energy from reaching your equipment. Also available are radio front end protectors that prevent damage from static electricity or lightning. Call (503) 923-2540 or write for a FREE information package.

Northwest Communication Laboratories
813 S.W. Highland, Suite C-310
Redmond, OR 97756
(503) 923-2540

Monitoring Times
October 1992
111
Closing Comments

Dear Fellow “Technocreeps,”

In an eleventh-hour bid to further misinform our legislators and heighten paranoia over cellular eavesdropping, cellular propagandist Norman Black recently tossed down the gauntlet, using the resources of the Associated Press to brand scanner owners “a bunch of technocreeps who are violating our privacy in the name of a hobby.”

Seasoned legislators see Black’s schoolyard name calling for what it is: a carefully choreographed effort to prop up sagging interest in the Cellular Telecommunications Industry Association’s proposed anti-scanner amendment to the FCC Funding Bill.

Cellular providers have historically refused to provide privacy for their customers’ conversations as stipulated by the FCC; worse, they have consistently avoided their moral responsibility to truthfully advise their customers that cellular telephone conversations may be easily overheard.

Rather than spend five dollars per phone to guarantee privacy to their trusting customers, the cellular magnates choose to malign scanner owners as “technocreeps,” “hackers” and “high tech snoops” in an effort to prejudice our legislators to enact an unnecessary and restrictive law, equally as inefficient, self-serving and embarrassing as their Electronic Communications Privacy Act of 1986.

The proposed anti-cellular-frequency amendment, which would prevent sale to the public scanners with cellular frequencies—or even cellular-restorable capability—would have virtually no effect on uninvited interception of cellular phone calls.

Cellular conversations would still be heard on image frequencies, on receivers with external converters, on test equipment and tunable receivers, even with UHF-TV sets. But the CTIA-sponsored law would provide the one marketing tool that cellular has wanted since the unfortunate passage of the ECPA: the illusion of privacy.

They would be able to continue to tell their customers—this time truthfully—that scanners no longer have cellular frequency coverage. In the industry’s profit-motivated mindset this would absolve them of any responsibility to provide real privacy for their customers.

Let’s hope that our legislators see through this crassly commercial ploy, this financial expedient of the CTIA, and pass the FCC Funding Bill without the cellular amendment.

Bob Grove
Publisher

A Scanner Listener Responds

In referring to radio hobbyists who listen to cellular phone conversations as “technocreeps,” Norman Black, spokesman for the Cellular Telecommunications Industry Association, not only misses the point, but does a disservice to those who buy and use the products produced by CTIA members.

The plain truth is that anyone who uses radio-assisted telecommunications—cellular, cordless, or ship-to-shore telephones—is broadcasting his conversation for all the world to hear. These transmissions travel considerable distances, penetrating, uninvited, the dwellings and businesses of others.

To hear these signals, no bugs must be planted; no one must “stand under the eaves” in order to hear a private conversation; one must merely listen to the radio. These communications are as fully in the public air space as the signals from any radio or television station.

The CTIA would like to preserve the fiction of “reasonable expectation of privacy” because that suits its commercial purpose. Radio-assisted phone users continue to believe this lie because the instrument they use looks and feels like an ordinary telephone receiver.

But how would they react if they realized, truthfully, that they are using a microphone connected to a radio transmitter? I suspect the myth of privacy would vanish in a puff of marketing babble.
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.
- Maximum IF bandwidth flexibility! The Variable Bandwidth Control (BWC) adjusts the wide and intermediate IF filter bandwidths from 5.5 to 2.0 kHz and 2.0 to 0.5 kHz—continuously.
- Stock fixed-width IF filters include a 5.5 kHz (wide), a 2.0 kHz (intermediate), and a 1.0 kHz (narrow). Optional JRC filters include 2.4 kHz, 300 Hz, and 500 Hz crystal type.
- All mode 100 kHz - 30 MHz coverage. Tuning accuracy to 1 Hz, using JRC's advanced Direct Digital Synthesis (DDS) PLL system and a high-precision magnetic rotary encoder. The tuning is so smooth you will swear it's analog! An optional high-stability crystal oscillator kit is also available for ±0.5 ppm stability.
- 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.
- Memory capacity of 200 channels, each storing frequency, mode, filter, AGC and ATT settings. Scan and sweep functions built in. All memory channels are tunable, making "MEM to VFO" switching unnecessary.
- A state-of-the-art RS-232C computer interface is built into every NRD-535D receiver.
- Fully modular design, featuring plug-in circuit boards and high-quality surface-mount components. No other manufacturer can offer such professional-quality design and construction at so affordable a price.
TAKE THE WORLD ON THE ROAD

WORLDWIDE RECEIVERS FROM ICOM

IC-R1 HANDHELD RECEIVER

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 3¾"W x 4.6"H x 1.4"D.

Easy operation is a snap with the IC-R1's Dual Frequency Selection (direct keyboard and rotary tuning), 100 memories and a 24-hour clock complete the world's smallest full-featured handheld receiver.

IC-R72 BASE RECEIVER

The IC-R72 continuously receives 10kHz-30MHz in SSB, AM and CW modes with exceptionally high sensitivity. An optional UI-8 provides FM reception. The IC-R72 incorporates a noise blanker, five scanning systems, internal backup battery and built-in clock with Icom's DDS System. The IC-R72 boasts a 100dB wide dynamic range while an easy access keyboard provides convenient programming versatility... superb for Shortwave Listener!