Volume 12, Number 1 • January 1993 $3.75

Monitoring Times

A Publication of Grove Enterprises, Inc.

Monitor Troop Deployment to Mogadishu!
SEE PAGE 7

FOUR FUNDAMENTAL FREQUENCIES
CRITICAL TOOLS IN FIGHTING THE RURAL FIRE

SKIP
WHEN SHORT-RANGE SIGNALS DEFY THE ODDS

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January 1993

Monitoring Times

Rural Fire Departments

By Otto Muller

Coordination of the units responding to a fire call is just as critical in the country as it is in the city. Water supply and travel time are the rural fire department's greatest obstacles. Here's how they keep their response efficient and fast by using only four frequencies to their best advantage.

Voice of Free China

By Stephen Hunter

Using the eyes of recent VOFC staff member, Michelle Wu, we are welcomed inside the Republic of China's shortwave outlet. Taiwan has a major interest in maintaining ties with the western world, and the listener will find both their signal and their programming easily accessible.

VHF Low Band Skip

By Brian Webb

Are you hearing Spanish on your scanner where they shouldn't be? Names of unknown taxi companies, street names or towns? You have entered the twilight zone of low band skip!

This article provides one of the most thorough treatments of skip in the 30-50 MHz range ever printed—how it happens and when, what equipment you need to receive it, and how to identify it. It's so thorough, in fact, we have to run the full story in two issues. Part I, however, lays all the foundation you need to start making skip reception your intentional target.

COVER: Photo by Bob Grove, Chief, Brasstown Fire Department

With GPS the Future is Here! 20

By David Lewis

Ever since the transmissions from global positioning satellites were made accessible by the public, a revolution has been taking place. A phenomenal number of practical applications are being discovered for the ability of GPS to compute one's exact lateral and vertical (altitude) position on the earth, and even to calibrate time itself.

The Classic Listener 24

By Salvatore Ferro

Sal's wife was the perfect candidate to get hooked on shortwave, but somehow she never took the bait... Until their household became the recipient of a throwaway Zenith TransOceanic.

A side article by Michael Schiffer traces the fascinating history of this classic Zenith shortwave portable—the first and the last of its kind.

And More ...

For the cooped-up winter months this issue contains a lot of things to do, whatever your expertise. The "Beginner's Corner" takes you on a whirlwind tour around the world in 80 minutes—a fun challenge you can customize and use over and over again.

If your interest was piqued by last month's article on "whistlers" and other odd noises from the earth, you might like to build the low frequency converter in "DeMaw's Workbench" so you can tune them in yourself. "Below 500 kHz" will entice you down in an overview of what else you can expect to hear in radio's basement.

"Satellite TV" also asks, "How low can you go?" only this time we're talking price. Turn here for some sound advice on how to put together a TVRO system for a good deal less than $1000.

"High Seas" takes you to VHF, and "Antenna Talk" helps you build an antenna for that range. "Scanning Report" has advice on maintenance for your existing antenna. And, most sophisticated of all, Experimenter's Workshop makes a nifty device to track which scanner frequencies are active, so you can make best use of your memory channels.

DEPARTMENTS

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LETTERS

Letters to the Editor

Welcome to the new year, and welcome also to all our friends who may be reading *Monitoring Times* for the first time, or after a long hiatus. This January issue mails out to everyone in our database in the hopes that you'll get hooked and decide to join us *every* month. Our department editors are knowledgeable, responsive, and they welcome your questions, suggestions and contributions. Most of them will answer correspondence accompanied by a self-addressed stamped envelope (SASE). Feature articles by free-lance writers give a more in-depth look at both scanning and shortwave broadcast topics. The shortwave guide to English language broadcasts is virtually unsurpassed; it alone is worth the subscription price...or so our readers tell us.

If you prefer to buy an issue now and then, *Monitoring Times* is becoming increasingly available in bookstores, hobby stores and newsstands. If you don't see it in your favorite venue, ask them to give *Monitoring Times* a trial run!

The Quirks of QSLing

Some letters we published here last spring got a few folks thinking more about the ups and downs of QSLing—the art of getting your logging verified by the station itself. Mike Hardester of Jacksonville, NC, sent a thoughtful letter based on his 25 or so years in the hobby:

"Die-hard DXers who collect QSLs will go to just about any length to obtain a QSL, and there is nothing quite so frustrating as sending a VERY complete and accurate report, return postage, 'goodies,' etc, and then receive nothing in return. Today, QSLs (regardless of the quality of the report) are becoming more and more difficult to obtain, and the cost (postage and return postage) can become a bit prohibitive for some of the younger hobbyists or those on a fixed income. In this respect, I feel that a list of stations which will readily QSL accurate and complete reports may be of value.

"In my early days of DXing/QSLing, I relied a lot on Gerry Dexter's book, *World Broadcast Station Address Book* (no longer in print). It was a source of information which helped me conserve limited resources. Today I'll check QSL columns or other reference sources (such as *Passport to World Band Radio* or *World Radio TV Handbook*-ed) to see how a station is replying to reports. I receive several DX bulletins in which I can check on which stations are verifying, what type of return postage is best (mint stamps, IRCs, $$$, etc). But even if it's rarely listed as replying to reports, I'll take a shot at it if it's a station I want a QSL from.

"What might prove to be of value for North American hobbyists would be a yearly list of QSLs received in North America. While lists such as the *QSL Survey* put out by the Suriname DX club may be of value, my experiences overseas (using a "foreign" mailing address) have shown that sometimes stations which are irregular verifiers towards reports from North America are excellent verifiers when responding to non-North American addresses."

Mike agrees that it is important to cultivate better relationships with stations which do reply, sending a thank you card at the very least, and sending holiday greetings at appropriate seasons.

Ken Loh of Santa Barbara, CA, says the money-saving suggestion in a recent QSL column of sending aerograms or postal cards "is the most counter-productive suggestion I have heard in a long time."

"First of all, a proper reception report should be either typed or very legibly written." If you follow that convention, Ken doesn't think it would be possible to fit all the required information on a card.

"Unfortunately, suggestions such as this give young QSLers the impression that they can hastily put together information to the broadcaster and rightfully expect a reply in return. QSLs are a favor and a courtesy extended to the listener, hopefully in return for information that is useful to the broadcaster. There is no economy in sending out reports which cannot be answered."

Good advice, Ken. You're also prevented from including return postage using a post card. Ken does point out that scenic postcards have a place in QSLing as an enclosure with the report or as a thank you for a QSL received.

Lastly, Gayle Van Horn got to hear from one of those "young QSLers." Miguel Trivino, a high school sophomore in Marietta, GA, says,

LETTERS

"You suggested we be creative when sending for a QSL. I have sent reports all over the world and have been very happy receiving them. I decided in a request to Radio Japan to include my phone number. On July 16, around 10:30 EST, I received a phone call from Sarah Moore, host of the 'Hello from Tokyo' show. The time difference was thirteen hours.

"I was very surprised and enthusiastic about receiving the call. She recorded the conversation to be used in a future show. She asked me why I placed my phone number on a QSL card, and I told her very proudly that I got the suggestion from *Monitoring Times*. Thank you for the good job you [Gayle] and *Monitoring Times* have done to increase my QSL awareness."

What's New?

James Snow of Murray, KY, has heard reports on the air of a new American-made shortwave radio (100-30,000 kHz), "about the size of a bread-box, maybe FM digital readout, no SSB, claims extreme sensitivity, etc. Delivery in mid-December; suggested price $199.95 plus $12 S/H. The radio is called 'For the People.' If it is of any interest, let all of us subscribers know about it."

No sooner said than done, James. Larry Magne reports in this issue on the results of his enquiries, and he will follow up on those comments after the unit becomes available.

Steven Hada of Rosemead, CA, is also wondering about some new technology he heard Ian McFarland mention on Radio Japan's SWL program. McFarland described "a system developed by Hitachi whereby full duplex communications (simultaneous two-way conversation) is possible using a single frequency and no additional bandwidth. This is accomplished by breaking up the signal [speech] into small intervals, then time compressing each interval down to 50 percent its original length. The compressed speech is then transmitted.

"Since the speech is compressed to half its time, the transceiver need transmit only 50 percent of the time. The other 50 percent of the time, it is in the receive mode. At the receiving end, the speech is expanded back to normal. Each transceiver rapidly alternates between transmit and receive modes. Thus, full duplex communications is possible using one frequency.

"Initial applications are said to be taxi and emergency services operating in the VHF bands, though ham radio was mentioned as an obvious application.

"Has anyone at *MT* heard about this new system? What are the SW receiver and scanner implications? Are any manufacturers planning equipment capable of receiving this type of communications?"

We are not aware of such developments in the U.S., but many solutions are being proposed in response to overcrowded conditions. *Electronic Design* carried a report that Britain may be close to finalizing a mobile radio specification that will call for voice and data channels of no more than 5 kHz wide! Current channel separation in the UK is 12.5 kHz. In many parts of the world 25 kHz is standard; in the U.S. spacing may be 10 or 20 kHz, depending upon the band.

The change in specifications would be made possible by a new technology called linear modulation, in which low-power, digital-signal-processing chips are installed in mobile and base transceivers.

Like Hitachi, Securicor PMR Systems, which developed the linear technology, is expecting customers for its new radios among public utilities and public safety services in Europe and North America.

If you see an article or have expertise on these and other new developments in radio technology, we will be happy to share it with our readers; just send it to the Editor!

Skipping a Little Further

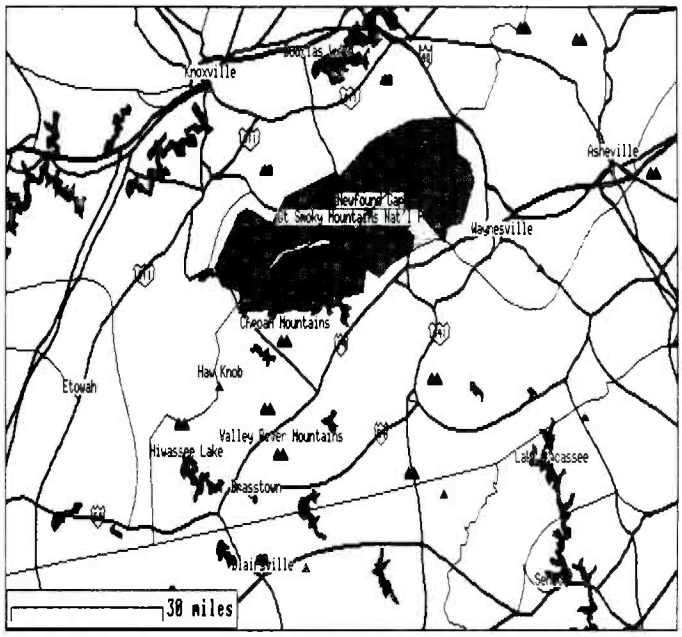
I hope you enjoy Part One of Brian Webb's article on VHF skip reception. He wrote us a few months ago to share a few of his own loggings of skip from Dade County, Florida (Brian lives in Thousand Oaks, CA!).

"One of my best catches was hearing the military looking for a looter in a pickup truck who was driving from house to house taking what he wanted. I also heard the South Florida Water Management District on 30.960 MHz. They were working on restoring service more than a month after Hurricane Andrew departed. I actually heard from the Homestead office! A lady from the office called me on the phone in response to a QSL request that I had sent."

We hope you enjoy this definitive feature article on VHF skip. When the second installment is published, you may want to copy them to keep as a reference source.

The Global View

Global Positioning Satellites have been around for a while, as reader George Sitts of Oakhurst, CA, reminded us. However, *MT* has not given this amazing technology much coverage until the introductory article by David Lewis in this issue. Although the system was designed by and for the defense department, with the kind of accuracy required for military purposes, it has been made available for civilian use at a lower resolution.



George's comment is, "Isn't it an interesting sign of our times; the Department of Defense has put up a very expensive GPS capable of location accuracy within 5 to 10 meters. They then spent more to degrade its accuracy for civilian use.

"Now the US Coast Guard is spending more tax money to undo the DOD degradation and bring the accuracy back to the original 5 to 10 meter range!"

The issues of accuracy and who is to control the system is of grave concern to organizations and other countries who are deciding whether to base critical navigational and control systems on GPS data. It will be interesting to watch developments in this post-cold-war atmosphere.

Meanwhile, if one of you gets a chance to ride in a car equipped with a GPS-guided autolocator, commemorate the occasion with a picture for *MT*! Jacques d'Avignon of Ontario sent the above map of western NC/north GA prepared by AutoMap, a road atlas for the PC, and daydreamed about the day the program can be used with an autolocator. (The map is deceptive, by the way; none of the larger towns nearby are shown—Jacques likes to flatter us!)

If there is anything certain in this world, it is that things will change. As we enter a new year, greet a new U.S. President, adjust to new technology, and extend a hand to those whom technology has neglected, I have no doubt this year will yield some great monitoring times.

Rachel Baughn,
Editor

Two Antennas Twice the Fun!

"...bringing you another nonstop 60 minutes of your kind of music from..."

"...fire has jumped to adjacent apartment building; requesting additional units..."

"...unidentified object does not respond to radio; attempting to make contact..."

"...appears to be gang-related, large number of youths on foot moving toward..."

"...blackout apparently caused by car striking utility pole at corner of..."

"...search from the northwest quadrant and proceed south, maintain visual..."

"...do not, repeat, do not approach intake by boat since dock is damaged in..."

"...campers are advised to leave upper elevations before sundown due to..."

"...conditions for trout in the deeper pools best before 6 am, they're taking..."

"...bright yellow, red trim Piper last reported lost and disoriented in fog near..."

"...sending a chopper over to have a look before the news people find out about..."

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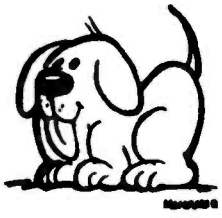
All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC [illegible]

New "World of Radio" Outlet?

The forces of capitalism are working their way into the tiniest corners of the former Soviet Union. In Aktau, Kazakhstan, the oblast radio is opening its microphones to anyone with a ruble. Two hundred rubles and an opinion will get you 10 minutes, according to the BBC.

Jam the Opposition



It's hard to teach an old Soviet dog new capitalist tricks, however. According to Russia's Radio, The Palaea Publishing House is apparently considering selective jamming of Radio Liberty transmissions because of its criticism of Boris Oleynik, author of *Prince of Darkness*. The book, which analyses the term of Mikhail Gorbachev as President of the USSR, has been bought out by the publishing company.

To protect their interests, the publishing company consulted the designers of jamming systems, who responded enthusiastically to the idea of smothering Radio Liberty's "vile and filthy" broadcasts.

The Government is Helpless

When the Polish Radio and Telecommunications Agency (PRTA) first began to issue licenses for commercial radio stations, there were about 600 applications. Forty-three licenses were eventually granted while others, anxious to hit the airwaves, ignored the law and went on the air anyway.

The government then fined each pirate 1.5 million zlotys — which went unpaid. Not only did these pirates stay on the air but others have since signed on, including one operated by an American pastor. The PRTA is described as being "helpless."

Down But Not Out

One day before being declared launch-ready and before the eyes of fifty reporters on a walk-through, the inflatable dome protecting the *Earthwinds* Hilton airship was ripped open by gusty winds. In spite of the efforts of crew members, who drove vehicles onto the shredded dome to try to contain the anchor balloon, the 350-foot tall air-filled balloon was pulled from its moorings and blown half a mile into the desert. After being torn by sagebrush, the balloon finally deflated.

The *Earthwinds* attempt to circumnavigate the earth (see *Monitoring Times*' November cover story) is still very much alive, however. Both the inflatable dome and the anchor balloon are expected to be replaced by the end of December. A "dress rehearsal" of all communications links is planned for sometime after December 20th, involving the crew, chase plane and operations and media center.

Earthwinds has a four-month flight window in which generally calm winds near the ground and a steady jet stream at 35,000 feet provide the only feasible conditions for launch and circumnavigation. Captain Larry Newman reported that several perfect launch days have passed since the set-back November 19th, and according to the Reno *Gazette-Journal*, he predicts a 100 percent chance the craft will lift off before the window closes February 15th.

Following a successful launch, *Earthwinds* can be tracked on its beacon frequency of 28303 kHz; the public may call 1-900-93EARTH to hear daily updates by Captain Larry Newman.

Not on Monday Night

It's shaping up as one of the gridiron classics of all times: the lawyers for the Cleveland Browns vs. local tavern owners.

Apparently, the Browns think that sports fans are heading for their favorite watering holes instead of to the stadium.

Last fall, Browns officials warned several tavern owners that using satellite dishes to receive "blacked out" games violated federal law. The taverns then installed high-powered TV antennas to pick up the games from stations outside the blackout area.

The Browns said, "enough is enough," and filed suit in federal court, seeking a $100,000 fine against each tavern for damaging the team's "ability to protect live gate attendance ticket sales and associated revenue..."

According to the *News-Herald*, there were 25,000 unsold seats for the next Browns home game.

Reasonable Expectation of Privacy

If you can prove you have taken steps to guard your cordless phone privacy by purchasing a shorter-range phone or one with a scrambling device, then you may indeed be acknowledged to have a "reasonable expectation of privacy," at least in Texas, Louisiana, and Mississippi.

The Fifth US Circuit Court of Appeals has ruled that when cordless phone users have taken such steps to protect their privacy, the government can't listen in. However, the Fourth Amendment privacy right would have to be evaluated on a case by case basis to examine the equipment used.

This ruling is seen as a natural step toward preventing eavesdropping by private citizens as well as police, and will undoubtedly be cited as a precedent nationwide.

Maintaining that cordless phones should be treated like cellular phones, American Civil Liberties Union spokesperson, Janlori Goldman, said in the *Wall Street Journal* report, "One circuit is willing to recognize that this might be an absurd distinction."

Civil Suit

An amateur radio operator with an apparent dislike of at least one religious station, has reportedly been convicted of operating a "pirate" radio station. What makes this station different from other similar incidents is that Paul Matar, KA1RDM, was convicted without FCC involvement.

According to the *W5YI Report*, the FCC was so understaffed that they could not participate in the apprehension.

Superior Court in Milford, Connecticut, used evidence gathered by WFIF-AM to charge Matar with interfering in business relations and slander. Over $12,000 in damages were awarded the religious station.

Witnesses said that the pirate station would come on WFIF's 1500 kHz frequency after the station had signed off. Engineers from a neighboring station pinpointed the transmissions to Matar, who denies the allegations based on the lack of FCC evidence. Meanwhile, the illegal broadcasts continue.

COMMUNICATIONS

Interference Complaints

Complaints of interference in the Private Radio Services previously handled by the Private Radio Bureau of the FCC have been transferred to the Commission's Field Operations Bureau.

Med Go-Ahead

The FCC will no longer require licensing for low-power medical devices in the 450 to 470 MHz band. The affected devices are used by over 3,000 hospitals to monitor the vital signs of patients.

Output powers on these devices generally range from between 2 and 5 milliwatts.

Radio Discovery

Geologists at NASA's Jet Propulsion Laboratory in Pasadena have discovered several previously unknown earthquake faults in California's Mojave Desert. The new faults were detected by analyzing Landsat 5 images at seven bands at optical and infrared wavelengths.

The newly observed faults are located within Fort Irwin, an active military training area, and are part of the same system that produced the magnitude 7.5 earthquake that occurred June 28, 1992 at Landers, California.

The project is funded by a division of NASA known, ironically, as the "Solid Earth" branch.

Broadcast Hopefuls

Programs looking for a way to get on the air will soon find two more outlets for transmitting their message to other parts of the globe. Radio Miami International (WRMI) anticipates beginning broadcasts in early 1993, beamed toward the Caribbean and Latin America. WRMI expects to transmit on 9955 kHz approximately 2200-0600 and 1000-1400 UTC daily.

Beginning this month, the World Radio Network gears up to provide satellite audio programming. WRN expects to provide a full-time service by mid-1993. The broadcaster will be distributing audio to AM, FM, and cable stations in Europe and North America and can offer conference feeds, concert relays, interviews, etc. worldwide.

Thanks to Roger Armstrong and Jim Shephard; Jeff Chanowitz, Rockville, Maryland; Tom Cranner, Elsworth, Tennessee; Ron Mosher, Plainesville, Ohio; *W5YI Report*; BBC Monitoring Service, Larry Van Horn. "Communications" is compiled by Larry Miller and the editor from news items submitted by our readers.

Monitoring Mogadishu

The deployment of U.S. forces to aid food distribution in Somalia has gotten underway. While *MT* solicits your reports of active frequencies as events unfold, here are a few frequencies known to be used in this and similar engagements.

One of the most active military services at all stages of the operation will be the Air Mobility Command; they and other Air Force units use the Global HF System. Check out the following GHFS frequencies, particularly 11176 kHz. You may also refer to Larry Van Horn's feature on Air Force reorganization (September 1992) for more frequencies and procedures. All frequencies are in kHz (Upper Side Band).

4725	6738	8967
8993	11176	13201
15015	17975	

Air Traffic Control frequencies for Major World Air Route Area AFI-3 should also be especially busy. Mogadishu should be audible on 5658 and 11300 kHz from evening until morning in North America.

For Navy activity, check the HICOM (High Command Worldwide Voice Network) channels of 6697 and 11267 kHz.

Some clear traffic may come over the FLTSATCOM satellites, especially the 23 degree West comsat; check frequencies between 261.025 to 262.975 MHz every 25 kHz on narrowband FM.

Four Fundamental Frequencies for Fighting the Rural Fire

By Otto H. Muller

"Hamilton Fire..." and then a pause. I'm on my way into the house from the weeds in the backyard, racing up the stairs to the closet where I store my boots and bunker pants. Two tones come over the pager hooked onto my belt, and as the second one arrives its alert sounds. "Beep, beep, beep, beep... and through the beeps another pair of tones can be heard. These trigger the siren on top of the fire station, alerting the whole village to the presence of an emergency.

By the time the text of the message is coming over, I am guiding my car down the street. "You are responding to a structure fire at the Hawley residence, on the River Road, a quarter of a mile south of Kenyon Road." I'm not really familiar with that spot, but I do know that it's 'way out in the boondocks.

Because my pager was monitoring the fire frequency, I heard that first little announcement for "Hamilton Fire," and that gave me the drop on some of my colleagues. A few are at the station already though, and I hear them answer up, "KCI 470 acknowledges that call."

I catch the second truck out of the station—the Rescue Truck. "Fire Control, One-Nine-Five out of service," is how our driver tells the dispatcher that we are under way. In our county each town has a two-digit identifier. Hamilton's is "19." The third digit indicates the kind of truck: the Chief is O; pumpers are from 1 to 4; rescue trucks are 5; tankers, 6; ladder trucks, 7; utility vehicles, 8; and ambulances are 9. In Alfred, another village I run with, the village name replaces the first two digits, and the scheme for the third digit is different—there the chief is "Alfred-9."

Bob Grove, Fire Chief, Brasstown Fire Dept.

Nothing is more crucial to rural firefighting than locating a water supply.

Bob Grove, Fire Chief, Brasstown Fire Dept.

Four channels may not sound like much, but rural fire departments have learned to use them efficiently and effectively.

While donning my Self Contained Breathing Apparatus, I listen to our chief approaching the scene in his own vehicle. He's still over a mile out, but he can see the yellow-green smoke billowing up already, and he tells the County Dispatcher, "Smoke showing. Send a tanker from Earlville to the scene, and a pumper from Earlville to standby at our station. We'll also need a pumper and a tanker from Morrisville to stand by at their station at this time." The dispatcher confirms the request and then starts the process of toning out those two departments.

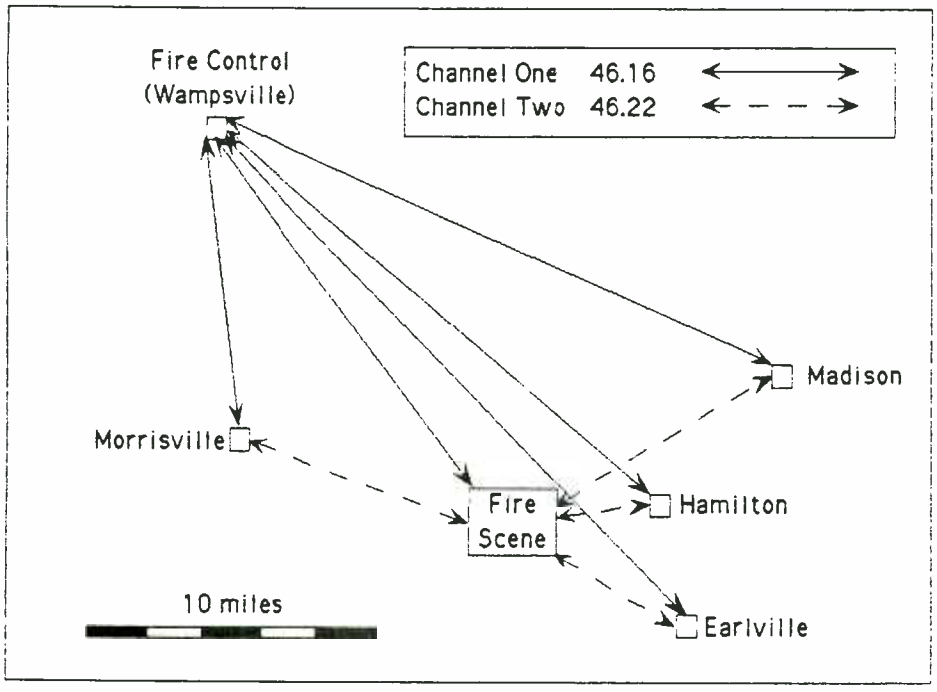
Communications with the dispatcher take place on Channel One, 46.16 MHz for us in Madison County. Our chief comes back to us on Channel Two, which is 46.22 MHz throughout New York State. "Take it easy when you come over the hill near Tom Fiser's farm," he warns, "his cows were crossing the road on their way back to the barn. He's trying to clear the way for us..." Then, switching back to Channel One, he tells the dispatcher that he has arrived on the scene and that there is heavy smoke showing on the first floor of a two story wood residence.

The dispatcher repeats the message, tacking on the time. All transmissions on Channel One are recorded, which will let us review the incident later to improve our performance in the future, and so the dispatchers are constantly inserting the times in their messages.

The chief sizes up the situation at the fire scene. He knows he'll be short on personnel, as it is the middle of the afternoon on a weekday. He has only heard three trucks call out of service from Hamilton. So he calls the dispatcher and asks that the apparatus from Morrisville start moving towards the scene, and requests another tanker, this one from Madison. To protect *their* villages, the chiefs from Morrisville and Earlville request that other units from the surrounding area be put on standby for them, and soon the dispatcher is very busy on Channel One.

Preparing to Fight

Our chief has talked to the homeowners and has been assured that everyone has gotten out safely. His job now is to prevent the spread of the



fire, put the fire out, and preserve as much of the building as possible. He knows that the three most important things about rural firefighting are water supply, water supply and water supply, and he makes that his next priority.

There are two ways of moving water to the pumper he will be setting up at the scene: in hoses or in tanker trucks. If a pond, stream, or other body of water is reasonably close at hand, hoses can be stretched between the truck fighting the fire and another truck at the water. As the distance increases, however, frictional losses within the fire hose will reduce the flow rate.

One alternative would be to put another pumper in the chain, but usually, if the distance between the water and the fire is more than a quarter mile or so, a tanker relay is established instead. To do this a large, collapsible open water tank (called a "drop tank" or "portable pond") is set up right next to the pumper fighting the fire. That truck will drop a suction hose into this tank to obtain its water. The tankers will shuttle back and forth between a pumper set up at the water supply, which will fill them, and this water tank, where they will dump their loads.

The drivers of the various trucks communicate over Channel Two to coordinate the relays. A single pumper can put out 1,000 gallons a minute, or more, and can keep a fleet of 1500 gallon tanker trucks very busy—especially if it's a long way to water.

Before his first truck has arrived at the fire, the chief has decided where it should go, where the portable pond will go, and where the water supply pumper will set up to fill tankers. He contacts each of the arriving trucks on Channel Two, and makes their assignments clear. They, in turn, keep him aware of just where they are and when he can expect them.

Dispatching, traffic control, operations and emergency channels minimize the danger and speed response time.

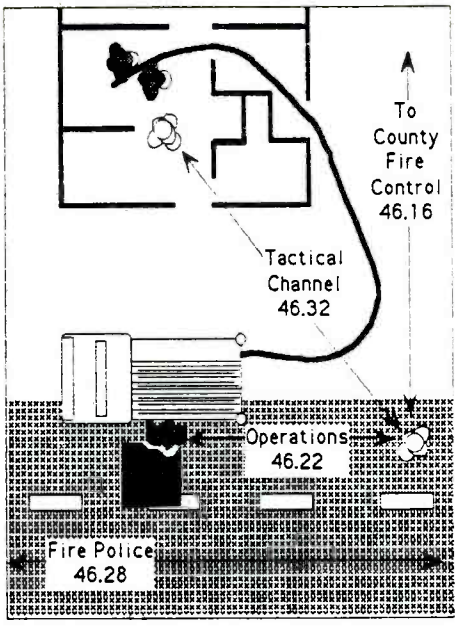
Harry Baughn

All of these trucks racing around on those country roads require a good deal of traffic control, and the Fire Police who provide this have their own frequency, 46.28 MHz in this county. In addition to the fire apparatus, there will often be ambulances, firefighters, electric linemen and others coming to the fire, and then the nor-

mal school buses, trucks and tractors that need to use the roads.

Much of the work of the Fire Police is similar to that of flagmen at a construction site. Coordinating it all requires a channel which can be used freely without interfering with chiefs and dispatchers. The officer in charge of the Fire Police, of course, will have a portable with Channel Two capability so that contact with the chief can be maintained.

My truck pulls in just after the initial attack pumper, and we stumble out, awkward in all of our turnout gear. We come off the trucks with tools in hand. For the officers, the essential tool is a portable radio. A channel reserved for dangerous situations at the fire scene is the Tactical



Channel, which in Madison County is 46.32 MHz. Very much like a lifeline, this frequency is kept in reserve so that it will be available when needed. It is disconcerting to think about a firefighter in trouble, who may be unable to get a cry for help heard through all the clutter of a standard fire channel. So the only people who should be using it are those in harm's way.

Going In

I might think about the danger as my buddy and I drag a hose line into the rear of that house, but that isn't my job—that's up to the officer with the portable radio in his pocket. He will be able to talk with the chief and connect us on the inside with those on the outside—with nobody else interfering.

The room we enter is pretty warm. There are flames licking up the door jamb from the adjacent room, and the smoke is banking down several feet from the ceiling. We move quickly into that next room and start spraying water. The fire darkens down, but steam fills the room, reducing visibility still further, even next to the floor.

Our officer gets in touch with the chief to check on how ventilation efforts are progressing. He contacts another team, also using the Tactical Channel, which has gone to the roof. Apparently they're working hard to cut a hole in the roof, and should be through soon. We sit tight for a minute or two, and then watch the room clear dramatically as the vent hole is opened and the smoke and hot gases make their way outside.

We move on to the next room, and are well on our way to knocking down the fire when our officer gets bad news on his portable. Something's gone wrong; a truck has been delayed, and the portable pond has only a little water left in it. Time to retreat. But at least we found out by radio, and not by experiencing that sick feeling which comes from losing water pressure in a hose you've been depending upon! Our retreat is calm and rational, but sad. We were doing so well...

Once outside, we watch with dismay as the sodden, charred wood in the rooms we'd reclaimed heats up and beings to burn again. But luck is on our side this time, as two full tankers suddenly appear. An hour later the fire is out, doused as fire has been for centuries—by large quantities of water. "Putting the wet stuff on the red stuff," as some firefighters are fond of saying.

The System Setup

Today the role of radio communications is crucial in getting the people and equipment to the fire, and in improving the safety and efficiency of the operations once they are there. The four frequencies in use have four different purposes and three different intended ranges.

Channel One is county wide and should be used only for communications with Fire Control. The dispatchers there have a big transmitter with a high antenna capable of reaching the whole county, even under adverse conditions. Some counties with rugged topography will set up repeaters for their main channels. Channel Two (sometimes called "Operations" or "truck-to-truck") is intended to reach a dozen miles or so, and permit communication between the different units involved in the effort and their base stations. Truck radios are mobile units with low antennas and hence somewhat restricted ranges. Fire police and firefighters at risk have two additional frequencies, and use portables with very little range.

Scanner enthusiasts will do well to learn what system is used in their county to identify fire apparatus. Then, by monitoring the dispatch channel (our Channel One), they can stay informed about what activities are going on throughout their county.

If an incident develops within a few miles of their location, it is probably a good idea to start monitoring Channel Two, also. It is here where much of the interesting information is being passed back and forth. Then, from the comfort and safety of their homes they can piece together a reasonably accurate picture of how the fire is being fought. If the fire is very close, they might try the other channels—bearing in mind that the usefulness of these channels comes in a large part from the fact that they are mostly vacant.

You should be able to learn about most of the standard operating procedures (SOP's) in your area from listening to your radio. Unlike law enforcement, the Fire Service has little need for secrecy, so nearly all transmissions are easily understood. To really appreciate what you hear, though, and to develop an understanding of the tactics and strategies involved in firefighting, nothing beats "hands-on" experience—the kind you can get in most rural areas of the country by joining a volunteer fire department!

MT

After the Fire

Scanner listeners traditionally have an interest in fires. But if you can't join the action by joining a local fire department, you can still find ways to volunteer your help. Don Griffin, a subscriber from Troy, NY, told us about a group formed to provide assistance to burned-out victims of house fires, especially in rural or small-town areas where other agencies may not be active.

After the Fire acts on cases referred to them by five local fire departments. It distributes a simple pamphlet advising the family on safety matters, and gives them some first steps toward putting their lives back together by suggesting who they need to notify, what documents should be replaced, etc. They also help locate basic necessities to help the family through the first few traumatic days.

If you'd like to get some ideas on starting a similar group, send a self-addressed stamped envelope to *After the Fire*, c/o Don Griffin, 508 3rd Avenue, Troy, NY 12182.

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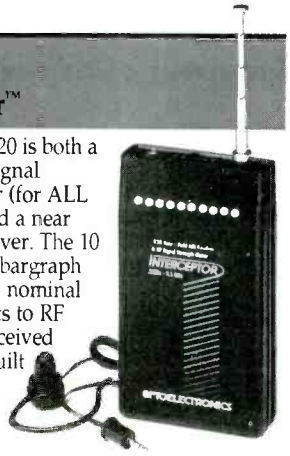

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Welcome to the Voice of Free China

Spotlight on Michelle Wu

By Stephen R. Hunter

"Hello, dear listeners. This is Michelle Wu speaking to you from the Voice of Free China with another edition of *Science, Technology and Medicine*. Today's program is 'War, Technology, and the Human Race.'"

And so begins another interesting program segment from the Voice of Free China by one of its newest voices, Michelle Wu. Michelle was reporting to the shortwave audience on the topic of the month—various viewpoints relating to war and the human race. Another recent program concerned the differing views of leading educators on the wide gap between National defense technology and industrial technology.

I have "spoken" to Michelle many times by way of letters. In her letters she expresses many ideas on shortwave broadcasting. She says, "It is difficult to envision an audience out there, when one sits in a closed studio. However, your letters have made a world of difference."

Shortwave listeners will find this philosophy is common to all broadcasters at the English Services of VOFC. Michelle feels that her job as a broadcaster "has linked her up to a new world." Listeners from all over the world write in, reminding her that "we live in a global village."

Michelle says that she sees herself as an "intercultural communicator—bridging cultural gaps, and building friendships on the air." Her goal is to continue this link—"to link Taiwan up with my friends" in the shortwave listening world.

Besides *Science, Technology and Medicine*, Michelle co-hosts *Mainroads and Byways* with Wendy Yu, Paula Chao, and Philip Wang and *Trends* with Wendy and Paula. Last summer, Michelle began a brand new program, *Reflections*, which is a program on Chinese literature. She also produces *Music Box* with selections of new records popular in Taiwan. (See schedule for further programming details.)

Michelle has been on the VOFC English language staff for a year and a half. She has a B.A. from the Department of Foreign Language and Literature at National Taiwan University and an M.A. from the Graduate Institute of Translation and Interpretation at Fu Jen Catholic University. In June of 1991, Michelle concluded her studies qualifying her to translate English and Mandarin Chinese. Looking through the classified ads led Michelle to call her friend Jade Lim, who is the manager of the English staff. Sure enough, there was a vacancy at VOFC.

Michelle also loves to travel. Being the daughter of a diplomat, she has visited more than 17 countries in Asia, Scandinavia, Western Europe, North America and Africa. She considers herself a "citizen of the world"; the thing she detests most is bigotry. It was the thought of reaching out to millions of SWLs all over the world that decided her to accept the position at the VOFC in June 1991.

Besides traveling, Michelle loves photography, movies, literature, art, swimming and snorkeling. She also collects postcards. I might add that VOFC gives some of the most exquisite and colorful QSL cards in the world. Also look to receive some unique gifts and station souvenirs for English verification reports—but more on that later.

The VOFC English staff — back row: Stephen Burstein, Philip Wang, Isaac Kuo and Michael David Roffman; front row: Wendy Yu, Michelle Wu, Jade Lim and Paula Chao.

Preparing a Shortwave Program

In her letters Michelle shares some of her insight into creating a shortwave program. The news can be heard at the top of each programming hour. It frequently crackles with the tension set up by the divided nature of China today—separated physically by the straits of Taiwan and ideologically as well. After the news a wide variety of programming is available covering everything from favorite Taiwanese recipes to the invention of gunpowder.

What makes these 15 minute segments so varied and interesting is the creative flexibility of the program hosts. Among her many duties,

Michelle writes her own scripts, records, edits, and samples music, collects data and does her own research for all of her stories. She also translates Chinese literature into English for the *Reflections* program.

Michelle briefly describes how she prepares one of her programs. During a recent edition of *Science, Technology and Medicine*, she presented listeners with a detailed story recounting the discovery by the Chinese around 850 A.D. of how to make gunpowder. How did she come up with that topic? She says, "Since *Science, Technology, and Medicine* is really unfamiliar territory for me, I keep my ears and eyes open for anything interesting while skimming through magazines and newspapers, and watching TV. When something strikes my interest, I start looking for material and calling people up for information. Then I start writing the script or interviewing people. During this time, I also listen to music intentionally—that is, if the music strikes a chord, I note it, and try to bring it into the program." Each of Michelle's programs is periodically punctuated with beautiful pieces of Chinese music.

Listeners can obtain a wealth of information not only about the ROC, but about the world...

Listeners can obtain a wealth of information not only about the Republic of China (ROC), but about the world, by listening to these thoughtfully produced and detailed programs.

The VOFC is fairly unique in its responsiveness to listeners' desires. Recently, Michelle sent out over 1000 questionnaires in an effort to determine what subjects are most on SWLs' minds. All the broadcasters at VOFC have a similar creative autonomy over their program content.

DXing at the VOFC

There is as yet no DX club at the VOFC. According to a recent listeners' survey there is a real desire for one. Sangean has been providing basic shortwave information to DXers in Taiwan. However, of interest to regular listeners is *Radio Corner*, recently taken over by Wendy Yu. Wendy says that she is considering starting a DXer's club as soon as she learns the ropes. *Radio Corner* deals with many different radio related topics. One recent program, for example, discussed the "HF" radio scene, including the future of shortwave listening in Taiwan. *Radio Corner* can be found at the end of *Mailbag Time*. Refer to the programming schedule at the end of this article for times and frequencies as well as a list of all programs.

Reception reports at the VOFC are very important, and QSLs are sent out for every English report. Also expect to receive multi-colored stickers, an issue or two of their fine monthly publication, and a copy of the *Free China Journal* newspaper as well as an occasional unique souvenir. For instance, during the recent survey all listeners who completed a questionnaire received an inflatable world globe with "Voice of Free China" lettered inside.

When letters arrive at the station, they are first sorted by language. Each listener is assigned a computer code and return address labels are typed up. The English letters are given to Jade who looks them over for general content. If a letter is addressed to an individual broadcaster it is given to them. Station broadcasters personally answer all their own mail. Letters addressed to the station are given to Vicky, a part-time worker who fills out the QSLs and takes care of the mailing list.

Michelle says that DXers from the U.S. usually give the most detailed reception reports, although she says there is a trend toward commenting on program content versus reception quality. All reception reports should be mailed to the Voice of Free China, P.O. Box 24-38, Taipei, Taiwan, Republic of China. Listeners in North America may send to P.O. Box 192793, San Francisco, CA, 94119-2793.

The Staff at VOFC

And now let's introduce more of the staff in the English division at the VOFC. Jade Lim, who has been with the station more than ten years, is in charge of programming, distributing work, assigning studio hours and coordination—she's the boss. She has a M.A. in journalism from Northwestern University. She currently hosts *Kaleidoscope, Mailbag Time, Jade's Kitchen and Starlight.*

Philip Wang (four years) edits the news and produces *Horizons*, which very often has interviews with noted politicians or important government officials. He also cohosts *Main Roads and Byways.*

Chris Galati (two years) had been helping edit and read the news, hosting *Sportsbeat* which frequently had discussions on the Major Taiwan Baseball League as well as on American baseball and *Live Concert* which, as it sounds, had generous excerpts from concerts done by well known Taiwanese singers. Unfortunately for listeners, Chris has moved on to a new career in finance. He was replaced by the returning Steve Burstein who will host *Economic Journal.*

Wendy Yu (two years) has a background in engineering and anthropology, went to college in

Voice of Free China English Program Schedule

(Effective from September 27, 1992 - March 28, 1993)

A.N.: Australia & New Zealand CA: Central America E: Europe J: Japan NA: North America SEA: Southeast Asia

UTC Time	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	Freq/Meters (Service Area)
0200	News Main Roads & Byways Mailbag Time Radio Corner*	News Perspectives Reflections	News Kaleidoscope Intercultural Music City	News Journey into Chinese Culture Taiwan Economic Journal	News Horizons Jade Bells & Bamboo Pipes	News People Music Box	News Trends Jade's Kitchen	9680/30.99 (NA) 5950/53.09 (NA) 15345/19.60 (J.NA) 11860/25.3 (SEA) 11740/25.6 (CA)
0300	Let's LearnChinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	9765/30.7 (A.N.)
0300	News Trends	News Main Roads & Byways Mailbag Time Radio Corner*	News Perspectives Reflections	News Kaleidoscope Intercultural Music City	News Journey into Chinese Culture Taiwan Economic Journal	News Horizons Jade Bells & Bamboo Pipes	News People Music Box	9680/30.99 (N.A.) 5950/53.09 (N.A.) 15345/19.6 (J.N.A.) 11745/25.5 (SEA)
0400	Jade's Kitchen Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	9765/30.7 (A.N.)
0700	News Main Roads & Byways Mailbag Time	News Perspectives Reflections	News Kaleidoscope Intercultural Music City	News Journey into Chinese Culture Taiwan Economic Journal	News Horizons Jade Bells & Bamboo Pipes	News People Music Box	News Trends Jade's Kitchen	5950/53.09 (NA)
0800	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	
2200	News Main Roads & Byways Mailbag Time	News Perspectives Reflections	News Kaleidoscope Intercultural Music City	News Journey into Chinese Culture Taiwan Economic Journal	News Horizons Jade Bells & Bamboo Pipes	News People Music Box	News Trends Jade's Kitchen	9850/30.45 (E) 11915/25.17 (E)
2300	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	Let's Learn Chinese	

* Last Sunday and following Monday of the month.

the U.S. and was an exchange student in England. She hosts *Jade Bells and Bamboo Pipes*, *Journey into Chinese Culture*, and *Radio Corner*. Wendy also co-hosts *Mainroads and Byways* and *Trends* with Michelle who has been with VOFC for a little more than a year.

Isaac Kuo hosts the final 15 minutes of each program hour, *Let's Learn Chinese*. An accompanying study book is available free from the VOFC.

And last, but not least, is Paula Chao who joined the staff in December 1991. Paula was born in Taipei of Chinese parents from the mainland. She has worked with the BCC as an intern translating letters from English into Chinese. She has also worked as a bilingual tour guide at the National Palace Museum in Taipei. Paula has a masters degree from UCLA in the United States. In addition to reading the daily news, Paula will host *Journey Into Chinese Culture* by herself. She will take turns hosting *Trends* and *Mainroads and Byways*.

A Quick Tour Through Time

The Central Broadcasting Station began international broadcasts in 1932. The CBS preceded the current Broadcasting Corporation of China (BCC) which came into existence in 1948. The Voice of Free China embarked on broadcasting to the world the next year on October 10, 1949 in Mandarin, English and Amoy. October 10 is National Day of the ROC. The country was founded on this day—popularly called "double tens"—in 1911.

Today the VOFC beams programs worldwide in ten foreign languages (English, French, German, Spanish, Japanese, Korean, Thai, Indonesian, Vietnamese and Arabic) and five Chinese dialects (Mandarin, Amoy, Cantonese, Hakka and Chauchow).

There are seven shortwave transmitting stations beaming programs in three directions using over 2,300 kilowatts. Transmissions to the West arrive via WYFR Family Radio Station in Okeechobee, Florida. In April 1990, the VOFC entered into a licensing agreement with C-Span to air English programs for one hour a day, seven days a week on its Audio 1 network.

The status of the VOFC is currently in a state of change primarily because of the situation of a separated China. Shortwave broadcasting is very important in establishing Taiwan's place in the international arena and plays an important role in working toward the eventual reunification of China by keeping communications open between the two sides of the Taiwan Strait.

The VOFC is currently under the Broadcasting Corporation of China, as it has been since 1948. The BCC is a private radio broadcaster which is owned by the ROC's ruling party, the Kuomintang. The BCC is commissioned by the ROC government to produce programs aired by the VOFC.

However, the ROC is looking into the possibility of combining the BCC's Department of International Services with the Central Broadcasting Station to form the National Broadcasting Corporation. This is currently only a draft proposal and has been passed by the Executive Yuan. The Legislative Yuan has yet to review the proposal.

Should the draft proposal be approved, the VOFC would become a public radio station similar to NHK or the BBC.

Immediately after the station relay ID is heard at the top of each hour ("WYFR, Okeechobee, Florida"), listen to the beautiful sounds of the National Anthem of the Republic of China. Then sit back, relax and prepare yourself for a journey into Chinese culture unlike anything you have ever heard before. Good listening to the Voice of Free China. MT

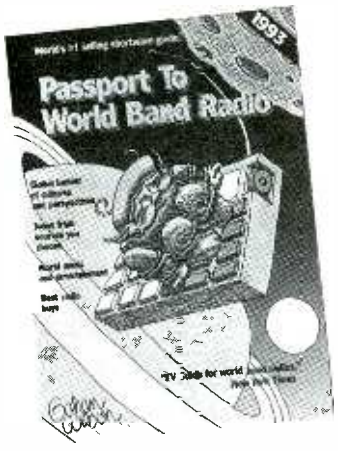
The author thanks the English Department at the VOFC, especially Michelle Wu, for their assistance in writing this article.

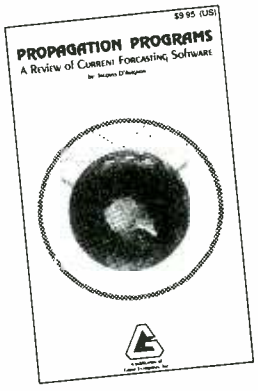
Since this article was written, Michelle Wu accepted a university teaching post and is no longer a full-time staff member. However, she continues to produce the weekly Reflections program, having found it, "impossible to say good-bye and to make a 'clean break' from the place and this job I love so much."

MT subscribers/contributors Stephen Hunter and Gigi Lytle were among those Michelle thanked publicly for their friendship.

Here's the way to start your New Year

Just Right!





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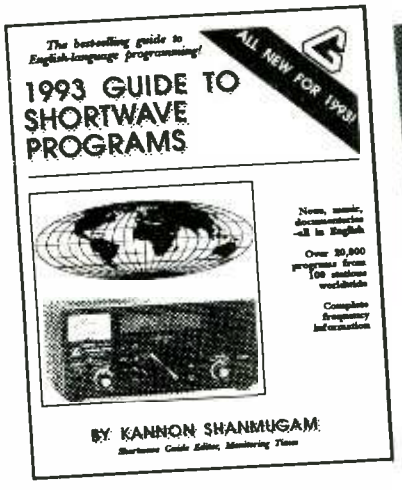

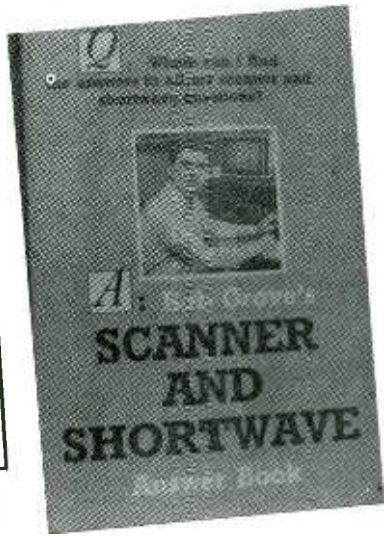

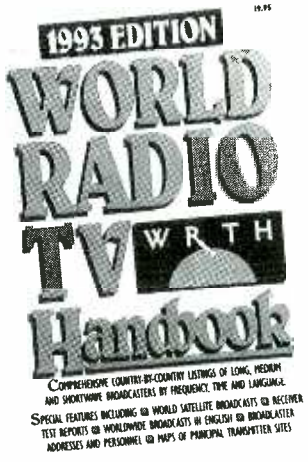

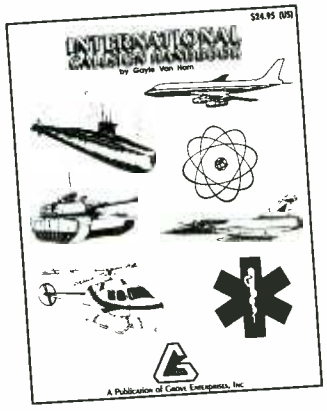

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DXing VHF Low Band Skip

How to Hear Distant Stations Between 30 and 50 MHz

By Brian Webb

Imagine listening to a police man-hunt on the other side of the country, a cordless telephone conversation from Central America, or a real estate company in Argentina. Far fetched? Not at all. Of the entire radio spectrum, few parts are more interesting than the VHF low band. Lying between 30 and 50 MHz, this region can combine the local communications heard on the higher bands with the long range reception of shortwave. DXing this band is easier than you think. All you need to get started is some basic information.

Propagation

An important ingredient for successful VHF skip DXing is an understanding of radio wave propagation. Between 30 and 50 MHz, radio signals are propagated long distances by two different means: F_2 and Sporadic-E.

F_2

The primary medium for long distance low band reception is the F_2 layer of the ionosphere. This layer is created by solar radiation and is found on the daylight side of the earth between altitudes of 200 and 250 miles (322 and 402 km). The highest frequency that the F_2 layer is capable of propagating is called the maximum usable frequency (MUF). The F_2 layer's MUF is influenced by the **time of day**, **solar activity**, and the **season**.

The F_2 region's ionization and the MUF are at their minimum before sunrise. As the morning progresses, the F_2 layer's ion density and the MUF increase, reaching their maximum value around noon. During the afternoon, the F_2 layer's ionization and the MUF decrease.

The daily peak F_2 MUF is heavily influenced by solar activity. When the 11-year solar cycle is at its minimum, the daily peak MUF is approximately 17 MHz. As solar activity increases, the daily peak MUF rises. Eventually, about two years before the peak of the cycle, the daily peak MUF will reach 30 MHz, making long distance VHF reception possible. During the peak of the cycle, the daily peak MUF can reach 70 MHz.

As the solar activity declines, so does the daily peak MUF. About two or three years after the peak of the cycle, the daily peak MUF will drop below 30 MHz, making the VHF low band unusable for long distance DX reception. The solar activity and F_2 MUF decline until the minimum is reached and the next 11-year cycle begins.

VHF F_2 reception also varies according to the season. During the late spring and early summer, F_2 propagation above 30 MHz is scarce and much of the time the band appears to be dead. Conditions are better in the mid-spring and mid-summer when a small number of stations can be heard. Virtually all of these stations are from a zone between 30° north to 30° south of the equator. North American DXers will hear stations from Florida, the Gulf Coast, southern Texas, Mexico, Central America, the Caribbean, and the northern half of South America.

Around the time of the spring and autumn equinoxes, reception from a zone extending from 45° north to 45° south latitude becomes possible. Listeners in North America will hear a mix of U.S. and Latin stations (the equinoxes produce the best conditions for hearing Latin America). At the same time, very long transequatorial signal paths can occur, allowing reception of stations halfway around the world. North American DXers should be alert for morning openings to southern Africa and afternoon openings to Australia and the South Pacific.

From mid-autumn to mid-winter, the reception footprint moves into the winter hemisphere, and the F_2 MUF is the highest. Although transequatorial propagation is still possible, most of the stations heard are from a zone extending from the equator to the sub-arctic.

The minimum distance from which a VHF signal can be heard via F_2 varies with the frequency. This is a result of the propagation geometry (Figure 1). Local VHF stations are usually heard out to a range of 50 miles (80 km). Fringe stations are sometimes audible out as far as 150 miles (241 km). Extending from 150 miles (241 km) to beyond 1,000 miles (1,609 km) is a dead zone from which F_2 reception is not possible. Signals from this zone penetrate the F_2 layer at angles too steep to be refracted earthward. As the distance from the receive site is increased, the inside edge of the DX zone is reached. This represents the minimum distance that a signal can be heard via F_2.

At 30 MHz, signals can be heard via F_2 no closer than about 1,200 miles (1,931 km). As the frequency is increased, the inside edge of the receive zone moves farther outward. At 47 MHz, this distance increases to 2,100 miles (3,379 km). Let me clarify this concept with a real world example: From my location in southern California, I can hear stations on 30 MHz from the entire eastern half of the U.S. Up at 47 MHz, however, I can only hear stations from the east coast and Appalachia (PA, SC, NC, FL, CT, DE).

Yet another factor that influences VHF F_2 reception is the DXer's latitude. The length of the F_2 season, daily peak MUF, and consistency of reception all decrease the further the listener is located from the equator. This can be illustrated by comparing my observations of the 1991-1992 VHF F_2 season with those of Max Van Arnhem. My receive site is located at 34° north. During the last F_2 season, I received skip for a 10 month period (from late September to late April). The observed daily peak MUF was almost always above 39 MHz and on several days it was above 47 MHz. F_2 reception was consistent; skip was heard almost every day between September and March.

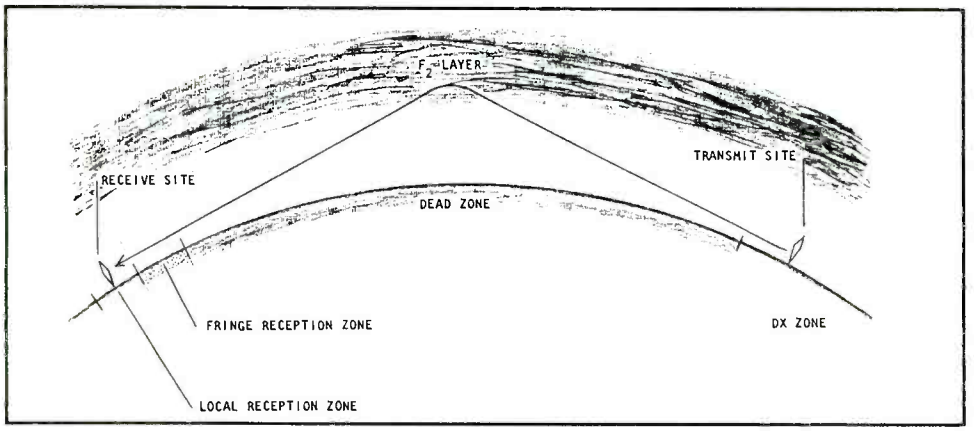


Figure 1: F_2 propagation geometry and reception zones.

Van Arnhem, who is situated at 52° north, noted different conditions. His F_2 season was only 7 months long (from late September to late April), his observed MUF was usually 5 MHz lower than mine, and his reception was much more erratic. In a letter he wrote: "This season, daily variations in the MUF are very great ... there are days without F_2 skip ... while sometimes the MUF is as high as 44 MHz."

Another interesting phenomenon is that F_2 skip is better heard from certain directions compared to others. Over the equator and the tropics, the F_2 layer exhibits the least seasonal variations, is the most immune to solar flares and geophysical disturbances, and exhibits the highest MUF. As you move away from the equator, the F_2 is more influenced by seasonal, solar, and geophysical effects. In addition, the MUF decreases. Thus, for DXers in the temperate latitudes, signals are best heard from the direction of the equator and worst from the direction of the pole (the north pole for listeners in the northern hemisphere and the south pole for DXers in the southern hemisphere).

For North American listeners, signals will be heard best from the south. Immediately before and after the annual mid-year F_2 blackout and during periods of disturbed propagation, virtually all of the stations received will be from Caribbean and Latin America. When F_2 propagation is good, the highest MUF, longest signal paths, and best signal strengths will be towards the southeast, south, and southwest. Conversely, reception of stations from the sub-arctic and arctic is uncommon and transpolar VHF propagation is rare.

Listen Up: There's Little Time Left

Now that we've gone over the dynamics of F_2 propagation, information on when to listen is in order. As mentioned earlier, solar activity needs to be high for VHF F_2 reception to occur. Unfortunately, the current solar cycle reached its peak a few years ago and solar activity is on the decline. This means that DXers in the temperate latitudes have only two more VHF F_2 seasons remaining. The approximate starting and ending dates of these seasons are listed in Table 1.

Table 1: VHF F_2 Season Beginning and Ending Dates

1992 - 1993

DXer's Latitude (°N)	Begins	Ends
35	September 7	April 7
45	September 21	March 21
55	October 21	February 21

1993 - 1994

DXer's Latitude (°N)	Begins	Ends
35	October 21	February 21
45	November 21	January 21
55	---	---

Since VHF F_2 reception is a daytime phenomenon, do all of your F_2 DXing during the day. Some F_2 skip should be present, especially at the lower end of the band (between 30 and 34 MHz). Experiment and listen at different times of the day. Besides hearing new stations, you'll also get familiar with how VHF F_2 skip works. Certain areas are heard best at specific times. The optimum time to hear various areas is summarized in Table 2.

Table 2: Optimum Times for Various DX Target Areas

Target Area	Optimum Time
>5,000 miles (8,045 km) east	Sunrise to mid-morning
1,800 to 2,600 miles (2,896 to 4,183 km) east	Mid-morning to noon
Directly north or south	Late morning to early afternoon
1,800 to 2,600 miles (2,896 to 4,183 km) west	Noon to mid-afternoon
>5,000 miles (8,045 km) west	Mid-afternoon to sunset

Sporadic-E

VHF low band signals are also heard over long distances via Sporadic-E propagation (also written as E_s). E_s is the result of patches of ionization that form just below the E-layer of the ionosphere. These clouds of ions are dense and occur at altitudes between 50 and 60 miles (80 and 97 km). With diameters between 50 and 100 miles, these ionized patches tend to move towards the west or northwest at speeds between 150 and 250 miles (241 and 402 km) per hour.

The ion density of Sporadic-E clouds is often very high. This leads to observed MUFs well above 50 MHz. E_s propagation is occasionally present in the 2-meter amateur band and has even been noted as high as 223-225 MHz band. Another consequence of this very high ion density is low signal path loss and very strong signals. It's not unusual to hear a station more than 1,000 miles (1,609 km) away exhibit a stronger signal than your local stations.

Unlike F_2 propagation, which allows DX to be heard from a vast area, E-skip reception is much more limited. Although multi-hop Sporadic-E propagation does occur, most E-skip is the result of a single bounce. This, combined with the fact that E_s ionization occurs at relatively low altitudes, limits the maximum range of most E-skip to about 1,300 miles (2,091 km). The minimum distance that signals can be heard via Sporadic-E is about 225 miles (362 km) at 30 MHz and 375 miles at 50 MHz.

The small diameter of E_s clouds further limits the area from which DX can be heard. Sometimes Sporadic-E skip is only heard from an area as small as the state of Kansas. From my listening post in southern California, I usually only hear one or two areas at a time such as northern Texas, Kansas, or the Washington-Oregon-Idaho region.

As mentioned earlier, Sporadic-E clouds tend to drift at high speed towards the west and northwest. This movement has two interesting effects on low band reception. First, the strength of a received signal can go from weak to very strong and back to weak in the course of an hour. In addition, the area being heard often changes. A DXer in California might hear low band stations from Texas in the morning, Colorado in the early afternoon, and Oregon in the evening.

The times at which E-skip appears and the lengths of the openings vary with the DXer's latitude. In the equatorial region, Sporadic-E can appear at any point of the 11-year cycle, in any season, and at any time of day or night. The openings last from several hours to an entire day.

At temperate latitudes, Sporadic-E openings occur each year, regardless of the solar activity. About 80% of the E_s openings occur in the late spring and early summer with peak activity during the four week period centered on the summer solstice. During the mid-year Sporadic-E season, skip can materialize at any time of day, but it's most common in the late morning and early evening. A minor E-skip season also occurs around the winter solstice with most (but not all) openings in the evening. In the temperate regions E-skip openings last from several minutes to an hour.

At the high latitudes and in the polar regions, Sporadic-E is limited to the years of moderate and high solar activity. The openings occur during the night time hours of the spring and autumn and last from several minutes to an hour.

Important indications of Sporadic-E to watch for are changes in television reception on the channels between 54 and 88 MHz (channels 2, 3, 4, 5 and 6 in the Americas). Look for video on normally empty channels, images superimposed on your local station's picture, or your local station's video appearing to pulsate. If you see any of these signs, go to your scanner and check the 30-50 MHz band for E-skip.

Table 3: U.S. Non-government Frequency Allocations

30.580 - 31.980
33.020 - 33.980
35.020 - 35-980
37.020 - 37.980
39.020 - 39.980
42.020 - 46.580
47.020 - 49.580

Table 4: U.S. Military and Government Frequency Allocations

30.000 - 30.550
32.000 - 33.000
34.000 - 35.000
36.000 - 37.000
38.000 - 39.000
40.000 - 42.000

Equipment

Contrary to popular belief, you don't need a receiver like an R-7000 and a log periodic antenna to hear VHF low band skip. Even a modest receiving setup should pull in a large amount of DX. There's a good chance that you already have all of the equipment you'll need.

Receiver: Any scanner that can receive the 30-50 MHz band will do. Although not critical, a large channel capacity is helpful, especially for ferreting out E-skip.

Antenna: Good VHF skip reception is possible with a relatively simple antenna. If you already have a scanner or shortwave antenna, it might work. You can test your existing antenna by listening between 30 and 40 MHz. If you can hear stations more than 20 miles (32 km) away, your existing antenna will probably suffice.

If your existing antenna isn't up to the task, you can make a simple indoor VHF low band monopole. This type of antenna is easy to make and should work well as long as the surrounding walls are transparent to RF. Cut a piece of hookup wire to a length of 7 feet 3.75 inches (2.22 m) and solder the end to an RF connector. Plug the connector into your radio's antenna jack and then orient the monopole so that it's more or less vertical. Then use a nail or push pin to affix the end to the wall.

Cassette Recorder: This is an essential piece of equipment for catching CW station IDs, station callsigns, place names, and other information needed to identify a station. A cassette recorder also allows you to save your best DX catches for posterity. Your recorder should have jacks for mic, remote, and earphone as well as a tape counter.

The recorder should be connected directly to the receiver via a patch cord. An earphone or speaker should be plugged into the earphone jack to allow monitoring while the unit is recording.

Timer: A useful accessory is an electronic timer. You can use a timer to activate your cassette recorder when you're away from home and record skip for later playback.

Frequencies

The topic of which frequencies to monitor is too broad to be discussed in detail here. For the newcomer I would suggest beginning by hunting for U.S. skip. My advice is based on the fact that the U.S. probably has more 30-50 MHz stations than any other country, they're widely heard (at least as far as Europe via F_2), and they often identify themselves. U.S. VHF low band activity is concentrated into the sub-bands listed in Table 3 (frequencies in MHz).

The sub-bands listed in Table 3 are used by business, police, fire/paramedics, local government, etc. All of the channels are spaced in 20 kHz steps (i.e. 35.020, 35.040, 35.060 MHz, etc).

U.S. Military and other government communications can also be heard. These stations are mostly found in the sub-bands listed in Table 4 (frequencies in MHz):

The U.S. military tends to use channels that are spaced in 50 kHz steps (i.e., 34.000, 34.050, 34.100, 34.150 MHz, etc.). These sub-bands also contain stations operated by other government agencies such as the U.S. Fish and Wildlife Service (34.830 MHz). Since the above segments of the 30-50 MHz band contain relatively few U.S. stations, they're free from interference and serve as windows for foreign DX. Because foreign stations can appear on just about any frequency, scan these sub-bands in 5 kHz increments.

You can increase the amount of skip that you hear by intelligently selecting the frequencies that you monitor. Choose frequencies that will be below the expected MUF. Since the F_2 MUF varies with the 11-year solar cycle and solar activity is declining, select frequencies between 30-43 MHz during the current (1992-1993) F2 DX season and 30-36 MHz during the 1993-1994

season. When searching for Sporadic-E, which often propagates signals above 50 MHz, you may choose frequencies from throughout the 30-50 MHz band. It's also important to select frequencies that are free of local stations. This prevents your radio from locking onto locals while scanning and keeps you from wasting your time trying to identify a local.

When choosing frequencies, give preference to those that have a high volume of radio traffic. These would be U.S. business, special industrial, fire, police, and special emergency (ambulance) frequencies. Be sure to avoid frequencies that are allocated only for mobile or low power use. These frequencies tend to be quiet and rarely have any signals strong enough to be heard clearly. Information on U.S. frequency allocations can be found in the back of any *Police Call* frequency directory in a section titled "Consolidated Frequency Tables."

The more frequencies you search, the greater your odds of finding skip. If your scanner has the channel capacity, (or if you have a second radio), you can also program in the frequencies used in the U.S. for forest products, petroleum production, telephone maintenance, power and utilities, motor carrier (trucks and buses), highway maintenance, local government, forestry conservation, and paging. If you still have channels left that you want to fill, program in U.S. military frequencies.

Monitoring Techniques

Single Frequency Monitoring: This method involves continuously monitoring a frequency for at least 30 minutes and listening for voice and CW station IDs. You can either monitor the frequency in person or record the received signals while you're away from home for later playback.

Search Between Limits: This technique uses a scanner's ability to search between two frequencies. It's a simple way to locate skip and determine the MUF. When using this method program your radio to search in 5 kHz steps.

Limited Channel Search: This method calls for programming your radio to scan all of the clear channels in a limited portion of the 30-50 MHz band or to only scan the channels used for a specific purpose. For example, you could scan the channels of the 33.420 - 33.980 MHz fire/paramedic sub-band or the low band channels used exclusively by the U.S. Coast Guard.

Extensive Channel Search: This approach is a rapid scan of 200 or more clear channels between 30-50 MHz. When used for F_2 DXing, it enables you to easily find skip and determine the MUF. It's also the best way to hunt for Sporadic-E openings. During E-skip season you can use your radio as an Es alarm by letting it operate in this way for extended periods.

These advantages, however, come at a cost. You'll need a radio with at least 200 channels and be willing to dedicate them to low band DXing. It will also be necessary to carefully select the frequencies to be scanned and then load them one by one into your scanner. Once you begin scanning, you'll find that several of the channels that you believed to be clear are used by local stations. As each of these occupied channels is found, you'll have to replace it with another clear frequency.

Useful Tips

• As mentioned earlier, many U.S. low band stations identify themselves. The majority of the IDs are a verbal recital of the station's callsign by the base station. Stations operated by businesses sometimes ID when they are calling a mobile unit or at the end of a conversation. Since these IDs are unpredictable, be sure to have your cassette unit recording when you're listening to business and industrial stations.

Many police, fire/paramedic, and ambulance base stations identify themselves at the start of each hour (a few also ID on the half hour). At about 50 minutes past the hour, check police, fire, and ambulance frequencies for activity. If you find an active frequency, go back to it at 58 minutes past the hour, start your cassette recorder, and sit on the frequency for four minutes, to try to catch the ID.

Some stations identify themselves with an automatic Morse Code ID. Most of the time you'll stumble onto one of these IDs as you scan the band. If you don't hear the entire ID, or if it's too fast for you to copy, note the frequency and the time you heard it. Go back to the frequency an hour later with your tape recorder on; if you're lucky, you'll hear the ID again.

• Accurate record keeping is a simple way to enhance VHF low band DXing. Taking detailed notes of what you hear can help you produce higher quality loggings, identify what you hear, and DX more efficiently. When you intercept interesting radio traffic, write down the basic facts and anything that might assist you in identifying the station, such as the following:

- Frequency
- Date (UTC)
- Time (UTC)
- Mode (Narrow Band FM, AM, etc.)
- Type of signal (voice, voice and music, modulated CW)
- Type of propagation (F_2 or E_s)
- Language (English, Spanish, French, etc.)
- Accent (U.S. Southern, New York City-New Jersey, Mexican, etc.)
- Place names mentioned (Cherokee County, I-95, Avenida Juan Peron, etc.)
- Callsigns heard
- References to the local time
- Subject matter discussed

Maintaining lists is also helpful. Since I'm only interested in hearing skip, I try to avoid frequencies that are used by local stations. This is easy, because I keep a list of all locally used frequencies. I also maintain a list of clear frequencies which have distant stations that I haven't had a chance to log. It contains frequencies used by distant U.S. business and military stations and the frequencies on which Morse Code IDs have been noted.

Time to Get Started

F_2 skip is still feasible until February or April, depending upon your latitutde, so let's not waste any time recording and logging potential skip transmissions. In a second installment, we'll discuss how to identify those unknown loggings, how to build an outdoor VHF sloping dipole if your current antenna has not proven adequate, and we'll publish a selected list of logged and identified skip communications for your inspiration!

Meanwhile, I'd be interested in what you hear. Comments and questions are welcome at the following address: Brian Webb, P.O. Box 6484, Thousand Oaks, CA 91359-6484.

With GPS, The Future Has Arrived

By David Lewis

The NavStar Global Positioning System, or GPS, represents the ultimate integration of space, computer, and radio technologies. Essentially, GPS can provide extremely accurate position and velocity information very quickly anywhere on Earth. This is accomplished with the use of a group of high-orbiting satellites (the "constellation"), a ground-based control network, and portable and mobile receivers.

Developed and implemented by the U.S. Department of Defense (DOD) at a cost of $10 billion, the primary function of GPS for both military and civilian interests is navigation. Ever since humans have ventured into unknown territory, on land or water, methods of keeping track of where we are and where we are going have been of utmost importance. GPS is revolutionizing navigation in all segments of transportation, threatening other technologies with obsolescence.

If you have not already heard reference to GPS on your scanner, expect to shortly. All types of civil and military services are using GPS routinely to pinpoint locations more precisely than possible with any other method. Airborne firefighters, police officers, paramedics, Coast Guard rescue vessels, armed forces ground and air units, commercial and private pilots—this list is getting longer faster than it can be written.

How GPS Works

When completed, the GPS constellation will consist of 24 satellites, 21 continuously operational with three "on-line" spares. Each satellite carries radio transmitters and atomic clocks. The receiver on Earth calculates its position by analyzing the amount of time it takes for transmitted signals to arrive from the different satellites and then triangulating. Each satellite's radio signal consists of a complex code which is precisely synchronized with the other satellite signals. The atomic clocks, known for extreme accuracy, ensure that the signals do remain "in synch."

The transmitted code, known as "pseudo random code," is a long string of digital information which is continuously transmitted and repeated. Each cycle takes one week. A GPS receiver has this code "playing" along in its memory and as the satellite signals are received, incoming codes are sampled and compared to the receiver's reference code. Since radio signals travel at a finite speed, each satellite's signal arrives at a slightly different time and thus the

Lancaster County Engineering Department/GPS World

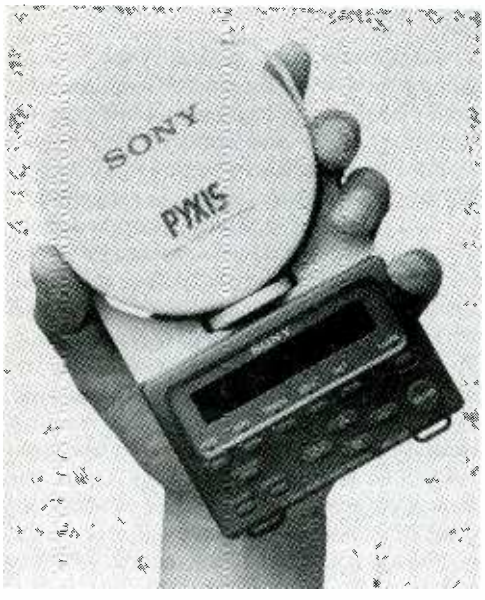
Global positioning systems are not only used for navigational purposes, but are being used to update land surveys.

David Lewis

One of the first widespread uses of GPS was for maritime navigation. Pictured is the Margaret Chase Smith Ferry of the Maine State Ferry Service

nodes, "in synch" as they leave the satellites, arrive slightly "out of synch." Microprocessor circuits in the receiver use these minute timing differences to compute the receiver's position relative to each satellite.

The satellites are also continuously transmitting information about their orbital positions. The GPS receiver combines this data with relative position calculations to provide a three



With the Sony Pyxis™ Global Positioning System you can have "the whole world in your hand."

How May I Use Thee?

Let me count the ways! Last year, *GPS World* magazine (P.O. Box 1965, Marion, OH 43305-2064; 614-382-0886) ran its first annual contest for the most innovative and important applications of GPS technology. The May issue published thirty-two distinct projects which used GPS technology either to do what had never before been possible, or to accomplish tasks in much less time and expense than with previous methods.

Navigation and surveying in difficult terrain such as the Great Barrier Reef in Australia, in the National Forests, or in remote areas of China or the Amazon comprised many of the projects. One prize winner uses GPS to track the location of ambulances that call for helicopter evacuation of severely injured trauma patients, enabling the helicopter to fly directly to the site instead of searching for recognizable landmarks.

Another winning usage involves the measurement of radiation patterns transmitted by television and radio antennas. With GPS a plane can fly in circular paths around the antenna, while antenna signal strength and the plane's position coordinates are being automatically recorded.

Mapping towns in Africa, charting new roads in Papua New Guinea or in environmentally sensitive regions of the U.S., pinpointing targets for data communications, finding lost hikers or soldiers in the deserts of Kuwait, finding a favorite fishing hole... the uses to which GPS has already been put seem endless. Time itself (as in the atomic clocks at WWV) uses GPS to calibrate the exact time. In 1987, AT&T first used the same kind of GPS-referenced timing to synchronize lines for digital telecommunications. Several U.S. airlines are testing GPS for use in navigation and landing systems.

The future has arrived indeed.

The JRC JLR-4400 Portable GPS features ultra-small design for portability.

dimensional position (latitude, longitude, and altitude) here on Earth.

The satellites orbit at an altitude of 10,900 miles and one complete orbit takes 12 hours. (For comparison, geo-synchronous communications satellites are over twice as high: 22,500 miles; and take 24 hours to complete their orbit to match the Earth's rotation). GPS satellites are in six orbital planes and are distributed such that at least four of them are "visible" from any point on Earth at all times. At the time of this writing, 19 of them are in orbit and functioning.

How GPS is Used

GPS was designed and built as a military system. The Persian Gulf War saw extensive use of GPS in positioning and navigation on land, at sea, and in the air; it also served as a major component in weapons delivery systems. As a military system it is more than living up to the potential envisioned when development was begun in the late 1970's.

A GPS receiver is most commonly used in combination with ("embedded" in) other electronics circuitry to accomplish a specific task. Consider the hand-held units offered now by several companies. These compact, self-contained receivers are also navigational computers: in addition to providing position information, microprocessor circuitry allows course and speed to be displayed almost instantly. A sequence of intermediate destinations, known as waypoints, can be entered with keystrokes, and the necessary course alterations will be displayed as each waypoint is reached.

Most of the receivers on the market today can be interfaced to an autopilot (on a boat or an aircraft) and make the course changes independent of human control. At any instant the present position, heading, distance, speed, and time remaining to the next waypoint can be displayed. Any deviation (typically caused by wind or current) from the planned route is taken into account and compensated for.

Monitoring GPS

Although GPS satellites don't transmit a signal that can be listened to in the conventional sense, you can monitor the status of the entire system on a shortwave receiver. Tune to WWV, National Bureau of Standards, on 2.5, 5, 10, 15, or 20 MHz at 14 minutes past the hour: you'll hear an update of how many satellites currently are in orbit, and which, if any, are temporarily out of service for testing or maintenance purposes.

You'll also hear their disclaimer that "GPS is not fully operational at this time." The Department of Defense isn't going to consider GPS operational until all of the satellites are in orbit and functioning, despite the fact that the system is actually working quite well for two-dimensional "fixes." Three dimensional coverage will not be reliable for 24 hours a day until all satellites are deployed.

The GPS unit can also be interfaced with a CD-ROM chart display system which shows the navigator his or her position on a chart or map of the area. Quite commonly used on boats now, this type of system is a major emerging technology in automotive design. Imagine the screen on your dashboard with the roadmap displayed with a blinking "you are here" symbol!

While industry experts estimate that 90% of GPS equipment currently in use falls into the marine and aeronautical navigation field, they

The Garmin GPS 50 Personal Navigator component set.

The MotorolaTRAXAR 6-channel GPS Handheld navigator.

predict that within a few years 90% will be in the land mobile industry.

Unbeatable Accuracy

Just how precise is GPS? With a handheld unit costing about $1,400, repeatable accuracy of position within 15 meters (50 feet) can be achieved. This is significantly better performance than is available with LORAN or any other means of positioning. The military versions of GPS receivers, using a protected code not available to their civilian counterparts, provide accuracy of position to 5 meters!

Then there is Differential GPS. This is the segment of GPS technology used by surveyors and cartographers; while not giving instant readouts, differential methods can provide accuracies of less than one centimeter! Thus maps and charts are now being created which are exponentially more detailed and accurate than previous versions.

Longwave listeners take note: The U.S. Coast Guard is installing differential GPS equipment in some of their coastal beacons, and GPS data will be transmitted on these beacons locally to give vessels in the area better accuracy for maneuvering in tight harbor approaches and channels.

A discussion of GPS isn't complete without mentioning the Russian counterpart, known as GLONASS. This system, with 12 of 24 planned satellites currently in use, has a lot in common with GPS despite independent development. Proposals exist and product development is under way to manufacture equipment which will use GLONASS and GPS side by side to realize capabilities greater than either system alone provides. The breakup of the Soviet Union has slowed progress, but in this country efforts to combine the two technologies continue unabated.

Planes, trains, boats, automobiles—GPS is being used in every kind of vehicle imaginable, and is going to be used in ways as yet unimagined. Keep your ears tuned for further developments in this the cutting edge of "high-tech": the Global Positioning System.

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NPD-D Uniden National Police Directory by Norm Schrein
FBE-D Uniden Eastern Frequency Directory by Norm Schrein
FBW-D Uniden Western Frequency Directory by Norm Schrein
ASD-D Air Scan Directory by Tom Kneitel K2AES
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TTC-D Tune in to Telephone Calls by Tom Kneitel K2AES
CBH-D Big CB Handbook/AM/FM/Freeband
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A "Classic" Listener

By Salvatore Ferro

Until recently, I could not get my wife interested in my favorite pastime, shortwave listening. Despite my most enthusiastic and sincere efforts, Evelin flatly rejected the shortwave listening hobby as not for her.

Now, the opposite is true. She has become as devoted a listener as I am. Previously, though, she baffled me with her total lack of interest.

It baffled me because Evelin's personality is ideally suited to the entertainment value provided by listening to shortwave broadcasts. Growing up in Puerto Rico and being of Spanish descent both contribute to Evelin's ongoing interest in Spanish culture. I frequently tried to impress upon her that shortwave radio offers a cornucopia of Spanish language programming. Her interest in Latin music and enjoyment of listening to the current news in her native tongue could easily be satisfied by just casually scanning the tropical bands any evening.

I would even tune in a Spanish language station and ask her to translate the program's key points for me, hoping she would catch the shortwave listening bug. WRONG! After five minutes she would excuse herself to grab a quick snack from the kitchen. Then she would boil water for a cup of tea. While the water was heating she would meander upstairs to check if our six year old daughter was sleeping soundly.

After returning downstairs Evelin would snare the T.V. guide "just to see if anything good" was on. With her tea and snack gathered, she would finally glide into the living room and turn on the television just to see if the "Dick Van Dyke Show" rerun was one she had already seen. It always was, but it was also always one of her "favorite" episodes. And there I would sit, alone with my shortwave radio, listening to a program in a language I did not understand, hungry for companionship (and a snack and a cup of tea of my own.)

Currently, Evelin regularly cajoles me to sit with her while she eagerly translates Spanish broadcasts. She even reserves Saturday nights as our "night in." It is at 0100 UTC that we tune into the BBC's "Play of the Week," one of her favorite programs on shortwave.

Not too long ago I tried to get Evelin interested in this very program. I always succeeded in getting her to sit down with me, only to lose her, again after only five minutes of listening. Instead of a snack and tea, Evelin usually did her nails during the BBC's weekly play, oblivious to that week's latest mystery, comedy or drama. But, Evelin received many compliments on her nails the next day, so I guess the evenings were not total losses.

What caused Evelin's transformation to avid shortwave listener? The arrival of a 1950's vintage Zenith Royal 1000-D Trans-Oceanic shortwave radio!

In cleaning out his parents' attic, a friend of ours discovered the Zenith under a pile of "attic stuff." When neither he nor his parents expressed any interest in keeping the radio (since it lacked FM!), he gave it to me, knowing it would have a good home where it would be used and enjoyed.

As soon as our friend left, Evelin descended upon the radio. Eyes wide with interest and grinning ear to ear, Evelin opened the front panel of the radio and proclaimed "isn't this radio great?" I was stunned. She saw greatness in an Eisenhower era shortwave radio?

When Evelin turned on the Zenith's power switch, we were both surprised to hear the "pop" of battery life. Our friend had installed nine fresh D cells before giving me the radio. Unfortunately, turning the large tuning dial produced no reception whatsoever. I voted we pack up the radio for the night and settle beside my Sony ICF-2010 for the "Research File" on Radio Netherlands which was coming on momentarily at 0050 UTC.

Pretending I was in the next state, Evelin ignored my suggestion and discovered the Zenith's antenna hidden in its carrying handle, a place I would never have looked. Once she extended the antenna, my wife proceeded to gleefully giggle as reception hissed through the built in speaker. She had tuned into the English language broadcast of Radio Japan on 5960...Bitten!...Stung!

In that single moment, as she carefully turned the tuning dial back and forth to clear up Radio Japan's reception, Evelin caught the shortwave listening bug. Over the next couple of hours I learned why this particular radio was the catalyst for her newborn hobby. I also discovered why my efforts to get her interested in shortwave listening failed.

The Zenith Trans-Oceanic immediately captivated my wife with its bulky size, hidden antenna, large knobs and classic, analog dial. A lover of antiques, Evelin saw beauty and style in the Zenith, traits she thought the Sony lacked. She also preferred analog tuning to my Sony's push-button, digital method. This didn't make sense

until she explained to me that the continual fine tuning and fiddling required by the Zenith's less contemporary technology to hold a drifting signal kept her interested in the broadcast. It was a challenge to maintain clear reception. By paying more attention to the tuning process, Evelin felt both accomplishment and a sense of adventure as she locked onto clear stations. By being more interactive with the radio, her listening was rewarding and pleasurable.

The Trans-Oceanic also created an exotic atmosphere with its hisses, squeaks, whistles and crackles. These "annoyances" actually reminded my wife of what it must have been like for those oppressed listeners of the 1950's to sit huddled beside their radios, like she does now, searching the bands for news and information from mysterious, unfamiliar countries.

After a while I began to feel the same sense of adventure as together, we searched for news and music from overseas lands.

Now it all made sense. My *style* of shortwave listening was the problem, not shortwave listening, itself. Evelin felt the digital technology of my Sony to be too antiseptic and automatic for her liking. Merely punching in a frequency and sitting back to listen to a clear signal just was not exciting to her. It was too passive. Searching for programs, fiddling with the reception and listening to the static of technology developed in the same era we were both born in is the "classic" world she envisioned shortwave radio to be. It has become, for Evelin, a world of mystery, adventure, intrigue and exploration. She is happiest just scanning the bands, "discovering" new worlds and picturing them in the harsh, gritty tones of black and white; the kind seen in the movies of the 1950's.

So, it took a vintage radio with all its "classic" features and idiosyncrasies to entice my wife into the rewarding hobby of shortwave listening. What a wonderful time it has become for us both. Now we share hours together, listening to everything from Latin music to news about the newborn nations that used to be a part of what was called the Soviet Union.

It is even common for both of us to be sitting in the same room, listening to broadcasts from two different countries, sometimes in two different languages! Good thing our daughter is bilingual.

MT

Zenith's Transoceanic:

The First Multi-Band Portable Radio

By Michael Brian Schiffer

Multi-band or "all-band" portable radios today are achieving new levels of technical sophistication and popularity. One can even buy a digitally tuned set small enough to fit in a shirt pocket. The very first multi-band portable, Zenith's Trans-Oceanic Clipper, had analog tuning and was somewhat larger. Nonetheless, this six-band set was a remarkable radio, the first of nine generations of the Trans-Oceanic.

The story of the Trans-Oceanic begins just before World War II with Eugene F. McDonald, Jr., Zenith's president. He was a wealthy explorer and adventurer, who lived in a 185-foot yacht moored on Lake Michigan. His glamorous lifestyle provided inspiration for many of Zenith's pricey products, including the Trans-Oceanic.

It was McDonald's custom to take short vacations on Lake Michigan, cruising in his yacht. On one of these excursions, in the summer of 1939, McDonald had along a standard Zenith portable. Being some distance from civilization, however, he was unable to receive a single station. On August 2 he sent a radiogram to Zenith's chief engineer back in Chicago, instructing him to begin work on a high-performance portable.

Howard O. Lorenzen was an engineer assigned to the new project, and he recalls that McDonald "was one who wanted to be abreast of the latest news and world developments, and so this lack of daily news was very irksome to him." The solution was found in shortwaves. A sensitive receiver with shortwave bands could pick up European news broadcasts directly.

During the next two years, Zenith's laboratory supplied a succession of Trans-Oceanic prototypes—about 20 in all, which McDonald himself tested in the field. When he was finally satisfied, McDonald furnished his friend, Arctic explorer Donald McMillan, two of the latest laboratory receivers for further trials on his ship, the *Bowdoin*. After encountering a few glitches, McMillan was able to give "Gene" a glowing report from Greenland on July 27, 1941: The radio worked "beautifully"; they got "both European and American stations day and night." And no wonder: it had five shortwave bands (49, 31, 25, 19, and 16 meters).

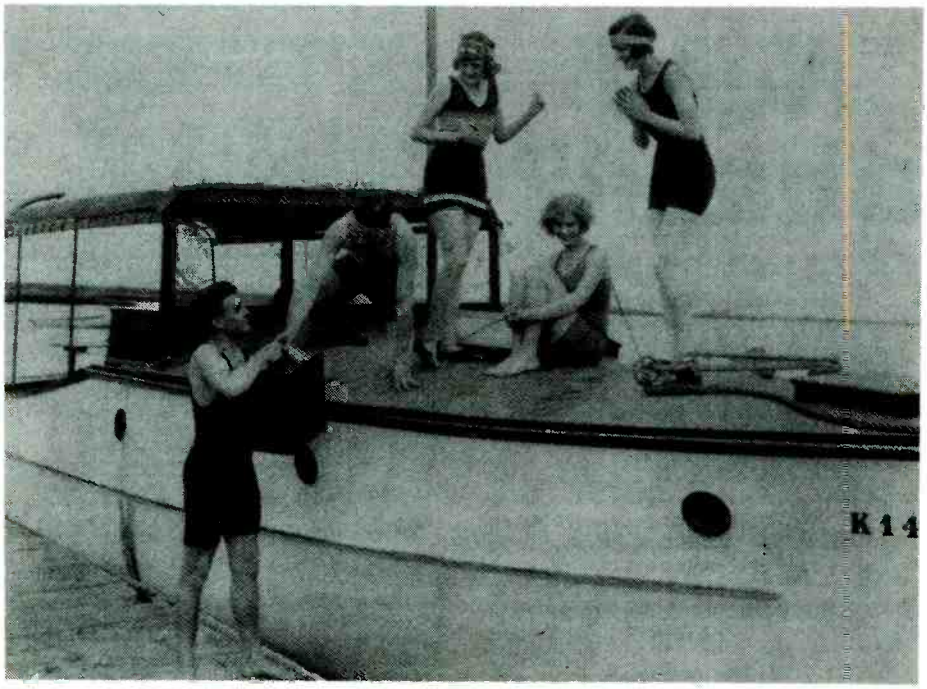
McDonald put the Trans-Oceanic Clipper into production in short order, against the advice of other Zenith executives who felt that the set would be too expensive to find much of a market. McDonald was equally sure that people would buy the radio because it performed so well. Being the boss, McDonald prevailed; he was also right. When the Trans-Oceanic assembly line was shut down on April 22, 1942 (to make way for military production), it was the highest priced U.S. portable (over $100), but thousands of orders remained unfilled.

The United States was already at war during the 3-1/2 months that the Trans-Oceanic was available to Zenith dealers. Although the portable radios were useful for Americans stateside seeking war news, the Trans-Oceanic became especially comforting to the soldiers, at war abroad, seeking entertainment and news about home. Zenith received scores of touching testimonials from American servicemen. Typical was the comment of Private James Henry Brown, writing in 1944:

> I now own one of your greatest creations, the Zenith trans-ocean portable deluxe model 7G605, and it has been of great service to me and a lot of the boys up here in the Aleutians. It is constant entertainment. With six bands to tune, we can get programs all times of the day.

Other letters described Trans-Oceanics that kept on playing even after splashing into the Mediterranean, being bombed on a Pacific island, or falling off a fast-moving truck in Africa.

Although the Trans-Oceanic was out of production for the remainder of the war, McDonald had set aside a secret stash of the sets for his friends. Frank Sinatra received one at a public presentation before more than 1,000 admiring



The portable radio was already popular in the 1920's. Pictured above is the RCA Radiola 26, in an Atlantic Radio Company photograph acquired by Ron Boucher and published in the June issue of Antique Radio Classified. Similar to this shot from the '20s, Zenith's Trans-Oceanic became a status symbol and found its way into many upscale magazine advertisements.

phonograph-record clerks. The use of the Trans-Oceanic portable as a conspicuous gift to a celebrity enhanced its desirability, especially since mere mortals couldn't buy one at any price.

After the war, the Trans-Oceanic was redesigned. Already a large set, it grew more to accommodate an enormous battery pack. The huge battery pack allowed the radio—which in one version had seven tubes (plus rectifier)—to operate very economically, around 2 cents per hour—a figure that would not be bettered until the advent of the transistor radio. The Trans-Oceanic was redesigned again in 1951 and 1954, but got no smaller.

The post-war Trans-Oceanics with tubes, though expensive ($87.50 and up), were very successful. With their short-wave bands, the set provided access to the world and the appearance of worldliness to its owner. The Trans-Oceanic was used as a prop in fashion layouts, and advertised in upscale magazines, like *Holiday*, perpetuating its image as a necessity for the social in-crowd.

Like all successful products, the Trans-Oceanic had a host of imitators, mostly in the fifties. RCA, Hallicrafters, and other companies made multi-band tube portables, but none had the impact of the original.

The Trans-Oceanic survived the transition to transistors. McDonald, still at Zenith's helm in the mid-fifties, ordered his engineers, finally, to shrink the Trans-Oceanic, "leaving no room for a grain of sand." The first solid state Trans-Oceanic, the Royal 1000, debuted in late 1957. It had eight bands and cost $250. Though relatively compact, it weighed—with batteries—13 lbs. The nine transistors, by the way, plugged into sockets; and the set, with its metal chassis, was entirely hand-wired. Zenith was very reluctant to enter the age of throw-away electronics.

In 1960 the Trans-Oceanic underwent another transformation, getting one more band and becoming the Royal 1000D. Three years later, FM was added to create the Royal 3000. In the first days of August 1964, Zenith manufactured the one-millionth Trans-Oceanic, though McDonald did not live to see it.

The 11-band Royal 7000 appeared in 1973, and six years later acquired one more band—its twelfth and last. During the seventies the Trans-Oceanic faced a field of formidable competitors made abroad. Like the earlier Trans-Oceanics, the Royal 7000 was made in Chicago. In 1980, however, Zenith shut down the assembly line, transferring production to its Taiwan plant. The Royal 7000 was the last portable radio manufactured in the United States.

Moving the manufacture of the Trans-Oceanic abroad did not solve the problems of even cheaper foreign-made clones entering the U. S. market. By this time, competition was intense, and the strong loyalty of U.S. customers to Zenith had begun to wane. In 1981, after four decades of distinguished service, the Zenith Trans-oceanic was discontinued.

Today—a half-century after the first model came out—the Trans-Oceanic's spirit lives on in an assortment of multi-band portables that accompany their owners on business and pleasure around the globe. A lifestyle once confined to the very wealthy, like Eugene F. McDonald, is now enjoyed by many Americans. MT

The author, an archaeologist, is Professor of Anthropology at the University of Arizona. This article is excerpted from the ***Portable Radio in American Life*** *(University of Arizona, 1991), which provides a history of the portable radio from 1890 to 1965.*

Shortwave Broadcasting

Glenn Hauser
Box 1684-MT
Enid, OK 73702

All times UTC; all frequencies kHz;
**asterisk before/after time signifies station sign-on/sign-off;*
+means continuing but inaudible.

AFGHANISTAN (non) R. Free Afghanistan, Munich, alternates Pashto and Dari in quarter-hour segments: 0230-0300 on 11725, 9605, 9530, 7165; 0300-0330 on same plus 7180; 1300-1330 on 17760, 17725, 15445, 15340; 1530-1600 on 17750, 15340, 15170, 11875 (BBCM)

ALBANIA R. Durres with election program, Sunday around 1400-1800 on strange 9044, maybe MW spur mixture, not // Tirana 6100.5 (Wolfgang Bueschel, Germany, DSWCI *SW News*)

ARMENIA R. Yerevan in English at 2245-2257 on new 7440, 9480=best, 12060; 2344-2357 on new 9480, 11980 (Brian Alexander, PA, *World of Radio*) And on new 9870 to North America 0330-0400 in Armenian and English, messing up **AUSTRIA!**

AZERBAIJAN V. of Azerbaijan to start English to Europe in next few days (Baku correspondent via Mayak, Nov. 5, via BBCM) Only frequencies heard for domestic service: R. Baku-2 on 4957.5 at 1630-2059; -1 on 4784.9 (Eugene, RVI *Radio World*) 4958 also at 0300 (Stig H. Lindholm, Waterloo, Belgium, WDXC *Contact*)

BANGLADESH English at 1230 still heard only on 15200, no sign of others on 25, 19, 16 meters (David Norcross, Guam)

BELARUS *Die Antwort*, German religious program from Freiburg, Switzerland, is on R. Minsk Sundays 1930-2000 on 6010, 7210, 7255, 7420, 9710.

BOSNIA-HERCEGOVINA Radio B-H on new 6219.96, Sunday 2155-0105 after Sofia closed 6220, time pips and IDs on the hour, variety of music, RTTY QRM, suppressed carrier USB (Brian Alexander, PA, *W.O.R.*)

BOTSWANA R. Botswana heard again on 7255 from 0255, cowbells and farm animals (P.W. Mueller, Germany, DSWCI *SWN*)

BRAZIL DST runs from Oct. 25 to Jan. 30 in 12 states in the south, southeast, west-central except Tocantins, plus Bahia (*O Globo* via *Play-DX*) That is, UTC -2.

BULGARIA Add to last month's incomplete R. Sofia sked: 1130-1300; 1830-2000 on 9560, 9700, 11720; 2045-2130 on 9560; 2245-2415 & 0100-0145 on 7225; 0400-0530 on 7290. *Sofia Calling* is sometime within these: Fri. 2045, Sat. 0100, Mon. 1130, 1830, 2245, Tue. 0400 (John Norfolk, OK) Beware of announced sked, given in UTC+2 not UTC (Eugene, RVI *RW*) Mix with Angola 9700 at 0445 made for a "Concerto for Rooster & Orchestra"! (Norfolk)

BURMA (non) Democratic Voice of Burma is supported directly by Norwegian government. Four young Burmese activists in Oslo record the tapes, send them to Kvitsoy transmitter. Many programs are recorded in rebel camps along the Thai border, such as the Manerplaw HQ of the Karen rebels (Bertil Lintner, *Far Eastern Economic Review* via Chuck Albertson) Newly printed QSL from P.O. Box 6720, Skt Olovs Plass, N-0130 Oslo; 500 kW on 17840 at 1430-1525 (Bjoern Fransson, Sweden, DSWCI *SWN*)

CANADA Visited CKWX-1130 Vancouver, where C.E. Jack Wiebe told me 6080 was off for repairs but would return by Xmas with more than the previous 10 watts; license renewed for SW tho not of commercial value. Also spotted large folded dipole atop CBC building—for 6160? (Mitch Sams, *Fine Tuning*) BBC relay on 6315 at 1110, spur of 5965 (Brian Alexander, PA) Mixing product with Korea relay on 6140

CHINA CRI resumed usual 7405 to west N. Am. at 1400 & 1500, but RTTY on low side (gh) to the east supposed to be on 9665 at 1200 tho still announcing summer's 15210 (gh) actually on 9655, no sign of Thailand (Brian Alexander, PA, *W.O.R.*) CRI special for New Year with listener contributions airs Dec. 31 and Jan. 2 (Bruce MacGibbon, *SW Echo* via Baxter) Hong He PBS, Gejiu Is., per QSL is comprehensive station in Yunnan; signed by Shen De-chun, Chief, and Cheng Lin, Editor in Chief; sked on 4930.4 (ex-4934) is 2225-0030, 0225-0500, 0855-1400; Suns. 0230-0500, 1230-1400 (*DXclusive* via *DX-Kuuntelija* via DSWCI *SW News*) Yunnan PBS, Education program from 1045 on 5958.4 had English lesson at 1100. And Gannan PBS, Hezuozhen from 0949 on 5969.5 (Tsutomu Kito, Japan, DSWCI *SWN*)

COLOMBIA R. Nacional on new 9685 ex-11825, 2300-0330; seems a separate SW service (Ernie Behr, Bill Westenhaver)

CONGO RTVC, 4765 with English news segment 2219-2223 (Keith Hill, NY, *FT*)

COSTA RICA AWR back on 9722.5, English from 2300 (Don Thornton, NJ, *W.O.R.*) After 3-month absence, also 1100-1300, but slow to resume *Costa Rica Today*, Suns. 1230; still heavy wow on cart machine (gh, *W.O.R.*) 9722.55 (Alexander) 13750 finally active at 1223, weak (Bill Westenhaver, PQ) Last month's announced schedule for Spain relay proved not fully accurate. Comparing satellite-delays we found on one Saturday at 2030, 17845 was Spain, 9745 C.R.; 21460 C.R. replaced 5970 in the 2300-0100 period. Next Saturday 21460-C.R. on abruptly at 1900 in phase with 9745, while 17845 and 15110 at that time were Spain; but not 21460 the following Saturday (gh, *W.O.R.*) Radio for Peace International may revise program sked Jan. 1. New self-supporting tower holds antenna boom 65 feet long, smaller antennas side-mounted. Heavy new transmitter must be assembled inside hot new building. Please help us track jammer on 7374.7 which is usually absent UTC Mondays, apparently from Caribbean area. RFPI seldom heard in South America, with no more than 30 watts in that direction (James Latham, RFPI *Mailbags*) *World of Radio* sked: see last month.

CROATIA "Unknown" site on MW 1125 is Micidial, heard on harmonic 3375 at 1937 (*DXclusive* via *Play-DX*)

CUBA RHC USB on 9815 0000-0200 uses New York rhombic with 13 dB gain, former PTP transmitter. Other SWBC stations should get disused SSB units before they're scrapped! Due to adjacent interference, RHC soon sought other 49mb channels for English than 6060: 0000-0500 on 6010, 0500-0700 on 6000 (Arnaldo Coro Ortiz, *DXers Unlimited*)

DOMINICAN REPUBLIC R. Cima finally closer to nominal frequency, 4959.87 ex-4962 around 0100, 1100 (Brian Alexander, PA, *W.O.R.*) No, it's 4959.86 past 0600 (Ernie Behr, Ont.) Who cares? (Arnie Coro) Very close independent measurements confirm each other (gh)

ECUADOR HCJB resumed 6205 for Euro service 0700-0830 (Edwin Southwell, Brian Alexander) Without a trace of embarrassment, *DX Partyline* read a letter from Mike Schulsinger condemning Radio Fax for using 6205, life-threatening hazard to coastal comms! (*W.O.R.*) HCJB's new interval signal causes terrible splatter on all adjacent frequencies, worse than any IS I've heard; we don't need such unnecessary QRM (Ernie Behr, Ont.) Many other stations have no backup power; surges when it comes back on blow out transformers, transmitters. HCJB has access to three independent power sources—hydro, diesel and if necessary, Ecuadorian grid at Pifo site; also diesel standby at studio. Drought causing hydro power shortage led government to change time zone to UTC -4, since Nov 28, duration uncertain. HCJB's external broadcasts other than Spanish would stay on UTC, but might suffer mixups (*DX Partylines*) HCJB did resume SSB 17490 in November, but never put it on ID tapes even when it's the best/only frequency audible! Colombia also tried UTC-4 but it only lasted one month, May; absurd to have Ecuador ahead of countries to the east of it, and DST absurd on the constant SR/SS equator (gh) New staffer from Russia has started Russian DX program on HCJB—Sun. 0245 and 0515 on 9600, 11735; 1100 on 11735; Mon. 0345 on 9600, 11735; 2345 on 15250 (Sergei ---, DXPL) Peru's Shining Path terrorists are believed to have robbed

stations in Cuenca, Guayaquil—to put on own clandestine? (*DXPL*)

EQUATORIAL GUINEA R. Africa Dos Mil, 6910, had classical music, poetry 2145-2200 s/off (George & Fisher, MA, *SPEEDX*)

ERITREA V. of the Broad Masses of Eritrea, Asmera, on new 5000 // 7380, 7020, 3940 (BBCM)

ETHIOPIA VOE reported some regional stations had equipment exposed to rain, or taken to museums; former V. of the Gospel building not repaired since nationalised in 1969, endangering safety of equipment and workers (BBCM) (non) Since Radio Moscow openly announces it carries Horizon—Voice of Ethiopian Patriotism, we no longer classify it clandestine (BBCM) Heard on a Sunday at 1530-1600 on 21785, 15580, 11975, not 17570 (Finn Krone, Denmark, DSWCI *SWN*)

RFI Radio France Internationale

FRANCE (non) RFI provides news in French by phone from Washington, 24 hours—202-944-6075 (RFI)

GEORGIA Georgia Radio heard in English on new 9565.3 at 1600-1630, 11805.3 at 0600-0630, both followed by Russian (Ernie Behr, Ont.)

GERMANY DW still heard on unannounced and unlisted site and frequency, Elmshorn 6140 at 0800-0830 fade via long-path, seems DSB reduced carrier (Bob Padula, Vic., *Australian DX News*)

AWR-Asia

GUAM By late November, God had hurled not three, not four, not five, but *six* typhoons at this unfortunate island home of two missionary stations (gh) If both transmitters again functioning, KSDA English is at 0100 on 15610, 1600 on 11980, 2300 on 15610 daily; 0200, 1700 and 1800 on 13720, Saturday and Sunday only, including *DX Asiawaves* Sat. 1615, 2315, Sun. 0215, 1615, 1815 (via Gordon Darling, PNG)

GUINEA RTG Conakry, new 100 kW in Sofoniya on 7125 strong from 0558 past 0645 (Ernie Behr, Ont.)

HONDURAS R. Copan Internacional is installing better antenna on the outskirts of Tegucigalpa, and studio-transmitter link; will test again on 15675 (Jeff White, R. Miami Int'l)

HUNGARY *Budapest International* quotes an American out of context complaining about "stupid Americans" mispronouncing Budapest; but stupid Hungarians picked 5975 as new frequency for North America at 0300-0400, inaudible behind BBC-Antigua, also on 9585, 11910; to Europe 2200-2300 on 11910, 9835, 6110 (via John Carson, OK) Actually heard on 9835 at 0300 (Norm Blakely, OH) Also new on 13620 in Hungarian to America 2300-0030 (UTC Monday to 0100) plus 11910, 15160. Their fax is +36 1 138 8838 (BBCM) Relays of France, all in French: 0500-0600 9845, 11850; 0600-0700 13660, 15530; 0700-0800 17690; 1600-1630 & 1700-1800 15460 (BDXC *Communication*)

INDIA AIR dropped 17387 for the 1000-1100 broadcast, still on 15050, 17895, 21735 (Arthur Cushen, RNZI *Mailbox*) 17387 still printed in October schedule (via Kevin Klein) All four heard here, 21735 co-channel UAE, not all simultaneous (David Norcross, Guam)

INDONESIA RRI Jakarta Programa Nasional: 4777.1 at *1250-2115+, 9525 at *0953-1605+, 9680 at *0953-1605+, 15154.4 at +2230-0810* (Tsutomu Kito, *OzDX*) Both RRI Jambi and Sumenep use 3355 at same time, 1700-2200; Jambi also at 0500-0900, 4927 at 2200-0100, 0900-1400. Fak Fak on 3644 at 1400-2000. You have to be in Merauke to hear 3905 at 0200-0700. RKPDT2 Bima on 3187 at 0930-1400. RPDK Bolaang Mongondow, 250 watts on "105 metres," around 2857 kHz at 2200-0400, 0800-1400. Station on 3580 is RPDT2 Poso, not Asahan, 350 watts at 0900-1500 (David Foster, *OzDX*)

IRAN VIRI has *Listener Special* UTC Sats 0100 during 0030-0130 English, very good on 11790, weak on 9022, covered by BBC on 15260 (Bill McClintock, MN, *W.O.R.*) At 1930-2030 on 9022, 15260 and 9720 ex-15315 (Eugene, RVI *Radio World*) External service from Mashhad 1530-1630 6005 also on 9640 announced as 9460 (BBCM) (non) Voice of the Worker was on 4195 in Persian at 1800-1900 (BBCM)

IRAQ RII has English around 0345-0415 on 11860 (Bob Thomas, CT & Brian Alexander, PA) Also on 15340 (Arthur Cushen, RNZI) (non) V. of Rebellious Iraq in Arabic at 1300 on 6003 & 7003, next day on 6004; at 0900 on 9073. V. of the Iraqi People (communist), 55 minutes in Kurdish & Arabic on 7030v and 3915v at 1300, 1700, 0400 (BBCM)

IRELAND RTE says SW service for Irish abroad in Europe is again being considered (Tony Vaughan, BDXC *Communication*)

ISRAEL Israel Radio program changes compared to last month: *Calling All Listeners* and *DX Corner* after 1400 on Sundays, not Mondays. *Israel Sounds*, Sun. 2230, Thu. 1400. *This Land*, Mon. 1400, 2000, Wed. 2230. *Business & Science*, Tue. 1400, 2230. *Letter from Jerusalem*, Fri. 1100, 2000, 2230 (*Calling All Listeners*) Will it exist by January?

ITALY R. Europe, Pioltello, testing 100 W USB on 25900 Sat. & Sun. 1300-1600, taped reports wanted c/o Play-DX, Via Davanzati 8, I-20158 Milano. R. Banana plans winter tests around 6650 at 0200-0400 (C. Catellani, *Play-DX*)

JAPAN (non) R. Japan puts *Media Roundup* on Sackville relay half the year, *Hullo from Tokyo* the other half, to satisfy fans of both programs part of the time (Ian McFarland, RJ*MR*)

JIBUTI R. Jibuti, erratic or missing from 4780 since May, has been regular again since mid-October (BBCM) Better signal than ever from 0258 past 0336, but incessant CW QRM (David M. Clark, Ont., *FT*) Ute pauses around 0300; check then (Hans Johnson, MD, *FT*)

KIRIBATI R. Kiribati, 17440 AM nominally from 0500 but one day abruptly on at 0548, off at 0937 (David Norcross, GU) Opened at 1825, past 1933 (Bruce MacGibbon, OR, RJ*MR*)

KOREA NORTH R. Pyongyang in English at 0000 on 11335 announced 15130 ex-15115; 1300 on 13760 ex-13650 (Norm Blakely, Ont., *W.O.R.*) KCBS Hyesan on 3920.1 at 1408 // 3350 (Mikhail P. Timofeyev, Russia, DSWCI *SWN*) V. of National Salvation at 1218 without jammer on 6962 // 4450 (John Adams, Vic., *ADXN*) Suggest it's 2 x 3481 (Craig Seager, *ADXN* ed.)

LAOS Savannakhet resumed MW 585 transmission after 4-year suspension for repairs costing 30 megakip, now 16 hours per day (BBCM) How about SW which used to be around 7387?

LATVIA R. Latvia, 5935, three minutes of English at 2128, then German on a Wednesday (Hans Johnson, MD, *FT*) R. Riga International, English on Sats. 1900-1930 on 5935, Sunday repeat not observed (Edwin Southwell, UK) Blocked nights here now by WWCR anyway.

LEBANON "KING" undated sked, 6280 shows English weekdays 0900-1230, Sats. 1800-2200, Suns. 1600-2200, plus *University Network* (Dr. Gene Scott) daily 2200-0200. "WINGS," 11530 with English weekdays 0700-1100, 1300-1630, Sats. 0700-0800, 1300-1630, Suns. 1300-1500, plus *University Network* daily 2100-0100, Sats. & Suns. also 0300-0700, weekdays also 0300-0630 (via Alan Roe, England)

LIBERIA R. Liberia, ELBC, on 3255 is controlled by Charles Taylor's National Patriotic Front, from Gbargna, scheduled 0600-0800 & 1745-2400 on 3255, 0800-1745 on 6090; address there is Box 16, but from outside Liberia report via LBS, Box 242, Danane, Cote d'Ivoire. Mainly in English, some French and local languages; hostile to ECOMOG and ULIMO. The rival ELBC continues from Monrovia on 7275,

supporting ECOMOG. 3255 has English news at 0700, 2300 (BBCM)

LITHUANIA R. Vilnius at 0000 on new 7150, ex-9530, also on 17605, 17690 (Brian Alexander, PA) Domestic service on 9710 at 2300-2200; also Moscow relay 6010 at 0400-1659, 9675 at 1659-2200 (BBCM)

NETHERLANDS (non) RN starts relays via Russia Jan. 1 (Jonathan Marks, *SCDX/Mediascan*) from three sites: Chita, Irkutsk, Petropavlovsk, plus Tashkent, Uzbekistan (RN*MN*)

NETHERLANDS ANTILLES Bombshell from TWR: Shortwave will be terminated voluntarily July 1, will concentrate on MW800 to Venezuela instead, and satellite feeds to hundreds of Latin American AM and FM stations. SW schedule will be reduced already Jan. 3 (*Bonaire Wavelengths*)

NEW ZEALAND RNZI's *Around the World with Rudi Hill* returns in late January (Hill) If on previous 4-week rotation, would be Tue. Jan. 26 at 0900 or 0930 on 9700; repeat UTC Friday 0430 on 17770 (gh) RNZI uses broadbeam antenna between 1850 and 1058, then 335° at 1058-1207; and 35° at 1650-1850 (RNZI *Mailbox*)

NICARAGUA R. Amistad, Matagalpa, quite good at 1050 on 2539.5, 2nd harmonic of 1270 (Crawford, *DXSF* via Radio Nuevo Mundo)

PAKISTAN R. Pakistan English hour at 1700 on new 9430, best on 11570 (Eugene, RVI *RW*)

PALAU KHBN undated sked shows 9830 at 0800-1530 including English 1230-1530 weekdays, 1200-1530 Sats., (Sunday missing); and on a frequency starting with 1 [11900 or 11980?] at 2000-0100 with English 2230-0100 weekdays, 2230-2300 and 2330-0100 Saturdays. Other blocks are in Mandarin or "Assemblies of God" as if that were a language—speaking in tongues? (via Alan Roe, England)

PAPUA NEW GUINEA To maintain national coverage during the 1994-1998 solar trough it may be necessary for NBC to use a frequency between 1.6 and 2.0 MHz (via Gordon Darling)

PHILIPPINES R. Blagovest, Russian religious program via Veritas, 2130-2226 on new 7265 (M.P. Timofeyev, Russia, DSWCI)

RUSSIA R. Alpha & Omega, 9695, daily 1500-1600, 200 kW from Yekaterinburg, then Radonezh (Nikolai Rudnev, Stroitel, Russia, *ADXN*) R. Art is new, cultural with theatre angle, ads from Moscow, 0510-0700 on 11655, 1500-1800 on 11700; (BBCM) Magadan missing from formerly strong 5940, 7320, 9530 and 9600 since August (Ernie Behr, Ont., *W.O.R.*) Radio M and Radio N use same 50 kW Yekaterinburg transmitter. Radio M is ex-R. Dvizhenie, 0600-0700 Tue.-Sat. on 6200, 1230-1330 Tue./Wed./Fri. on 6220, address CPO Box 12, 620051 Yek'burg. Radio N, or Radio Nera, 0500-0600 & 0700-1000 Tue.-Sat. on 6200, addr. GSP-808, 620219 Yek'burg (Rudnev, *ADXN*) RMWS block program guide has an embarrased empty space 0430-0500 and 2030-2100 daily when we know they carry R. Aum Shinrikyo. Other times available for sale are: Sat. 1031, 1531, 2131, Sun. 0031, 0531, 1231, 1831, 2231, Mons. 0331. *Focus on Asia & Pacific*, Mon.-Fri. 2211, Tue.-Sat. 0111, 0611, 0911, 1311. *Africa As We See It*, daily 0631, 1931, 1631. Good evenings on 21480 with better audio than 21690, though 21480 runs about three words or a double satellite delay behind 21690. *PWBR* says 21690 is Irkutsk, but is 21480 listed? Of course not! (gh) R. Radonezh on 7230 ex-9695 at 1600-1700, Orthodox (Y. Kato, RJ*MR*) So Alpha & Omega too? See above (gh) Russian Patriotic Movement, Irkutsk, irregular on 6125 2200-2230, 2245-2315 (Rudnev, *ADXN*) R. Moscow carries Spanish religion, *La Voz de la Salvacion*, Tues. 0310-0325, from Church of God of Prophecy. Russian site on 21845 heard with Dr. Gene Scott, from before 0630 to 0800 when RMWS begins, not // WWCR-5920 (now 5935) and Lebanon 11530 (BBCM) Scott says four hours per day from Novosibirsk, Samara, to be expanded to 24 hours; only drawback is finding a practical way to pay R. Moscow (via Tim Hendel, FL) Scott also at 0400-0800 on 15315 (Rias via Bueschel, WWH)

RWANDA RRR on 12110 = 2 x 6055 at 1906 (N. Rudnev, Russia, WDXC) 1646-1903 (M.P. Timofeyev, Russia, DSWCI *SWN*) and 0433-0453 (Bernard Grondin, Reunion, DSWCI) French, vernacular.

SA'UDI ARABIA Rarely heard English from BSKSA, 9704.94 until 2101 (Alexander, PA)

SERBIA R. Yugoslavia & Red Cross produce *Bridges of Humanity*, Suns. 0100 & 0200 on 9580, about human rights, civil war, refugees; also 1230 to us on 17740 (Bob Thomas, CT, *W.O.R.*) Abrupt fadein from nothing to good signal around 1240 here (gh, OK)

SPAIN *Amigos de la Onda Corta*, REE's DX program with ballsy voice typical of Spanish women, retimed to Sun. 0035 on 6055, 6125, 9620, 11945 [+ CR relays!], 1035 on 12035, 17715, 17890, 21555 (gh)

SUDAN 7200 fair at 1340-1400 (Gigi Lytle, TX) nice winter longpath (gh) Algerian Islamic Salvation Front to set up transmitter in Khartoum for propaganda to Algeria (*The European* via *DX Spot*, Spain) Why not shortwave?

SWEDEN R. Sweden invited listener participation for railway show, phone 468-784-7288, fax 468-667-6283 (gh)

SWITZERLAND SRI's *Grapevine*, Sats., invites tapes from listeners for broadcast (gh)

TAHITI RFO on 15175 ex-15170 at 0500-0800 // 6135, 11825; mix Norway 0600-0700 (Cushen, RNZI)

TIBET Xizang PBS, Lhasa, Tibetan program on new 4820 +1400-1550* // 5035, 5950, 5995 (Tsutomu Kito, Japan, *OzDX*) Chinese on 5240 and 4750 at 1440 (Timofeyev, Russia, DSWCI) Same pair at *2259-2330 (Dieter Lippmann, Germany, *ibid.*)

UAE Abu Dhabi winter English: N. America 2200-2400 on 11710, 9605; N.W. America 2200-2400 11815, 0000-0200 on 9505 (via Alan Roe, UK) Must be misprint: 9505 only in Arabic.

UKRAINE RUI announces 0100 English on 9860, 9710, 9750, 9745, 7240, 7195, 7150, 6145, 6070, 6055, 6020, 6010; some no-show, others heavy interference from Moscow, Spain, Holland, Germany. Faint on 9710, 9750, 7240, best on 7195 (Bob Thomas, CT)

USA *World of Radio* with your columnist: on WWCR 15685, Fri. 2215; 7435, Sun. 0405, 0800; Mon. 0000; on WRNO, Sat. 2300 & Sun. 0300 on 7355, Sun. 2130 on 15420; on *Let's Talk Radio*, Spacenet 3, ch. 21, subcarrier 5.8 MHz ex-6.2, Fri. 2230, Tue. 0130. Listen for announcements of new times and an additional *daily DX program* by gh. *Crossband RNI* returned UTC Mons. after 2nd, 4th and 5th Sundays at 0300 on 7435, delayed from *L.T.R.* two nights earlier. Jeff White's conversation, mailbag and DX show *Miami en Vivo* is on WRNO 7355, UTC Mondays 0230-0300. R. Miami International verifies with a single QSL design for all its Cuban clients, but *La Voz de la Fundacion* has its own QSL (gh) Dr. Gene Scott says KCBI was fired up briefly Nov. 1 so that would be its anniversary; his *University Network* via KCBI became fairly regular from Nov. 20, days on 15375, nights on 9815 (via Tim Hendel, George Thurman, gh) In early Nov., WEWN already sent out public schedule showing service *started* Dec. 28, financed by Piet and Trude Derksen (via John Carson) Only limited operation, not all four transmitters by Dec. 28 (Ben Chambliss, WEWN) More potential WEWN conflicts—VOA-Botswana on 13710; on 7540 at 2110 we heard WWJ82 and KMA65 trying to contact AGA6TR and AGA6LA on SSB (gh) These are FEMA stations (Fred Lehman, OH, Miami Valley DX Club) WJCR to 13595 from 7465 (George Thurman, IL) C.S. Monitor revised sked Nov. 17, including 5850 for WSHB at 0000-0600, WCSN 0600-0800, option to 1000 (CSMWS) KKOB, 770, Albuquerque, NM, incredibly audible on 16th harmonic 12320 at 2300 (Ron Kashner, Steamboat Springs, CO) Also here at many times during the day, unfound on other high or low harmonics (gh, OK)

VIETNAM VOV, English 1100-1130 on 7287.60, poor but worse on 9840 (Chuck Bolland, FL) 15005.1 at 1800-1830 (Werner Schauermann, Germany, DSWCI *SW News*)

Until the next, 73 de Glenn!

Broadcast Loggings

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

0000 UTC on 7315
CROATIA: Croatian Radio. News update on the war. (Richard Jones, Dayton, OH) Fair signal quality for Hrvatski Radio on 6210 kHz, at 0150 UTC. Pop music tunes to time pips and ID at 0200 UTC. Parallel programming noted on 13830/7240 kHz, with fair signal quality. (Thomas Banks, Dallas, TX)

0015 UTC on 17690
UKRAINE: Radio Ukraine Int'l. *Ukraine Diary* on becoming a democratic state. Musical bridge to discussion on constructing a constitution. Program on parallel 17605 kHz. (Jerry Witham, Keaau, HI) Additional monitoring at 0302 UTC on 11980 kHz. (Maywoods DX Team-KY/ Loy Lee, Dr. Joel Roitman, John Hafendorfer, Charles Everman) (Banks, TX)

0020 UTC on 9530
SPAIN: Radio Exterior Espana. Twenty-five minutes of English, with excellent signal! *Panorama* program of entertainment news. (Jones, OH) (Frank Hillton, Charleston, SC) (Rich Jackson, Kansas City, MO)

0030 UTC on 11870
SERBIA: Radio Yugoslavia. Good signal for fifteen minutes of English. News and commentary on Yugoslavia's role in the United Nations. (Jones, OH)

0030 UTC on 4830
VENEZUELA: Radio Tachira. Spanish. Ballads and Spanish pops. Station ID at 1000. Two additional Venezuelans monitored as; Radio Valera on 4840 kHz, 0330-0400 sign-off ID and anthem, Radio Continental on 4939.6 kHz at 0900. (Ed Rausch, Cedar Grove, NJ)

0050 UTC on 7170
SENEGAL: ORTV Du Senegal. French/Arabic. Islamic recitations for ten minutes. Announcer talk to African music, and additional Islamic programming. (Maywoods DX Team-KY)

0120 UTC on 6020
NETHERLANDS: Radio Netherlands. *On The Waterfront* program; *Media Network* heard at 0152 UTC on 9860 kHz. (John S. Carson, Norman, OK)

0130 UTC on 9875
AUSTRIA: Radio Austria Int'l. Newscast to program feature, *The Black Triangle.* Commentary and chat to ID. (Jones, OH)

0235 UTC on 4810
SOUTH AFRICA: Radio Orion. Afrikaans/English. Station ID, U.S. rock music, and Afrikaans newscast. Polka interval signal, time pips at 0300. (Rausch, NJ) Radio RSA heard on 15220 kHz at 0433 UTC. African news and program interviews with youths. (Robert Tucker, Savannah, GA)

0258 UTC on 5009.5
MADAGASCAR: RTV-Malagasy. French. Interval signal at tune-in. Choral national anthem at 0259 UTC. Station ID/frequency quote. (Hillton, SC)

0320 UTC on 17760
PHILIPPINES: Radio Pilipinas. *News Focus* on manufacture of leather goods in India, women's conference in Korea. (Craig Young, Okinawa) VOA Relay heard on 11760 kHz at 2317 UTC. Asian headline news. (Tucker, GA)

0330 UTC on 11625
VATICAN STATE: Vatican Radio. Station ID/frequency schedule at tune-in. Religious programming to Swahili service at 0345 UTC. (Hillton, SC) Discussion on the Last Supper, on 21515 kHz at 1355-1405 sign-off. (Rausch, NJ)

0330 UTC on 6185
MEXICO: Radio Educacion. Spanish. Station ID at half-hour tune in. Station promotionals, regional topics, and Mexican pops. (GVH)

0345 UTC on 7385 USB
COSTA RICA: Radio For Peace Int'l. Feature *Food for the Thoughtful.* (Carson, OK) RFPI heard on 15030 kHz at 1400 UTC. (Jones, OH) Costa Rica's Radio Relojmonitored on 4832.5 kHz at 0425, 0531 & 0930 UTC on 4831 kHz. (Rausch, NJ) (Maywoods DX Team, KY)

0354 UTC on 4765
CONGO: RTV Congolaise. French. Sign-on drum signal, Congo national anthem to ID "ici Brazzaville." Station frequency schedule to news briefs and African music. (Maywoods DX Team, KY) Station audible on this frequency 2345-0000 sign-off. (Hillton, SC)

0543 UTC on 5056
FRENCH GUIANA: RFO Guyane. French. Jazz music program. (Maywoods DX Team, KY) RFO audible on this frequency at 0730 UTC. (Rausch, NJ)

0600 UTC on 4915
GHANA: GBC. English ID as, "this is the Ghana Broadcasting Corporation." National and regional news. Local public service announcements and features. (Duane Hadley, St. Petersburg, FL)

0605 UTC on 11827
TAHITI: RFO Tahiti. French/Tahitian. Lovely and exotic Polynesian music from announcer duo. IDs and chat. (Maywoods DX Team, KY)

0800 UTC on 7240
AUSTRALIA: ABC-Perth. English world news, and rock music to Asian service at 0900. Heard on parallel 9610 kHz. ABC-Brisbane heard on at 0900 UTC on 4920/9660 kHz with *Queensland Tonight* program to ABC ID. (Rausch, NJ) Northern Territory SW Service monitored as follows; VL8T (Tennant Creek) 2325 kHz at 1605 UTC; parallel programming on VL8A (Alice Springs) 2310 kHz, and VL8K (Katherine). Easy listening tunes and "ABC" IDs included. (Witham, HI)

0815 UTC on 4864
BOLIVIA: Radio 16 De Marzo. Spanish. Bolivian folkloric music to ID and local news at 0830. Bolivia's Radio Grigota sign-on heard on 4830 kHz at 1000 UTC. (Rausch, NJ)

0900 UTC on 6000
BRAZIL: Radio Guiaba. Portuguese. Station ID with newscast. Brazilians monitored were; Radio Cancao Nova on 4825 kHz at 1000. Radio Florestas Verdes on 4825 kHz at 1030 UTC, Radio Brazil Tropical on 5015 kHz at 1145 UTC. (Rausch, NJ)

1025 UTC on 6055.4
PERU: Radio Continental. Spanish. Peruvian flute music program. "Canned" ID/promotional at 1028 UTC. Nice signal. Peru's Radio Ancash noted on 4991 kHz at 1050 UTC. (Hillton, SC)

1105 UTC on 5011.5
ECUADOR: Escuelas Radiofonicas Populares. Spanish. Station IDs, music and program chat. Religious station Radio Catolica monitored on 5030 at 1215 UTC. (Jack R. Davis, Birmingham, AL)

1130 UTC on 4890
PAPUA NEW GUINEA: NBC. English/Pidgin. Regional announcements, station ID and pop tunes. Additional PNG Radio Simbu heard on 3355 kHz at 1215 UTC. IDs, pops and C & W music. (Hillton, SC)

1140 UTC on 7295
MALAYSIA: RTV Malaysia. Nice signal for English service. U.S. and Asian pop vocals. World newscast with ID included. (Hillton, SC) Malaysia's RTM-Sarawak heard on 4835 kHz at 1200 UTC. (Rausch, NJ)

1430 UTC on 15020
INDIA: All India Radio-Aligarh. Hindu prayer service. (Rausch, NJ) Program on Indian film industry on 11620 kHz (Bangalore) at 1850. (Fraser, MA) National news and Indian music heard on 11620 kHz at 2055. (Tucker, GA) Maywoods DX Team monitored this frequency to 2137 UTC with "Quiz on India's Contributions to the World."

1605 UTC on 3277
INDIA: (Kashmir) All India Radio-Srinagar. Newscast in unidentified Indian dialect. Regional music at 1610 to announcer chat. ID format at 1630 UTC. (Witham, HI) English news also heard on this frequency at 1230 UTC. Sitar music and Hindu talk. (GVH)

1610 UTC on 4935
KENYA: Kenya Broadcasting Corp. National news to features on Nairobi. *African Commentary* program to regional choral music at 1618. Obituary notices read to station ID. (Witham, HI)

1815 UTC on 9500
SWAZILAND: Trans World Radio. African dialect. Religious readings to brief prayer at 1828. Closing devotional to station ID at 1830 UTC. (Witham, HI)

1825 UTC on 15650
IRAN: (Clandestine) Radio Azadi. Farsi. Tone modulation to ID and stirring sign-on music at 1831. Tone check audible on parallel 9400 kHz, but no program material. Lengthy announcer discourse on anti-Iranian government. Muffled and distorted audio. Middle Eastern music to band fade-out at 1845 UTC. (Witham, HI)

1900 UTC on 7415
PIRATE: WARI. Dr. Lobotomy playing rock music for *On the Edge* program. Dead Man Radio heard on this frequency at 2238 UTC, followed by Hello Radio at 2234. Intermittent comments, "hello you creeps" and "hello you bloodsuckers." Radio USA heard on 7418 kHz at 7418 kHz. Programming included a parody of "1996 Geriatic Olympics" with events to include "Hip Replacement Hockey." (George Archibald, Paoli, PA) *This was George's first experience with Pirate Radio. Nice start! - GVH*

1925 UTC on 9435
ISRAEL: Kol Israel. *DX Corner* on Israel's Tecsat I microwave satellite. (Fraser, MA)Israeli press review and talks on the economy on 9435 at 2249 UTC. News briefs to 2256 anthem sign-off. (Tucker, GA) Domestic Arabic service heard with Middle Eastern news topics at 0400 UTC on 5900 kHz. (Rausch, NJ)

2120 UTC on 6190
GERMANY: Sender Freies Berlin. German. U.S. and German rock/pop tunes. Clear station IDs and promotionals. (Brian Bagwell, St. Louis, MO)

2130 UTC on 11685
SAUDI ARABIA: BSKSA. Good signal with twenty minutes of English. Station ID to traditional Middle Eastern music. (Jones, OH)

2305 UTC on 11530
LEBANON: Voice of Hope. Fair signal quality for Gene Scott show. (Rausch, NJ) Tentative logging on King of Hope at 0025 UTC, on 6280.2 kHz. Weak signal on English devotional, easy listening music. (Archibald, PA)

2348 UTC on 4910.7
HONDURAS: HRXK-LV de la Mosquitia. Spanish. Devotional to choral hymns. Bible verse, IDs as, "este es La Voz de la Mosquitia". (Hillton, SC) Religious station La Voz Evangelica heard on 4820 kHz at 0330 UTC. (Rausch, NJ)

Utility World

Larry Van Horn
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Ring out the Old, Ring in the New

Well it's finally here, the end of another year, and the start of a new one: 1993. January is always a good time to reflect on what has been, and make some predictions for the future.

Looking back over the last year, it was a quieter than normal period in the Utility World. There were no major wars to monitor and no major HF frequency shakeups.

Probably the biggest communications story of the last year was monitoring the events surrounding Hurricane Andrew as it hit the Florida and Louisiana coasts. I am very thankful to still be here in New Orleans writing to you from our home, as Andrew directly threatened us here in the local area. Thanks to each of you who took time to send us letters of concern.

Second place winner in the Utility World would be all the radio activity surrounding this year's presidential campaign and election. As the President and his staff moved around the country at a vigorous pace, Mystic Star HF channels came alive and offered us all some unique insight into President Bush's reelection campaign. It was a lot of fun.

Now let's look into the old crystal ball and see what the future holds. 1993 looks like it will be a very busy year. All sorts of changes are already appearing on the radio horizon.

On a personal level, one of the must notable will be my retirement this spring from the United States Navy after over 22 years of service. Around July 1, I will report to my new and hopefully permanent duty station, Dog Branch Road in Brasstown, NC. Believe me, folks, this is the biggest thrill of my life, and I am honored to be a part of the staff in B-town.

Another big change in 1993 will be in Bob's *Shortwave Directory*. I have already begun work on updating and getting the *GSD* in shape. I want to remind our readers that I don't have all the answers; your help is needed and always appreciated.

One specific area of immediate need is obtaining an updated list of Navy MARS afloat callsigns. I have the international calls and new address scheme, but we need an update on the MARS callsigns. Any help along this line would be much appreciated.

In the past many of you have voluntarily provided Bob with information for the *Shortwave Directory*, or you have been approached by him directly. By contacting a greater number of monitors through the pages of *Monitoring Times*, I am asking for that same support and more! You know, if all of you who have bought Bob's book would sit down with your copy right now and take a few minutes to jot down some notes, we would have the best HF reference in the field today. Any updates, suggestions, or changes should be sent to Brasstown as soon as possible. I solicit your help in making this next edition the best yet.

New Aero Freqs

It appears that the start of the new year will ring in some new HF aeronautical frequencies, according to Thomas A. McKee in Cary, NC. He reports that some changes will be made to the NAT (North Atlantic) and CAR (Caribbean) family of frequencies.

A new NAT-F frequency group for Gander and Shanwick is planned for implementation this month. In order to accommodate this additional group some NAT-A and NAT-E frequency shifts are required. Here is the new line-up:

NAT-A	3016 5598 8906 13306 17946
NAT-E	2962 6628 8825 11309 13354
NAT-F	3476 6622 8831 11336(Tentative)

Caribbean frequencies will also get an overhaul. A new CAR-B group has been formalized with some of the frequencies coming from the old CAR-A group. The two new Caribbean groups are:

CAR-A	2887 5550 6577 8918 11396 13297 17907
CAR-B	3455 5520 6586 8846 11387 17907

A tip of the old hurricane glass to Tom for sending that data to the Ute World column.

New Callsigns

Things past and future come to us from Geoff Halligey, author of the *Confidential Frequency List* published by Gilfer. Geoff says the new edition of the *CFL* (8th edition) is selling well. The 9th edition is in the works and it will be even better with the inclusion of ARQ-E3, ARQ-M2 and Piccolo stations.

He reports that some recent callsign allocation changes have been issued by the ITU (International Telecommunications Union) in Geneva, Switzerland, as follows:

E2A - E2Z	Thailand
LYO - LYZ	Lithuania (Delete from the CIS allocation)
YLA - YLZ	Latvia (Delete from the CIS allocation)
9AA - 9AZ	Croatia

By now you may have noticed several new stations on the air using the new Croatia callsign block. These include the following marine coastal stations:

9AD Dubrovnik Radio (ex-YUX)
9AR Rijeka Radio (ex-YUR)
9AS Split Radio (ex-YUS)

In Germany, DHS-Ruegen Radio (a main marine coastal station in former East Germany) has ceased all its CW and RTTY transmissions. That leaves DAN-Norddeich Radio as the only long distance Coast Station in Germany.

Speaking of Germany, in the September issue of this column I had a couple of logs with the callsigns DGU20H3 and DFU20H3. The DF series of callsigns are transmitted from Bonames, a little place just north of Frankfurt/Main, Germany. The DG series comes from Elmshorn, Northwest of Hamburg, Germany.

When the two numbers following the letters are identical, then the frequencies are the same. Many of the frequencies are thus duplicated so that, for whatever reason, the transmission can be switched to either Bonames or Elmshorn.

You might notice the suffix H3 at the end of the callsign. H3 and similar suffixes denote the antenna in use.

Meteorological station HLL8 in Seoul, South Korea, has opened a new meteo FAX transmission service on 5857.5 kHz using an IOC of 576 and drum rotation of 120 rpm. The output power is 1 kilowatt. Look for weather charts at the following transmission times: 0000, 0300, 0600, 0640, 0730, 0900, 1200, 1500 and 2100 UTC.

Here's a correction to Gayle Van Horn's *International Callsign Handbook*. In section 3 there are several places that give "Brentwaters" as a location. According to Geoff that should read "Bentwaters" instead.

Thanks to Geoff for all the information presented above. Your interesting contributions and HF updates are always welcomed here.

Attention Aero Buffs!

The public sale of Defense Mapping Agency (DMA) aeronautical charts and publications has been transferred from DMA to NOAA/ National Ocean Service (NOS) effective 1 October 1992. A new free aeronautical quarterly "Dates of Latest Editions" bulletin is available from NOS. Requests for their new catalog and bulletin containing DMA aeronautical products may be sent to:

NOAA Distribution Branch (N/CG33)
National Ocean Service
6501 Lafayette Avenue
Riverdale, MD 20737 Telephone: (301) 436-6993

According to the folks at NOAA/NOS, if you have an existing subscription with DMA, that sub will be transferred to NOAA/NOS automatically. Thanks to Mr. Roger West in Amery, WI, for forwarding this information to Ute World readers.

Idling on the Air

As a special feature for our beginners this month, long-time Ute World reporter, Robert Hall, explains the term "Idling":

People reading through RTTY-type logs may often come across the word "idling," and perhaps wonder whether someone has fallen asleep and is not on the job! Actually the term has a sound technical significance. Take a look at the following logging entry:

> 19204.9 kHz - 1307 UTC - MRT (Martinique) - RFLI (callsign) - ARQ E3 (mode) - 192/418 (speed/shift) - FF (for French Forces), Fort de France - idling.

In the parentheses I have explained the separate items in the entry, but what is the meaning of the word "idling" at the end? Quite simply, it means that I have tuned into a fairly strong signal that shows all the above characteristics, but either nothing has appeared on my VDU (Video Display Unit) screen, or it has produced only meaningless garbage.

I know what *should* appear on this frequency from previous logs or from utility reference books. Once the communications terminal confirms the correct tuning of speed and shift, it is determined that I am in fact receiving a transmission carrier from RFLI, the French Navy station on Martinique Island. Although I recognize the audio and other details, nothing comes up on the VDU, and so it is logged as "idling."

Now this may sound boring and a waste of time, but to RTTY buffs it has an important meaning. It verifies that this RFLI frequency is still active, that it could be received at this location, and that the French were anxious to keep the circuit open by continuous sound transmission (thus blocking the frequency for other possible users).

Many French military and naval stations around the world use the ARQ-E, ARQ-E3 and M2 transmission modes, and they are often connected into "circuits" which are kept free from interference by the use of "idling" transmissions. When not "idling," one can often see traffic in French and in code, but never, I am afraid, does anything really interesting come up. All the hot stuff goes out either in deep code or by SATCOM (satellite communications).

And, as I have reported previously, the idling transmissions are interrupted at regular intervals with a circuit or line test, abbreviated in French to "Controle de Voie," which you may see abbreviated to "CdeV" in some logging columns.

Thanks, Robert, for that nice beginner explanation of "Idling" and "Controle de Voie." Next month Robert will discuss packet radio on HF from a South African point of view.

New Military

Speaking of packet, I have been getting reports of some weird US Air Force packet comms in the 14 MHz region. On 14648.0 the Air Force appears to have set up shop with a packet BBS. Some of the stations reported on this frequency include: AFA01-Washington, DC; AFA02-Key West, FL; AFA03-Bonita Springs, FL; AFA05-Homestead AFB, FL; and AIR1AF-location unknown. While most of the transmissions reported on this frequency are in English, some Spanish has been reported in use by various stations in the net. More information on the users and purpose of this network would be appreciated.

Also seen in this vicinity (14646.5) is another packet BBS system. On the surface, this appears to be connected with the Army, but as mentioned above the exact purpose of the network is still a mystery. Some of the stations noted on this frequency include: KF2XEW (RFC) RF Comm Group, Harris Corp-Rochester, NY; P19STC-Staelduim, Netherlands; VE9LBQ-CRB Ottawa, Ontario, Canada; and for Fort Monmouth, NJ, using the callsigns WE1COM and AC2CQ.

My first impression of this network is that it is experimental in nature, based on the callsign at Harris and on the participants. The one that throws me off however, is the Netherlands station. As with the Air Force system, any information on this network would be much appreciated.

A lot of folks are probably familiar with the USMAG (United States Military Assistance Group) operated in Central and South America. I profiled that network in the first Ute World column I did for *MT* in March 1988. Now, in addition to that voice network, there appears to be a new data network operated by the United States Army in Latin America.

This network has been operated for some time in the 20 MHz band using a variety of data modes. The net control station appears to be ACC60 located at Fort Detrick, MD. Ft. Detrick is the home of the 1110th Army Signal Battalion and it is one of the nation's largest communications facilities. You will find voice comms on 20146, Morse code on 20147 and SITOR-A/B on 20148.2 kHz. So far all comms appear to be in Spanish. Stations seen operating in this network include:

One of this first things I noticed about the above calls was that the three HK3 calls sure looked amateur radio-ish. Curiousity got the best of me and out comes my *Amateur Radio Call Book*. Yep, two out of three made it in the *Callbook* and guess what it shows (Military Army outfits):

HK3EJC	Comando del Ejercito, Minjusticia, Bogota
HK3EMC	Escuela Militar de Cadetes, Calle 81 36-00, Bogota
HK3SIM	No listing

Based on language used, traffic seen and other information, my instinct is that this network is probably the Army equivalent of the Inter-American Naval Telecommunications Network that we have seen on HF for years. Only time will tell. Letters have been sent to the two above addresses and I will let you know the results.

Time for a hurricane and on to your logs.

ACA5	Corozal, Panama (Probably Fort Kobbe)	HK3SIM	Bogota, Colombia
		HPGN	Panama City, Panama
ACC60	Fort Detrick, MD USA	HR2	Tegucigalpa, Honduras
CAWZJ	Santiago, Chile	HTGN1	Managua, Nicaragua
CEM	La Paz, Bolivia	LTR46	Buenos Aires, Argentina
CVL5D	Montevideo, Uruguay	PRU65	Lima, Peru
DECA2	Guatemala City, Guatemala	PTO2	Brasilia, Brazil
DECA3	Guatemala City, Guatemala	SAL1	San Salvador, El Salvador
HCE24	Quito, Ecuador		
HIR4	Santo Domingo, Costa Rica	YWH3	Caracas, Venezuela
HK3EJC	Bogota, Colombia	ZPQ5	Asuncion, Paraguay
HK3EMC	Bogota, Colombia	No Call	San Jose, Costa Rica

Utility World

Utility Loggings

Abbreviations used in this column

AF	Air Force	Kyodo	Kyodo Tushin News Agency (Japan)
AFB	Air Force Base		
AM	Amplitude Modulation	LDOC	Long Distance Operational Control
ARQ	Synchronous transmission and automatic repetition (in general)	MACS	Military Aeronautical Communication System
ARQ-E3	Single channel ARQ ITA3 system	MAP	Maghreb Arabe Presse
ARQ-M2	Multiplex ARQ system with 2 data channels	MARS	Military Affiliate Radio System
ASECNA	Agence pour la Securite de la Navigation Aerienne en Afrique et a Madagascar	MENA	Middle East News Agency
		Meteo	Meteorological
CANFORCE	Canadian Forces	MFA	Ministry of Foreign Affairs
Centro	Center for Portuguese	MOD	Ministry of Defense
CNA	Central News Agency, Inc	Ops	Operations
Comms	Communications	QSX	I am listening to (call/frequency)
COMSTA	Communications Station		
CQ	General call for any station	RAF	Royal Air Force
CW	Continuous Wave (Morse Code)	RN	Royal Navy
		RTTY	Radioteletype
DE	Morse Code proword meaning 'from'	SATCOM	Satellite Communications
FAA	Federal Aviation Administration	SITOR-A	Simplex teleprinting over radio mode A
FAF	French Air Force	UHF	Ultra High Frequency
FAX	Facsimile	UN	United Nations
FEMA	Federal Emergency Management Agency	Unid	Unidentified
		US	United States
FF	French Forces	USAF	United States Air Force
FM	Frequency Modulation	USB	Upper Side Band
HF	High Frequency	USCG	United States Coast Guard
ID	Identification		
ITA3	International Telegraph Alphabet 3	USN	United States Navy

Note to contributors: please, please do not cut your logs into strips! Frequencies kHz unless noted otherwise.

2670.0 NMB-USCG Group Charleston, SC, with Special Notice to Mariners advising all vessels to avoid Nicaraguan waters as several foreign flag vessels had been seized recently by Nicaraguan ships. In USB at 0423. (Neal Perdue-Madison, AL) *Hey what gives here, folks; I thought we were at peace with this bunch. Will bear watching, that is for sure-Larry.*

3897.8 TNL-ASECNA Brazzaville, Congo, with ARQ-M2/96 weather and traffic on both channel A and B at 1724. (Robert Hall-Capetown, South Africa)

4033.5 US Army MARS stations AAV5TI working AAR5UY with CW traffic at 2306. (Jack Dix-Yonkers, NY)

4346.0 CWA-Cerrito Punta Carretas Radio, Uruguay, with CW CQ marker at 0946. (Dix-NY)

4570.2 HZN46-Jeddah Meteo, Saudi Arabia, with 96 baud RTTY weather codes at 0300. (Hall-RSA)

4788.0 TJK-ASECNA Doaula, Cameroon, with 50 baud RTTY traffic at 0310. (Hall-RSA)

5015.0 German female 3/2-digit number station in AM at various times. (Robert Thomas-Bridgeport, CT)

5020.1 RWW74-Moscow Meteo, Russia, with 50 baud RTTY weather codes at 0320. (Hall-RSA)

5148.3 RVO73-Moscow Meteo, Russia, with fax weather charts at 0325. (Hall-RSA)

5205.0 X9R35, F3M and Front Door heard using USB at 0130. Also noted on frequency Mike 10 (8160.0) at 0120, USB. X9R35 passed these two HF frequencies on SATCOM frequency 262.150 MHz (FM). Id'ed as X9R on UHF. (J. Metcalfe-Lancaster, KY)

5211.0 04L calling FEMA station WGY904 at 1729, USB. (Metcalfe-KY)

5526.0 Centro Manaus, Brazil, working Centro Maiquetia, Colombia, in Spanish in USB at 0445. (Arsenio Fornaro-Brooklyn, NY)

5680.0 NMN-COMSTA Portsmouth working '08' then moved to 8984 in USB at 0232. (Jeff Haverlah-Humble, TX)

6469.0 D4A-S.Vicente Radio, Cape Verde Island, with CQ CW marker at 0941. (Dix-NY)

6712.0 King 24 working Goldmine 41 (Apparent ground station) in USB with phone patch to Patrick AFB Rescue Ops for weather report at 0157. (Haverlah-TX)

6715.0 Air Force Rescue 120 working 'Moffett Rescue' at 0239 in USB. (Haverlah-TX)

6761.0 Windpipe calling McClellan, then Offutt and Andrews in USB with no success at 0250. Caught him also on 6757 W-103 calling Broadloam, 6730 X-903 and 9017 X-904 at various times. (Haverlah-TX)

6812.0 Air Force One working Crown on F-888 using USB at 0140. (Bart Boyer-Salem, OR) *Welcome to the column, Bart; hope you check in often-Larry.*

6835.1 GFL22-Bracknell Meteo, UK, with 50 baud RTTY weather codes at 0445. (Hall-RSA)

7321.6 LYNX-MFA Lagos, Nigeria, with RTTY idler and CW call sign at 2250. (Dix-NY)

7425.0 Missionary working Butter 9 in LSB at 0139. This is the first legitimate user of that frequency I have heard. (Peter Stawicki-Norman, OK)

7485.0 KMA65-Unid US Government station, standing by on FEMA frequency F-23, USB at 0029. (Metcalfe-KY) *Probably another unid FAA station on FEMA channels-Larry.*

7506.0 ZRO2-Pretoria Meteo with fax schedule at 0500. (Hall-RSA)

7552.1 WNXR567-Southern Bell Telephone Key West, FL, AAR4USS-US Army MARS Fort Stewart, GA, and WNID658-Southern Bell Telephone Jacksonville, FL, with emergency traffic at 2132, USB. (Metcalfe-KY)

7568.0 Sidewinder and Rattler coordinating high speed data transmissions at 2316, USB. (Metcalfe-KY)

7932.0 WNGX406, KNFZ234, MECC1, MECC2, all Florida Division of Emergency Management stations heard in the Hurricane Andrew aftermath, USB. Also A1A, mystery station (*there is a route A1A in Florida-Larry*) heard in FEMA nets, giving as net control station (NCS) (Wilmington, DE location) for National Guard Emergency Operations Network, USB at 2300. This is an Operation Secure frequency. (Metcalfe-KY)

7935.0 Unid stations AFA01, AFA02, AFA07 in USB at 0030. Said they would move to 14 MHz frequency the following day. (Metcalfe-KY) *Any bets this is the bunch I mentioned in this month's column on 14648.0. I have also seen an unid USAF on this one with the call "Enterprise"-Larry.*

8080.0 English female 3/2-digit number station in AM at 2312. Also the USS Guadalcanal calling USS Nashville for a radio check in USB at 2221.(Dix-NY) *Hummm, new Gator Freighter (Navy Amphibious Ship) tactical voice channel-Larry.*

8083.0 RIJ75-Tashkent Meteo, Uzbekistan, with fax weather chart at 1708. (Hall-RSA)

8142.0 OLX-Prague Radio, Czechoslovakia, with V CW marker at 2359. (Dix-NY)

8176.0 VIP-Perth Radio, Australia, with marine weather in USb at 1130. (Metcalfe-KY)

8526.0 JMC-Tokyo Radio, Japan, with V CW marker at 0948. (Dix-NY)

8664.0 HMZ-Pyongyang Radio, North Korea, with CQ CW marker and traffic list at 1003. (Dix-NY)

8672.8 MTO-RN Rosyth, UK, with 75 baud RTTY broadcast at 2304. (Dix-NY)

8855.0 Centro Belem, Brazil, working Varig 250 with position report at 0057. Centro Brasilia, Brazil, working Varig 871 for position report in Portuguese at 0316. RG871 request relay to Manaus. At 0325 heard Paramaribo Center working Belem Center. At 0429 heard Centro Porto Velho working Varig 835 in Portuguese. All comms used USB. (Fornaro-NY)

8989.0 VXA-CANFORCE MACS Edmonton Military working unid aircraft in USB at 0335. (Haverlah-TX)

8990.0 Jeddah, Saudia Arabia, working Saudi 002 in USB at 0335. (Haverlah-TX) *Jeff, I think you are right, I tend to agree that this might be a Saudi AF channel versus a Saudia Airline LDOC-Larry.*

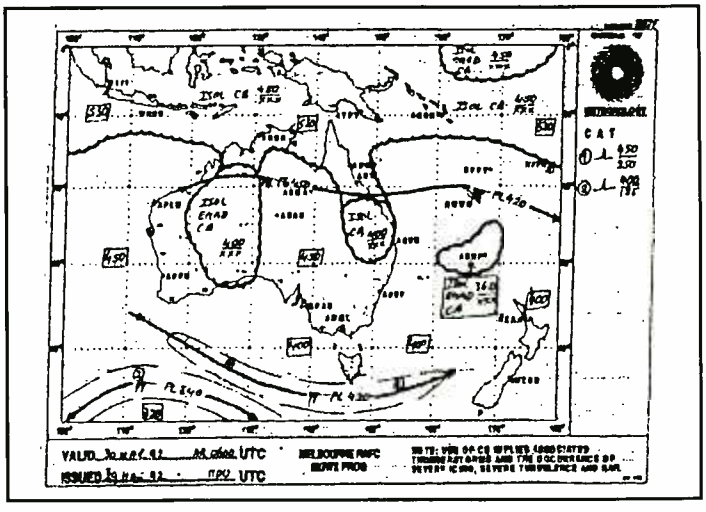
9014.0 Hound 4 and 5; Sweeper 1 and 3 plus others and Dragnet in net using USB at 2028. (Haverlah-TX)

9040.0 German female 3/2-digit number station in AM at 2341. (Haverlah-TX)

9057.0 Broadloam working Snowslide on '904' (9017). Then moved to this channel S-309 and used it as primary in USB at 2239. (Haverlah-TX) Gunrack and Crossfire in USB at 0254. (Metcalfe-KY)

9203.0 GFE22-Bracknell Meteo, England, with Eastern hemisphere fax weather chart at 2300. (Dix-NY)

9218.0 RTB26-Novosibirsk Meteo, Russia, with fax weather chart at 1645. (Hall-RSA)
9338.0 3MA34-CNA Taipei, Taiwan, with fax press photo at 1810. (Hall-RSA)
10366.0 RFTJF-FF Port Bouet, Ivory Coast, with ARQ-E3 "Controle de Voie" at 1938. (Hall-RSA)
10416.7 CNM31-MAP Rabat, Morocco, with Spanish 50 baud RTTY news bulletins at 1916. (Hall-RSA)
10493.0 WGY918-FEMA Mobile comms station operating from Franklin, LA, at 1449 in USB. (Metcalfe-KY)
10638.5 RFQP-FF Djibouti with ARQ-M2/200 idling at 1858. (Hall-RSA)
10656.6 MKK-British Army Standbridge, UK, with 50 baud RTTY with RY's, foxes and counts at 1855. (Hall-RSA)
10665.0 Spanish female 4-digit number station in AM at 0003. (Dix-NY)
10757.2 CNM31/39-MAP Rabat, Morocco, with 50 baud RTTY RY's and frequency information for South America at 1852. (Hall-RSA)
10892.1 GXQ-British Army Stanbridge, UK, with 48 baud VFT Foxes, RY and counts at 1837. (Hall-RSA)
10980.0 RDD79-Moscow Meteo, Russia, with fax weather chart at 1640. (Hall-RSA)
11107.0 German female 3/2-digit number station in AM at 0013. (Dix-NY)
11120.5 FDC-FAF Metz, France, with V CW marker at 1942. (Dix-NY)
11159.0 Aircraft Spar 65, Andrews and Offutt AFB trying various frequencies in early evening hours. Other frequencies included 5026.0 8086.0 14769.0 kHz. 14 MHz frequency attempted after aircraft operator reported 14 MHz amateur frequencies were being received from all parts of the U.S. onboard the aircraft. (Metcalfe-KY) *Hummm, Now looks like there is a new public service for amateur radio, hi-Larry.*
11201.0 NMR26-USCG Air Station Borinquen, Puerto Rico, working aircraft Charlie 3 November (USN) in USB at 1832. (Percue-AL)
11214.0 Foxtrot tango working Blackeagle 02. Also Foxtrot working Mike talking about playground activity in USB at 0411. (Haverlah-TX) *Interesting, my listing shows RAF and USAF tactical-Larry.*
11215.0 '570' working Radio Maintenance on HF1, mentioned HF2 and problems with KY-75. 570 mentioned he planned on calling McClellan later. QRM from 11214 activity, believe Canadian in USB at 0422. (Haverlah-TX) *Probably Jeff, I have this one as a CANFORCE channel Alpha channel. The HF1 and HF2 probably refer to radios in the cockpit of '570'-Larry.*
11366.0 Belem Varig LDOC working Varig 845 from Los Angeles to Rio with position report in Portuguese in USB at 0315. (Fornaro-NY)
11408.0 Astrocap, Smuggler, Snowplow and Ligament in comms. Good quality here on P-382 using USB at 1945. (Richardson/Comer-Titusville, FL) *Hey guys, interesting. We had 5826 as P-382. Hummm, Bill B please take note-Larry.*
12162.9 RGO25-Moscow Meteo, Russia with strong signal but poor fax chart at 1725. (Hall-RSA)
12207.0 English male in AM sending 3/4-digit numbers at 1956. (Dix-NY)
12586.0 XSG-Shanghai Radio, PRC, with CQ CW marker at 2259. (Dix-NY)
12709.0 8PO-Barbados Radio with DE CW marker at 2125. (Dix-NY)
12780.6 9AR-Rijeka Radio, Croatia, with V CW marker at 1943. (Dix-NY)
12905.9 MTO-RN Rosyth, UK, with 75 baud RTTY broadcast at 2240. (Dix-NY)
13843.5 FDC-FAF Metz, France, with V CW marker at 2239. (Dix-NY)
14383.5 GXQ-British Army, Stanbridge, UK, with 50 baud channel 1-3 VFT, foxes, RY's, and counts in clear at 1700. (Hall-RSA)
14481.9 RFGW-MOD Paris, France, with ARQ-E3 French press news at 1755. (Hall-RSA)
14550.0 SPW-Warsaw Radio with DE CW marker QSX on 16789.0 at 2259. (Dix-NY)
15044.0 Astrocap, Smuggler, Snowplow and Ligament in comms with radio checks and stations asking for traffic. Astrocap advises units to go to P-384 for secondary check. USB at 1933. (Richardson/Comer-Titusville, FL)
15048.0 Bangor Codfish and many others giving Nabgor immediate request and position reports. USB at 1950. At 2019 gave mission report. Mission 6021 was four B-2s, callsign Newest 21; gave armament and take off times. Times were not UTC or US time zones. (Richardson/Comer-Titusville, FL)
15708.0 '932' calling '906' in USB over a 3 minute period. (Haverlah-TX)
15876.0 3MA24-CNA Taipei, Taiwan, with fax broadcast of Chinese newspaper parallel 14685.0/19678.5 at 1503. (Hall-RSA) *My notes indicate this is also parallel 9430.0 kHz-Larry.*
16014.1 RFVI-FF Le Port, Reunion, with ARQ-E3 idling at 1638. (Hall-RSA)
16282.1 MKD-RAF Akrotiri, Cyprus, with 50 baud RTTY RY's at 1615. (Hall-RSA)
16306.4 VER?-Unid station possibly CANFORCE Ottawa, Canada, with ARQ-M2/200. Strange Signals. (Hall-RSA) *I show nothing in my references-Larry.*
16325.1 RFTJD-FF Libreville, Gabon, with ARQ-E3 idling at 1630. (Hall-RSA)
16918.6 MTO-RN Rosyth, UK, with 75 baud RTTY broadcast at 2218. (Dix-NY)
16942.5 9AR-Rijeka Radio, Croatia, with V CW marker at 1919. (Dix-NY)
17000.0 Vladivostok Meteo, Russia, with fax transmission at 2331. (Dix-NY)
17069.6 JJC-Tokyo Meteo, Japan, with Japanese Meteo characters using fax at 2206. (Dix-NY) Kyodo New Agency broadcast of Japanese news paper at 1540 parallel to 22542.0 at 1540. (Hall-RSA)
17366.9 5YE-Nairobi Meteo, Kenya, with with weather fax chart at 2230. (Dix-NY)
17415.0 HEK66-Berne Air LDOC noted here from 18023 then to 18480 (HBO58) at various times in USB. (Haverlah-TX)
18046.0 Astrocap, Smuggler, Snowplow and Ligament in Comms. Bad quality here on P-384 went to P-382 for secondary check. (Richardson/Comer-Titusville, FL) *Thanks fellows, new designator here, Bill Battles please note-Larry.*
18190.0 Interpol broadcast using SITOR-A with crypto, no call sign seen at 1558. (Hall-RSA)
19027.3 PWX33-Brasilia Naval Radio, Brazil, with 75 baud RTTY test tape "cintado de prueba" at 1247.
19296.9 RFQP-FF Djibouti with ARQ-E3 idling at 1303. (Hall-RSA)
19340.1 SUA313-MENA Cairo, Egypt, with Arabic 72 baud RTTY news bulletins at 1257. (Hall-RSA)
19399.7 VVD69-Delhi Meteo, India, with 50 baud RTTY weather codes at 1243. (Hall-RSA)
19425.7 SIV-MFA Stockholm with SWED-ARQ/100 English message for Embassy in Rabat, Morocco, at 0943. (Hall-RSA)
19870.0 UN New York with UN press reports using SITOR-A at 1220. (Hall-RSA)
20734.1 4UZ-UN Geneva, Switzerland, with SITOR-A traffic for UNHCR Conakry at 1432. (Hall-RSA)
20944.0 SAM-MFA Stockholm, Sweden, with English SWED-ARQ traffic for Delhi and Jakarta at 1445. (Hall-RSA)
21859.1 SAM-MFA Stockholm, Sweden, with Swedish SWED-ARQ news about Yugoslavia at 1308. (Hall-RSA)
22865.0 9VF235-Kyodo Singapore with Japanese fax press broadcast at 0950. (Hall-RSA)
22940.1 JJC-Kyodo Tokyo, Japan, with fax of Japanese newspaper at 1533. (Hall-RSA)
23191.9 RFGW-MOD Paris, France, with ARQ-E3 idling at 1138. (Hall-RSA)
23521.0 JMH6-Tokyo Meteo, Japan, with excellent fax weather chart at 0950. (Hall-RSA)
23585.7 Swedish Embassy Harare, Zimbabwe, with English SWED-ARQ traffic to SIDA-Stockholm at 1205. (Hall-RSA)
23586.0 SAM/SIDA-MFA Stockholm, Sweden, with SWED-ARQ traffic to Harare and Luanda in English and Swedish at 1205. (Hall-RSA)
23593.0 Swedish Embassy Manila, Philippines, with English SWED-ARQ messages at 1036. (Hall-RSA)



This weather fax from AXM, the Australian WX Bureau, was received by Jacques d'Avignon in Ontario, Canada, on 20.469 MHz. They used just over 1 kW of power!

The Scanning Report

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

Antenna Tune-Up

Seasoned scanner buffs will tell you that antenna problems typically occur in the middle of winter. Here in the Northeast, accumulations of snow and ice can damage antennas and high winds can force moisture into coax connections.

The inability of your antenna to pull in low power signals is usually the first indication that something is wrong. In most instances, you'll be able to hear the base unit, but the mobile and hand held units will be barely audible or non-existent. If your antenna could pull in low power signals when it was new, you can restore its original performance with a "Winter Antenna Tune-up." Here's what you'll need to do:

Coax connections on outdoor antennas should be cleaned with a lightly oiled cotton swab. The two oils that are commonly used are WD-40 and CRC. Both products displace moisture and can be found in hardware and department stores. For tougher cleaning jobs, a spray can of electrical contact cleaner will work quite well. However, be careful of over-spray. The chemicals in some cleaning products can damage coax cable.

Rooftop antennas should be disassembled and cleaned on a yearly basis. The element contact points can be cleaned with 400 grit "wet & dry" sandpaper. Lubricate the sandpaper with one of the oils that was previously mentioned and lightly sand the contact areas. Remove the residue with a clean, dry cloth and then reinstall the elements. If you're also replacing the connecting hardware, use brass nuts and bolts. Steel hardware will corrode aluminum and severely damage your antenna.

After the antenna is cleaned and reassembled, spray a light coat of urethane or lacquer on the connection areas. The waterproof coating will help to keep the connection points dry and free from corrosion.

Antennas that utilize a matching transformer (balun), are especially prone to corrosion. If you merely twisted the balun wires around the connector (Figure #1), the performance of your antenna will certainly be compromised. To restore the antenna's ability to capture weak signals, disconnect the balun, clean the connection points, cut the wires to expose new ends, and reinstall. Finally, weatherproof the connection points with Radio Shack tape sealant, catalog #278-1648.

The coax connection at the balun and at the base of your antenna should also be sealed. Coax connectors that have been exposed to the weather will allow moisture to enter into the cable. Contaminated coax cable must be replaced and protected from the weather. Again, use the tape sealant from Radio Shack.

If you've recently installed cable television accessories in your coax line, the problem may not be with your antenna. Cable TV splitters (Figure #2), can reduce the received signal as much as 50% percent. Cable accessory loss is especially noticeable in the 800 megahertz frequencies. The higher frequencies are adversely affected by any type of connector, splitter or coupling device. To achieve the best results and minimize signal loss, use a continuous length of coax cable between your antenna and scanner radio.

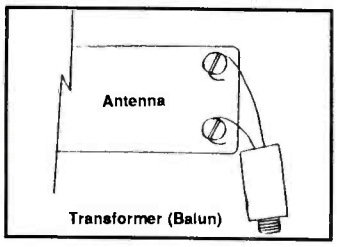


Figure 1

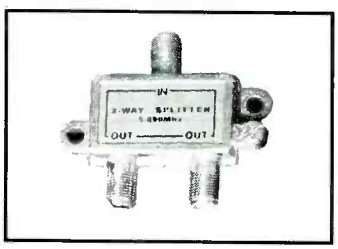


Figure 2

Antenna repairs during the winter months can be very hazardous. Depending upon your location, freezing temperatures, snow and ice, can make roof top antenna repairs virtually impossible. But if you're willing to be patient, and plan ahead, roof top repairs during the winter are not impossible. Here are a few suggestions to consider:

1. Listen to your local, extended weather forecast. Most agencies project the weather in five day increments. Plan your antenna activities to correspond with the warmest day forecasted.
2. Use the days preceding the event to gather your tools and to make the necessary preparations. When the warm weather arrives, you don't want to waste valuable time hunting for items that could have been gathered in advance.
3. Wear a safety belt. It could save your life!

We all know that the ideal time to check roof top antennas is during the summer season. But if you're a typical hobbyist, you simply don't have the time to perform warm weather antenna maintenance. You're too busy working around the house, cutting the grass, tending the garden and performing dozens of additional tasks. If you're shaking your head in agreement, gather your tools, pick a warm day and give your antenna a well deserved mid-winter tune-up.

Treasure Hunt

No listening post is complete without several photos of local police, fire or other emergency services hanging on the wall. Beautifully framed color prints add a touch of excitement and realism to any scanning shack.

But as we all know, taking pictures with a 35mm camera isn't easy. Setting the film speed, adjusting the lens and choosing the correct exposure seems to take forever. And despite our best efforts, the developed pictures are usually not suitable for framing.

Does it sound familiar? Are you tired of throwing away photographs because of improper camera settings? If so, the folks at Minolta have designed a camera just for you. The "Maxxum 3xi" takes the guesswork out of using a 35mm camera. All you do is load the film, point and shoot. If you're an experienced camera buff, the Maxxum 3xi can be also be manually adjusted. Simply set the camera to "manual" and you can add a touch of creativity to any photograph.

If you're worried about lenses, relax. Minolta has also included a 50mm, 1.7, autofocus lens! Once again, the guesswork has been eliminated. You don't need to adjust the focusing ring. The lens also contains a micro computer that continuously feeds information to the main computer in the camera. In the autofocus mode, the camera will automatically adjust the lens for a clear, sharp picture. All you do is point the camera, push a button, and relax. The Maxxum 3xi automatically selects the correct settings to produce the best picture.

Minolta even made loading the film automatic. You simply open the back, drop in the film and close the case. After your last picture, the camera rewinds the film and the data panel reminds you to install a new roll. Best of all, you can win the Maxxum 3xi by participating in our first Treasure Hunt of 1993! Here are the clues:

1. The weight of the Maxxum 3xi (without lens and battery is 420g. How much is that in ounces?

2. The Maxxum 3xi uses a "2CR5" lithium battery. How many volts are provided by the 2CR5?
3. A neck strap is included with the Maxxum 3xi. True or False?
4. What award-winning photographer took the picture on the front cover of the November 1992 edition of *Monitoring Times*?
5. What is a photometer?

You can check out the Maxxum 3xi by visiting your local camera shop or department store. You'll discover that the Maxxum 3xi is a lightweight, compact and professionally crafted instrument. In addition to the features that we've already mentioned, the 3xi also contains a built in flash, a self timer, a battery condition indicator and many additional features that we simply can't list in this limited space.

Maybe the Maxxum 3xi is just what you need to snap that shot that makes the cover of *MT*!

Frequency Exchange

If you've never thrown a snow ball, you're in for a special treat. Our first stop is the home of Ed Richardson, in ***Winnipeg, Canada.***

Winnipeg Police	Winnipeg Fire Department
156.1500 Park Police	413.1625 Channel #1
413.2250 Channel #1	413.0125 " #2
413.1250 " #2	413.4125 " #3
413.250 " #3	413.6250 " #4
413.7375 " #4	
413.650 " #5	Winnipeg Ambulance Service
413.7875 " #6	413.9125 Channel #1
413.8625 " #7	413.3625 " #2
413.9750 " #8	413.5875 " #3
412.9375 " #9	412.7875 " #4
464.0625 Pagers	

Provincial Commons	Winnipeg Transit System
155.6700 Police Common	153.7700 Supervisors
158.5500 Fire Commissioner	412.5625 Buses
158.7600 Ambulance Common	412.6375 Buses
158.8800 Fire Commissioner	412.6625 Buses
158.9250 Fire Commissioner	413.8125 Buses

Royal Canadian Mounted Police

155.550 Channel #1	155.310 Channel #8	156.490 Channel #15
155.580 " #2	155.670 " #9	155.250 " #16
155.700 " #3	155.460 " #10	413.0625 Airport Pol.
155.640 " #4	155.850 " #11	413.2875 Airport Pol.
155.880 " #5	156.030 " #12	
155.280 " #6	156.060 " #13	
155.520 " #7	156.240 " #14	

As we depart Winnipeg, don't discard your coat; you'll need it when we arrive at ***Omaha, Nebraska:***

39.820	Ambulance/Hospital	155.950	Boys Town Police
39.900	Douglas County Sheriff	170.150	KETY TV channel #7
39.980	Douglas County Fire	173.225	Omaha World Herald
42.200	Nebraska Highway Patrol	450.300	WOWT TV channel #6
42.300	" "	450.350	KFAB Helicopter
42.460	" "	450.420	KMTV TV channel #3
154.010	Omaha Fire Department	450.600	WOWT TV channel #6
154.190	" "	450.950	WOWT TV channel #6
154.950	Douglas County Sheriff	453.235	Millard Fire Dept.
155.010	Boys Town Police	453.425	Metro Area Transit
155.220	SkyMed Helicopter	453.525	" "
155.070	Douglas County Sheriff	455.550	KMTV TV channel #3
155.130	" "	453.600	Irvington Fire Dept.
155.325	Lifeflight Helicopters	457.250	Nebraska Hwy Patrol

The above list was submitted anonymously. Send your corrections and or additions to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Les Butler lives in Michigan and he has invited everyone to monitor the ***Oakland, Michigan,*** sheriff frequencies. According to Les, the sheriff is using a new trunked system. Here are the new and old frequencies:

NEW TRUNKED SYSTEM	OLD SYSTEM	
851.0625	39.14	Marine Division
851.4625	154.980	Sheriff
852.0625	155.165	Sheriff
852.2125	155.730	Sheriff
852.4625	159.030	Sheriff
853.4625	423.250	W. Bloomfield Police
854.0625	423.275	Farmington Hills Police
854.4625	423.375	Farmington Hills Police
855.0625	423.450	W. Bloomfield Police
855.4625	424.175	W. Bloomfield Police
	425.250	Farmington Police
	425.275	W. Bloomfield Police

Are you ready to visit the Ozarks? Harley Bogart lives in ***Ozark, Missouri,*** and he has invited us to stop in for coffee.

42.06	State Police	154.130	Springfield City Fire
42.12	"	155.400	Aurora Hospital
42.22	"	434.575	Springfield City Fire
42.38	"	453.100	Springfield City Police
48.30	Empire Electric	453.400	"
151.040	Highway Department	460.100	"
151.130	Highway Department	460.225	"
151.155	Wildlife Dept.	460.400	"
153.800	Monett City Utility		

Looking for a warmer climate? No problem. Let's visit with Donald Chapman, in ***Houston, Texas.*** However, keep your coat, hat and gloves nearby.

154.710	Galveston County Sheriff	460.025	Houston Police
154.875	"	460.050	"
154.890	Harris County Sheriff	460.075	"
155.950	All agencies car to car	460.100	"
155.370	All agencies state wide base to base	460.125	"
		460.150	"
155.505	Texas Department of Public Safety	460.225	"
		460.325	"
		460.475	"

Harris County Sheriff New Trunked System

856.2125	857.2125	858.2125	859.2125	860.2125
856.2375	857.2375	858.2375	859.2375	860.2375
856.4875	857.4875	858.4875	859.4875	860.4875
856.7125	857.7125	858.7125	859.7125	860.7125

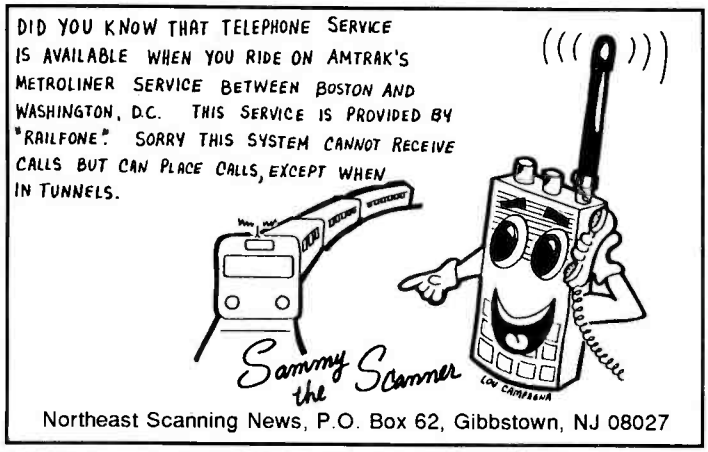
Our final stop is ***Pittsburgh, Pennsylvania*** (I warned you to keep your coat handy.) An anonymous reader has treated us to a diversified group of frequencies. Again, your corrections and additions are encouraged.

48.30	Duquesne Power and Light	463.775	Pittsburgh Children's Hosp.
44.84	Game Commission		
44.960	Game Commission	463.975	Pittsburgh Children's Hosp.
151.985	Bell Telephone		
152.330	Yellow Cab	464.100	Salvation Army
158.760	PA State Pol. phone patch	464.375	Century 3 Mall
158.250	Peoples Gas Co.	464.687	Parkway Center Mall
159.045	PA Turnpike Control	464.775	Forbes Regional Hosp.
163.925	FBI	464.875	Monroeville Mall
163.950	FBI		
461.875	Pittsburgh Children's Hosp.		

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

Computer Corner

In the past, I've offered the two frequency management programs that I like the best—Radiolog and RAC. As you probably can imagine, there are many more shareware programs that are available. So in fairness to everyone, programmers and users alike, who may not agree with my choices, I've decided to offer a "grab bag" of frequency management programs.



Northeast Scanning News, P.O. Box 62, Gibbstown, NJ 08027

I have three separate shareware programs that you can use and judge for yourself. All three disks are free, but you'll need to supply three formatted, 5-1/4 disks, the mailer and stamps. Too much of a hassle? No problem. Here's the deal of the new year: I'll send you the three programs for $5.00 dollars—that includes first class postage to your doorstep. If you add it up, you'll spend that much sending me the disks and postage paid mailer.

The choice is yours, but there is a catch. This offer is only good until March 1, 1993. Requests after that date will be returned. And please be patient. Since I'll be copying three disks per each request, I'll need a few extra weeks to respond. Send your requests to Bob Kay, P.O. Box 173, Prospect Park, PA 19076. If you like any of the software, be sure to send the programmer the requested registration fee. I'll offer the Radiolog and RAC programs in a future column.

Track Refinishing Revisited

In the November 92 issue, we mentioned that David Williams had monitored a track refinishing machine on 151.625 MHz. According to Patrick Griffith, of Denver, Colorado, railroads will often assign track work to private contractors. The contractors work in locations throughout the United States and often use itinerant frequencies for local communications. As most of you know, itinerant frequencies are usually low power, portable-to-portable communications.

Extensive track work usually requires a complete shutdown of rail traffic—resulting in little or no communication between the contractor and the railroad. Thanks Pat, for the information.

Fuzzbusting

The Connecticut General Assembly has legalized radar detectors. Only two other jurisdictions in the nation, Virginia and the District of Columbia, have elected to maintain their ban on automotive radar detectors.

Connecticut also banned the use of hand-held radar guns from inside police vehicles because radiation from the guns may cause cancer. However, outside-mounted units will continue to be used to enforce speed limits.

Cellular Cloning

When a New York cellular customer received a 20 pound box of phone bills, he was told that his cellular phone had been cloned. Cloning requires sophisticated, but readily available equipment that can receive cellular phone signals and record the information on microchips. The chips are then inserted into cellular phones, allowing the phones to tap into legitimate services.

In Brooklyn, New York, a bronx electronics repair shop was raided and the owner charged with cloning cellular phones for a fee. Cellular carriers estimate that the losses from cellular cloning could reach 300 million dollars per year. Because of the financial threat, the cellular industry has created a permanent fraud task force.

With cellular outlaws bent on stealing cellular services, the cellular industry could certainly use our help. Scanner listeners could have monitored their local cellular phone frequencies and reported suspicious activity directly to the cellular carrier. However, when the cellular industry lobbied for the passage of the Electronic Communications Privacy Act (ECPA), they prevented us from becoming involved.

It's almost laughable when you realize that there's a nationwide task force of scanner buffs already in place and willing to help. But rather than utilize this vast army of volunteers, the cellular industry has restrained us with the ECPA. Meanwhile, the real criminals are having a 300 million dollar field day.

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(*Excludes Cellular)

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BEARCAT BC200XLT	279.99	(7.00)
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BEARCAT BC310A	85.99	(7.00)
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RELM UC202 (2 or more)	129.99	(6.00)

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BC003	7.99	ESP25	16.99
BC002	59.99	GRE8002	79.99
PS001	12.99	GRE-HH	54.99
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Betty Bearcat	5.99
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Covert Techniques	9.95
Tomcat's Big CB	13.95
World Radio	18.99
Survival Directory	6.95
Rail Scan	7.95
Police Call	8.69
Scanner Modification	17.99

RELM RH-256NB HIGH BAND TWO-WAY RADIO

SPECIAL PACKAGE DEAL

$339.99

(Plus ($9.00 Shipping Each)

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

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

UNIDEN BEARCAT BC-400XLT

$99.99

($7.00 shipping)

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

BEARCAT BC-100XLT

100 Channel Digital Programmable Hand-Held Scanner

$159.99

($7.00 shipping)

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

SANGEAN ATS-803A

SHORT WAVE RECEIVER

$168.99

($7.00 shipping)

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

BEARCAT BC-147XLT

16 CHANNEL BASE SCANNER

$99.99 *($7.00 Shipping)*

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

SPECIAL!! LOWEST PRICE EVER FOR A PROGRAMMABLE SCANNER

Cobra

SR-901

AVAILABLE ONLY FROM SCANNER WORLD

ONLY! $74.99 Each

(Plus $6.00 Shipping Each)

$69.99 (2 or more)

Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructions. Size: 7¼" W x 2" H x 7¼"D. One year factory warranty.
(Optional mobile cigarette lighter cord #901MPC $4.99)

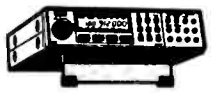
UNIDEN BEARCAT BC 800XLT

DIGITAL BASE SCANNER

$249.99 *($8.00 Shipping)*

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

UNIDEN BEARCAT BC-950 XLT



$249.99 *($7.00 shipping)*

Digital Programmable 100 Channel Scanner

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

UNIDEN MR 8100

SPECIAL SALE PRICE ONLY **$289.99** *($10.00 Shipping Each)*

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

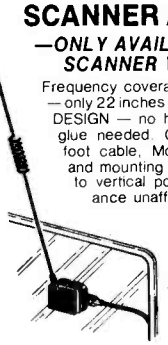
MODEL: FB-911 **ORIGINAL FIRE BOX PHONE**

$54.99 *($5.50 Shipping Each)*

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

GM-1™A GLASS MOUNT SCANNER ANTENNA

—ONLY AVAILABLE FROM SCANNER WORLD—



Frequency coverage 25-1200 MHz — only 22 inches tall. NEW REVISED DESIGN — no holes to drill — no glue needed. Complete with 17 foot cable, Motorola connector, and mounting hardware. Swivels to vertical position — performance unaffected by moisture on the window. Made in USA.

SPECIAL

$39.99

($4.00 Shipping Each)

GLASS MOUNT ANTENNAS FOR TRANSCEIVERS

Includes mounting kit and cable. Low Band, High band and UHF band include PL259 connectors. 800 cellular band antenna includes TNC connector.

GM-27	27 MHz Low Band for CB	$39.99 ($4.00)
GM-155	144-174 MHz High Band	$39.99 ($4.00)
GM-450	450-470 MHz UHF Band	$39.99 ($4.00)
GM-800	Cellular Telephone Band	$34.99 ($4.00)

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"Uncle Skip" Arey, WB2GHA

GEnie T.AREY1

A Brief, On Air Tour

Wow!!! A new year. A new president. Larry and Gayle Van Horn moving to Brasstown. It's enough to take your breath away. Time sure does fly. Every year so many things change. But some things do, in fact, remain the same. Give or take the odd solar flare, we still use these winter months to chase down all those stations you read about in the pages of *MT*.

Last month I anticipated many beginners finding new receivers under their Christmas trees. We reviewed the basic controls that you might find on any world band receiver. Now that folks have figured out how to turn their rigs on, maybe we should take a quick look at what you might try to hear on a cold winter's night in 1993.

Old Uncle Skip is always a bit leery of putting frequencies in his column. Stations have been known to make frequency changes. Often without telling me. What nerve! No radio sage wants to look bad by giving out "dated" information. But don't forget folks, you can always turn to the "Shortwave Guide" a few pages further on and you can double check Old Uncle Skip's program prognostications against the latest data.

Anyway, what we are going to do here is sit down with your new receiver and run through a whirlwind world tour in about eighty minutes—just to prove it can be done! This will also serve to acquaint beginners with a notion of what is out there in radio land.

Of course, serious listening will require that you spend a bit more time monitoring each station, especially if your goal is to seek confirmation by way of a QSL card or letter. If you are listening around and something catches your ear, please don't be afraid to stop and listen for awhile. You can try for fifteen countries in eighty minutes some other night. This is supposed to be fun, remember?

Pay attention folks, things are going to start moving pretty quickly as Uncle Skip's Roadside Radio Repair Service and W.C. Fields Memorial Pool Hall presents:

AROUND THE WORLD IN EIGHTY MINUTES
OR
HOW FAST CAN YOU TUNE YOUR RECEIVER?

0140 UTC / 8:40 PM EST 6040 kHz
GERMANY

Our first stop takes us across the ocean to the rapidly changing European continent. Not too long ago there were two Germanys. Radio Berlin International disappeared shortly after the Berlin Wall. What remains is **Deutsche Welle** in the Federal Republic of Germany broadcasting on 140 frequencies in 28 languages. Deutsche Welle is a station you will want to return to frequently. They are known throughout the broadcasting world for their excellent, balanced news service. Also, if you are interested in learning a new language, Deutsche Welle has a "German By Radio" program.

0145 UTC / 8:45 PM EST 9420 kHz
GREECE

Since it's pretty cold in Germany this time of year, let's head down to the Mediterranean for a bit. Elliniki Radiophonia (Hellenic Radio) shares **The Voice of Greece** with the world over nine frequencies in 16 languages. Since it targets North America at this time of night (0000-0350 UTC) this is a good time to tune in. If you are a student of music or if you are simply fond of Greek melodies, you will find this station worth an extended listen since the majority of its programming beamed toward the United States is musical.

0150 UTC / 8:50 EST 9530 kHz
SPAIN

Now we can swim the Mediterranean westward and lock our receivers on Radio Exterior De Espana, **Spanish Foreign Radio**. Best known for its *News* and *Panorama* programs, SFR uses 31 frequencies to talk to the world in 10 languages. This is another station that offers programming for language students. If you have someone in your household who is struggling through Freshman Spanish you may want to bring them over to the radio. But not tonight, because we are on the move once again.

0155 UTC / 8:55 EST 7335 kHz
UNITED STATES OF AMERICA

Let's touch down back home for a second and tune in to **WRNO Worldwide**. This station is credited with breaking through the bureaucratic logjam that has led to a whole passel of commercial shortwave outlets in the good old USA. This station broadcasts a variety of programming. Perhaps the best thing about US-based world band broadcasters is that you can send a reception report for regular surface postage and get your verification back in about a week.

0200 UTC \ 9:00 PM EST 9745 kHz
ECUADOR

So much for patriotism; we must now move on to yet another country in our quest. Down in South America you will find La Voz De Los Andes, better known as **HCJB**. HCJB stands for Heralding Christ Jesus' Blessings. Needless to say this is one of the world's more powerful religious broadcasters using 38 frequencies to spread the gospel in 14 languages. Take time to listen in because they also broadcast some enjoyable secular programming including *Studio 9*, a very interesting DX program (Hint: If you are conducting this exercise on a Sunday evening, check back on this frequency at 0230 UTC to hear *Studio 9*). Many radio monitors' first QSL card came from this station.

0205 UTC \ 9:05 PM EST
BREAK TIME

Look, your tuning fingers must be a little cramped. You have five minutes to run cold water over them before we take the big push. If you simply must keep tuning your receiver at this point, why not slip over to 5000 or 10000 kHz and check your watch against time signal station WWV Fort Collins, Colorado? Better yet, tune 7335 kHz and set your watch using CHU, Ottawa, Canada, and grab yourself a bonus country.

0210 UTC \ 9:10 PM EST 5950 kHz
CHINA (REPUBLIC OF TAIWAN)

Okay, you purists out there are going to call this country a bit of a cheat. The International Service of the Broadcasting Corporation of China's **Voice of Free China** broadcasts on 27 frequencies in 15 languages. However, 11 of these signals, including the one listed above, are relayed by way of the transmitters of WYFR in Florida, USA. This is something that beginners need to be aware of. Many international broadcasters use relay stations to get their signal into various parts of the world. When seeking accurate confirmation of your monitoring, you should check with a source publication such as *The World Radio TV Handbook* or *Passport to World Band Radio* which can be purchased from many of the advertisers found in *MT*.

VOFC offers news and lifestyle programs. This is another station that budding linguists can use by listening in on their *Let's Learn Chinese* program. Get to know this station on the other side of the world by reading the feature article in this month's *MT*.

0215 UTC \ 9:15 PM EST 7115 kHz
RUSSIA

Out goes the Union of Soviet Socialist Republics, in comes The Commonwealth of Independent States. Still, Russia is Russia and **Radio Moscow** is its voice to the world. Even with the breakup of the USSR, they can still be heard on gazzillions of frequencies in just about any language that is worth talking, at any time of the day or night. Some pundits predict that this will change since Russia is going through some extreme economic times. This may even represent a "grab it while you can" situation. You will want to get this station and country logged and verified as a hedge against the ever-changing world situation. Radio Moscow will probably always be there, it just may become harder to hear as the years go by.

0220 UTC \ 9:20 PM EST 6135 kHz
SWITZERLAND

The external service of the Swiss Broadcasting Corporation, **Swiss Radio International** uses 29 frequencies to talk to the world in seven languages. They are well known for news and current affairs, but also broadcast many excellent documentaries on all aspects of Swiss life. SRI has a fine DX program called *Swiss Radio Merry-go-round* that has just come on the air if you are doing this whirlwind world tour on a Saturday night.

0225 UTC \ 9:25 PM EST 9475 kHz
EGYPT

The Voice of Africa from Cairo, more commonly called **Radio Cairo**, broadcasts on 38 frequencies in 30 languages. Most of their English language programming centers on news and commentary. At the risk of stating the obvious, this station is a great source of music of the Arabic world. Also, given the general volatility of the Middle East, this is a good station to keep an ear on from time to time. And yes, they, too, offer language training by radio. Arabic, of course.

0230 UTC \ 9:30 PM EST 9580 kHz
ALBANIA

You folks who are just getting started in world band radio really missed something. The external service of Radiotelevisione Shqiptar, **Radio Tirana**, used to use its 24 frequencies and 15 languages in unique ways. Albania was the little country with great big transmitters that seemed to hate everybody. During its communist period it even attacked fellow communist countries as not living up to Marxist ideals. They were one of the last countries to get caught up in the fall of international communism, but their programming indicates they enjoy the new world order. When listening in you will hear new commentary and unique Albanian music. Now that they like everybody, they are also stressing tourism in their broadcasts.

0235 UTC \ 9:35 PM EST 9510 kHz
ROMANIA

Let's head back north and take a look at another country that has benefited from the new world order. **Radio Romania International** seems to have come through the shift in the world order with nary a scratch. Its 55 frequencies broadcast to the world in 15 languages. They are best known for their broadcasts of Romanian folk music. Many of their programs are very entertaining, stressing tourism. And guess what? They have a *Romanian by Radio* program.

0240 UTC \ 9:40 PM EST 9600 kHz
PORTUGAL

Swinging back east we run across **Radio Portugal**, the external service of Radiodifusao Portuguesa. They use 20 frequencies to broadcast

Egypt is just one stop on our whirlwind tour of the world.

in English, French, Italian and Portuguese. This station is one of many that offer a fine DX program one evening per week. Remember, sailors from this country discovered most of the world. Why not take a few minutes to discover Radio Portugal?

0245 UTC \ 9:45 PM EST 5975 kHz
ENGLAND

More properly called The United Kingdom of Great Britain and Northern Ireland (UKOGBANI if you're Glenn Hauser), this is the home of the one and only **British Broadcasting Corporation**. Old Uncle Skip just can't get through the day without an hour or two of the "Beeb's" excellent programming. The BBC looks at the world and then tells the world about it on 61 frequencies in over 30 languages. This is another station that makes wide use of relay stations including transmitters in Canada and the USA. The BBC is likely to become a fixture in your listening plans.

0250 UTC \ 9:50 PM EST 9605 kHz
VATICAN CITY STATE

The hub of Roman Catholicism, The Vatican is a country within a country. Think of it as a few blocks in downtown Rome, Italy. **Vatican Radio** broadcasts on 27 frequencies in over 34 languages (including Esperanto). One of its main tasks is to provide religious services in the Roman Catholic tradition worldwide. If you are interested in church music you will hear some of the best broadcast here.

0255 UTC \ 9:55 PM EST 11390 kHz
NETHERLANDS ANTILLES

Time to head back toward home with a quick trip to the Caribbean. **Trans World Radio** broadcasts on 10 frequencies in English, German, Portuguese and Spanish. This station is another worldwide religious broadcaster. Another way to log the Netherlands Antilles is by way of the **Radio Nederland** relay stations there. But that would not fit with the format of this world excursion.

Well, Bunkey, you've done it. Around the world (in a zigzag sort of way) in eighty minutes. You now know where to find your first 15 countries. Next month we will take a look at the process of confirming contact with stations and getting those often elusive QSL cards.

MT

Steve Douglass

Monitoring Tricks

It's winter and the airwaves are humming with activity. Your equipment is working fine and your hard work fine tuning the system paid off. Your reception is the best that it has been in months.

But did you know there are some extra things you can do that will enhance your monitoring, cut through the static and really help clean up those scratchy signals? Even better, you may already own the equipment to do this! Stashed away gathering dust may be that piece of hardware that will add to your monitoring post's efficiency. Here are a few little "tricks of the trade" that can really boost the enjoyment of your monitoring system.

Stereo Scanning

How about hooking your scanners or shortwave receivers up to a stereo? Adding a stereo to your monitoring post has several advantages. You can improve the audio of any scanner or receiver by patching it through a stereo system. By amplifying the audio and using the stereo's bass and treble control you can eliminate some of the background noise and interference associated with shortwave monitoring.

If your stereo has a graphic equalizer, then you are really in luck. The equalizer controls can custom tailor your receiver's audio, eliminating background interference while boosting the audibility of the signals you are intercepting. A 12 band graphic equalizer works almost as well as some of those expensive shortwave audio filters offered by radio manufacturers. I have found graphic equalizers on sale for around $50.00 new and even cheaper at garage sales and flea markets.

A stereo can also provide a great way of recording your radio catches. Connecting your receivers through the stereo's cassette recorder not only provides a source of permanently logging your intercepts, but also allows you another way to enhance and control the audio output of your scanners and receivers. Using the Dolby noise limiting circuitry of the recorder, you can eliminate some of the background hiss and you can even boost weak signals by utilizing the recorder's input level controls.

Keep in mind, when hooking up a mono receiver to a stereo amplifier or recorder, you will need to have the proper jacks so you will hear audio on *both* stereo channels. If your scanner provides a 1/8" extension speaker output, you will need an adaptor that will split the mono output into *two* mono outputs. Visit your local Radio Shack and order catalog number 42-2154 (mono 1/8" plug to two phono jack Y adaptor). If your scanner has a mono phono recorder output jack, then you'll need Radio Shack catalog number 42-2436 (mono phono plug to two phono jacks) so you can hear the audio on both speakers.

You can take advantage of the fact that your stereo has two separate channels by using them to record from two scanners or receivers at the same time. Using two separate hook-up cables, Radio Shack catalog number 42-2444 (1/8" plug to phono jack), and hooking them up to two separate receivers (for example, a scanner and a shortwave radio), you can record or monitor through your stereo both radios at the same time. The audio from the scanner can be heard on one channel and the shortwave on the other. You can monitor or record both sources at once or switch between the two by using the stereo's balance control. (See graphic)

Mobile Enhancement

The same techniques apply to mobile monitoring. Patching your mobile scanner through the car's stereo system can really boost the audio power. If your stereo doesn't have provisions for external inputs you can add them by purchasing Radio Shack's *CD to Cassette Adapter* (model #12-1951). The adaptor looks like a regular cassette with a 1/8" stereo plug attached to it. You'll also need Radio Shack's stereo to mono 1/8" plug adaptor (catalog number 274-328) so you can hear the scanner on both stereo channels.

Other Nifty Ideas

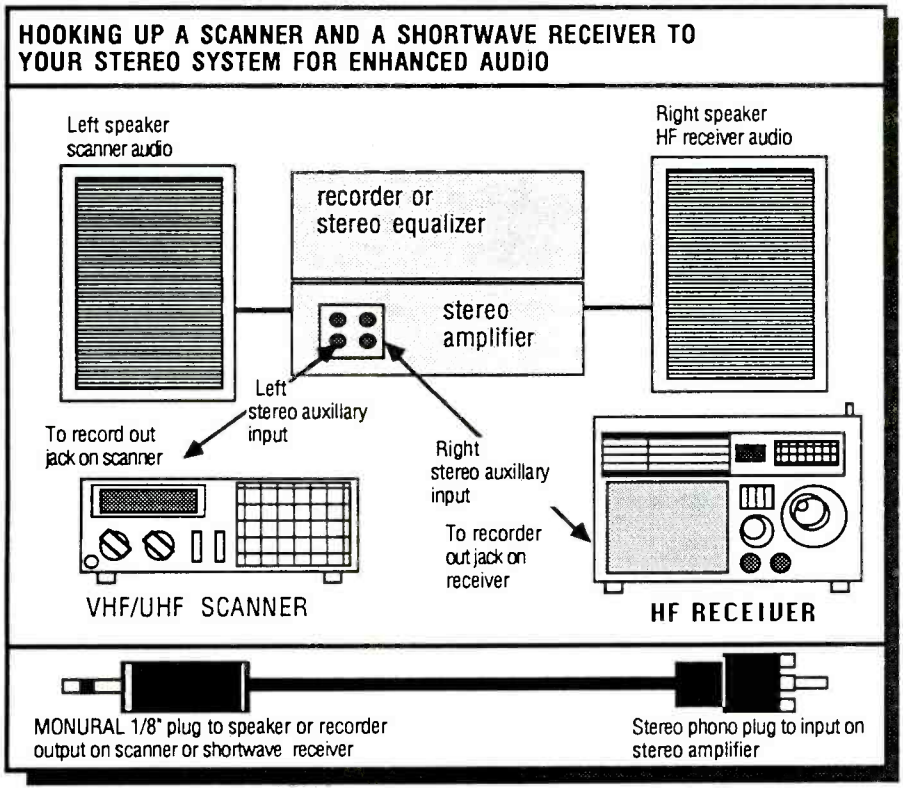
Mobile Scanner Repeater

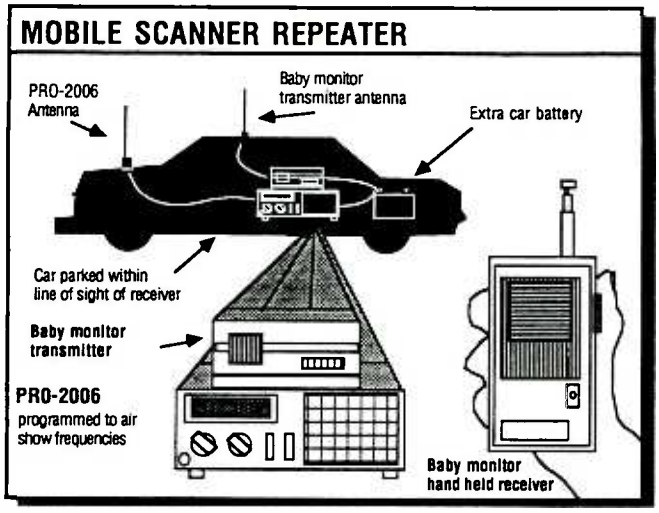
Here is a clever idea thought up by Reswell, New Mexico, monitor, Elwood Johnston. Elwood had bought a Realistic PRO-2006 for exclusive use as a UHF military monitor. The trouble was that it wasn't very portable, and Elwood wanted to take it to the many airshows he visited every year. However, lugging around bulky external battery packs and the scanner was also impractical.

Instead Elwood mounted the scanner in his car and used a little ingenuity to invent a "mobile scanner repeater." Using a salvaged baby monitor, Elwood added an external antenna, wired it to the car's twelve volt system and mounted it in the car next to his PRO-2006 (which had been preprogrammed with all the airshow frequencies). The baby monitor (now a 49 MHz mobile scanner repeater) rebroadcast the scanner's audio to the portable handset that Elwood used inside the airshow.

Elwood arrived at the show early and picked a parking spot on top of a slight hill which overlooked the airshow grounds and also the area from which Elwood would be observing the airshow. The audio quality was quite good and the range of the "mobile repeater" was quite surprising.

The baby monitor could be heard from all over the airshow grounds and faded only occasionally when blocked by a large aircraft on static display or a metal hangar. Elwood shared his monitor with other scanner users at the airshow who didn't have UHF military band capability. All they had to do was punch in the 49 MHz frequency of the baby monitor and they, too, had instant military monitors.





Similar results can be obtained by using 49 MHz walkie talkies or wireless FM intercoms. Elwood is experimenting with using voice activated walkie talkies as mobile repeaters. The voice activation circuitry would only transmit a signal when the squelch is broken on the PRO-2006. The advantage of this setup lies in being able to monitor the "mobile repeater" with an ordinary portable scanner. Just enter the repeater frequency on the priority channel and the scanner will retain its scanning capabilities.

Record It

There are many scanner tape recorder activators on the market and, as most monitors know, they are very helpful for recording communications unattended. These handy little devices automatically activate a cassette recorder when the squelch is broken on a scanner, thus enabling many hours of communications to be compressed onto a single tape. Automatic tape recorder activators can be found from about $40.00 on up, but did you know you might already own one? That voice-activated recorder that you have lying in your desk drawer will work almost as well as an expensive automatic squelch-activated scanner recorder.

Keep in mind, there are a couple things you may have to do to adapt it to work with your receiving equipment. The easiest route is to purchase the proper cables and connectors. Most recorders have an external microphone jack. Just attach the proper cables to the external microphone input and the recorder or speaker output on the scanner. If you are using the external speaker output, you may have to get a double jack and an external speaker so you can monitor what you are recording.

Adjust the recorder's VOX sensitivity level and the scanner's volume level so that when the squelch breaks on an active channel it activates the recorder. Note: Even with the volume practically turned off, some scanners have enough output to keep the recorder's activator open, so you may have to purchase an attenuator to lower the level of the scanners's output. Radio Shack's recorder attenuator and adaptor set, (cat. no. 274-300-$2.79) will do the trick.

VCR Scanner Recorder

Many of us have had the experience of having to discard an old VCR whose video heads had worn out, because they were too expensive to repair. But before that old one it ends up in the garbage, consider using it as a scanner recorder. Although the video heads may be shot, the audio heads might still function. Using the audio input jacks you can connect it to your scanner and it will become a six hour communications logger!

These are just a few tricks that many monitors employ. Do you have an idea that you would like to share with other Federal File readers?

Mailbag

California Angels

Robert Kelty, author of the fine military monitoring book *Mobile Radio Systems,* recently logged some Blue Angels communications at airshows in San Francisco's "Fleet Week" and Moffett NAS's "Last Airshow." Frequencies used were 251.600 MHz (flight line common), 275.350 MHz (Comm 2 formation talk back), 302.150 MHz (Comm 3 solos) instead of the old solo frequency of 307.00 MHz. Also used at the Salinas airshow were 275.550 MHz and 319.800 MHz.

Two new pilots for the Blue Angels are "Thumper" and "Dino." Some new maneuvers that the Blue Angels have added to their display are the *Barrel Roll Break, Corkscrew Climb, Five Abreast Loop,* and the *Double Farval.*

At the Mather "Final Airshow," Robert and two other monitors made a concerted effort to find the USAF Thunderbirds UHF frequencies. T-Bird Control was found on 235.250 MHz, T-Bird reply on 322.950 and Thunderbird leader on 141.850 MHz. Thanks for the report, Bob !

Sunnyvale military monitor Kenneth J. Navarre Jr. also sent in some Blue Angels information. Upon roll-out, the "Boss" calls his commands on 302.150 MHz. As aircraft 1-4 line up for takeoff the Boss calls for smoke on/brakes off. He stays on this frequency while the flight of four performs the Diamond loop. Aircraft 1-4 then switch to 275.350.

Where's That MILCOMSAT?

Dave Frederick from Rio Rancho, New Mexico, is experimenting with a home brew Helix antenna for monitoring MILCOMSATs in the 240 to 260 MHz band.

According to Dave, he got the design from the *Satellite Experimenter's Handbook* ($20 plus $3 s/h from ARRL, 225 Main St., Newington, CT 06111) and its specifications say it will deliver 14 dB of gain. Dave has his mounted on an equatorial mount so he can aim it all through the Clarke satellite belt. It's all attached to a PRO-2006 with 100 ft. of RG-6 coaxial cable. Dave says that he is using a computer program called *Traksat* to help locate some of the MILCOMSATS. In the data file that came with the program Dave found five satellites called FLTSAT 1 through FLTSAT 5. According to the program there are three satellites within the viewing range of Dave's location and they move up then down again 200 (+/-1 00) on the Clarke Belt with a cyclic period equaling one day.

However, Dave says that even with all his high tech gear he isn't having any success monitoring any military satellite communications. He asks, is the program misleading him? If so, then what are the locations of the Milcomsats (FLTSATCOM and AFSATCOM)?

As far as your Federal File author can tell, the locations your Traksat gives you are correct for the Navy's FLTSATCOM birds. Unfortunately these positions can't be verified since the exact positions of all military satellites are classified. However, many monitors have ferreted out the approximate positions from their viewing locations by monitoring three FLTSATCOM frequencies: the UHF narrow band frequencies of 261.400 MHz, 262.400 MHz, and 263.400 MHz, which broadcast a "white noise" open carrier for antenna alignment purposes.

Program these frequencies into your PRO-2006 and slowly search the Clarke belt for the carriers. Be advised that the satellites only broadcast on these frequencies when "queried" by a ground station or a ship, so it might take some time to locate them.

Even though your Helix antenna system sounds like it should do the job, you might consider adding an antenna preamplifier to it. An inexpensive preamplifier that gives good results on the military satellite bands is the Radio Shack 20 dB In-line Coax Amplifier (catalog no. 15-115). Although intended for use with TV satellite systems, it works well in amplifying weak signals on the UHF military bands. In the meantime, if any Federal File readers out there can help Dave locate the military satellites or have any equipment suggestions, let us know!

MT

James R. Hay

VHF Radio Channels Revisited

This January issue brings with it my sincere hope that you have enjoyed a happy holiday season, and my best wishes for health, happiness and success in 1993.

The VHF bandplan for the United States printed in September's column generated enough interest that this month we will dive into the whole matter of VHF channelling.

The International Telecommunications Union (ITU) is the international body which is responsible for allocating frequencies for use by the various services. In the case of the maritime mobile service and VHF channels which are essentially local in nature, the ITU has designated the frequencies and channel numbers, and has also set up a priority order in which individual countries are encouraged to assign frequencies for various purposes. Table 1 lists the channel numbers and the frequencies which are associated with them.

It is recognized that each country will have its own particular needs; therefore, the ITU simply recommends the order in which a country should assign a particular channel for a particular use. Table 2 lists these orders of priority.

Table 3 spells out the American, Canadian and British channel assignments for the VHF maritime mobile band.

In Table 3, port operations refers to the direction of the movement of ships within a port. Ship movement refers to the direction of the movement of ships outside a port. Public Correspondence includes telephone calls and messages to and from persons aboard ship. The letter "A" beside a channel number refers to the use of the ship transmit frequency by both ship and coast station in what is usually a two frequency channel. The letter "B" refers to the use of the coast station transmit frequency in a two frequency pair.

Until next time, enjoy the goodies Santa gave you and good listening.

MT

Table 1: Channel/Frequency Assignments

Channel	Ship Transmit (MHz)	Coast Transmit (MHz)
1	156.050	160.650
2	156.100	160.700
3	156.150	160.750
4	156.200	160.800
5	156.250	160.850
6	156.300	
7	156.350	160.950
8	156.400	
9	156.450	156.450
10	156.500	156.500
11	156.550	156.550
12	156.600	156.600
13	156.650	156.650
14	156.700	156.700
15	156.750	156.750
16	156.800	156.800
17	156.850	156.850
18	156.900	161.500
19	156.950	161.550
20	157.000	161.600
21	157.050	156.050
21	157.050	161.650
22	157.100	161.700
23	157.150	156.150
23	157.150	161.750
24	157.200	161.800
25	157.250	161.850
26	157.300	161.900
27	157.350	161.950
28	157.400	162.000
60	156.025	160.625
61	156.075	160.675
62	156.125	160.725
63	156.175	160.775
64	156.225	160.825
65	156.275	160.875
66	156.325	160.925
67	156.375	156.375
68	156.425	156.425
69	156.475	156.475
70	156.525	
71	156.575	156.575
72	156.625	
73	156.675	156.675
74	156.725	156.725
75	See note	See note
76	See note	See note
77	156.875	
78	156.925	161.525
79	156.975	161.575
80	157.025	161.625
81	157.075	161.675
82	157.125	161.725
83	157.175	156.175
83	157.175	161.775
84	157.225	161.825
85	157.275	161.875
86	157.325	161.925
87	157.375	161.975
88	157.425	162.025

Note: channels 75 and 76 (156.775 and 156.825 MHz) are not assigned in order to provide a guard band for channel 16)

Table 2: ITU Channel Priorities

Channel	Intership	Port Operations Simplex	Port Operations Duplex	Ship Movement Simplex	Ship Movement Duplex	Public Corres.
1			10		15	8
2			8		17	10
3			9		16	9
4			11		14	7
5			6		19	12
6	1					
7			7		18	11
8	2					
9	5	5		12		
10	3	9		10		
11		3		1		
12		1		3		
13	4	4		5		
14		2		7		
15	12	14				
16	Distress, Safety and Calling Channel					
17	13	13				
18			3		22	
19			4		21	
20			1		23	
21			5		20	
22			2		24	
23						5
24						4
25						3
26						1
27						2
28						6
60			17		9	25
61			23		3	19
62			20		6	22
63			18		8	24
64			22		4	20
65			21		5	21
66			19		7	23
67	10	10		9		
68		6		2		
69	9	11		4		
70	6					
71		7		6		
72	7					
73	8	12		11		
74		8		8		
75	Guard Channel for Channel 16					
76	Guard Channel for Channel 16					
77	11					
78			12		13	27
79			14		1	
80			16		2	
81			15		10	28
82			13		11	26
83						16
84			24		12	13
85						17
86						15
87						14
88						18

Table 3: Channel Assignments: U.S., Canada, UK

Channel	United States	Canada	United Kingdom
1	Not assigned	Not assigned	Port Ops/Pub Cor
2	Not assigned	Not assigned	Port Ops/Pub Cor
3	Not assigned	Not assigned	Port Ops/Pub Cor
4	Not assigned	Not assigned	Port Ops/Pub Cor
4A		Safety	
5	Port Operations		Port Ops/Pub Cor
5A		Ship movement	
6	Safety	Safety	Intership only
7			Port Ops/Pub Cor
7A	Commercial	Comm/Non-Comm	
8	Commercial	Safety	Intership only
9	Comm/Non Comm	Ship movement	Intership only
10	Commercial	Ship movement	Pollution control
11	Commercial	Ship movement	Port operations
12	Port operations	Ship movement	Port operations
13	Bridge to bridge	Bridge to bridge	Port operations
14	Port operations	Ship movement	Port operations
15	EPIRB's	Ship movement	Port operation
16	Distress, Safety and Calling		
17	State control	Ship movement	Port operations
18			Port operations
18A	Commercial	Commercial	
19			Port operations
19A	Commercial	Government	
20	Port operations	Port operations	Port operations
21			Port operations
21A	Coast Guard	Coast Guard	
21B		Marine Broadcast	
22			Port operations
22A	CG Liason	CG Liason	
23	Coast Guard	Public Corresp	Public Corresp
24	Public Corresp	Public Corresp	Public Corresp
25	Public Corresp	Public Corresp	Public Corresp
25B		Marine Broadcast	
26	Public Corresp	Public Corresp	Public Corresp
27	Public Corresp	Public Corresp	Public Corresp
28	Public Corresp	Public Corresp	Public Corresp
60		Public Corresp	Public Corresp
61	Not Assigned		Public Corresp
61A		Coast Guard	
62	Not Assigned		Public Corresp
62A		Coast Guard	
63	Not Assigned		Public Corresp
64	Not Assigned	Public Corresp	Public Corresp
64A		Comm Fishing	
65			Public Corresp
65A	Port Operations	Safety	
66			Public Corresp
66A	Port Operations	Ship movement	
67	Commercial	Commercial	Coast Guard
68	Non Commercial	Non Commercial	Port Operations
69	Non Commercial	Comm/Non Comm	Inter ship
70	Digital Data	Digital Selcal	Digital Selcal
71	Non Commercial	Non Commercial	Port Operations
72	Non Commercial	Comm/Non Comm	Inter ship
73	Port Operations	Comm Fishing	Safety
74	Port Operations	Ship movement	Locks & Bridges
75	Guard band for channel 16		
76	Guard band for channel 16		
77	Port Operations	Ship movement	Inter ship
78			Port Operations
78A	Non Commercial	Commercial	
79			Port Operations
79A	Commercial	Commercial	
80			Port Operations
80A	Commercial	Commercial	
81			Port Ops/Pub Cor
81A	Coast Guard	Coast Guard	
82			Port Ops/Pub Cor
82A		Coast Guard	
82B	US Government		
83			Public Corresp
83A	CG Auxilliary	Government	
83B		Marine Broadcast	
84	Public Corresp	Public Corresp	Port Ops/Pub Cor
85	Public Corresp	Public Corresp	Public Corresp
86	Public Corresp	Public Corresp	Public Corresp
87	Public Corresp	Public Corresp	Public Corresp
88	Commercial	Public Corresp	Public Corresp

SWLs ... Come on Down!

Looking for something new in 1993? If you've never tuned "down under," or if it's been a while, this month's column is for you! We'll discuss a quick way to get on the longwave band and see what can be heard there. By the way, it's a perfect time to begin. The best longwave DX usually appears in the middle of winter.

Gearing Up

Many of today's receivers go down to at least 150 kHz as received from the factory. However, if you're using a radio that doesn't cover the longwaves, or if you want to go lower than 150 kHz, an outboard converter is the way to go.

Installing a converter is easy and requires no modification of your receiver; you simply connect an antenna to the converter input and connect the output to your receiver's antenna jack. (See Figure 1.) You should use a shielded cable between the converter and your receiver to prevent bleedthrough of HF signals.

A converter is a circuit that "moves" a portion of the longwave band to a frequency range that can picked up by your existing receiver. For example, my own LF Engineering L-101 converter moves the LW band to the 80 meter ham band (3.5-4.0 MHz). I can then get all the benefits of my SW receiver (notch filter, noise blanker, S-meter, etc.) and apply them to longwave signals.

Let's take a quick tour of the longwaves to see what you can expect to find. We'll begin our tour by...

Sailing the Ocean Blue

The upper part of the longwave band (415 to 500 kHz) has long been home to sea-going interests. Although HF and satellite links have taken away some of the activity on this band, there's still plenty to hear. If you're fortunate enough to live near one of the coasts, all the better.

At exactly 500 kHz is the international distress and calling frequency. This channel can really light up during maritime emergencies. More often, you'll hear ships and coastal stations making initial contact and moving off to other frequencies.

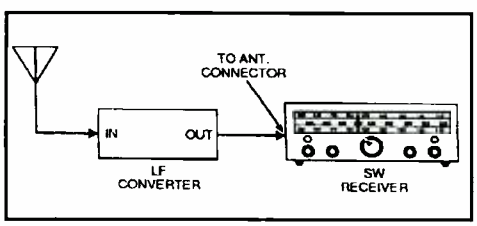


Figure 1: Converter hookup

Moving down from 500 kHz, you will hear a good deal of maritime CW traffic including weather broadcasts aimed at ships on the high seas. Along with routine weather, you'll hear special bulletins, such as iceberg and gale warnings. Whenever I hear an ice warning being pounded out on CW, I imagine what it was like that fateful night in 1912 when the great Titanic went down. History has it that the airwaves were filled with iceberg warnings that night.

Hunting Beacons in the Night

To the uninitiated, monitoring beacons would probably rank somewhere beside listening to a broken record. The truth is, few beacon chasers tune to a particular signal for very long—usually just long enough to confirm reception.

The strong attraction to this sport is no surprise when you consider the simplicity of a typical beacon site. Many consist of no more than a small shelter out in the middle of a field that houses a low power transmitter. A simple wire antenna or vertical top-hat completes the installation. Most run just 25 watts, and are designed to cover only 50 miles or so. It's really exhilarating to snag one at ten times that range. To top it off, you can even get a QSL from the engineer-in-charge of a beacon.

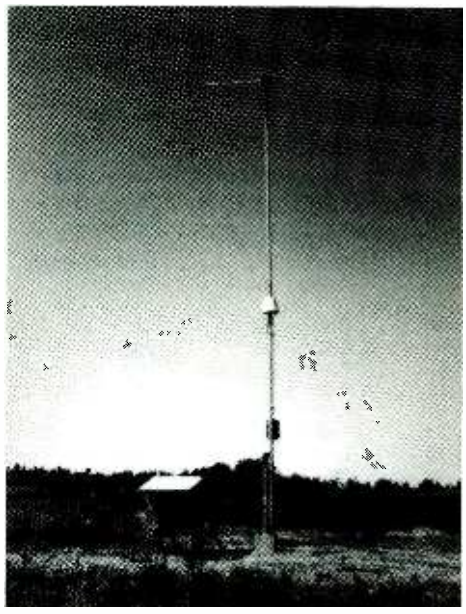
Although their signals are meant only for aircraft and maritime navigation, beacons make superb DX targets for several reasons. First, most operate 24 hours a day at a fixed power level. Because they send short, repetitive Morse IDs, they punch through the noise where other modes can fail. With the aid of a beacon directory or past loggings, you can determine the precise location of the beacon.

Facing the music

In Europe, several broadcast stations operate on longwave. Though intended only for European consumption, signals can sometimes be heard on the east coast of the U.S., especially during winter. One of the most frequently logged stations is Atlantic 252 (252 kHz) from Ireland. Many LWLs have probably heard LW broadcasters and incorrectly dismissed them as local AM broadcast band interference.

LOWFERS Work Hard

Under the right conditions things can really get exciting between 160 and 190 kHz. Here, experimenters run flea-powered transmitters which can sometimes be heard hundreds of miles away. LOWFERS—Low Frequency Experimental Radio Stations, are operated by unlicensed (yet legal) experimenters under authority of Part 15 of the FCC rules.



Beacon site at a small airport (LJG, 212 kHz, Brockport, NY).

In essence, the rules allow operation of a 1-watt transmitter (any mode) with a 50 foot antenna. Also, any out-of-band emissions must be at least 20 dB below the carrier frequency. Any mode is allowed, but plain old CW seems to lead the way.

Most LOWFER activity is carried out beacon-style, with the operator's initials or the suffix of a ham call serving as the ID. Very often the ID message also contains QSL information.

Giving GWEN a Try

The raspy bursts you'll hear around 165 kHz are from the nationwide GWEN (Ground Wave Emergency Network) operated by the U.S. Air Force. Its nuclear-hardened sites send and receive signals similar to the packet transmissions used by hams. Originally, GWEN was to be a much larger network, but deep budget cuts and a reduced defense threat put an end to that.

Whistling Dixie

Further down the band, you can hear an assortment of military RTTY/CW stations as well as standard time and frequency stations like WWVB (60 kHz). At the extreme low end, you might hear one of radio's oldest mysteries—Whistlers. Whistlers are naturally-created sounds generally after a thunderstorm. Their erie, descending pitch will give you a logging you won't soon forget. Listen for them from 20 kHz and down.

When things have settled down from the holidays, why not take a moment to drop a line to *MT?* Tell me what you'd like to see, and what you're up to on the longwaves. Pictures of stations are also welcome.

See you next month.

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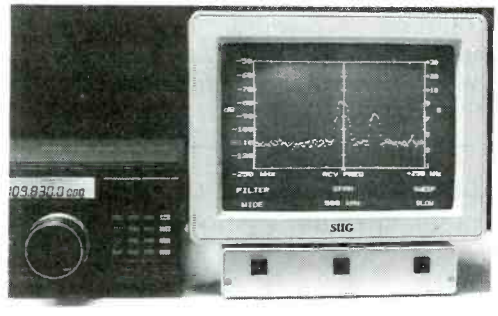

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Karl Zuk

Give That Man A Show!

The GIL GROSS Show

"Call the doctor who links pet birds with lung cancer. He'll be good in the middle of the third hour." Gil Gross and producer Gregg Cockrell, ensconced in a small office at the CBS Broadcast Center in New York City, plan their evening. News clippings and books fill the room, and the telephone constantly rings. In just a few hours, Gil will be broadcast to 150 stations nationwide and America wants to join Gil on the air.

The man deserves the attention he enjoys. Gil Gross is the host of the first talk show broadcast on the CBS Radio Network: The Gil Gross Show. It's a rare combination of journalism and entertainment. For three hours each weekday night, you can tune in and hear the voices that made news today, listener comments on these events, and Gil's insightful commentary on it all. You'll walk away amused, enlightened, and anxious for his next show.

"You've got to make it serious and stupid, too!" Gil has learned. Cast aside your concepts of traditional news reporting! "The first story should be the most interesting, not necessarily the most important. Get them with the first story and they'll listen to the whole show. When I first pick up a newspaper I read *Calvin and Hobbes* and maybe *The Far Side*, then I look at the front page. Make it entertaining and listenable, make them care about it, and write it well. Illogical stories hold an audience. After you pull them in and they're with me, I'll make them stay!"

This approach may seem unorthodox to some, but Gil shares his philosophy with America's highest rated radio performer, Paul Harvey. For six years, Gil served as substitute host of Paul Harvey's newscasts when Paul enjoyed vacation or a day off. "Harvey News is a writer's show. It allows you to do it as it should be done. You can really tell the story!"

Although Gil has been in radio for 26 years, he's been a journalist almost since birth. Growing up in New York City, his first passion was experimenting with a printing press. As a teenager, Gil was instrumental in reviving an underground newspaper that competed with the official journal of Forest Hills High School. Broadcasting entered his life while attending Milliken University in Decatur, Illinois. After giving up a brief career driving United Parcel trucks, he joined the staff of local station WDZ and did everything he could to learn the ropes.

Just as he was graduating college and heading back to New York, he met a girl who tried to persuade him to stay in Illinois. The day before he was supposed to leave for home, Gil arranged employment interviews at WLS and WGN in Chicago. Dressed in cowboy boots, blue jeans, and a denim shirt, he walked into WLS and was hired on the spot. Gil's first assignment was the overnight shift at the 50,000 clear channel giant.

Gross was only 23 years old when he became sidekick to legendary DJ Larry Lujack every morning on WLS. "I was basically a novice, but he treated me as an equal." Gil recalls. He also rubbed elbows with Charlie Van Dyck. "Charlie and I went to a high school to promote the station and the crowd called out the names of both of us." The crowd mobbed them, and to Gil, it was pretty scary. The price of true fame!

The years that followed were spent in a variety of prestigious positions. Gil became the first newscaster to bring rock 'n' roll news to the ABC Radio Networks. It was hard for his editors to get used to lead stories about artists like Fleetwood Mac, but the affiliate stations loved the tie-in with their music formats. NBC's News and Information Service, The RKO Radio Network, and local New York City stations WNBC and WCBS all enjoyed Gil's talents in the late seventies and early eighties. Gross also found himself in Northern Ireland and Israel, reporting war news to America. Excitement filled his life as he gathered details of battles and occasionally ducked the crossfire.

The world of talk radio enlisted Gil in 1989 as host of the afternoon drive-time slot on WOR in New York City. Four hours a day, Gil would greet his home town, talk to listeners and introduce them to the never-ending parade of celebrities visiting his studio. Millions of people tuned in, and the station's ratings soared. With plenty of time to spend with his guests and listeners, he had discovered a heavenly way to enjoy broadcasting.

Behind the microphones of WOR, Gil shared with his audience the greatest event of his life: the birth of his son Spencer. Never was a child greeted into the world by so many people! "My listeners were amazing. They sent all sorts of presents and stuff to wear. He's what's really important to me. I love to bring him to work in the afternoon. He'll come over and throw books around and have a great time, and I love it!"

A similar response came when the final edition of his show aired last year. The owners of WOR decided to switch to another host, Boston's controversial Gene Burns. Gil received a fond farewell from his fans. "I received over a thousand letters."

What seemed like a setback became a wonderful twist of fate. Gil saw opportunity knocking. Gil arranged a meeting with CBS Radio, a network who had never broadcast long form talk shows before. Known for producing excellent programming in the past for CBS, they welcomed his ideas with open arms. He walked out with a carte blanche ticket to create. "They said 'Just go do what you do.' I promised them 25 stations and got 40. Now we have 150! ABC handed us stations on a plate when they canceled Tom Snyder and Deborah Norville. Now we're filling in the gaps! It's great! Now I can talk to people in the news and I don't have to chase them. We call them on the phone! The only thing I fear is that we're boring!"

The best insurance against boredom is Gil's ace producer Gregg Cockrell. The team of Gil and Gregg have convinced hundreds of impor-

Look for Gil Gross on these clear channel stations:

WGY	810	Schenectady, NY
WPRO	630	Providence, RI
WRKO	680	Boston, MA
KSL	1160	Salt Lake City, UT
WOAI	1200	San Antonio, TX
WCKY	1530	Cincinnati, OH
KMOX	1120	St. Louis, MO
WBT	1110	Charlotte, NC
WHAM	1180	Rochester, NY

Check local listings for air times.

Be an American BandScan Reporter.

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

tant figures to visit the show. General H. Norman Schwarzkopf and New York Governor Mario Cuomo joined Gil on the air recently. "We interview news makers, not celebrities."

It's not all serious! "We'll do a feature on Madonna and have fun with it." When the controversy about a talking Barbie doll saying "Math is tough!" upset women's libbers nationwide, they looked to their listeners for insight on the crisis. Their board engineer feigned the voice of Barbie, and the results were classic comedy!

The Gil Gross Show is produced live from 8 to 11 pm Eastern time weeknights, and is aired by some stations during different hours of the evening. West Coast stations usually broadcast a replay from 8 to 11 pm Pacific time. When special events occur, like election night, the show is produced live for six hours straight. "We'll never air a show that is outdated!" Gil insists. Four times a year, the show will go on the road and originate from the studios of one of their affiliates.

If you think that all talk shows are the same, turn on your radio tonight and look for The Gil Gross Show. Warning: This show is very addictive, and we won't be held responsible for years of avid listening!

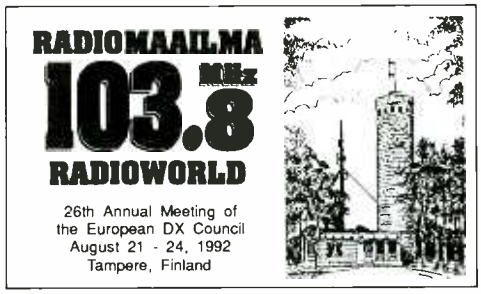
Bits 'N' Pieces

• More people are being shocked than ever before! Howard Stern continues his quest to dominate morning radio across America. The undisputed king of shock radio now leads the ratings in New York and Los Angeles. According to recent Arbitron ratings, Stern moved from fourth to first in Los Angeles, slaying arch-rivals Mark and Brian on KLOS.

Stern now entertains listeners in New York, Philadelphia, Cleveland, Dallas, Chicago, Baltimore and Washington, D.C. with his sexy stunts, outrageous humor, and exclusive celebrity interviews. Howard is a wonderful complement to classic rock stations that carry his show. Not only are their ratings better in the morning, but they increase in all dayparts.

Stern has also renewed his television career with a new talk show on cable television's E! network. "These guys really need me!" claims Stern. "Nobody can find this channel!

• Congratulations to Marc Sophos, profiled in the June 1990 edition of this column. After 19-1/2 years of litigation and applications, Marc's Westchester Council for Public Broadcasting has been granted a license to operate with 200 watts on 90.3 MHz in Ossining, New York, a suburb of New York City. The man has the patience of a saint!



Mailbag

Visitors attending the 26th annual meeting of The European DX Council were on the radio, as well as listening to it. Bandscan reporter R.C. Watts sends details of a special temporary FM station that broadcasted from the site of the meeting in Tampere, Finland. The Finnish Post and Tele authorities granted a license to the conference to operate on 103.8 FM with 200 watts using a two bay vertical antenna mounted on top of a stately watchtower. The station operated 24 hours a day for a week in stereo providing reports on the conference, interviews, DX programs and various music. A great time was had by all!

International Bandscan

Experience the new feeling of freedom flowing through Moscow! Just turn on Radio Maximum, and you'll think everyone was born in the U.S.A. The days of droning nationalistic folk songs and pep talks to the masses are gone. Now there are T-shirt give-aways, entertainment news, slick jingles, and shows like Casey's Coast to Coast. Russians are now listening to Larry King every night!

Radio Maximum's afternoon DJ, 16 year old Tanya Bocharova, speaks perfect English as she creates radio reminiscent of America in the 1970s. She loves to play her favorites: Donna Summer, Chicago, and The Beach Boys. You'll also hear modern sounds like Depeche Mode and The Scorpions, although The Beatles and Queen remain enormously popular. Tanya only earns about twenty cents an hour, but she loves it. "Just being on the air is fun, you know?"

The station is a joint venture of the weekly newspaper Moscow News and three American companies: Story First Communications, radio programming syndicator Westwood One, and broadcast equipment giant Harris Corporation. They all enjoy Russian capitalism. Radio Maximum has cornered the market on young listeners in the nation's capitol and advertising dollars are pouring in!

Until next month, Happy New Year and happy trails!

MT

Low Cost Satellite TV Systems

Most of us began our monitoring hobby with great enthusiasm and little cash. My first radio was an abandoned Motorola table/clock radio. Even though the entire AM spectrum could be tuned in less than the flick of a wrist, I found that by careful tuning I could hear the whole United States. In fact, on that little radio I was able to earn *Electronics Illustrated's* 10 countries Broadcast Band DX certificate. You probably got one, too.

The point is: if you have an interest in some aspect of monitoring don't let the price tags get you down. Get around them!

TVRO On The Cheap

Many of you may have had an interest in getting started in satellite TV monitoring only to have your dreams unplugged by the local satellite TV dealer. Price tags ranging from $2,000 to $3,500 may have soured you on this end of the hobby. Those who have the desire, but not the cash, or perhaps are a little more adventurous and willing to do some tinkering, there are alternatives.

The first alternative to the local dealer is mail order. The advantage to buying from your local dealer is that he delivers the goods, does the work and answers the trouble call when something goes wrong. That's what you pay him to do. The mail order method assumes that you can handle the job, provides a technical hotline for assistance and replaces anything that is covered under specific warranties. In return, you can save anywhere from $500 to $1,500 over the same system sold locally.

The Mail Order Houses

Regardless of how you may eventually get a TVRO system I would urge you to get the mail order catalogs. This as a good way to see what is available on the market and do a little price shopping. You may end up buying various parts of the whole system from different vendors.

Before listing the mail order companies I have to issue this disclaimer: Listing here does not constitute an endorsement of the products or services. This is America and the free market system. Let the buyer beware.

All of the companies want you to succeed. To do so they have made available various aids to installation. After a little bit of study you'll see that installing your own system is very easy. Don't be intimidated by unfamiliar terms or complicated sounding directions. If you're reading this magazine you're at least as bright as your local dealer.

DBS Satellite Television 2316 Channel Drive Ventura, CA 93603	800-327-4728 California: 805-652-0255 FAX: 805-652-2190
NBO Distributors. Inc. 5631 Palmer Way Carlsbad, CA 92008	800-346-6466
SATMAN 6316 N. University #3798 Peoria, IL 61612	800-247-4291 Illinois: 309-692-4140
Skyvision 2066 College Way Fergus Falls, MN 56537	800-543-3025 Minnesota: 218-739-4879 FAX: 218-739-4879

The Used Equipment Market

Buying used satellite TV equipment is the cheapest way into this bobby. There are a few pointers which may help in your success. Avoid "hamfests" and "flea markets." My experience is that if a ham doesn't want it, it's not worth having. Sure, if you're an electronics wizard who can turn a busted washing machine into a shortwave radio, do it. Most of us have not had good experiences with soldering irons.

Occasionally, you'll see ads in the local classifieds for an individual wishing to sell their complete system. This may or may not be worth the effort. Usually such installations are professionally installed and the seller is asking too much. If they're asking as much as $1,500 don't buy.

Ask to see such an operation in a full workout. It should track well from one side of the Clarke Belt to the other and have excellent pictures at each stop along the way. If you do buy it, you may need a good sized pickup truck and a few extra strong arms to effect the transfer. It there's a descrambler involved, make sure it's not a pirated clone which may be worthless later. If there is no descrambler, don t pay more than $1,000 for the whole system. Remember, too, that there won't be any warranties.

I've sold my two previous systems by word of mouth. In both cases happy homeowners got complete satellite systems for $500 and $700 respectively and got years of enjoyment out of them. In some areas where cable is just being installed, homeowners may be eager to sell their system. In such cases it's possible to get a good TVRO system at a fire sale price. Make an offer; you might be surprised.

Used Gear From Dealers

Dealers seem to have mixed feelings about selling used equipment. Most dealers have used equipment and, if pressed, will sell it.

In my own informal survey using the Yellow Pages, I contacted thirteen dealers in a fifty mile radius of where I live and asked about used systems. Here are the results: Five had only answering machines and did not return the call. Three had no used equipment for sale. Three had used equipment. One promised to call back but never did. One was out of business. Of the three who had used equipment, all had a variety of gear which included some reputable names such as Houston Tracker, General Instrument, Uniden and a few old and forgotten names from the very early days of this hobby.

I ended up buying a Uniden 7000, which is a standard satellite receiver featuring stereo audio tuning with a digital display, Polorotor control and actuator control built-in, a 70 MHz loop on the back for "cheap 'n' easy" SCPC reception, infra-red remote control, and a reputation for delivering decent video. The best part is that it is a well known brand which is easily serviceable at many locations. The cost was $150.

More Used Options

Call around in your area and take extensive, careful notes. If you're within easy driving distance of the dealer ask to see the unit in operation. Dealers should be more than willing to make a deal. If they do a good job, treat you fairly and offer a good product, you'll be back. It would be ideal if an owner's manual comes with the receiver; there may be extra features you'll miss without it. Ask for some kind of warranty. Make sure the unit comes with the proper power supply and infra-red remote control.

If there is little to choose from in your area, you may want to try some long distance buying. Several companies have a certain amount of used and surplus TVRO gear available. The surplus equipment is often new and in the factory carton. Such gear is usually the result of being overtaken by technology, overly optimistic manufacturing or bankruptcy. In most cases the gear is good, though no longer under warranty.

Again, the consumer should take care. Without the ability to actually inspect the product it's impossible to guarantee it's what you want. Call the following for information on their surplus and/or used TVRO equipment:

Greensheet	908-707-1800
Long's Electronics	800-633-4984
United Satellite Systems	218-681-5616

Putting it All Together

Assembling all the information you've collected from the above sources, it should be possible to put together a very good satellite

system for well under $1,000. Here are some additional tips. One dealer told me when I asked if he had any used dishes, "We never get a dish back." That's just as well: This is the place to spend a little more money. A dish is the one thing you are least likely to trade up.

A good quality satellite dish can be purchased new from any of the above sources for prices ranging from $300 to $800, depending on the size and general quality. Although it's possible to get a new 7 or 7.5 foot dish for $250-$300, I would urge you to go the distance for a ten footer. The extra gain from the added size will be worth the increase in price. A decent 10 foot dish can be had for $350 to $380.

Now, instead of buying a separate feedhorn and LNB, try the California Amplifier's LNBF combined unit. They can be had for around $100. If you're interested in C-band only, this is a good way to start. The LNB part of the feedhorn is a 40 degree noise figure which is considered very good.

So, now you have a ten foot dish, feedhorn and 40 LNB for $450. Now add $150 for a decent satellite receiver such as mentioned above, add 100 feet of "all-in-one" cable to get the signal from the dish to the receiver (about $75), an actuator motor to move the dish around in the sky (about $90), and there it is: the complete TVRO system for $765.

How Low Can You Go?

By doing some serious shopping, you'll be able to shave an additional $200 off that price. It's just a matter of sniffing out the bargains and making deals. If you really want to do some tinkering, try one of the 7.5 foot spun aluminum dishes from Long's for $49. Of course there'll be a $30 crating charge and probably $40 for shipping (it's a one piece dish which must be shipped via freight truck), but you'll still have a pretty good dish. Find a used feedhorn and higher noise figure LNB for about $50 to put on that dish, use minimal wire for about $30, add the $90 actuator (they're tough to find used) and with your $150 receiver you'll have a complete system for $440. It's all possible.

Mailbag

• Bruce Backlund of Sag Harbor, NY, writes that Armed Forces Radio and Television Service (AFRTS) on Spacenet 2 (69 degrees) channel 20 has AFRTS Radio on 7.40 MHz audio subcarrier. While the video is encrypted, the audio is in the clear. Have you missed the AFRTS radio service on shortwave? Well, here it is.

• Kevin Young of Lake Luzerne, NY, is having trouble receiving clear SCPC signals using a Heil SCPC receiver on his Toshiba TRX 80 satellite receiver. He notes as well that Satellite Music Networks FM audio subcarriers are transmitted on frequencies far below those that his TRX 80 can receive.

Kevin, I'm going to assume that your dish is a 10 footer and that you're using a fairly low noise figure LNB (40 degrees or less). If so, the problem is probably caused by the dish not being peaked dead on. Most dealers do an excellent job of installing systems. However, SCPC (Single Channel Per Carrier) signals are a very narrowband transmission which need all the help they can get to be tuned. SCPC reception taxes the very limits of the home TVRO system. If you believe that your system is peaked as well as it can be then there are alternatives. The first is to upgrade the receiver.

Bob Heil (618-295-3000) has been working on a narrowband filter for the SC-1 and it should be available as of this writing. Just as the narrowband filters on shortwave radios work to increase the carrier-to-noise ratio, so does this. If it doesn't do the job, I would have to consider going to a larger dish and a lower noise temperature LNB. This may seem like a lot to go through just to get better SCPC reception, but to the hobbyist, "extremism in the pursuit of better signals is no vice!"

The second problem of receiving audio subcarriers which fall below the ability of your receiver is remedied by installing a T-1 Translator which allows those frequencies to be tuned by your satellite receiver. The T1 Translator is sold only by USS whose phone number is in this column.

My thanks also to Al from New York for the copies of *Satellite Communications* (to which I now subscribe). I misplaced your last name, but you know who you are, and I thank you.

MT

Ike Kerschner, N3IK

More Power to 'ya

Dead or low batteries were a problem even in the early days of ham radio. In the days of tube type radios, when a battery went dead all we could do was to replace it, usually at fairly high cost! Today most batteries in radio gear are at least the rechargeable type; consequently all we need do is plug the charger in to give them a new lease on life.

Primary Batteries

Carbon-zinc and alkaline are the types of batteries with which we are most familiar. They come in various sizes; designated as AAA, AA, C and D. Each of these batteries has a nominal voltage of 1.5 volts. The difference between the various sizes is the current capacity (current capacity is rated in amp hours, ah, or milliamp hours, mah). The larger batteries of course have the greatest current capacity (or life in use). For example, if a device requires 50 milliamps (ma) to operate, a 500 mah battery will operate that device for 10 hours.

Naturally, most of the equipment hams use requires more than 1.5 volts to operate properly. To obtain that voltage we must add batteries in series (that is, we connect the positive terminal of one battery to the negative of the next) until the required voltage is reached. For example, eight 1.5 volt cells would equal 12 volts. (Strictly speaking, we should call each of the above units a "cell"; a battery is not created until two or more cells are connected together.)

There are several other types of primary batteries that should be mentioned. They are lithium, silver oxide and mercury. These particular units produce extremely long life in low current applications and are found mainly in memory circuits in the modern ham rigs, clocks,and watches.

You should NEVER attempt to recharge primary batteries! Recharging a primary battery is dangerous and could result in the battery exploding, causing serious injury to the equipment and user. I know it is possible to renew carbon-zinc batteries to some extent; however, the practice should be discouraged because even if the recharging is successful it is possible the case of the battery will be perforated allowing chemicals to leak into and damage your equipment!

Rechargeable Batteries

On the other hand, some are designed to be used over and over again. The most popular rechargeable cell most of us are familiar with is the ni-cad (nickel-cadmium). Ni-cads can be recharged up to 500 times.

The ni-cad only produces 1.2 volts per cell; consequently it requires 10 cells to produce 12 volts. Although the current capacity of a ni-cad is lower than a primary cell of similar size, the ability to recharge makes it more economical. The ni-cad also is available in the standard sizes as well as smaller and larger cells to enable them to be tailored for a particular application.

The lead acid cell is another type of rechargeable battery that is of interest to hams. This cell produces two volts per cell and is available in several forms.

The usual lead acid battery has vent holes to vent gas produced by chemical action and plugged holes for adding distilled water to renew the cell. There is also a lead acid battery that uses a gel for the electrolyte; the benefit of this is that normally these gel cells can be mounted in any position (note: not all gel cells are sealed, so use caution and be sure to use the correct type for your application). There is a lead acid cell which is maintenance free; that is, it has gas vents but no holes for adding water. These cells can be used in any position without danger of spilling the electrolyte.

Battery Power Packs

Pictured is a power pack that I use for both my hand-held rigs when I need to use the HT for a long period of time. I also use this power pack to operate my Argonaut and HW-9 QRP transceivers. In both cases I can expect several days of use from this power pack. The pack consists of two six volt 7ah lead acid batteries. The case is an old camcorder power pack pouch which was purchased with a set of batteries for ten bucks at a ham-fest.

Lead acid gel cells are commonly available at hobby stores. Fliers of radio controlled model planes use them to start the engines of their models, operate fuel pumps, charge ni-cad batteries for electric motors and several other tasks at the flying field.

A good battery that I highly recommend is available from Tower Hobbies (PO Box 9078, Champaign, IL 61826, phone 800-637-6050). The battery is called the Hobbico Torqmaster LC 12; it is rated at 12 volts 7ah and is priced at $24.99. A charger for this battery is only $8.99 additional. This is a sealed power pack, and does a great job. If you follow instructions carefully for charging, this battery will last for years!

Another power pack that I have used successfully consists of two Radio Shack four-battery holders wired in series. If you like to backpack or travel in areas where power for recharging is not readily available, this is the way to go. I use eight D-size alkaline batteries and can easily power my HW-9 for a full week with this pack. The battery holders are available in sizes for AA, C, and D. Batteries are available from many other sources and most maintenance free batteries work quite well.

Carry cases can be made from a variety of readily available sources. As mentioned earlier,

camcorder power packs are one source, another is the ever popular fanny pack; camera cases work well, as do smaller ladies purses, and several cases on the surplus market work well. Use whatever type of connector you prefer. I use the cigar lighter, because a wide variety of portable equipment uses such connections, making the power pack as versatile as possible.

A recent addition to the ham market is a power pack that has a built-in "power remaining indicator." These packs cost well over a hundred dollars. I feel this to be an extremely high price to pay in light of the many batteries available at much lower price.

Re-building Battery Packs

I have received numerous inquiries about how to rebuild a battery pack for various handheld transceivers and scanners. The process is very simple, and far less expensive than purchasing a new battery pack (a particular battery pack costing $59 can be reproduced for less than $15 using the following method).

Carefully examine the battery pack. Normally it will be held together with two to four screws. Remove the screws and take the top off the pack. Now it should easily separate into two halves. Inside you will find a number of ni-cad batteries. The size of the ni-cads will vary. Unsolder the cells and locate similar sized cells at your local electronics store (I have always been able to find the cells I needed at Radio Shack).

Don't worry if you have a 600mah pack and you can only locate 500 or 550 mah, or vice versa. As long as the ni-cad fit in the pack, it will work. If you cannot find exactly what you need, check the store for cordless telephone batteries. I actually prefer the telephone packs for two reasons: first, they are less expensive per cell, and second, the cells always have solder tabs to make it easier to connect the required number. Solder the correct number of cells in series, put electrical tape over the connections and reinstall.

This is only a small part of the battery story. If Santa was good to you and left lots of battery powered gadgets under the tree, I hope we have given you some ideas that will increase your fun while saving your money.

Best wishes for a happy and prosperous 1993.

73 Ike, N3IK

Rob Gerardi's Ham DX Tips

Happy New Year to one and all! This time of year is the antarctic summer and that means increased activity from there. Here's some DX tips from there and elsewhere you can try: ***ANTARCTICA*** KC4AAA, operating from Byrd-Amundsen station at the South Pole, has been on 14260 kHz, SSB, at 0345 UTC daily. His QSL manager is NC6J, Robert Chambers, 2247 W. Jewett, San Diego, CA 92111. VP8GAY is presently operating from one of the British Antarctic bases and can be found operating CW at the following times: 14001 to 14015 kHz at 0100 UTC, 7001 to 7015 kHz 0200 to 0400 UTC, 3501 to 3515 kHz, 28001 to 28015 kHz at 1700 UTC, and 21001 to 21015 kHz at 1800 UTC. If you are lucky enough to locate him, send your reports/QSLs to: D.J. Warburton, GM0LVI, Law Vista High St., Errol, Perth PH2 7QQ, Scotland. ***BERMUDA*** The Radio Society of Bermuda offers two awards for contacting amateurs there. The Bermuda 100 award is a plaque offered to those who have verified 100 contacts with VP9 (Bermuda) amateurs. The Worked All Bermuda Award is offered to those who have contacted amateurs operating from all nine Bermuda parishes. If you want an application and detailed rules, write: The Radio Society of Bermuda, P.O. Box HM 275, Hamilton HMAX, Bermuda, using a #10 size envelope, SASE or SAE w/2 IRCs. To help you log some of those parishes, check the Bermuda Net which meets on 14275 kHz Sundays at 1330 UTC. ***BURKINA FASO*** XT2BW can be found operating: CW on 14015 kHz at 2015 UTC, RTTY 14085 kHz Sundays at 2145 UTC, 21085 kHz at 1300 UTC, and SSB on 14211 kHz at 2100 UTC Sundays he meets with his QSL manager WB2YQH (Robert Nadonly, 135 Wetherstone Dr., West Seneca, NY 14224). ***CROATIA*** One of the Belgian members of the UN peace keeping forces here is ON5AI/9A who will be active from here to June of 1993. Check the various DX nets on 20 meters as he checks into several as time and conditions permit. He promises a special QSL, send your QSL requests to P.O. Box 45, 2460 Kasterlee, Belgium. ***HOWLAND ISLAND*** NT0X, Randy Rowe, is heading up a DX-pedition to this rare Pacific island which should start around 26 January and last seven to ten days. Listen for a KH1 prefixed station on or near: 3795, 7070, 14195, 21295, 28495 kHz SSB; 3505, 7005, 14005, 21005, 28005 kHz CW; and 14085, 21085, 28085 kHz RTTY. The QSL to NT0X's 1993 callbook address. ***JAN MAYEN*** Mathias Bjerring, JW5NM, (P.O. Box 498, N-9170 Longyearcity, Norway) can be found using CW on 7005 kHz at 0330 UTC and 10105 kHz at 0500 UTC. ***TAIWAN*** The new address of the incoming QSL bureau here is: P.O. Box 93, Taipei, Taiwan, ROC. ***SAN FELIX ISLAND GROUP*** XQ0X, Juan is active from here once again, during the lobster fishing season which will last through March. Look for him operating SSB on the "256 Group Net" 1456 kHz around 2300 UTC. His QSL manager is CE3ESS, Mikey Gelerstein, P.O. Box 9834, Santiago, Chile. ***SAO TOME*** Charles L. Lewis, C Postal 522, Sao Tome, D.R.S.T.P., West Africa, (via Portugal) has been kind to write and tell us that he should be active as S92SS when you read this, and that you can use the address above to obtain QSLs for this operation as well as his prior operation as A22AA. He asks that you include a self-addressed envelope and IRC or "Green Stamp" when making such a request. ***SOMALIA*** With the large number of Canadian Forces being deployed here as part of a large UN Peacekeeping Force, be prepared for the possibility of several T5/VE or 4U/VE prefixed amateurs operating from here. As with our earlier tip of Croatia, it is not unusual for UN peacekeepers to place such rare spots on the air and of course they have always been accepted as legal operations for various amateur awards. T53UN has been active on 21030 kHz CW or 21235 kHz at 0030 UTC most days. QSL T53UN to: Kent Phillips, P.O. Box 1652, Icosea, Cyprus. ***SOUTH SHETLANDS*** Operating from the Polish Antarctic research base is HF0POL which can be found operating on the following freqs and modes on them: 1833 kHz CW and possibly SSB at 0530 UTC, 3505 kHz CW at 0145 UTC, 7010 kHz CW from 0045 UTC, 14015 kHz CW at 2100 UTC, 14236 kHz in the SSB DX Net at 0230 UTC, 28010 kHz CW at 1515 UTC. Handling the QSLs for this station is: SP9DWT, Zbigniew Kukzak, ul Gromady Grudziaz 17 m 4, 30-675 Krakow, Poland. ***USA*** The Western States Senior Citizens net meets on 7180 kHz SSB daily at noon Pacific Local Time daily. If you are a Senior Citizen and an amateur they invite you to join, if you are not an amateur they still would like you to tune in. Starting the 23rd of January at 1900 UTC until 0400 the 25th, (the ARRL VHF/UHF sweepstakes) look for me (Rob Gerardi) operating on 50, 144, and 432 MHz SSB as part of the N9BJG multi operator contest team, (operating from grid EM58), or under my own callsign N9LAG. SWL reports for N9BJG or N9LAG should be sent to P.O. Box 91, Benton, IL 62812. Amateurs wishing to QSL a contact with N9BJG should send their requests to his callbook address. ***UZBEK*** UI8AAA can be found on 3505 kHz CW at 1230 UTC most days. His QSL manager is K9FD, Mervyn Schweigert, Route 2 Box 138-A, Red Bud, IL 62278.

Hoping that your new year is a good one, that's it for this month. 73 de Rob.

George Zeller

Pirate Busted by Court, Not FCC

For the first time in history, a pirate radio station has been busted without involvement by the FCC. **WFIF-AM,** a licensed religious station on 1500 kHz in Milford, Connecticut, won a $12,000 civil suit against Paul Matar, also of Milford. WFIF claims that Matar maliciously operated a pirate on their frequency in 1990 and 1991.

A Milford municipal court found that Matar is guilty of slanderous broadcasts that harmed WFIF's business relations, according to the October 7 issue of *Radio World* magazine. Thanks go to *MT* readers Loy Lee of Richmond, KY, and Hank Lambert of Winter Park, FL, for copies of this article.

Matar, known over the air as "Vigilante DJ," signed on occasionally after the daytime-only WFIF signal left the air. He attacked the station, its staff, its beliefs, and its advertisers. Joseph Casey, regional director of the Boston FCC Field operations Bureau, said that FCC direction finding operations were unsuccessfully attempted after WFIF complaints. Matar's transmissions were irregular, and Casey claimed that the FCC's budget was insufficient to permit regular stake outs of Matar.

Lacking FCC evidence, WFIF submitted signal measurement evidence to the court of Matar's transmissions that were made by private engineers. The judgement in the civil case was in favor of WFIF, and against Matar. In addition, WFIF attorney William Secola is currently pursuing contempt of court charges against Matar, which could lead to fines and/or imprisonment.

National Vanguard Schedule

Regular *MT* contributor Alan Masyga of Winona, MN, sends in a complete schedule for **National Vanguard Radio,** which he received direct from the station. This semi-clandestine voice of the neo-fascist National Alliance reports four relay outlets for its weekly "American Dissonant Voices" program. They are still heard over shortwave on 7355 kHz at 0200 on Sundays via **WRNO** in New Orleans. Three local stations also carry the program: **KMTL-760** in Sherwood, AR, at 1500 on Sundays, **KPLA-770** in Riverbank, CA, at 0200 on Mondays, and **WTIS-1110** in Tampa, FL, at 1630 on Saturdays. All times and dates are in UTC.

The National Alliance also operates four dial-a-clandestine telephone messages with taped narratives by Vanguard announcer Kevin Alfred Strong! One, located in North Olmsted, Ohio, is reached at (216) 734-6210. Their programming is highly controversial, but it appears that the Vanguard organization is expanding its communications network.

Off The Record Returns

Andy Cadier's "Off The Record" Europirate column has returned to the pages of the British *Short Wave Magazine*. As we previously reported in *MT* the publication suspended their pirate column during the summer because of censorship threats backed by potential fines and imprisonment from the UK government Radiocommunication Agency. Cadier is once again printing pirate information and loggings, but he now omits station names from the listings.

Cadier says that like *MT's* "Outer Limits," his column also will be covering clandestines and other unusual unlicensed signals. *MT* reporter Eric Suter of Sutherland, Maryland, reports that other European DX hobby bulletins who print pirate loggings have been operating for years through pirate maildrops, hoping to avoid RA censorship.

Pirate FAX Station

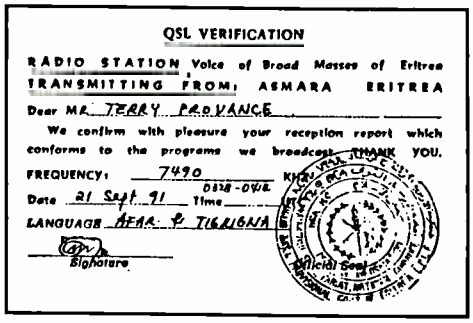
Ron Bruckman of Hempstead, Maryland, sends in a very interesting intercept of a Europirate FAX station. On November 1 at 1600 UTC he logged a station in 120/576 FAX mode on 27503 kHz. Ron encloses a printout of the FAX photo, which is a cartoon drawing of a man carrying a candle through a dark room. We would print this picture here, but it's a little too fuzzy to duplicate well in the magazine. A caption underneath the drawing reads, "73 A TONS."

Ron says that he has never heard a pirate FAX station before, and that FAX of any kind is extremely rare on 11 meters. I've never previously seen a log like this either. Congratulations go to Ron for a great catch! Utility station monitors should keep their eyes open for similar signals when daytime propagation is open on this band to Europe.

An Avalanche of Pirates

We received a lot of good information this month, including the copy of a clandestine QSL from the **Voice of Broad Masses of Eritrea** that is pictured this month. Terry Provance of Zanesville, Ohio, was delighted when his mailman delivered this verie. But, there was a massive explosion of North American pirate activity during the fall of 1992. Our readers have buried us with recent loggings. For this issue only, we're expanding the loggings section to show what has been heard. I'll hold the other material for February.

Dennis Myhand of Dermott, AR, says that he heard a VVV DE FUF Morse code marker as pirate QRM around 7415 kHz on a November evening. This costal utility station is a French


QSL VERIFICATION

RADIO STATION Voice of Broad Masses of Eritrea
TRANSMITTING FROM: ASMARA ERITREA
Dear MR. TERRY PROVANCE
We confirm with pleasure your reception report which conforms to the programs we broadcast. THANK YOU.
FREQUENCY: 7490 KHz
Date 21 Sept 91 Time 0318-0415
LANGUAGE AFAR & TIGRIGNA
Signature
Official Seal

Terry Provance bagged this Eritrean clandestine QSL.

Navy operation in Martinique. It is unlisted in the 7415 kHz vicinity in all of my utility references, so it appears that they were off frequency and out of band for one day.

Maildrop addresses used by the huge quantity of pirate stations reported this month include P.O. Box 452, Wellsville, NY 14895; P.O. Box 109, Blue Ridge Summit, PA 17214; P.O. Box 25302, Pittsburgh, PA 15242; and P.O. Box 293, Merlin, Ontario N0P IW0. It's obvious that the FCC bust activity reported in 1992 issues of *MT* have not deterred shortwave pirate broadcasting in North America. We barely have room in these pages to list everything!

East Coast Beer Drinker- 7415 at 0430. Although less active lately, the station still plays rock music while promoting beer consumption. Addr: Blue Ridge Summit. (Skip Harwood, Beale AFB, CA; Dennis Myhand, Dermott, AR)

EBO Radio- 7415 at 0130. Uncle Billy programs rock that is increasingly supplemented by graphic sexist commentary. He sometimes relays other pirate stations. Addr: Wellsville. (Ed Rausch, Cedar Grove, NJ, Alan Masyga, Winona, MN)

Hello Radio- 7415 at 0215. This guy, who randomly shouts "HELLOOO RADIOOO," is a longtime pirate jammer with no redeeming value. But Alan Masyga says that he hears worse things in the 20 meter ham bands on 14313 kHz. Addr: None. (Myhand; Masyga)

Jolly Roger Radio- 7405 at 0230. Blackbeard the Pirate's rock, comedy, and FCC helicopter reports are probably the slickest productions in pirate radio today. Addr: None, but solicits computer reception reports via the ANARC BBS at (913) 345-1978. (Gigi Lytle, Lubbock, TX; John Hollowell, Port Republic, MD)

KMCR, Magic Carpet Radio- 7417 at 0200. Female announcer Wanda B. English sometimes replaces Magic Mike on this station. 60's rock is the staple format. Addr: Blue Ridge Summit. (Harwood)

Mystic Voice of the Western Prairie- 7413 at 2200. This new one programs cowboy and country music. Addr: Blue Ridge Summit. (Pat Murphy, Chesapeake, VA; Schmehl, PA; Rausch)

Radio Beaver- 7417 at 0030. Bucky Beaver plays Canadian rock and discusses Canadian politics, but he's ventured south of the border with his recent **Voice of the Night** impersonation contest. Addr: Merlin. (Robert Ross, London, Ontario)

Radio Comedy Club International- 7425 at 2230. They play some rock music, but shows are dominated by commercially recorded comedy material like you

hear on the nationally syndicated Dr. Demento show. Addr: Blue Ridge Summit. (Rausch)

Radio Deadman- 7413 at 2230. Previously inactive for years, they reactivated with a rerun of a well produced mid-1980's Halloween program. Addr: Old addresses now defunct. (Schmehl, Rausch)

Radio Free America- 7415 at 0145. Bill O. Rights analyzes individual freedom and the USA constitution, always signing off with a stirring brass band rendition of the USA national anthem. Addr: Wellsville. (Hollowell)

Radio Halloween- 7409 at 2300. Their Halloween format should remind us that pirate activity increases around holidays. Tip: Christmas and New Year are prominent examples! Addr: Wellsville. (Murphy)

Radio North Coast International- 7415 at 1800. Inactive since the mid-1980's, this old veteran reappeared a couple of times during the fall with Captain Willy's rock oldies and comedy sketches. Addr: Wellsville. (Murphy; Rausch)

Radio Strange- 7416 at 0130. Their fall shows mixed diverse novelty music with parodies of USA presidential candidates. They announce that they operate on the longwave, medium wave, shortwave, and rubber bands. Addr: None, unfortunately. (Peter Stawicki, Norman, OK; Rausch; Bruckman)

Radio USA- 7419 at 2330. Despite a high profile FCC bust, Mr. Blue Sky's excellent productions of punk rock music and comedy continue from a leaky bathtub off the North American coast. A phony and profane Radio USA that attacks pirate author Andrew Yoder is also sometimes heard. Addr: Wellsville. (Bill Hennessy, Marble Falls, TX; Lytle; Schmehl; Masyga)

The Fox- 7417 at 0000. Apparently a new one, featuring Beelzebub with a mix of pirate advocacy, rock music, and Firesign Theater comedy. Addr: None yet. (Rausch)

Voice of Anarchy- 7416 at 0030. Leonard Longwire hosts a low key show with very diverse musical styles and occasional interview segments. Do not confuse this one with **Anarchy One,** which is a quasi-clandestine with leftist political programming. Addr: Blue Ridge Summit. (Lytle; Schmehl; Masyga)

Voice of the Abnormal- 7425 at 2145. Yukon Jack often appears around Halloween with seasonal fare, and this year was no exception. Addr: None, but has verified logging reports in the ACE bulletin. (Rausch)

Voice of the Kentucky Fried Rodent- 7416 at 2300. Their announcer says that this station's relationship with rodents is the same as Jeffrey Dahmer's relationship with humans. Addr: Wellsville. (George Zeller, Cleveland, OH)

Voice of the Night- 7415 at 0245. Sometimes Lad programs rock music. Sometimes he jams other pirates. He has replaced the **Voice of Tomorrow** as the least popular pirate in history. Addr: Pittsburgh, increasingly unreliable. (Harwood; Masyga; Ross)

Voice of the Laughing Idiot- 7416 at 0030. Their announcer has perfected a fascinating simultaneous mix of semi-lucid discussions and hysterical laughter. Addr: None. (Rausch; Hollowell)

Voice of the Very Last Days- 7417 at 0345. A new operation with a clever parody of the Book of Revelation. Addr: Blue Ridge Summit, but they say that the world will end soon, and QSL's therefore can't be mailed quickly enough. (Rausch)

WARI- 7415 at 1830. Dr. Lobotomy programs rock music, but also relays programming from other pirates. Addr: Wellsville. (Rausch, Hollowell)

WDDR- 6799 at 2030. Jimmy Zero and J. G. Tiger play ancient 1950's rock and genuine historical commercials of the era. Note the frequency, which is a band that is often overlooked while searching for pirates. Addr: Wellsville. (Murphy)

WEED- 7415 at 0100. Their slick productions of rock, comedy, and drug advocacy were more widely and frequently heard during the second half of 1992. Addr: Still none, announces a computer BBS that has been largely unproductive. (Harwood, Myhand, Rausch, Ross, Hollowell)

WKIK- 7415 at 0115. Their frequent ID's from an alleged Jacksonville, FL, location are sometimes supplemented by rock music. They share a telephone voice mailbox with the **Voice of the Night.** Addr: Wellsville, but reliability erratic at press time. (Rausch; Lytle)

WLIS- 7425 at 2300. The call letters stand for "We Love Interval Signals." They play genuine shortwave broadcast station interval signals, which they treat like hit records. Addr: Blue Ridge Summit. (Murphy, Rausch)

WMAD- 7415 at 0230. Host Al Jaffe from *Mad* magazine usually interviews perennial presidential candidate Alfred E. Newman. Addr: Wellsville. (Myhand, Rausch)

WQNR- 1626 at 2300. Apparently a new one with a top 40 oldies format and a slogan of "Queens Nassau Radio." Now that winter is here, we can expect increased pirate activity just above the AM broadcast band. Addr: None. (Schmehl)

WYMN- 7415 at 0115. Veteran announcer Pirate Jenny hosts female folk-rock vocals and sly feminist sketches. This is still the only all-female pirate in North America. Addr: Wellsville. (William Rogers Jr., Vassar, MI, Rausch)

Whew! We'll get to more Europirate and clandestine news next month.

MT

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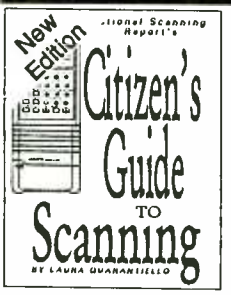

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Jack Albert

The RTTY Decoder Olympics

Audio filters, for the most part, determine the performance of any RTTY terminal unit (TU), packet modem or facsimile decoder. After receiving many letters from people asking "Which RTTY unit is better?"; "How can I improve RTTY reception?"; and "The filters in my RTTY TU are really bad. Can I find better ones that will pull the signal out of the noise?" I decided it was time to look for an authoritative answer.

After purchasing test equipment at hamfests and industrial equipment auctions, I was able to set up a small testing laboratory to perform simple measurements on RTTY equipment. Tests were performed on all-mode packet modems for ham radio and (receive only) communications terminals for shortwave listening. Because the competition was tough, I called the test "The RTTY Olympics."

Before I started, I had to set my own set of rules, not being able to afford equipment to do the job according to industry standards. Using a Hewlett Packard 400FL ac volt meter, a Digitech 2183-03 digital data generator, a home-brew FSK oscillator/noise generator and a home-brew bandpass filter, I was able to do a test that would reasonably compare the five units chosen for testing. The test required by the industry is "BERT," or Bit Error Rate Test, to determine the signal-to-noise performance—a measurement of how much noise it takes to generate a certain number of errors in the data at a given signal level.

Wow! I'm out of breath! Simply stated: when you copy a RTTY signal and the noise starts to increase, at what noise level will you get errors in the copied text and how many errors are there?

However, when you're trying to copy a RTTY signal that's buried in the noise, I don't think you're interested in a BERT test. You merely want to know if your system is up to snuff or if the signal is simply too weak to copy.

Therefore, I decided to set up my own test for determining what I would call "NT" or Noise Threshold. For this comparison, a laboratory generated "Quick Brown Fox" test was and adjusted by an FSK oscillator to a reference audio level which was then mixed with laboratory generated noise. The goal was to receive lines of text, with no errors, for 1 minute.

I set up the equipment by connecting the data generator to the FSK oscillator/noise generator. An ac volt meter was used to measure the level of the FSK oscillator or noise generator by toggling the selector switch.

I set up the data generator and sent the "Quick Brown Fox" message to the UUT (Unit Under Test). I then set the FSK oscillator to a fixed level as indicated by the ac voltmeter (I used -10 dB as a reference). I then raised the noise level until I saw errors in the QBF message. Then I reduced the noise until I copied text with no errors. After copying the QBF for one minute, I jotted down the measurement of the noise and the FSK signal level.

By the way, the noise is measured through a bandpass filter. The bandwidth of the filter is set to twice the FSK shift. If the signal is -10 dB (about .245 vrms) and the noise -24 dB (about .049 vrms) the noise threshold (NT) is 14 dB. If the UUT (Unit Under Test) can tolerate a higher noise level, let's say -23.5 dB, the NT is then 13.5 dB.

In other words, if the noise level is closer to the signal level, the NT decreases and the UUT can still copy error free text. If the noise increases beyond the NT then you'll start to see errors in the text. After all, "if you can't hear it, it isn't there." I hope we will be able to run other equipment through the "RTTY Olympics" in the future. But for now, if you own or are considering one of the units tested, I hope you will find the comparison helpful.

An Interesting Observation

For many years the military and perhaps the U.S. Government used an old electrical, mechanical encryption system known as the KW-7. It was in use for many years and you could recognize it because for a long while they sent a synchronizing signal. The signal sounded very much like an old model 19 that was sending the null character (nowadays it's called the "diddle").

When the encrypted signal went into traffic, it produced a repetitious cadence that appeared to increase in baud rate. The old system, so I'm told, needed this time period (called the preamble) because the encryption box used mechanical wheels that had to synchronize to the changing baud rate.

This system is no longer in use on the HF bands. Using their brilliant powers of observation, radio hobbyists have determined that the old system was replaced by a new one. The same frequencies are being used: 7.9593, 10.426, 12.120 MHz, just to name a few.

But, the new system appears to be sending a constant 75 baud shift during idle, and then it goes into a preamble followed by synchronous data. What's most interesting is that the preamble has the same characteristics as the RTTY mentioned a few months ago on 8.493 MHz. Remember it? It was the one that sent RY's and then went into what appeared to be a "BERT" test. However, the BERT only lasted for 63 characters and then the signal was scrambled for a while. The sequence then repeated.

Whatever it is, both systems appear to have similar encryption schemes. I'll keep you posted!

NNN

Noise Threshold Performance

UUT	BAUD/SHIFT 50/170			BAUD/SHIFT 75/170			BAUD/SHIFT 300/200		
	S	N	NT	S	N	NT	S	N	NT
M8000	-10	-24	14 dB	-10	-23.5	13.5 dB	-10	-27.5	17.5 dB
M7000	-10	-24	14 dB	-10	-25.5	13.5 dB	-10	-27.5	17.5 dB
M1000	-10	-22	12 dB	-10	-24	14 dB	-10	-30	20 dB
PK-232	0	-14	14 dB	0	14	14 dB	0	-18.5	18.5 dB
KAM	-10	-25.5	15.5 dB	-10	25.5	15.5 dB	-10	na	na

Notes: The M1000 was the best at 50 bd and the M8000/7000 did better at 75 and 300 baud. The KAM had a problem with ASCII mode. No matter how low the noise was, it copied scrambled text. There appeared to be a problem with coding of the data or a bug in the firmware. The 300 baud test used ASCII mode. The filter performance using 300 baud ASCII is the same for packet.

Units Tested:
Universal M1000, M7000, M8000:
Universal Radio, Inc., 6830 Americana Pkwy., Reynoldsburg, OH 43068; 614-866-4267.
PK-232: AEA, P.O. Box C2160, Lynnwood, WA 98036; 206-774-5554
KAM: Kamtronics, 1202 E. 23rd St., Lawrence, KS 66046; 913-842-7745.

Welcome to 1993! How did you ring in the new year? In case you spent it DXing, how about some addresses to begin your '93 QSL collection?

"Greetings from High Adventure Radio." Sound familiar? It will if you logged KHBN. Broadcasting from the beautiful Pacific island of Palau, this religious station continues to QSL 100% to hobbyists. Send your reports and return postage to; Voice of Hope-Asia, P.O. Box 66, Koror, Palau 96940. For a speedier reply try; High Adventure Ministries, P.O. Box 7466, Van Nuys, CA 91409.

High Adventure also operates the Wings of Hope from Lebanon. For one IRC and an English report, you can receive a colorful world map card. Send to; P.O. Box 3379, Limassol, Cyprus.

The BBC's Hong Kong Relay Station remains a popular DX target. To receive a full data verified card, send your reports directly to the station via BBC East Asia Relay Co., Ltd., Tsang Tsui Broadcasting Station, Nim Wan, Yuen Long, New Territories, Hong Kong.

Go after those QSLs!

ALBANIA

Radio Tirana, 11825 kHz. Partial data "folkstyle" card, without veri signer. Personal thank-you note and program schedule included. Received in 21 days for an English report and one IRC. Station address: Rruga Ismail Qemali, Tirana, Albania. (Raymond King, Kelowna, BC Canada)

AUSTRALIA

CAAMA Radio-VL8T Tennant Creek, 4910 kHz. No data station letter, signed by Sonette Johnson-Receptionist. Station stickers, and program schedule included. Received in 30 days for an English report, audio program cassette, and mint stamps. Station address: P.O. Box 2924, Alice Springs NT, 0871 Australia. (Ed Rausch, Cedar Grove, NJ)

AUSTRIA

ORF-Radio Austria Int'l, 6015/9875 kHz. Full data QSL card, without veri signer. Station stickers, postcards, and schedules included. Received in 30/50 days for an English report. Station address: A-1136, Wien Wurzborggasse 30, Austria. (Michael J. McFerrin, Brights Grove, ON Canada) (Richard A. Jones, Dayton, OH) (King, Canada) (Nicolas P. Adams, Port Murray, NJ)

BRAZIL

Porto Velho Aeradio, 8855 kHz. Full data prepared card verified by Edivaldo Oliveria-Station Chief. Received in 30 days for an English utility report, 2 IRCs, and a self-addressed-envelope. Station address: c/o Telecomunicacoes Aeronauticas, Caixa Postal 161, Aeropuerto de Belmont, Porto Velho, Rondonia, Brazil. (Rausch, NJ)

CUBA

Radio Havana, 5965/6180 kHz. No data scenery card, without veri signer. Received with a personal letter, and program schedule. Received in 233 days for an English report and 2 IRCs. Station address: Apartado 6240, La Habana, Cuba. (Paul Sullivan, Albany, CA) Ronald C. Morrison, Dallas, TX)

MALI

Radio Beijing Relay Station, 11715 kHz. Full data card without veri signer. Program schedules, magazines, stickers, and calender included. Received in 24 days for an English report. Station address: P.O. Box 4501, Beijing, People's Rep. of China. (Jones, OH) (Frank Hillton, Charleston, SC)

NEW ZEALAND

Radio New Zealand, 17770 kHz. Partial data scenery card, without veri signer. Tourist brochure, and program schedules included. Received in 19 days for an English report and 2 IRCs. Station address: P.O. Box 2092, Wellington, New Zealand. (Sullivan, CA)

NIGER

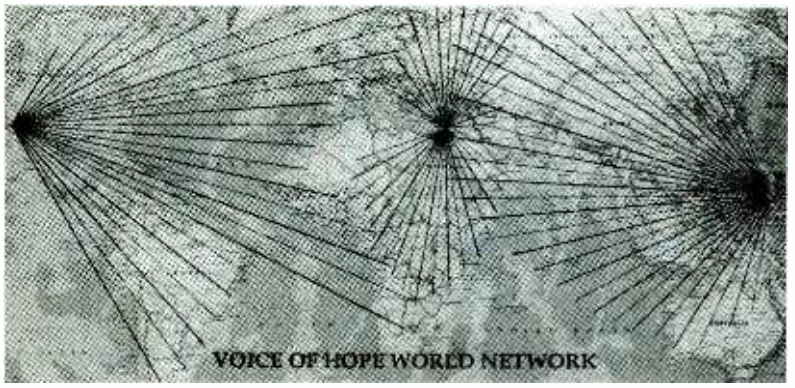
ORTN-La Voix Du Sahel, 3260 kHz. Full data station logo/map card of Niger. Received in 2 years (!) following numerous French follow-ups, IRCs, U.S. currency, and travel brochures. Station address: Boite Postal 361, Niamey, Niger. (Stephen J. Price, Conemaugh, PA)

PANAMA

Panama Intelmar Radio, 8589 kHz. Full data prepared QSL card, without veri signer. Received in 14 days for an English utility report, and a self-addressed-stamped-envelope. Station address: P.O. Box 2009, Balboa, Panama. (Rausch, NJ)

PIRATE

Radio Esoterica, 7415 kHz. Full data card and personal letter signed by "Moriarty." Noted this was a temporary card with a promise of a better card in the future. Also received a dub of the studio tape of Program #1. Received in 18 days for an English report. Pirate mail drop: P.O. Box 146, Stoneham, MA 02180. (Al Underwood, Silver Springs, NY)



John Carson of Norman, OK, received this Voice of Hope World Network QSL.

Weekend Music Radio-The Voice of Scotland, 15043 kHz. Full data QSL card, and personal letter from Jack Russel. Bumperstickers, business card, and a cartoon included. Veri signer mentioned a possible new signal on 3290 kHz, running 400 watts from homebrew transmitter. Received in 87 days for an English report. New mailing address: WMR, 14 Stone Row, Coleraine, Co. Londonderry BT52 1EP, Northern Ireland. (Underwood, NY) *Nice QSL Al!-GVH*

SAUDI ARABIA

B.S.K.S.A., 21670 kHz. Received via registered mail, full data station letter, signed by Director of Ministry of Information. Tourist brochures and Islamic pamplets included. Received in 75 days for an English report. Station address: Kingdom of Saudi Arabia Ministry of Information, Engineering Affairs, Riyadh. (Tom Risher, Whittier, CA)

SHIP TRAFFIC

KIHU-OISL, 156.600 MHz (Tanker). Full data prepared card verified with ship's stamp, illegible signature. Received in 24 days for an English utility report, one IRC, U.S. mint stamps, and a self-addressed-envelope. Ship address: c/o Neste O/Y, Keilaniemi, SF-02150 Espoo 15, Finland. (Russ Hill, Oak Park, MI)

MADISON MAERSK-OVJB2, 156.65 MHz. (Container) Full data letter signed by Radio Officer. Received in 21 days for an English utility report and one U.S. dollar (which was returned). Ship address: A.P. Moller, Esplanaden 50, DK-1098, Copenhagen, Denmark. (Hank Holbrook, Dunkirk, MD) *Hank notes the Maersk line ships are excellent at QSLing!*

MARINE PRINCESS-WNLH, 156.65 MHz (Bulk Carrier). Full data prepared card verified by Radio Officer. Received in 26 days for an English utility report and U.S. mint stamps. Ship address: Marine Transport Lines Inc., Meadowland Plaza, 150 Meadowland Parkway, P.O. Box 1550, Secaucus, NJ 07094. (Holbrook, MD)

ZIEMIA SUWALSKA-SQMX, 156.600 MHz (Bulk Carrier). Full data prepared card verified with ship's stamp and signed by Frank Hebel-Radio Officer. Received in 45 days for an English utility report one IRC. U.S. mint stamps, and a self-addressed-envelope. Ship address: c/o Polish Steamship Co., Polska Zegulga Morska, Malo Polska 44, 70-515 Szczecin, Poland. (Hill, MI)

SWITZERLAND

Swiss Radio Int'l, 6135/9885 kHz. Full data scenery QSL, verified by Gillian Zbinden-Secretary English Programs. Received in 37 days for an English report. (Mc Ferrin, Canada) (Adams, NJ)

UNITED ARAB EMIRATES

UAE Radio-Abu Dhabi, 11965 kHz. Full data card verified by Station Director. Station stickers and tourist brochures included. Received in 16 days for an English report. Station address: P.O. Box 63, Abu Dhabi, United Arab Emirates. (Jones, OH) (Wright, MS)

UNITED KINGDOM

Radio Japan-Skelton Relay Station, 6160/9770 kHz. Full data color Special Relay Card, verified by Kumitoshi Hishikawa. Received in 30/45 days for an English report and mint stamps. Radio Japan newsletter and program schedule included. Station address: NHK Tokyo 150, Japan. (Rausch, NJ) (Sam Wright, Biloxi, MS) (GVH-LA)

English language

shortwave guide

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 5 ,6 ,7, or 8 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (7:30 PM Eastern, 4:30 PM Pacific) in North America, not on Sunday.

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

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

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday
M: Monday
T: Tuesday
W: Wednesday
H: THursday
F: Friday
A: SAturday

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

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

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

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

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

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

Consult the propagation charts. To 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

Bye-bye, Bonaire

Late-breaking news relayed by Glenn Hauser brought the unexpected announcement that Transworld Radio will be ceasing all shortwave broadcasting from the Netherlands Antilles. Reductions will begin to take place January 3rd. See the Shortwave Broadcasting column for more details.

China Radio International

This month Radio Beijing officially becomes China Radio International, bringing the English name in line with the Chinese which was changed years ago. Beijing Radio is the name of the city's local station, and the similarity in names sometimes caused confusion.

The service has embarked on other forward-looking projects as well. CRI has also broken ground on a new office and studio building, expected to be completed in about two years. To reach non-shortwave listeners in the U.S., it is renting time on KPLA, 770 kHz AM, in the San Francisco area during the 5-5:30 pm driving time!

VOA Conference

As the United States was focused on the presidential election victory of Bill Clinton, over 150 representatives of broadcasters from around the globe quietly converged on Washington, D.C. to discuss the state of international broadcasting.

During the conference, participants addressed new trends in programming, the use of satellites and rebroadcasting, and the future of international broadcasting.

Among the broadcasters present at the conference were Radio Netherland's Jonathan Marks, Dieter Weirich of Radio Deutsche Welle, the director of Vatican Radio Reverend Pasquale Larquie, and representatives from Radio Finland, Radio Nigeria, Radio Syria, Radio Romania International, Radio Hungary, and the World Radio Network, just to name a few.

At the conference, the future of shortwave was reaffirmed by USIA director Eugene Kopp and other broadcasters as the "only direct way of reaching audiences without the use of gatekeepers." In addition, the conference discussed the best ways for international broadcasters to gain audiences in the United States. The use of 1-800 numbers and other free print media were pointed out as successful examples.

"Cutback" or "Purge"?

Personnel in Albanian Radio-Television continue to be cut back. Thirty-one television employees were discharged, then 11 were dismissed from Radio Tirana International, many of them experienced reporters.

Zeri i Populllit asks, "Why is this happening? Radio Tirana International prepares programmes for Albanians abroad, but also for people throughout the world who are interested in listening to them. The improvement in the quality of these programmes has been evident to listeners...Meanwhile, those who prepare these programmes and have long experience are now being dismissed."

Another external service which was drastically pruned back two years ago is Radio Canada International. It was featured recently in the *Vancouver Sun* as the agency that refused to die. In spite of being virtually cut off from funds, the skeleton staff has managed to fill 232 hours of air time each week for listeners who range from Canadian peacekeepers in Bosnia to Chinese students hoping to improve their English. While the future of even this reduced budget is uncertain, "for an agency that was supposed to be dead by now, RCI is doing surprisingly well," says Carol Goar of the *Toronto Star*.

We thank the CRI *Messenger*, Jeff Chanowitz (who attended the VOA conference), R. Rogers, and the BBC Monitoring Service for this month's Hot News.

English language **shortwave guide**

MT Monitoring Team

P.O. Box 98, Brasstown, NC 28902-0098

Greg Jordan
Frequency Manager
North Carolina

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

Kannon Shanmugam
Program Manager
Kansas

John Carson
Oklahoma

Dave Datko
California

B.W. Battin
New Mexico

Jim Frimmel
Texas

February Deadline: December 30

newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC
(7:00 PM EST, 4:00 PM PST)
BBC
CBC, Northern Quebec [S]
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Thailand
Radio Vilnius
SBC Radio 1, Singapore
Spanish National Radio
Swiss Radio Int'l
Voice of America
0005
Radio Pyongyang
0010
Radio Beijing*
0030
All India Radio
BRT, Brussels
Christian Science Monitor (SE Asia) [M]
Christian Science Monitor [T-F]
HCJB
Radio Havana Cuba [T-S]
Radio Korea
Radio Netherlands
Voice of America (Americas, East Asia) (Spec English) [T-S]
Voice of America (East Asia) (Special English) [M]
0035
All India Radio (News Service)
0045
Radio Korea (News Service)
0055
WRNO [H, A]

0100 UTC
(8:00 PM EST, 5:00 PM PST)
BBC
CBC, Northern Quebec
Christian Science Monitor
Croatian Radio, Zagreb [M-A]
Deutsche Welle
FEBC Radio Int'l, Philippines
Radio Australia
Radio Belize
Radio Canada Int'l [S-M]
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Sofia
Radio Tashkent
Radio Thailand
Radio Ukraine Int'l
Radiotelevisione Italiana
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
Voice of Indonesia
WWCR [T-A]
0115
Radio Havana Cuba* [T-S]
0125
Radio Korea [T-A]
0130
Christian Science Monitor (SE Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Netherlands
Radio Tirana
Radio Yugoslavia
Voice of Greece [M-A]
0155
Voice of Indonesia
WRNO [W, A]

0200 UTC
(9:00 PM EST, 6:00 PM PST)
BBC
CBC, Northern Quebec [S-M]
Channel Africa, Johannesburg
Christian Science Monitor
Croatian Radio, Zagreb [S]
Deutsche Welle
Radio Australia
Radio Canada Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Romania Int'l
Radio Thailand
RAE, Buenos Aires [T-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Free China
Voice of Myanmar
WWCR [T-A]
0215
Radio Cairo
Radio Nepal
0230
Christian Science Monitor (Africa, Middle East) [M]
Christian Science Monitor [T-F]
HCJB
Radio Finland [T-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio Netherlands
Radio Pakistan (Special English)
Radio Portugal [T-A]
Radio Tirana
Radio Yugoslavia
SLBC, Sri Lanka
0245
All India Radio (News Service)

0300 UTC
(10:00 PM EST, 7:00 PM PST)
BBC
CBC, Northern Quebec [T-S]
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize
Radio Budapest
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-F]
SBC Radio 1, Singapore
Voice of America
Voice of Free China
WWCR [T-A]
0309
BBC*
0310
Radio Beijing*
0315
Radio Cairo
Radio Havana Cuba* [T-S]
0330
BBC (Africa)*
Christian Science Monitor (Africa, Middle East) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l [T-A]
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Iraq Int'l
Radio Netherlands
UAE Radio, Dubai
0340
Voice of Greece [M-A]
0350
Radio Yerevan
0355
Radio Japan [M-F]

0400 UTC
(11:00 PM EST, 8:00 PM PST)
BBC
CBC, Northern Quebec
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Moscow
Radio Romania Int'l
Radio Sofia
Radio Tanzania
Radio Thailand
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Turkey
WRNO [F]
WWCR [T-A]
ZNBC Radio 2, Lusaka
0405
Radio Pyongyang
0410
Radio Beijing*
0425
Radiotelevisione Italiana
0430
BBC (Africa)* [M-A]
Christian Science Monitor (Africa, Asia) [M]
Christian Science Monitor [T-F]
Radio Bahrain
Radio Botswana
Radio Havana Cuba [T-S]
0450
Channel Africa, Johannesburg
0455
WYFR (Network) [T-A]

0500 UTC
(12:00 AM EST, 9:00 PM PST)
BBC ("Newshour")
CBC, Northern Quebec [T-S]
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
HCJB
Kol Israel
Radio Australia
Radio Bahrain
Radio Beijing
Radio Japan
Radio Lesotho
Radio Moscow
Radio New Zealand Int'l [A-S]
Radio Thailand
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
ZNBC Radio, Lusaka
0510
Radio Beijing*
Radio Botswana
0520
Radio For Peace Int'l [T-A]
0530
Christian Science Monitor (Africa, Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Moscow (World Service)
Radio Romania Int'l
Radio Thailand
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
0545
Voice of Nigeria*

0600 UTC
(1:00 AM EST, 10:00 PM PST)
BBC
CBC, Northern Quebec
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra*
Radio Australia
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M-F]
SBC Radio 1, Singapore

newsline

Swiss Radio Int'l
Voice of America
Voice of Malaysia
WWCR
ZNBC Radio, Lusaka [M-A]
0605
Radio Pyongyang
0609
BBC*
0615
Radio Canada Int'l [M-F]
0620
Radio Finland [T-A]
0630
BBC (Africa)*
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Romania Int'l
RTV Congolaise, Brazzaville [M-F]
Voice of Nigeria
0645
Radio Romania Int'l
Voice of Nigeria*
0655
Radio Korea [M-F]

0700 UTC
(2:00 AM EST, 11:00 PM PST)
BBC
Christian Science Monitor
ELBC, Liberia
GBC Radio, Accra
MBC, Blantyre [M-A]
Radio Australia
Radio Czechoslovakia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S-F]
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Free China
Voice of Myanmar
WWCR [M-A]
0703
Croatian Radio, Zagreb [M-A]
0705
Radio Pyongyang
0715
Radio Havana Cuba* [T-S]
0730
All India Radio (News Service)
BBC (Africa)* [M-A]
BRT, Brussels
Christian Science Monitor [M-F]
HCJB
Radio Czechoslovakia
Radio Ghana
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Netherlands
0745
Radio Finland [T-A]
0750
Radio For Peace Int'l [T-A]
0755
Radio Japan [M-F]

0800 UTC
(3:00 AM EST, 12:00 AM PST)
BBC
Christian Science Monitor
GBC Radio 1, Accra [S]
GBC Radio 2, Accra
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Pakistan
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Indonesia
Voice of Malaysia
ZNBC Radio 2, Lusaka [M-A]
0803
Croatian Radio, Zagreb [S]
0805
Radio Pyongyang
0830
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Moscow (World Service)
Radio Netherlands
0840
Voice of Greece [M-A]
0850
All India Radio (News Service) (Special English)
0855
Radio Korea [M-F]
Voice of Indonesia

0900 UTC
(4:00 AM EST, 1:00 AM PST)
BBC
Christian Science Monitor
Deutsche Welle
ELBC, Liberia
GBC Radio 1, Accra [M-F]
GBC Radio 2, Accra
MBC, Blantyre M-A]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Finland [T-A]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of Nigeria
0903
Croatian Radio, Zagreb [M-A]
0910
Radio Beijing*
0915
Radio Korea (News Service)
0930
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle (Africa)* [M-F]
Radio Afghanistan
Radio Finland [T-A]
Radio Moscow
Radio Netherlands
0940
Radio Togo
0950
Radio Pacific Ocean [A]
0955
Radio Japan [M-F]

1000 UTC
(5:00 AM EST, 2:00 AM PST)
All India Radio
BBC
BRT, Brussels [M-A]
Channel Africa, Johannesburg
Christian Science Monitor
GBC Radio 2, Accra [A]
HCJB
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
ZNBC Radio 2, Lusaka [M-A]
1003
Croatian Radio, Zagreb [S]
1010
Radio Beijing*
1030
Christian Science Monitor [M-F]
MBC, Blantyre [M-F]
Radio Austria Int'l [M-F]
Radio Korea
Radio Moscow
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
1040
Voice of Greece [M-A]
1055
All India Radio

1100 UTC
(6:00 AM EST, 3:00 AM PST)
BBC
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra [A-S]
Kol Israel
MBC, Blantyre [A-S]
Radio Australia
Radio Bahrain
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Pakistan
SBC Radio 1, Singapore
Swiss Radio Int'l
TWR, Bonaire [M-F]
Voice of America
WYFR (Network) [M-F]
ZNBC Radio, Lusaka
1105
Radio Pakistan (Special English)
Radio Pyongyang
1110
Radio Belize [T-A]
Radio Botswana [M-F]
1115
Radio Korea (News Service)
Radio Nepal
1125
Radio Belize [M]
Radio Botswana [A-S]
1130
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Czechoslovakia
Radio Lesotho
Radio Moscow
Radio Netherlands
Radio Thailand
RTM, Malaysia*
1135
All India Radio (News Service)
1150
Channel Africa, Johannesburg
1155
Radio Japan [M-F]
Radio Korea [M-F]

1200 UTC
(7:00 AM EST, 4:00 AM PST)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Jordan
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [S-F]
Radio Sofia
Radio Tashkent
Radio Thailand
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Voice of America
WWCR [M-F]
1210
Radio Beijing*
1215
HCJB [M-F]
Radio Korea
1225
Radio Finland [T-F]
WYFR (Network) [M-F]
1230
All India Radio (News Service)
BRT, Brussels [S]
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Cairo
Radio France Int'l
Radio Moscow
Radio Netherlands
Radio Yugoslavia
SLBC, Sri Lanka
TWR, Bonaire [A-S]
1235
Voice of Greece
1245
SLBC, Sri Lanka
1255
WYFR (Network) [M-F]
1257
HCJB [M-F]
1258
Africa Number One, Libreville

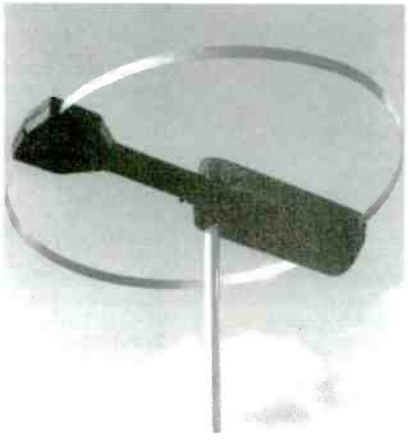
1300 UTC
(8:00 AM EST, 5:00 AM PST)
BBC ("Newshour")
CBC, Northern Quebec [A-S]
Christian Science Monitor
GBC Radio, Accra
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize
Radio Canada Int'l [M-F]
Radio Moscow
Radio Romania Int'l
Radio Tanzania [A-S]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
WWCR [M-F]
1303
Croatian Radio, Zagreb
1305
Radio Pyongyang
1310
Radio Beijing*
Radio Korea [M-F]
1320
Radio For Peace Int'l [T-A]
SLBC, Sri Lanka
1325
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l [M-F]
Radio Canada Int'l (Asia)
Radio Finland [T-F]
Radio Moscow
Radio Netherlands
Radio Tashkent
RTM, Malaysia
UAE Radio, Dubai
Voice of America (Spec English)
Voice of Turkey
1346
All India Radio [A]
1355
WYFR (Network) [M-F]

1400 UTC
(9:00 AM EST, 6:00 AM PST)
BBC
BRT, Brussels [M-A]
CBC, Northern Quebec
Christian Science Monitor
ELBC, Liberia
GBC Radio, Accra
Kol Israel [S-H]
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l [S]
Radio Finland [A]
Radio France Int'l
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow
RTM, Malaysia*
SBC Radio 1, Singapore
Voice of America
ZNBC Radio 2, Lusaka [M-F]
1410
Radio Beijing*
1415
Radio Korea (News Service)
Radio Nepal
1425
HCJB [M-F]
1430
All India Radio (News Service)
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Finland [T-F]
Radio Moscow
Radio Netherlands
Radio Romania Int'l
1445
BBC (East Asia) (Spec Eng) [M-F]
Voice of Myanmar
1455
All India Radio
Radio Korea [M-F]

1500 UTC
(10:00 AM EST, 7:00 AM PST)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle

STEP UP YOUR SHORTWAVE SET UP.

ISOLOOP 10-30 HF PORTABLE ANTENNA.
This is the one that gives you freedom of speech, whether you have to deal with restrictive covenants at home or in your apartment or condo, or if you are traveling in your boat, car, or RV. It features 150 watts, continuous coverage from 10 to 30 MHz, narrow bandwidth to suppress out-of-band signals. The IsoLoop antenna comes fully assembled with no mechanical joints. There is simply no better value in antennas!



PK-232MBX DIGITAL MULTI-MODE CONTROLLER.
It can receive eight different types of data signals, including Morse code, Baudot, ASCII, Time Division Multiplex (TDM), WEFAX, NAVTEX, Packet and AMTOR. Also featured is SIAM which automatically identifies many types of digital signals, excellent software support for PC compatibles, Macintosh and Commodore 64 & 128 computers. This unit is essential for the serious digital listener.

AEA-FAX.
Here's the superior way to decode multi-level gray fax images received by your general coverage receiver. Featured is AEA's exclusive on-screen tuning scope that allows you to simultaneously tune and receive. There is also Autolist for unattended image capture and save-to-disk, "daisy-chain" external RS-232 input allowing AEA-FAX to share a COM port with PK-232 MBX, up to 16 gray levels (VGA), support for EGA, CGA and Hercules formats. AEA-FAX prints to HP LaserJet or Epson compatible printers and includes hardware demodulator, 3 1/2" and 5 1/4" software disks plus a comprehensive instruction manual. AEA-FAX is a must for your set-up!

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AEA
Connect with us

Advanced Electronic Applications, Inc.
PO Box C2160, 2006 - 196th St. SW, Lynnwood, WA 98036 Sales: (206) 774-5554

newsline

GBC Radio 2, Accra
National Unity Radio, Omdurman
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-A]
Radio Canada Int'l [S]
Radio Japan
Radio Moscow
Radio Portugal [M-F]
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
Voice of Ethiopia
WWCR [M-F]

1505
Radio Finland [T-A]
Radio Pyongyang

1510
Radio Beijing*

1515
Radio Canada Int'l (Europe)

1525
Radio Veritas Asia [T-F]

1530
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Moscow
Radio Netherlands
Radio Tirana
Voice of Ethiopia
Voice of Greece [M-A]
Voice of Nigeria

1540
Radio Veritas Asia [A-M]
Voice of Nigeria*

1545
Radio Korea (News Service)

1550
Radio For Peace Int'l [T-A]

1600 UTC
(11:00 AM EST, 8:00 AM PST)
BBC
CBC, Northern Quebec [A-S]
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
ELBC, Liberia
GBC Radio 2, Accra
MBC, Blantyre
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l [S]
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Moscow
Radio Pakistan
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
Yemen Radio
ZNBC Radio 2, Lusaka [M-A]

1609
BBC*

1610
Radio Beijing*
Radio Botswana [M-F]

1615
Radio Pakistan (Special English)

1620
Radio Tallinn [M-F]

1630
Christian Science Monitor [M-F]
HCJB [M-F]
Radio Austria Int'l [M-F]
Radio Canada Int'l
Radio Moscow
UAE Radio, Dubai
Voice of America (Europe) (Spec Eng)

1655
Radio Korea [M-F]

1700 UTC
(12:00 PM EST, 9:00 AM PST)
BBC
CBC, Northern Quebec [A]
Channel Africa, Johannesburg
Christian Science Monitor
GBC Radio 2, Accra
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Jordan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Pakistan
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America

1705
Radio Pyongyang

1710
Radio Beijing*

1715
Radio Korea (News Service)

1725
Radio Surinam Int'l [M-F]

1730
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Moscow
Radio Netherlands
Radio Romania Int'l

1740
BBC (Africa)*

1750
Channel Africa, Johannesburg

1800 UTC
(1:00 PM EST, 10:00 AM PST)
All India Radio
BBC
CBC, Northern Quebec [A]
Christian Science Monitor
GBC Radio, Accra
Kol Israel
KVOH
MBC, Blantyre
Polish Radio, Warsaw
Radio Afghanistan
Radio Australia
Radio Bahrain
Radio Belize [M-F]
Radio Canada Int'l
Radio Czechoslovakia
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [S-F]
Radio Tanzania
Voice of America
ZNBC Radio, Lusaka

1805
Radio New Zealand Int'l* [M-F]

1815
ZNBC Radio 2, Lusaka*

1830
BSKSA, Riyadh
Christian Science Monitor [M-F]
Radio Belize
Radio Kuwait
Radio Mogadishu
Radio Moscow
Radio Netherlands
Radio Sofia
Voice of America (Spec English)

1840
Voice of Greece

1845
BSKSA, Riyadh*
Radio Cote d' Ivoire
Radio Guinea, Conakry

1855
BBC (Africa)* [M-F]

1900 UTC
(2:00 PM EST, 11:00 AM PST)
All India Radio
BBC
BRT, Brussels
CBC, Northern Quebec [M-H]
Christian Science Monitor [M-A]
Deutsche Welle
ELBC, Liberia
GBC Radio 2, Accra*
HCJB
KVOH
Radio Australia
Radio Beijing
Radio Canada Int'l [M-F]
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Romania Int'l
RAE, Buenos Aires [M-F]
SLBS, Freetown
Spanish National Radio
Voice of America

1910
Radio Beijing*
Radio Botswana

1920
Voice of Greece

1930
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l
Radio Czechoslovakia
Radio Finland [M-F]
Radio Ghana
Radio Moscow
Radio Netherlands
Radio Yugoslavia
Voice of Nigeria

1935
Radiotelevisione Italiana

1945
Radio Togo

1955
BBC (Africa)* [M-F]
Radio Finland
Radio Korea [M-F]

2000 UTC
(3:00 PM EST, 12:00 PM PST)
BBC
Christian Science Monitor
GBC Radio, Accra
Kol Israel
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Iraq Int'l
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Indonesia
Voice of Nigeria
ZNBC Radio 2, Lusaka

2005
Radio Pyongyang

2010
Radio Beijing*
Radio New Zealand Int'l* [S-H]

2025
Radio Havana Cuba* [M-A]
Radiotelevisione Italiana

2030
Christian Science Monitor [M-F]
Polish Radio, Warsaw
Radio Havana Cuba [M-A]
Radio Moscow
Radio Nacional de Angola

2045
BSKSA, Riyadh
Radio Korea (News Service)
Radio Sofia

2055
Voice of Indonesia

2100 UTC
(4:00 PM EST, 1:00 PM PST)
All India Radio
BBC ("Newshour")
CBC, Northern Quebec [S-F]
Christian Science Monitor [M-A]
Deutsche Welle
ELBC, Liberia
GBC Radio 2, Accra*
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Czechoslovakia
Radio Japan
Radio Moscow
Radio New Zealand Int'l [A-H]
Radio Romania Int'l
SLBS, Freetown
Spanish National Radio
Voice of America
Voice of Turkey
ZNBC Radio 2, Lusaka

2110
Radio Beijing*
Radio New Zealand Int'l* [S-H]

2120
Radio For Peace Int'l [M-F]

2130
Christian Science Monitor [M-F]
Radio Cairo
Radio Moscow

2145
Radio Korea

2200 UTC
(5:00 PM EST, 2:00 PM PST)
All India Radio
BBC
BRT, Brussels
CBC, Northern Quebec [S-F]
Christian Science Monitor
CIQX, Montreal [M-F]
GBC Radio 2, Accra
MBC, Blantyre
Radio Australia
Radio Beijing
Radio Budapest
Radio Canada Int'l
Radio Czechoslovakia
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l [A-H]
Radio Tirana
Radio Ukraine Int'l
Radio Yugoslavia
Radiotelevisione Italiana
SBC Radio 1, Singapore
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Free China

2203
Croatian Radio, Zagreb

2209
BBC*

2210
Radio Beijing*

2225
Radio Havana Cuba* [M-A]

2230
Christian Science Monitor [M-F]
Kol Israel
Radio Finland [M-F]
Radio Havana Cuba [M-A]
Radio Moscow
Radio Vilnius
Voice of America (Spec English)

2240
Radio Korea [M-F]

2245
GBC Radio, Accra
Radio Sofia
Radio Yerevan
Voice of Greece

2300 UTC
(6:00 PM EST, 3:00 PM PST)
All India Radio
BBC
CBC, Northern Quebec [M-F]
Christian Science Monitor [M-A]
ELBC, Liberia
Radio Australia
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Moscow
Radio New Zealand Int'l
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
Voice of Turkey

2305
Radio Pyongyang

2330
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Moscow
Radio Nacional, Bogota [A]
Radio Netherlands
Radio New Zealand Int'l [S-H]
RTM, Malaysia*

2340
Radio Yerevan

2345
SLBC, Sri Lanka [M]

2350
Radio For Peace Int'l [M-F]

2355
Radio Japan [M-F]

"Overall, the Drake R8 is simply the best radio we have ever tested for quality listening to programs... There's nothing else quite like it."

Lawrence Magne
Monitoring Times

"The best of the best for high-quality listening to news, music and entertainment from afar. Superb for reception of faint, tough signals."

Editor's Choice
Passport to World Band Radio
Tabletop Receivers for 1992

"The R8 is a like a breath of fresh air, with its ground-up engineering and up-to-date digital control from the front panel... a quality HF receiver of American manufacture that should successfully compete on the world market."

Bill Clarke
73 Amateur Radio Today

WHAT IN THE WORLD ARE YOU LISTENING TO?

The world is an ever-changing place, but there is one thing you can rely on to remain the same...the Drake reputation for American-crafted, quality communications products and unsurpassed customer service. Now, the Drake R8 Worldband Communications Receiver has been heralded by the experts as "the best of the best," delivering "unparalleled all-around listening performance" that is "right up there with the best for DXing."

So if you want to keep up with a changing world, and you're not listening to a Drake R8, we'd like to suggest you make a change. Call **1-800-568-3795** today for more information about the R8, to find the dealer nearest you, or to order an R8 direct from the factory with a free 15-day trial period. If you're not impressed by Drake's quality, performance and ease of operation, all in a receiver costing less than $1,000.00, return the R8 Receiver within 15 days, and we'll refund your money in full, less our original shipping charge.

The world is a big place. If you want to hear it all, listen to a Drake R8. If you're missing it, what in the world are you listening to?

R.L. Drake Company
P.O. Box 3006
Miamisburg, OH 45343
U.S.A.

DRAKE
In touch with the world.

Many Radio Amateurs and SWL's are puzzled. Just what are all those strange signals you can hear but not identify on the ShortWave Bands? A few of them such as CW, RTTY, Packet and Amtor you'll know — but what about the many other signals?

Hoka Electronics have the answer! There are some well known CW/RTTY decoders with limited facilities and high prices, complete with expensive PROMS for upgrading etc., but then there is CODE3 from Hoka Electronics! It's up to you to make the choice - but it will be easy once you know more about Code3. Code3 works on any IBM-compatible computer with MS-DOS 2.0 or later and having at least 640k of RAM. The Code3 hardware includes a digital FSK Convertor unit with built-in 115V ac power supply and RS232 cable, ready to use. You'll also get the best software ever made to decode all kinds of data transmissions. Code3 is the most sophisticated decoder available and the best news of all is that it only costs **$495!**

- Morse - Manual/Auto speed follow. On screen WPM indicator
- RTTY/Baudot/Murray/ITA2/CCITT2 plus all bit inversions
- Sitor - CCIR 625/476-4, ARQ, SBRS/CBRS FEC, NAVTEX etc
- AX25 Packet with selective callsign monitoring, 300 Baud
- Fascimile, all RPM/IOC (up to 16 shades at 1024x768 pixels)
- Autospec - Mk's I and II with all known interleaves
- DUP-ARQ Artrac - 125 Baud Simplex ARQ
- Twinplex - 100 Baud F7BC Simplex ARQ
- ASCII - CCITT 5, variable character lengths/parity
- ARQ6-90/98 - 200 Baud Simplex ARQ
- SI-ARQ/ARQ-S - ARQ1000 simplex
- SWED-ARQ/ARQ-SWE - CCIR 518 variant
- ARQ-E/ARQ1000 Duplex
- ARQ-N - ARQ1000 Duplex variant
- ARQ-E3 - CCIR 519 variant
- POL-ARQ - 100 baud Duplex ARQ
- TDM242/ARQ-242 - CCIR 242 with 1/2/4 channels
- TDM342/ARQ-M2/4 - CCIR 342-2 with 1/2/4 channels
- FEC-A - FEC100A/FEC101
- FEC-S - FEC1000 Simplex
- Sports Info. - 300 Baud ASCII F7BC
- Hellscreiber - Synch./Asynch
- Sitor RAW - (Normal Sitor but without synchronisation)
- ARQ6-70
- Baudot F7BBN
- Pactor - coming soon!

All the above modes are preset with the most commonly seen baudrate setting and number of channels which can be easily changed at will whilst decoding. Multi-channel systems display ALL channels on screen ***at the same time.*** Split screen with one window continually displaying channel control signal status e.g. idle Alphas/Beta/RQ's etc., along with all system parameter settings e.g. Unshift on space, ***Shift on Space,*** multiple carriage returns inhibit, auto receiver drift compensation, printer on, system sub-mode. Any transmitted error correction information is used to minimise received errors. All modes, by default, react correctly to third shift signals (e.g. Cyrillic) to generate ungarbled text unlike some other decoders which get 'stuck' in figures mode! Facility to show control characters in any mode. Save ALL channels to disk at the same time ***(Option 3 only)***.

Six Options are currently available extra to the above standard specification as follows: 1) Oscilloscope. Displays frequency against time. Split screen storage/real time. Great for tuning and analysis. $45. 2) Piccolo Mk 6. British military multi-tone system that we were the first to decode! $75. 3) Ascii storage. Save to disc any decoded ascii text for later processing. $50. 4) Coquelet Mk1 & 2 - two French, 13 and 8, tone systems, only on offer from Hoka! $75. 5) 4 Special ARQ and FEC systems i.e. TORG-10/11, ROU-FEC/RUM-FEC, HC-ARQ (ICRC) and HNG-FEC. $95. 6) Auto-classify, why not let the PC tell YOU what the keying system is?! Automatic recognition of over 30 systems - only $75.

NOW AVAILABLE FROM US DEALERS!

Call or write (2 IRC's) for our comprehensive information pack - there is just not enough room here to tell you everything about Code3!
Professional users - please ask about our new CODE30 DSP unit now available! (Piccolo down to -12dB S/N!! (3kHz non-fading channel, Gaussian noise)).

HOKA ELEKTRONIK, Feiko Clockstraat, 31, 9665 Oude Pekela, Netherlands
Tel: +31 5978 12327, Fax: + 31 5978 12645

English language

shortwave guide

0000 UTC [7:00 PM EST/4:00 PM PST]

FREQUENCIES

0000-0025	Netherlands	6020na	6165na		
0000-0027	Czechoslovakia	7345na	9580na	11990na	
0000-0030	Australia	13605pa	15170va	15320va	15365pa
		17630as	17750as	17880as	
0000-0030	Canada, RCI Montreal	5960am	9755am	13670am	
0000-0030 a /var	Croatian Radio via WHRI	7315na			
0000-0030	Lithuania, Radio Vilnius	7150na	7440na	17605na	17690na
0000-0030 sm	Norway	9645am			
0000-0030	Swiss Radio Int'l	6135na	9650na	9885na	12035na
		17730na			
0000-0030	United Kingdom,BBC London	5965as	5975na	6005af	6175na
		6195as	7145as	7325na	9580as
		9590na	9915na	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15360pa	17830as		
0000-0050	Korea, North	11335na	13760na	15130na	
0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, CRI	9770na	11715na		
0000-0100	Cook Islands	11760pa			
0000-0100	Costa Rica, AWR	9725ca	11870ca		
0000-0100	Costa Rica, RFPI	7375na	7385na	13630na	15030na
0000-0100	Cuba, RHC Havana	6060am	9815am		
0000-0100	Guam, KSDA Guam	15610as			
0000-0100	India, All India Radio	9910as	11715as	11745as	15110as
		15135as	15145as	17830as	
0000-0100	Malaysia, RTM Radio 4	7295do			
0000-0100	New Zealand, RNZI	17770pa			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100	Russia, Radio Moscow	11780va	11850va	11970na	12050va
		15290va	15405va	15425va	15485va
		15560va	17560va	17570va	17655na
		17720na	17860va	17890va	21480na
		21490na	21505na	21690va	
0000-0100	Sierra Leone, SLBS	3316do			
0000-0100	Singapore, SBC1	5010do	5052do	11940do	
0000-0100	South Korea, Seoul	15575na			
0000-0100	Spanish National Radio	9530na			
0000-0100	Thailand	4830as	9655as	11905as	
0000-0100	USA, CSMonitor Boston	7395na	9850af	13760na	17555as
0000-0100 sa	USA, CSMonitor Boston	17865as			
0000-0100	USA, KTBN Salt Lake City	7510am			
0000-0100	USA, KVOH Los Angeles	17775am			
0000-0100	USA, VOA Washington	6130am	7405am	9455am	9775am
		11580am	11695am	15120am	15205am
		17820na			
0000-0100	USA, WHRI	7315na			
0000-0100	USA, WINB Red Lion, Penn.	15145eu			
0000-0100	USA, WJCR Upton, Kentucky		7465na	7490na	
0000-0100	USA, WRNO New Orleans	7355am			
0000-0100	USA, WWCR Nashville	7435na	13845na		
0000-0100	USA, WYFR Okeechobee, FL		5985am	6065na	
0030-0055	Belgium, R Vlaanderen	9930na	13655na		
0030-0055	Belgium, R Vlaanderen	9930na	13655sa		
0030-0100	Australia	15240pa	15320va	15365pa	17630as
		17715pa	17750as	17795pa	17880as
		21740pa	21775as		
0030-0100	Canada, RCI Montreal	5960am	9755am		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	21455am	
0030-0100	Iran, Islamic Republic	9022am	11790am	15260am	
0030-0100	Netherlands	6020na	6165na	9860as	11655as
		11835na			
0030-0100	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0030-0100	United Kingdom,BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na	11750sa	11955as	12095na
		15260sa	15360pa		
0030-0100	Yugoslavia	11870am			
0045-0100	South Korea World News	7275as			

SELECTED PROGRAMS

Sundays

0000 KSDA, Guam: Your Story Hour. Dramatized for children.
0000 Radio Canada Int'l: Inside Track. A sports feature magazine.
0011 Radio Moscow: News And Views. Russian views on news developments.
0030 KSDA, Guam: Voice Of Prophecy. H Richards' devotional.
0030 BBC: The Ken Bruce Show. Ken Bruce plays pop music, past and present.
0030 Radio Canada Int'l: Media File. The ethics, responsibilities, and performance of the media.
0031 Radio Moscow: Ads. Airtime for sale.

Mondays

0000 KSDA, Guam: Music Scrapbook. See S 2300.
0000 Radio Canada Int'l: Royal Canadian Air Farce. A humorous look at the land up north.
0011 Radio Moscow: News And Views. See S 0011.
0015 KSDA, Guam: Bible In Living Sound. See S 2315.
0030 KSDA, Guam: Greatest Story Ever Told. A Bible reading.
0030 BBC: In Praise Of God. Christian religious services and meditations.
0030 Radio Canada Int'l: Arts Canada or Innovation Canada. See S 0407.
0031 Radio Moscow: Folk Box. A program for lovers of folk music.
0045 KSDA, Guam: Voice Of Prophecy. See S 0030.

Tuesdays

0000 KSDA, Guam: Music Scrapbook. See S 2300.
0011 Radio Moscow: News And Views. See S 0011.
0015 KSDA, Guam: Bible in Living Sound. See S 2315.
0030 KSDA, Guam: Greatest Story Ever Told. See M 0030.
0030 BBC: Panel Game. A radio game show.
0030 Radio Canada Int'l: As It Happens. A detailed look at the people and events making news in Canada and abroad.
0031 Radio Moscow: Yours For The Asking. Music as requested by listeners.
0045 KSDA, Guam: Voice of Prophecy. See S 0030.

Wednesdays

0000 KSDA, Guam: Music Scrapbook. See S 2300.
0011 Radio Moscow: News And Views. See S 0011.
0015 KSDA, Guam: Bible in Living Sound. See S 2315.
0030 KSDA, Guam: Great Story Ever Told. See M 0030.
0030 BBC: Omnibus. Topical features on almost any topic, from Dracula to drugs.
0030 Radio Canada Int'l: As It Happens. See T 0030.
0031 Radio Moscow: Jazz Show. See M 0531.
0045 KSDA, Guam: Voice of Prophecy. See S 0030.

Thursdays

0000 KSDA, Guam: Music Scrapbook. See S 2300.
0011 Radio Moscow: News And Views. See S 0011.
0015 KSDA, Guam: Bible in Living Sound. See S 2315.
0030 KSDA, Guam: Greatest Story Ever Told. See M 0030.
0030 BBC: Comedy/Drama. See W 1530.
0030 Radio Canada Int'l: As It Happens. See T 0030.
0031 Radio Moscow: Music At Your Request. See M 1231.
0045 KSDA, Guam: Voice of Prophecy. See S 0030.

Fridays

0000 KSDA, Guam: Music Scrapbook. See S 2300.
0011 Radio Moscow: News And Views. See S 0011.
0015 KSDA, Guam: Bible in Living Sound. See S 2315.
0030 KSDA, Guam: Great Story Ever Told. See M 0030.
0030 BBC: Music Feature. Critics pick the best versions of classical compositions in "Best On Record" (1st).
0030 Radio Canada Int'l: As It Happens. See T 0030.
0031 Radio Moscow: Jazz Show. See M 0531.
0045 KSDA, Guam: Voice of Prophecy. See S 0030.

Saturdays

0000 KSDA, Guam: Your Story Hour. See S 0100.
0011 Radio Moscow: News And Views. See S 0011.
0030 KSDA, Guam: Power to Cope. See S 1630.
0030 BBC: From The Weeklies. A review of the British weekly press.
0030 Radio Canada Int'l: As It Happens. See T 0030.
0031 Radio Moscow: Folk Box. See M 0031.
0045 BBC: Recording Of The Week. See M 0615.

0100 UTC [8:00 PM EST/5:00 PM PST]

FREQUENCIES

0100-0115	India, All India Radio	9910as	11715as	11745as	15110as
		15135as	15145as	17830as	
0100-0120	Italy, RAI, Rome	9575am	11800am		
0100-0125	Netherlands	6020na	6165na	9660as	11655as
		11835na			
0100-0127	Czechoslovakia	5930na	7345na	9580na	
0100-0130 twhfa	Canada, RCI Montreal	5960am	9755am		
0100-0130	Iran, Islamic Republic	9022am	11790am	15260am	
0100-0130	Laos, National Radio of	7116as			
0100-0130 sm	Norway	9565am			
0100-0130	Sweden	9695as	11820as		
0100-0130	Uzbekhistan, R. Tashkent	5930as	5995as	7190as	7265as
0100-0150	Germany, Deutsche Welle	6040na	6055na	6085na	6145na
		9515na	9565na	9610na	9700na
		9770na	11865na		
0100-0159 sm	Canada, RCI Montreal	9535am	9755am	11845am	11940am
		13720am			
0100-0200 twhf	Argentina,RAE BuenosAires	11710am			
0100-0200	Australia	13605pa	15240pa	15320va	15365pa
		17630as	17715pa	17750as	17795pa
		17880as	21590as	2*740pa	21775as
0100-0200	Australia, ABC Brisbane	4920do	9660do		
0100-0200	Australia, ABC Perth	9610do			
0100-0200	Bulgaria, Sofia	9700na	11720na		
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Cook Islands	11760pa			
0100-0200	Costa Rica, RFPI	7385na	13630am	15030am	
0100-0200	Cuba, RHC Havana	6060am	9815na		
0100-0200	Ecuador, HCJB Quito	9745am	15155am	21455am	
0100-0200	Indonesia, Voice of	7125as	9675as	11752as	11785as
0100-0200	Japan NHK	5960na	11840me	15195as	17810as
		17835as	17845as		
0100-0200	Korea, Seoul	15575om			
0100-0200 smtwh	Malaysia, RTM Radio 4	7295do			
0100-0200	Namibia BC Corp, Windhoek	3290af			
0100-0200	New Zealand, RNZI	17770pa			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200	Russia, Radio Moscow	11970na	12050va	13775na	15290va
		15405va	15410va	15425va	15485va
		17560va	17560va	17570va	17655va
		17720na	17860va	17890va	21480na
		21490na	21505na	21690va	
0100-0200	Sierra Leone, SLBS	3316do			
0100-0200	Singapore, SBC1	5010do	5052do	11940do	
0100-0200	Spanish National Radio	9530na			
0100-0200	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0100-0200	Thailand	4830as	9655as	11905as	
0100-0200	Ukraine, Kiev	7195eu	7250eu	9640eu	10344eu
		11520eu	12060na	17605na	17690na
0100-0200	United Kingdom,BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na	11750sa	11955as	12095na
		15260sa	15280as	15360pa	17790va
		21715as			
0100-0200	USA, CSMonitor Boston	7395na	9850af	13760na	17555as
0100-0200 sa	USA, CSMonitor Boston	17865as			
0100-0200	USA, KTBN Salt Lake City	7510na			
0100-0200	USA, KVOH Los Angeles	17775am			
0100-0200	USA, VOA Washington	5995am	6130am	7405am	9455am
		9775am	11580am	15120am	15205am
		7115as	7205as	9740as	11705as
		15250as	17740as	21550as	
0100-0200	USA, WHRI Noblesville	7315am			
0100-0200	USA, WINB Red Lion, Penn.	15145na			
0100-0200	USA, WJCR Upton, Kentucky		7465na	7490na	
0100-0200	USA, WRNO New Orleans	7355na			
0100-0200	USA, WWCR Nashville	5935na	7435na		
0100-0200	USA, WYFR Okeechobee, FL		5985am	9505am	15440am
0130-0150 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
0130-0155	Finland, YLE	11755na	15185na		
0130-0200	Austria, ORF Vienna	9870sa	9875na	13730na	
0130-0200	Netherlands	9860as	11655as		
0130-0200	UAE Radio, Dubai	11795na	13695eu	15320eu	15435eu
0130-0200 WAR/var	Yugoslavia	11870na			
0145-0200	Vatican Radio	9650as	11935as		

SELECTED PROGRAMS

Sundays

0101 BBC: Play Of The Week. Hour-long productions.
0107 Radio Canada Int'l (Latin Am): Inside Track. See S 0000.
0107 Radio Canada Int'l (United States): Quirks And Quarks. Professor Jearl Walker brings science to the masses.
0109 Deutsche Welle: Commentary. Opinion on current issues.
0111 Radio Moscow: Moscow Mailbag. Joe Adamov, host.
0117 Deutsche Welle: Feature. "Mailbag," "Nickelodeon" (listener requests for German music), or "Technical Tips For DXers."
0130 Radio Canada Int'l (Latin America): Media File. See S 0030.
0130 Radio Canada Int'l (US): Inside Track. See S 0000.
0131 Radio Moscow: Audio Book Club. The best of Russian classics and contemporary Russian literature.
0134 Deutsche Welle: German By Radio. An advanced German language course for English speakers.

Mondays

0101 BBC: Feature/Drama. Topical programming.
0107 Radio Canada Int'l: Open House. See S 1337.
0109 Deutsche Welle: Commentary. See S 0109.
0111 Radio Moscow: Moscow Mailbag. See S 0111.
0116 Deutsche Welle: Living In Germany. Social scene.
0130 R Canada Int'l (Latin Am): Royal Canadian Air Farce. M 0000.
0130 Radio Canada Int'l (US): Open House. See S 1337.
0131 Radio Moscow: Russian By Radio. See S 1531.
0134 Deutsche Welle: Larry's Random Selection. Light side.
0145 BBC: Feature. Topical programming.

Tuesdays

0100 Radio Canada Int'l: As It Happens. See T 0030.
0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0111 Radio Moscow: Focus On Asia And The Pacific.
0130 BBC: Folk In Britain. Ian Anderson is the host, folk music.
0131 Radio Moscow: Music. See M 0631.
0145 BBC: Health Matters. Medical news/keeping fit.

Wednesdays

0100 Radio Canada Int'l: As It Happens. See T 0030.
0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0111 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
0130 BBC: Talks. Topical programming.

0131 Radio Moscow: Music. See M 0631.
0145 BBC: Country Style. David Allan profiles country music.

Thursdays

0100 Radio Canada Int'l: As It Happens. See T 0030.
0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0111 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
0130 BBC: Waveguide. See W 0415.
0131 Radio Moscow: Music. See M 0631.
0140 BBC: Book Choice. See W 0425.
0145 BBC: The Farming World. News of all things agricultural.

Fridays

0100 Radio Canada Int'l: As It Happens. See T 0030.
0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0111 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
0130 BBC: Seven Seas. Malcolm Billings, maritime news.
0131 Radio Moscow: Music. See M 0631.
0145 BBC: Global Concerns. An update on environmental issues.

Saturdays

0100 Radio Canada Int'l: As It Happens. See T 0030.
0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0111 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
0130 BBC: Short Story (except 2nd: Seeing Stars). See S 0430.
0131 Radio Moscow: Music. See M 0631.
0134 Deutsche Welle: Through German Eyes. See S 1513.
0145 BBC: Jazz Now And Then. George Reid, weekly mix.

English language

shortwave guide

0200 UTC [9:00 PM EST/6:00 PM PST]

FREQUENCIES

0200-0225	Netherlands	9860as	11655as		
0200-0230 mtwhfa	Kenya, Voice of	4935do			
0200-0230 sm	Norway	9565na			
0200-0230	Philippines, FEBC Manila	15450as			
0200-0230	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0200-0230	Sweden	9695na	11705na		
0200-0230	Swiss Radio Int'l	6135am	9650am	9885am	12035am
0200-0230	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		7135as	7325na	9410eu	9580as
		9590na	9670me	9915na	11750sa
		11955as	12095va	15260sa	15280as
		15360pa	15380as	17790as	21715as
0200-0230	USA, VOA Washington	5995am	7405am	9775am	11580am
		11695am	15120am	15205am	
0200-0250	Germany, Deutsche Welle	6035as	7285as	9615as	9690as
		11945as	12055as		
0200-0259 twhfa	Canada, RCI Montreal	9535sa	9755sa	11845sa	11940sa
		13720sa			
0200-0300	Australia	15240pa	15320va	15365pa	17630as
		17715pa	17750pa	17795pa	17880as
		21525as	21590as	21740pa	21775as
0200-0300	Australia, ABC Brisbane	4920do	9660do		
0200-0300	Australia, ABC Perth	6070do	9610do		
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6035eu	6125eu	7230eu	7260eu
		9650eu			
0200-0300	Cook Islands	11760pa			
0200-0300	Costa Rica, RFPI	7375na	7385na	13630na	15030na
0200-0300	Cuba, RHC Havana	6060na	9655na		
0200-0300	Ecuador, HCJB Quito	9745am	15155am	21455am	
0200-0300	Egypt, Radio Cairo	9475na	9675na		
0200-0300 as	Guam, KSDA Guam	13720as			
0200-0300	Hungary, Radio Budapest	6110na	9835na	11910na	
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0300	Namibia BC Corp, Windhoek	3290af			
0200-0300	New Zealand, RNZI	17770pa			
0200-0300	Romania, R.Romania Int'l	5990am	6155am	9510am	9570am
		11830am	11940am		
0200-0300	Russia, Radio Moscow	9470va	9530va	9685va	11710va
		11850va	12050va	15290va	15405va
		15410va	15425va	15560va	17560va
		17720na	17730va	17850va	17860va
		17890va	21490na	21505na	21690va
0200-0300	S. Africa, Channel Africa	11745af			
0200-0300	Sierra Leone, SLBS	3316do			
0200-0300	Singapore, SBC1	5010do	5052do	11940do	
0200-0300	Taiwan, V. of Free China,	5950na	9680na	9765pa	11740ca
		11860as	15345as		
0200-0300	Thailand	4830as	9655as	11905as	
0200-0300	USA, CSMonitor Boston	9350af	9455na	13760sa	
0200-0300 sa	USA, CSMonitor Boston	17555as	17865as		
0200-0300	USA, KTBN Salt Lake City	7510am			
0200-0300	USA, KVOH Los Angeles	17775am			
0200-0300	USA, VOA Washington	7205as	9740as	11705as	15120am
		15205am	15250as	17735as	17740as
		21550as			
0200-0300	USA, WHRI Noblesville	7315na			
0200-0300	USA, WINB Red Lion, Penn.	15145eu			
0200-0300	USA, WJCR Upton, Kentucky		7465na	7490na	
0200-0300 vl	USA, WRNO New Orleans	7355am			
0200-0300	USA, WWCR Nashville	5920na	7435am		
0200-0300	USA, WYFR Okeechobee, FL		5985am	9505am	15440am
0205-0238	Honduras, Voz Mosquitia	4911do			
0230-0245	Pakistan	9515as	15115as	17640as	21730as
0230-0300	Albania, Radio Tirana	9580na	11825na		
0230-0300 s	Kenya, Voice of	4935do			
0230-0300	Netherlands	9860as	11655as		
0230-0300	Phillipines, Manila	17760pa	17840pa	21580pa	
0230-0300 twhfa	Portugal	9570am	9600am	9705am	11840am
0230-0300	Sri Lanka B'casting Corp.	9720as	15425as		
0230-0300	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325na	9670me	9915na
		11750sa	11955me	12095va	15260sa
		15280as	15360pa	17790va	21715as
0245-0300	South Korea, Seoul	9640am	11805am	15575am	
0250-0300	Vatican Radio	7305na	9605na	11620na	
0255-0300	Bonaire, TWR Bonaire	11930am			

SELECTED PROGRAMS

Sundays

0200 KSDA, Guam: AWR Magazine. Stories about science, nature, discoveries, and health matters.
0209 Deutsche Welle: Commentary. See S 0109.
0211 Radio Moscow: Music And Musicians. Music from world-famous performers and composers.
0213 Deutsche Welle: Sports Report. The latest news from the world of sports.
0215 KSDA, Guam: DX Asiawaves. News from the world of shortwave radio.
0219 Deutsche Welle: Mailbag Asia. Musical requests and answers to listener questions.
0230 BBC: Feature. Topical programming.
0230 KSDA, Guam: Digging Up The Past. No details available.
0245 KSDA, Guam: Probe. A Bible study program.

Mondays

0209 Deutsche Welle: European Journal. A review of major events in Europe, with interviews and analyses.
0211 Radio Moscow: Music And Musicians. See S 0211.
0230 BBC: Composer Of The Month. Profiles of famous classical-music composers.
0234 Deutsche Welle: Science And Technology. New scientific and technological developments.

Tuesdays

0207 Radio Canada Int'l: As It Happens. See T 0030.
0209 Deutsche Welle: European Journal. See M 0209.
0211 Radio Moscow: Update. See M 2311.
0230 BBC: Quiz. See M 1215.
0231 Radio Moscow: Folk Box. See M 0031.
0234 Deutsche Welle: Man And Environment. A program on all topics relating to the environment in industrial and developing countries.

Wednesdays

0207 Radio Canada Int'l: As It Happens. See T 0030.
0209 Deutsche Welle: European Journal. See M 0209.
0211 Radio Moscow: Update. See M 2311.
0230 BBC: Development '93. Aid and development issues for developing nations.
0231 Radio Moscow: Music At Your Request. See M 1231.
0234 Deutsche Welle: Insight. See T 1534.

Thursdays

0207 Radio Canada Int'l: As It Happens. See T 0030.
0209 Deutsche Welle: European Journal. See M 0209.
0211 Radio Moscow: Update. See M 2311.
0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.
0231 Radio Moscow: Jazz Show. See M 0531.
0234 Deutsche Welle: Living In Germany. See M 0116.

Fridays

0207 Radio Canada Int'l: As It Happens. See T 0030.
0209 Deutsche Welle: European Journal. See M 0209.
0211 Radio Moscow: Update. See M 2311.
0230 BBC: Drama. See H 1130.
0231 Radio Moscow: Music At Your Request. See M 1231.
0234 Deutsche Welle: Spotlight On Sport. See W 1534.

Saturdays

0200 KSDA, Guam: Digging Up The Past. See S 0230.
0207 Radio Canada Int'l: As It Happens. See T 0030.
0209 Deutsche Welle: Commentary. See S 0109.
0211 Radio Moscow: Update. See M 2311.
0215 KSDA, Guam: Focus On Living. Life's problems and their solutions.
0223 Deutsche Welle: Panorama. A review of the major news events of the week.
0230 BBC: People And Politics. Background to the British political scene.
0230 KSDA, Guam: Power To Cope. See S 1630.
0231 Radio Moscow: Jazz Show. See M 0531.
0234 Deutsche Welle: Economic Notebook. See F 1534.

English language

shortwave guide

0300 UTC [10:00 PM EST/7:00 PM PST]

FREQUENCIES

0300-0315	Vatican Radio	7305na	9605na	11620na	
0300-0325	Netherlands	9860as	11655as		
0300-0330	Czechoslovakia	5930na	7345na	9540na	
0300-0330	Egypt, Radio Cairo	9475na	9675na		
0300-0330	Phillipines, Manila	17760pa	17840pa	21580pa	
0300-0330	United Kingdom,BBC London	3255af	5975na	6005va	6175na
		6180eu	6190af	6195eu	7135me
		7325na	9410eu	9600af	9670me
		9915na	11730af	11760me	11955me
		12095eu	15070af		
		11750sa	15260sa	15280pa	15310as
		21715va			
0300-0330	USA, VOA Washington	5965eu	11905me	15160me	17810eu
		17895me			
0300-0350	Germany, Deutsche Welle	6045na	6055na	6085na	6120na
		9535na	9545na	9640na	9705na
		9770na			
0300-0400	Australia	15240pa	15320va	15365pa	17630as
		17670as	17715pa	17750as	17795pa
		17880as	21525as	21590as	21740pa
		21775as			
0300-0400	Australia, ABC Brisbane	4920do	9660do		
0300-0400	Australia, ABC Perth	9610do			
0300-0400	Bonaire, TWR Bonaire	9535am	11930am		
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, CRI	9690na	9770na	11715na	
0300-0400	Cook Islands	11760pa			
0300-0400	Costa Rica, RFPI	7375na	7385na	13630na	15030na
0300-0400	Costa Rica, TIFC	5055ca			
0300-0400	Cuba, RHC Havana	6060na	9655am		
0300-0400	Ecuador, HCJB Quito	9745am	15155am	21455am	
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Honduras, HRPC Luz y Vida	3250ca			
0300-0400	Japan NHK	5960am	15230va	15325am	17810am
		17825am	21610am		
0300-0400	Kenya, Voice of	4935do			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0400	New Zealand, RNZI	17770pa			
0300-0400	Russia, Radio Moscow	9470va	9685va	11675va	11710va
		11850va	12030na	12050va	15405va
		15425va	17570va	17605va	17665va
		17730na	17735va	17850na	17860va
		17890va	21490na	21505na	21690va
0300-0400	S. Africa, Channel Africa	7270af			
0300-0400	Sierra Leone, SLBS	3316do			
0300-0400	Singapore, SBC1	5010do	5052do	11940do	
0300-0400	Sri Lanka B'casting Corp.	9720as	15425as		
0300-0400	Taiwan, V. of Free China,	5950na	9680na	9765as	11745as
		15345na			
0300-0400	Tanzania	5985af	9685af	11765af	
0300-0400	Thailand	4830as	9655as	11905as	
0300-0400	Turkey, Voice of	9445na			
0300-0400	USA, CSMonitor Boston	9350af	9455na	13760sa	
0300-0400 sa	USA, CSMonitor Boston	17555as	17865as		
0300-0400	USA, KTBN Salt Lake City	7510am			
0300-0400	USA, KVOH Los Angeles	9785sa			
0300-0400	USA, VOA Washington	6035af	7265af	7280af	7405af
		9575af	11835af	11940af	15115af
		17715af	21600af		
0300-0400	USA, WHRI Noblesville	7315na			
0300-0400	USA, WJCR Upton, Kentucky		7465na	7490na	
0300-0400 vl, irr	USA, WRNO New Orleans	7395am			
0300-0400	USA, WWCR Nashville	5920na	7435na		
0300-0400	USA, WYFR Okeechobee, FL		5985am	9505am	
0330-0400	Albania, Radio Tirana	9580na	11825na		
0330-0400	Austria, ORF Vienna	9870ca	13730am		
0330-0400	Japan NHK	11870na	17810na		
0330-0400	Netherlands	9590na	11720na		
0330-0400	UAE Radio, Dubai	11945na	13675na	15400na	15435na
0330-0400	United Kingdom,BBC London	3255af	5975na	6005af	6175va
		6180eu	6190af	6195eu	9410eu
		9600af	9915na	11740af	11760me
		11955me	12095eu	15280as	15310as
		15420af	17885af	21715as	
0340-0350 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
0345-0359 varies	Armenia, Radio Yerevan	11675na	11790na	13645am	15580na

SELECTED PROGRAMS

Sundays

0309 Deutsche Welle: Commentary. See S 0109.
0311 Radio Moscow: Moscow Mailbag. See S 0111.
0315 BBC: Sports Roundup. News from the world of sports.
0317 Deutsche Welle: Feature. See S 0117.
0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
0331 Radio Moscow: Your Top Tune. A quiz show featuring popular music.
0334 Deutsche Welle: German By Radio. See S 0134.
0350 BBC: Write On+ Listener letters, opinions, and questions.

Mondays

0309 Deutsche Welle: Commentary. See S 0109.
0311 Radio Moscow: Moscow Mailbag. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0316 Deutsche Welle: Living In Germany. See M 0116.
0330 BBC: Anything Goes. See S 1430.
0331 Radio Moscow: Ads. See S 0031.
0334 Deutsche Welle: Larry's Random Selection. See M 0134.

Tuesdays

0309 Deutsche Welle: European Journal. See M 0209.
0311 Radio Moscow: Newmarket. A look at commercial products and opportunities in Russia.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0331 Radio Moscow: Audio Book Club. See S 0131.
0334 Deutsche Welle: Economic Notebook. A look at the economic scene in Germany and around the world.

Wednesdays

0309 Deutsche Welle: European Journal. See M 0209.
0311 Radio Moscow: Science And Engineering. See S 0611.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Discovery. An in-depth look at scientific research.
0331 Radio Moscow: Russian By Radio. See S 1531.
0334 Deutsche Welle: Insight. See T 1534.

Thursdays

0309 Deutsche Welle: European Journal. See M 0209.
0311 Radio Moscow: Moscow Mailbag. See S 0111.
0315 BBC: Sports Roundup. See 0315.
0330 BBC: Assignment. A weekly examination of topical issues, from Batman to bandits.
0331 Radio Moscow: Audio Book Club. See S 0131.
0334 Deutsche Welle: German By Radio. See S 0134.

Fridays

0309 Deutsche Welle: European Journal. See M 0209.
0311 Radio Moscow: Moscow Mailbag. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Focus On Faith. Comment and discussion on major issues in various religions.
0331 Radio Moscow: Russian By Radio. See S 1531.
0334 Deutsche Welle: Science And Technology. See M 0234.

Saturdays

0309 Deutsche Welle: European Journal. See M 0209.
0311 Radio Moscow: Moscow Mailbag. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: The Vintage Chart Show. Paul Burnett with classic Top 20 hits.
0331 Radio Moscow: Audio Book Club. See S 0131.
0334 Deutsche Welle: Through German Eyes. See S 1513.

English language

shortwave guide

0400 UTC [11:00 PM EST/8:00 PM PST]

FREQUENCIES

0400-0425	Netherlands	9590na	11720na		
0400-0427	Czechoslovakia	5930na	7345na	9540na	
0400-0430	Bonaire, TWR Bonaire	9535am	11930am		
0400-0430	Canada, RCI Montreal	9650eu	11905eu	15275me	15445me
0400-0430 varies	Croatian Radio via WHRI	7315na	9495na		
0400-0430	Cuba, RHC Havana	6060na	6180am	9655na	
0400-0430	Ecuador, HCJB Quito	9745am	15155am	21455am	
0400-0430	Guatemala, Radio Cultural	3300do			
0400-0430 sm	Norway	9560na	9650na		
0400-0430	Romania, R.Romania Int'l	5990am	6155am	9510am	9570am
		11830am	11940am		
0400-0430	Sri Lanka B'casting Corp.	9720as	15425as		
0400-0430	Swiss Radio Int'l	6135am	9885am	12035am	13635me
0400-0430	Tanzania	5985af	9685af	11765af	
0400-0430	Thailand	4830as	9655as	11905as	
0400-0430	United Kingdom,BBC London	3255af	3955eu	5975na	6180eu
		6190af	6195eu	7105af	7230eu
		7325na	9410eu	9600af	9610af
		9915na	11760me	15070va	15280as
		15310as	15420af	15590eu	17885af
		6005af	6175am	11750va	11955me
		12095va	21715as		
0400-0450	Germany, Deutsche Welle	6065af	6130af	7150af	7225af
		7275af	9565af	9665af	9765af
		11765af	13770af		
0400-0450	North Korea	15180as	15230as	17765as	
0400-0500	Australia	15240pa	15365pa	17630as	17715pa
		17750as	17795pa	17880as	21525as
		21740pa	21775as		
0400-0500	Australia, ABC Brisbane	4920do	9660do		
0400-0500	Australia, ABC Perth	9610do			
0400-0500	Bulgaria, Sofia	9700na	11720na		
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0500	China, CRI	11680na	11840na		
0400-0500	Cook Islands	11760pa			
0400-0500	Costa Rica, RFPI	7375na	7385na	13630na	15030om
0400-0500	Kenya, Voice of	4935do			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0500 mtwhf	Namibia BC Corp, Windhoek	3270af	3290af		
0400-0500	New Zealand, RNZI	17770pa			
0400-0500	Russia, Radio Moscow	9905na	11675va	12015na	12030na
		12040va	13645na	13665va	15210va
		15320va	15405va	15425va	15470va
		15550va	17570va	17605na	17860va
		17870va	17890va	21690va	21775va
0400-0500	S. Africa, Channel Africa	7270af	15430af		
0400-0500	Sierra Leone, SLBS	3316do			
0400-0500	Singapore, SBC1	5010do	5052do	11940do	
0400-0500 vl	South Africa,Radio Oranje	3215do			
0400-0500	USA, CSMonitor Boston	9455am	9840af	9870na	13760na
		17780as			
0400-0500 sa	USA, CSMonitor Boston	17555as			
0400-0500	USA, KTBN Salt Lake City	7510am			
0400-0500	USA, KVOH Los Angeles	9785am			
0400-0500	USA, VOA Washington	5995me	6040me	6140me	7170me
		7265af	7280af	7405af	9575af
		9885af	11835af	11850af	15115af
0400-0500	USA, WHRI Noblesville	7315na	9495sa		
0400-0500	USA, WJCR Upton, Kentucky		7465na	7490na	
0400-0500 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0400-0500	USA, WRNO New Orleans	7395am			
0400-0500	USA, WWCR Nashville	5920na	7435na		
0400-0500	USA, WYFR Okeechobee, FL		5985am	9505am	
0415-0440	Italy, RAI, Rome	7275me	9575me		
0430-0500	Cuba, RHC Havana	6060na	6180na		
0430-0500	Nigeria	3326do	4770do		
0430-0500	Swaziland, TWR Swaziland	5055af	5965af	7215af	9655af
		11750af			
0430-0500	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	7230eu
		9410eu	9600af	11760me	12095va
		15070va	15280as	15310as	15400af
		15420af	15590eu	21470af	21715as
0430-0500	USA, VOA Washington	5995me	6040me	6140me	7170me
		7200me	7265me	9715me	11815me
0445-0500 t	Sri Lanka B'Casting Svc	9720am	15425am		
0455-0500	Nigeria, Voice of	7255af			

SELECTED PROGRAMS

Sundays

0407 Radio Canada Int'l: Arts Canada or Innovation Canada. A look at the arts scene, or new ideas and technology
0409 Deutsche Welle: Commentary. See S 0109.
0411 Radio Moscow (North America): Moscow Mailbag. S 0111.
0411 Radio Moscow (World Service): News And Views. S 0011.
0413 Deutsche Welle: Sports Report. See S 0213.
0415 BBC: Feature. Topical programming.
0419 Deutsche Welle: International Talking Point. Round-table.
0430 BBC: Short Story. Dramas written by BBC listeners (except 3rd: Seeing Stars, a monthly look at astronomy).
0431 Radio Moscow (North America): Topical feature.
0431 Radio Moscow (World Service): Radio Oumu Shinri-Kyo. A Japanese evangelical program relayed by Radio Moscow transmitters.
0434 Deutsche Welle: People And Places. Stories, music.
0445 BBC: Talks. Lost a copy of your favorite record? Write to Mike Read and he'll "Replace A Disc" (3rd, 10th).

Mondays

0407 Radio Canada Int'l: Inside Track. See S 0000
0409 Deutsche Welle: European Journal. See M 0209.
0411 Radio Moscow (North America): Moscow Mailbag. S 0111.
0411 Radio Moscow (World Service): News And Views. S 0011.
0415 BBC: Talks. Film-making is subject of "On Screen" (4th).
0430 BBC: Off The Shelf. Serialized readings from famous books.
0431 Radio Moscow (North America): Ads. See S 0031
0431 Radio Moscow (World Service): Radio Oumu Shinri-Kyo See S 0431
0434 Deutsche Welle: Africa In The German Press
0445 BBC: Andy Kershaw's World Of Music. Exotic world music.

Tuesdays

0407 Radio Canada Int'l: Spectrum. See M 1337.
0409 Deutsche Welle: Africa Report. Reports and background.
0411 Radio Moscow (North America): Update. See M 2311.
0411 Radio Moscow (World Service): News And Views. S 0011.
0415 BBC: Health Matters. See T 0145.
0430 BBC: Off The Shelf. See M 0430.
0431 Radio Moscow (North America): Music. See M 0631.
0431 Radio Moscow (World Service): Radio Oumu Shinri-Kyo. See S 0431.
0434 Deutsche Welle: European Journal. See M 0209.
0445 BBC: Talks. See M 2315.

Wednesdays

0407 Radio Canada Int'l: Spectrum. See M 1337.
0409 Deutsche Welle: Africa Report. See T 0409.
0411 Radio Moscow (North America): Update. See M 2311.
0411 Radio Moscow (World Service): News And Views. S 0011.
0415 BBC: Waveguide. Tips on how to hear the BBC better.
0425 BBC: Book Choice. A short review of a recently released book.
0430 BBC: Off The Shelf. See M 0430.
0431 Radio Moscow (North America): Jazz Show. See M 0531.
0431 Radio Moscow (World Service): Radio Oumu Shinri-Kyo See S 0431.
0434 Deutsche Welle: European Journal. See M 0209.
0445 BBC: Country Style. See W 0145.

Thursdays

0407 Radio Canada Int'l: Spectrum. See M 1337.
0409 Deutsche Welle: Africa Report. See T 0409.
0411 Radio Moscow (North America): Update. See M 2311.
0411 Radio Moscow (World Service): News And Views. S 0011.
0415 BBC: The Farming World. See H 0145.
0430 BBC: Off The Shelf. See M 0430.
0431 Radio Moscow (na): Yours For The Asking. T 0031.
0431 Radio Moscow (World Service): Radio Oumu Shinri-Kyo. See S 0431.
0434 Deutsche Welle: European Journal. See M 0209.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

0407 Radio Canada Int'l: Spectrum. See M 1337.
0409 Deutsche Welle: Africa Report. See T 0409.
0411 Radio Moscow (North America): Update. See M 2311.
0411 Radio Moscow (World Service): News And Views. S 0011.
0415 BBC: Feature. See M 0145.
0430 BBC: Off The Shelf. See M 0430.
0431 Radio Moscow (North America): Audio Book Club. S 0131.
0431 Radio Moscow (World Service): Radio Oumu Shinri-Kyo. See S 0431.
0434 Deutsche Welle: European Journal. See M 0209.
0445 BBC: Folk In Britain. See T 0130.

Saturdays

0407 Radio Canada Int'l: Spectrum. See M 1337
0409 Deutsche Welle: Commentary. See S 0109
0411 Radio Moscow (North America): Update. See M 2311.
0411 Radio Moscow (World Service): News And Views. S 0011
0415 BBC: Good Books (except 23rd: A Month In The Country). See W 1445.
0423 Deutsche Welle: Panorama. See A 0223.
0430 BBC: Jazz Now And Then. See A 0145.
0431 Radio Moscow (North America): Top Priority. See S 0511.
0431 Radio Moscow (World Service): Radio Oumu Shinri-Kyo. See S 0431.
0434 Deutsche Welle: Man And Environment. See T 0234
0445 BBC: Worldbrief. See F 2315.

English language **shortwave guide**

0500 UTC [12:00 AM EST/9:00 PM PST]

FREQUENCIES

0500-0510	Lesotho, Maseru	4800do			
0500-0510 w	Malawi B'casting Corp.	3381do			
0500-0515	Israel, Kol Israel	11588am			
0500-0515 t	Sri Lanka B'Casting Svc	9720am	15425am		
0500-0530	Cameroon CRTV Beau	3970do			
0500-0530	Swaziland, TWR Swaziland	5965af	9655af	11750af	
0500-0530	United Kingdom,BBC London	3255af	3955eu	6005af	6180as
		6190af	6195eu	7120eu	9410eu
		9600af	9640na	11760me	12095va
		15070as	15310as	15400af	15420af
		15590va	17885af	21470af	21715as
		5975na	15280as	15575as	
0500-0530	Vatican Radio	7250eu	11625af	15090af	17730af
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	6130na
		9535na	9670na	9690na	
0500-0600	Australia	15240pa	15320pa	15365pa	17630as
		17715pa	17750as	17795pa	17880as
		21525as	21740pa	21775as	
0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	China, CRI	11840am			
0500-0600	Cook Islands	11760pa			
0500-0600	Costa Rica, RFPI	7375na	7385na	13630na	15030na
0500-0600	Cuba, RHC Havana	6060na			
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0600 sa	Eq.Guinea, R.East Africa	9585af			
0500-0600 varies	Italy, IRRS Milan, Italy	7125eu			
0500-0600	Japan NHK	6085me	7230eu	15230na	17765na
		17810na	17825na	17860as	21610na
0500-0600	Kenya, Voice of	4935do			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 mtwhf	Namibia BC Corp, Windhoek	3270af	3290af		
0500-0600	New Zealand, RNZI	17770pa			
0500-0600	Nigeria	3326do	4770do	4990do	7255af
0500-0600	Russia, Radio Moscow	5905va	7165na	7175va	9825va
		9905na	12060va	13645va	13665va
		15405va	15425va	15550va	17560va
		17605va	17890va		
0500-0600	S. Africa, Channel Africa	15430af			
0500-0600	Sierra Leone, SLBS	3316do			
0500-0600	Singapore, SBC1	5052do	11940do		
0500-0600	Spanish National Radio	9530na			
0500-0600	Thailand	4830as	9655as	11905as	
0500-0600	USA, CSMonitor Boston	9455na	9840af	9870na	13760na
		17780as			
0500-0600 sa	USA, CSMonitor Boston	17555as			
0500-0600	USA, KTBN Salt Lake City	7510am			
0500-0600	USA, KVOH Los Angeles	9785am			
0500-0600	USA, VOA Washington	5995eu	6035me	6040me	6060eu
		6140me	6873eu	7170me	7200me
		7405me	9575me	9670me	9700eu
		9715me	11815me	11825me	11850me
		15115me	15205me		
0500-0600	USA, WHRI Noblesville	7315na			
0500-0600	USA, WINB Red Lion, Penn.	15145eu			
0500-0600	USA, WJCR Upton, Kentucky		7465na	7490na	
0500-0600 mtwhfa	USA, WMLK Bethel, Penna.	9465eu			
0500-0600	USA, WRNO New Orleans	7395am			
0500-0600	USA, WWCR Nashville	5920na	7435na		
0500-0600	USA, WYFR Okeechobee, FL	5985am	9850eu	11580am	11915eu
		13695am	15565am		
0510-0515	Botswana, Gaborone	7255af			
0510-0600 vl	South Africa,Radio Oranje	9630do			
0520-0530	Finland, YLE	6120va	9665va	11755va	15440va
0524-0600 f	Ghana, Radio 2, Accra	3366do			
0525-0600	Ghana, Radio 1, Accra	4915do			
0530-0600	Austria, ORF Vienna	6015na	6155eu	13730eu	15410eu
		21490me			
0530-0600	Cameroon CRTV Yaounde	4850do			
0530-0600	Romania, R.Romania Int'l	15340af	15380af	17720af	17745af
		17790af	21665af		
0530-0600	Russia, AWR Russia	15125as			
0530-0600	Swaziland, TWR Swaziland	5965af	11750af		
0530-0600	UAE Radio, Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180as	6190af	6195eu	7120eu
		9410eu	9600af	9640na	11760me
		12095va	15070as	15280as	15310as
		15400af	15420af	15575af	21470af
		21715as			
0545-0600	Cameroon CRTV Beau	3970do			

SELECTED PROGRAMS

Sundays

0509 Deutsche Welle: Commentary. See S 0109.
0511 Radio Moscow (North America): News And Views. See S 0011.
0511 Radio Moscow (World Service): Top Priority. A panel discussion on major events.
0517 Deutsche Welle: Feature. See S 0117.
0531 Radio Moscow (North America): Moscow Medley. No details available.
0531 Radio Moscow (World Service): Ads. See S 0031.
0534 Deutsche Welle: German By Radio. See S 0134.

Mondays

0509 Deutsche Welle: Commentary. See S 0109.
0511 Radio Moscow (North America): News And Views. See S 0011.
0511 Radio Moscow (World Service): Top Priority. See S 0511.
0516 Deutsche Welle: Living In Germany. See M 0116.
0531 Radio Moscow (North America): Folk Box. See M 0031.
0531 Radio Moscow (World Service): Jazz Show. A jazz music program.
0534 Deutsche Welle: Larry's Random Selection. See M 0134.

Tuesdays

0509 Deutsche Welle: European Journal. See M 0209.
0511 Radio Moscow (North America): News And Views. See S 0011.
0511 Radio Moscow (World Service): Update. See M 2311.
0531 Radio Moscow (North America): Music. See M 0631.
0531 Radio Moscow (World Service): Yours For The Asking. See T 0031.

Wednesdays

0509 Deutsche Welle: European Journal. See M 0209.
0511 Radio Moscow (North America): News And Views. See S 0011.
0511 Radio Moscow (World Service): Update. See M 2311.
0531 Radio Moscow (North America): Music. See M 0631.
0531 Radio Moscow (World Service): Music At Your Request. See M 1231.

Thursdays

0509 Deutsche Welle: European Journal. See M 0209.
0511 Radio Moscow (North America): News And Views. See S 0011.
0511 Radio Moscow (World Service): Update. See M 2311.
0531 Radio Moscow (North America): Music. See M 0631.
0531 Radio Moscow (World Service): Folk Box. See M 0031.

Fridays

0509 Deutsche Welle: European Journal. See M 0209.
0511 Radio Moscow (North America): News And Views. See S 0011.
0511 Radio Moscow (World Service): Update. See M 2311.
0531 Radio Moscow (North America): Jazz Show. See M 0531.
0531 Radio Moscow (World Service): Music. See M 0631.

Saturdays

0509 Deutsche Welle: European Journal. See M 0209.
0511 Radio Moscow (North America): News And Views. See S 0011.
0511 Radio Moscow (World Service): Update. See M 2311.
0531 Radio Moscow (North America): Folk Box. See M 0031.
0531 Radio Moscow (World Service): Music. See M 0631.
0534 Deutsche Welle: Through German Eyes. See S 1513.

0600 UTC [1:00 AM EST/10:00 PM PST]

FREQUENCIES

0600-0610 s	Malawi B'casting Corp.	3381do				
0600-0615	Switzerland, SRI	165eu	3985eu	9535eu		
0600-0625	Cameroon CRTV Yaounde	4850do				
0600-0625	Kenya, Voice of	4935do				
0600-0630	Laos, National Radio of	7116as				
0600-0630 s	Latvia, Radio Riga	5935eu				
0600-0630	Swiss Radio Int'l	9860af	13635af	15430af	17565af	
		17565af	21770af			
0600-0630	United Kingdom,BBC London	3955eu	6180eu	6190af	6195eu	
	7230eu 9410eu	9600af	11760me	11940af	11955as	
	12095eu 15070va	15310as	15400af	15420af	15590va	
	17790as 17830as	17885af	21470af	5975na	7150pa	
	9640va 15280as	15360pa	15575as	21715as		
0600-0630	Vatican Radio	6245eu	7250eu			
0600-0640 last a	Lithuania, RadioCentras	9710eu				
0600-0645 s	Cameroon CRTV Douala	4795do				
0600-0650	Germany, Deutsche Welle	11765af	13610af	13790af	15185af	
		15435af	17875af			
0600-0650	North Korea	15180as	15230as			
0600-0658	New Zealand, RNZI	17770pa				
0600-0700	Australia	11720pa	15240pa	15320pa	15365pa	
		17630as	17715pa	17750as	17795pa	
		17880pa	21525as	21590pa	21740pa	
		21775as				
0600-0700	Canada, CFCX Montreal	6005do				
0600-0700	Canada, CFRX Toronto	6070do				
0600-0700	Canada, CFVP Calgary	6030do				
0600-0700	Canada, CHNX Halifax	6130do				
0600-0700	Canada, CKZU Vancouver	6160do				
0600-0700	Cook Islands	11760pa				
0600-0700	Costa Rica, RFPI	7375na	7385na	13630am	15030na	
0600-0700 West NA	Cuba, RHC Havana	6060na				
0600-0700	Czechoslovakia	6055va	7345va	9505va	11990va	
0600-0700	Ecuador, HCJB Quito	11925am	21455am			
0600-0700 sa	Eq.Guinea, R.East Africa	9585af				
0600-0700	Ghana, Radio 1, Accra	4915do				
0600-0700 f	Ghana, Radio 2, Accra	3366do				
0600-0700 varies	Italy, IRRS Milan, Italy	7125eu				
0600-0700	Kiribati	17440do				
0600-0700	Lebanon, King of Hope	6280me				
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do				
0600-0700	Malaysia, Voice of	6175as	9750as	15295as		
0600-0700	Malta, V. of the Medit.	9765eu				
0600-0700 s	New Zealand, ZLXA	3935do				
0600-0700	Nigeria , Voice of, Lagos	7255af				
0600-0700	Nigeria, domestic service	3326do	4990do			
0600-0700	Russia, Radio Moscow	5905va	7165va	7175va	7270na	
	9825na 9905na	12035va	12050va	12055va	13645va	
	15125va 15225va	15405va	15425va	15550va	17560va	
	17605va 17635va	17890va	21690va			
0600-0700	S. Africa, Channel Africa	15430af				
0600-0700	Sierra Leone, SLBS	3316do				
0600-0700	Singapore, SBC1	5010do	5052do	11940do		
0600-0700 vl	South Africa,Radio Oranje	9630do				
0600-0700	South Korea, Seoul	7275om	11810na	11945am	15155na	
		15170na				
0600-0700	Swaziland, TWR Swaziland	5965af	7200af	11750af		
0600-0700 sa	Thailand	4830as	9655as	11905as		
0600-0700	USA, CSMonitor Boston	9455na	9840eu	9870am	17555as	
		17780as				
0600-0700	USA, KTBN Salt Lake City	7510na				
0600-0700	USA, KVOH Los Angeles	9785na				
0600-0700	USA, VOA Washington	3980eu	5995eu	6040eu	6060me	
	6110eu 6140eu	6873eu	7170me	7325me	11805me	
	11815me 11825me	11915me	15205me	6035af	6125af	
	7405af 9530af	9575af	15115af	17715af		
0600-0700	USA, WHRI Noblesville	7315eu	9495am			
0600-0700	USA, WJCR Upton, Kentucky		7465na	7490na		
0600-0700 smtwhf	USA, WMLK Bethel, Penna.	9465eu				
0600-0700	USA, WWCR Nashville	5920na	7435na			
0600-0700	USA, WYFR Okeechobee, FL	5985am	7355eu	9680eu	11725na	
		13695af	15565am			
0603-0610 tent	Croatian Radio, Zagreb	6210eu	9830eu	13830eu		
0615-0630 s	Cameroon CRTV Bertoua	4750do				
0615-0630	South Korea World News	7550eu	15575me			
0615-0700 mtwhf	Canada, RCI	6150eu	7155eu	9740af	9760eu	
		11935af				
0625-0700	Kenya, Voice of	4935do				
0630-0635 mtwhf	Congo, RTV Congolaise	7105do	9610do			
0630-0655	Belgium, R Vlaanderen	5910au	11695eu			
0630-0700	Austria, ORF Vienna	6015na				
0630-0700 smtwhf	New Zealand, ZLXA	3935do				
0630-0700	United Kingdom,BBC London	5975na	6180eu	6190af	6195eu	
	7230eu 9410eu	9600af	9640pa	11760me	11940af	
	11955as 12095eu	15070va	15310as	15400af	15420af	
	15590va 17830as	17885af	21470af	7150pa	15280as	
	15360pa 17790as	21715as				
0630-0700	Vatican Radio	11625af	15090af	17730af		
0635-0700	Monaco, TWR Monaco	9480eu				
0645-0700	Finland, YLE	6120eu	9560af	11755eu		
0645-0700	Ghana B'casting Corp.	6130af				
0645-0700	Romania, R.Romania Int'l	11810pa	11940pa	15335pa	17720pa	
		17805pa	21665pa			

SELECTED PROGRAMS

Sundays

0609 Deutsche Welle: Commentary. See S 0109.
0611 Radio Moscow (North America): Moscow Mailbag. S 0111.
0611 Radio Moscow (World Service): Science And Engineering. Developments in Russian science and technology.
0613 Deutsche Welle: Sports Report. See S 0213.
0615 BBC: Letter From America. Alistair Cooke presents his unique reflections on the USA.
0619 Deutsche Welle: International Talking Point. See S 0419.
0630 BBC: Jazz For The Asking. Digby Fairweather plays listener requests.
0631 Radio Moscow (North America): Feature. See S 0431.
0631 Radio Moscow (World Service): Africa As We See It. News and features for the African continent.
0634 Deutsche Welle: People And Places. See S 0434.

Mondays

0609 Deutsche Welle: European Journal. See M 0209.
0611 Radio Moscow: Moscow Mailbag. See S 0111.
0615 BBC: Recording Of The Week. A personal choice from the new classical music releases.
0630 BBC: Feature. See S 1401.
0630 Radio Canada Int'l: Inside Track. See S 0000.
0631 Radio Moscow (North America): Music. Music as selected by Radio Moscow staff.
0631 Radio Moscow (World Service): Africa As We See It. S 0631.
0634 Deutsche Welle: Africa In The German Press. See M 0434.

Tuesdays

0609 Deutsche Welle: Africa Report. See T 0409.
0611 Radio Moscow (North America): Update. See M 2311.
0611 Radio Moscow (World Service): Focus On Asia And The Pacific. See T 0111.
0615 BBC: The World Today. See M 1645.
0630 BBC: Rock/Pop Music. Hear the latest in reggae, soul, and rap on "World Ranking" (through February 2nd).
0630 Radio Canada Int'l: Arts Canada or Innovation Canada. S 0407.
0631 Radio Moscow (North America): Music. See M 0631.
0631 Radio Moscow (World Service): Africa As We See It. S 0631.
0634 Deutsche Welle: European Journal. See M 0209.

Wednesdays

0609 Deutsche Welle: Africa Report. See T 0409.
0611 Radio Moscow (North America): Update. See M 2311.
0611 Radio Moscow (World Service): Focus On Asia And The Pacific. See T 0111.
0615 BBC: The World Today. See M 1645.
0630 BBC: Meridian. Events in the world of the arts.
0630 Radio Canada Int'l: Open House. See S 1337.
0631 Radio Moscow (North America): Jazz Show. See M 0531.
0631 Radio Moscow (World Service): Africa As We See It. S 0631.
0634 Deutsche Welle: European Journal. See M 0209.

Thursdays

0609 Deutsche Welle: Africa Report. See T 0409.
0611 Radio Moscow (North America): Update. See M 2311.
0611 Radio Moscow (World Service): Focus On Asia And The Pacific. See T 0111.
0615 BBC: The World Today. See M 1645.
0630 BBC: Sports International. See H 0230.
0630 Radio Canada Int'l: The Arts Tonight. Interviews, panel discussions and reviews covering the arts.
0631 Radio Moscow (North America): Yours For The Asking. T 0031.
0631 Radio Moscow (World Service): Africa As We See It. S 0631.
0634 Deutsche Welle: European Journal. See M 0209.

Fridays

0609 Deutsche Welle: Africa Report. See T 0409.
0611 Radio Moscow (North America): Update. See M 2311.
0611 Radio Moscow (World Service): Focus On Asia And The Pacific. See T 0111.
0615 BBC: The World Today. See M 1645.
0630 BBC: Meridian. See W 0630.
0630 Radio Canada Int'l: The Arts Tonight. See H 0630.
0631 Radio Moscow (North America): Audio Book Club. S 0131.
0631 Radio Moscow (World Service): Africa As We See It. S 0631.
0634 Deutsche Welle: European Journal. See M 0209.

Saturdays

0609 Deutsche Welle: Commentary. See S 0109.
0611 Radio Moscow (North America): Update. See M 2311.
0611 Radio Moscow (World Service): Focus On Asia And The Pacific. See T 0111.
0615 BBC: The World Today. See M 1645.
0623 Deutsche Welle: Panorama. See A 0223.
0630 BBC: Meridian. See W 0630.
0631 Radio Moscow (North America): Top Priority. See S 0511.
0631 Radio Moscow (World Service): Africa As We See It. S 0631.
0634 Deutsche Welle: Man And Environment. See T 0234.

English language shortwave guide

0700 UTC [2:00 AM EST/11:00 PM PST]

0700-0710	Cameroon CRTV Bafoussam	4000do			
0700-0710 w	Malawi B'casting Corp.	3381do	5995do		
0700-0715	Romania, R.Romania Int'l	11810au	11940au	15335au	17720au
		17805au	21665au		
0700-0730	Australia	6020pa	15240pa	15320va	15365pa
		17630as	17715pa	17750as	17795pa
		21525as	21740pa	21775as	
0700-0730	United Kingdom,BBC London	5975na	7150pa	9640va	11955as
		15280as	15360pa	21715as	
		6180eu	6190af	6195eu	7230eu
		7325af	9410eu	9760eu	11760me
		11940af	12095eu	15070eu	15310as
		15400af	15420af	15575as	17640va
		17790as	17885af	21470af	21660af
0700-0750	North Korea	15350as	17765as		
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Cook Islands	11760pa			
0700-0800	Costa Rica, RFPI	7375na	7385na	13630na	15030na
0700-0800	Ecuador, HCJB Quito	11730eu	15270eu	21455eu	
0700-0800 sa	Eq.Guinea, R.East Africa	9585af			
0700-0800	Ghana B'casting Corp.	6130af			
0700-0800	Ghana, Radio 1, Accra	4915do			
0700-0800 f	Ghana, Radio 2, Accra	3366do			
0700-0800 varies	Italy, IRRS Milan, Italy	7125eu			
0700-0800	Japan NHK	5970eu	6025eu	15405pa	17765eu
		17810as	17860as	21575as	
0700-0800	Kenya, Voice of	4935do			
0700-0800	Lebanon, King of Hope	6280me			
0700-0800 tent	Liberia, ELBC Monrovia	7275do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monte Carlo, TWR	9480eu			
0700-0800	New Zealand, RNZI	9700pa			
0700-0800 smtwhf	New Zealand, ZXLA	3935do			
0700-0800	Nigeria	3326do	4990do		
0700-0800	Russia, Radio Moscow	4950va	4975va	5960va	7130va
		7160va	7310va	9855va	9905na
		11705va	11765va	11880va	11975va
		12010va	12055va	13705va	15280va
		15295va	15345va	15350va	15375va
0700-0800	Sierra Leone, SLBS	3316do			
0700-0800	Singapore, SBC1	5010do	5052do	11940do	
0700-0800 vl	South Africa,Radio Oranje	9630do			
0700-0800	Swaziland, TWR Swaziland	7200af	11750af		
0700-0800	Taiwan, V. of Free China,	5950na			
0700-0800 sa	Thailand	4830as	9655as	11905as	
0700-0800	USA, CSMonitor Boston	9445na	9840eu	9870am	17555as
		17780as			
0700-0800	USA, KTBN Salt Lake City	7510na			
0700-0800	USA, KVOH Los Angeles	9785na			
0700-0800	USA, WHRI Noblesville	7315eu			
0700-0800	USA, WJCR Upton, Kentucky		7465na	7490na	
0700-0800 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0700-0800	USA, WWCR Nashville	5920am	7435am		
0700-0800	USA, WYFR Okeechobee, FL	9850af	11915af	13695eu	15566na
0703-0800 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0705-0800 a	Cameroon CRTV Douala	4795do			
0730-0745 mtwhf	Icelandic National Radio	9265om			
0730-0745 mtwhfa	Vatican Radio	6245do	7250do	9645na	15210na
0730-0755	Belgium, R Vlaanderen	5910eu	9905va	11695pa	
0730-0800	Australia	6020pa	11880pa	15240pa	15320va
		15365pa	17630as	17715pa	17750as
		21525as	21590as		
0730-0800	Czechoslovakia	17725pa	21705as		
0730-0800	Ecuador, HCJB Quito	9745au	11730eu	11925au	15270eu
		21455va			
0730-0800	Italy, AWR Italy	7210eu			
0730-0800	Netherlands	9630pa	11895pa		
0730-0800	United Kingdom,BBC London	6180eu	6190af	7325eu	9410eu
		9600af	9760eu	11760me	11860af
		11940af	12095va	15070eu	15105af
		15400af	15420af	15590af	17640va
		17830as	17885af	21470af	21660af
		7150pa	9640va	11955as	15280as
		15310as	15360pa	17790as	21715as

0800 UTC [3:00 AM EST/12:00 AM PST]

0800-0803 daily	Croatian Radio, Zagreb	6210eu	9830eu	21480eu	
0800-0810	Cameroon CRTV Bafoussam		4000do		
0800-0810 w	Malawi B'casting Corp.	3381do			
0800-0825	Finland, YLE	17800as	21550as		
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0825	Netherlands	9630pa	11895pa		
0800-0825	Swaziland, TWR Swaziland	7200af	11750af		
0800-0830	Australia	5995pa	9710pa	15240pa	17630as
		17750as	21590as	25750as	
0800-0830	Ecuador, HCJB Quito	9745au	11730eu	11925au	21455va
0800-0830	United Kingdom,BBC London	6180eu	6190af	7325eu	9410eu
	9600af 9760eu	11760me	11860af	12095eu	15070eu
	15310as 15360pa	15400af	15420af	15590me	17790as
	17830as 17885af	21470af	21660af	7150pa	9640pa
	9660eu 11950af	11955as	15105af	15280as	17640va
	21715as				
0800-0835	Monte Carlo, TWR	9480eu			
0800-0845	Pakistan	17902eu	21520eu		
0800-0850	North Korea	15180as	15230as		
0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425va			
0800-0900 a	Cameroon CRTV Douala	4795do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Cook Islands	11760pa			
0800-0900	Costa Rica, RFPI	7375na	15030na		
0800-0900 sa	Eq.Guinea, R.East Africa	9585af			
0800-0900	Ghana, Radio 1, Accra	4915do			
0800-0900 f	Ghana, Radio 2, Accra	3366do			
0800-0900 asmtwh	Guam, KTWR Guam	15200as			
0800-0900	Indonesia, Voice of	7125as	9675as	11752as	11785as
0800-0900 varies	Italy, IRRS Milan, Italy	7125eu			
0800-0900	Kenya, Voice of	4935do			
0800-0900	Lebanon, King of Hope	6280me			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0900	New Zealand, RNZI	9700pa			
0800-0900 smtwhf	New Zealand, ZXLA	3935do			
0800-0900	Nigeria	3326do	4990do		
0800-0900	Nigeria, Voice of	7255af			
0800-0900	Papua New Guinea	4890do			
0800-0900	Russia, Radio Moscow	4740va	4940va	4975va	5960va
	7130va 7160va	7310va	9535va	11705va	11765va
	11920va 11975va	12010va	12055va	13705va	15295va
	15345va 15350va	15420va	15435va		
0800-0900	Sierra Leone, SLBS	3316do	5980do		
0800-0900	Singapore, SBC1	5010do	5052do	11940do	
0800-0900	Solomon Islands, SIBC	5020do	9545do		
0800-0900 vl	South Africa,Radio Oranje	9630do			
0800-0900	South Korea, Seoul	7550eu	13670eu		
0800-0900	USA, CSMonitor Boston	9445am	11705eu	13615as	15665pa
		17555as			
0800-0900	USA, KNLS Anchor Point	7365as			
0800-0900	USA, KTBN Salt Lake City	7510am			
0800-0900	USA, VOA Washington	11735eu	15160eu	15195me	21455me
		21570me			
0800-0900	USA, WHRI Noblesville	7315eu	7355sa		
0800-0900	USA, WJCR Upton, Kentucky	7465na	7490na		
0800-0900 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0800-0900	USA, WWCR Nashville	5920na	7435am		
0803-0810 tent	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0803-0900 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0830-0845	Vatican Radio	6245eu	7250eu	9645eu	15210eu
0830-0900	Australia	5995pa	9580pa	9710va	15240pa
		17630as	17750as	21590as	25750as
0830-0900	Austria, ORF Vienna	6155eu	13730eu	15450au	21490as
0830-0900	Ecuador, HCJB Quito	9745au	11925au	15270eu	21455au
0830-0900	Finland, YLE	15355as	17800as		
0830-0900	Netherlands	9630pa	11895pa		
0830-0900	United Kingdom,BBC London	6180eu	6190eu	7325eu	9410eu
	9660eu 9760eu	11860af	11940af	11955as	12095eu
	15070va 15280as	15360pa	15400af	15420af	15590me
	17640va 17830as	21660af	21715as	17885af	
0835-0850 smtwhf	Monte Carlo, TWR	9480eu			
0835-0850 mtwhf	Swaziland, TWR Swaziland	7200af	11750af		
0850-0900 s	Monte Carlo, TWR	9480eu			

0900 UTC [4:00 AM EST/1:00 AM PST]

0900-0903 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0900-0905	Ghana, Radio 1, Accra	4915do			
0900-0905 f	Ghana, Radio 2, Accra	3366do			
0900-0910	Malawi B'casting Corp.	5995do			
0900-0915	Guam, KTWR Guam	15200as			
0900-0915	Lebanon, Radio Voice of	6550me			
0900-0915 s	Monte Carlo, TWR	9480eu			
0900-0925	Netherlands	9630pa	11895pa		
0900-0930	Costa Rica, RFPI	7375na	15030na		
0900-0930 asmtwf	Guam, KTWR Guam	15200as			
0900-0930 mtwhf	New Zealand, ZLXA	3935do			
0900-0930	Swiss Radio Int'l	9560as	13685as	17670as	21770as
0900-0930	United Kingdom,BBC London	1170as	5975eu	6045eu	6180u
		6190af	6195as	7325eu	9410eu
		9660eu	9740as	9750eu	9760eu
		11760me	11860af	11940af	12095eu
		15070va	15400af	17640va	21660af
		15190sa	15280as	15310as	15360as
		15420af	15575me	15590me	17705eu
		17790af	17830as	17885af	21470af
		21660af	21715as		
0900-0950	Germany, Deutsche Welle	6160as	9565af	11915as	15410af
		17780as	17820as	21465as	21600af
		21650as	21680as		
0900-1000	Australia	5995pa	9580pa	9710va	13605as
		15170as	21725as		
0900-1000	Australia, ABC Brisbane	9660do			
0900-1000 s	Bhutan Broadcasting Svc	6035do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, CRI	8450au	11755au	15440au	17710au
0900-1000	Cook Islands	11760pa			
0900-1000	Ecuador, HCJB Quito	9745au	11925au	21455au	
0900-1000 sa	Eq.Guinea, R.East Africa	9585af			
0900-1000	Guam, KTWR Guam	11805pa			
0900-1000 s	Italy, AWR via Portugal	9670eu			
0900-1000 varies	Italy, IRRS Milan, Italy	7125eu			
0900-1000	Japan NHK	11815eu	11840eu	15270au	17860as
		21610as			
0900-1000	Kenya, Voice of	4935do			
0900-1000	Lebanon, King of Hope	6280me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-1000	New Zealand, RNZI	9700pa			
0900-1000	Nigeria	3326do	4990do		
0900-1000	Nigeria, Voice of	7255af			
0900-1000	Papua New Guinea	4890do			
0900-1000	Philippines, FEBC Manila	9800as	11685as		
0900-1000	Russia, Radio Moscow	4740do	4940do	4975do	6000am
		7130am	7245va	9535va	9780va
		9855va	11705va	11765va	11920va
		11975va	12055va	13705va	15175va
		15280va	15295va	15345va	15545na
0900-1000	Sierra Leone, SLBS	3316do			
0900-1000	Singapore, SBC1	5010do	5052do	11940do	
0900-1000 vl	South Africa,Radio Oranje	9630do			
0900-1000	Tanzania	5985af	9685af	11765af	
0900-1000	USA, CSMonitor Boston	9445am	11705eu	13615pa	15665pa
		17555as			
0900-1000	USA, KTBN Salt Lake City	7510am			
0900-1000	USA, VOA Washington	11735eu	15160eu	15195me	21455me
		21570eu			
0900-1000	USA, WJCR Upton, Kentucky			7465na	7490na
0900-1000 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0900-1000	USA, WWCR Nashville	5920am	7435am		
0905-1000	Cameroon CRTV Yaounde	4850do			
0905-1000 sa	Ghana, Radio 1, Accra	4915do			
0905-1000 mtwhf	Ghana, Radio 2 School prg	7295do			
0905-1000 sa	Ghana, Radio 2, Accra,	3366do			
0910-0940 smwha	Mongolia, Ulaanbaatar	11850pa	12015pa		
0915-0930 smtwh	Guam, KTWR Guam	15200as			
0915-0930	South Korea World News	9570am	13670eu		
0930-1000	Afghanistan, Kabul	9635as			
0930-1000	Netherlands	9630pa	11895pa		
0930-1000	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9660eu	9740as
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070va	15310as
		15400af	15420af	15575me	15590me
		15190sa	17640va	17705eu	
0940-0950	Greece, Voice of	17525eu			
0950-0953 a	Russia, Vladivostok	4050do	4485do	5015do	5905do
		6035do	6175pa	7175pa	7210pa
		7260pa	7270pa	7345pa	9530pa
		9600pa	9635pa	9825pa	9905pa
		11815pa	15535pa	15595pa	17620pa
		17695pa	17825pa	17850pa	

1000 UTC [5:00 AM EST/2:00 AM PST]

1000-1025 mtwhf	Belgium, R Vlaanderen	5910eu	9905eu		
1000-1025	Netherlands	9630pa	11895pa		
1000-1030 tent	Afghanistan, Kabul	9635as			
1000-1030	Tanzania	5985af	9685af	11765af	
1000-1030	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9660eu	9740as
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070va	15190sa
		15310as	15400af	15420af	15575me
		17640eu	17705eu	17790af	17885af
		21470af	21660af	21715as	
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1000-1100	Australia	5995pa	9580pa	21725as	
1000-1100	Cameroon CRTV Yaounde	4850do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, CRI	8450au	11755au	15440au	17710au
1000-1100	Cook Islands	11760pa			
1000-1100	Costa Rica, AWR	9725ca			
1000-1100	Costa Rica, RFPI	7375na	13630na	15030na	
1000-1100	Ecuador, HCJB Quito	9745au	11925au	21455au	
1000-1100 sa	Eq.Guinea, R.East Africa	9585af			
1000-1100 sa	Ghana, Radio 1, Accra	4915do			
1000-1100 mtwhf	Ghana, Radio 2 School Prg	7295do			
1000-1100 sa	Ghana, Radio 2, Accra	3366do			
1000-1100	India, All India Radio	15050as	17387as	17895as	21735as
1000-1100 varies	Italy, IRRS Milan, Italy	7125eu			
1000-1100	Kenya, Voice of	4935do			
1000-1100	Malaysia, RTM Kuching	7160do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	New Zealand, RNZI	9700pa			
1000-1100	Nigeria	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100	Philippines, FEBC Manila	9800as	11665as		
1000-1100	Russia, Radio Moscow	9455na	9495na	11840na	15485na
1000-1100	S. Africa, Channel Africa	17780af			
1000-1100	Sierra Leone, SLBS	3316do			
1000-1100	Singapore, SBC1	5010do	5052do	11940do	
1000-1100 vl	South Africa,Radio Oranje	9630do			
1000-1100	USA, CSMonitor Boston	9455am	9495na	13625as	17555as
1000-1100 sa	USA, CSMonitor Boston	15665me			
1000-1100	USA, VOA Washington	5985as	11720au	15425au	
1000-1100	USA, WHRI Noblesville	9850sa			
1000-1100	USA, WJCR Upton, Kentucky			7465na	7490na
1000-1100	USA, WWCR Nashville	5920am	15690na		
1000-1100	USA, WYFR Okeechobee, FL		5950am		
1030-1040 mtwhf	Malawi B'casting Corp.	5995do			
1030-1100	Austria, ORF Vienna	6155eu	13730as	15450as	21490pa
1030-1100	Czechoslovakia	6055va	7345va	9505va	11990va
1030-1100	Iran, Islamic Republic	9525as	11715af	11790as	11910as
		11930me			
1030-1100	Italy, AWR Italy	7230eu			
1030-1100	South Korea, Seoul	11715na			
1030-1100	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1030-1100 sa	Tanzania	5985af	9685af	11765af	
1030-1100	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1030-1100	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9660eu	9740as
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070va	15190sa
		15310as	15400af	15420af	15575me
		17640va	17705eu	17790af	17885af
		21470af	21660af		
1040-1050	Greece, Voice of	15650as	17525as		
1055-1100	Bonaire, TWR Bonaire	11815am	15345am		

The time on this offer is FADING AWAY!

Offer expires promptly 1/31/93

Get a FREE 1 year subscription or renewal to Monitoring Times when you buy any of these fabulous ICOM products!

RCV-6 -- ICOM R71A

This receiver is as professional as it looks. The brilliant fluorescent display provides frequency information down to tenths of a kilohertz and alerts the listener to other dial settings (mode, memory, channel, VRO).

Signal resolution of 10 Hz eliminates the need for RIT, even on SSB or RTTY mode and may be scanned or searched. An effective noise blanker has adjustable controls for optimum reduction of a wide variety of impulse noises, from power line hash to the Russian woodpecker. This latest version also reintroduces passband tuning. Filter selectivities of 6, 2.3 and 0.5 kHz are provided; you may add one more for use in any mode.

Of interest to the visually impaired is the optional EX-310 speech synthesizer which announces the displayed frequency in English.

Only $999.95 plus $14.50 UPS shipping!

RCV-8 -- ICOM R72

For the serious shortwave enthusiast on a budget, the new R72 offers full 100 kHz-30 MHz frequency coverage and direct keypad entry with advanced features. A backlit LCD shows the receiver's 10 Hz frequency resolution, while 101 scannable memory channels store frequencies in AM, LSB, USB, RTTY, and CW. Dual-range search is included as well as an analog S meter and a recorder activator coupled to a 24 hour clock timer.

Only $919.95 plus $14.50 UPS shipping!

RCV-14 -- ICOM R9000

- Continuous 100 kHz - 2000 MHz frequency coverage
- Built-in CRT spectrum display
- Eight different scan functions
- Challenging sensitivity
- Passband tuning
- Fully-adjustable noise blanker
- 60 dB tunable IF notch filter
- and much more!

Only $4695.95 plus $30 UPS shipping (US only)

SCN-4 -- ICOM R7000

Used by government and military angencies worldwide, the ICOM R7000 provides total spectrum 25-1000 (triple conversion) and 1025-2000 (quadruple conversion) MHz frequency coverage with 100 Hz flourescent readout accuracy! Add to this enormous tuning range 99 memory channels with priority function, keyboard entry or dial tuning, FM/AM/SSB modes, five tuning speeds, S-mete/center tuning meter, 2.8/9/15/150 kHz filter selection, noise blanker, internal speaker with 2.5 watts of audio power, spurious signal suppression greater than 60 dB, high sensitivity, and programmable scanning with auto-write memory, and you have the most advanced scanner receiver ever designed for the serious VHF/UHF listener.

Only $1158.95 plus $14.50 UPS shipping

SCN-15 -- ICOM R7100

ICOM has done it again! They took the most popular features of the legend R7000, added a few new features that listeners wanted, and released this new, compact receiver.

The R7100 offers continuous frequency coverage (no gaps) from 25 to 2000 MHz on a brilliant LCD readout, selectable tuning steps, USB/LSB/AM/FM modes with wide and narrow selectivity switching.

900 scannable memory locations store frequency, channel number, mode and search steps; ten search banks with memory channel lockout, 5 or 12 channel-per-second scan speed and scan-resume delay are also found on this model.

High sensitivity and stable SSB reception are additional perks, as are sensitive, all-mode squelch and easy pushbutton function selection.

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SCN-14 -- ICOM R100

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1100 UTC [6:00 AM EST/3:00 AM PST]

FREQUENCIES

1100-1110 mtwhf	Ghana, Radio 2 School Prg	7295do			
1100-1110 sa	Malawi B'casting Corp.	5995do			
1100-1120	Pakistan	17902eu	21520eu		
1100-1130	Ecuador, HCJB Quito	9745au	11925au	15155au	21455au
1100-1130	Iran, Islamic Republic	9525af	11515af	11790as	11910as
		11930me			
1100-1130	Israel, Kol Israel	17545eu			
1100-1130 irreg	Mozambique	9525af	11818af	11835af	
1100-1130	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1100-1130	Swiss Radio Int'l	13635as	15505as	17670as	21770as
1100-1130	United Kingdom,BBC London	5965na	6045eu	6180eu	6190af
		6195eu	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15310as	15400af	15420af	15575me
		15220na	17640va	17705eu	17790af
		17885af	21470af	21660af	
1100-1130	Vietnam, Voice of	9840as	12020as	15010as	
1100-1150	Germany, Deutsche Welle	15410af	17765af	17800af	17860af
		21465af	21600af		
1100-1150	North Korea	6576na	9977na	11335na	
1100-1200	Australia	6020pa	6080pa	7240pa	9580pa
		9710va	13605pa	15170as	21725as
1100-1200	Bonaire, TWR Bonaire	11815am	15345am		
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Cook Islands	11760pa			
1100-1200	Costa Rica, AWR	9725ca	11870ca		
1100-1200	Costa Rica, RFPI	7375na	13630na	15030na	
1100-1200	Czechoslovakia	6055va	7345va	9505va	11990va
1100-1200	Ghana, Radio 1, Accra	4915do			
1100-1200 sa	Ghana, Radio 2, Accra	3366do			
1100-1200 varies	Italy, IRRS Milan, Italy	7125eu			
1100-1200	Japan NHK	6120na	11815sa	11840na	
1100-1200	Malaysia, RTM Kuching	4950do	7160do		
1100-1200	Malaysia, RTM Radio 4	7295do			
1100-1200	New Zealand, RNZI	9700as			
1100-1200	Russia, Radio Moscow	9600na	12055na	15485na	17830na
1100-1200	S. Africa, Channel Africa	11900af			
1100-1200	Singapore, SBC1	5010do	5052do	11940do	
1100-1200 vl	South Africa,Radio Oranje	9630do			
1100-1200	South Korea World News	15575af			
1100-1200	USA, CSMonitor Boston	9455am	9495na	13625as	17555as
1100-1200 sa	USA, CSMonitor Boston	15665me			
1100-1200	USA, KTBN Salt Lake City	7510na			
1100-1200	USA, VOA Washington	5985as	6110au	9760as	11720au
		15155au	15425as	21640as	
1100-1200	USA, WHRI Noblesville	7315na	9850sa	11790sa	
1100-1200	USA, WJCR Upton, Kentucky		7465na	7490na	
1100-1200	USA, WWCR Nashville	13815na	15690na		
1100-1200	USA, WYFR Okeechobee, FL		5950am	7355am	
1115-1130	South Korea World News	7275as	11740as		
1115-1145	Nepal, Kathmandu	3230as	5005as	7165as	
1120-1130	Vatican Radio	6245do	7250do	9645do	15210do
1125-1130 sa	Botswana, Gaborone	5955af	7255af		
1125-1150 mtwhf	Finland, YLE	15400na			
1130-1140	Lesotho, Masseru	4800do			
1130-1155 s	Belgium, R Vlaanderen	17555va	21810na		
1130-1200	Austria, ORF Vienna	6155eu	11780as	13730va	15450as
1130-1200	Bulgaria, Sofia	11630eu	11720eu	13670eu	17780eu
		17825eu			
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1200	Netherlands	5955eu			
1130-1200	Netherlands	5955eu			
1130-1200	South Korea, Seoul	9650na			
1130-1200	Thailand	4830as	9655as	11905as	
1130-1200	United Kingdom,BBC London	5965na	6045eu	6180eu	6190af
		6195eu	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		17640va	17705eu	17790af	17885af
		21470af			
1130-1200	Yugoslavia	17710as	17740am	21605pa	

SELECTED PROGRAMS

Sundays

1109 Deutsche Welle: Arts On The Air. Reports and interviews on cultural events and developments.
1111 Radio Moscow: Culture And The Arts. A look at the varied arts and cultures of Russia.
1130 BBC: The Ken Bruce Show. See S 0030.
1131 Radio Moscow: Audio Book Club. See S 0131.
1134 Deutsche Welle: German By Radio. See S 0134.

Mondays

1109 Deutsche Welle: Newsline Cologne. A current affairs program with worldwide reports and a German press review.
1111 Radio Moscow: Science And Engineering. See S 0611.
1130 BBC: Composer Of The Month. See M 0230.
1131 Radio Moscow: Music. See M 0631.
1134 Deutsche Welle: Hello Africa. Musical requests and greetings to friends.

Tuesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1111 Radio Moscow: Update. See M 2311.
1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
1131 Radio Moscow: Russian By Radio. See S 1531.
1134 Deutsche Welle: Hello Africa. See M 1134.

Wednesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1111 Radio Moscow: Update. See M 2311.
1130 BBC: Meridian. See W 0630.
1131 Radio Moscow: Audio Book Club. See S 0131.
1134 Deutsche Welle: Hello Africa. See M 1134.

Thursdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1111 Radio Moscow: Update. See M 2311.
1130 BBC: Drama. A production from the BBC's crack drama team.
1131 Radio Moscow: Russian By Radio. See S 1531.
1134 Deutsche Welle: Hello Africa. See M 1134.

Fridays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1111 Radio Moscow: Update. See M 2311.
1130 BBC: Meridian. See W 0630.
1131 Radio Moscow: Audio Book Club. See S 0131.
1134 Deutsche Welle: Hello Africa. See M 1134.

Saturdays

1109 Deutsche Welle: Africa This Week. A review of trends and events on the African continent.
1111 Radio Moscow: Update. See M 2311.
1130 BBC: Meridian. See W 0630.
1131 Radio Moscow: Music. See M 0631.
1134 Deutsche Welle: Mailbag Africa. Listeners' questions, music requests, and the club corner.

1200UTC [7:00 AM EST/4:00 AM PST]

FREQUENCIES

1200-1205	New Zealand, RNZI	9700as			
1200-1210 w	Malawi B'casting Corp.	3381do	5995do		
1200-1215	Cambodia, Voice of	9695as	11938as		
1200-1225 sa	Ghana, Radio 2, Accra	3366do			
1200-1225	Netherlands	5955eu			
1200-1230 smwha	Mongolia, Ulaanbaatar	11850as	12015as		
1200-1230 as	Norway	17860as	21705as		
1200-1230	Thailand	4830as	9655as	11905as	
1200-1230	United Kingdom,BBC London	6045eu	6180eu	6190af	6195eu
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070eu	15220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17840af	17885af
		21470af	21660af		
1200-1230	USA, VOA Washington	6110as	9760au	11715as	15155au
		15425as			
1200-1230	Uzbekhistan, R. Tashkent	5945as	9540as	15470as	17745as
1200-1300	Australia	5995pa	6020pa	6080pa	7240pa
		9580pa	9710pa	21725as	
1200-1300	Australia, ABC Brisbane	4920au			
1200-1300	Australia, ABC Katherine	2485do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1300	Bonaire, TWR Bonaire	11815am	15345am		
1200-1300	Brazil, Radiobras	15445am			
1200-1300 mtwhf	Cameroon CRTV Douala	4795do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300 mtwhf	Canada, RCI Montreal	9635am	11855am	17820am	
1200-1300	China, CRI	8425au	9665na	9715as	11600pa
		11660as	15450pa		
1200-1300	Cook Islands	11760pa			
1200-1300	Costa Rica, AWR	9725ca	11870ca		
1200-1300	Costa Rica, RFPI	13630na	15030na		
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17890am	21455om
1200-1300 sa	Eq.Guinea, R.East Africa	9585af			
1200-1300	Ghana, Radio 1, Accra	4915do			
1200-1300 varies	Italy, IRRS Milan, Italy	7125eu			
1200-1300	Kenya, Voice of	4935do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1300	Nigeria	4990do	7285do		
1200-1300	Nigeria, Voice of	7255af			
1200-1300	Palau, KHBN	9830va			
1200-1300	Papua New Guinea	4890do			
1200-1300	Russia, Radio Moscow	9655na	9755na	11840na	11985na
		12050na	12055na	15280na	15485na
		17670na	17830na		
1200-1300	Sierra Leone, SLBS	3316do	5980do		
1200-1300	Singapore, SBC1	5010do	5052do	11940do	
1200-1300 vl	South Africa,Radio Oranje	9630do			
1200-1300 sa	Tanzania	5985af	9684af	11765af	
1200-1300	USA, CSMonitor Boston	9425au	9495am	13625as	13760na
1200-1300 as	USA, CSMonitor Boston	15665eu			
1200-1300	USA, KTBN Salt Lake City	7510am			
1200-1300	USA, WHRI Noblesville	7315na	9850sa	11790sa	
1200-1300	USA, WJCR Upton, Kentucky		7465na	7490na	
1200-1300	USA, WWCR Nashville	13815na	15690na		
1200-1300	USA, WYFR Okeechobee, FL	5950am	6015am	11830am	17760am
1203-1210 as	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
1215-1300	Egypt, Radio Cairo	17595as			
1215-1300	South Korea, Seoul	9750am			
1226-1300	Ghana, Radio 2, Accra	7295do			
1230-1255	Belgium, R Vlaanderen	17555as	21810na		
1230-1255 mtwhf	Finland, YLE	15400na	17880na		
1230-1300	Austria, ORF	6155eu	13730na	15450va	17730as
1230-1300	Bangladesh	15200as	15605as	15647as	17750as
1230-1300	France, RFI Paris	9805eu	11670eu	15155eu	15195eu
		15365na	21645na		
1230-1300	Netherlands	9855eu			
1230-1300	Sri Lanka B'casting Corp.	6075as	9720as		
1230-1300	Sweden	15170as	17740as		
1230-1300	United Kingdom,BBC London	6045eu	6180eu	6190af	6195ca
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11760me	11940af
		12095eu	12170as	15070eu	15220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17840af	17885af
		21470af	21660af		
1230-1300	USA, VOA Washington	6110as	9760au	11715au	15155as
		15425as			
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	
1235-1245	Greece, Voice of	15635na	15650na	17515na	

SELECTED PROGRAMS

Sundays

1201 BBC: Play Of The Week. See S 0101.
1211 Radio Moscow: News And Views. See S 0011.
1231 Radio Moscow: Ads. See S 0031.

Mondays

1209 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
1211 Radio Moscow: News And Views. See S 0011.
1215 BBC: Quiz. A radio game show.
1231 Radio Moscow: Music At Your Request. Music as requested by listeners.
1245 BBC: Sports Roundup. See S 0315.

Tuesdays

1209 BBC: Words Of Faith. See M 1209.
1211 Radio Moscow: News And Views. See S 0011.
1215 BBC: Multitrack 1. See M 2330.
1231 Radio Moscow: Folk Box. See M 0031.
1245 BBC: Sports Roundup. See S 0315.

Wednesdays

1209 BBC: Words Of Faith. See M 1209.
1211 Radio Moscow: News And Views. See S 0011.
1215 BBC: New Ideas. See M 1615.

John Carson of Norman, OK, sent this Chilean QSL from Radio Esperanza.

1231 Radio Moscow: Music. See M 0631.
1235 BBC: Talks. See M 1635.
1245 BBC: Sports Roundup. See S 0315.

Thursdays

1209 BBC: Words Of Faith. See M 1209.
1211 Radio Moscow: News And Views. See S 0011.
1215 BBC: Multitrack 2. See W 2330.
1231 Radio Moscow: Jazz Show. ee M 0531.
1245 BBC: Sports Roundup. See S 0315.

Fridays

1209 BBC: Words Of Faith. See M 1209.
1211 Radio Moscow: News And Views. See S 0011.
1215 BBC: Feature. Topical programming.
1231 Radio Moscow: Yours For The Asking. See T 0031.
1245 BBC: Sports Roundup. See S 0315.

Saturdays

1209 BBC: Words Of Faith. See M 1209.
1211 Radio Moscow: News And Views. See S 0011.
1215 BBC: Multitrack 3. See F 2330.
1231 Radio Moscow: Music At Your Request. See M 1231.
1245 BBC: Sports Roundup. See S 0315.

1300 UTC [8:00 AM EST/5:00 AM PST]

FREQUENCIES

1300-1315	South Korea, Seoul	9750na			
1300-1320	Brazil, Radiobras	15445am			
1300-1325	Kenya, Voice of	4935do			
1300-1325	Netherlands	9855eu			
1300-1330	Afghanistan, Kabul	9635as			
1300-1330	Bonaire, TWR Bonaire	11815am	15345am		
1300-1330 mtwhf	Cameroon CRTV Douala	4795do			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1330 as	Finland, YLE	15400na	17880na		
1300-1330 as	Norway	9590eu	25730af		
1300-1330	Swiss Radio Int'l	6165eu	7480as	9535eu	11690as
		12030eu	13635as	15505as	17670as
		21770as			
1300-1330	United Kingdom,BBC London	5965am	6180eu	6190af	6195ca
		9410eu	9515na	9660eu	9740as
		9750eu	9760eu	11750as	11760me
		11820as	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		7180as	15220na	17640va	17705eu
		17790af	17840af	17885af	21470af
		21660af			
1300-1330	USA, VOA Washington	6110as	9760au	11715as	15155au
		15425au			
1300-1350	North Korea	9325eu	9345eu	9640as	13650as
		13650am	15230as	15230am	
1300-1355	Polish Radio Warsaw	6135eu	7145eu	9525eu	11815eu
1300-1400	Australia	5995pa	7240pa	9580pa	11800pa
		11855as	13755as		
1300-1400	Australia, ABC Alice Sprg	2310do			
1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Katherine	2485do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, ABC Tennant Cr	2325do			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955am	17820am		
1300-1400	China, CRI	9715as	11660va	11855na	
1300-1400	Cook Islands	11760pa			
1300-1400	Costa Rica, RFPI	13630na	15030na		
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1300-1400 sa	Eq.Guinea, R.East Africa	9585af			
1300-1400	Ghana, Radio 1, Accra	4915do			
1300-1400	Ghana, Radio 2, Accra	7295do			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400	Nigeria	4990do	7285do		
1300-1400	Nigeria, Voice of	7255af			
1300-1400	Palau, KHBN	9830va			
1300-1400	Papua New Guinea	4890do			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400	Romania, R.Romania Int'l	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, AWR Russia	11855as			
1300-1400	Russia, Radio Moscow	7370va	9640na	9655na	9755na
		9755na	9895na	11655na	11870va
		11985na	11995va	12050na	17830na
1300-1400	Sierra Leone, SLBS	3316do	5980do		
1300-1400	Singapore, SBC1	5010do	5052do	11940do	
1300-1400 vl	South Africa,Radio Oranje	9630do			
1300-1400	Sri Lanka B'casting Corp.	6075as	9720as		
1300-1400 sa	Tanzania	5985af	9684af	11765af	
1300-1400	USA, CSMonitor Boston	9425au	9495am	13625as	13760na
1300-1400 as	USA, CSMonitor Boston	15665eu			
1300-1400	USA, KNLS Anchor Point	7355as			
1300-1400	USA, KTBN Salt Lake City	7510am			
1300-1400	USA, WHRI Noblesville	9465na	11790na		
1300-1400	USA, WJCR Upton, Kentucky		7465na	7490na	
1300-1400	USA, WWCR Nashville	5935na	15690na		
1300-1400	USA, WYFR Okeechobee, FL	5950am	6015am	9705na	11550as
		11830am	13695na	17750na	17760am
1315-1330	Lebanon, Radio Voice of	6549.5			
1320-1400	Jordan	9560eu			
1325-1400 mtwhf	Kenya, Voice of	4935do			
1330-1345	South Korea World News	7275as	11740as		
1330-1357	Canada, RCI Montreal	6150as	9535as	11855na	
1330-1400	Austria, ORF Vienna	11780as	15450as		
1330-1400	Cameroon CRTV Douala	4795do			
1330-1400	Finland, YLE	15400na	17880na		
1330-1400	India, All India Radio	9665as	11760as	15120as	
1330-1400 a	Indonesia,Radio Republik	3385do	6070do		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands	13770pa	17610pa		
1330-1400	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1330-1400	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
		6195ca	7180af	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11820as	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		7180as	17640va	17705eu	17790af
		17840af	17885af	21470af	21660af
1330-1400	USA, VOA Washington	6110as	9760as	15155au	15425au
1330-1400	Uzbekhistan, R.Tashkent	5945as	9540as	15470as	17745as
1330-1400	Vietnam, Voice of	9840as	12020as	15010as	
1345-1400	Vatican Radio	11640au	15090au	17525au	21515au

SELECTED PROGRAMS

Sundays

1311 Radio Moscow: Music And Musicians. See S 0211.
1337 Radio Canada Int'l: Open House. The effect of religion on politics, social justice, and personal relations.

Mondays

1311 Radio Moscow: Top Priority. See S 0511.
1313 Radio Canada Int'l (North America): Open House. See S 1337.
1331 Radio Moscow: Russian By Radio. See S 1531.
1337 Radio Canada Int'l (Asia): Spectrum. A current-affairs magazine, with reports produced by Canadian domestic radio.

Tuesdays

1311 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1313 Radio Canada Int'l (North America): As It Happens. See T 0030.
1331 Radio Moscow: Music. See M 0631.
1337 Radio Canada Int'l (Asia): Spectrum. See M 1337.

Wednesdays

1311 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1313 Radio Canada Int'l (North America): As It Happens. See T 0030.
1331 Radio Moscow: Music. See M 0631.
1337 Radio Canada Int'l (Asia): Spectrum. See M 1337.

Thursdays

1311 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1313 Radio Canada Int'l (North America): As It Happens. See T 0030.
1331 Radio Moscow: Music. See M 0631.
1337 Radio Canada Int'l (Asia): Spectrum. See M 1337.

Fridays

1311 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1313 Radio Canada Int'l (North America): As It Happens. See T 0030.
1331 Radio Moscow: Music. See M 0631.
1337 Radio Canada Int'l (Asia): Spectrum. See M 1337.

Saturdays

1311 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1331 Radio Moscow: Your Top Tune. See S 0331.
1337 Radio Canada Int'l: Arts Canada or Innovation Canada. See S 0407.

English language **shortwave guide**

1400 UTC [9:00 AM EST/6:00 AM PST]

FREQUENCIES

1400-1410	Malawi B'casting Corp.	3381do			
1400-1415	Vatican Radio	15090au	17525au	21515au	
1400-1425	Netherlands	13770pa	17610pa		
1400-1430	Cameroon CRTV Douala	4795do			
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1400-1430 smtwh	Israel, Kol Israel	11587am	11603na	15640na	15650as
		17575eu	17590eu		
1400-1430	Malaysia, RTM Kuching	4950do			
1400-1430	United Kingdom,BBC London	6190af	6195af	6195as	7180as
		9410eu	9515na	9660eu	9740as
		9750eu	9760eu	11750as	11820as
		11940af	12095eu	15070eu	15220na
		15310as	15575me	17640va	17705eu
		17790af	17840na	17880af	21470af
		21660af			
1400-1500	Australia	5995pa	7240pa	9540pa	9580pa
		9770va	11800pa	11855pa	
1400-1500	Australia, VLW6 Wanneroo,	6140do			
1400-1500	Cameroon CRTV Yaounde	4850do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955am	17820am		
1400-1500	China, CRI	7405as	11815as	11855na	15165as
1400-1500	Cook Islands	11760pa			
1400-1500	Costa Rica, RFPI	7375na	13630na	15030am	
1400-1500	Finland, YLE	15400na	21550na		
1400-1500	France, RFI Paris	11910as	17650as	17695as	
1400-1500	Ghana, Radio 1, Accra	4915do			
1400-1500	Ghana, Radio 2, Accra	7295do			
1400-1500	India, All India Radio	9665as	11760as	15120as	
1400-1500 varies	Italy, IRRS Milan, Italy	7125eu			
1400-1500	Japan NHK	9535va	11815na		
1400-1500	Jordan	9560eu			
1400-1500 mtwhf	Kenya, Voice of	4935do			
1400-1500	Lebanon, King of Hope	6280me			
1400-1500	Malaysia, RTM Radio 4	7295do			
1400-1500	Malta, V. of the Medit.	11925eu			
1400-1500	Nigeria	4990do	7285do		
1400-1500	Nigeria, Voice of	7255af			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow	6065as	7170as	7260as	7330as
		7345as	7370va	7370as	7380as
		9705va	9755na	11995na	12015va
		15490va	15580va	17670na	17695va
		17810va	21690na		
1400-1500	Sierra Leone, SLBS	3316do	5980do		
1400-1500	Singapore, SBC1	5010do	5052do	11940do	
1400-1500 vl	South Africa,Radio Oranje	9630do			
1400-1500	South Korea, Seoul	9570as			
1400-1500	Sri Lanka B'casting Corp.	6075as	9720as		
1400-1500 sa	Tanzania	5985af	9684af	11765af	
1400-1500	USA, CSMonitor Boston	9530as	13625as	13760am	15665eu
		17555am			
1400-1500 sa	USA, CSMonitor Boston	13710na			
1400-1500	USA, KTBN Salt Lake City	7510na			
1400-1500	USA, VOA Washington	6110as	9760as	15160au	15425au
1400-1500	USA, WHRI Noblesville	9465na	15105na		
1400-1500	USA, WJCR Upton, Kentucky		7465na	7490na	
1400-1500	USA, WWCR Nashville	13845na	15690am		
1400-1500	USA, WYFR Okeechobee, FL	6015am	9705na	11550as	11830am
		17760am			
1405-1430	Finland, YLE	6120va	6155eu	9730af	11755eu
		11820va	15440me	17880eu	
1415-1425	Nepal, Kathmandu	3230do	5005do	7165do	
1415-1429	Canada, RCI Montreal	11935eu	15305eu	15315eu	15325eu
		17795eu	17820eu	21545eu	
1415-1500	Bhutan Broadcasting Svc	5023do			
1430-1500	Albania, Radio Tirana	7155eu	9760eu		
1430-1500 mtwhfa	Cameroon CRTV Douala	4795do			
1430-1500	Ecuador, HCJB Quito	11925am	17890am	21455am	
1430-1500	Iraq	15240as			
1430-1500	Myanmar, Voice of, Burma	5990do			
1430-1500	Netherlands	9895as	13770as	15150as	17610as
1430-1500	Romania, R.Romania Int'l	11775as	15335as	17720as	
1430-1500	United Kingdom,BBC London	6180eu	6190af	6195as	9410eu
		9515na	9740as	9750eu	9760eu
		11750as	11820as	11940af	12095eu
		15070va	15310as	15575me	17640va
		17705eu	17790af	17840va	17880af
1430-1500	United Kingdom,BBC London	7180as	15260na	21470af	21660af
1430-1500 **NEW**	USA, KJES New Mexico ****	11715na			
1445-1500 smwha	Mongolia, Ulaanbaatar	7260as	13780as		

SELECTED PROGRAMS

Sundays

1401 BBC: Feature. Topical programming.
1411 Radio Moscow: Science And Engineering. See S 0611.
1413 Radio Canada Int'l: Sunday Morning. A magazine program covering virtually everything under the sun.
1430 BBC: Anything Goes. Bob Holness presents a variety of musical requests.
1431 Radio Moscow: Your Top Tune. See S 0331.

Mondays

1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
1411 Radio Moscow: Moscow Mailbag. See S 0111.
1430 BBC: Off The Shelf. See M 0430.
1431 Radio Moscow: Audio Book Club. See S 0131.
1445 BBC: Talks. See S 0445.

Tuesdays

1405 BBC: Outlook. See M 1405.
1411 Radio Moscow: Newmarket. See T 0311.
1430 BBC: Off The Shelf. See M 0430.
1431 Radio Moscow: Music. See M 0631.
1445 BBC: Feature. See M 0145.

Wednesdays

1405 BBC: Outlook. See M 1405.
1411 Radio Moscow: Moscow Mailbag. See S 0111.
1430 BBC: Off The Shelf. See M 0430.
1431 Radio Moscow: Russian By Radio. See S 1531.
1445 BBC: Good Books. Recommendations of books to read (except 20th: A Month In The Country, Michael Hayes' wanderings of rural Britain).

Thursdays

1405 BBC: Outlook. See M 1405.
1411 Radio Moscow: Culture And The Arts. See S 1111.
1430 BBC: Off The Shelf. See M 0430.
1431 Radio Moscow: Audio Book Club. See S 0131.
1445 BBC: Recording Of The Week. See M 0615.

Fridays

1405 BBC: Outlook. See M 1405.
1411 Radio Moscow: Moscow Mailbag. See S 0111.
1430 BBC: Off The Shelf. See M 0430.
1431 Radio Moscow: Russian By Radio. See S 1531.
1445 BBC: Global Concerns. See F 0145.

Saturdays

1401 BBC: John Peel. See T 0330.
1411 Radio Moscow: Newmarket. See T 0311.
1430 BBC: Sportsworld. Extensive coverage and results of all the weekend's sports.
1431 Radio Moscow: Audio Book Club. See S 0131.

English language

shortwave guide

1500 UTC [10:00 AM EST/7:00 AM PST]

FREQUENCIES

1500-1515 smwha	Mongolia, Ulaanbaatar	7260as	13780as		
1500-1525	Netherlands	9895as	13770as	15150as	17610as
1500-1530 mtwhf	Portugal	21515me			
1500-1530	Romania, R.Romania Int'l	11775as	15335as	17720as	
1500-1530	Swiss Radio Int'l	13635af	15505af	17670af	21770af
		21820me			
1500-1530 sa	Tanzania	5985af	9684af	11765af	
1500-1530	United Kingdom,BBC London	3915as	5975eu	6045eu	6180eu
		6190af	6195eu	6195as	9410eu
		9515na	9740na	9750eu	9760eu
		11750as	11940af	12095eu	15070va
		15310as	15400af	15420af	17840na
		15260na	15575me	17640va	17705eu
		17790af	17860af	17880af	21470af
		21490af	21860af		
1500-1550	Germany, Deutsche Welle	9735af	11965af	13610af	17735af
		17765af	21600af		
1500-1550	North Korea	9325eu	9640af	9977af	13785eu
1500-1555	Seychelles, FEBA	9810as	11685af	15330as	
1500-1600	Australia	5995pa	7240pa	7260pa	9510pa
		9580pa	9770pa	11800pa	11855pa
		13755pa			
1500-1600	Bangladesh	4880do			
1500-1600	Cameroon CRTV Yaounde	4850do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955am	17820am		
1500-1600	China, CRI	7405na	11815as	15165as	
1500-1600	Cook Islands	11760pa			
1500-1600	Costa Rica, RFPI	13630na	15030am		
1500-1600	Ecuador, HCJB Quito	11925am	17890am	21455am	
1500-1600	Ethiopia, Voice of	7165af			
1500-1600	Ghana, Radio 1, Accra	4915do			
1500-1600	Ghana, Radio 2, Accra	7295do			
1500-1600	Guam, KTWR Guam	11650as			
1500-1600	Japan NHK	11865am	15355na		
1500-1600	Jordan	9560eu			
1500-1600 mtwhf	Kenya, Voice of	4935do			
1500-1600	Malaysia, RTM Radio 4	7295do			
1500-1600	Malta, V. of the Medit.	11925eu			
1500-1600	Myanmar, Voice of, Burma	5990do			
1500-1600	Nigeria	4990do	7285do		
1500-1600	Nigeria, Voice of	7255af			
1500-1600	Philippines, FEBC Manila	11995as			
1500-1600	Russia, Radio Moscow	6065na	7170na	7260na	7345na
		7370va	9755na	11665na	11995na
		12050na	13645na	15405na	15485na
		17670na			
1500-1600 twhfa	Seychelles, FEBA	9810as	15330as		
1500-1600	Sierra Leone, SLBS	3316do	5980do		
1500-1600	Singapore, SBC1	5010do	5052do	11940do	
1500-1600 vl	South Africa,Radio Oranje	9630do			
1500-1600	Sri Lanka B'casting Corp.	6075as	9720as		
1500-1600	USA, CSMonitor Boston	9530as	13625as	13760pa	15665eu
		17555am			
1500-1600 sa	USA, CSMonitor Boston	13710na			
1500-1600	USA, KTBN Salt Lake City	15590na			
1500-1600	USA, VOA Washington	6110as	7125as	9645as	9760as
		15395as			
1500-1600	USA, VOA Washington	9700eu	9760eu	15205me	
1500-1600	USA, WHRI Noblesville	9465sa	15105na		
1500-1600	USA, WJCR Upton, Kentucky		7465na	7490na	
1500-1600 vl, irr	USA, RNO New Orleans	15420na			
1500-1600	USA, WWCR Nashville	13845na	15690am		
1500-1600	USA, WYFR Okeechobee, FL		11830am	15215am	
1525-1600 varies	Philippines, R Veritas	15140as			
1530-1540 mtwhfa	Greece, Voice of	15630na	15650na	17525na	
1530-1600	Austria, ORF Vienna	6155eu	11780as	13730eu	21490va
1530-1600	Netherlands	9895as	13770as	15150as	17610as
1530-1600	Sudan Nat'l B'casting Cor	9540do	9550do	11635do	
1530-1600	Switzerland, SRI	15430va			
1530-1600	Tanzania	5985af	9684af	11765af	
1530-1600	United Kingdom,BBC London	6190af	6195eu	6195as	7180as
		9410eu	9740na	9750eu	11750as
		11775na	12095eu	15070va	15260as
		15310as	15400af	17840va	17705eu
		17840na	17880af	21470af	21660af
1545-1600	South Korea World News	7275va			
1545-1600	Vatican Radio	15090au	17865au		

SELECTED PROGRAMS

Sundays

1507 Radio Canada Int'l (North America): Sunday Talk. No details available.
1509 Deutsche Welle: Religion And Society. News and developments concerning the world's major religions.
1511 Radio Moscow: News And Views. See S 0011.
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.
1531 Radio Moscow: Russian By Radio. Russian language lessons for English speakers.
1534 Deutsche Welle: Pop From Germany. A look at the German pop music scene.

Mondays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1511 Radio Moscow: News And Views. See S 0011.
1515 BBC: Feature/Drama. See M 0101.
1531 Radio Moscow: Folk Box. See M 0031.
1534 Deutsche Welle: Monday Special. An interview or report on an event or development with special relevance for Africa.

Tuesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1511 Radio Moscow: News And Views. See S 0011.
1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
1531 Radio Moscow: Music. See M 0631.
1534 Deutsche Welle: Insight. An in-depth feature, giving the background to political events and international developments.

Wednesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1511 Radio Moscow: News And Views. See S 0011.
1515 BBC: Talks. See M 0415.
1530 BBC: Comedy/Drama. A production from the BBC's crack drama team.
1531 Radio Moscow: Jazz Show. See M 0531.
1534 Deutsche Welle: Living In Germany. See M 0116.

Thursdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1511 Radio Moscow: News And Views. See S 0011.
1515 BBC: Classics With Kay. See S 2315.
1531 Radio Moscow: Yours For The Asking. See T 0031.
1534 Deutsche Welle: Spotlight On Sport. Background stories and coverage of important sporting events.

Fridays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1511 Radio Moscow: News And Views. See S 0011.
1515 BBC: Music Review. See H 2315.
1531 Radio Moscow: Music At Your Request. See M 1231.
1534 Deutsche Welle: Economic Notebook. See T 0334.

Saturdays

1509 Deutsche Welle: Africa Highlight. A weekly feature on an important topic concerning Africa.
1511 Radio Moscow: News And Views. See S 0011.
1513 Deutsche Welle: Development Forum. Reports and interviews on projects and progress in Africa and Asia.
1515 BBC: Sportsworld. See A 1430.
1531 Radio Moscow: Ads. See S 0031.
1534 Deutsche Welle: Science And Technology. See M 0234.

English language

shortwave guide

1600 UTC [11:00 AM EST/8:00 AM PST]

FREQUENCIES

1600-1555	Polish Radio Warsaw	7285eu	9525eu	11840eu	
1600-1605	Singapore, SBC1	5010do	5052do	11940do	
1600-1610	Lesotho, Maseru	4800do			
1600-1610	Malawi B'casting Corp.	3381do			
1600-1625	Netherlands	9895as	13770as	15150as	17610as
1600-1630 as	Norway	11875as	15230af		
1600-1630	Pakistan	11570me	13665me	15060me	15550af
		17555af	17725me		
1600-1630	Sweden	15270va	17870na	21500na	
1600-1630	United Kingdom,BBC London	5975as	6190af	6195eu	9410eu
	9515na 9630af	9740me	9750eu	11750as	11940af
	12095eu 15070eu	15400af	17640va	17695eu	17705eu
	17840na 17860af	17880af	7180as	15260na	15310as
	21470af 21660af				
1600-1630	USA, VOA Washington	6110me	9700eu	11995me	13710eu
		15205me	15225me		
1600-1630	Vietnam, Voice of	9840eu	12020eu	15010eu	
1600-1630	Yemen	5970as	7190as		
1600-1635	Guam, KTWR Guam	11650as			
1600-1640 vl	South Africa,Radio Oranje	9630do			
1600-1640	Vatican Radio	15090au	17865au		
1600-1645	UAE Radio, Dubai	11795af	13675eu	15320eu	21605eu
1600-1650	Germany, Deutsche Welle	6170as	7225as	9690as	9875as
		11785as	15105as	15595as	
1600-1700	Australia	5995pa	6060pa	9510pa	9580pa
	11800pa	11855pa	11880pa	13755as	13755pa
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, CRI	11575af	15130af	15170af	
1600-1700	Cook Islands	11760pa			
1600-1700	Costa Rica, RFPI	7375na	13630na	15030na	
1600-1700	France, RFI Paris	6175eu	11705af	12015af	15530me
		17620af	17795af	17850af	
1600-1700	Ghana, Radio 1, Accra	4915do			
1600-1700	Ghana, Radio 2, Accra	7295do			
1600-1700	Guam, KSDA Guam	11980as			
1600-1700 mtwhf	Kenya, Voice of	4935do			
1600-1700	Korea, Seoul	5975om	9870af		
1600-1700	Nigeria	4990do			
1600-1700	Nigeria, Voice of	7255af			
1600-1700	Russia, Radio Moscow	7115na	7170na	7260na	7345va
	7370va 9755na	11995na	12030na	12050na	13645na
	13665va 15375na	15425na	15485na	17670na	17695na
1600-1700	S. Africa, Channel Africa	5960af	15430af		
1600-1700	Saudi Arabia BC Svc	9705eu	9720eu		
1600-1700	Sierra Leone, SLBS	3316do	5980do		
1600-1700	Sri Lanka B'casting Corp.	6075as	9720as		
1600-1700	Swaziland, TWR Swaziland	9600af			
1600-1700	Tanzania	5985af	9684af	11765af	
1600-1700	USA, CSMonitor Boston	11580as	13625as	17510na	21640af
1600-1700 sa	USA, CSMonitor Boston	13710na	17555am		
1600-1700	USA, KSDA Guam	11980as			
1600-1700	USA, KTBN Salt Lake City	15590am			
1600-1700	USA, VOA Washington	9575af	11920af	11995af	15225af
	15410af 15495af	15580af	17650af	17800af	21625af
1600-1700	USA, WHRI Noblesville	9465am	15105am		
1600-1700	USA, WJCR Upton, Kentucky	7465na	7490na		
1600-1700 vl, irr	USA, WRNO New Orleans	15420na			
1600-1700	USA, WWCR Nashville	13845am	15690am		
1600-1700	USA, WYFR Okeechobee, FL	11705na	11830am	15215na	15355am
		17760eu	21615af		
1610-1615 mtwhf	Botswana, Gaborone	5955af	7255af		
1620-1658 mtwhf	Morocco, Rabat	17595as			
1630-1657	Canada, RCI Montreal	7150as	9555as		
1630-1700	Ecuador, HCJB Quito	15270me	17790me	21455me	21480om
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700 mtwhf	Portugal	21515me			
1630-1700	United Kingdom,BBC London	5975as	6190af	6196eu	9410eu
	9515na 9630af	9740me	11750as	11940af	12095eu
	15070eu 15260na	15310as	15400af	15420af	17640va
	17695eu 17860af	17880af	21470af	21660af	
1630-1700	USA, VOA Washington	6180eu	9700eu	9760me	11710me
		15205me	15245me		
1635-1700 s	Guam, KTWR Guam	11650as			
1650-1700 smtwhf	New Zealand, RNZI	9670pa			

SELECTED PROGRAMS

Sundays

1600 KSDA, Guam: AWR Magazine. See S 0200.
1607 Radio Canada Int'l (North America): Centerpoint. No details.
1609 Deutsche Welle: Arts On The Air. See S 1109.
1611 Radio Moscow: Top Priority. See S 0511.
1615 BBC: Feature. See S 0230.
1615 KSDA, Guam: DX Asiawaves. See S 0215.
1630 KSDA, Guam: Power To Cope. Advice for problems.
1631 Radio Moscow: Africa As We See It. See S 0631.
1634 Deutsche Welle: German By Radio. See S 0134.
1637 Radio Canada Int'l: Inside Track. See S 0000.
1645 BBC: Letter From America. See S 0615.

Mondays

1600 KSDA, Guam: Music Scrapbook. See S 2300.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1611 Radio Moscow: Culture And The Arts. See S 1111.
1615 BBC: New Ideas. Technology, innovations, new products.
1615 KSDA, Guam: Bible In Living Sound. See S 2315.
1630 KSDA, Guam: Greatest Story Ever Told. See M 0030.
1631 Radio Moscow: Africa As We See It. See S 0631.
1634 Deutsche Welle: Asia-Pacific Report. Correspondents' reports, interviews, and background news.
1635 BBC: Talks. "Whatever Happened To+?" (4th).
1637 Radio Canada Int'l: Spectrum. See M 1337.
1645 BBC: The World Today. International topics.
1645 KSDA, Guam: Voice Of Prophecy. See S 0030.

Tuesdays

1600 KSDA, Guam: Music Scrapbook. See S 2300.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1611 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1615 BBC: Megamix. See T 1130.
1615 KSDA, Guam: Bible In Living Sound. See S 2315.
1630 KSDA, Guam: Greatest Story Ever Told. See M 0030.
1631 Radio Moscow: Africa As We See It. See S 0631.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1637 Radio Canada Int'l: Spectrum. See M 1337.
1645 BBC: The World Today. See M 1645.
1645 KSDA, Guam: Voice Of Prophecy. See S 0030.

Wednesdays

1600 KSDA, Guam: Music Scrapbook. See S 2300.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1611 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1615 BBC: Rock/Pop Music. See T 0630.
1615 KSDA, Guam: Bible In Living Sound. See S 2315.
1630 KSDA, Guam: Greatest Story Ever Told. See M 0030.
1631 Radio Moscow: Africa As We See It. See S 0631.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1637 Radio Canada Int'l: Spectrum. See M 1337.
1645 BBC: The World Today. See M 1645.
1645 KSDA, Guam: Voice Of Prophecy. See S 0030.

Thursdays

1600 KSDA, Guam: Music Scrapbook. See S 2300.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1611 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1615 BBC: Network UK. Issues and events affecting the UK.
1615 KSDA, Guam: Bible In Living Sound. See S 2315.
1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
1631 Radio Moscow: Africa As We See It. See S 0631.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1637 Radio Canada Int'l: Spectrum. See M 1337.
1645 BBC: The World Today. See M 1645.
1645 KSDA, Guam: Voice Of Prophecy. See S 0030.

Fridays

1600 KSDA, Guam: Music Scrapbook. See S 2300.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1611 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1615 BBC: Science In Action. News about science and technology.
1615 KSDA, Guam: Bible In Living Sound. See S 2315.
1630 KSDA, Guam: Greatest Story Ever Told. See M 0030.
1631 Radio Moscow: Africa As We See It. See S 0631.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1637 Radio Canada Int'l: Spectrum. See M 1337.
1645 BBC: The World Today. See M 1645.
1645 KSDA, Guam: Voice Of Prophecy. See S 0030.

Saturdays

1600 KSDA, Guam: Micronesian Snapshots. News and culture.
1609 Deutsche Welle: International Talking Point. See S 0419.
1611 Radio Moscow: Focus On Asia And The Pacific. See T 0111.
1615 BBC: Sportsworld. See A 1430.
1615 KSDA, Guam: DX Asiawaves. See S 0215.
1623 Deutsche Welle: Development Forum. See A 1513.
1630 KSDA, Guam: Digging Up The Past. See S 0230.
1631 Radio Moscow: Africa As We See It. See S 0631.
1634 Deutsche Welle: Religion And Society. See S 1509.
1637 Radio Canada Int'l: As It Happens. See T 0030.
1645 KSDA, Guam: Probe. See S 0245.

English language

shortwave guide

1700 UTC [12:00 PM EST/9:00 AM PDT]

1700-1705	Ghana, Radio 2, Accra	7295do			
1700-1710	Cameroon CRTV Bafoussam		4000do		
1700-1728	Sierra Leone, SLBS	3316do	5980do		
1700-1730 mtwhf	Canada, RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17820eu	21545eu		
1700-1730 as	Norway	9655eu			
1700-1730	Russia, AWR Russia	12030as			
1700-1730	Sri Lanka B'casting Corp.	6075as	9720as		
1700-1730	Swaziland, TWR Swaziland	3200af	9520af		
1700-1730	Swiss Radio Int'l	13635af	15430af	17635af	21770af
1700-1730	United Kingdom,BBC London	9515na	15260na	17895af	21470af
		21660af			
		3915as	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9630af
		9740eu	11750as	11775na	12095eu
		15070eu	15310as	15400af	15420af
		17640va	17695eu	17860af	17880af
1700-1730	USA, VOA Washinton	3980eu	6040me	9575af	9700eu
		9760me	11920af	11995af	13710af
		15205me	15390af	15410af	15445af
		15495af	15580af	17650af	17800af
		21625af			
1700-1750	North Korea	9325eu	9640af	9977af	11705eu
1700-1800	Algeria, R. Algiers	17745na			
1700-1800	Australia	5995pa	6060pa	6080pa	7240pa
		7260pa	9580pa	11880pa	11910pa
		13755pa	13755as		
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, CRI	4130af	8260af	9570af	11575af
		15345af			
1700-1800	Cook Islands	11760pa			
1700-1800	Costa Rica, RFPI	7375na	13630na	15030na	
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	21480na
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 sa	Eq.Guinea, R.East Africa	7190af			
1700-1800	Ghana, Radio 1, Accra	4915do			
1700-1800	Guam, KSDA Guam	13720af			
1700-1800 varies	Italy, IRRS Milan, Italy	7125eu			
1700-1800	Japan NHK	7140as	9535na	11815na	15210me
		15345me			
1700-1800 mtwhf	Kenya, Voice of	4935do			
1700-1800 smtwhf	New Zealand, RNZI	9675pa			
1700-1800	Nigeria	3326do	4990do		
1700-1800	Nigeria, Voice of	7255af			
1700-1800	Pakistan	11570eu	15550eu		
1700-1800	Russia, Radio Moscow	7115as	7170as	7260as	7345as
		9755va	12050na	13645na	13665va
		15375na	15375na	15425na	15510na
		15580na	17670na	17695na	17710na
1700-1800	S. Africa, Channel Africa	5960af	15430af		
1700-1800	Saudi Arabia BC Svc	9705eu	9720eu		
1700-1800	Tanzania	5985af	9684af	11765af	
1700-1800	USA, CSMonitor Boston	11580as	13625as	17510na	21640af
1700-1800 sa	USA, CSMonitor Boston	13710na	17555am		
1700-1800	USA, KTBN Salt Lake City	15590am			
1700-1800	USA, VOA Washinton	6110as	7125as	9645as	15395as
1700-1800	USA, WHRI Noblesville	13760am	15105am		
1700-1800	USA, WJCR Upton, Kentucky		7465na	7490na	
1700-1800 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
1700-1800	USA, WWCR Nashville	13845na	15690na		
1700-1800	USA, WYFR Okeechobee, FL		21500va		
1706-1800	Ghana, Radio 2, Accra	3366do			
1715-1730	Cameroon CRTV Beau	3970do			
1715-1730	South Korea World News	7550as	15575as		
1715-1730	Vatican Radio	6245eu	7250eu	9645me	
1715-1745	United Kingdom,BBC London	9560ca	21660ca		
1728-1800	Sierra Leone, SLBS	3316do			
1730-1745 a	Cameroon CRTV Douala	4795do			
1730-1800 a	Latvia, Radio Riga	5935eu			
1730-1800	Netherlands	6020af	9605af	21515af	21590af
1730-1800	Romania, R.Romania Int'l	15340af	15365af	17745af	17805af
1730-1800	Swaziland, TWR Swaziland	3200af			
1730-1800	United Kingdom,BBC London	3255af	3915as	5975as	6005af
		6180eu	6190af	6195eu	9410eu
		9630af	9740me	11775na	12095eu
		15070eu	15260na	15310as	15400af
		15420af	17840va	17695eu	17860af
		17880af	21660af		
1730-1800	USA, VOA Washington	6040eu	9575af	9700eu	9760eu
		11920af	15205me	15410af	15495af
		15580af	17650af	17800af	21625af
1730-1800	Vatican Radio	11625af	15090af	17730af	
1740-1800	Cameroon CRTV Yaounde	4850do			
1745-1800 mtwhfa	Cameroon CRTV Douala	4795do			
1745-1800	India, All India Radio	7412as	9950as	11620as	11860as
		11935as	15080as		
1745-1800 tent	Madagascar,RTV Madagascar		3232do	3286do	5005do

1800 UTC [1:00 PM EST/10:00 AM PDT]

1800-1810	Malawi B'casting Corp.	3381do			
1800-1815	Israel, Kol Israel	11587na	11675eu	15640af	17575va
1800-1825	Belgium, R Vlaanderen	9905eu	17750af		
1800-1825	Netherlands	6020af	9605af	21515af	21590af
1800-1830	Canada, RCI Montreal	13670af	15260af	17820af	
1800-1830	Congo, RTV Congolaise	3265af	4765af		
1800-1830	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
1800-1830	Egypt, Radio Cairo	15255af			
1800-1830	United ingdom,BBC London	3255af	3955eu	5975as	6180eu
		6190af	6195eu	7160me	7325af
		9410eu	9600af	9740me	11750as
		12095eu	15070eu	15310as	15400af
		17640eu	17880af	21660af	
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1800-1840 w	Cameroon CRTV Bertoua	4750do			
1800-1845 mtwhfa	Cameroon CRTV Douala	4795do			
1800-1845	Swaziland, TWR Swaziland	3200af	9600af		
1800-1850 smtwhf	New Zealand, RNZI	9675pa			
1800-1855	Polish Radio Warsaw	7270eu	9525eu		
1800-1900	Argentina,RAE BuenosAires	15345eu			
1800-1900	Australia	5995pa	6010pa	6060pa	6080pa
		7240pa	9580pa	11880pa	11910pa
		12000pa			
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Cameroon CRTV Yaounde	4850do			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Cook Islands	11760pa			
1800-1900	Costa Rica, RFPI	13630am	15030am		
1800-1900 sa	Eq.Guinea, R.East Africa	7190af			
1800-1900	Ethiopia, Voice of	9662af			
1800-1900	Ghana, Radio 1, Accra	4915do			
1800-1900	Ghana, Radio 2, Accra	7295do			
1800-1900	Guam, KSDA Guam	13720as			
1800-1900	India, All India Radio	7412as	9950as	11620as	11860as
		11935as	15080as		
1800-1900 varies	Italy, IRRS Milan, Italy	7125eu			
1800-1900	Ivory Coast, Abidjan	11920af			
1800-1900 mtwhf	Kenya, Voice of	4935do			
1800-1900	Korea, Seoul	15575eu			
1800-1900	Kuwait, Radio Kuwait	13620na			
1800-1900 irreg	Mozambique	3265af	4855af	9618af	
1800-1900	Nigeria	3326do	4990do		
1800-1900	Russia, Radio Moscow	7170as	7260as	9685as	9755va
		9875va	9895va	11630va	11685va
		11745va	11995na	12030na	12050na
		15375va	15425na	15515na	15580va
		17565va	17655va	17695na	17710na
1800-1900	Saudi Arabia BC Svc	9705eu	9720eu		
1800-1900	Sierra Leone, SLBS	3316do			
1800-1900	Tanzania	5985af	9684af	11765af	
1800-1900	USA, CSMonitor Boston	9425pa	13840na	15565eu	21640af
1800-1900 sa	USA, CSMonitor Boston	17555am			
1800-1900	USA, KTBN Salt Lake City	15590am			
1800-1900	USA, VOA Washinton	6040eu	9575af	9700eu	9760me
		11920af	11995af	13710af	15205me
		15410af	15445af	15580af	17650af
		17800af	21625af		
1800-1900	USA, WHRI Noblesville	13760na	17835sa		
1800-1900	USA, WINB Red Lion, Penn.	15295eu			

1800 UTC continued

1800-1900	USA, WJCR Upton, Kentucky		7465na	7490na	
1800-1900	USA, WMLK Bethel, Penna.	9465eu			
1800-1900	USA, WWCR Nashville	13845am	15690na		
1800-1900	USA, WYFR Okeechobee, FL		21500va		
1815-1830	Lebanon, Radio Voice of	6550me			
1815-1900	Bangladesh	9565as	12030as	15255as	
1830-1900	Afghanistan, Kabul	9635am			
1830-1900	Austria, ORF Vienna	5945eu	6155eu	12010me	13730af
1830-1900	Bulgaria, Radio Sofia	6235eu			
1830-1900 as	Canada, RCI Montreal	13670me	15260me	17820me	
1830-1900	Finland, YLE	6120eu	9730af	11755af	15440eu
1830-1900	Iran, Islamic Republic	9022af	15260eu		
1830-1900	Netherlands	6020af	9605af	21515af	21590af
1830-1900	Sri Lanka B'casting Corp.	9720eu	15120eu		
1830-1900	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7325eu	9410eu
		9600af	11750as	11955va	12095eu
		15070eu	15400af	17880af	21660af
1830-1900 WAR	Yugoslavia	6100eu	7200eu		
1833-1900	Ivory Coast, Abidjan	11920af			
1840-1850 mtwhfa	Greece, Voice of	15630af	17525af		
1845-1900	Ghana B'casting Corp.	6130af			
1845-1900	Guinea, RTV Conarky	4900af	7125af		
1845-1900 s	Mali, RTV Mali	4783do	4835do	5995do	7285do
1845-1900	Swaziland, TWR Swaziland	3200af			
1850-1900 smtwhf	New Zealand, RNZI	15120pa			

1900 UTC [2:00 PM EST/11:00 AM PST]

1900-1915	Tanzania	5985af	9684af	11765af	
1900-1920	Brazil, Radiobras	15265eu			
1900-1925	Netherlands	6020af	9605af	21515af	21590af
1900-1930	Canada, RCI	13670af	15260af	17820af	
1900-1930	Iran, Islamic Republic	9022af	15260eu		
1900-1930	Ivory Coast, Abidjan	11920af			
1900-1930	Japan NHK	9640am	11850af	11865va	
1900-1930 s	Lebanon, King of Hope	11530me			
1900-1930 as	Norway	15220va	17730va		
1900-1930	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	7325eu
		9410eu	9600af	9630af	11750pa
		12095eu	15070eu	15400af	17880af
		21660af			
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1900-1945	Cameroon CRTV Yaounde	4850do			
1900-1950	Germany, Deutsche Welle	9765af	11765af	11785af	11905af
		13790af	15350af	17810af	
1900-2000	Australia	5995pa	6060pa	6080pa	7240pa
		7260pa	9580pa	11720pa	11855pa
		11910pa			
1900-2000	Canada, FCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, CRI	9440af	11515af		
1900-2000	Cook Islands	11760pa			
1900-2000	Costa Rica, RFPI	13630am	15030am		
1900-2000	Ecuador, HCJB Quito	15270eu	17790eu	21455eu	21480eu
1900-2000 sa	Eq.Guinea, R.East Africa	7190af			
1900-2000	Ghana B'casting Corp.	6130af			
1900-2000	Ghana, Radio 1, Accra	4915do			
1900-2000	Ghana, Radio 2, Accra	7295do			
1900-2000	India, All India Radio	7412va	9950va	11620va	11860va
		11935va	15080va		
1900-2000 mtwhf	Kenya, Voice of	4935do			
1900-2000	Kuwait, Radio Kuwait	13620na			
1900-2000 s	Morocco, Rabat	11920as			
1900-2000 smtwhf	New Zealand, RNZI	15120pa			
1900-2000	Nigeria	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-2000	Romania, R.Romania Int'l	7145eu	9690eu	9750eu	11940eu
1900-2000	Russia, Radio Moscow	11900va	11995va	12050va	12055va
		12060va	12070na	13645na	13665va
		15180na	15375na	15405na	15415na
		15425na	15500na	15580na	17565va
		17605na	17655va	17695na	17795va
1900-2000	Saudi Arabia BC Svc	9705eu	9720eu		
1900-2000	Sierra Leone, SLBS	3316do			
1900-2000	Spanish National Radio	6130as	9675af	9685eu	9875eu
1900-2000	Sri Lanka B'casting Corp.	9720eu	15120eu		
1900-2000	Swaziland, TWR Swaziland	3200af	3240af		
1900-2000	USA, CSMonitor Boston	9425pa	13840na	15665eu	21640af
1900-2000 sa	USA, CSMonitor Boston	17555am			
1900-2000	USA, KTBN Salt Lake City	15590am			
1900-2000	USA, KVOH Los Angeles	17775sa			
1900-2000	USA, VOA Washington	6040eu	9525as	9575af	9700eu
		9760eu	11710eu	11870as	11920af
		15180au	15205eu	15410af	15445af
		15495af	15580af	17800af	
1900-2000	USA, WHRI Noblesville	13760na	17835na		
1900-2000	USA, WINB Red Lion, Penn.	15295eu			
1900-2000	USA, WJCR Upton, Kentucky		7465na	7490na	
1900-2000	USA, WMLK Bethel, Penna.	9465eu			
1900-2000	USA, WWCR Nashville	13845na	15690am		
1900-2000	USA, WYFR Okeechobee	15355eu	21615af		
1910-1915	Botswana, Gaborone	3356af			
1920-1930	Cameroon CRTV Beau	3970do			
1930-2000	Czechoslovakia	6055eu	7345eu		
1930-2000 fa	Kazakhstan, R. Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
1930-2000	Netherlands	17605af	21590af		
1930-2000	Polish Radio Warsaw	6095eu	6135eu	7145eu	7270eu
		9525eu			
1930-2000	Saipan, KFBS Saipan	9460af			
1930-2000	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	7325eu
		9410eu	9600af	9630af	11750pa
		12095eu	15070eu	15400af	17880af
		21660af			
1935-1945	Togo, RTV Togolaise	5047af			
1935-1955	Italy, RAI, Rome	7275eu	9710eu	11800eu	
1940-2000 smwha	Mongolia, Ulaanbaatar	11850eu	12015eu		
1945-2000	South Korea World News	6135as			
1950-2000	Sudan Nat'l B'casting Cor	9540do	9550do	11635do	
1950-2000	Vatican Radio	5885eu	7250eu		

The staff at Radio Netherlands.

2000 UTC [3:00 PM EST/12:00 PM PST]

2000-2010 mtwhf	Kenya, Voice of	4935do			
2000-2010 w	Malawi B'casting Corp.	3381do			
2000-2010 smwha	Mongolia, Ulaanbaatar	11850eu	12015eu		
2000-2015 mtwhfa	Greece, Voice of	7450eu	9395eu		
2000-2025	Netherlands	17605af	21590af		
2000-2025	Polish Radio Warsaw	6095eu	6135eu	7145eu	7270eu
		9525eu			
2000-2030	Canada, RCI Montreal	5995eu	7235eu	11945eu	13650eu
		15140eu	15325eu	17875eu	
2000-2030	Israel, Kol Israel	9435na	11587eu	11603sa	11675eu
		15640eu	17575eu		
2000-2030	Nigeria, Voice of	7255af			
2000-2030 mtwhf	Portugal	11740eu			
2000-2030	Swiss Radio Int'l	9885eu	9885me	12035me	13635me
		15505me			
2000-2030	United Kingdom,BBC London	3255af	3955eu	5975eu	6005af
		6180eu	6190af	6195eu	7160me
		7180pa	7325eu	9410eu	9600as
		9630af	11750pa	12095eu	15070eu
		15260sa	15340pa	15400af	17880af
		21660af			
2000-2030	Vatican Radio	9645af	11625af	15090af	
2000-2050	North Korea	6576eu	9345eu	9640af	9977af
2000-2100	Australia	5995pa	6060pa	6080pa	7240pa
		9580pa	9860pa	11720as	11910pa
		12000pa			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, CRI	9440af	9920eu	11500eu	11715af
		15170af			
2000-2100	Cook Islands	11760pa			
2000-2100 sa	Eq.Guinea, R.East Africa	7190af			
2000-2100	Ghana, Radio 1, Accra	4915do			
2000-2100	Ghana, Radio 2, Accra	7295do			
2000-2100	India, All India Radio	11935af	15080af		
2000-2100	Indonesia, Voice of	7125as	9675as	11752as	11785as
2000-2100	Kuwait, Radio Kuwait	13620na			
2000-2100	Lebanon, King of Hope	6280me			
2000-2100 smtwhf	New Zealand, RNZI	15120pa			
2000-2100	Nigeria	3326do	4990do		
2000-2100	Russia, R Galaxy , Moscow	11880eu			
2000-2100	Russia, Radio Moscow	12050va	13665na	15375na	15405na
		15425na	15500va	15560na	17605na
		17655va	17695na	17795va	21480na
2000-2100	Saudi Arabia BC Svc	9705eu	9720eu		
2000-2100	Sierra Leone, SLBS	3316do			
2000-2100	Swaziland, TWR Swaziland	3200af	3240af		
2000-2100	USA, CSMonitor Boston	9455as	13625pa	13770am	15665eu
		17510am	17555sa		
2000-2100	USA, KTBN Salt Lake City	15590am			
2000-2100	USA, VOA Washington	6040eu	9700eu	9760eu	11710eu
		13710af	15160eu	15205eu	15410af
		15445af	15495af	15580af	17650af
		17800af	17895af	21485af	21625af
2000-2100	USA, WHRI Noblesville	13760af	17835va		
2000-2100	USA, WJCR Upton, Kentucky		7465na	7490na	
2000-2100	USA, WMLK Bethel, Penna.	9465eu			
2000-2100	USA, WRNO New Orleans	15420na			
2000-2100	USA, WWCR Nashville	13815na	15690na		
2000-2100	USA, WYFR Okeechobee, FL	7355eu	15355na	15566eu	15585eu
		17610na	17750af	21525eu	21615na
2005-2100	Syria, Radio Damascus	12085na	15095na		
2010-2100 sa	Kenya, Voice of	4935do			
2015-2030	Benin, Voice of the Rev.	4870af	5025af		
2025-2045	Italy, RAI, Rome	7235me	9575me	11800me	
2030-2035	Latvia, 1st Programme	5935do			
2030-2100	Canada, RCI	5995eu	7230eu	11945eu	13650eu
		15140eu	15325eu	17875eu	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100 mh	Estonia, Tallinn	5925eu	9560eu		
2030-2100 varies	Georgian Radio, Tbilisi	11760eu			
2030-2100	Korea, Seoul	6480eu	7550af	15575eu	
2030-2100	Sweden	6065va	9655va	17730as	
2030-2100	United Kingdom,BBC London	3255af	3955eu	5975ca	6005af
		6040	6180eu	6190af	6195eu
		7180pa	7325eu	9410eu	11750pa
		12095eu	15070eu	15260sa	15340pa
		15400af	15495	15580as	
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	Bulgaria, Sofia	6235eu			
2045-2100	South Korea World News	5975as			

2100 UTC [4:00 PM EST/1:00 PM PST]

2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2110	Malawi B'casting Corp.	3381do			
2100-2110	Vatican Radio	5885eu	7250eu		
2100-2115	Bulgaria, Sofia	6235eu			
2100-2115	Swaziland, TWR Swaziland	3240af			
2100-2130	China, CRI	3985eu	11715af	15110af	15170af
2100-2130	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
2100-2130	Korea, Seoul	6480eu	7550af	15575eu	
2100-2130	Lebanon, King of Hope	6280me			
2100-2130 smtwhf	New Zealand, RNZI	15120pa			
2100-2130 as	Norway	15180va			
2100-2130 mtwhf	Portugal	15250af			
2100-2130	Sweden	6065va	9655va	17730as	
2100-2130	United Kingdom,BBC London	3255af	3955eu	5975ca	6005af
		6180eu	6195as	7325eu	9410eu
		9590na	11750pa	12095eu	15070na
		15260sa	15340pa	15400af	
2100-2150	Germany, Deutsche Welle	6185as	9670as	9690as	9765as
		11785as			
2100-2200	Australia	5995pa	6060pa	6080pa	11720pa
		11880pa	13705pa	15365as	
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	China, CRI	9920eu	11500eu	15170eu	
2100-2200	Cook Islands	11760pa			
2100-2200	Costa Rica, RFPI	13630na	15030na		
2100-2200 chngabl	Cuba, RHC Havana	17705eu			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200 sa	Eq.Guinea, R.East Africa	7190af			
2100-2200	Ghana, Radio 1, Accra	4915do			
2100-2200	Ghana, Radio 2, Accra	7295do			
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2100-2200	Japan NHK	11815me	11840eu	15430eu	17810as
		17890as			
2100-2200	Nigeria	3326do	4990do		
2100-2200	Romania, R.Romania Int'l	5955eu	7145eu	9690eu	9750eu
		11940eu			
2100-2200	Russia, Radio Moscow	11780na	12040na	12050na	12070na
		13645na	13665na	15355na	15375na
		15405na	15425na	15485na	15500na
		15560na	17605na	17655va	17690na
		17710va	17735va	21480na	21690va
2100-2200	Sierra Leone, SLBS	3316do			
2100-2200	Spanish National Radio	6130eu			
2100-2200	Sri Lanka B'casting Corp.	15120as			
2100-2200	Ukraine, Kiev	5960eu	7250eu	7340eu	9600eu
		9635eu	9865eu	15135na	15570eu
2100-2200	USA, CSMonitor Boston	9455as	13625pa	13770na	15665eu
		17510na	17555sa		
2100-2200	USA, KTBN Salt Lake City	15590na			
2100-2200	USA, VOA Washington	6040eu	9700eu	9760me	11710me
		11870pa	11960me	13710af	15185pa
		15205me	15410af	15495af	15580af
		17650af	17735pa	17800af	17895me
		19261af	21485af	21625af	
2100-2200	USA, WHRI Noblesville	13760am	17835na		
2100-2200	USA, WJCR Upton, Kentucky		7490na		
2100-2200	USA, WMLK Bethel, Penna.	9465eu			
2100-2200	USA, WRNO New Orleans	15420na			
2100-2200	USA, WWCR Nashville	13815am	15690am		
2100-2200	USA, WYFR Okeechobee, FL	7355eu	15566eu	17750af	21525eu
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2130 s	Indonesia, R. Republik	6070do			
2115-2130 mtwhf	United Kingdom,BBC Carib.	15140ca	17715ca		
2115-2200	Egypt, Radio Cairo	9900eu			

2100 UTC continued

2130-2145	Cameroon CRTV Beau	3970do			
2130-2155	Finland, YLE	6120af	11755as	15440eu	
2130-2200	Austria, ORF Vienna	5945eu	6155eu	9870af	
2130-2200	Canada, RCI Montreal	11880af	15150af	17820af	
2130-2200	Ecuador, HCJB Quito	15270eu	17790eu	21455eu	21480eu
2130-2200	Kazakhstan, R. Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
2130-2200 smtwhf	Lebanon, King of Hope	6280me			
2130-2200	Lithuania, Radio Vilnius	9530na	17605na	17690na	
2130-2200	New Zealand, RNZI	17770pa			
2130-2200	Sweden, RS	6165eu	9655pa	11955as	
2130-2200	United Kingdom,BBC Falk.I	13660sa			
2130-2200	United Kingdom,BBC London	3255af	3955eu	5975ca	6005af
		6180eu	6195as	7325eu	9410eu
		9590na	11750pa	12095eu	15070na
		15260sa	15340pa	15400af	
2145-2200	Cameroon CRTV Yaounde	4850do			

2200 UTC [5:00 PM EST/2:00 PM PST]

2200-2125	Belgium, R Vlaanderen	5910eu	9905eu		
2200-2210	Cameroon CRTV Bafoussam		4000do		
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2215	Cameroon CRTV Yaounde	4850na			
2200-2218	Congo, RTV Congolaise	4765do	5985do		
2200-2225	Italy, RAI, Rome	9710as	11800as	15330as	
2200-2229	Yugoslavia, Belgrade	6100eu	7200eu	9505na	
2200-2230	Albania, Radio Tirana	9760eu	11825eu		
2200-2230	Canada, RCI Montreal	5960na	9755na	11705as	11905na
		13670na			
2200-2230 2Russia	China, CRI	9740eu			
2200-2230	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
2200-2230 a	Indonesia,Radio Republik	3385do	4805do		
2200-2230	Swiss Radio Int'l	9810sa	9885sa	12035sa	15570sa
2200-2230 s	USA, KGEI San Francisco	15280sa			
2200-2230	USA, VOA Washington	9530eu	11905me	11960me	15225me
		15445me 1		7885eu	
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2245	USA, WINB Red Lion, Penn.	15185eu	15195eu		
2200-2300	Australia	11720pa	11880pa	13705as	15240pa
		15320pa	15365as	17795pa	
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2300	Cook Islands	11760pa			
2200-2300	Costa Rica, RFPI	13630ca	15030ca		
2200-2300	Cuba, RHC Havana	6180va			
2200-2300 sa	Eq.Guinea, R.East Africa	7190af			
2200-2300	Ghana, Radio 1, Accra	4915do			
2200-2300	Ghana, Radio 2, Accra	7295do			
2200-2300	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, RNZI	17770pa			
2200-2300	Nigeria	3326do	4990do		
2200-2300	Russia, Radio Moscow	15355na	15405na	15410na	15425na
		15485na	17570na	17605na	17655va
		17720va	17735na	21480na	21690na
2200-2300	Sierra Leone, SLBS	3316do			
2200-2300	Singapore, SBC1	5010do	5052do	11940do	
2200-2300	Taiwan, V. of Free China,	17750eu	21720eu		
2200-2300	Turkey, Voice of	9445na			
2200-2300	UAE Radio Abu Dhabi	9605na	11710na		
2200-2300	United Kingdom,BBC London	5975na	6195as	7325am	9410eu
		9570pa	9590na	9915ca	11750sa
		11945as	11955as	12095na	15070na
		15260sa	15340as	15400af	17830as
2200-2300	USA, CSMonitor Boston	9465na	13625as	15405as	15665eu
		17555am			
2200-2300	USA, KTBN Salt Lake City	15590am			
2200-2300	USA, VOA Washington	7120as	9770as	11760as	15185au
		15290au	15305au	17735au	17820au
2200-2300	USA, WHRI Noblesville	13760na	17835sa		
2200-2300	USA, WJCR Upton, Kentucky		7490na		
2200-2300	USA, WRNO New Orleans	15420na			
2200-2300	USA, WWCR Nashville	12160na	13815na	15690na	
2200-2300	USA, WYFR Okeechobee, FL		17610na	17750eu	21525eu
2203-2209	Croatian Radio, Zagreb	6210eu	9830eu	13830eu	
2230-2300 mtwhf	Congo, RTV Congolaise	4765do			
2230-2300	Israel, Kol Israel	9435eu	11567na	11603eu	11675eu
		15640sa	17575eu		
2230-2300	Sweden	6065eu			
2230-2300	USA, VOA Washington	9530eu	11905me	11960me	17885me
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Armenia, Radio Yerevan	11920am	12050am	17660am	
2245-2300	Bulgaria, Sofia	9700na	11720na		
2245-2300	USA, WINB Red Lion, Penn.	15145eu			
2245-2300	Vatican Radio	9600au	11830au	15090au	

English language

shortwave guide

2300 UTC [6:00 PM EST/3:00 PM PST]

FREQUENCIES

2300-2305	Ghana, Radio 1, Accra	4915do			
2300-2305	Ghana, Radio 2, Accra	7295do			
2300-2315	Bulgaria, Sofia	9700na	11720na		
2300-2330	Canada, RCI Montreal	11940sa	15235na		
2300-2330 as	Norway	11795am			
2300-2330	United Kingdom, BBC London	5975na	6175na	6195as	7145as
		9410eu	9570pa	9590na	9915sa
		11750sa	11945as	11955as	12095na
		15070na	15260sa	15280pa	15340pa
		15400af	17830af		
2300-2350	North Korea	11700am	13650am		
2300-2350	Turkey, Voice of	9445na			
2300-0000	Australia	11720pa	11880pa	15240pa	15320pa
		15365as	17795pa		
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000	Cook Islands	11760pa			
2300-0000	Costa Rica, AWR	9725ca	11870ca		
2300-0000	Costa Rica, RFPI	13630na	15030na		
2300-0000	Guam, KSDA Guam	15610as			
2300-0000	India, All India Radio	9910as	11715as	11745as	15110as
		15145as	17830as		
2300-0000	Japan NHK	11735eu	11815am	15195as	17810pa
		17840va			
2300-0000 smtwha	Malaysia, RTM Radio 4	7295do			
2300-0000	New Zealand, RNZI	17770pa			
2300-0000	Russia, Radio Moscow	12050na	15405na	15410na	15425na
		15485na	17560na	17570na	17655na
		17685na	17720va	17735na	17860na
		17890na	21480na	21690na	
2300-0000	S. Africa, Channel Africa	4810af			
2300-0000	Sierra Leone, SLBS	3316do			
2300-0000	Singapore, SBC1	5010do	5052do	11940do	
2300-0000	Thailand	4830as	9655as	11905as	
2300-0000	UAE Radio Abu Dhabi	9605na	11710na		
2300-0000	USA, CSMonitor Boston	9465na	13625as	13770na	15405af
		15665eu	17555af		
2300-0000	USA, KTBN Salt Lake City	15590na			
2300-0000	USA, KVOH Los Angeles	9725am			
2300-0000	USA, VOA Washington	7120as	9770as	11760au	15185au
		15290au	15305as	17735as	17820as
		9530me	11905me	11960eu	17885me
2300-0000	USA, WHRI Noblesville	13760sa			
2300-0000	USA, WINB Red Lion, Penn.	15145eu			
2300-0000	USA, WJCR Upton, Kentucky		7465na	7490na	
2300-0000	USA, WRNO New Orleans	7355na			
2300-0000	USA, WWCR Nashville	12160na	13845na		
2315-0000 unconfm	Iraq, Radio Iraq Int'l	15150na	17740sa		
2330-0000	Australia	17795pa	21740pa		
2330-0000	Austria, ORF	9870sa	13730sa		
2330-0000 as	Canada, RCI Montreal	11940sa	15235sa		
2330-0000	Canada, RCI Montreal	9755am	11730am	13670am	
2330-0000 a	Colombia, R.Nacional	11822.5	17865am		
2330-0000 m	Sri Lanka B'Casting Svc	15425am			
2330-0000	United Kingdom, BBC London	5975na	6175na	6195as	7145as
		7325na	9570pa	9590na	9915sa
		11750sa	11945as	11955as	12095na
		15070na	15260sa	17830as	
2330-0000	Vietnam, Voice of	9840as	12020as	15010as	
2335-2345 smtwhf	Greece, Voice of	7450eu	9425sa	11645sa	
2345-0000	Croatia, Zagreb	5085eu	6210eu	9830eu	13830eu

SELECTED PROGRAMS

Sundays

2300 KSDA, Guam: Music Scrapbook. No details available.
2305 BBC: World Business Review. The previous week's news and upcoming events.
2307 Radio Canada Int'l (Caribbean): Arts Canada or Innovation Canada. See S 0407.
2307 Radio Canada Int'l (Latin America): Quirks And Quarks. See S 0107.
2311 Radio Moscow: Top Priority. See S 0511.
2315 BBC: Classics With Kay. Brian Kay with his choice of classical music.
2315 KSDA, Guam: Bible In Living Sound. Dramatized Bible stories.
2330 KSDA, Guam: Voice Of Prophecy. See S 0030.
2330 Radio Canada Int'l: Double Exposure. A mocking look at the week's top news stories and newsmakers.
2331 Radio Moscow: Audio Book Club. See S 0131.

Mondays

2300 KSDA, Guam: Music Scrapbook. See S 2300.
2305 BBC: World Business Report. The latest news from the markets worldwide.
2311 Radio Moscow: Update. Comments on and in-depth analysis of the latest developments worldwide.
2315 BBC: Talks. Topical programming.
2315 KSDA, Guam: Bible In Living Sound. See S 2315.
2330 BBC: Multitrack 1. Tim Smith presents the smash singles on the UK pop-music charts.
2330 KSDA, Guam: Voice Of Prophecy. See S 0030.
2331 Radio Moscow: Russian By Radio. See S 1531.

Tuesdays

2300 KSDA, Guam: Music Scrapbook. See S 2300.
2305 BBC: World Business Report. See M 2305.
2311 Radio Moscow: Update. See M 2311.
2315 BBC: Concert Hall. See S 1515.
2315 KSDA, Guam: Bible In Living Sound. See S 2315.
2330 KSDA, Guam: Voice Of Prophecy. See S 0030.
2331 Radio Moscow: Audio Book Club. See S 0131.

Wednesdays

2300 KSDA, Guam: Music Scrapbook. See S 2300.
2305 BBC: World Business Report. See M 2305.
2311 Radio Moscow: Update. See M 2311.
2315 BBC: From Our Own Correspondent. See S 0330.
2315 KSDA, Guam: Bible In Living Sound. See S 2315.
2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and competitions.
2330 KSDA, Guam: Voice Of Prophecy. See S 0030.
2331 Radio Moscow: Russian By Radio. See S 1531.

Thursdays

2300 KSDA, Guam: Music Scrapbook. See S 2300.

2305 BBC: World Business Report. See M 2305.
2311 Radio Moscow: Update. See M 2311.
2315 BBC: Music Review. News and views from the world of classical music.
2315 KSDA, Guam: Bible In Living Sound. See S 2315.
2330 KSDA, Guam: Voice Of Prophecy. See S 0030.
2331 Radio Moscow: Audio Book Club. See S 0131.

Fridays

2300 KSDA, Guam: Music Scrapbook. See S 2300.
2305 BBC: World Business Report. See M 2305.
2311 Radio Moscow: Update. See M 2311.
2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
2315 KSDA, Guam: Bible In Living Sound. See S 2315.
2330 BBC: Multitrack 3. The latest on the British pop scene.
2330 KSDA, Guam: Voice Of Prophecy. See S 0030.
2331 Radio Moscow: Top Priority. See S 0511.

Saturdays

2300 KSDA, Guam: Micronesia Snapshots. See A 1600.
2305 BBC: Words Of Faith. See M 1209.
2307 Radio Canada Int'l (Caribbean): Inside Track. See S 0000.
2307 Radio Canada Int'l (Latin America): Coast To Coast. Opinions of Canadians on issues affecting them.
2310 BBC: Book Choice. See W 0425.
2311 Radio Moscow: Top Priority. See S 0511.
2315 BBC: A Jolly Good Show. See T 1515.
2315 KSDA, Guam: DX Asiawaves. See S 0215.
2330 KSDA, Guam: Focus On Living. See A 0215.
2330 Radio Canada Int'l: Arts Canada or Innovation Canada. See S 0407.
2331 Radio Moscow: Russian By Radio. See S 1531.
2345 KSDA, Guam: Probe. See S 0245.

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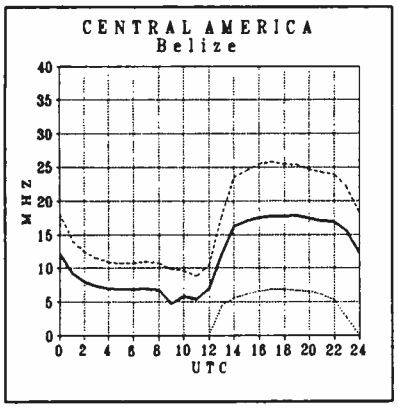
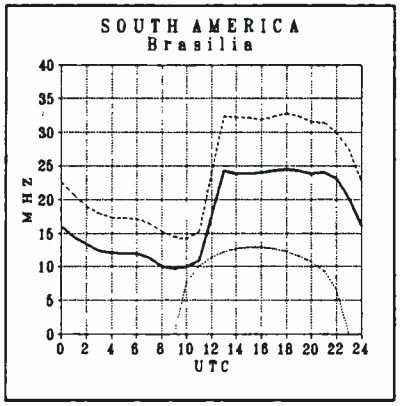
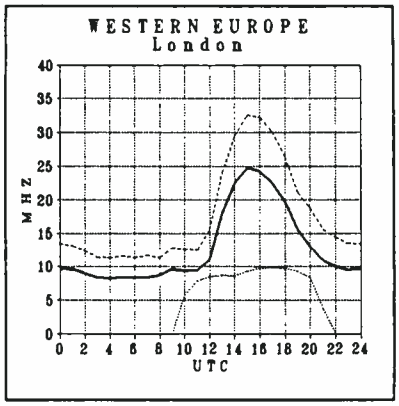
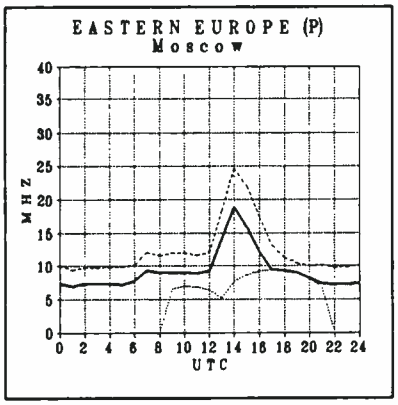
Propagation conditions: Eastern United States

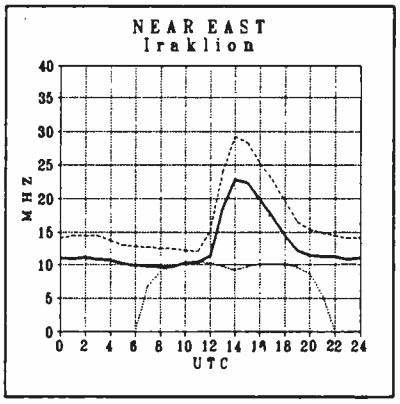
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear. *To provide better propagation coverage to the Mediterranean area, the Near East (Iraklion) has been added and Scandinavia has been dropped.*

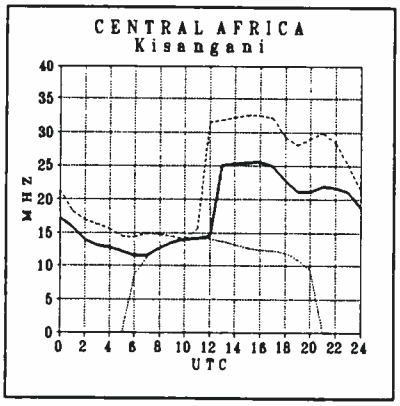


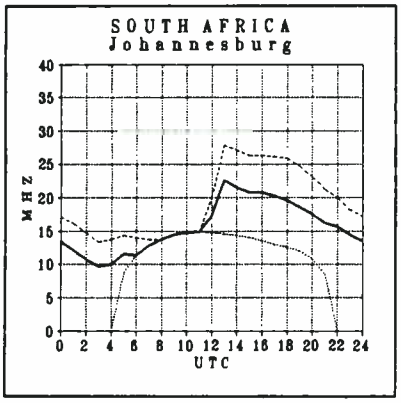


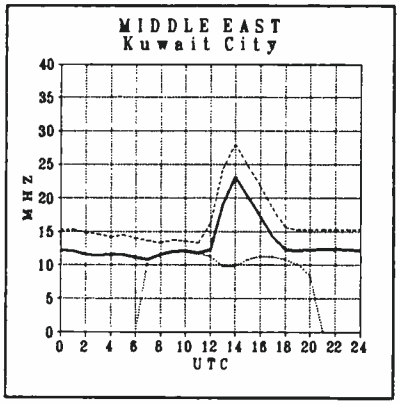


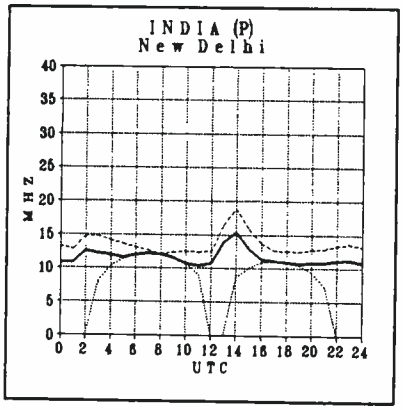


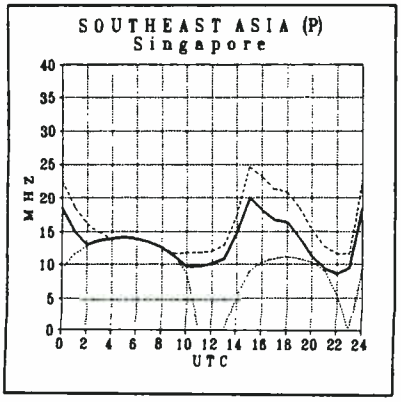


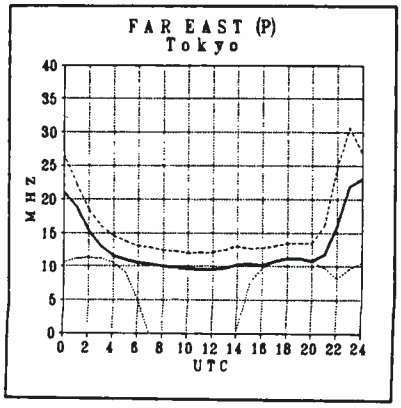


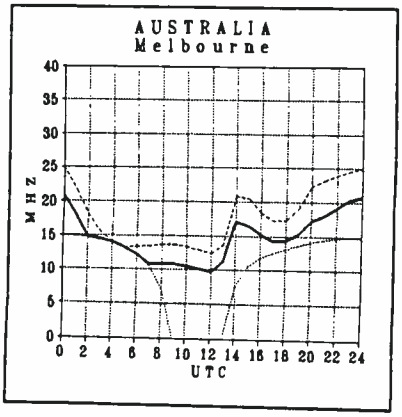






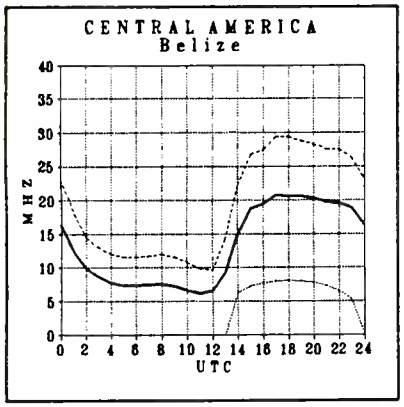


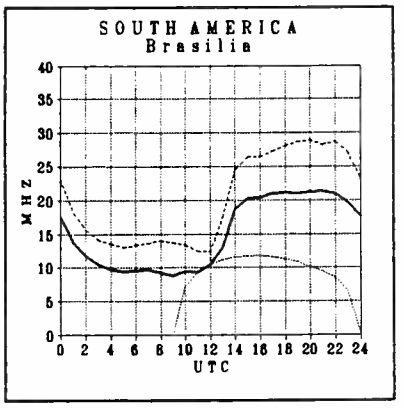


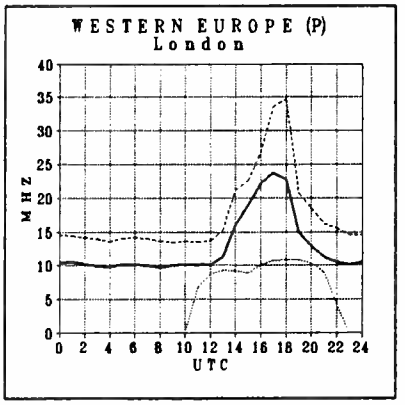


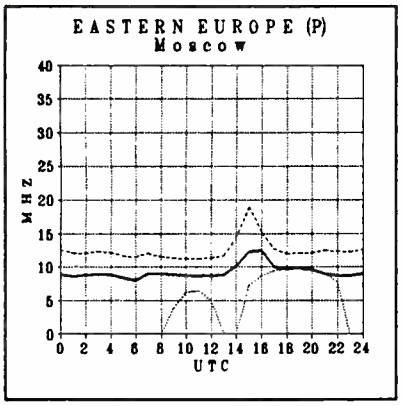
Propagation Conditions: Western United States

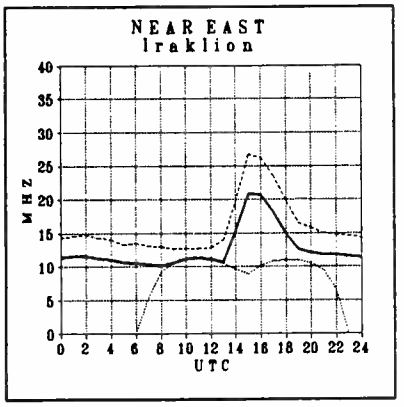
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.

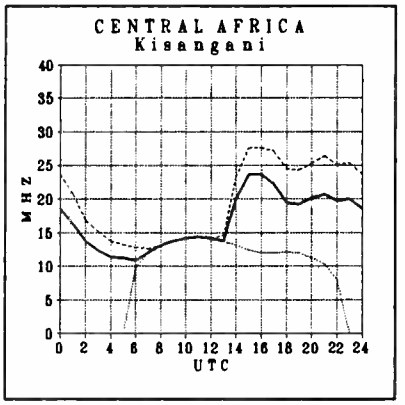


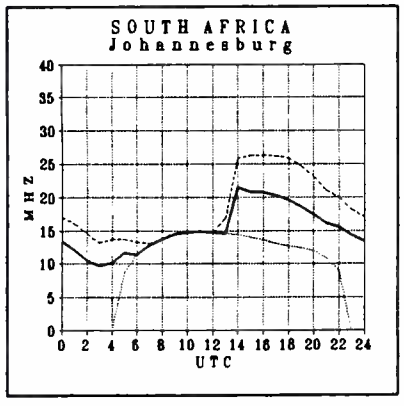


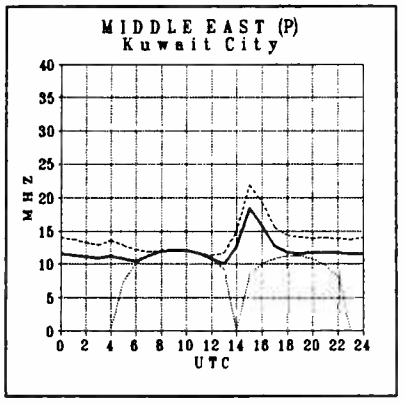


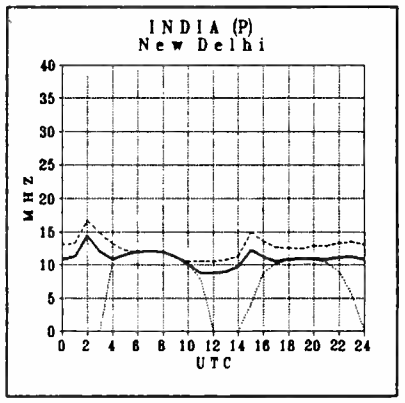


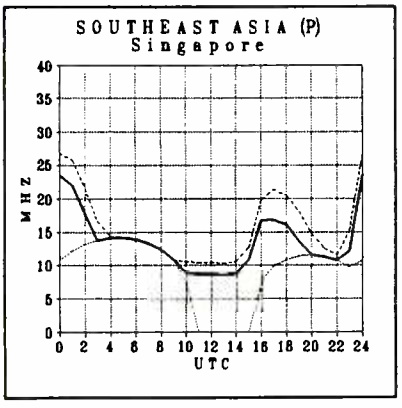


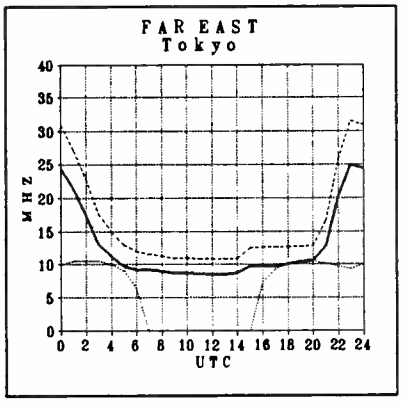


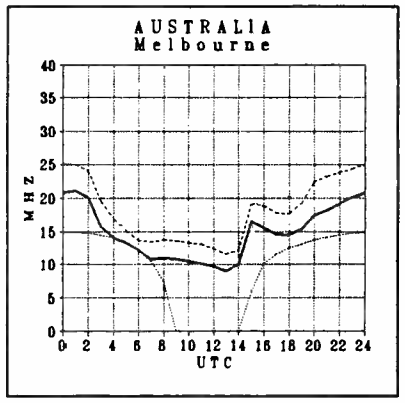






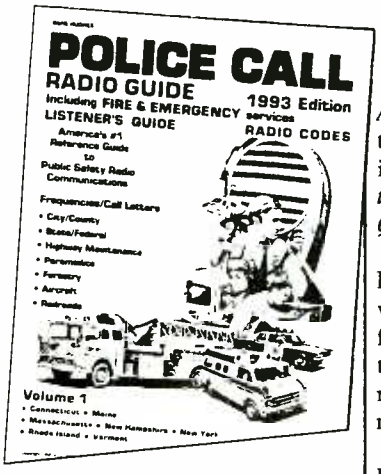






what's new?

Larry Miller



Get a Lift from Police Call

Like a flower blooming in the middle of winter, the 1993 edition of *Police Call* is now available to brighten an otherwise bleak hobby landscape.

The new edition of *Police Call* is, says the publisher, "the biggest ever." There are over 300,000 records compiled in nine regional volumes. Part 1 of each volume lists FCC licensees alphabetically by state. Each record contains data on base station location, frequency, FCC callsign and equipment type (base, mobile, repeater, etc.). Part 2 is a cross-index by frequency.

In addition to the two main parts, there are also sections on frequencies used by the federal government, railroads and aircraft. Each volume begins with a 25-page illustrated "Listener's Guide Book" that explains the basics of modern communications.

The 1993 *Police Call*, edited by Gene Hughes, retails for $9.95 per regional volume and is available from electronics retailers and mail order firms nationwide.

New Ham Radio Videos

CQ Communications, Inc., started out in 1945 publishing *CQ Amateur Radio*. Over the years, they've added eight other titles, including *Popular Communications* and *Communications Quarterly*.

Now, CQ Communications, Inc. returns to its ham radio roots while investing in publishing's future in multi-media. Following the new surge of interest in ham radio, CQ has released four 50-minute VHS videos.

They are: "Getting Started in Ham Radio" which covers the early stages of the new ham's involvement in the hobby; "Getting Started in Amateur Satellites," a down to earth guide to communicating through the various ham satellites now in orbit; and "Getting Started in Packet Radio," which focuses on the nuts and bolts of actually getting on the air and using packet. The fourth video, "Getting Started in DXing" is described as "a springboard for the beginning DXers that also sharpens the skills of the experienced DXer."

These network-quality videos are reasonable priced, just $19.95 each plus $3.50 shipping. To order, visit your favorite ham store or call CQ at 516-681-2922 or write CQ Communications, Inc., 76-MT North Broadway, Hicksville, New York 11801.

Sportrax

Radio can do some amazing things. With all of the new technology that's rushing toward us, it seems that there's no end to uses for the airwaves.

One firm has produced a product that uses radio to get you sports scores — the company calls it "the ultimate sports information tool."

Sports news is distributed via satellite to a network of FM broadcast stations in some 35 major cities across the United States and Canada. The FM stations then transmit the information via their FM sidebands. The specially-tuned Sportrax monitor decodes the information and displays "a never-ending stream of sports results, news, statistics, scores and more" — things like the latest odds, injury updates, relevant weather forecast and more. Included is virtually every event that has ever been labeled as a sport, from college football to golf and tennis.

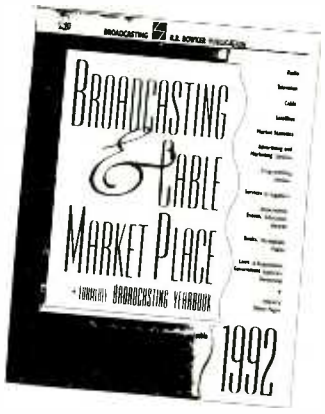
As you might suspect, this marriage of radio technology and information distribution does not come cheap. In fact, you've got to be crazy about sports, almost literally, in order to get Sportrax. The monitor is $495 plus shipping and handling. The annual subscription fee is — sit down, please — $714.00.

For more information, contact Sportrax at 1-800-SPORTING.

Broadcasting and Cable Marketplace

Yes, it's expensive; yes, it's big — a whopping three inches thick to house its nearly 2000 pages. What is it? The most exhaustive reference to domestic broadcasting stations available. AM and FM radio, TV, cable companies, even satellite carriers--they're all included in the annual *Broadcasting and Cable Marketplace*.

How many radio and TV stations are there in New York City? Who is the head of WGGZ in Baton Rouge? When did FUN-AM in Las Vegas first go on the air? What is the format, power, frequency and target audience of KBLA-AM in Santa Monica?



A separate professional yellow pages section lists alphabetically the names, station affiliations and phone numbers of thousands of key personnel in the broadcasting industry.

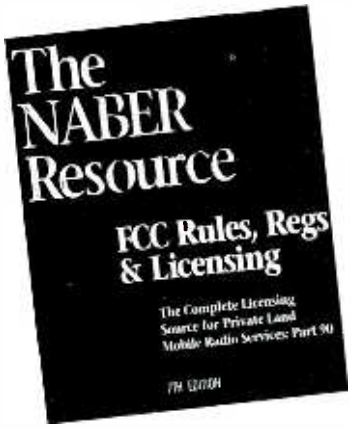
Hundreds of pages under separate chapters list meetings and events, market statistics and services, advertising agencies, programming services, equipment suppliers, FCC broadcasting regulations and law firms.

A broadcasting library in one bound volume would be an appropriate description of this massive missal. *The Broadcasting and Cable Marketplace* is an annual publication; the 1992 edition was $185 from R.R. Bowker, 121 Chanlon Rd., New Providence, NJ 07974.

The Naber Resource

The National Association of Business and Educational Radio (NABER) is the FCC's official coordinator for land mobile radio licensees and applicants. This includes public safety as well as business users of the spectrum.

The NABER Resource is an invaluable encyclopedia of frequency information for scanner listeners, as well as a how-to procedure for prospective licensees who wish to use two-way radio in the Part 90 (land mobile) services.



The majority of this new book is an exhaustive and illuminating reprint of the FCC Part 90 regulations, complete with frequency and user details for the entire VHF/UHF land mobile spectrum, even including details on the new 220-222 MHz allocation.

Step-by-step procedures on filing an application are included along with lists of addresses for FCC offices and coordinators.

The NABER Resource is $22.45 postpaid from NABER, 1501 Duke St., Alexandria, VA 22314.

NYC Scanner Directory

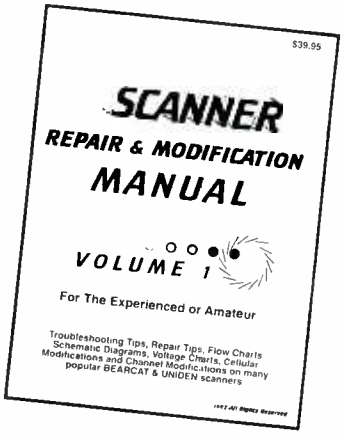
Metro Concepts is a firm that specializes in printing and advertising novelties. Its owner, David Garofalo, is also an avid scanner listener who kept extensive records on his scanning.

"We kept our interest in electronics a hobby until we realized that there was still a wide market for an active frequency listing containing government, military, police, fire, and business frequencies. It seemed natural then," says David, "to publish our list."

The thing that makes the Metro Concepts frequency directory different is that the author lists only the active frequencies in the New York City metropolitan area.

The book is divided into a red section (an alphabetical listing) and a blue section, which contains listings by frequency.

The *Metro New York Area Frequency List* runs about 72 pages (printing on only one side) and is attractive and easy to use. It's affordable at just $12.95 plus 6% sales tax for New Jersey residents (no mention is made of additional shipping charges). To order your copy, write Metro Concepts at 189 Berdan Avenue, Suite 155-MT, Wayne, New Jersey, 07470. Tell them that you read about it in *Monitoring Times*.



Scanner Repair and Modification

For the home repair enthusiast who would rather fix his own scanner than send it in, this new publication will come in handy. Partial schematic diagrams, voltage charts, instructions for memory expansion and cellular frequency restoration, and diagnostics vary depending on the model.

Volume I concentrates on Bearcat models BC210XL, 210XW, 20/20, 140XL, 145XL, 175XL, 147XL, 800XLT and 855XLT. A future release (Volume II) will home in on Cobra and Realistic® brands.

Volume I contains 65 pages, 8-1/2" x 11", and is saddle stitched. The price is $39.95 plus shipping and can be ordered directly from Thomas Distributing, 128 East Wood, Dept. MT, Paris, IL 61944; ph. 217-466-4210.

M-7000 Serial Interface Adapter

The JJ-7000 Serial Interface Adapter plugs into the serial port of your Universal M-7000 RTTY decoder, allowing the machine to store received data to a disk file and also use the system printer. The JJ-7000 is then plugged into your computer.

This handy little device is available for $24.95 plus $5.00 shipping from J&J Enterprises, 4001 Parkway Dr., Bossier City, Louisiana 71112. Their phone number is 318-631-3081.

Scanners Can Live Again!

Gerry Oliver has been repairing scanners for just under 20 years now. He can handle most types of scanner, including even the old crystal jobs, and most types of problems. He also buys old scanners, dead or alive, then either repairs them and resells them as "used" or cannibalizes them for parts.

G&G Communications is a rock solid firm with clear terms and a reputation for satisfied customers. Having problems with your scanner? Looking for a reliable used scanner? Want to unload a unit that you no longer use (or that has died)? Contact G&G and ask to get a copy of their latest flyer. Their address is 9247 Glenwood Drive, Dept. MT, Leroy, New York 14482.

Review

By Chuck Morrison, Engineer for Grove Enterprises

Touchstone

What is it?

Touchstone is EEsof's computer aided simulation and optimization program for linear RF and microwave circuits. It allows circuit designs to be modelled and optimized on computer before breadboards or prototypes are built. Touchstone was designed by professional microwave engineers for professional use; it is probably the most versatile microwave circuit modelling tool on the market.

```
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OPTIMIZED CAPACITOR VALUES
DIM
      FREQ MHZ
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      IND NH
      CAP PF
      LNG MIL
      TIME PS
      COND /OH
      ANG DEG
VAR
      L1=680
      L2=820
      C1/1.97454
      C2/1.77506
      C3/1.72838
      CC1/15.60217
      CC2/18.26998
EQN
CKT
      CAP 1 2 C^C1
      INDQ 2 3 L^L1 Q=35 F=35 MOD=1
      CAP 3 0 C^CC1
      CAP 3 4 C^C2
      INDQ 4 5 L^L2 Q=35 F=35 MOD=1
      CAP 5 0 C^CC2
      CAP 5 6 C^C3
      INDQ 6 7 L^L2 Q=35 F=35 MOD=1
      CAP 7 0 C^CC2
      CAP 7 8 C^C2
      INDQ 8 9 L^L2 Q=35 F=35 MOD=1
      CAP 9 0 C^CC1
      INDQ 9 10 L^L1 Q=35 F=35 MOD=1
      CAP 10 11 C^C1
      DEF2P 1 11 FIL
TERM
PROC
OUT
      FIL DB[S21] GR
      FIL S11 SC2
      FIL DB[S11] GR1A
FREQ
      ESWEEP 80 220 300
GRID
      RANGE 80 220 10
      GR1 -100 0 10
      GR1A -40 0 10
OPT
      RANGE 136 154
      FIL DB[S21]>-2 20
      RANGE 120 128
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      RANGE 165 180
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      RANGE 210 220
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Figure 1: Circuit File

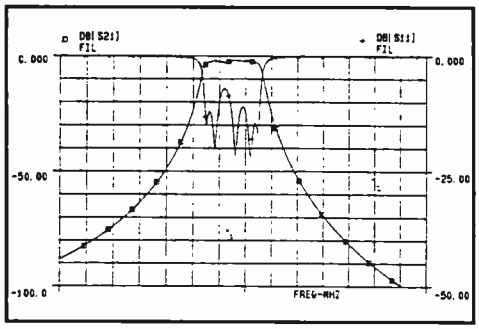

Figure 2

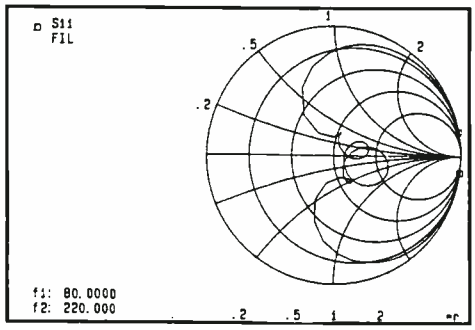

Figure 3

Inputs

The circuit to be analyzed is input by creating a Circuit File (fig. 1). Here the circuit is entered in nodal form; individual circuit elements are entered and each connection between elements is given a node number. More than one separate circuit may be entered per circuit file. In this way, the final circuit may consist of several sub-circuits which are connected together. Also included in the circuit file are the units (ohms or kohms, picofarads or microfarads, etc.), the form of the output data, and the frequencies of analysis. Optional lines in the circuit file include defining relations between circuit elements, defining circuit terminating impedances (default is 50 ohms), defining optimization goals, and defining tolerances on circuit elements.

Circuit files make use of data files containing published or measured data for active devices (transistors, FETs, etc.) These files may be S (most common), Y, Z, H, or G parameters, with or without noise parameters. The Touchstone file format is the industry standard; many manufacturers offer data on their devices in Touchstone format on floppy disk. Data may also be entered directly into Touchstone from a compatible network analyzer through an IEEE-488 bus interface.

Outputs

Touchstone analysis outputs may be presented in either a rectangular grid form (fig. 2), Smith chart form (fig. 3), or tabular form. Available outputs include S-Parameters, impedance, delay, stability, noise figure, voltage gain, and VSWR data. A graphics cursor, mouse controlled, may be used to read out any point on an output curve and display frequency and measurement data. Graphs and tables may be output to a variety of printers and plotters.

Features

Touchstone has several features which separate it from the competition. One such feature is optimization. Design goals and a range of values for each circuit element are entered into the circuit file. Touchstone compares the actual circuit response to the desired circuit response, then varies component values to make the circuit response as close as possible to the desired response. Touchstone won't design your circuit for you, but if you get close, it will take you the rest of the way.

Another feature is yield prediction. Component tolerances and pass/fail criteria are entered into the circuit file. Touchstone will then randomly vary the component values within the tolerance limits, and display the percentage of time the circuit passes the test. In this way designs may be optimized for maximum manufacturing yield.

Perhaps the best feature of Touchstone is the wealth of elements which can be modelled. The current element catalog contains some two hundred fifty pages of element models, including capacitors, inductors, resistors, transistors, op-amps, antennas, coaxial transmission lines, printed circuit transmission lines (microstrip, stripline, and co-planar waveguide), and transformers. Idealized elements and real elements including parasitics and losses are included. The microstrip and stripline models include bends, tees, crosses, and gaps.

Other RF design programs have you calculate the idealized transmission line characteristics from your printed circuit physical dimensions, and then it models them without accounting for non-ideal effects. The effects of bends, crosses, and the like, are usually just guessed at. Touchstone allows you to input the actual physical dimensions of printed transmission line structures. All of the non-ideal effects are accounted for behind the scenes. At the end of the modelling and optimization process, you are left with physical dimensions which can be directly transferred to a printed circuit layout.

Much of the black magic which used to be associated with microwave design is gone; Touchstone allows the modelling of nearly any possible linear circuit element. There is even a model for a printed circuit plated through-hole.

Accuracy

Touchstone's accuracy is superb. Circuit element models are developed by the top engineers and scientists in the industry, and are updated as necessary. Other RF design programs, with their limited element models, still put most of the microwave design effort on the bench. With Touchstone, if you put everything into the model accurately, you can be reasonably confident that what you build will act like what is on the computer. The time that would have been spent tweaking breadboards, without quite understanding how they worked, can now be used for developing ideas.

Manuals

Touchstone comes with two manuals outlining program operation, *a Quick Reference Guide*, and an *Installation Guide*. The manuals contain a full tutorial on program use, example circuit files, optimization examples, and a full catalog of the element models. The *Quick Reference Guide* contains abbreviated descriptions of circuit file entries and element models. The *Installation Guide* contains full instructions on program installation and interfacing with printers, plotters, and network analyzers. All documentation is concise and easy to read, and covers all facets of working with Touchstone.

Support

Full technical support is available through EEsof's telephone, fax, and bulletin board lines. The bulletin board is available 24 hours a day, and provides information on new program offerings, program updates, application notes, and EEsof software training classes. It also provides direct access to EEsof's technical staff and the vast network of EEsof users. Problems and questions are quickly and clearly answered by experts in the field.

Hardware Requirements

Touchstone/DOS runs on IBM and compatible personal computers. The following are required:

- 8088/8086/80286/80386/80486 Processor
- Math Coprocessor
- EGA or VGA video board
- 640 Kbytes conventional memory
- 2 Mbytes expanded memory (requires EMS expanded memory manager program)
- 40 Mbyte hard disk
- Parallel port
- MS-DOS version 3.3 or 5.0
- EEsof software key and EEsof hardware key (the program will not run unless the proper software key file is installed and the proper hardware key is installed on the parallel port.)

Overall

I have used Touchstone almost daily since 1987. It is a tool which is almost indispensable if you do any serious RF design work. The knowledge gained about a design through computer modelling before the first breadboard is built can save weeks of bench work, and the EEsof models are the best in the business.

For more information about Touchstone, or any of EEsof's software products, contact

EEsof Incorporated
5601 Lindero Canyon Road
Westlake Village, CA 91362
(818) 879-6200

Bob Grove, WA4PYQ

Realistic® PRO-39 Handheld Scanner

Yes, at first glance it does look like the PRO-43 and, yes, one might think—erroneously—that it is simply a repackaged Uniden BC200XLT. But there are considerable differences among all three.

The new Realistic® PRO-39 handheld scanner is in a nearly-identical package to the PRO-43 and it has the same function keys. Even the display is identical. But there is where the similarity ends.

Measuring 2-3/4"W x 5-3/4"H x 1-5/8"D and weighing about a half pound, the PRO-39 covers 30-54 MHz FM, 108-137 MHz AM, 137-174 MHz FM, 380-512 MHz FM and 806-960 MHz FM (less cellular—see page 107 for modification).

200 memory channels may be entered into 10 banks; 10 additional "monitor" channels (scratchpad memory of 10 active channels temporarily stored during the search sequence) may be entered into permanent memory later. Scan rate is a brisk 25 channels per second, and searching clips along at 50.

Any channel may be prioritized (sampled every 2 seconds), and any channel may be delayed for 2 seconds before scan resume, or resume immediately after signal dropout.

Memory channels will be retained for up to an hour with the batteries removed. Any number of channels may be temporarily deselected ("lockout") from the scan sequence. A key lock may be switched on to prevent accidental resets of functions while the unit is being carried.

Sensitivity for a 20 dB signal-to-noise ratio is typically 1 microvolt (2 microvolts on aircraft and 800 MHz bands). While this may seem poorer than competitive models, in actual field use you probably won't hear a difference. Not only that, but every dB reduction in sensitivity means a 3 dB reduction in intermod interference—a blessing for metropolitan listeners!

Spurious signal and IF rejection is 50 dB at VHF (UHF not specified). While the PRO-43 utilizes triple conversion, the double conversion superheterodyne design of the PRO-39 uses 10.7 MHz and 455 kHz as its intermediate frequencies. One crystal and one ceramic filter provide adjacent channel selectivity of -6 dB at 20 kHz bandwidth and -50 dB at 40 kHz bandwidth—perfectly adequate for most scanning applications.

Up to 200 milliwatts of audio power is available to the internal 1-3/8" speaker and to the external earphone jack. Standby current drain (audio squelched; no signal present) is a mere 40 milliamperes, substantially less than the 85 milliampere battery drain specified for the PRO-43 and approximately 100 milliamperes for the BC200XLT.

Two separate jacks allow powering the scanner from an external source, or for charging the optional nicad cells (6 AA required). Replaceable alkalines may be chosen as well, allowing long term storage and quick access of the scanner without the necessity of frequent recharging, a real advantage for travelers and reporters.

A plastic belt clip on the back of the radio allows hip-mount convenience and the BNC antenna connector permits attachment of either the included rubber duckie or an external antenna.

The new PRO-39 runs head-on with the popular Uniden BC200XLT which sells for about $60 less and includes batteries and AC adaptor, an actual marketing difference of around $80. But this should not be mistaken for a criticism of the PRO-39 as a product, and its features may be a redeeming factor for its selection over the 200.

The Realistic® PRO-39 handheld scanner is $299.95 from Radio Shack.

MT

Go with the PROs!

REALISTIC® SPECIAL!

Order any of these great radios before 1/31/93 and RECEIVE *FREE SHIPPING!*

PRO-2026 – Only $189.95 and FREE UPS SHIPPING!

Made for Radio Shack by Uniden, the PRO-2026 has the major features of the popular BC760XLT, but is designed for mobile operation only (Bearcat accessories will not work with the PRO-2026).

Frequency range is 29-54, 108-174, 406-512 and 806-956 MHz (less cellular). Any channel may be selected for priority, sampled every few seconds for activity. Factory-preset police, fire, ambulance, aircraft, marine and weather channels may be scanned by pressing the appropriate button when driving in new locations.

PRO-2006 – Only $359.00 and FREE UPS SHIPPING!

Considered by many as the best scanner on the market, this exceptional unit delivers a wide range of frequencies not found on most scanners--including public service, broadcast FM, military bands and CB! Resists strong signal overload interference.

Rapid 26 channel-per-second scan and search compliments this scanner's excellent interference immunity for metropolitan monitoring. Built-in speaker and telescoping antenna are included. Jacks are provided for an external speaker, tape recorder and a DC adaptor.

PRO-43 – Only $299.95 and FREE UPS SHIPPING!

Yes, Realistic® is now leading the market with their new 200 channel, programmable, handheld scanner with increased frequency range: 30-50, 118-174, 220-512 and 806-1000 MHz (less cellular).

Military and civilian aircraft, public safety, amateur, government, maritime, business--all VHF/UHF communications services in a compact 2-1/4"W x 5-3/4"H x 1-1/2"D handheld weighing only 14-1/2 ounces; sturdy belt clip and BNC flex whip included.

Runs on 6 AA alkaline or nicad batteries (ACC47 rechargeable batteries not included). With its fast 25 channels per second scan rate, this triple-conversion scanner is a winning companion.

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Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

•Lowe's Compact SRX-50 Portable
•Forthcoming Models

In North America, Grundig has been turning "world band radio" into a household term. Lowe Electronics has been doing similarly, on a smaller scale, in the United Kingdom. With a growing line of tough, high-quality tabletop and "portatop" models, all designed and made in England, Lowe has come to be known as the value champion of premium shortwave receivers.

Needed: A Lowe-End Model

But there's a rub. While portables such as those from Grundig sell in the hundreds of thousands of units each year, tabletop models from Lowe and others scarcely tickle the thousands column. Why, besides price? Among other things, portables are designed by consumer electronics firms and make sense to ordinary folks. Tabletop models, products of specialized "ham" and maritime manufacturers, come from another planet. Virtually none, for example, so much as receives FM broadcasts, and few even come with built-in antennas. Welcome to 1963!

In order for Lowe to do unto England what Grundig has done unto America, it needs to come up with a more popular product than is found in its conventional tabletop line. The recently introduced HF-150 "portatop" was a step in this direction, but something with far more popular appeal was imperative.

Enter the SRX-50, a compact, digitally tuned portable selling in Britain for £39.95—a bit over $60. Stateside, that's inexpensive. In pricey, taxey Europe, that's rock-bottom cheap.

This radio is no Lowe. Rather, it is another in the long line of Chinese OEM portables that has virtually flooded the world band market since the Gulf War. Lowe, which knows no English-made product can begin to compete with low-cost Chinese models, has simply affixed its name to this unit so that the European public can be introduced to world band radio.

For Europeans Only

In all, they've chosen with care among the offerings from Chinese manufacturers. The SRX-50 has the usual meager means for tuning these Chinese cheapies—five presets (memories) for shortwave, plus a pair of multi-speed up/down slew/scan buttons. Meager or not, it's a vast improvement over the "hunt and peck" approach used by analog models. The SRX-50 covers longwave, used in Europe, plus the usual AM (or "mediumwave," as it's known in Europe) and FM bands, with each band having five discrete presets. Shortwave coverage is only 5900-15500 kHz—a serious limitation for daytime listening in North America, but less so in Europe, where signals tend to come from closer in and thus on lower frequencies.

Another clue that this radio is for Europeans only is found in its AM tuning. American AM stations operate 10 kHz apart, but elsewhere spacing between channels is usually 9 kHz. So, you guessed it—the radio tunes AM only in 9 kHz increments.

Frequency readout is in XX.XXx MHz format. So, say, 15320 kHz reads out as 15.32 MHz, while 15325 kHz as 15.325 MHz. It's unconventional and tends to confuse at first. Yet, it is better than the anachronistic needle-and-dial tuning most low-cost models still use.

Performance Okay for Price

Performance comes as no surprise. The high point is sensitivity to weak signals, which is above average for a cheap Chinese digital portable. In this regard, the SRX-50 runs circles around DAK's $69.90 new DMR-3000.

And while the SRX-50 is reasonably sensitive, its dynamic range is at least adequate. You won't often find your station buried in "overloading" from powerful competing stations—an important consideration in Europe, where strong signals abound.

From there on, though, it's downhill. Selectivity, or adjacent-channel rejection, is poor, with strong signals easily heard on vacant channels 10 kHz away. Indeed, mighty (in North America) WWCR on 7435 kHz can be heard weakly on vacant 7465 kHz! This results more from inferior skirt selectivity than it does from a poorly chosen filter bandwidth, so in practice selectivity is not so bad as it might otherwise seem. So long as stations that could be causing interference to the station you are listening to are not much stronger relative to that station, the radio does a passable job of keeping serious interference at bay.

Image rejection isn't much better, the result of the SRX-50's using low-cost single-conversion circuitry. Signals "repeat" 900 kHz lower down, sometimes causing internally generated interference to the station you're trying to hear. A powerful station on 7110 kHz can bury 6210 kHz in unwanted interference, for example.

This disadvantage does have a silver lining, though. You can actually listen to healthy 19-meter signals located above the radio's upper tuning limit of 15500 kHz. Want to hear WWCR on 15685 kHz, where the SRX-50 "can't" tune? Dial up 14785 kHz, 900 kHz below, and there it is! Of course, the trick won't "extend" the lower tuning range. The Christian Science Monitor on its new channel of 5850 kHz, and the BBC on 5875 kHz, for example, can't be tuned, period.

Longwave, not heard in North America, and AM performance are both quite decent. However, the radio's AM upper tuning limit of 1602 kHz, rather than 1700 kHz, further points to this radio's being intended for Europe, rather than the Americas. FM performance is only adequate, with reasonable sensitivity and a so-so capture radio, but with a tendency to reproduce slop from nearby channels. Although audio quality is reasonable on longwave, AM and shortwave, on FM it's tinny with some audible distortion.

Overall: A Slice Above

Overall, this radio is just about what it's made out to be: a low-cost introduction to world band radio, as well as for use on trips. Warts and all, it's about as good as you can expect in a model with a street price under $100. Currently, it's retailed only in Europe, and without modifications would make little sense in North America.

But keep your eyes open. DAK this year showed that the Chinese can be persuaded to do major redesign to their world band radios, provided enough radios are being ordered. Lowe probably doesn't as yet have the critical sales mass to do this, but, in time, one or more of the world band specialty firms—people who know what they are doing—are likely to commission the Chinese to produce a much better product, likely under $100. Then, watch out!

Two Forthcoming Digital Models from Sangean

Late last year, Sangean indicated it would be introducing its new ATS-606, a smaller version of its popular $259 ATS-808, at less than half the '808's price. At that time, we pointed out, "Common sense tells us that somewhere there has to be a catch."

There is. The radio is due out before long, but at around the *same* price as the '808, not half price. Also due out soon is a shrunken version of the ATS-800, the new ATS-202. The list price hasn't been set as yet, but Sangean is hoping that the street price will be just under $100. Don't expect any surprises, although the '202, unlike the '800, is to come with a 9-10 kHz switch to select AM channel spacing worldwide.

American-Made "Portatop" Announced

In 1991, we gave good marks to a cheap portable from a populist group in Florida, "For The People." The rub is that although For The People openly proclaims in its program over WWCR that buying non-American products is "treason," their radio, sold under the Pomtrex and other labels, was made in no less than the People's Republic of China.

This wouldn't do, so they set off to have a digital world band "portatop" be designed and manufactured in the United States. The result, now reportedly about to be manufactured in the Commonwealth of Pennsylvania, is the $211.95, including shipping, American Electrola Model DXC-100 (For the People, Telford Hotel, 3 River St., White Springs, FL 32096; 800-888-9999). It is to come with a "light oak wood grained" cabinet and is being manufactured in North America—and its publicity claims "shortwave" reception from 100 kHz to 30 MHz, novel considering that the shortwave spectrum begins at 3,000 kHz.

The DXC-100, which uses a horizontal format more typical of portables than tabletop models, is nominally to be dual conversion, with keypad and two-speed knob tuning, plus 60 presets and frequency/presets scanning. Unlike other tabletop and portatop models, it includes FM and a built-in telescopic antenna, with a battery pack as an option for those seeking fully self-contained operation. An outboard 115 VAC adapter is standard, but with the right adapter the radio could operate off foreign voltages, as well.

Tantalizing is its apparent inclusion of a 12/24-hour clock having a sophisticated VCR-type timer with an electronic switch to control an outboard tape recorder, as well as the radio. There is no provision for reception of single-sideband signals, nor apparently are there any tone controls. However, there is a serial (RS-232?) interface for computer control, as well as sleep-off. There is a commendable two-year warranty and, as the radio is of American manufacture, service should not be a problem for Americans.

Unfortunately, the manufacturer's specifications don't tell beans about performance. But never fear—we'll be testing this interesting new model thoroughly it once it has been out long enough for the all-important "shakedown cruise" to be over.

For Americans Only

As the *For the People* newspaper politely puts it, "We are currently requesting USA orders only." Given their nationalist politics it's tempting to wonder whether this isn't rooted in nativist tendencies. Perhaps, but Japanese radios are usually sold first in Japan and Europe before being offered here, and German radios tend to be sold in Europe for months before making it to North American shores. Turnabout, after all, is fair play.

MT

John Catalano

Save a Forest!

Switch From Paper Logs to Computers

An acronym is a word made from the first letter of each of the words in a saying or title. For example, NASA is actually National Aeronautics and Space Administration. There is an acronym that, in my opinion, is not used often enough anymore. That acronym is KISS: Keep It Simple, Stupid. This month we'll look at a piece of software that does just that: helping to keep our listening simple and enjoyable.

With the dark days of winter upon us the need for collecting lists of shortwave station frequencies is greater than ever. But have you ever waited for some special free time on a snowy evening so that you could listen in on the world, only to find that you spent more time tuning around and band changing than listening? A program called DXLOG can help. Very simply put, this program has only one function: to replace a written paper log book. It has no radio tuning capability, no digital decoding (TNC) capability. Let's see what DXLOG version 3.2, from Data Designs in Mobile, Alabama, can do and what is required to use it.

The software is very simply loaded on the most basic IBM compatible with 640K of RAM, any monitor(monochrome is fine/color better), DOS 3.0 or newer and a hard drive of at least 10 Meg. The program is available on either 5.25 or 3.5 inch disk.

"What receiver is required?" I hear you ask. Well, since DXLOG does not control radio or TNC functions, any shortwave radio will do; from an ICOM R71 to the most simple portable—well, almost. No software can make up for radio deficiencies. So just keep your listening expectations in perspective relative to your radio.

Getting Started

Follow the "Getting Started" instructions included with DXLOG and you will have the program on your hard drive in less than five minutes with less than three lines of typing. "Simple" is an understatement! Now type "DXLOG" to bring up the Main Menu with items numbered zero through six, showing the six functions that you can easily and simply use DXLOG to perform. Included with the program is a fairly comprehensive list of international shortwave broadcast stations. This information can be accessed by the user in the DX SCHEDULE function of the program, choice "5", FILE ACCESS, on the main menu, and then number "2", ACCESS DX SCHEDULE, on the next menu.

Now you tell the program what detail of listening you are currently most interested in. This could be any of the following five parameters: Frequency, Time, Station, Country or Language. If you choose Time, the program lists all the stations which are broadcasting at the time you input. The list includes all five of the above parameters for each station. Any of these lists that you create can be sent to a printer for hard copy or to the monitor screen. For this example, using 1300 UTC as our desired TIME, three and a quarter pages of station listings are displayed by the program.

Since you are an informed *MT* reader, you realize that these schedules frequently change, as indicated each month in the "Shortwave Guide." Don't worry; there is a simple solution in the main menu which allows you into the DX SCHEDULES EDITOR. Here additions, changes and deletions are made.

A Hair-Saving Tip

Before you do anything, choose number "6", PACK/REINDEX ALL FILES, from the main menu as indicated (but not highlighted) in the instructions. This makes sure the files are in order and readable by the program. Failure to do this will cause the program to not recognize their existence and will have you tearing your hair in frustration trying to find the "problem." After performing this simple (there's that word again) task, you'll have all the data at your command! This "PACK/REINDEX" should also be performed after editing any files.

Okay. We've seen some of DXLOG's stuff, but what else can it do for us? Well, what functions do paper logs give us? Written log books perform three basic functions:

1. Keeping a record of stations received: Their frequency, time and date, identification/location, signal report and program details.

2. Using the data to re-tune to the stations at later dates.

3. Using the data for writing reception reports.

```
: STATION:                                  COUNTRY:                              :
: DATE:    /  /    FREQUENCY:          kHz. SINPO:        TIME:       ZONE:      :
:  TYPE OF STATION:          TRANS.TYPE:                  LANGUAGE:               :
: PROGRAM DETAILS:                                                                :
:                                                                                 :
:                                                                                 :
:                                                                                 :
:                                                                                 :
: SIGNAL COMMENTS:                                                                :
:                                                                                 :
:                                                                                 :
:                                                                                 :
: DATE RPT. SENT:    /  /        DATE RCVD:    /  /    TYPE QSL:                  :
```

Figure 1

```
:    STATION: BBC                              COUNTRY: UNITED KINGDOM           :
: STREET ADDRESS:                                                                 :
: P.O. BOX:                                                                       :
: CITY:                          ZIP/POSTAL CODES:                    STATE:      :
: ATTN (If a name needed):                                                        :
```

Figure 2

There are, of course, other characteristics of a paper log which I, and I'm sure you, have encountered:

4. Magnets for Coke and coffee spills.

5. Slipped-behind-the-desk wall insulation.

6. Litter basket fillers disguised as loose and irregular pieces of scrap paper with cryptic numbers scratched on the front, back and edges.

Well, DXLOG can do the first three functions simply, easily and provide even more. But you'll have to stick with the paper log to get functions 4,5 and 6.

We've seen how the included list of international shortwave stations can be used; now let's look at starting our own log. Surprise! The same functions (EDITOR and FILE ACCESS) and methods (access via five parameters) that we learned before for the DX SCHEDULE are used again for creating, viewing, printing and modifying your own LOG. It's that simple!

This time, however, you must fill out the entire "file card(s)," Figures 1 and 2. Figure 2 shows the logged station's "Address" card that you can fill out or modify via the ADDRESS BOOK EDITOR. Yep! Same procedure yet again. See all the power you've learned in such a short time?

The control of all of the functions of the program is via the Escape key, the Up/Down arrow keys and the Enter key. The Escape key will get you out of any screen which does not have explicit instruction in how to return to a menu screen. The arrow keys will move you up/down menu choices on different menu screens. The Enter key will move you around the "file card" forms (Figures 1 and 2) that you fill out for each station that you log; going from "file card" sections such as "DATE" to "PROGRAM DETAILS."

Secondary commands which you are prompted to use by the screen instructions are F10, which brings up lists such as stations already logged, and Page Up/Down keys which page through these lists instead of using the arrow keys to go a line at a time. Enough! Too many words make the simple hard.

A Reception Report Servant

DXLOG has shown it can take care of the first two uses of a paper log simply and with so much more flexibility while sorting and re-calling the data. After a few hours of winter listening by the fire and watching the snow fall (or for you in the South, watching the "Snow Birds" driving by), we will have quite a list of loggings; even some new stations. The third use of a paper log is for writing reception reports and hoping for that prized QSL card. Using DXLOG you need only to enter your PERSONAL and EQUIPMENT details; once. Right, this is via the RECEPTION REPORT EDITOR on the main menu.

Now every time you want to produce a reception report, it will be printed automatically by DXLOG after you log in a station. This report will include all the reception details that you have logged and all your personal/equipment details in a well-composed letter. DXLOG even lets you determine your closing salutation such as Sincerely, Regards or even Good-bye Turkey.

Conclusions and Suggestions

One nice use of DXLOG is on a laptop computer along with a small battery-operated shortwave radio. You can move your easy chair to the window, or fireplace or dockside. Unfortunately, on a laptop LCD screen DXLOG does not show the cursor, the place where you are about to enter data. This becomes a real PAIN. The authors should include a setup procedure which allows use on a monochrome LCD screen. If they have included one and I've missed it, then they have violated KISS.

An annoying, but not serious flaw, has to do with returning to previous menu screens. When you do this, instead of the highlight bar going to your previous choice on the screen, it is reset to the first choice at the top of the menu. Learning the "ropes" the first time would be made even simpler if you could re-trace your steps.

Being even more picky, I think that if the menu screens were better formatted they would require less menu searching/scanning.

But even with these comments, DXLOG is structured so that it will become your useful servant and, more importantly, your friend in a few minutes. At $19.95 plus $2.00 shipping and handling, DXLOG is an okay value. DXLOG version 3.2 is available from Data Designs, 210 Yester Oaks Drive, Mobile, AL 36608. Don't forget to specify your floppy disk type.

Now don't misunderstand me: Many of the other programs that have been reviewed in this column have the same, or greater features. Remember though, the purpose this month is simplicity. DXLOG doesn't provide a total monitoring environment, but sometimes even gourmets hunger for a SIMPLE hamburger.

MT

Build a Simple Low-Frequency Converter

This month's "Below 500 kHz" column has a quick introduction to the many interesting signals that reside below the standard broadcast band.

One service you can hear is the low-frequency experimenter's band, found between 160 and 190 kHz. Part 15 of the FCC regulations permits unlicensed low-power operation for those who wish to try their skill. The experimenters (Lowfers, as they call themselves) send out beacon signals that repeat self-assigned call letters, such as the operator's initials. Some years ago when I was an active Lowfer I used "DDM" as my callsign.

The maximum dc input power to the last stage of the transmitter is 1 watt. The antenna cannot exceed 50 feet in length. But these wee signals have been copied over paths that exceed a couple of hundred miles.

You may use any antenna of your choice for receiving the 160-190 kHz signals. The FCC Part 15 rules do not restrict the length of the receiving antenna. The longer the antenna, the better the reception.

But supposing you have a receiver that doesn't cover the low-frequency spectrum? The solution is to extend your coverage with a purchased or a homebrew outboard LF converter.

The Conversion Principle

A converter may be used with a receiver to provide coverage of bands above or below the tuning range of the receiver. The main receiver becomes what is called a "tunable IF (intermediate frequency)." The converter, if crystal controlled, is fixed-tuned with respect to its local oscillator. The band of interest is covered by adjusting the main tuning knob on the receiver. Tunable converters are practical, too. When they are used, the main receiver is set to a fixed frequency and the converter oscillator is tuned to obtain the desired range within the band of interest.

A Simple Low-Frequency Up-Converter

The circuit in Figure 1 is designed to up-convert 100 to 300 kHz by tuning your main receiver between 1.8 and 2.0 MHz (the 160-meter band). The 100-300 kHz spread falls within the 1750-meter band.

The converter operates from 12 volts dc. It draws approximately 25 mA of current. You can borrow the voltage from your solid-state receiver if it has an internal 12-volt power supply. The receiver may have a 12-volt output jack

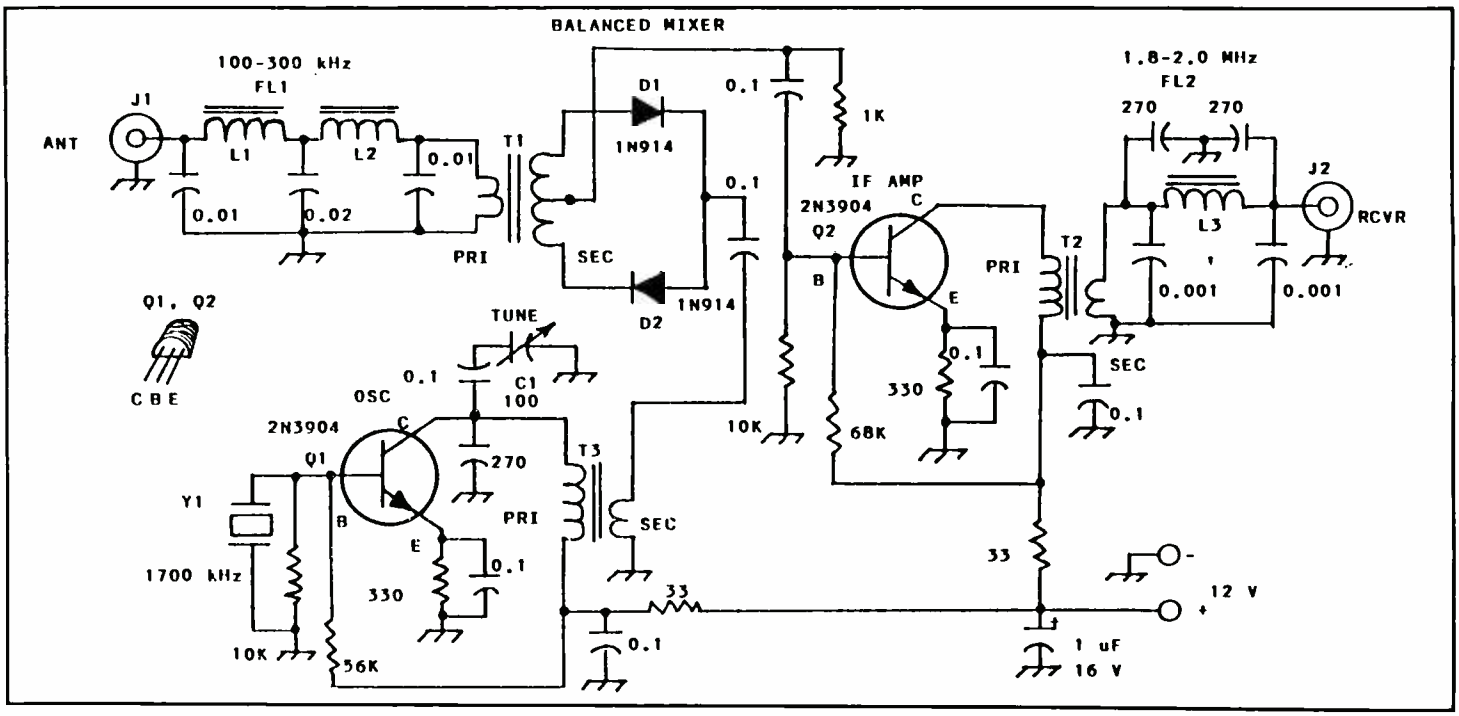


Figure 1: Schematic diagram of the low-frequency converter. All capacitors with decimal values are in uF and are 100-V disc ceramic. Remaining capacitors are in pF and are silver mica, polystyrene or ceramic. Resistors are 1/4-W carbon. K = 1000. Black dots indicate circuit connections.

C1 100 pF trimmer capacitor (see text).
L1, L2 26.5-uH inductor, 40 turns no. 30 enam. wire on an Amidon Assoc. T50-3 toroid core.
L3 3.18-uH inductor. 25 turns of no. 26 enam. wire on an Amidon Assoc. T50-2 toroid.
Q1, Q2 NPN general-purpose transistor, 2N3904, 2N2222, etc.
T1 Secondary has 16 turns of no. 26 enam. wire on an Amidon Assoc. FT-50-43 toroid. Center tap winding at 8 turns. Primary has 8 turns of no. 26 enam. wire wound over all of secondary winding.
T2 Primary has 16 turns of no. 26 enam. wire on same type core as T1. Secondary has 8 turns of no. 26 enam. wire over primary winding.
T3 Primary winding is 28 uH. Use 20 turns of no. 26 enam. wire on an Amidon Assoc. FT-50-61 toroid core. Secondary has 5 turns of no. 26 enam. wire over primary winding.
Y1 Quartz crystal, 1700 kHz fundamental type. See text for source.

on the rear apron. Otherwise, a 12-volt plug-in wall transformer may be used for the converter.

If you are interested in a higher-performance, low-frequency converter, you can find complete details in *QST* for June 1977 (DeMaw, "A High Performance Low Frequency Converter"). It was designed for high dynamic range for those regions where numerous strong signals are present.

How the Circuit Works

FL1 in Figure 1 is a low-pass filter that allows the desired LF signals to pass from the antenna to the mixer. Signals above 300 kHz are attenuated by the filter to help minimize strong-signal overloading.

D1 and D2 function as a simple singly balanced mixer. Energy from oscillator Q1 is applied to the mixer. This 1700 kHz injection voltage mixes with the incoming signals from 100 to 300 kHz to produce an intermediate frequency of 1.8 to 2.0 MHz for your main receiver to detect.

Q2 is an IF amplifier. It boosts the level of the signals that are produced by the mixer. This helps to make weak signals more readable. A single section low-pass filter (FL2) is used between the IF amplifier and the converter output. It keeps the 1700-kHz oscillator signal from passing to the main receiver. If this unwanted energy were permitted to enter the main receiver, it could be strong enough (near 1800 kHz) to desensitize the receiver.

Building the Converter

Inexpensive transistors and diodes are used in the Figure 1 circuit. The toroid cores specified can be obtained by mail from Amidon Assoc., Inc., 2216 E. Gladwick, Dominguez Hills, CA 90220. Y1 is available from JAN Crystals, P.O. Box 06017, Ft. Myers, FL, 33906-6017; 800-526-9825. Other crystal manufacturers can also provide Y1. Check surplus catalogs for this part, too.

C1 is a mica compression trimmer. Any trimmer in the range from 30 to 300 pF may be used. C1 is used to resonate the oscillator tuned circuit to cause Y1 to oscillate.

The converter can be assembled on a piece of perf board. You may wish to try your hand at laying out a PC board for this project. In any event, be sure to keep all leads as short and direct as practicable. Locate the Q1 circuitry as close to D1, D2 and T1 as possible. Use straight-line construction in order to keep FL1 well separated from FL2.

Be sure to observe the polarity of D1 and D2 when connecting them to the circuit. Note that the anode of one is 180 degrees opposite the other diode. The band at one end of the diode indicates which is the cathode end.

Using the Converter

Connect a long antenna (100 feet or greater) to J1. Use a short RG-58 coaxial cable from J2 to the receiver antenna jack. Tune the receiver to 1.9 MHz and apply operating voltage to the converter. You should hear an increase in background noise when the converter is turned on. If there is no increase in the noise, adjust C1 until the noise appears. If Q1 is not oscillating there will be no output from the converter. No other adjustments are necessary.

Some Final Thoughts

Further information about the Lowfers and their activities can be obtained from Ken Cornell, W2IMB, who lives at 225 Baltimore Ave., Point Pleasant Beach, NJ, 08742. He publishes the *Low Frequency Scrapbook*, which contains a wealth of information and simple circuits for low-frequency experimenters.

MT

Bill Cheek

Scanner Frequency Activity Tagger

For the PRO-2004/5/6 and Other Scanners

Greetings, Scanner Fans! A real hot-dawg is in store for you this month, contributed by one of the most dedicated scannists I've ever known and to whom I fondly refer as "Mr. Digital," Mark Persson of NY. Consider this scenario: you load up a few hundred channels with some new frequencies, hit the SCAN button and kick back... to wait... and wait! And then you go get a cold can of something or another and wait some more. After a while, you doze off, daydreaming about something else to do. Suddenly, you hit the ceiling as the scanner's squelch opens and sound blares.

You've got one now! This freq has some activity! Great—it's a keeper. Now you only have to wait for 399 more. About then, you wish you had some way of finding out which freqs are duds and which ones are good without all this miserable waiting. Well, here's a handy, quick and cheap way to tag active channels, ***hands-off***, while you're asleep or at work.

Thanks to a neat little function that already exists in the PRO-2004/5/6 and many other scanners, your job is about half-done. We just have to convolute its intended purpose a little. I'm talking about the lowly ***LOCKOUT*** function.

LOCKOUT in conjunction with the LOCKOUT REVIEW, forms a great team to identify good frequencies by locking out all active, but *only* active, channels. This slick and easy little logic circuit waits for a SQUELCH break and then generates a half-second pulse to activate a single CMOS bilateral switch wired into the keyboard to electronically press the lockout key. The scanner then resumes SCAN until the next squelch break, at which time, that channel gets locked out, too.

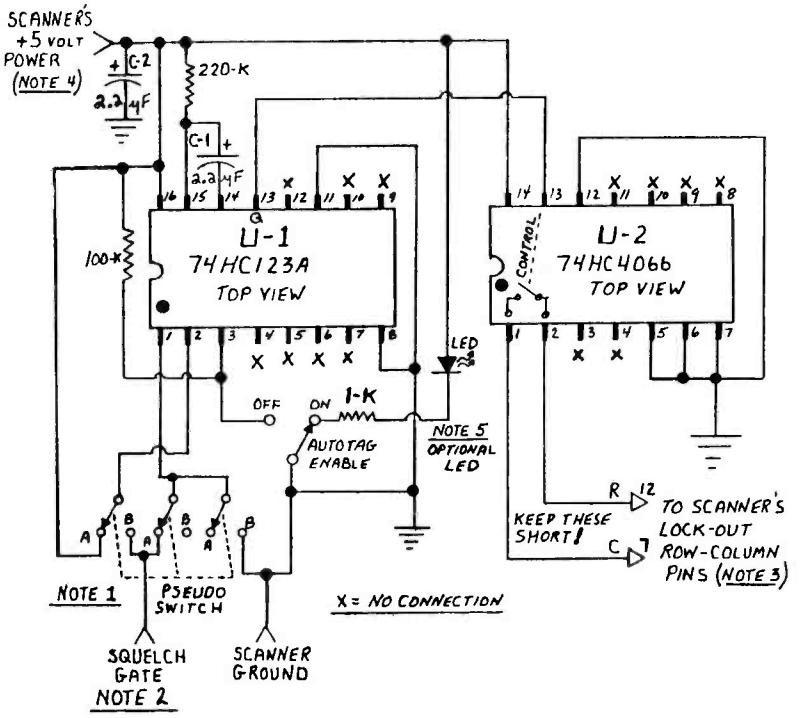
As active channels get locked out, the odds of finding less active channels are increased. You know which ones are busy and you don't have to worry about writing down what's what because they are all tagged with the lockout. Leave the radio on when you're gone and it will still find and tag active freqs. Obviously, you want to start the operation with no channels locked out and let the AutoTagger do the work for you.

Of course, RF, atmospheric burps and other undesired signals that break squelch will also be AutoTagged, but it's easy, later on, to see which ones are intermods and which are truly active.

After an AutoTag session, turn off the AutoTag function, set the scanner to channel 1, and press the lockout review key to quickly scroll through all the tagged active channels. Write them down, or better yet, put them right into your computer database manager so your scanner/computer interface can load them back into your radio in a flash. If you originally put the starting freqs into the computer to have an interface load them, all you have to do is remove the unused freqs; do a sort and you're ready to reload with just the plain good stuff.

The AutoTagger circuit is a snap with only two chips: one half of a "one shot" (74HC123A) and one quarter of a CMOS switch (74HC4066). The Q output of the 74HC123A feeds the control pin of a CMOS bilateral SPST switch which is connected to the two pins of the scanner's keyboard connector that define the lockout function.

AutoTagger Circuit For Most Scanners



AutoTagger Circuit Diagram Notes:

1. PSEUDO-SWITCH: You really don't want to use a switch here as shown! Instead, this scheme depicts the proper wiring of U-1 for PRO-2004/5/6 scanners (Position B) and most all other scanners (Position A). Hard-wire for your particular needs.
2. SCANNER'S SQUELCH GATE: For the PRO-2004, the most convenient point of access is CN-504, pin 9. In the PRO-2005/6, it's CN-3, pin 5. For most other scanners, it's at the NFM/ discriminator chip, usually called the "scan control" pin. See a service manual and/or back issues of the *World Scanner Report*, V1N4, etc. See Note 4
3. TO SCANNER'S LOCKOUT FUNCTION: For the PRO-2004, this is CN-502, pins 7 & 12 and for the PRO-2005/6, it's CN-501, pins 7 & 12. For all other scanners, determine the column and the row in the Keyboard Switch Matrix that govern the LOCKOUT function. Connect pin 1 of U-2 to the appropriate column pin and pin 2 of U-2 to the appropriate row pin.
4. SCANNER's +5v POWER: This must be a point of regulated +5v for the PRO-2004/5/6 and which is the output tab of IC-8. Refer to a service manual for other scanners. You should first measure the level of the squelch gate signal in your scanner. If over 5-volts, (often 7 to 8 volts), then the DC power for this circuit must be taken from the same level source; 8-volts will usually do nicely, and is a common supply voltage in most scanners. The caveat here is that signal levels in CMOS chips cannot exceed the supply voltage by more than 0.5-v.

   On the other hand, signals 33% lower than the DC supply voltage will usually work just fine. In other words, 5-volt logic will usually work okay in chips powered by 7-volts. You would NOT use 7-volt logic in chips powered with 5-volts, however! It's best to use the same DC power level as the logic level. This circuit is not critical, though, and the parts are very inexpensive; less than five bucks for everything.
5. The LED and 1-k resistor are purely optional and frivolous. When the AutoTag Enable Switch is disconnected from pin 3 of U-1, the circuit is ON by virtue of +5v via the 100-k resistor to pin 3. When a ground or low is applied to pin 3, the circuit is disabled and the LED goes off. How convenient! Still, you can eliminate the 1-k resistor and the LED, if you want. The AutoTag Enable Switch can be installed on the rear of the scanner, out of sight and out of mind, nice and easy-like!

The CMOS switch should be very close to the keyboard connector with only 1-1/2" inch wires from U-2, Pins 1 & 2. The other wires can be of any practical length.

A +5v high from the Q output puts a +5v high at the control pin of the switch and makes the switch close. The 1/2-sec pulse comes at the end of the scanner's squelch break to lock out the channel. A number of possible trigger points were tested and the squelch gate was determined to be best. Other points caused two lockout pulses to be created which locked out not only the desired channel, but the next one, too!

The PRO-2004's squelch gate, available at CN-504, pin 9, is high at +5v when squelch is set and low at 0-v when squelch breaks. The PRO-2005/6 are the same as the PRO-2004, but the squelch gate is at CN-3, pin 5.

One note here: the circuit is set up so that when you enable the AutoTag function, it will immediately output a Test Lockout pulse. This is an operational check, so just press the lockout key to remove the test lockout and you're ready to start the AutoTagging operation. Be sure to unlock ALL channels before you start AutoTagging. That's it for this month's circuit, so enjoy to the max!

If You Have Trouble

Especially if the AutoTag function seems to be erratic, add another one (maybe two) 2.2-uF capacitors in parallel with C-1. Otherwise, there is nothing unusual or persnickety about this circuit. If it doesn't work, you've made an error somewhere.

Other Scanners?

Why not? The essential requirement is for the scanner to have a lockout function. The lockout review referred to above, is a proprietary function in the PRO-2004/5/6 and is not available in other scanners. It's not necessary, though, since you can use the MANUAL function to step through the channels to see which have been locked out and which haven't.

Technically speaking, the only difference in this circuit for other scanners is a minor wiring change at pins 1 & 2 of U-1 as shown in the diagram. In all cases, the "contacts" of U-2, the CMOS bilateral switch, should be wired to your scanner's keyboard matrix, the ***one column*** and ***one row*** that's for your lockout key. Study the schematic diagram for your scanner to make this concept clear.

There is a major difference between the squelch gate circuits of the PRO-2004/5/6 and other scanners that you will want to note: Most scanners use an opposite logic gate: low for squelch SET and high for squelch BREAK. No problem with my circuit, but a minor change will be necessary. Refer to the schematic and below for the circuit variations between the PRO-2004/5/6 and most other scanners:

PRO-2004/5/6	MOST OTHER SCANNERS
1. Connect U-1, Pin 2 to the SQuelch Gate (See Note 2 on the schematic diagram)	1. Connect U-1, Pin 2 to scanner +5v supply
2. Connect U-1, Pin 1 to ground	2. Connect U-1, Pin 1 to scanner's Squelch Gate signal. (See Note 2 on schematic.)

NOTE: If the squelch logic in your scanner is +6 to +8v, then be sure to power this circuit with the same levels instead of +5v. 74HC CMOS circuits must always be powered with the same voltage, give or take 0.5v, as the highest signal level.

NOTE: For information about the squelch gate signal location in many scanners, refer to back issues of the *World Scanner Report*, V1N4, V1N7 and V1N9 for detailed data about the all-important NFM-Discriminator Squelch chip, and its logic and pinout for your scanner, or write for more information on various scanner IC chips at P.O. Box 262478-M, San Diego, CA 92196-2478.

Sources of Electronic Parts & Supplies

Active
PO Box 9100
Westborough, MA 01581
800-343-0874

Derf Electronics Corp.
37 Plain Avenue
New Rochelle, NY 10801
800-431-2912 / 914-235-4600

Digi-Key
Highway 32 South / PO Box 677
Thief River Falls, MN 56701
800-344-4539

Parts Express International
340 East First Street
Dayton, OH 45402
800-338-0531 / 513-222-0173

East Tech, Inc.
2917 Bayview Drive
Fremont, CA 94538
800-582-4044 / 800-582-1255

Jameco Electronics
1355 Shoreway Road
Belmont, CA 94002
415-592-8097

Mouser Electronics
11433 Woodside Avenue
Santee, CA 92071
619-449-2222

Please tell these companies you saw them mentioned in *Monitoring Times*.

W. Clem Small, KR6A, CET

A Log-Periodic Dipole Array for 220 to 450 MHz

One limitation of most beams is that they are only useful over a narrow band of frequencies; even multiband beams function well over only two or three narrow bands at most. However, for monitoring we often want general coverage of a very wide band of frequencies, and it would be nice to have a reasonably small beam antenna which would cover this wider range.

The best candidate for such a beam is the log-periodic dipole array (LPDA) which allows designs that cover up to a 10-to-1 frequency range (for example, 100 MHz to 1 GHz). The most broadband form of this antenna is constructed by sloping its elements in the forward direction (direction of maximum signal response). This technique also gives the antenna more gain. Most practical designs yield a bandwidth of 2-to-1 or so: still quite impressive when compared to the bandwidth of most other types of beams.

This month's featured antenna, the LPDA, was designed for use from 220 MHz to 450 MHz. This coverage includes both the 220 MHz and 440 MHz amateur bands as well as a wide stretch of military and federal government frequencies. The beam gives a good account of itself with 6 dB of gain compared to a halfwave dipole or about 8 dB referenced to the isotropic antenna standard.

Although this antenna was designed with monitoring in mind, it should also perform well as a low-power transmitting antenna.

Let's Build One

For this antenna you will need to get 10 ft. of 1/4 in. tubing or copper pipe, 31 in. of number 10 bare copper wire, and 6 in. of number 14 bare copper wire. You will also need a length of 50-ohm, foam dielectric, coaxial cable with a fitting at one end that mates with your radio's antenna socket. Take care to get coaxial cable which will fit inside the tubing you use for the boom, because that is necessary for the construction of the antenna's built-in balun feature (see fig. 1D).

1. Cut the elements from your wire and tubing stock to the lengths shown on the half-beam fig. 1A.

2. Solder the elements to the booms to make two half-beams; the elements are less likely to break off accidentally if you use silver solder rather than ordinary tin-lead solder. During construction of the LPDA, one half-beam is turned top-for-bottom and combined with the other; this makes the complete beam as shown in figs. 1B and 1D.

3. Expose about 3/8 in. of the center connector of the coax which will connect to the antenna; don't trim the braid (shield). To make insertion of the coax into the boom easier, you can trim the outside insulation from 25 in. of the feedline and thread the line into the rear of one of the boom tubes (the rear is the end with the longer elements).

If the beam is to be used outdoors, use some coax-type seal to seal both ends of the boom with the coax in it. Also seal the open end of the coax. Once the coax is through the boom, solder the coax's braid to the end of the boom from which it has just emerged. Then solder the coax center-conductor to the front end of the other boom as shown in fig. 1D.

4. The two half-beams of the antenna are now mounted in a plastic plumbing-pipe fixture by cutting slots in the threaded portion of the fixture as shown in fig. 1C. The pipe fitting which I used was a "Desanko" plastic adapter for chrome-to-plastic fitting of 1-1/4 inch to 1/2 inch trap pipes. Separation between the booms as they pass through the fitting is approximately 3/16 in.

Before gluing the elements in place adjust the boom members such that, when the fitting cap is screwed tight, there will be about 1/16 in separation between the boom tips at the far front end of the boom (end with shorter elements) and almost 5/8 in between the boom tips at the far rear ends (see fig. 1D). Once the booms are in place the cap is screwed tight to hold them in place and epoxy glue is used to fix them permanently in place.

5. Mount the beam with its elements vertically oriented to produce the vertical polarization commonly utilized at this frequency range. A piece of pipe which fits the fixture used in step 4 above is used as a mast. Bring the feedline away from the boom at a right-angle to the elements and loop it over to the mast. Secure it to the mast near the booms and run it down the mast.

6. If you live in lightning country and use this antenna outdoors be sure to use lightning protection; the minimum is to never use the antenna

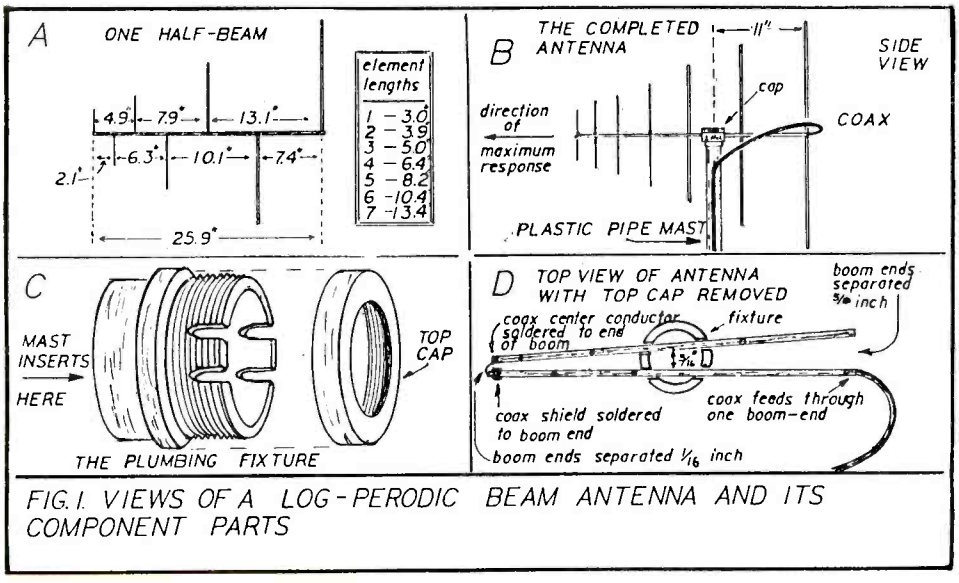


FIG. 1. VIEWS OF A LOG-PERODIC BEAM ANTENNA AND ITS COMPONENT PARTS

when it is stormy, and to disconnect and ground the antenna when it is not in use.

Using the Antenna

For best results the antenna should be mounted outside, high and in-the-clear. Point its small end in the direction from which you wish to receive signals. Inside mounting, far from wiring or other metal, may be satisfactory in non-metal buildings. The inside of a building with much metal used in its construction is not likely to be a good location for this or any other antenna.

A New Antenna Contest

We want to find the world's most unusual antennas: antennas that are quite different from those which we ordinarily encounter in the field of radio communications. Differences can be in terms of appearance, type of construction, application (the job the antenna has to do), the unusual place where the antenna is located or whatever makes the antenna strange or unusual.

I'll consider all entries, decide which are the most unusual, and report them in a future "Antenna Topics" column. Winners will each receive a copy of an interesting and useful book on radio communications. So what is the most unusual antenna you have ever seen, read or heard of? Let me hear from you.

World's Largest and Smallest Antennas?

Did you miss the results of our past contest to find the world's largest and smallest antennas? If enough readers are interested perhaps we can re-run the outcome or send $2 to *MT* and ask for a reprint of the April 1987 column. Just drop a card to me at *Monitoring Times* to indicate your interest in this or other topics.

Radio Riddles

Last Month

Last month I wrote: "If you have a shortwave beam antenna, and you want to receive signals from Ireland, you would point the beam toward Ireland. For signals from Japan you'd point it toward Japan." And then I asked: " But did you know that, for each location on earth, there is actually one other point on earth toward which your beam is always pointing, no matter what compass direction you choose to point it?" How can this be?

Well, think first of the North and South Poles; if you had a beam antenna at the North Pole it would point along an imaginary line that leads straight to the South Pole, no matter where on the horizon you pointed it. A look at a globe of the world will make this clear. The beam wouldn't always be pointing along a line that led to Africa, or to Peru, or to the USA, but you could always draw a straight line along the surface of the globe from your beam to the South Pole.

Now the South Pole is what is called the "antipode" of the North Pole. Any place that you might be on earth also has an antipode, a spot on the far side of the earth that is exactly opposite to the place you happen to be. And a beam antenna aimed at the horizon always points toward the antipode of its location, no matter where on earth the beam is located or what direction of the compass it is pointed!

This Month

What other very-wide-band beam antenna designs are available besides the LPDA? Why are they not much used outside of commercial, military, or government service?

You'll find an answer to this month's riddle, and much more, in your next issue of *Monitoring Times*. Till then, Peace, DX, and 73.

MT

ask bob

Bob Grove, WA4PYQ

***Q.** In parts of Europe TV antennas are mounted with vertical polarization rather than horizontal as in the U.S. Is this merely convention like the size of coins? (Joe O'Brien, Bronx, NY)*

A. Yes. Horizontal beam antennas do not need to be offset from a metal mast to prevent pattern distortion. Vertical base antennas for two-way communications match the easy vertical mounting of mobile antennas. It is all a game of tradeoffs.

***Q.** I have a scanner without 800 MHz coverage; can it easily be modified internally to allow reception of this frequency range? (Randy Hudson, Albemarle, NC)*

A. No receiver that doesn't have at least part of the 806-960 MHz band in it can be modified to include that portion of the spectrum. Your only possibility is to use an external converter.

***Q.** How come I can receive both sides of cellular telephone conversations on my PRO-43 scanner on AM aircraft frequencies like 125.3, 125.8 and 131.5 MHz? (David Cundiff, Lubbock, TX)*

A. Do you have a vivid imagination? Is this a cellular conspiracy to have aircraft frequencies deleted from scanners? If you hear the same frequencies on a Bearcat, those signal frequencies are actually being received; if not, the Realistic is producing spurs (spurious signals) of its own in the presence of unusually strong cellular transmissions. I suspect the latter is the case.

***Q.** Is the third-wire ground on a wall power receptacle a satisfactory radio ground? (Charles Jones, Tallahassee, FL)*

A. Grounding a receiver correctly accomplishes two things: it protects the user from electrocution, and in some cases reduces electrical line noise interference. It will not make signals stronger.

Because the third-wire ground is generally quite long from a radio wavelength standpoint, and because it runs alongside electrical wires, its noise-reduction potential is questionable. Try it and see.

***Q.** I read your review of the GE "Superadio," but I thought TRF receivers had no IF frequency. What gives? (Porter Southman, Chicago, IL)*

A. You are absolutely correct; I erred when I called the GE a TRF (tuned radio frequency) receiver. It does have a tuned RF amplifier, but it also has an intermediate frequency amplifier and oscillator, both missing on a TRF which I confused with a "DC"—direct conversion—receiver.

The direct conversion receiver converts the radio signal directly to audio without any IF; its selectivity depends upon the tuned RF stage and the audio amplifier.

But the review was valid; the GE Superadio is a good performer for the money!

***Q.** Is there any difference between attaching an external antenna to the whip of a shortwave receiver rather than to the external antenna jack? (Joe O'Brien, Bronx, NY)*

A. The whip goes directly to the input of a preamplifier to boost the received signal; to prevent overload problems from the longer antenna, the external antenna jack normally bypasses the preamp.

Attaching ten or fifteen feet of wire to the tip of a shortwave portable's whip is harmless and often improves reception; too much wire, however, can cause overload problems like desensitization (lower overall signal strengths), intermodulation (several stations being heard on one frequency—even though they aren't really there) and images (phantom signals on frequencies mathematically related to the receiver's intermediate frequency or IF).

On scanners the whip and the external antenna jack are connected to the same place because an adequate external antenna is not all that much bigger than the attached whip.

***Q.** Since it's legal to monitor cordless telephones, but not cellular, is it legal to listen in on a cordless user who happens to be talking to a cellular user?*

A. This is the stuff of which court cases are made. One could logically assume that since the eavesdropper is lawfully listening to a cordless transmission, he has no way of knowing that the other end is cellular, and that it should be the responsibility of the telephone users to know the limitations of their security.

***Q.** I visit the Caribbean annually and enjoy the island music. What is the best bet for frequencies and schedules? (Bill Perrelli, Hamden, CT)*

A. Radio Havana, Cuba, is a good choice on SW, as are some of the local relays and religious broadcasters. Many mediumwave broadcasters are also audible on the U.S. east coast; see last month's "American Bandscan" column for more details. Schedules for shortwave programs can be found in *MT* (if in English) or in standard references such as *Passport* or *WRTH*.

***Q.** I receive a local drive-in restaurant order window on 879.150 MHz; it is about a mile away. Is this their actual frequency, or is it an image? Peter Stavicki, Norman, OK)*

A. Since that frequency is right smack in the middle of the cellular telephone band, I doubt that they are on it. Most likely it is an image or intermod product of their actual frequency, more likely in the lower 150 or 450 MHz band.

Does it sound distorted? Is there another voice or sound mixed with it? Does it abruptly come on and shut off in the middle of a conversation? These are all indicators of intermod. If it is heard all the time without the other characteristics, it is probably an image created by the scanner.

***Q.** On some cordless phone conversations I hear only one side; on others, both sides. How come? (Joe O'Brien, Bronx, NY)*

A. Since cordless telephone bases and handsets transmit and receive simultaneously, they must use two different frequencies, otherwise they would only hear their own, stronger signal. Handsets are in the 49 MHz range and bases (which can be heard transmitting both sides of the conversation) are in the 46 MHz range of the spectrum.

Bob's Tip of the Month

Realistic® PRO-39 Cellular Restoration

The recently released PRO-39 handheld scanner from Realistic® is a fine performer, but its 800 MHz range is interruped by the factory censoring of cellular frequency coverage. Long-time *MT* supporter Larry Wiland of Youngstown, Ohio, would like to share the simple fix. Remember, however, that it is unlawful to listen to cellular phone calls.

(NOTE: These procedures may void your warranty. Do not attempt them unless you are familiar with small component soldering. Monitoring Times accepts no responsibility for damages resulting from attempting this modification.)

TOOLS NEEDED: Fine-tipped soldering iron, desoldering wick, small Philips screwdriver, long-nosed pliers, rosin core solder.

(1) Remove the battery door, holder and batteries from the bottom of the radio.

(2) Remove the four screws from the back of the scanner and carefully lift the back off.

(3) Unplug the two wiring harnesses at their connectors and remove the six bright colored screws holding the circuit board in place. Unsolder the ground wire from the lower right corner of the circuit board. Unsolder the two wire connections from the BNC antenna connector at the board. Carefully lift the board (grasping it near the Molex connector) and set it aside.

(4) Remove the two bright colored screws from the next circuit board. Carefully uplug the two-wire connector. Unsolder and lift the rectangular metal shield exposing the diodes.

(5) Carefully unsolder and remove diode D6 only; this will restore the missing cellular frequencies which can be searched in appropriate 30 kHz steps.

This completes the cellular restoration. Reverse all procedures to reassemble the radio and test it by entering any frequency between 869-894 MHz.

Curious about the other diodes? D4 would enable 68-88 MHz coverage, but deletes 30-54 MHz; D5 (present) allows 800 MHz band operation; and D7 would make cellular spacing 12.5 kHz (incorrect).

Thanks, Larry!

Club Circuit

Club Profiles

DecalcoMania

While the DecalcoMania club is not itself a radio listening club, it is a direct spin-off from the hobby. Since 1982 the club and its news bulletin are a meeting place for people who collect and trade broadcasting paraphernalia, promotional stickers, recordings and stories.

In addition to its bulletin, which is published 10 times per year, the club produces an audio "Decal-on-Tape" cassette. The cassette does not duplicate the bulletin, and is offered whenever enough material is accumulated. Two books have also been published by the club as reference materials for collectors.

The club plans an annual get-together to swap stickers, stories and adventures. Annual dues are $10 in the US, $11 in Canada, $16 in Europe and $17.50 in Asia. There is an additional $1.50 new member charge. For a sample bulletin, write DecalcoMania, P.O. Box 126, Lincroft, NJ 07738 and enclose $1.00 (US and Canada), $2.25 (Europe), or $2.50 (Asia).

Pitt County SW Listeners Club

The purpose of the Pitt County Shortwave Listeners Club (PC-SWLC) is to promote and to share information on the radio spectrum from 0-30 MHz. This club is for anyone who is interested in shortwave, AM, longwave, utilities, plus some VHF/UHF scanner monitoring. Newcomers are especially welcom at the meetings where information on frequencies, radio specs, loggings, books, magazines, and different kinds of radios are discusssed. Frequencies of interest include military, aeronautical, marine, Coast Guard, and radio direction finding beacons, among others.

The club meets the first Saturday of each month at Quincy's Restaurant (located on Greenville Blvd. in Greenville, NC) at 9 am. There is also a net each Thursday night at 8pm on the 147.090/690 repeater (scanner listeners program 147.090) to discuss frequencies and topics of shortwave.

The club, which began in the fall of 1991, already numbers around thirty members and has begun to schedule tours and guest speakers; it is hoping to link its net with a statewide repeater system.

For more information about the club's bulletin, dues, etc., send an SASE plus your name, address and phone number to PC-SWLC, Route 1, Box 276, Sumrell Rd, Ayden, NC 28513-9715.

Puna DX Club

This is a small club—but exclusive—you have to be in Hawaii to attend! Jerry Witham says the four or so members that attend the monthly meetings read and discuss loggings and other hobby-related events, with an occasional "show and tell" feature, such as QSL cards, new equipment, etc.

A club "hot line" is activated when a member hears a "rare catch," such as a pirate or clandestine, distant medium wave transmission, etc. The club meets at 7 pm on the first Tuesday of each month and alternates between members' homes. For more information contact Jerry Witham at P.O. Box 596, Keaau, HI 96749.

Club Listings A - L

If you belong to a DX club and you haven't seen it listed in *Monitoring Times,* write today and ask for a Club Circuit listing form. Your club will be listed every other month, and will be featured in a club profile at least once, as well as receiving a complimentary *MT* subscription for club use.

Clubs outside the U.S. are welcome as well and are eligible for the complimentary subscription if they will provide the difference in postage. Sorry, we do not list amateur radio clubs, only those focused on the monitoring hobby. Let's keep it growing!

All Ohio Scanner Club: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. Ohio and surrounding states; VHF/UHF and some HF and amateur coverage. *American Scannergram.*

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia, & Middle East; SWBC, utilities, longwave. *SWL.*

Association of Clandestine Enthusiasts (A.C.E.): Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.*

Association of DX Reporters (ADXR): Reuben Dagold, 7008 Plymouth Rd. Baltimore, MD 21208. International; Utilities, ham band, QSLing, MW, LW, and SWBC. *DX Reporter.*

Association of Manitoba DX'ers (AMANDX): Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF

Bay Area Scanner Enthusiasts: Herman Frisch, 4718 Meridian Ave. #265, San Jose, CA 95118. San Francisco Bay area; 30+ MHz. *Listening Post*

Bayonne Emergency Radio Network (BERN): Ray Baron, P.O. Box 1203, Bayonne, NJ 07002, 201-662-2222. NE Jersey; Fire/disaster.

Bearcat Radio Club: Larry Miller, Box 360, Wagontown, PA 19376, 1-800-423-1331. US and Canada; Scanning only. *National Scanning Report.*

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810, (508)470-1971, 50 mile radius Boston; SWBC.

Canadian International DX Club: Sheldon Harvey, 79 Kipps St., Greenfield Park, Quebec, Canada, J4V 3B1, 514-462-1459. Canada nationwide; General coverage; Publication: The Messenger.

Canadian Int'l DX Club: Sheldon Harvey, President, 79 Kipps St., Greenfield Pk., Quebec , Canada J4V 3B1, (514)462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger*

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 150 mile radious of Chicago; Dxing all bands. *DX Chicago.*

Cincinnati Area Monitoring Exchange (MONIX): John Vodenik, (513) 398-5968. SE Indiana, Kentucky, SW Ohio; SWBC, utility, military, satellites, scanning, BCB.

Decalco Mania: Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (206) 356-3927 (Phil). Collecting radio related items.

Drake SPR4 Int'l Club: Rick Sitz, 5210 14th St. W. #11, Bradenton, FL 34207. Worldwide; Drake SPR4 owners.

DX Audio Service (NRC): NRC Publications Center, P.O. Box 164, Mannsville, NY 13661-0164. Worldwide; AM/FM; DXAS Cassette 90-min monthly audio magazine. Sample $3 to above address

DX Club of India: Navin Patel, 809, M.G. Road, 1-Dutt Niwas, Mulund, Bombay-400 080, India. India; SW DXing.

European DX Council: Michael Murray, P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE, England. Europe.

Ft. Wayne Radio Listeners Club: Robert E. Hilton, 5809 Heatherview, Fort Wayne, IN 46818, (219)489-5821. Ft. Wayne area; All aspects of radio.

Houston Area Scanners & Monitoring Club: 909 Michael, Alvin, TX 77511, 713-388-1941.75 mile radius of Houston, TX; scanning & SW.

Int'l Radio Club of America (IRCA): Ralph Sanserino, 11300 Magnolia, #43, Riverside, CA 92505. Worldwide; BCB/AM DX. *DX Monitor.*

Longwave Club of America: Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215)945-0543. Worldwide; Longwave only. *The Lowdown.*

New Additions:

Rocky Mountain Monitoring Enthusiasts: James Richardson, 11391 Main Range Trail, Littleton, CO 80127, 303-933-2195. Regional Rocky Mtn area; scanner monitoring.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Jan 10	**Milwaukee, WI**	21st Annual WARAC Midwinter Swapfest/P.O. Box 1072 Milwaukee, WI 53201. Location: Waukesha Co Expo Center.
Jan 16	**Hammond, LA**	1993 Hammond Hamfest/Ernest Bush, N5NIB 331 Rock Rd, Hammond, LA 70403; 504-567-1261 days/504-542-0034 nights. Location: SLU University Center from 9:00-4:00. Free admission.
Jan 16	**Monterey, CA**	NPS ARC Winterfest 1993/Doug, KC3RL, 408-663-6117 Location: Monterey Peninsula College Armory, begins at 8:00 am Talk in on 146.97.
Jan 16	**Ft. Myers, FL**	Ft. Myers ARC/Earl Spencer, K4FQU 1735 Hanson St., Ft. Myers, FL 33901.
Jan 16	**Cameron, MO**	Green Hills, MO Valley & Ray-Clay ARCs/Gaylen Pearson, WBW 1210 Midyett Rd., St. Joseph, MO 64506.
Jan 17	**Yonkers, NY**	Metro 70 cm Network/Otto Supliski, WB2SLQ 53 Hayward St., Yonkers, NY 10704.
Jan 23	**Crystal River, FL**	Sky High ARC/Ron Wilhite, KK4HS 303 S. Adams St., Beverley Hills, FL 32665.
Jan 31	**Villa Park, IL**	Hamfest '93/WCRA, P.O. Box QSL, Wheaton, IL 60189 Location: The Odeum Exposition Center, 8:00 am to 3:00 pm.
Feb 6	**Lancaster, PA**	Columbia Area ARC/Tim Headings, KA3UQA 444 Woodcrest Ave., Lilitz, PA 17543.
Feb 13	**Pensacola, FL**	Pensacola Area Hams Assn./Bill Benrends, WA4YRN 1050 W. Carlton Rd., Pensacola, FL 32534.
Feb 19-20	**Sarasota, FL**	So Florida Section ARRL Convention/William Eddie Martin, KI4ZJ 870 Bahia Vista St., Sarasota, FL 34239.
Feb 20	**Charleston, SC**	Charleston ARC/Jenny Myers, WA4NGV 2630 Dellwood Ave., N. Charleston, SC 29405.
Feb 27	**Lebannon, PA**	Appalachian AR Group/Wilson Hein, WJ3G 34 Maple St., Lebannon PA 17042.
Feb 28	**Kenton, OH**	Champaign/Logan ARC/Jerry Temple, N8MTZ 402 Chesney St., Kenton, OH 43326.
Feb 28	**Vienna, VA**	Vienna Wireless Society/Nancy Draheim, NK4U 3513 Old Post Rd., Fairfax, VA 22030.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:
Monitoring Times Special Event Calendar, P.O. Box 98, Brasstown, NC 28902-0098

DX RADIO TESTS

The International Radio Club of America (IRCA), is a club devoted to the hobby of hearing distant stations on the standard AM broadcast band. 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.

Monday, January 4, 1993: WNTK-1020, P.O. Box 2295, New London, NH, 03257, will conduct a DX test from 3:00-3:30 am EST. The test will include Morse code, tones and voice ID's. Power will be 10 kW using an omnidirectional antenna pattern. Reception reports may be sent to: Mr. Robert L. Vinikoor, President.

Monday, January 4, 1993: KEAN-1280, P.O. Box 3098, Abilene, TX, 79604, will conduct a DX test from 3:30-4:00 am EST. The test will include Morse code, tones, voice ID's and country music. Reception reports may be sent to: Mr. James Cameron, Chief Engineer.

Monday, January 11, 1993: KDES-920, P.O. Box 2745, Palm Springs, CA, 92263-2745, will conduct a DX test from 4:00-4:30 am EST. The test will include Morse code ID's and music. Reception reports may be sent to: Mr. Joe Tourtelot, KB6FX, Vice President and General Manager.

Monday, January 18, 1993: WOC-1420, 3535 East Kimberly Road, Davenport, IA, 52807, will conduct a DX test from 2:15-2:30 am EST. The test will include Morse code, tones, voice ID's and big band music. Reception reports may be sent to: Mr. Jon Book, KB0EDE, Director of Engineering.

Monday, January 18, 1993: KXTO-950, 904 East Broadway, Lubbock, TX, 79403, will conduct a DX test from 2:30-3:00 am EST. The test will include Morse code ID's and bilingual (Spanish and English) program material. Reception reports may be sent to: Tanya Roberts, General Manager.

Monday, January 25, 1993: KEYZ-660, P.O. Box 2048, Williston, ND, 58802-2048, will conduct a DX test from 1:30-2:00 am EST. The test will include Morse code ID's and will be conducted in AM stereo. So, for those of you with AM stereo receivers, be sure to report any stereo reception. Reception reports may be sent to: Mr. Earl Gross, WD0APE, News Director.

Monday, January 25, 1993: KAZM-780, P.O. Box 1525, Sedona, AZ, 86336-1525, will conduct a DX test from 2:00-2:30 am EST. The test will include Morse code ID's, tones and march and polka music. Reception reports may be sent to: Mr. Joe Tabback, General Manager.

INDEX OF ADVERTISERS

STOCK EXCHANGE

Ads for Stock Exchange must be received 45 days prior to the publication date. All ads must be paid in advance to *Monitoring Times*. **Ad copy must be typed for legibility.**

Monitoring Times assumes no responsibility for misrepresented merchandise.

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word - *Subscribers only.* All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue. Send camera-ready copy or copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads contact Beth Leinbach, 704/389-4007.

PIRATE CASSETTES as monitored from Jabcos monitoring post—$10; R5000 MODIFICATIONS BOOKLET includes carrier operated scanning—$10; VOICEGATE NOISE REDUCTION SYSTEMS for shortwave—from $129; SASE for FREE catalog! Jabco, 15961 W. Bethel, Alexandria, IN 46001.

Military Aircraft/Satellite Band 16 dB Amplifiers: $79.95; 12 VDC Rechargeable Power Supplies $64.50; VHF & UHF 35 watt Mobile Radios with scan $399.95. Call ESP 1-800-967-7557 COD ORDERS ONLY!

PROSCAN FREQUENCY MANAGER Innovative DOS software. Track 9,999 frequencies. Indispensable for the scanner enthusiast. Other software available. SASE for details. Datafile, Box 20111, St. Louis, MO 63123.

THE QUANTUM LOOP — A compact, high gain ferrite rod antenna for serious BCB DXers. Details — SASE. Radio Plus+ Electronics, 3635 Chastain Way, Pensacola, FL 32504.

SHORTWAVE PARADISE BBS now has the new Winter schedules available. Call our computer line now at 1-305-524-1035. We are a FREE BBS computer system!

FOR SALE: DRAKE R4C-MS-4 SW ham crystals, $400. HAMMARLUND HQ-100X, $125; both plus shipping. 601-825-8108.

Interested in contacting fellow scanner buffs in the Bryan/College Station, Texas, area to share frequencies and other various scanner information. Also possible starting some type of scanner club for the area. Please contact S. Kapchinski, P.O. Box 11132, College Station, TX 77842.

GRUNDIG SATELLIT 500 shortwave radio, all accessories including VHS instruction tape. Hardly used, mint condition, $250. Bob 708-587-4647.

FOR SALE: INFOTECH M-6000 V.5 with new monitor, cables and manuals for $450 negotiable. Anthony 718-256-5571 before 8:45 pm EST.

SONY PRO-80 receiver, $325. Ernest Johnson, P.O. Box 1191, Johnson City, TN 37605.

KANTRONICS CW-RTTY INTERFACE for C64 with cartridge software, $45. N8IJH, 616-327-0986.

FOR SALE: OKIDATA 180 PRINTER, mint, $250; MCKAY DYMEK DA100D antenna, excellent, $120; SONY ICF2001D rcvr, mint, $290; JRC NRD525 printer cable, mint, $50; JRC CMH530 RTTY demodulator board, mint, $95; JRC NVA88 speaker, mint, $50. Walter T. Oliff, P.O. Box 748, Woodville, FL 32362, 1-904-421-9246.

BEARCAT 200XLT, excellent, full 800 MHz, two battery packs, holster, original carton, Metro West Taper Box II, manuals, $300 value just $220; JIM M75 GaAs FET PREAMPLIFIER, replaced battery compartment lid, works great, $55; or $265 takes all! 303-988-2958 after 8 pm.

WANTED: ZENITH 12 BAND RADIO R-7000, contact Tony Hare, #2 Lammas Mead, Hitchin Hearts, United Kingdom

AMC Sales long play cassette recorder, 6 hrs/cassette, $60; SONY ICF-2002, manual, $140; MFJ-1045 preselector, $45; MFJ-1030BX preselector, $30; DATONG RFA broadband preamplifier, $65. Pete 603-889-1067.

DRAKE AL-4 LOOP ANTENNA for SPR-4 wanted. Telephone +49-5923-5761 (0800-2100 UTC) or A.C. Wies, Steinstrabe 12, D-4443 Schuttorf, Germany.

WANTED: GRUNDIG SAT 650 — write or phone with details, Will Klepatsky, N6ABE, 4797 Mira Loma St., Castro Valley, CA 94546, ph. 510-581-2112, fax 510-733-6033.

FOR SALE: TEN TEC 325 USA COMMUNICATIONS RECEIVER, compact, mint, $295 including UPS. Harrison, 513-977-3153 9-4 pm EST.

FOR SALE: KENWOOD R-5000, $575; SONY ICF-7600, $125. Mark Gorden, 415-744-3591.

ICOM IC-R70 w/ FM option, mint condition, little used, with manual, original carton, $400 plus $15 UPS. Pete Carron, HCR-1 Box 502-D, Brodheadsville, PA 18322.

KENWOOD R-2000 receiver, mint, in box with Grove MiniTuner TUN3. Both $550 including S&H. 914-897-2814.

WANTED: BARLOW-WADLEY XCR-30 RECEIVER, good-excellent condition. Call Fred, 301-897-3975.

FOR SALE: UNIVERSAL M-7000 V5, $600. Todd, KM4IC, 919-914-4244.

Closing Comments

Another Win for the Cellular Pac

The well-funded Washington lobby known as the Cellular Telecommunications Industry Association (CTIA) once again sneaked a last-minute, self-serving provision into a pending bill just before Congressional adjournment. And once again, it worked.

The profit-driven cellular investors are unconcerned with the erosion of our historical freedom of access to the airwaves which their commercial legislation has wrought; neighboring Canada and even former Communist countries now have more listening rights than Americans.

HR-6191, the "Pay-Per-Call" Bill, became Public Law P.L.102-556 when signed on October 28, 1992, by President Bush. While the major thrust of the Bill is to protect consumers from abusive 900-exchange pay-per-call advertising, it also contains a ringer: an anti-cellular scanner provision.

The issue is not an individual's right to privacy; it is cellular's continuous evasion of their moral and legal responsibility to protect their customers' conversations from being broadcast in the clear. And they have successfully evaded it once again through misleading lobbying, all to avoid paying slightly more for telephone scrambling.

The new law will require the FCC to deny certification after April 28, 1993, to any scanning receiver capable of tuning cellular frequencies, or readily alterable to receive cellular frequencies, or containing a descrambler for digitized cellular calls. Six months later no such scanner can be manufactured or imported.

FCC officials privately admit that they are facing a regulatory nightmare. The current definition of a "scanning receiver" is entirely inadequate to accommodate the new law. And what constitutes "readily altered"? A Notice of Proposed Rulemaking is being prepared and released at this time; a public comment period will follow.

Current cellular-capable scanners should be legally available for at least a year since there is no prohibition against selling them if they were manufactured prior to the cutoff date. Of course, enterprising investors may buy up all the cellular-capable scanners, then scalp the market when other sources dry up!

Scanner owners will still be allowed to modify their own radios, add external converters, buy cellular-capable non-scanning receivers and video equipment, acquire previously-manufactured equipment, purchase government and military equipment as well as test equipment excluded under the provision, repair older scanners indefinitely, and so on.

While the Bill's sponsors assured their colleagues that the proposal would enforce the Electronic Communications Privacy Act of 1986, the wording was contrived to protect cellular interests only—no reference is made in the new law to the other services covered under the ECPA.

The new law is welcome news to drug dealers who use cellular telephones as a tool of the trade. Their criminal activities are commonly reported to law enforcement authorities by conscientious listeners who happen to overhear deals going down, reporting drop points and contacts. The criminals will now be protected.

Perhaps there is some light at the end of the tunnel; President-Elect Bill Clinton has promised to re-examine such politically-inspired bills signed into law by the outgoing administration for possible reversal.

Perhaps the new administration will be perceptive enough to reverse both P.L.102-556 and the ill-worded and commercially-inspired ECPA '86, reverting to the wisdom of section 605 of the 1934 Communications Act; this section acknowledges that Americans may overhear conversations not intended for them, but provides stiff penalties for those who misuse that information. This is good law.

Bob Grove
Publisher

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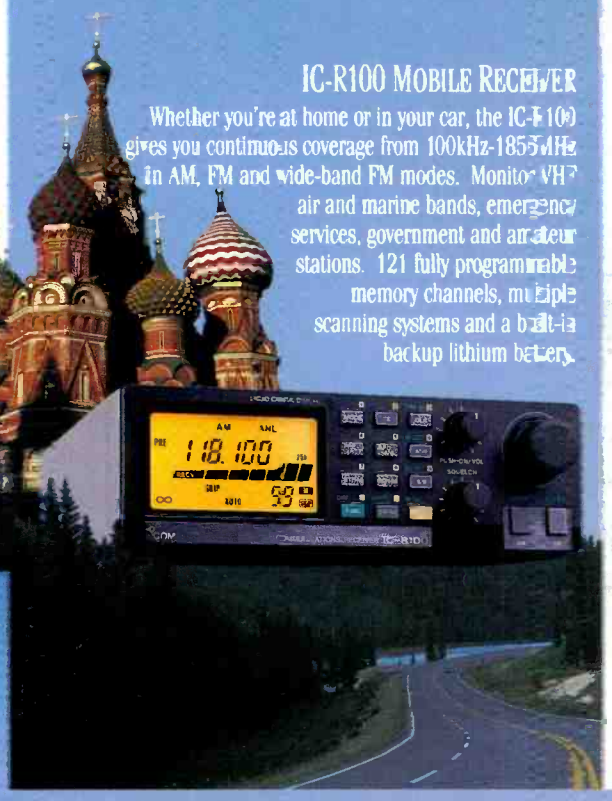

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