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MONITORING TIMES

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April 1991

MONITORING TIMES

Scanning in Scandinavia 24

It is, as it is in many countries, illegal. A brief feature from a Scandinavian (page 24) should make us feel fortunate. But is the U.S. headed in that direction? Read Bob Grove's "Closing Comments" and keep watching *MT* for more news of the FCC's latest venture.

And More . . .

You'll find a passel of new books for your library in "What's New?" (page 38). If Bob Grove's article on the effect of electro-magnetic fields on the human body (March issue) caught your attention, you may be interested in the review of the EMD milli-gaussmeter (page 40).

What's that, you say? This clever instrument will measure the electromagnetic field created by any electrical device -- and we did.

Other reviews include a radar detector which is also a radio (page 90), and the cheapest decent portable shortwave receiver Magne could find. It's under $35 (page 89)!

We have a lot for you to build this month -- a crystal set with better volume, an SSB module as a start toward your own SSB transmitter, or an inverted-L antenna with the configuration of your choice.

We also provide lots of frequencies for you to tune in -- maritime, military, shortwave broadcasts, aeronautical -- so no more talk. It's time to open 'er up and start making use of your April issue of *Monitoring Times*.

DEPARTMENTS

MONITORING TIMES

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LETTERS

"I just read your 'Closing Comments' on buying from the risk takers who specialize in shortwave radio products." Lee Smith of Hawthorne, New Jersey, had been eyeing a Sony ICF-2010 and wanted to get the best value for his dollar. "But even after checking out the big names like EEB, Grove and Universal, I decided to try for an even lower price. Why not, I reasoned. Sony stands behind the radio no matter who sells it, right?

"I purchased my '2010 from one of those big New York City discount houses for $285, an 18% savings over the shortwave stores and I was in my glory -- until the synchronous detector failed.

"I looked at the invoice to see what I could do to remedy the situation. It read, '7 day exchange only on defective merchandise.' Needless to say, I was not a happy SWLer at this point.

"Well, I did eventually get my money back but I missed out on all of the Gulf War monitoring. And I did eventually get a '2010, this time from a store that specialized in shortwave.

"The lesson, of course, is to buy from people who care. That feature brings the best 'value'."

Shorts: Charles Schilling of Elmira, New York, writes to say that *Monitoring Times* has been his favorite "since it was first published."

Robert Compton of Mertztown, Pennsylvania, says he's been listening to shortwave "for about 50 years." But, says Bob, "Since I've been reading your magazine I've heard twice as many stations and learned six times as much as in the previous 40 years." Thanks, Bob.

"Greetings from Okinawa!" says Paul G. Williams. "Here we have only one English channel on TV and it is heavily controlled by the military." As a result, Paul turns to shortwave. "Ninety percent of the information I receive comes from sources such as the BBC, Voice of America, Radio Moscow, Radio Australia, FEBC, WCSM, Radio Pyongyang and Radio Sweden."

"In the past I had a Hallicrafters SX-126 and a Hammarlund HQ 140 XA. Neither survived the rigors of travel and both bit the dust. Now I have a Panasonic RF-B600 -- I picked it up along with a Dressler ARA-30 antenna for only $175.00. Both are in excellent condition."

Paul is continuing to build his collection of QSLs and says that he's up to 36 countries verified with only two hold-outs -- Vietnam and Iraq. Paul, don't hold your breath about Iraq. I suspect they're going to be sore for a while.

"Thomas Nichols, Sr. a utility fan, is proud of his cousin, LCDR Gary Nichols, who is serving aboard the USS Tarawa. We wouldn't be surprised if Tom kept a special ear out for the Tarawa on the radio.

"I think all of the staff at *MT* does a great job. Keep up the good work." Thanks, Tom.

The FCC seems to be much on our minds this month with its more aggressive stance. If you've had reason to tangle with these gentlemen, there's a law student collecting information for a student thesis who'd like to hear about it. In particular, he writes: "If the FCC has ever violated your constitutional rights, please send a brief summary to George F. Arsics, Jr., 2571 Bethany Lane, Powder Springs, GA 30073.

Powder Springs. Haven't I seen that name somewhere in this issue?

Remember back about ten years or so ago, there was a movie about a haunted house called the *Amityville Horror*? Well, Jim Slater of Scranton, Pennsylvania, probably thought that his house had been targeted by demons. Mr. Slater recounts the horrifying details:

"One evening, I walked into my dining room, which was pitch black. Before I could even reach for the 'touch tone' lamp, it turned on, first low, then medium, then high and off -- a number of times. It scared the daylights out of me."

Well, instead of going for the parish priest and ordering up a deluxe exorcism, Jim went next door to talk to his friend, a ham radio operator.

[Continued on page 100]

PRESSTOP!

FCC May Ban Police, Fire, Medical Monitoring!

The Federal Communications Commission has begun a formal inquiry into the feasibility of removing police, fire and emergency medical frequencies from all scanners and amateur transceivers.

Introduced by attorney Eric Malinen, the measure was endorsed and inquiry approved unanimously by FCC commissioners. The Commission is now polling manufacturers of scanning receivers as to the cost of excluding public safety frequencies.

What is the FCC up to? Publisher Bob Grove presents the facts as we know them at presstime in his closing comments on page 104. Stay tuned to *MT* for further developments!

Tag That Baby

Retailers use them to keep shoplifters from walking off with their merchandise. Now hospitals are using electronic security devices to protect a far more precious commodity: newborn babies.

Some hospitals even sew or tape the sensors inside diapers to prevent kidnappings, hospital officials say.

The security system is almost identical to those used in retail stores where merchandise is tagged with an electronic sensor that triggers an alarm when passed through a sensor at the exit.

"You have something you want to protect, so you put a sensor on it," said Sam Shirley of the Deerfield Beach, Florida-based Sensormatic Electronic corp. "In this case, it's babies you want to protect."

Ninety-three infants were kidnapped from American hospitals from 1983 through October of 1990, say officials. A baby sensor system costs $40,000 to install. Says Joseph Baccile, director security at Abington Memorial Hospital in suburban Philadelphia, "It's better to be safe than sorry."

New Radio Telescope in Greenbank

Radiation Systems, Inc., a Sterling, Virginia-based firm, has received a $55 million contract from the National Science Foundation to build and test a replacement for the radio telescope at Greenbank, West Virginia. The original facility collapsed about two years ago,

The new system will have a 328 by 394 foot dish antenna that will be fully steerable. The new facility is expected to be operational in 1995.

National Radio Astronomy Observatory

Shortwave Listeners Invited to Leningrad

For one exciting week next August, radio enthusiasts from around the world will meet in Leningrad at the USSR's largest international radio festival, the 1991 Leningrad Hamvention.

Organized by Inter-Radio Leningrad, the Hamvention will provide a busy schedule for the amateur radio operator. Included will be seminars, guest lectures, conferences and practical sessions.

For the first time, the Leningrad Hamvention will offer special sessions for international shortwave listeners. Ian McFarland, the *Monitoring Times* award-winning host of Radio Canada International's "Shortwave Listening Digest" will deliver the keynote seminar.

For more information on this tour, contact Sheldon Harvey, in care of the Association for International Cultural Exchange Programs, 10 Canvin, Suite 33, Kirkland, Quebec, Canada H9H 4S4. The price is US$2,995.00.

Soviet Radio Undergoing Re-Changes

A radio station that had been broadcasting news and commentaries critical of Soviet President Mikhail S. Gorbachev has been forced off the country's main airwaves. According to the Associated Press, the move against Radio Rossiya, which had been on the air for just six weeks, was the latest attempt to halt media criticism of Gorbachev and the Soviet Government.

Radio Rossiya had been providing news, music and interviews that often attacked the Kremlin. The station was using the government's main transmitter, the huge Stankino tower in Moscow, to broadcast for two hours each morning on the main radio frequency, channel one. It also broadcast for two hours in the

afternoon on the popular Mayak channel, and for an hour and 45 minutes in the evening on Channel Two, which is received only in major cities.

Packet on MIR

Packet radio communications have been carried out between the Soviet Mir space station and many ground operators on 145.50 MHz. Callsigns of U2MIR and U2MIR-1 were used.

Mir now has a fully operational packet radio bulletin board system, complete with standard PBBS command system capable of supporting mail exchanges between users as well as disseminating news bulletins to all users of the system.

Searching for Intelligence

Leaders of NASA's Search for Extraterrestrial Intelligence (SETI) program are considering offering their multichannel spectrum analyzer for several commercial, government, and medical applications. The MCSA, which is in its final stages of development, will provide recognition of continuous wave (CW) signals from space when it "goes on the air" in 1992.

NASA identified the Defense Department, the Federal Aviation Administration, and intelligence agencies as potential users of the system.

Transistor Inventor Dead

John Bardeen, a co-inventor of the transistor, has died at the age of 82. Bardeen, along with two other scientists, Walter Brattain and William P. Shockley, first announced their discovery in 1948. Its first commercial application was in telephone switching equipment.

The invention literally transformed the electronics industry, pushing aside bulky and inefficient vacuum tubes and making portable radios, computers and appliances -- and even the space program possible.

Bardeen, who received the Nobel Prize for his invention, once remarked, "I knew the transistor was important, but I never foresaw the revolution in electronics it would bring."

Viking Founder Dies at 91

Edgar F. Johnson, 91, the founder of the E.F. Johnson Company, has died of cancer. Johnson, known as "a modest man from poor beginnings," founded E.F. Johnson Co. in 1923. His radios, the Johnson Viking, Valiant and other transmitters, were real workhorses.

Before beginning the process of selling rigs to hams, Johnson concentrated on marketing components to radio stations and amateur radio operators and listeners. During World War II, his company manufactured components and transmitters for the military.

By 1949, E.F. Johnson was the first company to build and sell ham radio transmitters. From 1959 until 1979, it led the nation in CB products.

When the popularity of CB faded in the late 70s, E.F. Johnson turned to manufacturing parts for cellular phones. The company later merged with Western Union and was sold to DEI Corp.

The War is Over

"We all look alike," said NBC News anchor Tom Brokaw to a US soldier in Saudi Arabia who shook Brokaw's hand and asked, "You're Peter Jennings, right?" Hodding Carter, speaking at a media symposium in Boston remarked, "When the three anchormen arrive on the scene, it's no longer a story."

CRACKDOWN by the FCC

by Tony Germanotta

From an MT story several years ago, J.J. Freeman of the Norfolk district office studies a compressed cube of confiscated contraband CB gear.

The scofflaws had finished dinner and were settling down to an evening of chit-chat when the head of FCC operations for two Southern states hopped into his sedan and set off for a mission out of a Cold War thriller.

After years of benign neglect, the FCC has decided to crack down on a network of blatant broadcast bandits. Most of the targets are CBers who souped up their rigs and slipped into adjacent government bands to blast away with signals that were able to carry across the country.

Because "Uncle Charlie" had let them slide so long, most believed the agency didn't care or wasn't paying attention. They were wrong.

All along, the FCC's scattered but supersensitive listening posts had been monitoring the transmissions, fixing their approximate locations and recording the information in government computer logs.

That means when FCC agents take to the highways in pursuit, they go armed with printouts of radio frequencies, CB "handles," the approximate locations and even the times of day the offenders are usually on the air.

Pay no attention to that man in the car

J. Jerry Freeman is engineer-in-charge of the Norfolk, Virginia, FCC region. His office is located in Virginia Beach and has jurisdiction over all of Virginia and North Carolina.

This night he was practicing a trade as old as radio itself. The techniques are little changed from the days of the kilocycle cops of the old American Radio Intelligence Division, which helped snare Nazi spies during World War II. But the equipment has moved light years from the dark old vans of the war movies, with their rooftop loop antennas and agents huddled at the dials of a glowing tube receiver. Many radio pirates still delude themselves into believing they're safe if there are no panel trucks in the neighborhood.

Freeman went to one of his office's many secret storage areas and got into what looked like an ordinary American car.

No suspicious antennas bristled from its body. No official seals marked it for identification. But this was anything but stock.

FCC engineers had removed the original roof and replaced it with a fiberglass duplicate in which special antennas had been imbedded. They're detectable only after a snow storm, Freeman joked, when the inlaid metal causes the snow to melt in a way that reveals the complex patterns used in direction finding arrays.

Under a dust cover on the floor between the front seats is the hardware that makes it all come together. Commercial scanners and custom designed radio-spectrum analyzing receivers are tucked together with preamplifiers and attenuators that enable the operator to hear faint signals or eliminate all but the offending source.

Near the windshield is what seems to be an ordinary electronic compass. But it is a display tied into the radio system that immediately tracks the source of whatever signal is being tuned in.

The days of rotating rooftop antennas with a safecracker's touch are gone. As soon as the source touches his transmit key, the FCC has a bearing.

Freeman used one of the FCC's radio phones to check in with Washington, which was gathering monitoring information from around the country. He glanced at his

computer printout of recent illegal activity in his area, and he tuned to 27.420 MHz, the frequency he would be monitoring that evening. 27.420 is just above the citizens' band, which tops out at 27.405 MHz, and is a frequency reserved for international services, Freeman said. But a network using single-sideband equipment had crossed into the territory some time ago and now was using it as a quasi-amateur radio channel.

Freeman was certain that none of the illegals were actually ham operators, but instead rogue CBers who had turned to linear amplifiers and off-limit bands to extend their reach.

At 7:23 p.m. someone began transmitting on the frequency. He identified himself by the number "387" and comfortably asked about the strength of his signal.

Someone identifying himself as "357" came back that "387" was putting out an "8" and, after "387" did a little tinkering with his illegal VFO, said the signal sounded better.

Freeman set off to the south after "357," the closer target, following the direction finder. But the radio-check conversation was brief, and he pulled his car into a school

Powder Springs, GA, FCC monitoring station

Did you really think the FCC would be driving around in a truck like this? Or in the legendary panel van bristling with antennas? Think again.

One Man's Story

Earl Davenport, of Chesapeake, Virginia, is one of the men the FCC recently snared broadcasting on forbidden frequencies. His handle is "Red Rooster," one he's used for over 25 years as a citizens' band operator.

Davenport admitted to being on the wrong frequencies and said he would stop, now that the FCC had come down on him.

But Davenport contended that he had been forced to go illegal by rogues who have taken over the regular CB channels.

He complained of blatant abuse by people running 1,000 watts of power and using foul language. And, he said, the FCC has not stepped in to help CBers who want to operate legally.

"There are dozens and dozens who do operate with powerful stations," Davenport said. "They're the commonest talkers in the world. Those on the higher frequencies were driven up there.

"I do not talk to people who are going to cuss and talk common," he said. "There's people out here who have wives in their car, children in their car."

Five blocks from his house, he said, is a man who illegally alters CB radios and runs a kilowatt of power that bleeds over all 40 channels.

"He's the nastiest talker on the radio," Davenport said. And blatant. But Davenport hasn't gone to the authorities about him.

You have to give your name when you complain to the FCC, and Davenport, who is retired with a disability caused by a severe head injury, worries about retaliation.

"Like any organization," he said, "There's leaks. In order for somebody to file a complaint, they have to write a letter and sign their name and address to the complaint. There's some potheads out here, dangerous people. I advised my people not to write a complaint for that very simple reason."

If the FCC is serious about enforcement, he said, they should set up an anonymous tip system and the calls would come flooding in.

Davenport said his disability makes it impossible for him to remember complicated things such as the Morse Code, so he had been prohibited from getting a ham ticket until the advent of the no-code class. But he would like to see the FCC come back and reinstitute a CB license and assign call letters to CBers.

"I'm not condemning them for what they've done," he said. "That's their job, and I was guilty of being on the wrong frequency. But if they would bring back a license...I would gladly pay $50 a year for a license if they would help us patrol the frequencies."

Davenport said he and his illegal friends have spent years assisting the community. They aid in disasters and call in tips to police when they see crimes -- if they can get through the CB chatter.

"It is not a toy to me," he said of his radio, "it's a serious piece of equipment, and I use it as such."

When he was caught, Davenport was operating on 27.795 MHz, he said. His CB radio had been converted to operate at that frequency but he claimed he had no extra power amplifiers attached.

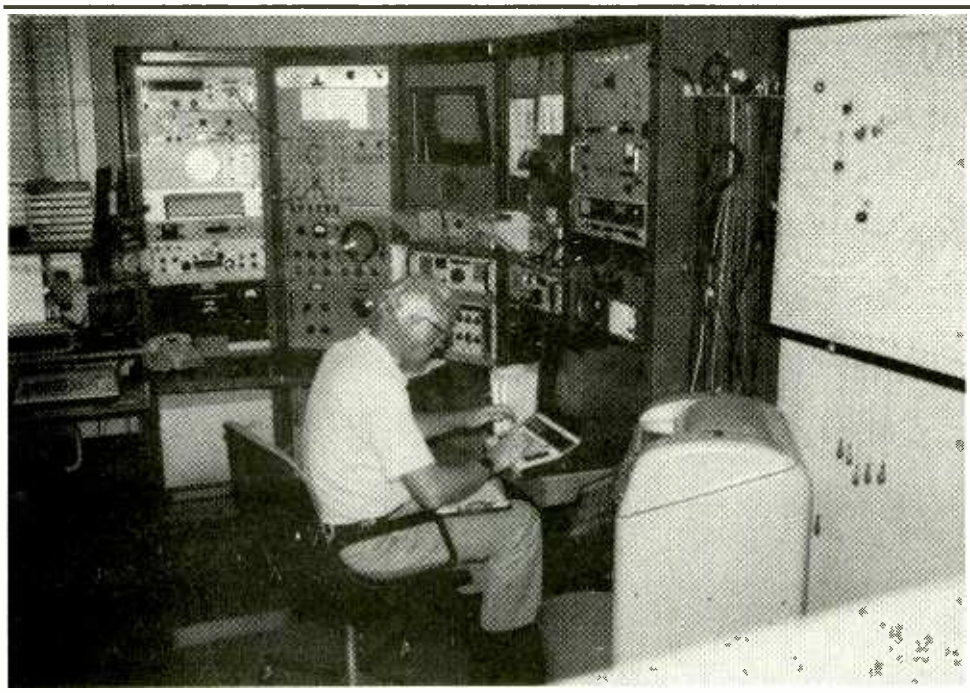
Right after the first FCC raids, some folks got on the illegal frequencies, threatened to go to court to fight the fines and promised to keep operating out of band.

But Davenport said he and his friends are backing off and heading down into the CB range, hoping that the FCC will turn its attention to cleaning up the abuses they find there as well.

Twenty seven years ago, soon after his accident, a friend gave Davenport his first radio "because I couldn't get out of the house."

He's been on it since, and intends to stay.

"It's good therapy for me," he said, "because I have to sit home so much."



Powder Springs, GA, FCC monitoring station

A call from the mobile unit to a local field office, a little triangulation, and bingo, the FCC zeroes in.

parking lot to wait for more.

Schools make for good monitoring points, he said, but cemeteries are best. "No overhead wires," he explained. Spend too much time in one, though, and the local cops are sure to stop by, he said. Worse than power lines are holiday decorations.

Christmas is a bad time for DF (direction-finding), he said. All those blinking lights give even the best of receivers fits.

In most places, the high tech equipment makes direction finding simple, but in Virginia Beach, where Freeman was operating, it is still a detective's art.

This is an area criss-crossed by inlets, creeks, bays and marshes. The streets are not laid out in regular grids but in circling developments that take advantage of the waterfronts.

"It's very difficult to DF around here," Freeman admitted. "You'll be working a signal, trying to home in on it and end up blocked by a body of water, and you'll have to drive two miles to get around it."

Zeroing in

Soon the targets were back on frequency, talking about radios, antennas and rumors of unusual activity by Uncle Charlie.

Freeman spun his car out of the lot and followed the signal. Using the radio spectrum analyzer, he could tell if he was getting closer (the bandwidth tends to broaden and the signal strength peaks) or if anyone was on nearby frequencies.

As one target asked once again about his signal quality, Freeman estimated he was within a quarter mile of his adversary. He turned the car into an upper-middle class development and drove through the neighborhood, spinning through cul-de-sacs, hoping to box in the source. He moved systematically, relentlessly until he hit one of the dreaded dead ends.

"He's close," Freeman said. "He's close."

Freeman backtracked and was headed for the next little development when "357" signed off. The frequency went quiet.

It was almost 9 p.m. when another of the FCC cars radioed to Freeman telling him they had tracked down a different offender. They were told not to go in, but to wait until all on the network had been found.

At 9:15 p.m., Freeman pulled his car to the top of a bridge, one of the highest spots in the coastal area. Just then, the frequency lit back up. One of the targets was talking about buying a new radio.

Freeman turned around and headed after the man. It was "357" again.

As he entered the area, Freeman rolled up his windows so the sound of the chase wouldn't escape and scare off his target. This time the tracking was easy. No water would cut off the trail.

As he got closer, Freeman turned off the preamplifiers and then began attenuating the signal. The display screen showed a strong, fat band and the electronic compass guided the way.

The target was complaining about a friend who had been busted by the FCC when Freeman slowed down and announced, "We've got him."

The compass pointed directly at a house on a corner. Freeman made the turn, and the compass spun with him, continuing to track that house. And if further proof was necessary, the house sported a 60-foot tower and beam antenna.

It was 9:57 p.m. and Freeman jotted down the address and pertinent information for the fine he would later issue. He had a tape recording of the man's transmissions and had verified that they came from the house in question. That was enough, Freeman said, for him to issue a $1,000 fine. He could also move to seize the man's equipment, but said he probably wouldn't unless the guy didn't take the heavy monetary hint and came back on the forbidden frequencies again.

No joking matter

The FCC considers off-band broadcasting very serious, he said. The radio spectrum is limited and getting crowded. Those who ignore the regulations can wind up interfering with ambulance and hospital communications, have been known to disrupt delicate air traffic control equipment and even the guidance systems used by planes.

"In the early days of radio they used to call us the kilocycle cops," Freeman said, adding it's a tough medium to patrol.

"You can't taste it, can't feel it and can't see it," he said. "But they want us to tell where it is and how strong it is."

Modern equipment has made the job easier. But there are still headaches.

"It's really difficult to DF in a building with 200 apartments," he said from experience. "But we have a little thing we call a snifter, that's hand held."

The FCC has decided to pay closer attention to pirates in the future, and those who live far from an FCC field office should not feel safe from detection, Freeman said. The FCC is always monitoring the frequencies, and his men are equipped with compact packages that can be attached to a rental car to do the detection work in any area out of driving distance.

How good are they? Freeman set out to find the other side of "357's" conversation and a few minutes later was circling a home miles away. Again a large outdoor antenna was further confirmation, along with a series of cars sporting antennas in the driveway. These folks would pay a heavy price for a few minutes of talking about radios, something they could have done free on a local phone call.

When Freeman finished his circle to confirm the location, a car across the street blinked its headlights at him. "That's one of my cars," Freeman said, with a chuckle. Both had homed in independently on the same offender.

COMMUNICATIONS ELECTRONICS INC.

Emergency Operations Center has expanded to our new two acre facility and World Headquarters. Because of our growth, CEI is now your *one stop source* for emergency response equipment. When you have a command, control or communications need, essential emergency supplies can be rushed to you by CEI. As always, for over twenty two years, we're ready, willing and able to help.

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Frequency range: 148-174 MHz. continuous coverage. Will also work 134-148 MHz. with reduced performance.
The *RELM* RSP500B-A is our most popular programmable 5 watt, 20 channel handheld transceiver. You can scan 20 channels at up to 40 channels per second. It includes CTCSS tone and digital coded squelch. Snap on batteries give you plenty of power. Additional features such as time-out timer, busy-channel lockout, cloning, plug-in programming and IBM PC compatability are standard. It is F.C.C. type accepted for data transmission and D.O.C. approved. We recommend also ordering the **BC45** rapid charge 1½ hour desk battery charger for $99.95, a deluxe leather case **LC45** for $48.95 and an external speaker microphone with clip **SM45** for $59.95. Since this radio is programmed with an external programmer, be sure to also order one **PM45** at $74.95 for your radio system.

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List price $449.95/**CE price $299.95/SPECIAL**
16 Channel • 25 Watt Transceiver • Priority Time-out timer • Off Hook Priority Channel
The *RELM* RH256NB is the updated version of the popular RELM RH256B sixteen-channel VHF land mobile transceiver. The radio technician maintaining your radio system can store up to 16 frequencies without an external programming tool. All radios come with CTCSS tone and scanning capabilities. This transceiver even has a priority function. Be sure to order one set of programming instructions, part # **PI256N** for $10.00 and a service manual, part # **SMRH256N** for $24.95 for the RH256NB. A 60 Watt VHF 150-162 MHz. version called the **RH606B** is available for $429.95. A UHF 15 watt, 16 channel similar version of this radio called the **LMU15B-A** is also available and covers 450-482 MHz. for only $339.95. An external programming unit **SPM2** for $49.95 is needed for programming the LMU15B UHF transceiver.

NEW! RELM® LMV2548B-A

List price $423.33/**CE price $289.95/SPECIAL**
48 Channel • 25 Watt Transceiver • Priority
RELM's new LMV2548B gives you up to 48 channels which can be organized into 4 separate scan areas for convenient grouping of channels and improved communications efficiency. With an external programmer, your radio technician can reprogram this radio in minutes with the **PM100A** programmer for $99.95 without even opening the transceiver. A similar 16 channel, 60 watt unit called the **RMV60B** is available for $489.95. A low band version called the **RML60A** for 30-43.000 MHz. or the **RML60B** for 37-50.000 MHz. is also available for $489.95.

RELM® Programming Tools

If you are the dealer or radio technician maintaining your own radio system, you must order a programming tool to activate various transceivers. The **PCKIT010** for $149.95 is designed to program almost all RELM radios by interconnecting between a MS/DOS PC and the radio. The **PM100A** for $99.95 is designed to externally program the RMV60B, RML60A, RML60B and LMV2548 radios. The **SPM2** for $49.95 is for the LMV25B and LMU15B transceivers. The **RMP1** for $49.95 is for the RMU45B transceiver. *Programmers must be used with caution and only by qualified personnel because incorrect programming can cause severe interference and disruption to operating communications systems.*

★★★ *Uniden CB Radios* ★★★

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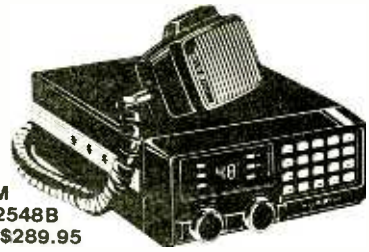

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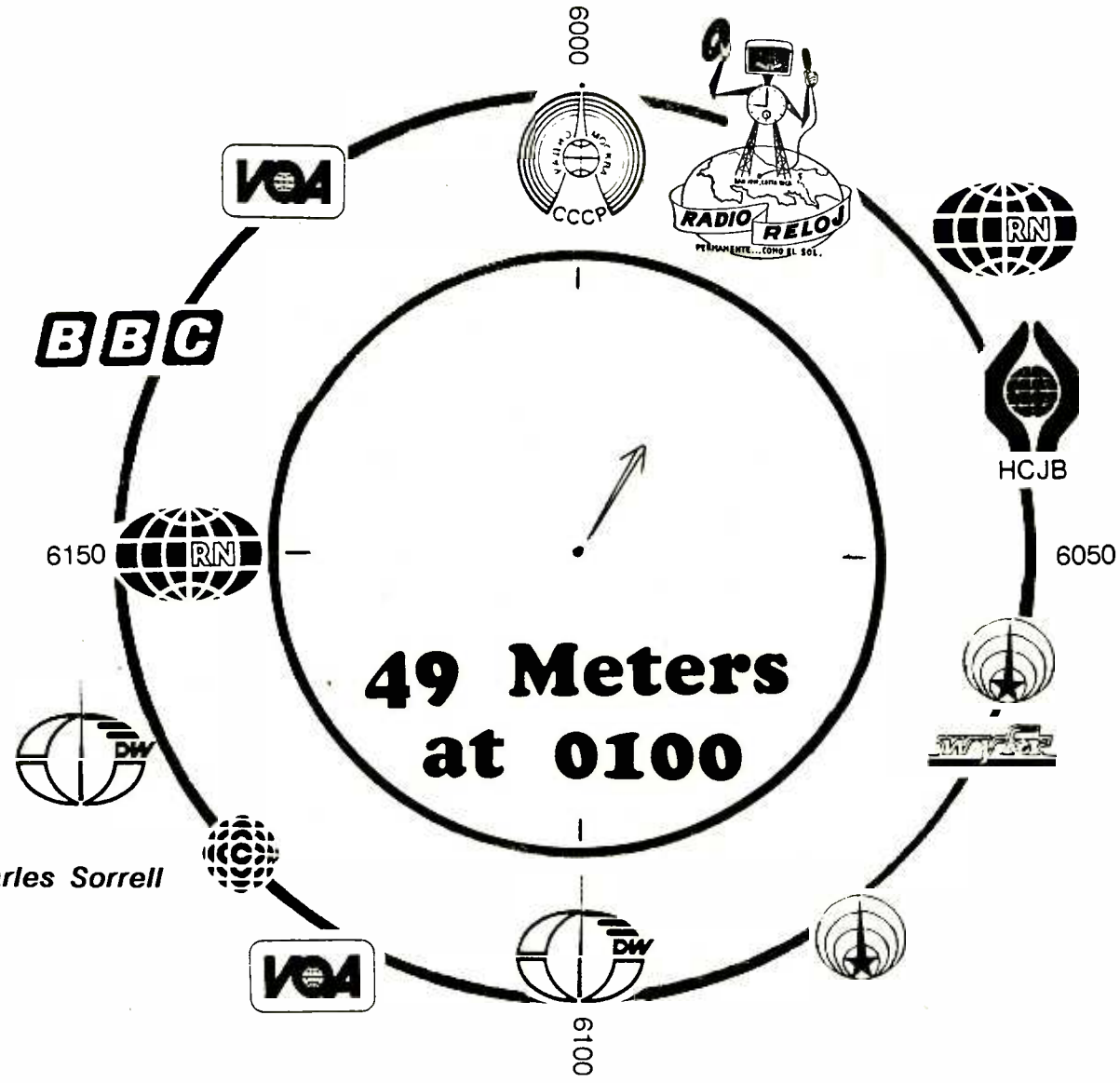

by Charles Sorrell

Did you ever dissect a band? I don't mean do a critique on the guitar player. I mean go through a range of shortwave frequencies and take it apart, kilohertz by kilohertz. Well, neither have I.

I slashed away at the 6000 to 6200 kHz range recently, though, and I soon learned what I'd thought before I began. Namely, that not even the three or four hour-long monitoring sessions I gave the attempt can paint a complete picture of what goes on in one hour within a one or two hundred kilohertz range.

You can, though, make a fair beginning, which is what I managed to do. You can build a framework and then fill in the remaining blanks later. Here are the results of my four monitoring sessions between 0100 and 0200 UTC, scouring the 6000 to 6200 kHz area. Fire up your radio and see how we compare.

6000 Radio Moscow, in English to North America via the Havana, Cuba, relay. Strong as it is, it suffers "splash" from the VOA on 5995 kHz -- even with the narrow filter in play.

6005 The BBC. But not at very good quality. I think this is via the Ascension relay. There's an unidentified Latin American station on the same frequency (co-channel, as they say), but it's too weak to make anything of. Later in the evening and sometimes earlier, RIAS in Berlin breaks through here.

6006 Radio Reloj in Costa Rica. One of the old-time Latin stations. If this one ever leaves shortwave, we'll know the medium is really in trouble in that part of the world. This is normally parallel to 4832 but Reloj has slid up to 4839 in recent months.

6010 Portuguese barely dominating on this busy frequency, which means probably Radio Inconfidencia, running 25 kilowatts from Belo Horizonte, Brazil. It's just as likely that, a few days later, Radio Mil in Mexico or Radio Los Andes in Venezuela will dominate. Indeed, one station may not stay on top through an entire evening.

6015 A noisy channel. Nothing is strong enough to do anything with until the third check when the Voice of America, probably

via Kavala, Greece, came up out of the pile.

6020 Radio Netherlands in English, from its 500 kW site at Flevoland, running from 0030-0125.

6025 More garble. This spot often produces signals from one of the few active Dominican Republic stations-Radio Amanacer, a religious station in Santo Domingo, and the occasional bits of Spanish breaking through the noise may well be from this station.

6030 Here's the government's Radio Marti holding forth with its usual wrecking ball signal in Spanish, to Cuba.

6035 La Voz del Guaviare in San Jose de Guaviare, Colombia, with a fair-to-midlin' signal in Spanish. Until around 1985, this one used the name "Radio Transamazonica."

6040 A dominating signal from Deutsche Welle, Germany, via their Antigua relay, in English to North America. There's something underneath this. Portuguese? Possibly Radio Clube Paranaense in Curitiba, Brazil?

6045 Radio Moscow again, in parallel with 6000 and also via Havana. Here's another case of being able to detect something underneath, too mashed to pull out.

6050 HCJB in Spanish.

6055 A jungle. Could be bits and pieces of Radio Continental in Peru as well as Radio Prague International. Might have expected a touch of Radio Baghdad here, too, but I'm told they are off the air.

6060 More Spanish, this from Radio Nacional, Buenos Aires, Argentina.

6065 WYFR. From Redwood City, California to Okeechobee, Florida, to you.

6070 CFRX, Toronto, relaying medium-wave CFRB. One of the few spots on shortwave where you can hear commercials in English, but maybe that's not a drawing point.

6075 Cocktails for two here. Deutsche Welle in German to North America at a strength about equal to the Colombian, Caracol, Bogota, which is scheduled with 10 kilowatts, 24 hours a day.

6080 Another fine mess, Ollie.

6085 Deutsche Welle in English and parallel with 6040 until it closes for a while at 0150. Deutsche Welle is active here on and off all evening. DW's departure reveals something else, seemingly in German, playing pop music. Bayerischer Rundfunk in Munich?

6090 Radio Moscow International running Spanish to Latin America. Again, there's something underneath and, again, it's too far under to ID.

6095 Another cacophony. Swiss Radio International doesn't show for its scheduled 0115 sign-on and should be heard if it's there so maybe a frequency change?

6100 Deutsche Welle again, in German for North America, Europe and Latin America, according to their program schedule -- which doesn't list sites. Antigua?

6105 Another pothole. Lots of QRM but there seems to be a station in Portuguese in there.

6110 The BBC in Spanish to Latin America, via Antigua. Something else there, too. Perhaps Radio Budapest, Hungary?

6116 La Voz del Llano at Villavicencio, Colombia. Weak, in Spanish and suffering a lot of QRM. I've decided 49 meters is not a good choice when you want to show off shortwave to a nonbeliever.

6120 Nothing here, though Radio Canada International opens at 0200.

6125 Another uncertain situation. English. Sounds like the Voice of America but it's weak so, if it's them, it's probably from one of the foreign relay stations.

6130 The Voice of America, in English, and probably via Greenville.

6135 Another iffy situation. Definitely a Brazilian, though, so probably Radio Aparecida. The parallel on 5035 is in an even sorrier state, but it seems to be a match with 6135. Swiss Radio shows up at 0115, in parallel with 9885.

6140 A horror. Equal amounts of spill and splash from 6135 and . . .

6145 Deutsche Welle in English for North America.

6150 Vatican Radio here in English until closing at 0109. Once they leave another Caracol station, Caracol Neiva, is uncovered.

6155 Radio Romania International in English but with very poor signals. Parallel with 9510 and the usual others. There's a Spanish station underneath but useless at the moment. Possible Radio Fides in Bolivia.

6160 Geesh. This frequency was a bundle of noise for three solid evenings. It wasn't until the fourth check that the normally heard CKZN, St. John's, Newfoundland, surfaced -- and even then not to a listenable level.

6165 Radio Netherlands via Bonaire with an 0130 sign-on in Dutch.

6170 Still another QRM-packed frequency.

6175 The BBC. I think this is via Radio Canada International's Sackville, New Brunswick, transmitter.

6180 Another garbage frequency. All of these bad spots sound like the so-called graveyard channels on the AM dial -- a dozen people all talking at once so you can understand none of them. If you've ever ventured onto the upper end of the AM dial at night, you'll know what I mean.

6185 Radio Educacion, Mexico City. This one operates 24 hours a day and often has some very nice musical offerings.

6190 The Voice of America, in Spanish for Latin America.

6195 It ends about like it began. Radio Moscow, only in Spanish for Latin America. Washington and Moscow five kilohertz apart, reaching for the same audience.

Of the 41 channels checked, positive or near positive IDs were made for stations on most of them. A full one-fourth of the channels were filled with QRM or, in one case, empty.

Even four hours of intensive listening left a good many questions. There were several instances where stations signed on after 0100, which may have been missed in passes though the band. There were cases of stations going off before 0200 which, again, may have left possibilities which couldn't be capitalized upon.

Imagine covering the action throughout the daily life cycle of this band, or any shortwave broadcast band, for that matter. Guaranteed to keep you hopping. Band surveys are a great way to log stations you haven't yet heard and that, alone, should be reason enough to give it a try.

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CIRCLE 123 ON READER SERVICE CARD

A Profile of Legendary **CKLW**

by Tony Fitzherbert

"It's 20 minutes before five! This is Lee Marshall -- 20-20 News! An unidentified young boy was riding his bike on Van Dyke this afternoon when a steel truck collided with that boy, knocking him about 20 feet. Eyewitness Dennis Mays was there. He called the law, then the Big 8 to say it was enough to make you sick . . . . " (From a typical Big 8 Newscast in the early '70s).

QUESTION: What foreign radio station consistently appeared among the top three in the Arbitron ratings during every period from 1965 into the 1970s -- in at least three United States markets?

ANSWER: Canadian CKLW regularly appeared at the top of the ratings in Detroit, Toledo, and Cleveland -- and this 50,000 watt station was the third most listened to station in the entire world from 1967 to 1975. Here is the profile of that legend.

The unique trademark of the "Big 8," as it was known throughout the world, was the famous "This is CKLW *20-20 News*" followed by a big, booming voice reporting floaters, carnage, rape, rotting corpses, billowing flames, smashing metal on the freeway, grisly murders and other mayhem, sandwiched between rapid fire rock and roll records.

CKLW began life as 540-CKOK on June 1, 1932. No Canadian government restrictions prohibited affiliation with U.S. radio networks in those early years. One of the most colorful and listened-to stations on earth, it originated in Windsor, Ontario, as a 5,000 watt CBS network station

On November 6, 1933, CKOK moved to the more favorable dial position of 840 kHz, still with 5,000 watts power. The call was changed to CKLW, and in 1934, it moved to 1030 kHz before finally settling on 800 kHz in 1941. In 1935 CKLW dropped CBS to become one of the original affiliates of the Mutual Broadcasting System. Additionally, until July 1, 1950, when the Canadian Broadcasting Corporation put CBE-1550 on the air, CKLW was the Windsor outlet for the CBC. The CKOK call in 1946 surfaced north in Sarnia, on 1070 kHz.

Through World War II years, with Mutual and CBC programming, CKLW regularly aired classical music, country concerts featuring acts such as the "Sons of the Saddle," and the popular announcer "Uncle Dudley." Dramas and network feed rounded out CKLW's programming. The CKOK-CKLW studio was a cavernous auditorium equipped with a grand piano, many sound effects, and space for the studio orchestra.

In 1948, CKLW became only the second privately owned Canadian station to be granted 50,000 watts, even though the station had a "poor record" for airing Canadian programs and employing Canadian talent. The issue of mandatory Canadian talent on the air was enacted by the Broadcast Act of 1958, and was enforced by the Board of Broadcast Governors, replaced in 1968 by the Canadian Radio-Television Commission (CRTC) -- an agency with which CKLW has suffered a checkered relationship.

To transmit the 50,000 watt signal, CKLW constructed a building and five guyed 3,000 foot high towers on Highway 18, eight miles from Harrow, Ontario. The 50,000 watt signal began on September 7, 1949. A new building housed the station's RCA transmitter at the site, 35 miles south of Windsor. Also in 1948, CKLW added a 250 watt FM outlet, on 93.9 MHz, and simulcasted the AM programming.

In March 1956, RKO Distributing Corporation became the primary owner of CKLW.

CKLW's unique location and market

CKLW today remains unusual in that it was licensed to a city of 200,000 people a mile *south* of the USA's fifth largest city -- separated only by the mile-wide Detroit River. Much of Windsor's economy, like Detroit's, is dependent upon auto manufacturing. Thousands of workers daily cross the border via the Ambassador Bridge and the Detroit River Tunnel, and rush hour backups to clear the tolls and customs may take more than a half hour.

The differences between Detroit and Windsor are far wider than the river. Detroit is home to a wide variety of ethnics, epitomizing the melting pot of the U.S. While blacks make up over 60 percent of Detroit, followed by vast sections of Poles, Greeks, and Arabs, Windsor maintains a distinctly Canadian mix of French and English. Windsor is very clean and quiet.

CKLW serves both markets but has identified more with the giant Detroit metropolis, much to the chagrin of the CRTC. Studies today show that at any time, 70 to 90 percent of all Windsor radios are tuned to US stations. The 50,000 watt signal of CKLW is regularly heard in four provinces and at least 28 states.

The international audience causes CKLW some problems, not the least of which has traditionally been conformity to the CRTC guidelines regarding Canadian talent (30 percent of all records aired on Canadian AM stations must be by Canadian artists, and broadcasters must tape their entire broadcast day for possible CRTC audits). This requirement has caused Canadian performers to often release their hits in the USA first. Otherwise American radio has not taken the "Subsidized Hits" seriously.

Conversely, CKLW did not have the public service requirements that the FCC has imposed upon its Detroit competition. However, all Canadian broadcasting format changes had to be sanctioned by the CRTC, as changes are today.

The Big 8

In September 1966, CKLW General Manager Bob Busse hired Paul Drew as program director. Searching for means to combat the gravitation of listeners to television, Drew realized that rock and roll would be the salvation of CKLW. Drew convinced RKO to install a rock format on CKLW. Thus, the "boss sounds" format, developed by California DJ Bill Drake, was adopted on all RKO stations including CKLW. The Drake sound was inspired by instant success on RKO-owned KHF, Los Angeles.

Rock in place, CKLW immediately spiraled to the top of the Detroit ratings. Management then went further than any other North American rock station with 20-20 News. To attract listeners from news heavy WWJ and WJR, the station aired *20-20 News* with local and bloody emphasis (at 20 after and 20 before the hour). Partial logic behind the 20-20 scheduling was motivated by the ratings. Most listeners enjoyed the music, and to be accurately rated, station management believed it necessary to program two back-to-back 15 minute quarter hours of music, from :45 to :20.

20-20 News and an average of 16 records per hour played by colorful disc jockeys, propelled CKLW to heights never before reached in Detroit. CKLW demolished the prominence of rock station WNKR-1310, Dearborn (Keener-13), whose six-tower directional array failed to get the 5,000 watt signal into Detroit's east side, or Windsor.

CKLW's signal not only blanketed all of metropolitan Detroit, but it covered almost half of the United States. Not only was CKLW number one in Cleveland, Toledo,

and Detroit, but it showed up in the ratings in such places as Hartford, Connecticut, Camden, N.J., and Danbury, Conn. In Danbury, when local WLAD-800 left the air at sunset, CKLW thundered in at almost local strength, much to the delight of Danbury listeners.

". . . the gang went fishing this afternoon, and pulled up something that they weren't planning on for dinner . . . it turned out to be a rotting body. Eyewitness Charles Evans told the 20-20 hot line that the stiff sunk to the bottom from the worm baited hook that belonged to Virginia Findlay, who tells what the floater looked like . . ."

From a CKLW 20-20 newscast

Big 8 music

Rosalie Trombley, CKLW music director, known as "The Hit Maker," was perhaps the most wooed female in the radio industry. In 1968, Rosalie moved from her part-time switchboard operator's job into the record library. Her penchant for selecting potential hits won her the powerful music director's job. Often a Canadian record played on CKLW sold more copies in Detroit than in all of Canada.

Every Thursday, limousines containing record producers and artists lined up along the curb, as the passengers meekly and respectfully awaited an audience with Rosalie, fervently praying that she would not turn thumbs down on air play on CKLW. Air play on the Big 8 virtually guaranteed air time all over the United States and Canada and a shot at the Top Ten. In its heyday, CKLW broke perhaps 95 percent of all of the hit records in North America. Radio stations all over the US and Canada obtained CKLM's hit lists to see what was "Hit Bound."

Trombley had been with CKLW since 1963, and the rows of gold and platinum records that lined her office walls attested to her influence. The Thursday parade of groveling directors and record company executives was a legend. Struggling Detroit musician Bob Seger whose songs were played on local FM rock stations could not crack the Big 8. He wrote a song about the powerful Trombley, and "Rosalie" became quite popular in the US, and was eventually played on CKLW.

Stevie Wonder was one who knew the importance of CKLW: He invited the on air staff to his first wedding.

CKLW's parade of personalities, particularly the morning disc jockeys, were Detroit household names. Robin Seymour went from CKLW to West Coast radio. Gary "The Morning Mouth" Burbank left for WLW, Cincinnati. Popular in the 1970s was Buffalo DJ Tom Shannon, who came from, and later returned to Buffalo's WKBW. WXYZ's Dick Purtan did morning duty when the Detroit

A tale of two cities: CKLW bridged the gap more effectively than did the Ambassador bridge ... too well, in the minds of the Canadian Commission.

station dropped its music for news and talk. He left CKLW in 1983 to go to WCZY-FM, Detroit.

Other CKLW "Hall of Fame" notables were Bud Davies, who left in 1967 to go to CKEY-590, Toronto, and Terry Knight, who defected in 1963 to WXYZ. Other CKLW people now faded into obscurity are Bill Gable, Johnny Williams, Charlie Van Dyke, and Super Max Kinkle.

The Big 8 was almost a pirate station broadcasting into the United States. A whole generation of kids from Ontario to Pennsylvania and Connecticut grew up listening to the Big 8. The DJs were devoutly loyal, and, above all, according to newspaper accounts, looked back upon their days at CKLW as the best time of their careers. Every DJ on the continent yearned to work behind the Big 8 microphone. The CKLW DJs had rock star followings.

"CKLW -- 50,000 watts . . . sounds like a million!"

(CKLW promo)

Unfortunately, CKLW's success bred difficulty for the station. CKLW and the CRTC constantly argued over Canadian content. And the government's influence, coupled with the maturing of FM radio caused the later downfall of the station.

20-20 News

". . . Meanwhile, the Wayne County Sheriff had a stiff of his own to worry about. The man shot in the head, right through the blanket he was wrapped in . . .

". . . The grim reaper's sharpened scythe struck again today, as an unidentified boy about 3 or 4 years old was felled by hot lead on a target range. That young life was snuffed out when he rounded a hill and caught a bullet in the head . . .

From a CKLW 20-20 newscast

CKLW's blood and guts newscasts set it aside from all of the other rock stations. Grant Hudson (now of WWJ), Byron McGregor, Dick Smythe, Randall Carlisle, and Lincoln Grey, among others, would often leave the news booth at 20 after or before the hour to a round of applause from their colleagues.

20-20 News was pure show business. They all had big booming voices -- the philosophy was to punch the listeners with the news, to get their attention. Jim Reese, air named Grant Hudson, an announcer at all-news WWJ-950, remembers that the news delivery called for a bombastic style -- and that the world will never see another station like CKLW.

While *20-20 News* was sensational, CKLW was serious about news. The news room staffed 27 people at one time. The reporters and stringers patrolled the streets of Detroit and Windsor looking for news. On-the-scene remote broadcasts sprinkled the show. The Big 8 frequently broke into records with major stories. CKLW broke to the world the arrest of Patti Hurst as a bank robber, and the Kent State University bloodbath, where the National Guard needlessly shot several students to death.

CKLW's news hot line offered weekly cash prizes for the best news tip, and $100 for the biggest story of the year. The hot line rang constantly. Often Big 8 listeners called the hot line before reporting crime to the police. One woman, holding a robber at bay with a butcher knife, called CKLW before she called the police. Another listener, when a co-worker went berserk at Chrysler's Jefferson Avenue plant, called the hot line, holding the phone outside the booth so that the sound of gunfire could be heard. A CKLW promo: *"When bullets buzz, buzz the Big 8."*

The most insignificant crime story was magnified by the Big 8 newscasters, thesaurus in hand. Both the delivery and the vivid descriptions contributed to the sensationalism of the most mundane variety store stickup. Former CKLW news director Keith Radford, at the station from 1970 to 1982, noted in an interview that "We were always the station they used as a bad example in journalism school -- they would pull a CKLW newscast apart as an example of how not to do news."

Even the newsmen amazed themselves. In the interview, Radford recalls sitting on a boat on the Detroit River with other staffers as Grant Hudson did his epic "Everyone is dead in Detroit" newscast, chronicling no less than ten murders in the Motor City the night before. Hudson's most unusual newscast was a self-researched expose' of frozen Martians being kept on ice at the Wright-Patterson Air Force Base in Dayton, Ohio. Hudson later admitted that it seemed a bit far fetched, but

received a report two weeks later that security guards were not allowed to check the contents of an exiting refrigerated truck at the gate. The truck was leaving Wright-Patterson bound for a high security Air Force base in Marietta, Georgia.

CKLW's colorful personalities enjoyed playing pranks on each other. Byron McGregor (real name - Gary Mack) and Gary Burbank competed to see who could play the worst prank. McGregor announced on 20-20 News that Gary Burbank's driveway had been blocked by 600 pounds of dripping wet horse manure delivered during the wee hours by unidentified pranksters. Burbank arranged for a young, pregnant female to arrive at the station with a policeman, claiming palimony while McGregor was on the air. These zany events added to the popularity of CKLW -- where, as one ex-staffer reflects, there was little business direction, but everyone had a good time.

As FM radio siphoned listeners away from the Big 8, management became concerned about the station's image. The saga of bloated bodies, and blood and guts was dropped in 1978. The "boss hits" format was dumped in 1974, replaced by a more toned down middle of the road format. In 1977, adult contemporary replaced the MOR (middle of the road) format, as FM was taking over the rock.

Until 1972, CKLW's studios were at 825 Riverside Drive West, in a building shared with the FM and CKLW-TV, channel 9. CKLW-TV had broadcast on channel 9 since 1953. CKLW Radio and TV were bought by Baton Broadcasting.

Since that time, the radio station has been sold several times. Also, in 1970, the CRTC agreed to a five year CBC takeover of the television station. In 1972, CKLW-TV wanted the Riverside Drive building to itself. The radio station moved to a beautiful new home at 1640 Ouellette Avenue, Windsor's main street, from which it broadcasts today.

The transmitter building, designed in the 1940s, is a huge two level 12,000 square foot structure at the transmitter site. It houses the 50 kW Harris MW 50 transmitter plus the RCA 5F backup and an old RCA 50 F unit. The building at one time provided living quarters for people who attended the transmitter.

CKLW-FM, a 100,000 watt station, has aired country music and easy listening formats over the years. Today it is CKMR (More 94) airing oldies.

CKLW receives many DX reports from Norway, Britain, and the northern US and Canada. An abundance of reports come from Finland, Sweden and Lapland. CKLW's signal in the southern part of the US receives interference from Trans-World Radio, 800 kHz, Bonaire, and the Scandinavian DXers must overcome interference from a million watt station at 801 kHz in Leningrad.

CKLW's U-4 signal must protect CJAD-800, Montreal, CJBQ-800, Bellville, Ontario, and various US stations. The primary null extends up Highway 401 toward London, Ontario.

Once the hit-maker station that launched "The Supremes," CKLW now airs "adult standards."

The end of the Big 8

The increasing popularity of FM, the maturing of the generation which grew up listening to the Big 8, and increased pressure on Canadian content by the CRTC accelerated the decline of CKLW as an international institution. Labor problems contributed, too, as the payroll was gradually trimmed from 97 to 20 people.

In 1977 a new automated transmitter resulted in the release of a lot of technical people. The resulting strike lasted for a year and a half. In the latter 1970s, DJ Dick Purtan (one of the highest paid personalities in North American radio) kept the ratings up.

Meanwhile, CKLW-FM experimented with country music. By the fall of 1983, Purtan moved to WCZY-FM (95.5) and CKLW's ratings plummeted. The station moved toward an adult music/news/sports/information format with Detroit Pistons basketball, telephone talk, and a morning news and information block -- all in an effort to siphon off WJR's listeners. Ratings, however, went from 1.8 to .7 by summer 1984.

In 1983, CKLW management tried to swap CKLW's format with the big band format of sister FM CJKY, but this move was denied by the CRTC, which had always been disenchanted by the station's programming toward American audiences. News was mostly from the Detroit side of the river, as were commercials. Many commercials had the tag at the end "Not available in Canada."

After the CRTC denied the format switch, some former Big 8 rock jocks were kept on the payroll for production work, or weekend air shifts -- all in preparation for the return of rock on FM. A new 100,000 watt FM transmitter was installed, feeding a 700 foot high tower south of Windsor. The call was changed to CFXX. Billboards all over Detroit proclaimed "The Fox is coming." The plan was to drop the big bands at 3 p.m. on April 6, 1984, without CRTC approval. But the owners changed their minds at the last minute, after seeing that the license of CJMF-Quebec City was taken away after that station changed formats without CRTC approval.

CFXX did work out an arrangement with the agency so that they could broadcast "Fox" programming for four hours a day, from 7 to 9 a.m. and from 5 to 7 p.m. Listeners were asked to write in with their support for a format change when the license renewal came up in July. Baton Broadcasting finally gave up and sold the stations for a bargain price.

When the new owners took over in the fall of 1984, they fired at least a third of the staff. A victim of the 1984 purge was Rosalie Trombley, unceremoniously dumped after 21 years of faithful service to CKLW. How the mighty fall. The once infallible Rosalie bitterly took her collection of over 200 gold and platinum records which lined the walls of her office when she was summarily evicted from her Ouellete Avenue quarters.

CKLW-AM program director Dave Shafer recalls the days when the station sent a driver around to pick up Mary, Florence and Diane to convey them to record hops. This trio began its brilliant career at CKLW record hops, and today is known worldwide as "The Supremes." Dave also laments that the station declined from a peak 28 percent to .7 percent when the rock format hit bottom. While the listeners became more sophisticated, the format did not.

The new owner adjusted the FM big band and instrumental format to a typical easy listening format and changed the call to CKEZ "EZ-94-FM". On AM, the sports and information programs were dropped and were replaced by Al Ham's "Music of Your Life," extremely popular at CJCL-1430, Toronto. The Big 8 officially died on April 6, 1984, the day that MYL began to air.

The CKLW ratings did increase, but CKEZ garnered few listeners. Today, CKEZ is "More 94," carrying an oldies format, under the call CKMR, and CKLW still airs adult standards. CKLW has a small (2.2 percent share) but loyal audience, consisting primarily of middle aged and middle to upper income adults. The MYL is augmented by Larry King at night, and both Notre Dame and NFL football broadcasts. CKLW presently has no network ties, and maintains a tiny news staff, not even a vestige of the 25 plus staff of the golden years. The contemporary CKLW is basically a music station.

Alas, the Big 8, *20-20 News*, the 16 hits per hour, and Rosalie Trombley are but colorful lore in an industry which is becoming devoid of imagination and fun. As Tom Shannon said from Buffalo in an interview, "CKLW was just a well-oiled machine," and Pat Holiday, who worked behind the Big 8 microphone for years said, "The Big 8 will never be duplicated again." And based upon the sterile programming heard on radio today, he is probably correct.

From the author: The Big 8 station profile has come to you with the help of Wally Dowhan, CKLW CE, Dave Shafer, CKLW PD, Julien and Martha Wolfe, various *Windsor Star* clippings, Fred Vobbe, and through notes supplied by NRC member Jim Nahirniak of Warren, Michigan. Thank you, all, for your help in making this profile possible.

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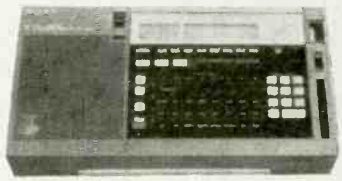

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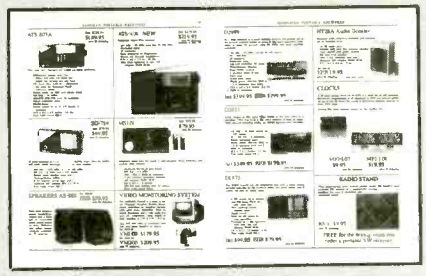

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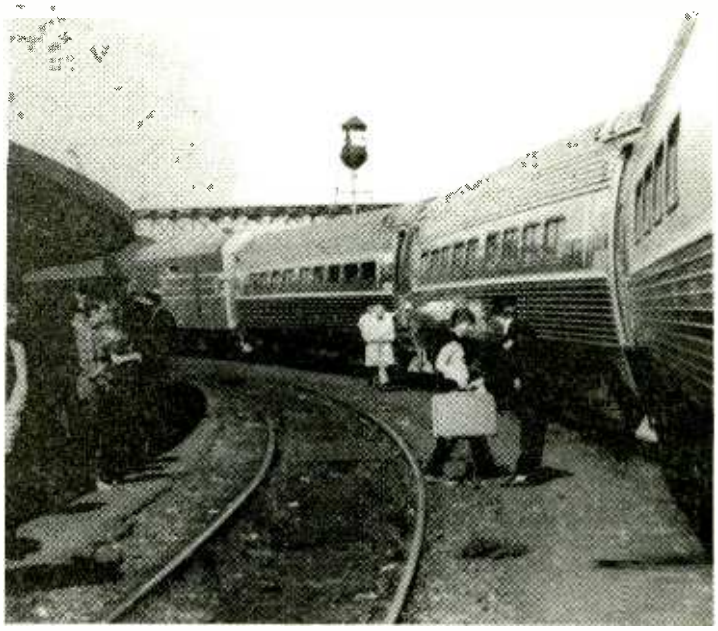
Tuning in to Trains

by Carl Olson



All photos by Bruce Heald

If you have a scanner and haven't already checked out the action on nearby railroads, here are some tips to get you started.

Of course, it is easy to imagine the most exciting part of monitoring the railroad -- hearing the roar of diesel engines coming through the scanner speaker when the train engineer reports his "all clear." However, there's a lot more to railroads than trains. All day long people are maintaining the roadbed, tracks, crossing signals, and communications equipment along the right of way.

Due to mergers of many regional railroads over the past decade, it is not uncommon for a railroad to have tracks reaching into a dozen states or more. Operations of that size require modern voice and data transmission systems that include microwave relays and multiple transmitter sites, usually built along the railroad right-of-way.

It is possible for radio communications to be monitored between a train in your area and a dispatcher several states away. For example, CSX (the combined result of a merger of the B&O, C&O and Seaboard Rail systems) dispatchers are centralized in an ultra-modern facility in Jacksonville, Florida, and can access remote controlled base stations throughout the CSX system, which covers most of the central and southeast United States.

Finding rail action on your scanner is easy. Virtually all two-way frequencies assigned to the railroad industry for communications with trains are between 160.200 and 161.600 MHz. If you have a programmable band scan option in your scanner, start hunting in this frequency range and make notes of the active channels (See the table on page 20). You may also run across metropolitan transit systems here if they include rail operations.

Tips on monitoring

Some railroads have split frequency operation, and one frequency will be used to call the dispatcher and a second frequency used for the dispatcher to transmit back. But the majority of radio channels will be simplex with bases and mobiles sharing one frequency.

Railroad employees have developed a special vocabulary over the hundreds of years it has taken for trains to evolve to today's high tech modern machines. Recognizing some key phrases will help you spot rail channels quickly and help you figure out what is happening. Say you've scanned across the band and found some activity, but what are they talking about? For example, the dispatcher tells the train they are clear to work certain blocks.

Many railroads use Block Authority to designate sections of track by name. The blocks can be less than a mile, or many miles long. A train may get permission to work in certain blocks, typically delivering and picking up carloads of freight to industry sidings along that section of track. Only one train will be given permission to occupy a given block at a time, and thus the chance of collision is greatly reduced.

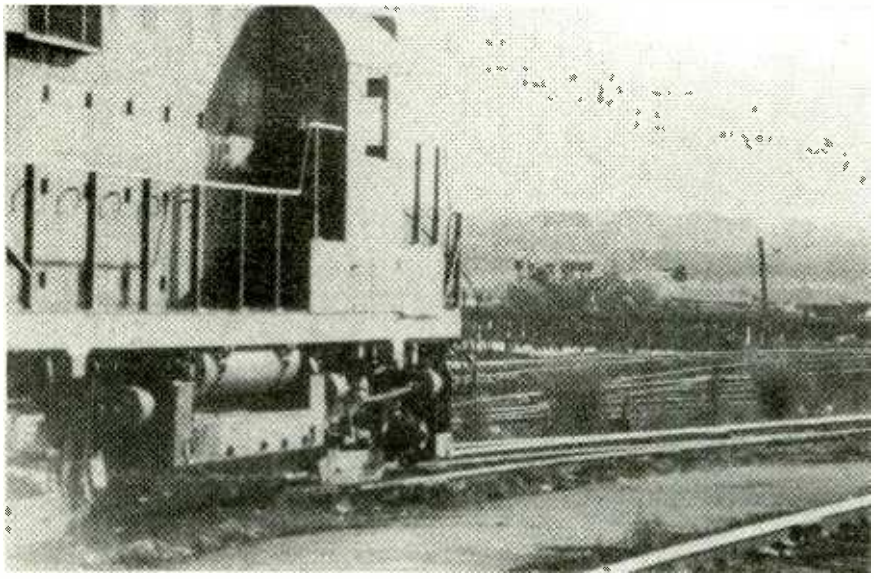
You may also hear trains calling ahead to ask a railroad flagman working on the tracks for permission "through the limits."

It is normal practice for work crews to install temporary markers at either end of a section of track where maintenance work is being done, and trains must be granted permission to pass these "limits" by that work crew. It is very common for work crews, track inspectors, and others working along the track to use portable radios. You may not be able to hear them because of the relatively low power of their portable transmitter -- two to five watts.

You may hear the train crew talking to a "tower." These are usually buildings located at busy switching junctions, and they are designated by name or letter code (QN Tower).

The tower is literally a building that is a couple of stories tall with windows that allow the tower operator to clearly see the neighboring tracks. The operator in the tower will function very much like an airport tower ground controller. Using remote controls in the tower, the operator will see to it that trains are routed onto the desired track when they pass.

Most of the trains you hear on your scanner will be freight trains, but your nearest rail line might also be used for scheduled passenger service (AMTRAK in the U.S.) and inter-city commuter rail. Passenger trains



attempt to adhere to tight schedules, and these schedules are made available to the general public. You can get copies of these schedules and see where the trains stop, and when. With this information you can estimate what time they may be in scanner range.

Chances are you will hear trains being identified by a number or letter code. Both freight and passenger trains are referred to this way. If you make notes during your monitoring sessions, you will probably find references to the same train numbers repeating over a period of days. Trains that regularly make the same run will use the same number or code. You are likely to hear references to locals; these are freight trains picking up and delivering cars to customers along the tracks. Even trains traveling between distant cities may be heard daily.

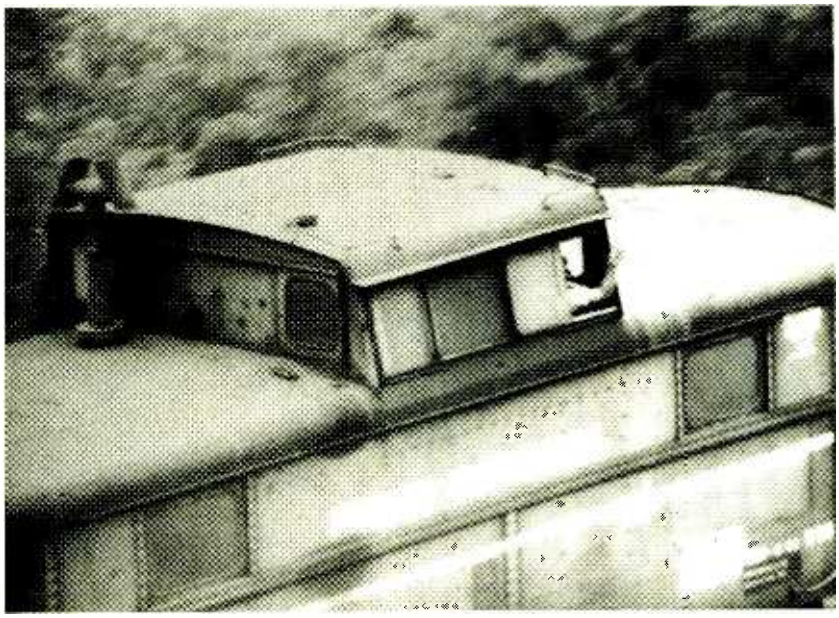
You might hear a yardmaster calling the relief crew to advise them of the arrival of the train they will be taking over, allowing the train to keep moving another few thousand miles toward its destination.

Passenger trains will have numbers, too. For example, the AMTRAK train called The City of New Orleans which runs between Chicago and New Orleans is train number 59 when headed south, and number 58 when northbound.

AMTRAK operates all passenger trains in the U.S., but the only track it owns is between Washington D.C. and Boston. So AMTRAK trains operate over a variety of host railroads

I am fairly new to the SWL and scanner scene but your Monitoring Times is right on target with information for all levels of expertise.

William J. Browne
Scottsdale, AZ



and use the host railroad's radio channels, as necessary.

A train will give its location by naming the nearest milepost along the track, which is marked by signs. If more than one track is available, they are understood to be numbered, although if you go to a nearby rail crossing you won't find signs saying Track 1 or Track 2. You might hear "455, east on 1 at milepost 32." Of course, other landmarks may be used, such as names of streets that tracks cross, names of buildings next to the tracks, etc.

The railroad employees will refer to the junctions where tracks meet by name. Many of these locations may not be recognizable at first. A hundred years ago there may have been a railroad depot or manned tower where today only a remote controlled switch and spur track exist. The railroad probably still refers to it today by the name given to the place years ago.

There are other interesting scanning possibilities along the railroad, besides employee communications. Today many railroads are using "talking hot box detectors." These are sophisticated sets of sensors coupled to low power radio transmitters on the same frequency the train monitors.

When a train passes the detector, a synthesized voice message is transmitted, alerting the crew onboard if an overheated axle bearing was detected, which side of the train it is on and about how many axles it is from the front of the train. Some of these detectors also report when no defect is detected. For example, you might hear: CSX . . . EQUIPMENT DEFECT DETECTOR . . . MILEPOST EIGHT-EIGHT POINT FIVE . . . TRACK NUMBER . . . TWO . . . TRAIN LENGTH . . . FOUR . . . FIVE . . . THREE . . . EIGHT . . . FEET . . . TRAIN SPEED . . . SIX . . . NINE . . . MILES PER HOUR . . . NO DEFECTS.

A typical scanner with an outdoor antenna might pick the low power signal from a detector 10 miles away. Talk about a great way to keep track of activity on your nearby railroad!

The familiar sight of the caboose has all but disappeared in many parts of the country. The caboose has been replaced by the end-of-train device (ETD), a small box with a flashing red light which is attached to the back of the last car. Some railroads have ETDs that incorporate a low-power transmitter which emits a rapid series of tones every few minutes. These are probably not going to be found on the same channel the railroad uses for voice, since the constant beep sounds would be disruptive to voice communications.

The principal function of the EDT is to monitor the air brake pressure at the end of the train. The tones are decoded in a receiver in the engine cab and the crew can tell that the air brake pressure meets specs. They are a useful way of alerting you to the presence of a nearby train.

Major railroads are a year-round, 24-hour-a-day operation offering the scanner enthusiast many possibilities for interesting listening.

Selected radio channels of principal U.S. railroads

Railroad	Region	MHz	
Atchison, Topeka & Santa Fe	Central and southwest	160.650	
Boston & Maine	New England	161.160	
Burlington Northern	Central and northwest	161.100	
Central Vermont	New England	161.415	
CSX-Chessie System	Midwest and mid-Atlantic	160.230	160.320
CSX-Seaboard System	Southeast	160.590	161.100
CONRAIL	East central	160.800	
Denver & Rio Grande	West	161.310	
North Western	North central	160.890	
Grand Trunk Western	Midwest	160.590	
Illinois Central	Midwest	161.190	
Missouri Pacific	Midwest and southwest	160.410	
Norfolk Southern	Southeast and midwest	161.190	160.950
Soo Line	North central	161.370	
Southern Pacific	Southwest	161.550	
Union Pacific	Central and northwest	160.740	
Western Pacific	Southwest	160.380	

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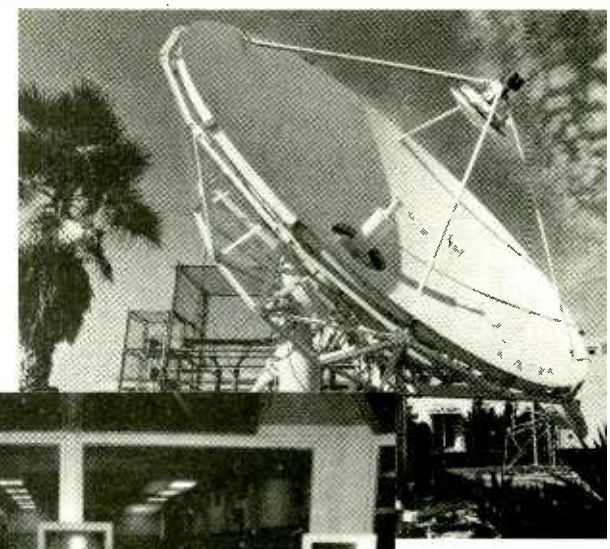
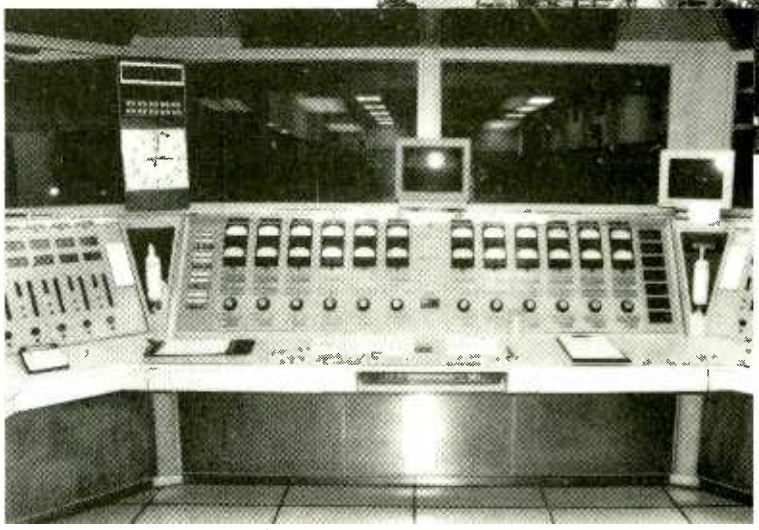
Voice of America Packs a Punch

Story and photos by Charles J. Korolden





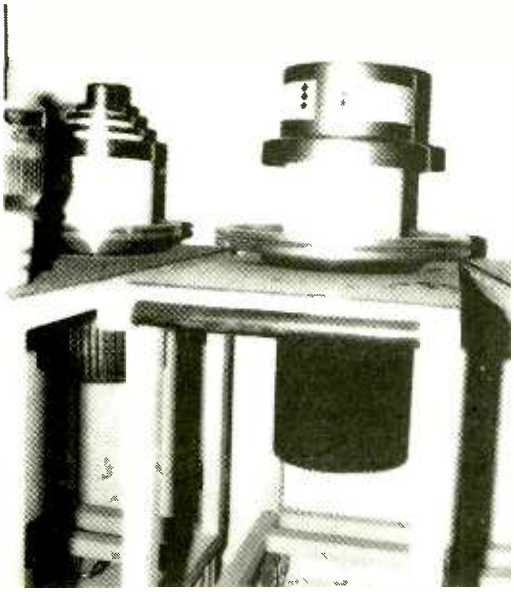
Programs put together in the Washington, D.C., studios are linked by satellite to the relay station's master control room in Delano, California; There the signal receives an enormous electronic punch to send it flying worldwide.

If you happen to drive a time-jumping Deloren and you find yourself a little short on plutonium, you can still get the time traveling punch you need just west of a friendly little city in the San Joaquin Valley. Delano, California, is the home of the Voice of America's international shortwave broadcasting relay station.

In 1988 the United States Information Agency, of which the VOA is an entity, installed a new high gain multi-band curtain array antenna that is capable of an ERP (effective radiated power) at about 1.2 gigi watts. An amazing amount of power.

The Delano Relay Station that's attached to this antenna, and a multitude of others that cover almost 800 acres, is responsible for transmitting news and educational programs to Southeast Asia and Latin America. The programs, originally produced in VOA studios in Washington, D.C., are then beamed to the relay station via satellite. VOA's highly qualified technicians at the relay station then begin to decode, amplify and route the satellite signals to the proper transmitters and antennas through the Master Control console with the aid of a computer.

The Delano Relay Station came to life in 1944 as part of the Office of War Information's effort to bring much needed information and entertainment to the troops serving in the Pacific. They went on the air with two 50,000 watt RCA transmitters operated by radio technicians from CBS. In 1945 a 200,000 watt Federal transmitter was added.



This is a PA-2 QS-200 power transmitting tube -- Cost? About $68,000!

The OWI was abolished at the end of World War II and the Voice of America, monitored by the Department of State, took over the job of broadcasting. A reorganization put the VOA under the United States Information Agency in '53 and ten years later the operations and maintenance, supplied by CBS, was turned over to government employees.

The station continued to upgrade. A comprehensive modernization program was introduced in 1965 and by '68 the power of the station had been doubled by adding three 250,000 watt automated transmitters and a pair of 50,000 watt independent side band units. In 1975 the overseas program quality was improved by modifications to two of the curtain antennas and their transmission lines. A new steerable curtain antenna was added two years later that could direct its signal to the Pacific.

The VOA's relay station broadcasts in English, Chinese, Cantonese, Bangladesh, Indonesian, Korean, Bengali, Vietnamese, Russian, Khmer, Thai, Swahili, Burmese and Lao just to name a few. They also carry programming for the BBC (British Broadcasting Company) and occasionally the United Nations.

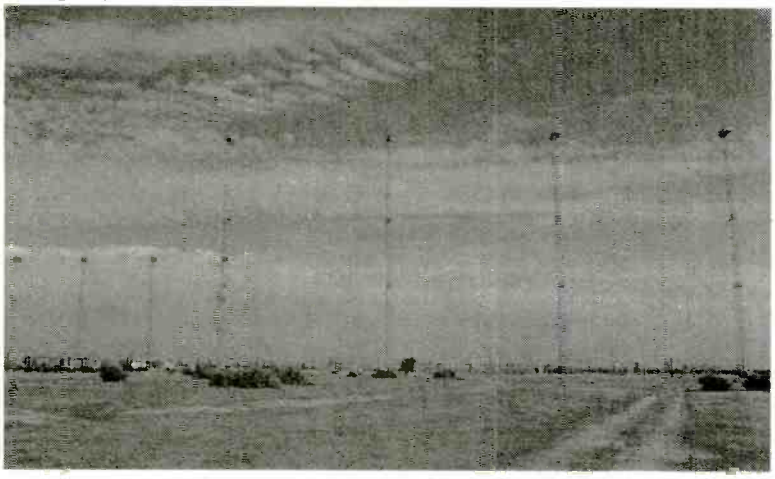
To make it all go takes a lot of hard work and money. After all the upgrading to date, the station is worth about $30 million and costs a little over $1.8 million per year to run. Half of the annual operating budget goes to paychecks for employees and supporting tradesmen. And then there's the electric bill, over $2,000 per day.

Station manager Lynn Smith stands next to one of the many anchors that support the curtain array antenna.

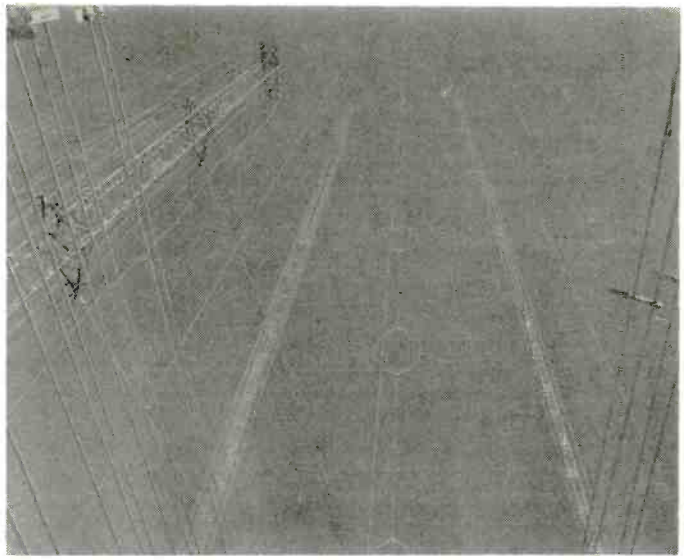
Today the Delano Relay Station is one of the most powerful and modern communication stations around. Consider the three Collins transmitters rated at 250,000 watts each and four Brown Boveri Company transmitters at the same wattage, add to that the 100,00 watts from two Continental Electronics sideband transmitters and you get whopping 1,850,000 watts of power -- yes that's about a dollar a watt per year to run.

Pump it through the new antenna with the claimed 1,000 gain and you're close to 2 billion watts. According to the station manager Lynn Smith, after all is said and done, it's closer to just over 1 billion. But it's still enough to jump start a Speilberg sportscar through time.

mt



Full view showing the towers that support the curtain. The taller towers are 408 ft. high and are the lower frequency 6- 12 kHz antennas. The higher frequencies (13-26 kHz) are covered by antennas about half that height.



Closer view of the curtain array antenna, showing a small section of the 72 broadband dipoles.

Scanning in Scandinavia

by L. Ytteren
Noboddy Town
Scandinavia

Introduction

It's a story that should make American scanner owners feel very, very, lucky. Because in some countries, mere possession of a VHF/UHF radio is a felony. And we're not necessarily talking about repressive communist or backward Third World countries, either.

Here, an anonymous Scandinavian author shares his experiences with radio -- including a chilling look at how police there catch "illegal" radio listeners.

History

20 years ago it all started with a CB set. Then I was hooked on radio. After a while I also began to listen in on the VHF. The police transmissions were the main target. My first "scanner" was a free oscillating converter that moved the 160-175 MHz band down to around 100 MHz on the FM band. It had no squelch and poor sensitivity and selectivity.

I made a 10 element beam antenna, and I was able to receive the police in the nearby village. It was noisy listening, but fun. The converter also re-radiated the VHF band so I was able to receive the interesting stations out in the garden also. But that was 20 years ago.

The Law

In Sweden you are allowed to have a VHF/UHF radio. They are not allowed in Norway, Denmark and Finland. So the only thing to do was to travel across the water to Sweden. There I bought my first real scanner. Crystal controlled. And the crystals cost a fortune. We swapped crystals and ended up with a large number. They covered the most popular frequencies like the police, fire brigade, hospitals and local companies. Illegal but fun.

A small table with frequencies in Scandinavia covering 25-1000 MHz is provided above.

Scandinavian Allocations

Type	Denmark	Sweden	Norway
Police	86 MHz	79 MHz	170 MHz
Police	400	390-410	460
Fire brigade	80	79	172
Taxi	170	160	171
Emergency	168	79	68/161
Mobile tlf			168 (old)
Mobile tlf NMT	460	465	465
Mobile tlf NMT	900	900	900
Maritime	156	156	156
Military	150-154	150-154	150-154
Military	0-80	30-80	30-80
Amateur	145-432	145-342	145/423
CB	27	27/29.7	27
Air	118	-------	136

What are people listening to

10	Police	4	Electricity works
9	Fire brigade	2	Private firms
8	Ambulance	1	Radio amateurs
4	Mobile telephones	1	Military
5	Community works	7	Aircraft

Precious Moments

Some 10 years ago, in the good old CB days, we also had a VHF police receiver in the car. One sunny summer day on the town square we were looking at the girls. A policeman stopped and looked in the car through the open window. At the same time there was a call for a police car.

He recognized the transmission of course, and what do you do? I grabbed the microphone for the CB radio and pretended that I answered "central." The policeman lifted his hand to the hat and disappeared.

That was close. The result could have been confiscation of my precious radios and a fine up to $500. Tough for a 19-year-old boy.

CB Meeting

The CB people had a meeting. Of course, the PTT (FCC) and the police knew about it. So they also came there. They started to check the cars. One of the boys had a tunable receiver and when the PTT tried it, the policeman said, "That's even better than our radio."

The Future

Future listening might be difficult due to digital transmissions and scrambling -- the new digital mobile telephone system, digital scrambling and so on. But there will always be those who want to listen in on the "news" when it happens.

Scrambling

There are several methods to make the spoken work unintelligible. A simple method is to invert the speech. So the low audio becomes the high and the high tones low. This is an easy way to stop the casual listener. Doctors and some mobile telephone systems use this method. Police use digital scrambling for narcotic work, but they are also using a simple audio bandsplit and inverting method. This is mainly to stop the newspapers from getting information.

One thing is that the firms which supply the radios for the police also supply the newspapers. They get their descramblers from the same source. It is not allowed for newspapers to have scanners in Denmark and Sweden. Nonetheless, one reporter I met had 16 scanners, even one in the bathroom.

PTT

From time to time the PTT has raided an illegal listening post. They use the method called "Rafter" in Peter Wright's book *Spy Catcher*. They listen to the local oscillator from the receiver. In some small towns, the PTT got 16 scanners just by driving down the main road.

In Sweden one youngster put the police transmissions on a loudspeaker in the grill of his car. He was fined, not for listening to the police, but for disturbing the peace.

Amusement Value

There are more people listening to the police than there are police listening. In the major cities like Oslo, Stockholm and Copenhagen, there are thousands of listeners. The amusement value is high.

Damage

I do not think the casual listener will harm or hinder any work done by the government. You feel the city is alive. But you get bored after a while. The boys in black are doing a fine job, often a social worker's job with all the drunks and other family tragedies.

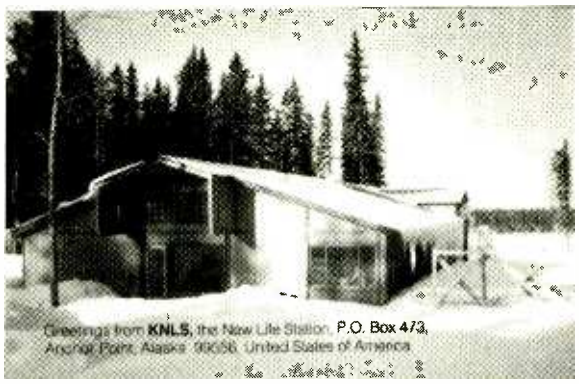
About the Author

L. Ytteren has been in the communications business for the last 20 years, working with the major communications companies such as: Ericsson, Pye, Motorola, Storno.

If you have a story of how radio has played a part in your life or the life of your community, send it to Monitoring Times. *If accepted for publication, we'll send you $50.00. All stories should be true, real life events. Manuscripts should be approximately 1,000 words and must include at least one clear photograph.*

Shortwave Broadcasting

Glenn Hauser
Box 1684-MT
Enid, OK 73702



(KNLS QSL from Ray Labrie, NH)

ALASKA KNLS planned to change all its frequencies March 31, including English hours tentatively: 0800 UTC on 11715, 1500 on 9615, 1800 on 11945, 2000 on 11910 (via Ben Krepp, Kevin Klein, Russ Lay, John Carson)

ANGOLA (non?) Voz da Resistencia do Galo Negro for a while was heard daily with a very strong signal on new 15500 until closing around 2210 (Dave Valko, PA, *Fine Tuning*) Then one such broadcast announced an upcoming change to 17890, where it was then heard on a Wednesday from 2055 to 2232, strong, but interference from HCJB until 2145; at 2200 had Portuguese news for Angolans in Portugal; maybe via Radio RSA or another high-power transmitter. This service is not daily and is not parallel to 7100, where it's also heard some days as late as 2340 sign-off; does anyone have an address for this? (Ernie Behr, Kenora, Ont., RCI *SWL Digest*)

AUSTRALIA The revived Gulf Link program was at 1430-1530 on 25750 and 21775, not other Radio Australia frequencies, as RA does not consider this one of their own services (Mike Bird, Radio Netherlands *Media Network*) Also heard on 21525 (William Westenhaver, PQ)

BANGLADESH Radio Bangladesh was heard on new 15657 from 1400 in Urdu to 1430 parallel to 17825; new 11747 from 1630 in Bengali to 1730 parallel 13615; on 9577 from 1815 in English to 1900 parallel 12030; most frequencies have very weak audio (Ernie Behr, Ont.)

BRAZIL Radio Tupi, Sao Paulo has taken over frequencies of two other stations, 24 hours: on 3325, Radio Difusora Universitario; on 4975, Radio Iguatemi (Antonio Ribeiro da Motta, RCI *SWLD*)

The Radio Beijing relay has been very strong on 15445, 0300-0356 in Spanish, parallel 11840, site? (Ernie Behr, Ont.) No Brazil ID is given, but suspect at least 15445 is new relay mentioned last month. There is no satellite-delay between these two frequencies.

BULGARIA Radio Varna has a broadcast at 1430-1500 in Bulgarian to ships at sea on 15330; A QSL is available for reports in English to Radio Varna, International Service, 9000 Varna (Rumen Pankov, *Onda Corta*)

CHINA Voice of Jinling, 1153 past 1230 shifted upward in frequency day by day, week by week: 4865, 4875, 4877 (D'Angelo, Cichorek, Washburn, *SPEEDX*) Watch out, WWV! See also BRAZIL

(non) Voice of Democracy broadcasts the same program hour after hour for a few days on 8057, between 2200 and 1530 UTC; next likely occasion is around April 5 (Tetsuya Kondo, Radio Japan *DX Corner*)

COLOMBIA CARACOL on 6150 is no longer from Neiva, but from Bandera, Cundinamarca; widely heard in Europe between 0100 and 0520 (Henrik Klemetz, Sweden, *Play DX*)

Previously reported on 2nd through 5th harmonics, La Voz del Llano (6116) was audible on 36696 kHz at 1200-1430 (Frank Helmbold, Germany, DSWCI *SW News*)

COSTA RICA The rare Radio Casino was audible earlier than scheduled on 5953-variable, from 0948 until wiped out by WYFR at 0957 (Bruce MacGibbon, OR, RCI *SWLD*) Also on 5954 with news at 1230 (Yimber Humberto Gaviria, Popayan, Colombia, *Pampas-DXing*)

TIAWR, 9725, has a series of eight QSL cards showing coats of arms of C.R. provinces (Robert Walker, MI, *DX Ontario*)

CZECHOSLOVAKIA Radio Prague International revised its November-May schedule to lengthen all previous 15-minute transmissions to 25, 27 or 30 minutes, including English to North America: 0000 on 7345, 9540, 11990; 0100, 0300 and 0400 on 5930, 7345, 9540. *DX-Special* is the first feature after the news on Wednesday; repeated as the last feature on Thursdays (via John S. Carson, OK)

DENMARK The Danish Christian Peoples Party, a minor force, wants the government to resurrect the old transmitter in Herstedvester, to transmit to the Baltic countries in their own languages, to show the world has not forgotten them and supports their struggle for freedom. The transmitter has been shut down since Radio Denmark began broadcasting via Norway in January 1990, but is intact and can be made ready on short notice (Finn Stelmach, South Australia, via Bob Padula, *ADXN*)

ECUADOR Gary Gears, 46, whose booming voice was heard on the SPEEDX Report and other shortwave stations such as KUSW and Radio Moscow, died in February of a heart attack in his sleep (HCJB *DX Partyline*)

More and more shortwave stations in Quito are reactivating as transmitter parts arrive from the USA; Radio Catolica Nacional, 5030; and then Radio Jesus del Gran Poder, 5050, heard at 1155 with a Franciscan net program (Rich McVicar, HCJB *DXPL*)

GABON VOA's one-hour relay via Africa Number One, 0300 on 9585 and 9655, was dropped at end of January due to lack of response (Bill Matthews, OH, Radio Korea *SW Feedback*)

GERMANY RCI added 9555 for relays to the Middle East at 0300-0500 via Deutsche Welle; site is Wertachtal (Paul Morneault, RCI via Bill Westenhaver, PQ)

GUATEMALA The clandestine La Voz Popular, not reported for a long time in North America, was heard during a visit here, on 7000 kHz, announcing schedule of Tuesday and Friday 2315-2425, and UTC Wednesday, Saturday at 0200-0310 on 3650, but the latter varies +/- 50 kHz; no address known (Bernhard Grundl,

via Dario Monferini, RCI *SWLD*)

GUIANA FRENCH Here's how Radio France International appeared on 7910 kHz after 0300: it's a mixing product between 9790 and 11670 (via Brian Alexander, *FT*)

HONDURAS HRXK, La Voz de la Mosquitia, 4910 is again off the air, and may not return. After the split-up of Landon and Pat Wilkerson, she continued to operate the Mision Bautista, now backed by a different group, Christian Emergency Relief Team, Carlsbad, CA. Ken Daugherty, spokesman for CERT International, trying to drum up contributions for Mrs. Wilkerson says, "Pat stands to lose everything! It costs about $1000 per month to keep the Gospel on HRXK. Needs about $7000 to repair generators, equipment and facilities. And she may lose her home and mission compound property simply because her support has not been sufficient." (Don Jensen, *NU* via *Radio Nuevo Mundo*)

HUNGARY Radio Budapest is another station facing drastic cuts, about 50% in staff and programming by end of June, partly due to double-digit inflation. Italian, Spanish, and Turkish are to be dropped; Hungarian a priority, German and English will remain, but the latter may be cut to 15 minutes, broadcast eight times a day to different targets, and on three shortwave frequencies instead of six. Their DX program, which had been broadcast 18 times a week may continue only by incorporating it into regular programming. Another possibility: one two-hour block in English; listener input invited. One proposal is for the foreign ministry to take over funding, but its income is down since visa requirements have been waived, and it's most interested in serving Carpathia, Balkans (Len Scott, a.k.a. Laszlo Pinter, RB, on RCI *SWL Digest*)

ICELAND Reykjavik was heard on new 6218 USB from 2200 past 0700, instead of briefer directional broadcasts such as 2300 on 11402, 13855, 15770 (Ernie Behr, Ont., *World of Radio*) Also at 2255 on 9265, still at 0500 check; and once on 9268 instead, as well as 6218 and 11410 around 0100 (Sheldon Harvey and William Westenhaver, PQ) 6218 and 9268 were heard at night into early morning, also 24 hours on 3295. This is why: a terrible gale caused the longwave 207 kHz transmitter to break down, and the SW relays were a temporary replacement for the fishing fleet (Timstra, Friesland, RN*MN*)

INDIA The older pair of 250-kW transmitters at Aligarh are named George and Fabian (Peter Bunn, *OzDX*)

INDONESIA Voice of Indonesia receives about 30 letters a month; reports and comments are welcome, verification by QSL card. English hours are at 0100, 0800 and 2000 on 11785, 11755, 7125 (Jawahar Almeida, *ANDEX*) One a day is terribly small for an ISWBC station, but not surprising since they are so hard to hear in North America, Europe.

Two RRIs almost co-channel: Gorontalo on 3264.66 and Bengkulu on 3264.84 between 1207 and 1226 (Dave Valko, PA, *FT*) RRI Bandung, 3204.4, at 1345 put distorted spurs on 3180.4 and/or 3073 (Kirk Allen, OK, *FT*)

IRAQ Less than a week before the ground war began, Radio Baghdad was still able to come up on a new shortwave frequency, 4600 at 0400-0430, apparently a combination of the general service and Voice of the Masses. Previously known frequencies, 3980 and 8350.3 were too poor to understand (Hans Johnson, MD, *World of Radio*)

(non) Voice of Free Iraq heard in afternoons here on 17960, 15600, 9995, 9570, 6055, once played the Radio Cairo news theme repeatedly instead of Radio Baghdad's, apparently a slip giving away its location, though some reports put it in Saudi Arabia (Hans Johnson, MD) Another favorite tune was the *Monty Python Flying Circus* theme, sometimes played twice an hour; 17960 was usually best here from 2000 past 2400 (gh, OK)

ITALY Radio Europe, Milano, raised power from 40 watts to 400, between 7293 and 7296 at 0800-1130 (L. Botto Fiora and Dario Monferini, *Play-DX*) Then tested on 13707.1 at 1119-1500 (*ibid.*)

KASHMIR AZAD Azad Kashmir Radio opening at 0040 on new 3664.4, almost parallel to 4790 (Dave Kernick, England, BDXC *Communicator*) Also heard a week before around 3662.7 (David Clark, Ont., NASWA *Journal*)

New clandestine called *Sadai Hurriat-e Kashmir*, around 1630 on 5000 kHz in Urdu and Kashmiri; news at 1640, closedown 1700; highly anti-India; no fixed sked yet, but believed on air between 0200 and 1700 for a few hours; claims to broadcast from Indian soil, but actually from Azad Kashmir, occupied by Pakistan (Kanwarjit Sandhu, India, *DX Post*)

KAZAKHSTAN Alma Ata has a new English program, heard on a Monday at 0130-0200 on 5915, also announcing 5035 and 7230, and the next one to be on Friday; though promoting foreign trade, the service is pro-Soviet (Mark Mitchell, Salisbury, UK, *World of Radio*)

KOREA SOUTH The Social Education (or Liberty) program was heard at 1337 on 6255 (Ashimori, *SPEEDX*) With DST in April, will Radio Korea via Canada go back to 1030-1100 on 11715?

LIBERIA (non?) Sudan Interior Mission, formerly operating ELWA here until badly damaged by civil war, may return from here, elsewhere in Africa, Caribbean or northern coast of Brazil (Ron Cline, HCJB, via Bill Dvorak, *W.O.R.*)

LITHUANIA Radio Vilnius got its Soviet shortwave relays back because the time is paid for in exchange for Moscow TV programs 1 and 2 being broadcast in Lithuania (Zigitas ---, Banga DX Club, RN*MN*)

(QSLs from John Flake, NC, and Ray Labrie, NH)

MALTA Voice of the Mediterranean is a joint venture between the governments of Libya and Malta, symbolizing friendship and solidarity between the two friendly peoples. English is at 0600-0800 on 9765, 1400-1600 on 11925. English features include: Mon., *Sugar & Spice* -- for females, and *Maltese Migration*. Tue., *Malta Your Host*. Wed., *Mailbag*. Thu., *Vitrage* (sic). Fri., *Psychology for Today*. Sat., *Out and About* -- music and folk shows on

Shortwave Broadcasting

Mediterranean countries, and an extra dosage of info on Maltese music, folklore, history and current events (Richard Vella Laurenti, VOM, via John Carson)

MOZAMBIQUE Radio Mozambique from 0247 on new 5113.8 (David Kernick, England, BDXC)

NETHERLANDS RN starts a new listener contact program, *Sounds Interesting*, Friday April 5 (RN*MN*)

NEW ZEALAND RNZI's *Mailbox* has added a third airing, Thursday at 0835, to Friday 1905, both of which are repeats of Monday 0330 on the first and third week of the month. However, some or all times should be one hour later now that DST is over (*W.O.R.*)

NICARAGUA Shortwave is back from here, with Radio Informaciones de Centro America -- RICA first heard around 4900 in late December by Paul Routenburg, Ont. as an unID. From mid-January it was on nominal 4920, only at 1200-1300 Monday-Friday with 1.3 instead of 10 kW (Jeff White, RN*MN*) But on 4926-variable at 0035 in late January; slowly drifts downward, then suddenly jumps back up again (Routenburg, *FT*) 4926.5 closing at 0200 (Tim J. Johnson, IL, *W.O.R.*) And a week later on 4927.4 at 0024-0100, playing pop music, not just news (Hans Johnson, MD, RCI *SWL Digest*)

Another one is now active, Radio Miskut, Puerto Cabezas, on 5970, closing one day at 2300, another day at 2359 (Bernhard Grundl, Guatemala, via Dario Monferini, RCI *SWLD*)

NIGERIA Only these listed shortwave regionals were inactive: 5965, 6025, 6100 (Mark Warner, *OzDX*, visiting Nigeria)

PERU Radio Villarica is the new name for Radio Huancavelica 4804.4 at 2340-2355 (Rafael Rojas & Pedro Arrunategui, Lima, RN *Radio Enlace*) A new station is Radio Cajabamba, 6858.7 varying to 6858.1, from town of same name in Cajamarca province, heard at 2335-0130 but announcing 6285 (Arrunategui) and same at 0135-0150 (Rojas, both via Dario Monferini)

PHILLIPPINES FEBC in English: 0100-0230 variable on 15450; 0900-1100 on 9800, 11685; 1300-1600 on 11685 (Vidjit Vijaysanker and M. Sanil Deep, Calicut, India, *DX Post*)

RUSSIA Radio Russia is now on SW, 1100-1300 on 15510 in Russian (Kirk Baxter, KS, via Bruce MacGibbon, Radio Japan *DX Corner*) And from 1300 to 1359 on 15630 and 15750, both USB; properly Russia's Radio since it's *Radio Rossiye*; followed on 15630 only for another hour by something called Radiostantsiya Mena, or Mene (Ernie Behr, Ont., *W.O.R.*) The former is the pro-Yeltsyn outlet banished from much of the time it had on Soviet domestic services.

SENEGAL ORTS reactivated on 4890.1 until sign-off at 0008; perhaps the same the day before on 4888.6 variable (Kirk Allen, OK, RCI *SWLD*) Previously on 4890.5 at 2225 past 2300 (Hans Johnson, MD, *ibid.*)

SYRIA Damascus on new 7500 at 0507-0530 (Peter Wilhelm Mueller, Germany, DSWCI *SW News*)

TAIWAN Voice of Free China sends out request cards; when you mail them back, they reply with a complimentary frisbee (Kevin Gooch, MO, *World of Radio*) Supermarket

TRISTAN DA CUNHA A reminder that ZOE should become propagationally possible over a darkness path in April, if still opening weekdays at 0709 UTC on 3290, 40 watts, as computed by David M. Clark, *DX Ontario*; schedule first reported by Ed Cichorek, NJ. Even if everything else is optimum, it's likely to be blocked by South Americans, and Papua New Guinea could also be in English as early as 0700; earlier in the evening, Namibia is on 3290.

UKOGBANI Lacking a revised published schedule from BBC, it took random listening to discover where BBC had put some programs. *Waveguide* appeared on Tuesday at 0715 (gh) and Monday at 1635 (Bill Westenhaver, PQ) By yearend, BBC plans three evenly-spaced *Newshours*, at 0500, 1300 and 2100 (BBC *Write On*)

The 0920-1000 BFBS broadcast was announced on 15245, 17830, 21590 (gh)

USA WWCR scheduled our *WORLD OF RADIO*: Friday 2215 on 15690, Saturday 1800 on 15690, UTC Monday 0130 on 7520; the middle broadcast may be temporary; times but not frequencies should shift one UTC hour earlier with DST the first Sunday in April; though WWCR wanted to replace 7520 with 7435 to escape KTBN-7510 interference. Radio Newyork International follows the Sunday evening broadcast, including *The Big Steve Show* during the first hour, including twice a month *Crossband RNI*, emphasizing pirate and ham DX news, avoiding duplication with *World of Radio* content.

USSR Radio Moscow in East African languages from 1400 as late as 1700 heard on 25780, one of few remaining 11-meter services; site? (William Westenhaver, PQ, and gh) See also KAZAKHSTAN, LITHUANIA, RUSSIA, UZBEKISTAN

UZBEKISTAN Radio Tashkent started 1991 with a new English half-hour to South Asia, at 0100 on 5955, 7190, 7265, 11975 (M. Sanil Deep, India, *DX Post*)

ZAIRE Observations made 50 km north of Goma: Bukavu not heard at all. Radio CANDIP regular on 5066. Presumed Mbuji-Mayi active on 7295 at 0515-0600 in French, 1545 past 1605 in Lingala. Lubumbashi on 7205 (not 7202) also at 1545-1605+ in French, and around 0515 (Mark Warner, *OzDX*)

Keep up with the latest by monitoring Glenn Hauser's broadcasts on WWCR, WRNO, RFPI Costa Rica, and Radio Canada International; and reading his magazines DX LISTENING DIGEST and REVIEW OF INTERNATIONAL BROADCASTING. Samples in North America $2 each from Box 1684-MT, Enid, OK 73702.

(Voice of Free China, from John Flake, NC)

Broadcast Loggings

Share your loggings with other readers by sending them to ***Gayle Van Horn****, P.O. Box 98, Brasstown, NC 28902*
English broadcast unless otherwise noted.

0033 UTC on 11680
BULGARIA: Radio Sofia. Report on the future of Bulgaria's cabinet. (Fraser, MA) (Landau, NJ)

0100 UTC on 9735
PARAGUAY: Radio Nacional de Paraguay. Spanish. National news and commentary, followed by Paraguayan folk music. Additional monitoring on same frequency at 0800 UTC with similar programming. (Barry, CA)

0140 UTC on 9875
AUSTRIA: Radio Austria International. Kurt Waldheim on tour. (Fraser, MA) (Landau, NJ)

0155 UTC on 4935
KENYA: Kenya Broadcasting Corporation. Repeated flute/drum interval signal, then announcement. Station identified itself as "This is K.B.C., the Kenya Broadcasting Corporation, Nairobi" at 0200 UTC. Christian inspirational program, followed by organ music. (Johnson, IL)

0200 UTC on 7125
UNITED KINGDOM: British Forces Broadcasting Service. Special programming of music, numerous IDs and messages to British troops serving in the Persian Gulf area. (Sewell, NJ)

0213 UTC on 9941
CLANDESTINE: La Voz del CID. Spanish. Discussion about Cuba and communism. Station ID and continued talk about Castro. (Tyler, MA)

0215 UTC on 9475
EGYPT: Radio Cairo. International news, headlines, and special coverage on the Persian Gulf. (Johnson, IL) Monitored to sign-off at 0328 UTC. (Landau, NJ) (Adams, NJ)

0250 UTC on 4790
PERU: Radio Atlantida. Spanish. Beautiful Peruvian flute tunes to "Atlantida" ID, time check and chat. (Westbrook, OH)

0307 UTC on 15415
LIBYA: Radio Jamahirya. Arabic. International news with low level audio quality. Additional programming monitored on 15240 kHz at 1459 UTC, with Arabic music, news and commentary. (Meloche, Canada)

0310 UTC on 15435
UNITED ARAB EMIRATES: U.A.E. Radio Dubai. Fair signal for Arabic music program, ID, and news on Persian Gulf. (Cavenaugh, LA) Monitored on 21605 kHz at 1630 UTC. (Landau, NJ) Audible on 13675 kHz at 0340 UTC. (Tyler, MS)

0312 UTC on 15325
JAPAN: Radio Japan. News on Kuwait and Persian Gulf. Station ID and frequency schedule. "People" program rebroadcasts featuring a Japanese mountaineer/environmental activist. Spanish programming at 0330 UTC with great audio and frequent IDs. (Tyler, MS)

0315 UTC on 9780
YEMEN ARAB REPUBLIC: Radio San'a. Arabic. Fair signal quality for announcer duo conversations. Traditional Arabic music past 0335 UTC. (Meloche, Canada)

0322 UTC on 3215
SOUTH AFRICA: Radio Oranje. Afrikaans/English. Multilingual programming that included a pop music program, local commercials, time check and station ID. (Frodge, MI)

0325 UTC on 7189.8
YEMEN PEOPLE'S DEMOCRATIC REPUBLIC. Yemen Radio. Arabic. Holy Koran recitations followed by Arabic music program. Persian Gulf War news at 0330 UTC. (Meloche, Canada)

0420 UTC on 4795
ECUADOR: La Voz de Los Caras. Spanish. Easy-listening style Spanish music, and station ID. Local time check and ads. (Westbrook, OH)

0435 UTC on 9445
TURKEY: Voice of Turkey. Program feature on Turkish history. (Meloche, Canada) Audible on same frequency at 2258 UTC, with sign-on ID and international news topics. (Starr, SC) Additional monitoring on same frequency at 2330 UTC, with "Turkish Album." (Fraser, MA)

0438 UTC on 7414
PIRATE: Hope Radio International. Musical tunes and advertisement for pirate T-shirt. "Crudco-DXR-1" shortwave radio spoof commercial. Wellsville, New York address given for QSLs and DJ comments. Address repeat and 0453 sign-off. (Tyler, MS)

0502 UTC on 7255
NIGERIA: Voice of Nigeria. National interest features, ID and reggae music tunes. (Frodge, MI) (Sewell, NJ) (Moloche, Canada)

0525 UTC on 4770
NIGERIA: Radio Nigeria. Station ID, and national news. Special feature on holiday celebrations in Nigeria and Rwanda. (Johnson. IL) Additional monitoring on same frequency at 2230 UTC. (ed.)

0530 UTC on 11550
TUNISIA: Radiodiffusion-TV Tunisienne. Arabic. Traditional Arabic music program. Additional monitoring on 7475 kHz at 2055 UTC with chat, ID and Arabic music. (Hetherington, NC)

0755 UTC on 4840
COSTA RICA: Radio Reloj. Spanish. Station ID as, "Radio Reloj numero uno en Costa Rico." DJ played a Spanish version of rock classic "Hotel California." (Johnson, IL)

1201 UTC on 11860
USSR: Uzbekistan SSR-Radio Tashkent. National news and feature, "Saturday Night With Our Listeners." Fair signal. (Landau, NJ)

1206 UTC on 13665
JORDAN: Radio Jordan. International news, traditional music program, and feature on Arab history. (Sewell, NJ) Additional programming monitored on 9560 kHz at 2040 UTC with Arabic programming past 2045 UTC. (Meloche, Canada) Audible at 0610 UTC on 11810, 11940 and 11955 kHz in Arabic with "Huna Aman" ID, talk, Arabic music and phone-in reports. (Johnson, IL)

1601 UTC on 17554
PAKISTAN: Radio Pakistan. National news, weather, and editorial. Slow-speed news at 1615 UTC. Moderate signal with strong fades. (Landau, NJ) Audible on 13665 kHz at 1605 UTC. (Hudgins, TN)

1700 UTC on 17940
IRAQ: Radio Baghdad. Political diatribe from Saddam Hussein, telling all Moslems "to join him in fighting the enemy." Newscast at 1712 UTC and station ID. (Price, PA) Tentative Radio Baghdad on 11830 kHz at 2254 UTC. (Johnson, IL) Audible on 13660 kHz at 2204 UTC with news on Iraqi education system. (Meloche, Canada)

1730 UTC on 15590
UNITED STATES: KTBN. Religious programming, news and ID beamed to Africa. (Sewell, NJ) Additional monitoring on same frequency at 0135 UTC. (Tyler, MS) (Wright, MS) (Cavanaugh, LA)

1735 UTC on 15205
ALGIERS: Voice of Palestine (via Radio Algiers) Arabic. Station ID as "Sault Al-Palestine." News topics covering Iraq, Israel, and USA to sign-off at 1800 UTC. (Price, PA)

1801 UTC on 11585
ISRAEL: Kol Israel. Interntional news in English. (Sewell, NJ) Additional monitoring at 2233 UTC on 7465 kHz. Interviews with survivors of Scud missile attacks in Tel Aviv. (Johnson, IL) Audible at 0058 UTC on 11605 kHz and 0207 UTC on 9435 kHz. (Starr, SC)

1825 UTC on 11890
OMAN: Radio Oman. Arabic. National news and ID. News coverage about Egypt to Arabic music. (Johnson, IL) Additional monitoring on same frequency at 2043 UTC with Arabic news and correspondents' phone-in reports. (Meloche, Canada)

1951 UTC on 12085
SYRIA: Radio Damascus. French. Lady announcer with news coverage on Iraq. (Meloche, Canada) Additional monitoring on same frequency at 2202 UTC with poor signal quality news in English. (Sewell, NJ) (Hudgins, TN) (Wright, MS)

1935 UTC on 11935
SAUDI ARABIA: Broadcasting Service of the Kingdom of Saudi Arabia. Arabic. Holy Koran recitations and news on the Persian Gulf at 2000 UTC. At 2150 UTC, an Arabic music program was abruptly cut off by an air raid siren. (I quickly turned on my TV to CNN where, in a couple of minutes, the reporter went live to cover a Scud missile attack.) (Johnson, IL) Audible on 9870 kHz at 2130 with Arabic music ID, both suffering from electronic interference. (Meloche, Canada)

1945 UTC on 13885
ICELAND: Icelandic National Broadcasting Service. Icelandic. National and world news with special news on the USSR. (Wright, MS)

2120 UTC on 6160
CANADA: CKZM-CBN Newfoundland. Minimal interference during news on the Persian Gulf and Canadian current events. (Bagwell, MO) Audible on same frequency at 1011 UTC. (Tyler, MS)

2140 UTC on 7415 USB
PIRATE: Radio Fluffernut. "Not-So-Top" rock music program, QSL address given and sign-off at 2213 UTC. (Frodge, MI)

2140 UTC on 9535
ALGERIA: Radiodiffusion-TV Algerienne. French. Fair signal quality with co-channel interference during discussions about Bulgaria and Cuba. (Meloche, Canada)

2150 UTC on 9780
UNITED ARAB EMIRATES: Voice of the UAE-Abu Dhabi. Arabic. Announcer chat and fair quality Arabic music program. (Wright, MS)

2155 UTC on 4815
BURKINA FASO: Radiodiffusion-TV Burkina. French. Announcer chat and program schedule. Station ID to African pop tunes. International news at 220 UTC and highlife music. (Westbrook, OH) (Wright, MS)

2200 UTC on 11620
INDIA: All India Radio. Indian music of tablas and sitar. Program called "Panorama of the Indian Cinema" followed by news on the Persian Gulf war. (Robinson, TN) (Hudgins, TN) (Sewell, NJ)

2205 UTC on 5047
TOGO: Radio diffusion-TV Togolaise. French. Fair signal quality for station ID and chat on Togo music celebration inLome. (Meloche, Canada)

2225 UTC on 4825
GUATEMALA: Radio Mam. Spanish. Lady announcer presents Spanish pop and traditional tunes. Station ID and promotional. (Law, LA)

2231 UTC on 7416
PIRATE: Action Radio. "Cheers" TV show theme music, "Middle of the Road" pop music, and comedy spot about Holly Farms Chicken. QSL address given for Wellsville, New York, and sign-off at 2320 UTC. (Frodge, MI)

2300 UTC on 7400
USSR: Lithuanian SSR-Radio Vilnius. Excellent signal quality for discussion on problems in Lithuania. (Robinson, TN)

2320 UTC on 15084
IRAN: Voice of Islamic Republic of Iran. Arabic. Low level music program. Monitored past 0036 UTC with news, Arabic music and IDs. (Wright, MS)

Utility World

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Maritime bands -- revised allocations

On July 1, 1991, several important changes are due to be made to the maritime radio bands as the result of decisions taken at the 1987 Geneva World Administration Radio Conference (WARC).

In January, *Monitoring Times* announced the changes that were coming and this month I will expand on that feature with the help of A.G. Halligey, author of the latest edition of Gilfer's *Confidential Frequency List*.

The expansion of some bands by allotting maritime channels to frequencies previously shared with the fixed service (but hitherto virtually unused by the maritime services) has provided 79 additional radiotelephone (USB) duplex and 406 additional RTTY channels. All will be paired.

Notably, paired channels are for the first time provided for both USB and RTTY in the 18/19 and 25/26 MHz maritime bands. The width of USB channels is reduced from 3.1 kHz to 3.0 kHz. RTTY channels will remain with a spacing of 0.5 kHz.

A paired channel is basically a full duplex channel. The ship will transmit on channel A and receive the coast station on its transmit channel, channel B. On the coast side, the coastal station receives on channel A and of course transmits on channel B. In effect, it is like transmitting on a telephone: you can transmit and receive at the same time.

When talking about paired frequencies, channel numbers relate to specific frequencies, one in the ship band and one in the coast station band. These frequencies are unchanging and are said to be "paired."

There will also be some other changes in the maritime bands: for example, a few frequencies are allotted to each band for "digital selective calling," a means of alerting one particular vessel.

Coast station RTTY channels are moved en bloc from their present position in the frequency spectrum between the coast station CW (Morse code) and Upper Side Band (USB) bands to the low frequency end of each coast station CW band. There are also minor adjustments to both the HF (shortwave) and LF (low frequency) ends of most ship and coast station CW bands.

Ship CW calling channels in all bands are reduced from 18 to 10 channels.

Both coast and ship stations will change to replacement frequencies indicated for the same channel number that they currently employ, at 0001 hours on July 1. The new frequencies are shown against their respective channel numbers in the accompanying Table 1.

A big Ute World round of thanks to Geoff for forwarding the material. Geoff's *Confidential Frequency List* is available from a number of radio stores.

New Maritime Frequency Channeling Table 1

Radiotelephone (USB) Bands (3 kHz spacing)

Ships	Channel Nos	Coast Stations	Total Ch
4065-4143	401-427	4357-4435	27
6200-6221	601-608	6501-6522	8
8195-8288	801-832	8719-8812	32
12230-12350	1201-1241	13077-13197	41
16360-16525	1601-1656	17242-17407	56
18780-18822	1801-1815	19755-19797	15
22000-22156	2201-2253	22696-22852	53
25070-25097	2501-2510	26145-26172	10

Maritime RTTY Bands (0.5 kHz spacing)

4172.5-4181.5	1-19	4210.5-4219.0	19
6263.0-6275.5	1-26	6314.5-6330.5	34
6281.0-6284.5	27-34		
8376.5	1	8376.5	1
8377.0-8396.0	2-40	8417.0-8436.0	39
12477.0-12549.5	1-146	12579.5-12656.5	156
12555.0-12559.5	147-156		
16683.5-16733.5	1-101	16807.0-16902.5	193
16739.0-16784.5	102-193		
18870.5-18892.5	1-45	19681.0-19703.0	45
22284.5-22351.5	1-135	22376.5-22443.5	135
25173.0-25192.5	1-40	26101.0-26120.5	40

Coast Station CW Bands

4221-4351	6332.5-6501	8438-8707	12658.5-13077
16904.5-17242	19705-19755	22445.5-22696	26122.5-26145

Can you hear VDE?

Every Sunday at 1455, a Morse Code station, VDE, sends his call sign for five minutes, then on the hour transmits a five-figure group message. Then the frequency goes quiet for another week. The frequency is 8970 kHz. The station is weak but readable in the UK. Is there anyone here in the States can hear these broadcasts? Please forward this via the loggings section of this column.

11176 is active

My mail has been flooded with those of you who have been monitoring interesting comms on 11176 kHz over the last few months. You all have been getting some very interesting intercepts. As example of that comes from two contributors who monitored the same communications.

William Briley in Minnesota says, "I was tuning into 11176 kHz and heard [Military Air Command] MAC #70166 ask for weather conditions at Andrews Air force Base, Maryland." The flight was told that conditions were bad with 100-200 foot ceiling and visibility of one-quarter to one-half mile. They were told to divert to Roanoke.

After a short exchange, they were told to have Mr. Hope call "Timberwolf" (President Bush) as soon as possible and gave the number for him to call.

The pilot told control that he would make one try at Andrews on runway 01 and if he couldn't make it, they would go to Roanoke. The pilot was told that Timberwolf would like to talk to Mr. Hope via phone patch. Bob Hope and President Bush talked for several minutes. President Bush thanked Bob Hope for entertaining the troops and asked him to call as soon as he landed.

William caught his transmissions from 0030 to 0120 and during those times the flight also used 13244 and 15015 kHz.

Now at about the same time, Lee Banner in New York was monitoring on 11176. Lee picks up his intercept at 0057. He says the conversation went through "Crown." At 0113, Crown requested MAC 70166 go to 15015 kHz for a phone patch from Command Post. Major Gold got Bob Hope on the line for the President. He said that General Schwarzkopf spoke highly of the work he had done, and how he came across genuine and warm on NBC News that night. He also said it was a bad connection and he would call him again when he landed.

These two intercepts are prime examples of the fact that you never know who or what you will hear on the utility bands. In fact, the next example proves the same point.

Mystic Star active for Gulf crisis

Pat Cox has also caught some interesting comms but these occurred on the Mystic Star network. With the Iraq/Kuwait war, the president's trip to the Helsinki summit, Mexico and South America, and also the trip to the Middle East on Thanksgiving, the frequencies have been very active.

Pat has caught activity on the following frequencies:
6730 6756 6810 6812 6883 11035 11055 13217

He even intercepted Secretary of State James Baker aboard SAM 206. He made telephone calls to Speaker Tom Foley, Senator Bob Dole and Congressman Bob Michael. He was unable to reach Senator George Mitchell, the fourth member of the congressional "big four." Of course, Saddam Hussein was the big topic of discussion.

Pat also had a question. Through his monitoring of Desert Shield/Storm operations, he has heard several of the ICAO four-letter airport designators like those that were discussed in last month's feature piece on monitoring the Middle East war. He has heard these being used on United State Air Force frequencies.

These have included:

KPOB Pope AFB, NC
EDAR Ramstein AFB, Germany
OERY Riyadh, Saudi Arabia

He would like to know who the following identifiers belong to. (Note: I have filled in the IDs for him and you.)

EDAF Rhein-Main AFB, Germany
LETO Madrid/Torrejon, Spain
LPLA Lajes AB, Azores
OEDR Dhahran Intl, Saudi Arabia
OMAD Abu Dhabi/Bateen, UAE
OMBD Dubai, UAE
EFHO An unknown in Finland
LEZA Zaragoza AB, Spain
OBBI Bahrain Intl, Bahrain
OEKM Khamis Mushait, Saudi Arabia
OMAM Abu Dhabi/Al Dhafra, UAE

Pat, I hope that helps you and our readers identify some of the transport airfields being used lately.

Special MAC call signs IDed

Long time contributor Bill Battles has done some dial searching and came upon a clue on the MAC + letters flight call sign we all have been hearing during Desert Shield/Storm.

He said recently while listening to Stockholm LDOC on 5541, MAC Victor 6489 came up with position/ops etc. That part's pretty normal. Then Bill heard him say he's Northwest 57?? and he requests Northwest Operations be advised he departed Frankfurt and was enroute Bahrain.

Pretty tricky, huh? These call signs appear to belong to one of the special Civil Reserve Air Fleet (CRAF) planes called up for Operation Desert Storm. Bill also heard another MAC Foxtrot Unit calling Bolero Whiskey on 13201. Any ideas from anybody would be appreciated on this one.

The Cape has gone weird

Bill also mentioned some real bizarre goings on around NASA frequencies. Not long ago he heard Cape Radio working Kilo Zero Zulu on 10780 at 2153. Kilo Zero Zulu (KOZ) requested something about Hot Rod, then Cape replied, "If you can go to frequency Latex Tobacco (LT) or higher, we can give you more power on a directional antenna."

Then a few minutes later, Cape advised to go to Ecuador Dogfight (ED) frequency. Zulu Echo replied, "Give me a call on the duplex."

Bill wants to know who thinks up these tactical identifiers? Probably a bunch of characters you wouldn't want to be alone in a dark room with. Bill has had no joy in finding either Latex Tobacco or Ecuador Dogfight and I ran through many known Cape frequencies, but as Bill put it, "They have literally parcels of frequencies available, so this is a real tough one."

For those of you updating your new identifiers, here are a couple Bill sent and one from the logs section of this column for this month:

6730	X-903
11226	X-905
17992	X-908
11220	S-310
11494	S-311
18397	W-112

Bill says he has heard X-907 and W-114 mentioned but has no freq tagged to them yet.

Well, that's about it for this month. Now it's time to go for a cool teul and check out what you logged on the bands.

Utility World

Utility Loggings

Abbreviations

AFB	Air Force Base	LSB	Lower sideband
AM	Amplitude modulation	MAC	Military Airlift Command
ARQ	SITOR	MAG	Military Assistance Group
CAP	Civil Air Patrol	MARS	Military Affiliate Radio System
CGC	Coast Guard Cutter	NCS	Net Control Station
COMSTA	Communications Station	NDB	Nondirectional beacon
CO	Commissioned Officer	NEACP	National Emergency Airborne Command Post
CONUS	Continental United States	PACCS	Post Attack Command and Control System
CRATT	Crypto RATT (RTTY)	QSO	Communication ("comm")
CW	Morse code	QSY	Change frequency
DOD	Department of Defense	RAF	Royal Air Force
EAM	Emergency Action Messages	RAAF	Royal Australian Air Force
FAX	Facsimile	RNZAF	Royal New Zealand Air Force
FEC	Forward error correction (RTTY mode)	RTTY	Radioteletype
FSK	Frequency shift keying (RTTY mode)	SAM	Special Air Mission
HF	High Frequency (shortwave)	TACAMO	VLF Airborne Radio Relay System
ID	Identification	UNID	Unidentified
ISB	Independent sideband	USB	Upper sideband
joy	success	USAF	United States Air Force
LANT	Atlantic	USN	United States Navy
LDOC	Long Distance Operational Control	USS	United States Ship

All times UTC, frequencies in kilohertz. All voice transmissions are English unless otherwise noted.

2010.4 T1J calling Tango and Echo control in USB at 0341. (Webb, CA)

2055.5 WLO-Mobile radio, Alabama, with V CW marker at 0700. (Webb, CA)

2063.0 J9K working D9T regarding RTTY equipment in USB at 0346. Mentioned Fort Raleigh and Fort Ord. (Webb, CA) *Interesting, sounds like the Army is using Alpha-numerical call signs like the Navy's -chief.*

2115.0 Unid Russian station noted here at 0555 in USB. (Webb, CA)

2261.0 NMA-COMSTA Miami working CG Rescue 2107 at 0132. (Battles, NH)

2273.5 3J working 6T talking about the war and H-hour at 1705 in USB. (Webb, CA) *Non-Desert Storm related -chief.*

2622.0 DOD Cape working Liberty Star in USB at 0548. (Alexander, PA)

3187.0 DOD Cape working Liberty Star in USB at 0340. (Alexander, PA)

4025.0 Army MARS net-AAR NCS with AAP and AAM in USB at 0257. (Hill, MI)

4028.0 Spanish female five-digit number station at 0607. (Fernandez, MA)

4030.0 Bulgarian female five-digit number station at 0610. (Fernandez, MA)

4125.0 KNB347-Freeport, Texas, Limited coastal station working Pipeline Observer. Answered to Freeport Base but gave call sign on his end at 2345 in USB. (Perdue, AL)

NMB-Coast Guard Group Charleston, South Carolina, working fishing vessel Miss Emma which was taking on water. At 2231 in USB. (Perdue, AL)

AFB2BJ USAF MARS working USN MARS NNN0RFW and Army MARS AAR4LL Memphis passing ham-grams and closing net at 0210 in USB. First multi-service MARS net ever heard. (Perdue, AL)

4416.0 X7A at 0317 and M4U at 0319 with coded traffic. Several others noted in USB. (Hill, MI)

4444.4 Two unid stations (males with fishing ops QSO and clearing with no names/IDs. Guess these guys have trouble remembering frequencies. (Fernandez, MA) *They go where they want -chief.*

4465.0 Keystone 4 net control of Pennsylvania Wing CAP at 2235 in USB. (Hill, MI)

Northeast 2 NCS with Northeast Region CAP in USB at 0120. Also heard Cycle 40 working Cycle 42?? (Hill, MI)

4470.5 NNN0AAY working NNN0AKJ with chit chat in USB at 0314. US Navy MARS. (Hill, MI)

4514.0 NNN0IFN working NNN0IDA with chit chat in USB at 0243. US Navy MARS. (Hill, MI)

4585.0 Mountain 29 NCS accepting net check-ins in USB at 2230. West Virginia Wing CAP. (Hill, MI)

4595.0 Stockholm LDOC, Sweden, working flight 289 at 0339 in USB. (Battles, NH)

4610.0 Numerous tactical call signs (Central Jungle was NCS) checking into net between 1430 and 1447. Net closed at 1502. No traffic ever passed and central time zone times were used. In USB. (Tyler, MI)

4625.0 VEB2-Israeli Mossad with buzzing notes at 0628. (Fernandez, MA) *This is still a Mossad station -chief.*

4882.5 Bulgarian female five-digit number station at 0646. Heard another female number station in background that was on 4030. Went to 4030 and now heard 4882.5 text in her background. At 0647, 4030's text ended with five tones, then another text began. Each text on each frequency was five-digit groups. Looks to me like bad isolation problems in the common transmitter used for both frequencies. (Fernandez, MA)

5180.0 DOD Cape working USS Sims, King 1, Orion Azores, Orion Bermuda, CGC Seneca in USB at 0618. (Alexander, PA)

5246.0 DOD Cape working King 1/2, CGC Forward and USS Sims in USB at 2256. (Alexander, PA)

5490.0 A very small airline or bush pilot operation in Canada using USB. Female dispatcher acts more like the pilot's mother. Told one pilot, "Now if the weather is bad when you get there, don't try to land, you just come home." At 2230. (Inman, TN)

5771.0 Spanish female five-digit number station at 0802. (Tyler, MI)

6403.0 CLJ-Havana Radio, Cuba, with CW traffic list and ID at 0503. (Bilodeau, IL)

6512.0 GW working Kilo with position reports of unknown aircraft from the two units. Heard words like enemy, weapons hold in the red, in the green, etc. In USB between 2100 to 0200 on two separate nights. Makes me wonder. (Robert J. Heckman, Chattanooga, TN) *Makes me wonder, also, Robert. This could be Middle East transmissions. The time of day is right, and the use of a split adds to the speculation. Welcome to the column -chief.*

6683.0 Air Force One, SAM 27000 on frequency asking AF1 to call them on Sierra (VHF). QSYed 6756 at 0749 in LSB. Not much HF traffic, some interplane between AF1, backup aircraft (27000) and NEACP aircraft (Best idea). AF1 secondary HF voice was 13205 USB. (Tyler, MI)

AF2 with phone patches to Crown and to Tech Control to try to firm up arrangements for VP Quayle and his staff at Rheinmein AFB, Germany. At 0450 in LSB. (Barnett, IN) *Welcome aboard, Tom -chief.*

6746.0 Roadside working Loophole on Sierra Alpha. Numerous calls, no answer. In USB at 1416. (Tyler, MI)

6791.0 V CW beacon along with steady tone at 0242. (Bilodeau, IL)

6853.0 German female five-digit number station at 0815. (Tyler, MI)

6860.0 English accented female three-digit number station at 0137. (Tyler, MI)

6934.0 Spanish female four-digit number station at 0309. (Hill, MI)

6940.0 Spanish female five-digit number station at 0335. (Tyler, MI)

Marmaduke? working 71. Mentioned 14 passengers and using four one-half drums (900 liters) of JP-1 fuel. Sounded American and call sign tentative in USB at 0337. (Tyler, MI)

6947.0 Duran working Protocol coordinating data circuits. "Use Baker-1 sideband on Alpha-3 frequency and let's put order wire on Alpha-1." Also mentioned channel A-7. Protocol wasn't heard (semi-duplex circuit?). Previously heard on 11422.5 LSB. Here at 0825 in LSB. (Tyler, MI)

6963.0 English female three/two-digit number station at 0229. (Edmunds, FL)

7421.7 COMSTA New Orleans in comms with station X4A requesting his to go to another frequency for assistance. I didn't know the CG was assigned this one. In USB at 0220. (Bob Heckman, Chattanooga, TN)

7430.0 V1B/J1C/E1B/C5M/A1M/M1M in comms with radio checks at 0000 in USB. Discussed antennas in use, mentioned military radios. (Heckman, TN) *USMAG in South America, Bob -chief.*

7549.0 OF working 7I trying to get FSK mode to work correctly at 0058 in USB. (Tyler, MI)

7588.0 English female three/two-digit number station at 0030. (Tyler, MI)

7654.5 English female three/two-digit number station at 2126. (Tyler, MI)

7725.0 Spanish female four-digit number station heard at 1036. (Tyler, MI)

7830.0 German female three/two-digit number station at 0404. (Fernandez, MA)

7918.0 Israeli Mossad phonetic alphabet station with five-digit numbers at 0408. (Fernandez, MA)

7963.0 Army or National Guard tactical radio ops talking on voice coordination circuit, and rapping on the term data circuit (11380). Used first names at 1427 in USB. (Tyler, MI)

8784.0 HEB-Bern Radio, Switzerland, with traffic list, then simplex phone patch with unid ship in USB at 0716. (Perdue, AL)

8805.7 OHG2-Helsinki Radio, Finland, with end of traffic list and had several IDs as Helsinki Radio in USB at 0657. (Perdue, AL)

8939.0 Kiev, USSR Volmet broadcast. All in Russian stopped at 0724 and another Russian language broadcast at 0725 in USB. (Tyler, MI)

8972.0 S4JG working Z7G trying to set up CRATT circuit on JA (pri) or JB (sec) frequency. CRATT didn't work. Z7G wanted to go green but S4JG didn't know what they meant. (*That's strange -chief.*) They finally tried PARKHILL secure voice, but no joy. S4JG is allegedly LANT TACAMO on station aircraft. At 0212 in USB. (Tyler-MI)

8975.0 Royal Australian Air Force Townsville working RAAF aircraft Aussie 393. 393 wanted Townsville to relay message at 0821 in USB. (Tyler, MI)

8997.0 Royal New Zealand Air Force, Auckland, passing weather forecast for Christchurch to RNZAF KIWI 965 at 1010 in USB. Mentioned 5726 as secondary guard frequency. This is Antarctic support units. (Tyler, MI)

9017.0 Bank Loan and Riot Gun, both female operators were extremely confused. Couldn't figure out what channel they were on (W-109?) at 2038 in USB. (Tyler, MI)

WWABNCP PACCS Drag Race radio check with Auto Sale and requesting check in secure voice. Auto Sale told Drag Race to QSY to W-102 channel. Drag Race went to W-104 at 1409 in USB. (Tyler, MI)

High Tide working War 46 at 1558. (Battles, NH)

9018.0 Abduction with phone patch via MacDill Airways to 3300 -- ANMCC Duty Officer -- for comms check at 2350 in USB. (Tyler, MI)

Air Force Auckland (RNZAF) telling Medford that Auckland had finally found the list of the survey team channels and would meet them on channel 1. Stations changed frequencies at 0812 in USB. (Tyler, MI)

9060.0 Two very weak stations passing message traffic. Often used Nigeria as phonetic for letter "N" plus frequent other mentions of Nigeria. Accented English, then African dialect at 0710 in USB. Nigerian military or researchers?? (Tyler, MI)

9090.0 English female three/two-digit number station at 0213. (Tyler, MI)

9222.0 Spanish female four-digit number station at 0231. (Edmunds, FL) At 0325. (Fernandez, MA)

9251.0 English female five-digit number station at 0343. (Edmunds, FL) At 0320. (Fernandez, MA)

9257.0 Several stations using one and two word tactical IDs. Conversations about weapons status, threat level and alligator status noted. My database says this is a Navy tactical channel. Not sure if this was an exercise or something from the Gulf. Around 1500 in USB. (Inman, TN) *I don't think this was a Gulf comm, Gary -chief.*

10255.0 KWS78-US Embassy, Athens, Greece, with QRA CW marker at 0126. (Bilodeau, IL)

10510.0 Spanish female five-digit number station at 0453. (Tyler, MI)

10526.0 English female three/two-digit number station at 0223. (Anderson, CA)

10665.0 Spanish female four-digit number station at 0223. (Anderson, CA)

10701.0 Oscar 91 calling Bravo 91 for a radio check in USB at 0126. (Bilodeau, IL)

10780.0 Orion Bermuda calling DOD Cape at 2314 in USB. Orion Azores working Fisher (Cape Radio) at 2339 in USB. Cape Radio working USS W.S. Sims in USB at 0615. (Alexander, PA)

10869.0 18-three character groups sent in CW (both numbers and letters) followed by a steady tone, increased in amplitude several steps. Then a repeat of the same groups. Maybe some type of propagation test at 1551? (Fernandez, MA)

10870.0 English female repeating 312 four times, then 0000 four times, over and over, then carrier quickly gone at 0234. (Tyler, MI)

11052.0 SAM 972 working Andrews AFB with phone patch to State Dept Ops in USB at 2222. (Hill, MI)

11108.0 Papa November female number station with flute music. Five-digit numbers in German at 1240. (Tyler, MI)

11129.9 Mexican military stations speaking Spanish at 2312 in USB. (Webb, CA)

11204.0 RAF Belize flight watch in USB at 0254. (Edmunds, FL)

11214.0 Dark Star Mike with patch to Sierra Pete reference EAM training with Solid Gold 08 on 260.8 or 254.2. Phone patch to Blue Crab for radio check, Dark Star Mike 2 in USB at 1609. (Tyler, MI)

11279.0 Kasasnodar, USSR Volmet with Russian weather broadcast at 0312 in USB. (Edmunds, FL)

Alma Ata, USSR Volmet with Russian weather broadcast at 0315 in USB. (Edmunds, FL)

11297.0 Rostov, USSR Volmet with Russian weather broadcast at 0325 in USB. (Edmunds, FL)

11422.5 Duran working Protocol QSLing messages sent via data. Station Control Car was called -- no answer at 0028 in USB. (Tyler, MI)

13201.0 King 79 working McClelland with phone patch to rescue ops at 1827 in USB. (Carl Parks, Palmetto, GA)

13327.0 Unid aircraft calling Madrid? at 1813 in Spanish in USB. (Battles, NH)

13445.0 Time domain secure voice (KY-28) traffic at 1526 in USB. Language was Spanish. Station was very weak. (Tyler, MI)

13498.0 AGA2LA (Langley AFB, VA) running phone patches to CONUS families for AFQ472 and AFQ371 in Saudi Arabia for the then Desert Shield Operations at 2200 in USB. (Tyler, MI)

13500.0 Mexican Maritime network in Spanish, several coastal stations noted at 2215 in USB. (Webb, CA)

13878.0 Cape Radio, DOD Cape working Orion Bermuda and Azores in USB at 2343. (Alexander, PA)

13898.5 CUW20-Albrook AFS Panama US Air Force MARS running phone patches via AFA2PU and then flirting with female MARS operator in USB at 2233. (Tyler, MI)

13927.0 Station G4A passing message to G4B Info station Zero, reference your time 1830 not possible due to CO's intentions at 2248 in USB. Probably foreign military. (Tyler, MI)

AGA2LA and AFA2FS running US Air Force MARS phone patches for AFQ (575/362) stations deployed to Saudi Arabia in USB at 2225. (Tyler, MI)

14467.0 NNN0CUP-USS Nimitz (CVN-68) US Navy MARS requesting a priority phone patch from NNN0NUW at 0153 in USB. (Perdue, AL)

14470.0 NNN0COZ-USS Forrestal (CV-59) US Navy MARS working NNN0NUW with phone patch at 0055 in USB. (Perdue, AL)

14477.0 NNN0CUS-USS Inchon LPH-12 working NNN0ERA at 1935 in USB. This was the eighth and last ship I served on in my 20 year Navy career. I've waited a long time to catch a log of her. Sent the RMC a lot of stuff with my request for a confirmation. (Perdue, AL) *Congrat, Neal, wish I could hear some of the ships I have served on and get them to answer -chief.*

15049.0 Yankee 3 Delta repeating EAM several times in USB at 1541. (Tyler, MI)

17251.5 LFN6-Rogaland Radio, Norway, working unknown ship on 16478.6 in USB. (Emil Kasprzyk, Austin, TX) *Welcome to the column, Emil -chief.*

17961.0 Jeddah, Saudi Arabia working MS-1 at 2117 then QSY to 8822 and on to another frequency in USB. (Battles, NH)

17992.0 Military net consisting of Interrogative/Streamer/Film Flam/Shop Ward and Book Store. This frequency was referred to as X-908 (Bill Battles, note -chief.) Secondary was W-109. (Edmunds, FL) *Thanks, Charles, it was new to my master list -chief.*

Shipwreck with EAM at 1626. (Battles, NH)

20185.7 Ascension Island tracking station relaying shuttle mission audio in LSB at 2344. (Alexander, PA)

20198.4 Ascension Island tracking station relaying shuttle mission audio in LSB at 2344. (Alexander, PA)

21964.0 JDJ working Houston Universal LDOC at 1858 USB. (Battles, NH)

25012.3 GYA-London (Whitehall) Naval, England, with frequency list and ID test tape at 1835. RTTY 796/75. (Fernandez, MA)

The Scanning Report

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

Cellular Madness

Policemen, firemen, political candidates, and common citizens have been monitoring the 800 MHz band for years. How do I know? Heck, just look in your local newspaper. Cellular monitoring has appeared in newspaper headlines across the entire nation.

The most recent episode occurred in Canada. The cellular phone calls of a well known politician were monitored and tape recorded. When the tapes were made public, lives were ruined and political careers went down the drain.

It appears that the general public seems to feel exempt from complying with the Electronic Communications Privacy Act, perhaps out of ignorance. Their cellular adventures regularly appear in local newspapers and magazines, resulting in at least one court case.

To bring you an up-to-date report on such monitoring, I needed to find an ordinary citizen--a person who didn't subscribe to *MT* and who knew nothing about the ECPA.

In the suburbs of Philadelphia, I found such a person, sitting in a park. His name is Joe Smith, and here's what he had to say about monitoring the 800 MHz band.

KAY: Mr. Smith, do you monitor 800 MHz?

SMITH: Sure. Doesn't everybody?

KAY: Are you a "scanner buff"?

SMITH: Nope. I'm just an average citizen.

KAY: What type of monitoring antenna do you use?

SMITH: I use a standard UHF television Bow Tie. I simply turn the antenna vertically, add a balun, and use low loss coax to feed my scanner radio.

KAY: Have you used this type of antenna outdoors?

SMITH: Sure. I use silicone glue to waterproof the connection points, and I mount the antenna on a wooden pole.

KAY: What type of coax cable do you use?

SMITH: I use cellular phone coax.

KAY: Where do you get "cellular coax cable?"

SMITH: From my local cellular dealer. They sell it to me by the foot--just like Radio Shack.

KAY: How do couplers and splitters affect 800 MHz reception?

SMITH: Using a splitter, or coupler, in the coax, generally results in a 3dB loss of signal. Using several of these devices can push the signal loss to 6dB's or more.

KAY: How can signal loss be prevented?

SMITH: When monitoring the 800 MHz band, don't use a splitter or coupler. I designate one antenna for monitoring that band, and I connect a continuous length of coax from that antenna to my radio.

How much does the public know about 800 MHz monitoring? Scanning Report interviews "an ordinary Joe."

KAY: Let's imagine for a moment that we use a coupling device or splitter. Can the signal be boosted in some manner?

SMITH: Sure. You can use a good quality, low noise preamp. But remember to check the frequency range of that device. If the preamp is only rated to 500 megahertz, it won't work on the 800 megahertz frequencies.

KAY: Have you tried mobile monitoring?

SMITH: Nope. I don't drive. But if I did, I wouldn't spend a lot of money on some fancy monitoring antenna.

KAY: What type of antenna would you use?

SMITH: I'd use a standard cellular car phone antenna.

KAY: What would be the advantage of using such an antenna?

SMITH: Cellular car phone antennas are inexpensive, and they are constructed to provide maximum signal gain.

KAY: You're well informed on the topic of 800 MHz monitoring. Are you sure that you're just an average citizen?

SMITH: Make no mistake about it, I'm just an average "Joe," sitting on a bench.

KAY: Are you here everyday?

SMITH: Yes sir. Rain or shine.

KAY: Thank you for the interview. I'll tell my Philadelphia readers to stop by and say hello.

While cellular monitoring is illegal, Mr. Smith's comments and ideas can legally be applied to monitoring the 800 megahertz business and public safety frequencies. Happy monitoring.

Treasure Hunt

During the month of April, there's a fresh, clean smell in the air. The warm sunshine softens the earth, and flowers proudly display their first blossoms of the new year. For those of us in the Northeast, the month of April marks the official end of Winter. Gone are the blustery winds and numbing cold. It's time to get outdoors, to walk in the warm sun, and to take a few pictures.

Think about it. When was the last time that you took pictures of the kids? And what about your scanning shack? Do you have a recent photo of all your equipment?

Sure, I know what you're thinking. Taking pictures with your old camera isn't exciting. You want a new camera, but you can't decide on which model to buy.

To solve your problem, the Minolta Corporation has donated a top of the line, 35mm SLR to the Treasure Hunt. The Minolta 3000i is a computer controlled, auto focus camera. You simply point the camera at the subject, push a button, and Minolta's on board computer sets the camera for a perfect picture--it couldn't be easier!

Loading the camera with film, is another complicated task that Minolta has simplified. With the 3000i, you simply open the back, drop in the film, and your ready to shoot a perfect roll of pictures.

To win the 3000i, you'll need to find the answers to the following questions:

1. Draw the Minolta logo.
2. In addition to the 3000i, Minolta also features a 5000, 7000, 8000 and 9000 model. True or False?
3. What agency provided the cover photograph for the January 91 edition of *MT*?
4. In a recent survey, *Monitoring Times* was rated the #1 Radio Magazine in North America. True or False?
5. Name the inventor of the BNC connector. (Here's a hint: look in the January '91 edition.)

Our lucky winner will receive the Minolta Maxxum 3000i and a 50mm, 1.7 auto focus lens. You can see the Minolta 3000i by visiting your local camera shop or department store. In the meantime, you can increase your chances of winning, by honoring our guidelines:

1. FAX submissions will not be accepted.
2. Multiple submissions are okay, but they must be mailed separately (one per envelope).
3. Post card submissions are encouraged, and you'll save postage.

Okay gang, this is your last chance to win the camera. Next month, we start a new Treasure Hunt, with more fabulous prizes. And remember, you can't win, if you don't play -- so send in your answers, and keep your fingers crossed!

Frequency Exchange

It's Springtime, gang! Time to tune the lawn mover, fertilize the grass, and sharpen the hedge clippers. But before you get carried away with warm weather chores, there's something that you should know. Our first stop this month is McMurdo Sound. Where is McMurdo? Well, I hope that you haven't stored your winter coat, because we're off to **McMurdo Sound, Antarctica.**

Brrrr, cold enough for you? Hey, don't blame me. We were invited here by a subscriber that calls himself "The Old Explorer." According to "OE," the following frequencies are active:

126.200	Tower, Williams Field
134.10	Tower, " "
139.80	Crash/Fire
143.00	I Net Main frequency
143.10	Pen Net used by VXE-6
143.40	Helicopter operations
340.200	Tower, Williams Field

I don't know about you guys, but I'm not hanging around to confirm OE's frequencies. Let's say good-bye to McMurdo, and hit the warm sands of **Sunnyvale, California.**

A subscriber who calls himself, "KB" claims that Sunnyvale is a scanner buff's dream area. KB claims that Sunnyvale isn't far from NAS Moffett Field. Here are the frequencies that he sent in:

139.575	Moffett Base security
151.955	DeAnza Campus Police
154.28	SWMA Fire
154.830	Foot Hill Campus Police
154.92	SWMA Police
170.350	NASA/AMES Security
453.575\675	San Jose Airport Police
453.80	Public works
482.337	CWMA Police
482.412	CAD system
482.962	Police dispatch
483.162	Police

From California, we travel to the home of Gene Rosenberg. Gene lives in **Bergen County, New Jersey**, and here are a few of his favorite frequencies:

477.1625	Repeater, town police
477.1875	Detectives, investigators
477.2125	Low power repeater for emergency use
477.1875	Car to car
477.2125	Car to car when repeater is down
472.7125	Sheriff repeater/Court House security

Thanks Gene, we hope that you invite us back for another

The Scanning Report

visit. Our next stop is **Fort Mill, South Carolina**. Larry Williams sent in an interesting set of frequencies for the old PTL Club. Larry claims that the frequencies are active and he predicts that the PTL will soon return to television.

151.925	464.50
152.480	464.0625
461.175	464.0875
463.70	469.0625
464.075	469.0875

Old TV Frequencies- 816.3875, 817.3875, 818.3875, 819.3875, 820.3875

Microwave link on 7050 MHz.

Is the PTL gearing up for a revival? Punch in the above frequencies and let me know what you guys hear. Send your frequencies and information to, Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Scanning Test

The first batch of Scanning Novice Certificates are in the mail. The successful candidates that passed the test are now moving up to the "Specialist Level." Of course, the obvious goal is to become a "Scanning Communications Expert."

As an SCE, you'll belong to an exclusive club that offers many additional benefits. For example, at the second annual *Monitoring Times* Convention, I will be hosting a special get-together for holders of the SCE certificate. But let's not get too far ahead of ourselves. The first step is to earn your Novice Certificate.

For the first time in scanning history, you can take a test that will determine your level of expertise. Upon completion of each skill level, you'll receive a certificate that can be proudly displayed in your home. To receive the Scanning Novice Test, send $10 dollars to "Scanning Test," P.O. Box 695, Honeybrook, PA 19344. After you pass the exam, I'll personally invite you to the next skill level. Good luck.

Computer Corner

Computers are finding their way into our listening posts. And many readers have asked for a software program that can store, and sort hundreds, if not thousands, of frequencies.

The program must be IBM compatible, simple to operate, and capable of organizing and listing frequencies in numerical order. It would also be desirable to group and recall frequencies by geographic location.

Here's what I'm talking about: After a long week at work, you decide to get away and go camping for the weekend. Your favorite campground is just a few hours away, and you have all the frequencies written in a log. Of course, you've misplaced the log, and your family is anxious to get on the road.

Does it sound familiar? Now imagine that you have a computer program with all the frequencies stored under the filename of "Campground." Wouldn't it be neat to just simply press a button on your computer, and have your printer provide you with a list of the frequencies?

Okay, that's what "Computer Corner" is all about. This small section of the column will be devoted to computer programs that make life easier for scanner buffs. If you have such a program, send it in. If it meets *MT*'s high standard of quality, I'll share it with everyone.

Send your computer programs, information and comments to the "Computer Corner," c/o Bob Kay, P.O. Box 98, Brasstown, NC 28902. If you want a personal reply, don't forget to include an SASE.

Cellular Phones and Traffic Jams

The peak for cellular phone usage comes during high traffic periods. When the normal traffic flow is halted, what do cellular customers do? They sit in their cars and make phone calls.

During the San Francisco (1989) earthquake, one cellular company experienced more than 2,000 calls per minute. Of course, the cell sites couldn't handle that many calls, and many cellular users got busy signals.

To cellular companies, busy signals translate into lost revenue. To prevent traffic jams from jamming the cellular network, the cellular folks are spending millions to upgrade their systems.

Connecticut Photo Radar

Last year, I created quite a controversy when I mentioned that the Connecticut State Police were issuing photo radar speeding tickets. I also offered a list of radar locations, and I asked our New England readers to provide some feedback.

After reading thousands of letters, I still wasn't sure if the devices actually existed. Some readers denied the claims, others swore that the radar locations were actively photographing speeding vehicles.

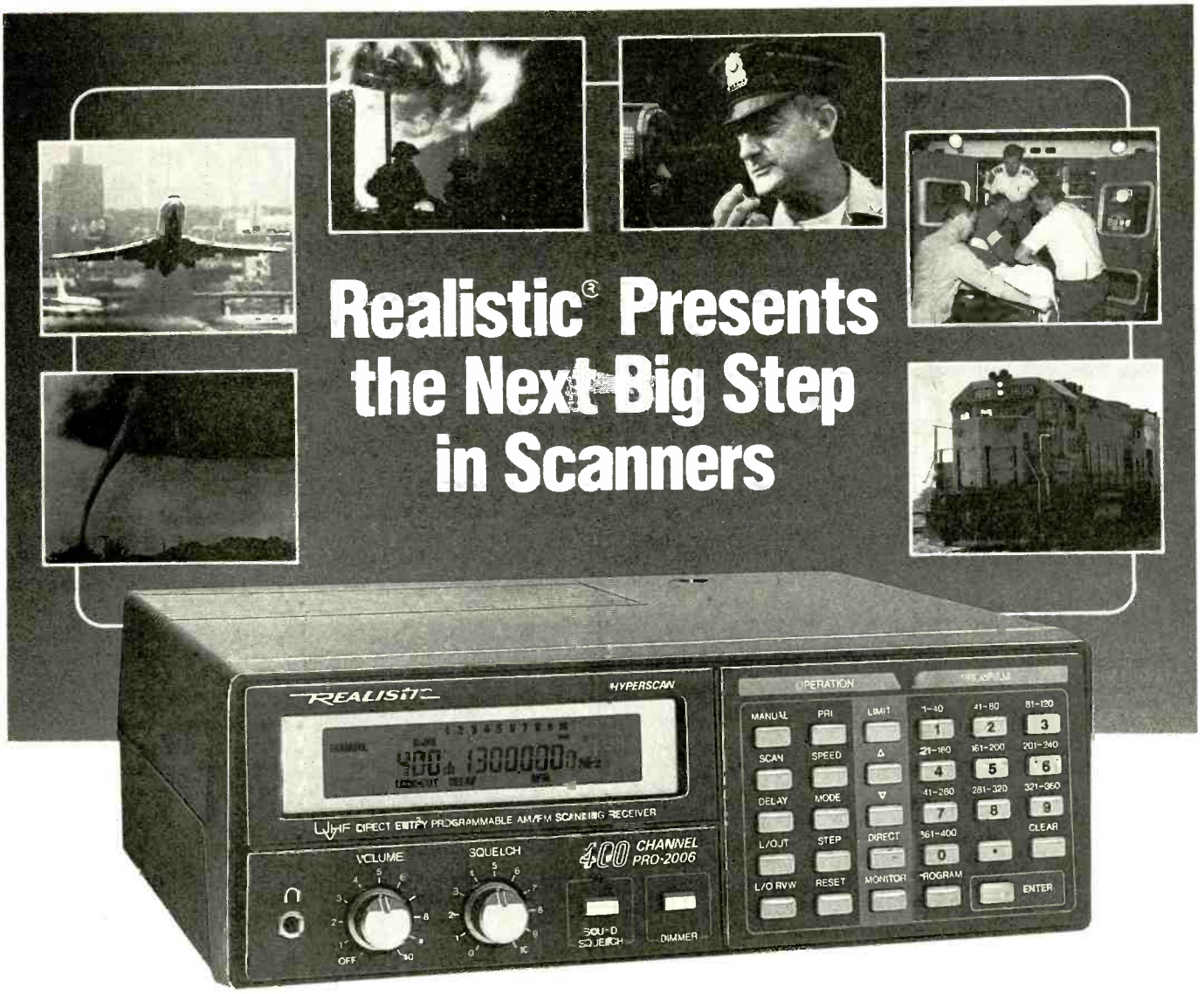
Mark Swarbrick

Photo radar does exist in Delaware; have you seen this sight in your state?

According to Marci Stamm, communications officer for the Connecticut State Police, "photo radar locations don't exist -- they never have and probably never will." Stamm claims that the controversy dates back to 1982, when the Department of Transportation installed traffic speed monitors.

The speed monitors use electrical wires that run under the highway. Vehicle tires that pass over the wires, trip a timing device that records the speed. However, the information doesn't go to the state police--it's sent to Washington, D.C. The data is then used to regulate federal laws that control highway speeds and traffic.

If you're a die hard fan of photo radar, there's still hope. At this writing, Virginia and Maryland are currently testing a radar-photo capturing device, according to a news clipping from Jim Kalach, Waterbury, CT.



HYPERSCAN

Now You Can Scan Up to 400 Channels in Less Than 16 Seconds!

You'll be "on the scene" of local action in a flash with the Realistic® PRO-2006 scanner. More than 196,000 exciting frequencies are at your command, including the new 800-MHz police and emergency bands. At up to 26 channels per second, you'll scan much faster than most scanners not equipped with the HyperScan® system.

You get ten 40-channel memory banks, a 10-channel monitor bank, search mode and selectable priority function. Frequency coverage is 25-520, 760-823, 851-868 and 896-1300 MHz. Precise ZeroMatic® tuning locks on-frequency for best reception. A backlit LCD display, memory backup and full array of jacks are included.

Take the next big step in communications excitement—check out the Realistic PRO-2006 today. *Available at . . .*

CREATING NEW STANDARDS

RELIABLE QUALITY—Over 1500 engineers and technicians develop, evaluate and test to our exacting standards—*NOBODY COMPARES*

PROMPT SERVICE—Over 7000 drop-off points nationwide insure dependable service to your satisfaction. Over 1,000,000 parts stocked. We service what we sell—*NOBODY COMPARES*

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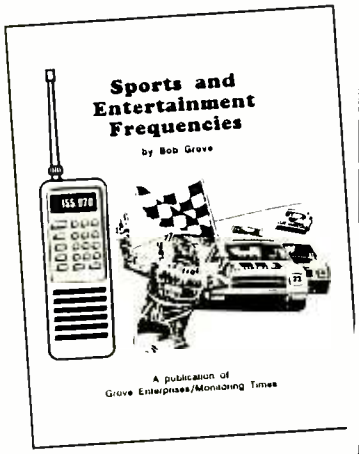
what's new?



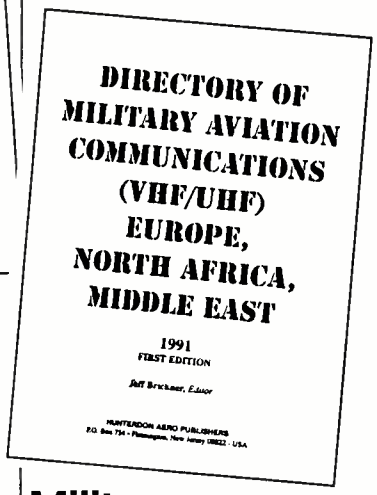
Pocket Guide to Sports Frequencies

You're sitting in the grandstand, cars racing by at breakneck speeds. Suddenly a squeal of tires--two vehicles slam into the guard rail. You see other drivers talking frantically into their headset mikes while track officials bark into their walkie-talkies.

Your scanner can pick up all of this excitement--if you know their frequencies. *Sports and Entertainment Frequencies* by Bob Grove is a new pocket-sized frequency directory that will tell you what they are.

The guide is loaded with over 2000 frequency listings for motor races, boating events, horse and dog racing, air shows, gambling casinos, Disney World and other theme parks, fast-food drive-ins, network sports remotes, parade wireless mikes and more.

The *Sports and Entertainment Frequencies* 4"x5" guide is $9.95 plus $2 shipping from Grove Enterprises, PO Box 98, Brasstown, NC 28902.



Military Directory

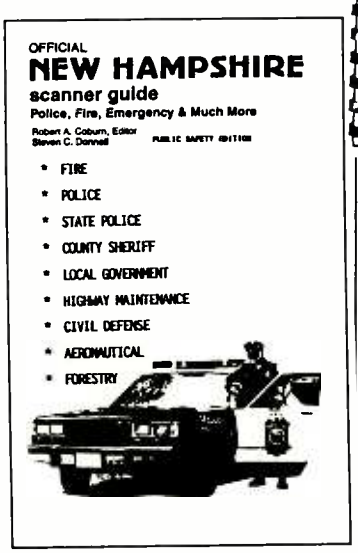
The most exhaustive military aeronautical frequency directories have now been expanded further. Hunterdon's popular North American regional directories are now supplemented with this 1991 *Directory of Military Aviation Communications (VHF/UHF): Europe, North Africa, Middle East* containing some 6000 VHF and UHF air-to-air and air-to-ground frequencies assigned to these additional regions.

All listings are cross-referenced first by frequency, then by location. Since these frequencies are all point-to-point, low power, their short range makes the directory of primary interest to listeners in North Africa, Europe and the Middle East.

The directory, by Jeff Brickner, is $19.95 plus shipping from Hunterdon Aero Publishers, PO Box 754, Flemington, NJ 08822; phone 908-806-7134.

Choose Your Scanner Guide!

This month we bring you a good selection of new scanner directories from which to pick and choose.



New Hampshire

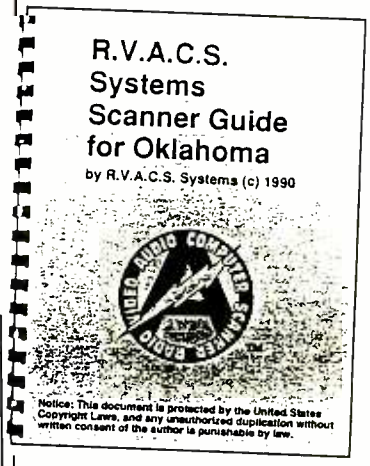
For New Hampshire scanner buffs who concentrate on public safety monitoring, the little pocket guide, *Official New Hampshire Scanner Guide* by Robert A. Coburn, is handy for carrying with your hand-held or putting in the glove compartment for mobiling.

Arranged alphabetically by city, this little public safety edition lists service, call sign, frequency, channel designator and use when applicable. Services include local and state police, fire, sheriff, local government, highway, civil defense, aeronautical and forestry.

Send $12 plus $2.05 shipping to Official Scanner Guide, PO Box 712, Londonderry, NH 03053.

Oklahoma

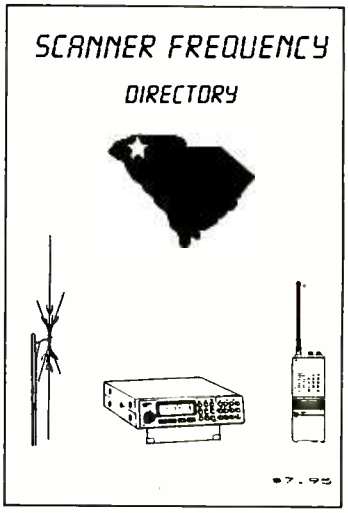
Because of its low population density, Oklahoma is one of the states that is frequently neglected by frequency collectors and publishers. Richard Armstrong has attempted to fill that gap.



An assemblage of newsletters, frequency lists and updates, the *R.V.A.C.S. Systems Scanner Guide* concentrates on public safety, federal and military installations in the Tulsa listening area.

The collection is punctuated with snippets of scanner descriptions as well as hints for the monitoring enthusiast.

Write to R.V.A.C.S. Systems, 125 E. 34th St., Tulsa, OK 74105 for more information.



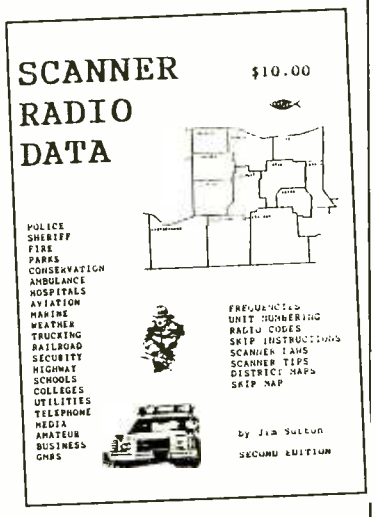
Western South Carolina

Now in its fifth edition, Larry E. Williams's *Scanner Frequency Directory* for upstate South Carolina and bordering areas of North

Carolina continues to provide excellent, comprehensive information for that specialized listening region.

Covering public safety, military, government, weather, aircraft, transportation, business/industrial and mobile telephones, the directory even includes some helpful hints for successful scanning. A special nationwide listing by state of highway patrol frequencies should be helpful to frequent interstate drivers.

Perhaps future editions will be from a better master; the dot matrix printer causes many dropouts, but it is hard to fault this concentration of usable information at such a reasonable price -- $7.95 postpaid from Radio Research, 10 Elf Lane, Greenville, SC 29611.



Upstate New York

Scanner Radio Data reflects the considerable frequency listings Jim Sutton has amassed over the years for the region of New York State bordered by Orleans, Wayne, Steuben and Cattaraugus counties, with special emphasis on Rochester.

Police and ambulance response codes abound, as do lists of unit designators for radio recognition.

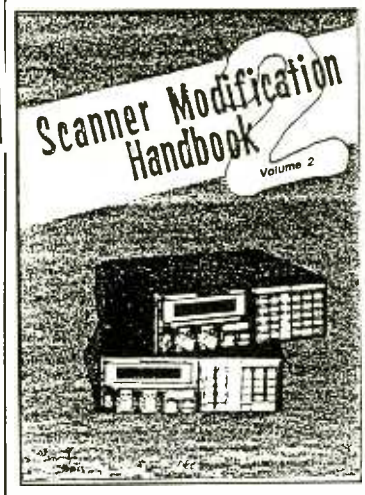
To get a copy of this second edition, send $10 plus $2 first class mailing to Jim Sutton at A.R. Christiano Hardware, 123 Main St., Leicester, NY 14481.

New York Metro/Northern New Jersey

There is no question that the most exhaustive and professional frequency guide in publication for New York/New Jersey residents is the *Scanner Master*. Its nearly 600 pages are loaded with an incredible wealth of information.

Arranged first by county, then cross-referenced both by agency and frequency, the fourth edition of this girthy guide contains not only frequency lists but ten codes, channelization plans, CTCSS (PL) tones, equipment profiles, frequency usage descriptions and maps and charts as well.

While public safety (police, fire, ambulance) listings are primary, additional entries include non-law enforcement federal government, aeronautical, maritime, amateur radio and railroads. A superb collection of useful scanner data for $29.95 plus $3.50 first class or $2 book rate shipping. Send to Scanner Master Corp., 2 Indian Ridge Road, Natick, MA 01721.

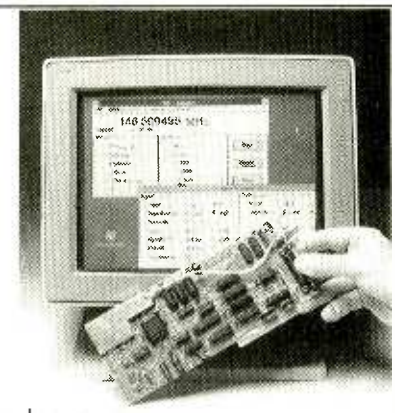


Scanner Mods

No doubt about it: Buy a radio and you immediately want to make it better. In some cases that can be done, and Bill Cheek is the one to tell you how to do it in his *Scanner Modification Handbook.*

Concentrating on the popular Realistic PRO2004/5/6/22 and PRO-34 scanners as well as the Uniden BC200/205XLT and BC760/950 XLT, Cheek provides exhaustive and illustrated procedures on building and adding S-meters, CTCSS (PL) squelch decoders, center frequency tuning indicators, additional memory channels, scan speed increase, tape recorder activators, spray-on shielding, extended delay and event counters as well as alignment instructions to perk your scanner.

Even if you have volume I, this new publication is intended to supplement it with even more useful mods. *Scanner Modification Handbook* (Volume 2) is available for $17.95 plus $3.50 shipping from Grove Enterprises and other *MT* advertisers.



Unique Frequency Counter/Tuner

One of the most advanced frequency counters ever made available to the radio frequency monitor has just been released by Optoelectronics (5821 NE 14th Avenue, Ft. Lauderdale, FL 33334; phone 800-327-5912).

Measuring signals as weak as 10 millivolts from 10

Review:

EMD MILLI-GAUSSMETER

The March 1991 edition of *MT* carried an in-depth look at historical and modern concerns about electromagnetic pollution and its affects on living organisms. The topic is hot, and a number of manufacturers have come to the fore with measuring devices. One of these is Electro-Magnetics Design, Inc. (9100 W. Bloomington Freeway, Suite 183, Bloomington, MN 55431; ph. 612-888-7473).

While the EMD ACGM-1 is not inexpensive ($450 plus shipping), it is a professional piece of equipment. It features autoranging--no adjustments--with 1% calibration accuracy and 0.1 milligauss display accuracy. Its recommended measurement bandwidth (-6 dB) is 20-180 Hz at levels of 0.1 milligauss (mG.) to 4 gauss rms, making it suitable for environmental health measurements of electrical power lines and related appliances.

A small probe with retractable six-foot cable allows sweeping of rooms, wiring and equipment, while the LCD display provides visual presentation of electromagnetic field intensity. A padded, zippered carrying bag is included.

Let's Check It Out

Since EMD has a one-month lead time from receipt of order, we could only borrow one briefly, but we put it to good use. We made tests around the office, our home and even in the city near power lines and at the power substation. The results are shown in the adjacent table.

Keep in mind, however, that these values were measured right at the source, not at any normal distance. While many devices show husky electromagnetic fields right at the source, they dissipate very rapidly with distance, often dropping to 1 or 2 mG at normal exposure locations.

So what does this mean in terms of our vulnerability? No one knows. In Sweden, where extreme caution is the rule, long-term exposure to levels in excess of 1 milligauss are not recommended; chances are this is overly-restrictive. An EMD engineer suggested that 10 mG is probably more realistic.

Some interesting observations: Steel cabinets around an offending device confine the electromagnetic field almost entirely, while plastic cabinets allow radiation into the environment; and separated, unshielded wiring--such as in an electric blanket--really zaps the unwary user!

MEASURED LEVELS AT THEIR SOURCE (See text)

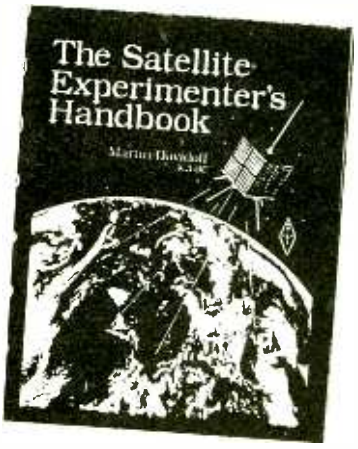
SOURCE	LEVEL (milligauss)
Video terminal (top)	111
Video terminal (front)	13
Computer (front)	4
Dual fluorescent lamp	325
Sangean ATS803A receiver	175
Regency scanner	212
Star SG-15 printer	355
Smith-Corona typewriter	200
40W soldering iron	365
HP Laserjet printer (side)	370
Adler-Royal typewriter (back)	500
Soundesign portable radio	110
Royal desk calculator	380
AC wall adaptor	1500
Sanyo microwave oven	260
Electric blanket	600
Power service transformer	40
Emerson color TV	25
JVC stereo receiver	25
Vehicle ignition coil	300
ICOM R7000 receiver (back)	16
Realistic PRO2006 scanner (top)	420
High tension power line*	20
Power substation*	10
Power line ground cable	700

**Approximately 30 feet away*

Hz through 2400 MHz, the PC-10 plugs into an IBM compatible computer, using Windows 3.0 as a control panel and readout display.

The unique aspect of the system is that, when connected to a receiver like the ICOM R7000, it will automatically tune the radio to the frequency of the closest signal for surveillance purposes!

Its eight-digit resolution shows frequency, pulse width, time interval, period and frequency ratio. A custom CMOS ASIC lends its versatility to laboratories, cellular telephone handoff tracking, service shops and other advanced communications applications.



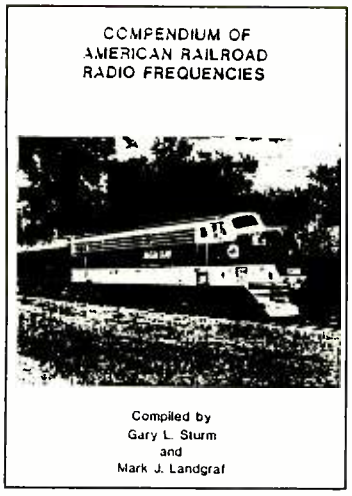
A Book for Satellite Experimenters

ARRL publications are acknowledged for their superb printing and editing; this newest release is no exception. Easy to read and profusely illustrated, *The Satellite Experimenter's Handbook* by Martin Davidoff carries the reader through the evolution of earth satellites, into modern amateur satellites, including methods to monitor their various beacons and transmissions, and on into weather satellites and techniques to monitor their imaging.

Simple projects are included to enable reasonably-skilled technicians to build converters, preamplifiers and antennas as well as digital demodulators to extract telemetry information and imaging data streams.

Considerable text is devoted to tracking the orbits of amateur satellites from all nations. A frequency list of the most popularly-monitored "birds" is included.

If you want solid information on this emerging monitoring technology, Davidoff's new book is the place to start. Send for the *Satellite Experimenters Handbook* and enclose $20 to the American Radio Relay League, 225 Main St., Newington, CT 06111.



More Railroad Frequencies

Railroad fans are a sturdy lot, often chasing the old engines for miles, especially excursion steamers. "I know." says Bob Grove. "I'm a steam engine fan."

But times have changed since the old days of flagmen and cabooses. Electronic signaling, repeaters, hot box detectors and other technological inventions fill the airwaves with signals.

The *Compendium of American Railroad Radio Frequencies* by Gary L. Sturm and Mark J. Landgraf directory contains thousands of frequency listings for railroads throughout the United States. Listings are in alphabetical order of company, followed by headquarters location, identifying car markings, frequencies and channel usage.

If this month's mini-feature whetted your appetite for more railroad monitoring, send $10 (includes first class postage) for the *Compendium* to Gary L. Sturm, 7629 Westford Court, Ft. Wayne, IN 46835.

Inside Information

We all enjoy getting scoops--inside information that others may not learn of for considerable time, if at all. We may hear it on our scanners or shortwave receivers, or we may read about it in this refreshing and informative volume.

The Book of Inside Information provides hundreds of tips for daily living which you may never think of, tips that save you money, make your life easier and make your decisions much more meaningful

Arranged by topic (money management and investments, real estate, taxes, retirement, estate planning, business and success strategies, marriage and family, home buying and hints, shopping tips, collecting, automobiles, travel, health and fitness, education), over 1000 separate tips are presented in this easy-to-read volume.

How do you handle difficult people? What's the best way to shop for used and new stereo equipment? Is there a way to beat radar speed traps without a radar detector? What are the warning signs of health problems? Can you set up a profitable sideline business? Which tax strategies really work? Are alkaline batteries really money savers? Is there money to be made in rentals? What collecting hints can make money? How should you care for jewelry, coins and stamps? Do cold remedies help or hinder the healing process?

We're not sure what most of this has to do with radio, but it sounds like one of those rare books that you shouldn't be without. The hard cover *Book of Inside Information* is $29.95 from Boardroom Classics, Customer Service Center, Box 736, Springfield, NJ 07081.

"Uncle Skip" Arey, WB2GHA

Nonradio Accessories

Ah yes . . . As we round the corner toward April the ice water in the veins begins to thaw and we seek movement. The wanderlust strikes and we prepare our plans for treks all over the planet. We abandon home and hearth and go looking for adventure.

Uh, Uncle Skip ... This is a radio magazine, not a travel brochure, remember?

Okay. You are right as usual, boss. But this is the time of year when people hit the road. I normally get into some sort of rap about portable equipment or DXing while sharing a sleeping bag.

Old hat, Uncle Skip ... how about a new angle?

Er, yeah, why not. Well, why not look off in an entirely new direction. Maybe we could look around the shack and see what things we long for when we hit the road. Those goodies that aren't really necessary in the field but make life at home worth the trip back. What better intro for (drum roll please)

UNCLE SKIP'S GUIDE TO NONRADIO ACCESSORIES

We are often defined by those things we find essential for daily living. Everywhere I go, my brief case carries: a magnifying glass, compass, chess set, 50 feet of nylon rope, a CIA letter opener, a dictionary and a Bible.

WHY? Just in case. Come to the next *Monitoring Times* convention and figure it out for yourself.

Things are the same around each person's listening post. We all have accouterments that are unique and useful to us. I cannot prove that my statue of W.C. Fields improves DXing but I am personally convinced of it. Over time, we all come to discover a few accessories that will not be found in most radio equipment catalogs but which come to be an essential part of our way of conducting radio business.

Eccentricity and superstition aside, there are a number of practical nonradio accessories that will make life in your shack worth living.

World Globe

If you are a shortwave listener, you are in the business of tracking down signals from all over the world. The quickest source of information may be a world map or atlas, but the best and most accurate source for radio users remains the good old world globe. Yep. Just like the one you used to get in trouble for spinning too fast in grade school.

The names of the countries are rapidly changing but the land masses remain the same. The globe is helpful in giving you a fine graphical representation of distances and paths that signals have to traverse to hit your receiver.

On the top of most world globes you will find a small metal disk. This disk is usually calibrated in hours and marked for zones of light and darkness. You can use this information to plot the best time of day to try and grab a country by finding out when your listening post and the country in question are both in relative darkness, usually the best time to listen. With a globe you can see why you are better off trying to grab stations in the South Pacific early in the morning instead of early in the evening.

If your rosette does not have such markings, you can hold your globe up to a light bulb. In this experiment, the light bulb becomes the sun and you can actually see the patterns of light and darkness that affect listening.

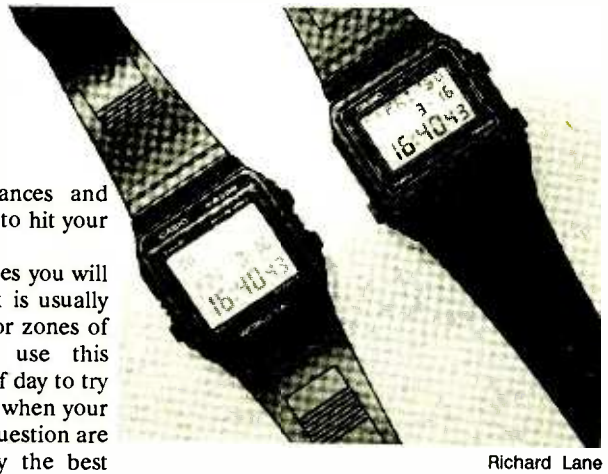
In addition to these radio practical applications, you can put a globe to use just like any other map. You can determine the locations of countries and their surrounding environment. Better than most maps, countries can be projected to relative scale because of the globe's curved surface. Most maps leave you thinking that Greenland is bigger than North America because of their flat projection of the earth's surface.

If you are one of those folks who finds themselves tied to their home computers, you can find programs that simulate the traditional world globe with excellent effect such as PC Globe for IBM clones. However, these programs may be good but you can't take your hand and spin them real fast like you did in grade school. Buy yourself the real thing at any good school supplies store. It makes a great conversation piece and, if you are not careful, you just might learn something.

Calculator

They didn't have fancy titles such as "learning disability" when I went through school. I was simply "dumb" when it came to math. Oh, I would get the right answer, but it would take forever to work it out. After I spent many days, over recess, finishing my math work, I grew to hate it a lot.

Over the years I have come to terms with this problem and this has been largely due to the invention of the electronic calculator. The pocket calculator allowed me to get free of simple arithmetic tasks, study, and fall in love with many of the more advanced concepts in mathematics. Anyone who has ever tried to figure out the square root of a number in long hand is very happy that calculators came along -- with the exception of slide rule designers.



Richard Lane

Casio is the leading source of watches that can keep you up-to-the-minute in world time as well as local.

As a radio hobbyist, you no doubt keep some sort of log. Your log can become more than a collection of old memories. A log book can be made subject to some basic statistical analysis that will allow you to determine your listening patterns. Take your handy calculator and figure the average number of hours you listen in a session, in a month, in a year. Adds up, doesn't it, Bunkey?

You can compute the best length in feet for a half-wave dipole antenna by dividing 492 by the frequency in megahertz. What's that? You only know the frequency in kilohertz? No sweat. Divide that puppy by 1,000. Megahertz back to kilohertz? Multiply by 1,000. With a calculator handy it is probably faster than moving the decimal points on a piece of paper.

In the event you really want to delve into the electronics theory and witchcraft, a calculator is essential to wading through the various formulas that can assist you on your quest.

You can buy a calculator for simple math functions at any discount store for around three dollars. You can move up from there into the "scientific" calculators that have many common formulas already preprogrammed. Pick up one that suits your taste and, as you fiddle with it, you will discover many uses around your radio shack.

Dual Time Watch

Another product of our "digital" age is a whole crop of watches with zillions of bells and whistles. One company really stands out in these gizmos. Casio makes watches that not only tell time but also tell temperature, windspeed and pulse rate in addition to the more mundane functions of day and date.

Several models at modest prices sport a feature that should put them on the wrists of every radio hobbyist in the world. These watches can be set to tell the time in two

What are those nonessential accessories that make your monitoring post feel like home? For Tracy Tritt of Winston-Salem, NC, it may be a cushy chair, coffee pot nearby and Garfield supervising from the shelf. We've all got 'em.

different time zones, one of which can be set to a 24-hour format. In other words, you can walk around with local time and Coordinated Universal Time (a.k.a. UTC, GMT, ZULU, etc.) strapped to your wrist, ready for DXing. No longer must you remember how to convert back and forth between the two time zones, forgetting to change your conversion formula during daylight savings time.

I am partial to the Casio "Tri-Graph" series but many of their other watches will give you the essential dual-time function.

File Cards

Long before computers were so commonplace in the home, most radio people made use of file cards to get their record management in order. For many folks this still remains the cheapest and easiest way to track and catch all those exciting stations no matter what facets of the radio hobby they are interested in.

Even if you do use a computer for your main record keeping, you can still set up a nice little "hit" list using good old fashioned three by five cards. By doing this you can leave Mr. Computer turned off during listening and avoid running up against all that interference it can generate in your receiver.

Take 24 file cards and mark them with the UTC hours. Then take a source such as *Passport To World Band Radio* and list the names and frequencies of the stations you are seeking on the cards that correspond with their various broadcast periods. You now have a handy guide for tuning that allows you to decide how to carve up your listening sessions.

Scanner users can also benefit greatly from a good set of file cards. Now that scanning receivers can be programmed to store hundreds of frequencies, what better way to keep track of things than a short stack of file cards giving pertinent information in frequency groups of 10 or 20 per card. This is much more manageable than a long list and the problem is really too small to dedicate a computer to the task.

Broadcast band DXers might want to have one card for each of the 10 kHz spaced frequencies to allow for better signal hunting and tracking.

Someday, flying a computer might become simple enough that such mundane tasks as frequency lists can be managed without taking up more than half of your listening time. For now, file cards remain the quickest tool for the task.

Graph Paper

This is another handy tool that may someday find itself fully replaced by the computer. But most of us will take a shot with plain old graph paper first. Graph paper gives you a resource to plot information graphically instead of in columns of numbers.

Take a look at the propagation conditions listed in "Shortwave Guide" in the current issue of *MT*. This will give you an idea of how graph paper might be useful in your shack. Many radio hobbyists take their first shot at using graph paper by tracking the solar flux patterns given at 18 minutes past the hour over radio station WWV and WWVH 1.5, 5, 10, 15 and 20 MHz. In graphing this information, you begin to get a feel for how the sun has a direct affect on your ability to listen.

Graph paper is also a wonderful tool for creativity. You can use its squares to aid you in laying out straight lines for most anything you want to design. You can lay out a floor plan for your listening post, or perhaps the placement of components on a circuit board. I even keep it around my desk just for doodling when I am doing something else. Graph paper remains a limitless resource waiting for your next great idea.

As you can see, sometimes the things we surround ourselves with when we are listening can make listening more fun than ever. Maybe next time you are on your way to the local electronics outlet you may want to take a quick turn through the local stationery store. Who knows, you may just come up with the next great system for tracking the elusive Radio Freedonia.

Maybe I should look into a column on 1,001 things to do with Post-It Notes or a technical piece on The Efficacy of Empty Beer Cans as Pencil Holders. Or would such studies take me too far afield?

Rod Pearson

Testing, Testing, ...

The White Sands National Monument just west of Alamagordo, New Mexico, attracts millions of visitors each year. The official pamphlet says it best: "Great wavelike dunes of gypsum sand grace the floor of the Tularosa Basin ... a vast undulating landscape of brilliant white sand, the most impressive part of the world's largest gypsum dune field." It's a place of beauty for the tourist and a great place for the military monitor, for here is the home of America's greatest top secret military test areas -- the White Sands Missile Range.

As we approach the White Sands National Monument, we pass Holloman Air Force Base, the heart of the White Sands Missile Range. Although the range is listed as an army installation, it is Holloman that really controls the area. The monument is just a stone's throw away from the base and is a great place to set up our receivers.

Don't be surprised if you see military vehicles blocking the road to the monument. From time to time the road is temporarily closed due to missile or laser testing. When I visited, I was surprised to see a cruise missile fly over the road with an F-15 following in hot pursuit. The road doesn't stay closed long, and soon we were eating our lunch and scanning the bands.

The monitor's first radio intercept usually isn't military, it's the park itself. A low power AM transmitter broadcasts local information on 1610 kHz. The voice gives park rules and a brief history of the monument.

Driving through the park on this self guided tour is invigorating. It's like driving through a winter wonderland that never melts. The stark beauty of the white sand can easily distract you from your scanning quest. As if to remind us why we are here, two F-15 Eagles buzz the park, announcing with a roar the presence of the nearby airbase.

Filming of test firings of emergency ejection seats can be heard on 34.850 MHz.

Holloman Air Force Base is an exciting place, a utility monitor's dream. The communications here are choice. Star Wars laser testing, F-15s flying NORAD missions and even the Space Shuttle itself can be heard here.

Among some of the tenants based at Holloman are the 49th Tactical Fighter Wing (an F-15 squadron), the 479th Tactical Training Wing (AT-38b squadron), the 6585th Test Group (new weapons systems, High Speed Test Track and Radar Target Scatter Division), 6586th Test Squadron (Airborne Laser Laboratory, Strategic Defense Initiative and the Advanced medium Range air to air missile program) and the 4th Satellite Communications Squadron (AFSPACE-COM).

If that isn't enough, in the middle of the White Sands range is the Northrop Strip, backup landing field for the NASA space shuttle program. Topping it all off, the F-117a Stealth fighter is moving from its remote Tonopah, Nevada, strip to be based here.

One of the most exciting parts of the test range is the High Speed Test Track operated by the 6586th Test Group. The ten miles of gleaming steel rail is the longest, most precisely aligned, surveyed, and best instrumented hypersonic test facility in the world. The tract allows closely controlled tests of monorail and dual rail rocket sleds, providing data on supersonic and hypersonic vehicle design, aircrew escape systems, high speed impact testing, aeropropulsion systems and simulated aircraft missile launches.

I had the pleasure of witnessing a test of a hypersonic vehicle during an open house on the range. Test tract radio communications take place on 148.450 MHz and 149.1750 MHz. Telemetry can be heard on 40.350 MHz and test track filming crews can be heard on 34.850 MHz.

Just like at a space launch, countdowns take place. A red and white helicopter hovers over the track as an aerial range safety controller. Ten miles away I hear the mighty twin rockets roar as the hypersonic vehicle comes to life. It takes very little time for an object traveling at Mach 6 to cover the 10 miles of track.

As the roar grows closer, I ready my camera and hope the 1/400th of a second shutter speed is fast enough to freeze the image of the hurtling test sled. It isn't. Faster than anything I can imagine the sled roars past in a blink of an eye. I click the shutter instinctively as the blur races through the viewfinder. The hypersonic sled streaks out of view but is chased by an invisible shock wave whose blast caught me by surprise. The sonic boom hit me and reverberated deeply through my chest, almost knocking me over. It was an unforgettable experience.

Other military projects are tested at White Sands. RATSCAT (Radar Target Scatter) is a unique outdoor electromagnetic laboratory for accurate radar signatures of vehicles/targets such as aircraft, cruise missiles, transport vehicles (jeeps and trucks), satellites and space reentry vehicles.

Advanced Strategic Defense Initiative projects are also evaluated here, such as flying laser platforms, stealth missiles and anti-satellite weapons. Various bombs and missiles are tested on the range as well for the Department of Defense, Navy and military contractors. Not only is the future of space travel and military aerospace tested here, the White Sands Missile Range has an important place in history, for located on its grounds is the infamous Trinity Site where the first atomic bomb was detonated. History was changed forever and the Nuclear Age was ushered in right here at White Sands.

The Space Age owes a debt to Holloman as well. Based at Holloman is the USAF's Aeromedical Division which houses the famous Astrochimps. The primates trained and raised here are relatives of the famous group of chimpanzees that blasted into space, paving the way for manned spaceflight. The

Holloman Air Force Base / White Sands Missile Range

Frequency	Description
324.300	Holloman approach
284.000 /128.100	Holloman departure
273.500	ATIS
255.900 /119.300	Holloman Tower
344.600	Holloman weather
372.200	Holloman weather
289.400 /128.100	Holloman dispatch
381.300	Clearance delivery
41.900 /381.600 /397.00	Holloman TAC Command Post
260.800 /264.900	Beak missile/bombing range
324.400	Flight tests
293.00	AR-644 primary
319.500	AR-310/AR-644 secondary
173.5875	Fire / Crash
34.850/ 163.4625	Launch filming
40.350	Telemetering
165.1125 /173.5375	Commanders Network
173 5125	
148.485 /149.175	Drone Control
163.000/ 163.4875	Hypersonic Test track
165.0125 /163.3375	Base security

White Sands Missile Range Frequencies

Frequency	Description
168.00	Cooling Network
173.5625	Laser testing
36.100/141.250	Military Police
164.100	NASA/NORTHROP STRIP OPS
169.0750	NASA TV OPS
164.500/172.400	Drone control
294.600/295.200	Cherokee Range Control
412.875	Missile tracking
34.31000	NASA Optics
169.400	NASA public relation
162.6125	NASA purge net
30.900/41.430/139.440	Range photo ops
36.510/36.910/34.850	White Sands Range Control
34.850/34.8100	

The White Sands missile range is patroled by helicopters which can be heard on 36.510 and 36.910 MHz.

Aeromedical Division continues to provide valuable (although sometimes controversial) medical research into the effects of space flight on living organisms.

Holloman and the White Sands Missile Range will continue to be at the forefront of new aerospace technology. The people at Holloman and White Sands are proud contributors to America's space program and have played a vital role in the defense of this country.

War Nerves

A buddy of mine recently ran into some trouble while on vacation in San Diego, California. He was driving near the Naval Base and was visually struck by the massive ships docking in the harbor. Being a photographer, he decided he would stop and take a picture of the scene. He found out how bad an idea that was. Soon my friend found himself surrounded by armed military, federal and civilian police all pointing guns at him! They frisked him, interrogated him and demanded to know why he was taking pictures of a top secret military installation.

After they were convinced he wasn't an Iraqi terrorist they released him, but before they let him go they confiscated his film. The federal agents involved said they would return his film when they determined if what he photographed was not a threat to national security. My friend was shaken, yet impressed by the security that surrounded the base. He was told by the police it was just a war time precaution.

If you are ever in the San Diego area you can listen in on the Naval Base in San Diego on the following frequencies:

Commanders net: 142.700/143.635, FIRE/CRASH 140.450 EOD teams: 140.1600, Shore Patrol: 150.075, Security: 140.040, 140.225, 140.675, 140.700, 148.325, 148.350, 148.750, 149.0500 and 149.375.

Hello From Tel Aviv!

The Gulf War created some unique opportunities for monitors. Not only were the airwaves a feast for experienced military monitors, they also pumped some new blood into the hobby. Intrigued by the events in the Middle East, more and more people have joined the ranks of those who like to listen in on the military.

Not only are there a lot of new monitors out there but we oldtimers are now getting to know each other by passing on the latest frequency information. While doing some monitoring for the networks, a sort of informal monitoring network of several amateur and professional monitors sprang up. Members exchanged information via computer and FAX from all over the country and the world.

The most surprising call was from a professional monitor based in Tel Aviv, Israel. David Bandsatt works as a monitor for several news agencies including NBC News. I had a nice long conversation with David and we traded tons of military and broadcast frequencies. David even FAXed me a great list of frequencies including comments from other Israeli and Persian Gulf monitors.

David is a member of the Israeli Army and passes on interception reports to them as well. David says he reads *Monitoring Times* and eagerly awaits each issue. David's top notch equipment includes several of ICOM's top of the line receivers, even two R-71As! He monitors the military on three AOR AR-3000 scanners and an ICOM R-7000. All of these are tied into several home grown antennas to complete a listening post that anyone would envy. Welcome to the column, David, and I know we all look forward to hearing from you.

Cellular Trial

Well folks, it looks like the infamous cellular police have bagged their first bad guy. Linus Baker from Amarillo, Texas, has been arrested for allegedly distributing a tape of a cellular phone call to several Amarillo media representatives. Baker is charged with seven counts of unlawful disclosure of an intercepted telephone conversation. He is also charged with intentionally disclosing to seven people the contents of a wire and electronic telephone conversation, namely a cellular phone conversation.

The taped cellular phone conversation was one between U.S. Representative Bill Sarpalius and Michelle Martinez. The intercepted tape was of a conversation that took place on August 29 in which Sarpalius had a 41 minute talk with Martinez as he played golf on a local golf course. The conversation between the U.S. Representative and Martinez reportedly contained a discussion about spending the weekend together at a Cancun, Mexico, resort.

Monitoring hobbyists hope that the trial will evolve into the first test case questioning the constitutionality of the 1986 Electronic Communications Privacy Act. When the act was approved by Congress it was vehemently opposed by airwave monitors. *MT* contributing writer Steve Douglass who lives in Amarillo, will be covering the trial and will file a story on the outcome of this possibly important test case.

Well, that's all for this month's Fed File. Enough writing, let's get scanning!

mt

Jean Baker, KIN9DD

Say What Again?

Welcome aboard. Here we are with another edition of aviation communications news and views. We continue with our glossary of controller/pilot phraseology in this issue. Hope you're taking good notes as there'll be a short quiz later.

DIRECT: "You're cleared direct to the Bebee Intersection, direct O'Hare." This term means a straight line of flight between two navigational aids, fixes, points, or any combination thereof. When used by pilots in describing off-airway routes, points defining direct route segments become compulsory reporting points unless the aircraft is under radar contact.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range of distance of an aircraft from the DME navigational aid. A DME fix is a geographical position determined by reference to a navaid which provides distance and azimuth information. It's defined by a specific distance in nautical miles and a radial or course (such as a localizer) in degrees magnetic from that aid.

EXPEDITE: "Please expedite your descent." Used by ATC when prompt compliance is required to avoid the development of an imminent situation (i.e. a separation conflict).

FINAL: Commonly used to mean that an aircraft is on the final approach course or is aligned with a landing area.

FIX: A geographical position determined by visual reference to the surface, by reference to one or more radio navaids, by celestial plotting, or by another navigational device.

FLIGHT CHECK: A call sign prefix used by FAA aircraft engaged in flight inspection/-certification of navigational aids and flight procedures.

FLIGHT LEVEL: A level of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Each is stated in three digits that represent hundreds of feet. Example: flight level 250 represents a barometric altimeter indication of 25,000 feet.

GROUND SPEED: The speed of an aircraft relative to the surface of the earth.

HANDOFF: An action taken to transfer the radar identification of an aircraft from one controller to another if the aircraft will enter the receiving controller's airspace and radio communications with the aircraft will be transferred. This can be from terminal control to enroute center, or vice versa.

IDENT: "United 403, ident please." A request for a pilot to activate the aircraft transponder identification feature. This will help the controller to confirm an aircraft identity or identify an aircraft.

IFR: Instrument Flight Rules. Rules governing procedures for conducting instrument flight. IFR conditions are weather conditions below the minimum for flights under Visual Flight Rules.

LATERAL SEPARATION: The lateral spacing of aircraft at the same altitude by requiring operation on different routes or in different geographical locations.

LOCALIZER: "ComAir 120, join the localizer and follow it inbound." The component of an Instrument Landing System which provides course guidance to the runway.

LONGITUDINAL SEPARATION: The longitudinal spacing of aircraft at the same altitude by a minimum distance expressed in units of time or miles.

MAINTAIN: Concerning altitude/flight level, the term means to remain at the altitude/flight level specified. The phrase "climb and" or "descend and" normally precedes "maintain" and the altitude assignment -- such as "Eastern 266, climb (to) and maintain (flight level) 230."

MAYDAY: The international radiotelephony distress signal. When repeated three times, it indicates imminent and grave danger and that immediate assistance is required.

NAVIGATIONAL AID (Navaid): Any visual or electronic device airborne or on the surface (ground) which provides point to point guidance information or position data to aircraft in flight.

OUT: "Indy Center, out." The conversation is ended and no response is expected.

OVER: "TWA 202, Washington Center -- over." "Over" means my transmission is ended, I expect a reply.

PAN: The international radiotelephony urgency signal. When repeated three times indicates uncertainty or alert, followed by nature of urgency.

RADAR CONTACT: Used by ATC to inform an aircraft that it is identified on the radar display and radar flight following will be provided until radar identification is terminated -- such as being handed off to the next sector, etc.

RADIAL: A magnetic bearing extending from a VOR/VORTAC/TACAN navigation facility.

READBACK: "USAir 889, I didn't hear your readback." This simply means "read my message back to me."

ROGER: "I have received all of your last transmission." It should not be used to answer a question requiring a yes or no answer.

SIGMET: Significant Meteorological Information -- A weather advisory issued concerning weather significant to the safety of all aircraft.

TACAN: Tactical Air Navigation, an ultra-high frequency electronic rho-theta air navigation aid which provides suitably equipped aircraft a continuous indication to the TACAN station.

VFR: Visual Flight Rules -- Rules that govern the procedures for conducting flight under visual conditions as opposed to Instrument Flight Rules. It is also used by pilots and controllers to indicate type of flight plan.

VORTAC: VHF OMNIDIRECTIONAL RANGE/TACTICAL AIR NAVIGATION -- A navigation aid providing VOR azimuth, TACAN azimuth and TACAN distance measuring equipment (DME) at one site.

VOR: Very High Frequency Omnidirectional Range Station -- A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the National Airspace System.

The VOR periodically identifies itself by Morse Code (See, knowing even a little Morse Code can come in handy in the darndest places) and may have an additional voice ID feature, which may be used by ATC or FSS for transmitting instructions/information to pilots.

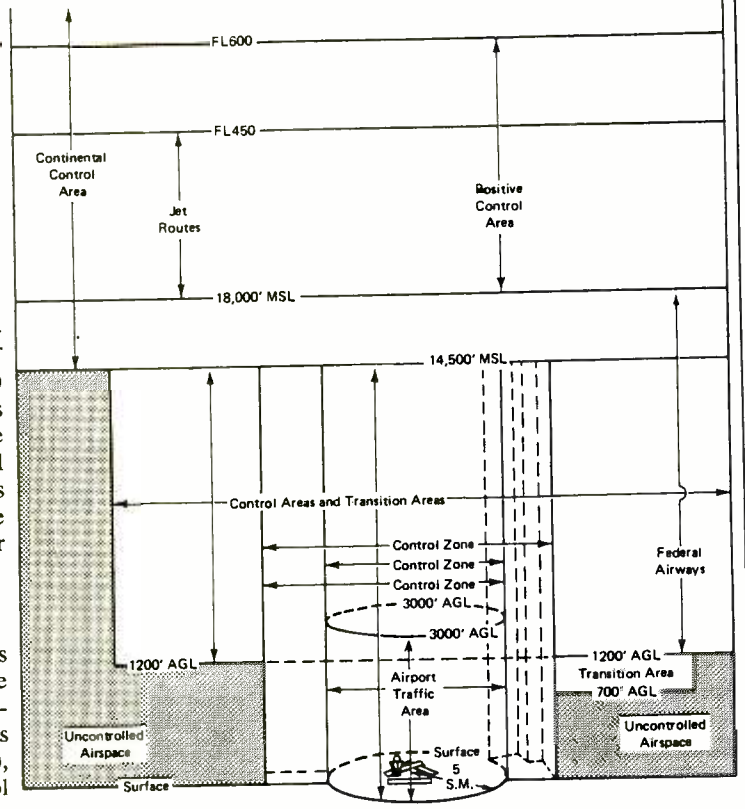
So there you have it. There are many, many more terms and phrases used by controllers and pilots than we could ever list here, due to space restrictions. However, the ones we started with in February and continued here are those you'll probably hear most frequently. Please write and tell us of any others you'd like defined -- we aim to please.

Getting it under control

Speaking of definitions (we were, weren't we?), one of our most faithful correspondents, Laura Quarantiello, has contributed some very useful definitions of airspace divisions used in the aviation world.

Ninety-nine percent of the aircraft radio traffic monitored by scanner enthusiasts, says Laura, consists of airplanes operating in controlled airspace under the radar eyes of air traffic control. That controlled airspace consists of the following:

POSITIVE CONTROL AREA (PCA): Extending from 18,000 feet MSL (mean sea level) up to and including 60,000 (FL 600), the positive control area is the place where only instrument-rated pilots may venture. Aircraft here are operating under IFR, at altitudes designated by air traffic control. In order to operate IFR, the aircraft must be equipped with the proper instruments for IFR flight, carry a radar transponder and a radio to communicate with ATC. Pilots must be IFR



rated and current.

CONTINENTAL CONTROL AREA (CCA): Airspace at and above 14,500 MSL located over the contiguous 48 states, the District of Columbia, and that area of Alaska east of 160 west longitude is designated as the Continental Control Area. The CCA does not include airspace below 1,500 feet or restricted/prohibited areas.

CONTROL AREAS: Control areas comprise the airspace labeled as VOR airways (known as "Victor" airways), additional control areas and control area extensions such as transition areas. A Victor airway is made up of a centerline that extends from one radio navigation aid to another and is shown in blue on aviation sectional charts. An airway normally extends to four miles on both sides of the airway centerline.

Transition areas from airways to airports for which an instrument approach is published extend from 700 to 1300 feet above the ground. These are established to enable an instrument pilot to stay within controlled airspace while on a descent to an airport.

CONTROL ZONES (CZ): A control zone is that controlled airspace which extends from the surface of the earth up to the base of the continental control areas. A CZ is usually depicted as a broken blue circle extending to a radius on charts of five miles around an airport and accommodating any instrument arrival and departure extensions necessary.

TERMINAL CONTROL AREAS (TCA): Terminal control areas exist at many large airports to divide both VFR and IFR traffic. They are tailor-made for each individual airport; therefore, each TCA had its own boundaries and altitudes that are depicted on sectional and terminal area charts.

AIRPORT TRAFFIC AREAS (ATA): In order to properly separate and control traffic at airports, the airport traffic area was established, along with control towers and radio communications between pilots and controllers. ATAs extend from the surface up to, but not including, 3,000 feet in a five statute mile area around airports with operating control towers. They are not shown on sectional charts. It is this airspace that is regulated and handled by tower (also known as "local control" controllers.)

AIRPORT ADVISORY AREAS: Airport advisory areas serve the same purpose as ATAs at airports without operating control towers but which have a Flight Service Station located on the premises. Advisories by an FSS consist of runway in use, wind speed and direction, altimeter setting and reported area traffic.

SPECIAL USE AIRSPACE: Airspace designated as special use consists of the following area: **Restricted and Prohibited**: these areas may be crossed only with the permission of the controlling agency identified on the sectional chart.

Warning and Alert areas may be entered and crossed without prior permission; however, extreme caution is advised due to the hazardous operations often in progress within these areas.

Military Operating Areas (MOAs) are visible on sectional charts and require no prior permission to transit. However, this is not recommended, and a "heads-up" attitude must be maintained due to extensive jet traffic and military operations here.

Thanks for your contribution, Laura. Remember, if others of our readers have information they think might be of interest to "Plane Talk," be sure to send it to my attention.

Scanning while on board

Is a scanner or other type of receiver allowed aboard an aircraft? It's an on-going debate. Regarding the law and actual practice, Bob Grove pointed out that federal rules and regulations state the operator/pilot of an aircraft has the final say on the subject of whether or not a scanner or any other electronic device not necessary to sustenance of life can be used onboard an aircraft. This is stated quite clearly in FAR (Federal Air Regulations) 91.21.

This writer was told by various pilots -- both airline and private -- that depending on the scanner radio itself some interference with nav/comm systems could occur if it was an old, poorly made unit. On the other hand, it most likely would not.

While I've known some people who have taken their scanners and used them aboard private aircraft, the airline people wouldn't even let me hand-carry my scanner aboard the flight I took to the *MT* convention, even though I showed them I'd taken the batteries out. I had to stuff it in my shoulder bag.

However, on one flight I took to San Francisco, I'd requested a flight attendant ask the captain if I could use my little unit to listen to exchanges between the tower and himself during take off. After he came aft to the cabin and looked at my pocket receiver, he told me to "go right ahead." Some airlines even have facilities so that passengers can listen through headsets and watch takeoff procedures on a screen in the cabin.

Readers, let us know if you've also had experiences with the aforementioned subject.

That's it for this time. See you in June with more goodies. Until then 73 and out.

Karl Zuk

The Pirate King

WJDI's studio includes a Russco audio console and two Pioneer reel to reel tape recorders.

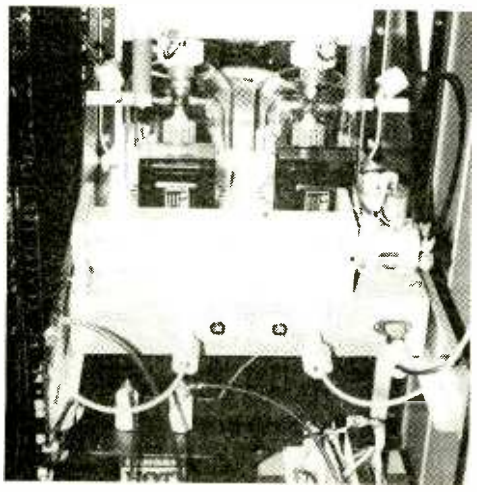
If you really love AM radio, you've probably wanted to do what George Donohue has done. George broadcasts on 1620 kHz with his own 5,000 watt transmitter. To maximize his audience, he goes on the air at night when his signal will travel all over the east coast.

All the equipment used to transmit his signal was personally built from scratch from parts acquired at ham fests, swap meets, and from friends and acquaintances. A huge modulation transformer was ordered and custom built for his high fidelity transmitter producing a sound that is unsurpassed. It takes a lot of knowledge and experience to design and create these electronic works of art. Over a period of thirty years, George has grown from an avid DXer into someone DXers long to hear.

As a child, radio piqued his imagination and transported him to lands and places far away. "I had a picture of this tremendous place with huge, huge controls. Announcers rode around in Cadillacs and had prestigious jobs. It was fabulous. I listened to so many different cities. I could get out of the little town I was in and escape with my radio. A lot of the announcers had the ability to make you feel that they were interested in you and your situation. You didn't know if anyone else was listening, but you were listening. I learned a lot about other parts of the country."

As a mediumwave DXer, Donohue logged over 2,500 stations and his QSL collection now resembles a snapshot album of radio in the sixties. "I used to get up early to hear all those stations. When the stations signed on down south they would play the national anthem and then they would also play 'Dixie.'

The next step was obvious. George wanted to become a broadcaster himself. Using a little oscillator called a Meissner Signal Shifter, and a lot of crude modifications, his goal was not far away. This ancient device can transmit with a whopping seven watts. A very inexpensive audio amplifier brought sound to the rig. With a wire antenna strung up into the trees, he could only be heard a few blocks, but it was great.



The craftmanship inside the homebrew transmitter cabinets is a work of art!

Some boys grow up wanting to meet their favorite big league baseball or football star. George wanted to talk to the local radio station's chief engineer, and nothing could stop him. "I walked into the station and asked about the transmitter he had. My friend and I said, 'Could we borrow the schematic for your transmitter? We want to build a transmitter and get on the air and play music.' The guy just about came over the board at us and told us if we ever got near his frequency he'd have us all in jail. We left there in a big hurry."

The incident made Donohue lose interest for a while, but not forever. It wasn't long before he began to wonder, if a short piece of wire could carry his signals a few blocks, how would a bigger antenna perform? Where could he find more wire? These were the days before Radio Shack stores, so he walked to a nearby Lafayette Radio outlet. Fortunately, they were sold out of wire, because before George left the store, the Lafayette salesman suggested he visit the other local radio station's chief engineer, a man named Roy.

"I stopped by the transmitter site and banged on the door. A jolly guy answered with a smile on his face. I walked into the transmitter building and there was a Collins 5,000 watt transmitter. I looked at that and said to myself, 'Now there's something to work at. I'd like to do this kind of work.' Little by little I was spending more and more time at the radio station."

Roy quickly became George's mentor. Day after day they would maintain the transmitter and directional antenna system together. "I would ask him endless questions and he seemed to know the answers to almost all of them. There were no mistakes in anything that he ever told me. His efforts went totally towards doing things as perfectly as he could."

George was a big asset to Roy, as well. When Roy was young, he had set up a radio shack in his parent's chicken coop. Many experiments and revisions of equipment molded him into an ace amateur radio operator able to send Morse code at over 50 words per minute flawlessly.

Tragically, bacteria from the chickens infected his lungs and he almost died. Many years later, the same bacteria slowly robbed Roy of his sight. As time went by, and Roy became almost totally blind, George became his new set of eyes. Whenever Roy's handicap hindered his work, or he needed a ride home, George was there for him.

Donohue eventually earned an FCC First Class Commercial Radiotelephone License and began a career that took him to the American Southwest for eight years. Without any college or formal technical training, he landed a job with Motorola doing research and development for the federal government. George's experience with transmitters and communications systems was invaluable to his new employers. As he taught himself solid state theory, he worked long hours completing assemblies for the Voyager and Galileo space probes and other aerospace projects.

Upon his return to upstate New York in 1985, George rekindled his friendship with Roy and his interest in broadcasting. Donohue got a job fixing two-way radios using his hometown mayor's garage as a workplace. Modifying a Collins amateur radio transmitter to operate on the broadcast band became a late-night project that spelled adventure.

"A guy heard me 15 miles away, which I thought was fabulous. I had a little turntable and a little tape recorder, and at night, when everybody left, I'd be on the air on 1580 kHz."

When Roy discovered what his friend was doing, he decided to lend a hand. "Roy came out here one day with a bag of 833A tubes and sockets. He had a dozen of them. They were in beautiful condition. I wrapped every one up and brought them home and started building. I built a 500 watt transmitter with a huge tank coil, and the design wasn't quite right, but it worked."

Sadly, Roy passed away on June 5, 1988, but he'll never be forgotten. Just look for Roy's gray felt hat atop George's homebrew modulator. "He was a guy that comes along once in a lifetime. Allowing me to be around his life I learned things that you just couldn't find out any other way. He never gave up on me."

After Roy's death, Donohue continued to build transmitters, and sometimes built them for friends, too, but he often became sidetracked. A linear amplifier for Citizen's Band, and another one for ham radio, led him to build a 1,000 watt transmitter three years ago that became his standard transmitter for his pirate broadcasts. Once in a blue moon, his voice and music would appear unannounced on 1620 kHz for a few hours and then disappear. George had honed his system into a remarkable, efficient

Be an American BandScan Reporter.
See any stories about radio in the local paper? Send them to American Bandscan, c/o MT

and professionally-built transmission facility. His signal was discovered by listeners all over the country.

The most recent addition to his shack required months of diligent work. Last year, Donohue upgraded his system with a new modulator and transmitter to bring his power up to 5,000 watts.

"I never really thought that with all the ability I had, the background, the desire, and the knowledge to build this stuff, that I could pump a signal out as far as this thing goes. I never realized I could be as strong as I was into places like North Carolina."

The transmitter is an amazing piece of work.

Built from scratch, the audio amplifier and plate modulator on left, exciter and power amp on right, aren't complete without Roy's hat.

"The final tube is a 4CX5000 that's stressed out to the limit. You can get near a 5,000 watt output level. So if I beat this guy to death it's probably a lot happier working for me than at some commercial station. I like this tube. I buried three of them in the back yard after they died. I dig a little hole and I put up a little cross that says, "'This is a final that served me well.'"

Christmas Eve 1990 marked the premiere broadcast of Donohue's five kilowatter. A combination of pop music and satire hit the ether and didn't fade for over a thousand miles. On January 2, 1991, federal agents began to scour his neighborhood searching for the pirate station's transmitter site. Anyone who had an antenna not made for television reception was questioned.

George had gone too far. The FCC wanted to capture the pirate king. This time, he just barely slipped through their fingers. An acquaintance of Donohue, a fellow transmitter builder in town, was accused of being the operator and was issued a notice of an "apparent forfeiture" of $2,000, which is currently being appealed. Donohue dismantled his entire station and is believed to have headed to Virginia. According to friends, Donohue is planning a new 10,000 watt transmitter for the future.

"There are so many people who want to hear this thing. I've met some really young kids who are into radio, that have helped me out, and they want to hear their name on the air. I have tons of parts for them if they want to build a little transmitter, and I give them the stuff to do it. I like doing it, because when I was very young there was no help. I wish there was a guy for everyone who would say, 'Hey, you want to build this? I can show you how.' You should give back what you've gotten from others."

There is no doubt George will return to the air someday. Tune in 1620 kHz now and then. Sooner or later the pirate king will reappear.

Bits 'n' pieces

■ Radio can save your life, or should we say, a radio can save your life. A pocket radio stopped a bullet fired right at the heart of a person being mugged in Los Angeles. Gary Lee was robbed of his wallet and shot as he was calling for help after his car had broken down. The muggers escaped with about $100, and Gary suffered only minor injuries. The radio was history.

■ Some things never change, even after 65 years. John Gambling has been on WOR in New York City every morning almost forever. The third one has just taken the reins to continue the tradition. John B. Gambling started it all, 20,000 broadcasts ago, and his son John A. Gambling took over the show in 1959. After 31 years of waking the Big Apple, he has now handed the program to his son, John R. Gambling.

"Virtually everyone of the letters we get from our listeners will say it has been wonderful to wake up in the morning and to know that in a changing world, there is something that remains essentially the same. That has been a tremendous strength," says resigning Gambling, John A. WOR continues to be a ratings leader in the New York metropolitan area operating with 50,000 watts on 710 kHz.

■ Calling all DXers. Here's a switch. It's getting harder and harder to get a QSL card from radio stations, but KMJY in Oldtown, Idaho, would love to hear from you. They have a 10 kW signal on 700 kHz and also operate on 104.9 FM. If you can pick them up, they would be glad to send you a QSL. Write to: Keith Lewis, KMJY, P.O. Box 1740, Oldtown, Idaho 83822, and remember to send them an SASE for your reply.

New Station Grants

Here are the latest allocations in the nation, as reported by the *M Street Journal*: Northport, AL 100.7; Little Rock, AR 99.5; Wrightsville, AR 107.7; Avalon, CA 92.7; Independence, CA 106.3; Coral Cove, FL 107.9; Edgewater, FL 93.1; Irvine, KY 106.1; Louisville, KY 100.5; Reidland, KY 106.7; Wilmore, KY 96.3; Copenhagen, NY 106.7; Montauk, NY 94.9; Delaware, OH 107.9; Greenfield, OH 97.5; Manchester, OH 101.3; Wauseon, OH 96.9; Woodville, TX 94.7; and Morrisville, VT 93.9.

For Sale

■ Your best advertising client could be a dairy farmer if you decide to invest in this medium market full-time AM station with a six kilowatt FM. A fully equipped modern building in northern Wisconsin houses a state-of-the-art facility located on prime real estate. You'll enjoy the profits, too. Contact Packerland Consultants at 414-235-2625. ■ WOKN-FM in Goldsboro, North Carolina, is on the block, featuring a 3,000 watt transmitter. It's a Class A FM that dominates an active town and Seymour Johnson Air Force Base, just a couple of hours outside of Raleigh/Durham. Call Bob Swinson for details: 919-734-4213. ■ Two powerhouses are being offered in Lebanon, Missouri. 100 kilowatt KJEL-FM and 5 kilowatt KIRK-AM, cover all of central Missouri and the Lake Ozarks region and can be purchased for $895,000, with only $250,000 down. Perfect call letters for Star Trek fans. Ralph Meador is awaiting your call at 816-259-2544.

Credits: *Broadcasting Magazine*, the *M Street Journal*, the *New York Times*, British DX Club and items sent in by readers Ken Hydeman, W. Earle Doan, Michael Westdal, and Lt. M.L. Cauthon stationed in sunny Australia. Until next month, happy trails.

Monitoring the War: video and text

One of the things that sets the monitoring hobbyist apart from the rest of society is an urgent need to know. This need may stem from a professional relationship such as the emergency medical care worker or the journalist or law enforcement personnel -- people who need to be technologically linked to current events.

Others of us who are not necessarily professionally concerned, nonetheless share this need for immediate information regardless of the situation. Who among us has not been gripped by the unfolding story of war in the Persian Gulf?

For the rest of society it's the odd Special Report or the nightly news. Cable subscribers have access to CNN (which finds itself in the peculiar position of being both ratings winner and reluctant mouthpiece of the enemy). Shortwave listeners have access to hundreds of hours of international broadcasts from all quarters. They are allowed to listen to each side and try to sort the truth from wishful thinking. Those who can't do the sorting listen to the BBC.

It has been said that this is a "satellite" war -- that, for the first time, reports of activities are instantly available live, via satellite and around the clock. Anyone with access to a home satellite TV system can bear out this assertion.

Still, merely having access to the information doesn't mean it will necessarily make sense. Instantaneous reports aren't worth much if they are erroneous. It takes time to sort out the live action and time is a luxury when the video tape is rolling.

For this reason, the most concise reporting and accurate information has come by way of the wire services. Not that individually they have all the answers, but collectively they give a clearer aggregate image. The best bit of information gathering which I have access to as a dish owner is X*Press X*Change. Stories filed from the front for the world's press services are gathered for X*Press subscribers to peruse.

Here, entire press briefings are repeated verbatim with the subscriber given the option of printing the entire text for later reading. Countless "sidebar" stories are also featured as the wire services' most thoughtful writers report.

But the biggest advantage to X*Press is the immediacy with which the stories are received by individuals. Reports pour into your InfoCipher 1500R 24 hours a day. For depth, it beats the radio. For accuracy, it beats television, and for speed it beats the newspaper. Don't forget that X*Press is available to cable subscribers as well as TVRO users. For more information call 800-7PC-NEWS.

Meanwhile, following is a chart of video activity concerning Gulf War news feeds. Galaxy 6 has seen the most activity. At times, as many as six or eight transponders may be carrying war related feeds. These are all "backhaul newsfeed" services and not regularly scheduled news broadcasts, so no times are listed.

Gulf News Broadcasts

Satellite	Xponder	Service
Spacenet 2	17	SCOLA (International Newscasts from around the world live and taped
	21	USIA/VOA/World Net -- also retransmits C-SPAN on occasion
Satcom F2	3	ABC Saudi pool
	21	JISO NY-Tokyo -- retransmits some CNN, VISNEWS feeds
Galaxy 2	21	ABC Saudi pool
Galaxy 6	2	NHK Tokyo -- retransmits some CNN
	3	U.S. news pool
	20	CNN Saudi pool
Westar 4	12	BBC Six O'Clock News (1 p.m. ET)
	18	NHK Tokyo -- retransmits some CNN

TRANSPONDER NOTES

■ There has been more activity in the Clarke Belt in the last month than there has been in years. Satellites have been shuffled around, services have hopped transponders and other services have folded. This is a direct result of bringing new satellites into service coinciding with the down-turn in the economy -- more and more programmers seek fewer and fewer advertising dollars.

Here's the play-by-play: Satcom C1, which was launched last fall, has replaced Satcom F1, which was dispatched immediately to replace Satcom F3, which was decommissioned and put in an orbital slot to be used as an emergency backup. The result is much stronger signals to all parts of the country on the two affected birds.

In addition, some of the channel residents have been doing some shifting of their own. American Movie Classics is now on F1.1: Turner Network Television (TNT) has swapped with Inspirational Network so that TNT is now on G1.18 and IN is now on F1.18.

In the gone-but-not-forgotten department: Mizlou Sports News Network (SNN) fell victim to foul play as Landmark (which owns the Weather Channel) allowed buy-out negotiations to drag on long enough for SNN to deplete itself financially. After it was forced off its transponder (F4,2) there was, in effect, no network and therefore SNN was worthless. Landmark's plan, according to industry journal reports, was to buy the remaining SNN assets for nickels and dimes and start their own sports network. Unfortunately, the recession kicked in and advertisers have shied away from "start-up" ventures, preferring to put their limited budget into proven ratings makers.

Among the other recent departures: Star TV Network (S1,13) called it quits after just four months on the air. Financial News Network (FNN F1,11) continues to stumble, with its collapse reported imminent. The Learning Channel (F1,2) is said to be in similar difficulty because FNN is a major shareholder.

Finally, the continuing saga of TVN, the erstwhile C-Band DBS venture which was to have launched last fall: In an effort to attract more financial backers, TVN has dropped its Leitch encoding plans in favor of the more widely available VideoCipher. Considered a good move by industry observers, this may be the last chance for TVN, which until now had been unable to sign carriage agreements with the big cable "basic" programmers -- without which TVN would be little more than a Pay-Per-View movie service. Even with this move it could be tough sledding in the current economic environment.

■ Two items of interest to the TVRO

enthusiast came through recently. GTI Electronics offers a brochure and price list of its WeatherFAX products including complete systems or system components. Piece together what you need to copy spectacular images from NOAA, GOES and much more. Write: GTI Electronics, 1541 Fritz Valley Road, Lehighton, Pa. 18235, or call them at 717-386-4032 or FAX 717-386-4032.

■ Mark Long has his new *1991 World Satellite Annual* out which features data on launch vehicles for the 1990s, communications satellites, and updates on all existing ITU Regions 1, 2 and 3 C and Ku band satellites. This is an indispensable tool for all TVRO enthusiasts. It's available through all the usual satellite TV mail order outfits or direct from MLE Inc., P.O. Box 159, Winter Beach, FL. 32971.

MAILBAG

Talmage Murray of Tampa, Florida, would like to know if there are any satellite systems which could be used for radio reception in portable operation.

Not that I am aware of. Which, of course, doesn't mean that there isn't such a device. It simply hasn't come to my attention. There are ready-made systems designed to be used on recreational vehicles (RVs). These systems, while small by backyard installation standards, are probably not what you want. Typically, they feature five or six foot reflectors, receivers, cables, C/Ku feedhorns/LNBs, etc., and are powered by the RV's battery system.

There would be nothing in this system which would make it truly portable in the shortwave sense. Developments in this direction are coming and it would not be too outrageous to expect a fairly portable satellite system capable of tuning in the audio subcarriers in the next ten years.

Dan Atkinson of Highland Springs, Virginia, would like to know how he can receive ITV television from England. Of particular interest is the coverage of the 1991 Rugby World Cup held in Europe from September to early November.

I think the chances of receiving any programming beamed at England or Europe from British or European satellites is very slim. But, let's not give up. I believe that for folks on the east coast, the solution is to try to pick up the Intelsat satellites which serve as a bridge between America and the European continent. There are some problems in trying to do this and I'll touch on a few.

First, you should know that these birds are virtually out of sight for the bulk of the North American continent. This means that, unless you have access to a 40 or 60 foot dish, reception will be limited to those on the east coast. Secondly, Intelsat signals are transmitted via circular polarization as opposed to the horizontal and vertical polarity of our domestic satellites. Luckily, there is a company which makes a feedhorn for such circumstances. The company is National ADL and its Intelsat feed can be ordered from, among other places, The Sky Store, 800-328-7733. Further, you'll notice that the signals are not quite as powerful as our domestic satellites which is yet another reason to have as big a reflector (dish) as you can afford.

Charles Bovans of Shingletown, California, enclosed a list from a satellite television guide detailing the satellite, channel and frequency of 89 audio subcarriers. He asks if there is a more complete list available.

Yes, Charles, there is. The most complete listing of FM audio subcarriers and SCPC (Single Channel Per Carrier) stations on both C and Ku birds is published by Westsat Communications in their Satellite Channel Chart. This 28 page publication is produced six times per year and contains a wealth of information. The Satellite Channel Chart goes through the Clarke Belt satellite by satellite and transponder by transponder listing each channel and the company to which it is leased. In addition, you'll find a C and Ku band satellite frequency/transponder conversion table and charts depicting the placement of all the satellites in our portion of the belt.

This publication is absolutely essential for the home dish owner who wants to know exactly what it is he's watching. Subscriptions are $36 per year from Westsat Communications, P.O. Box 434, Pleasanton, California 94566. You can call them at 415-846-7380. They don't have a printed policy about sample issues but it might seem reasonable that if you sent them a check for six or seven bucks, they might send a recent issue for your perusal.

Thanks also to a reader who sent a clipping from *Microwave Journal* which contained interesting information on recent developments in the commercial side of the satellite industry. Among some of the other tidbits is a reminder that Hughes Communications plans to launch its replacement for Galaxy 1, which will be called Galaxy 1R, in 1992.

This will be only a part of some major changes in the world of satellite television, not the least of which will be increased power output and channel capacity. The next 18 months will be extraordinary times for TVRO users.

on the ham bands

Ham Equipment "On the Cheap"

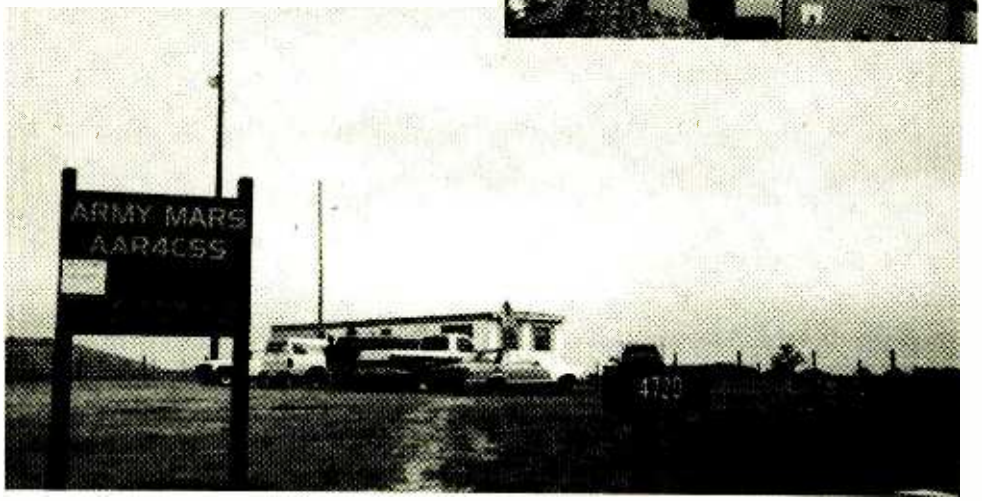
Buying ham gear can be an expensive proposition. High-tech communications gear rarely comes cheap. There are ways to trim the price tag on being an amateur radio operator, most of which are well known.

You could read the classified ads in your local newspaper and hope to hit a good estate sale. You could spend your weekends tracking down one of the many ham shows that inevitably blossom this time of year. (Check the convention calendar on page 101). Or you could take Ron Hester's advice and use your radio to find the real bargains.

Ron, who lives in Winston-Salem, North Carolina, offers a daily list of used equipment nets that you can tune to on shortwave. All times, notes Ron, are in EST -- not UTC.

Monday	7:00 pm	3.898	LSB
Tuesday	4:30 pm	3.910	LSB
Wednesday	8:00 pm	3.906	LSB
Thursday	4:30 pm	3.910	LSB
Thursday	7:30 pm	3.885	AM
Friday	7:00 pm	3.898	LSB
Saturday	8:30 am	3.985	LSB
Sunday	8:00 am	3.945	LSB
Sunday	10.00 am	7.275	LSB
Sunday	4:00 pm	3.942	LSB

Jack Nesmith of Deltona, Florida, reports that MARS station AAR4CSS was working 150-200 patches a day when he stopped by! When one amp went out, the station borrowed from the local sheriff's dept. Administration and housekeeping for the station comes from women of the local Army Reserve Military Police Company.



Hams Take a National Bow

One of several groups to receive a blizzard of publicity during the Persian Gulf War was ham radio operators. Almost every newspaper in the country did a story on local members of the Military Affiliate Radio System, better known as MARS.

Using their own equipment, time and expertise, these hams man the mikes and provide morale-boosting contacts between deployed sailors and their families. It works like this: a ship communicates with a stateside ham by radio. The ham then dials up the phone number requested by the sailor, acting as a link between the loved one on the phone and the sailor on the ship by "patching" the entire conversation over the radio.

More than 385 ships are equipped with MARS stations. The system is in operation during peace as well as during war.

Warning: Big BCARE is Watching

Ham radio operators in Boulder County, Colorado, also got some publicity recently, but it wasn't good. Members of the Boulder County Amateur Radio Service (BCARES) have come under fire for assisting police agencies in monitoring some of the anti-war rallies that occurred during the war.

According to reports, BCARES members staffed a "mini cam" at "several" demonstrations. The pictures taken of the demonstrators were then beamed back to police headquarters where they were then transferred to tape. According to police, the visual record allows officials "a big picture" of the event.

Barbara McClune, a Boulder area ham, defended BCARES actions, telling local newspaper reporters that "as part of the licensing procedure, the FCC requires ham operators to cooperate with civil authorities..."

Another amateur operator who took a dimmer view of the hams' involvement said, "The amateur radio hobby can have its good and bad side. Ham radio operators are often ready to help out in emergency situations. But when they have too much time on their hands and expensive equipment at their disposal, they can get into trouble. I think that this is one of those situations."

Packet: Policing Itself or Paying the Price

The *W5YI Report* asks, "Does this signal the end to packet radio?" The question is in response to the FCC's citing of eleven hams for violation of Part 97 restrictions against business communications on the amateur bands.

Packet radio operates much like a computer bulletin board, only the messages are transmitted by radio instead of phone lines. Messages are entered on the board and then may be retransmitted to other boards without the direct knowledge of the packet board operator. Unfortunately, the FCC holds each ham responsible for what is transmitted over his station and in this case, one of the messages that got transmitted and retransmitted concerned a for-profit 900 telephone number -- a violation of Section 97.113(a).

Packet radio operators now face the problem of having to bear responsibility for messages put on their systems by others, forcing them to be policemen. Each of the 11 cited hams received $300.00 levies.

That's it for this month's wrap-up of the world of ham radio. Keep us informed so that we can keep you informed. Send club news, station photos and information on what you've been hearing to "On the Ham Bands," c/o *Monitoring Times*, P.O. Box 98. Brasstown, NC 28902. '73s!

Bob Bundi's DX Tips

BAHRAIN Two stations are currently active from here: A92BE shows on 24932 kHz at 1300 UTC and on 18120 kHz at 1530 and 2330 UTC. QSL to his QSL manager WD4DCY Hubert W. Buck St., Rt 1 Box 290A, New Bern, NC 28560. A92FL has been showing on 10 meters between 28450 and 28680 kHz at 1500 UTC. QSL to Sherdon K Street, P.O.Box 26803, Manama, Bahrain.

BHUTAN VK9JS, Jim Smith, and his wife Kirsti, VK9NL, plan to operate A51JS starting 1 May all bands SSB and hopefully CW and RTTY as well.

CROZET FT4WC has been appearing on the "Friendly ET Net" 14160 kHz at 2100 UTC several days a week, and on the "2-56 Group" Net on 14256 kHz at 2200 UTC. For those who like the thrill of getting their DX away from nets look for him on 28510 kHz Saturdays between 1500 and 1600 UTC. Send your QSL requests to his QSL manager F6GVH: Michael Godefert, BCAC Couriers Exterieurs, 14 Rue Saint Dominique, F-75997 Paris Armees, France.

FIJI Look for Alan Osterman, SM5BQB, to operate as 3D2QB from here 'til 1 May, mostly CW but he will operate SSB on 21170 kHz. QSL to: Jan Eric Rehn, SM3CER, Box 54, S-863-01 Sundsbruk, Sweden.

LIBERIA Amateur activity is taking place from here once again, in the aftermath of the recent civil war, as EL2UN, one of the UN peace keepers here, has been on 21010 kHz at 2100 to 2300 UTC. Send your reports to: Christopher Berner, HB9AUZ, Willishalden, CH-3086 Zimmerwald, Switzerland.

LITHUANIA Back in January while Russian paratroopers were storming the Radio-TV complex, Vilnius hams were reporting to amateurs in Western Europe and North America (on 14155 kHz starting a half hour after the Russians began their actions) on what was occurring and reading translations (in English) of speeches from Lithuanian leaders.

It's a time to watch for if events heat up again here. The frequency may not be the same, but 20 meters with its world wide propagation at almost all hours will probably be the band and most likely it will be in the 14100 to 14170 kHz range where there are fewer operators.

OMAN Three amateurs have been keeping this country on the air since late January: A47KS can be found around 14185 kHz at 1500 UTC (QSL to: KD20M, Steven E. Sykes, 65 Culver Pkwy, Rochester, NY 14609). A41KJ has been on 14190 ∓ a few kHz every day starting at 1400 UTC. Send your reports to his QSL manager N5FTR, William M. Loeschman, 717 Milton, Angleton, TX 77515. Look for A41KV between 24850 to 28700 kHz at 1400 UTC. He announces his QSL address on the air.

QATAR VE3SNL/A7 may still be active from here; a member of the Canadian Forces Air Arm stationed here for "Desert Storm," he has been appearing rather frequently on 14185 kHz between 2100-2300 UTC and on 21235 kHz at 1500 UTC. QSL to: Graham Hutchison, Newman, CF P.O. 5000, Belleville, Ontario, Canada K0K 3R0.

SAUDI ARABIA There is very little in the way of amateur operations. Just about any ham who operates from here as /HZ or /7Z probably does not have permission to operate.

One of the few exceptions to this rule apparently has been 9K2CS/7Z, a Kuwaiti amateur who in late January appeared on the 14160 kHz ET net "with the help of friends...using borrowed equipment" to tell his friends on the DX net that he was ok and the logs for his (and another Kuwaiti amateur's) Yemen DXpedition, as 701AA, in the spring of 1990 were safely hidden in Kuwait awaiting his return. This was at 2100 UTC -- Watch this frequency and time for Yousuf, now that Kuwait is retaken.

The club station at the U.S. Embassy 7Z1AB has been active on 21335 kHz at ∓ 0830 UTC at various times; a check of this frequency and DX net at this time would be advantageous. QSL to WB2WOW, Peter D. Uberto, 625 Ratzer Rd., Wayne, NJ 07470.

SYRIA A member of the UN Peace Keeping Forces in the Golan Heights has been 14175 kHz at 0700 UTC. The QSL route is not yet known.

Add to Your DX Net List: The IARS net on 14243 kHz which meets daily at 0000 UTC and the Australian-Italian DX Net which meets on 21205 kHz at 0630 UTC daily. Good DX and 73!

Dr. John Santosuosso

P.O. Box 1116
Highland City, FL 33846

News from the Other Side

Our European readers have been very helpful in letting us know what is happening in their part of the world. So here is the latest news.

From the Netherlands, Ary Boender writes that the news is all bad for offshore Radio Caroline, which used to be heard in North American via its shortwave service. Caroline is currently off the air, and probably will not return. Even though its base aboard the ship M.V. Ross Revenge is in international waters, a new law recently passed by the British Parliament gives government officials the authority to board at any time. Sounds like RNI and the Sarah all over again. Radioships may be history.

If the ships are disappearing, land-based pirates continue, and some of these should be possible to hear on our side of the Atlantic. Not only is it illegal to broadcast without a license in Britain, it is just as illegal to listen to pirate stations! So, we will refer to our English contributor simply as Mr. H.

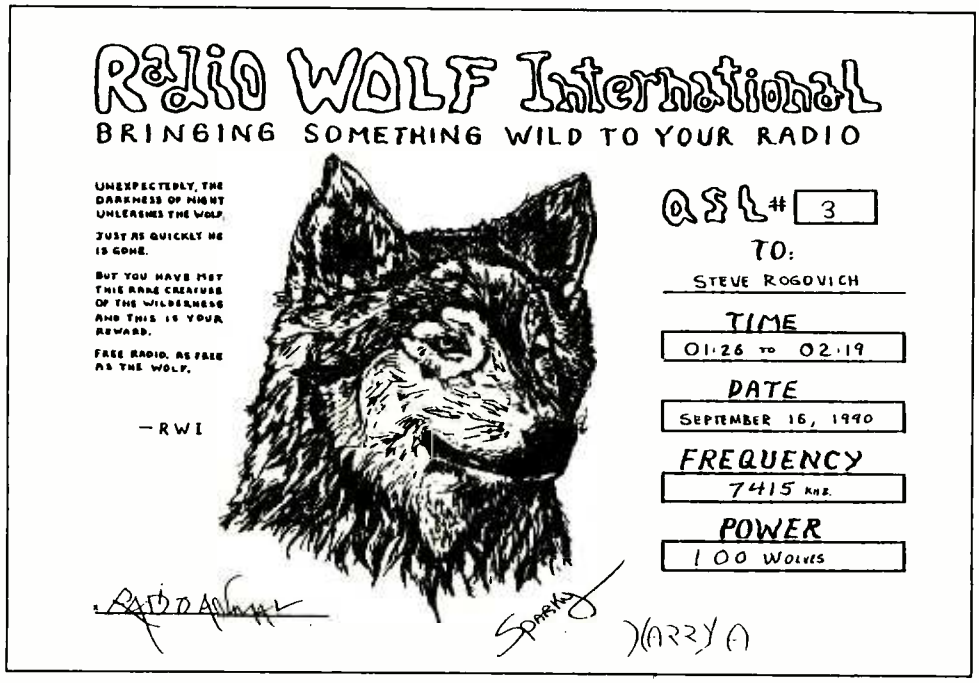
Mr. H. has heard all of the following recently and thinks we might just have a chance at some of them. On 6210 and 6275 kHz he has heard Free Radio London. Radio Orion was found on 6290, and Britain Radio International on 6230. Ireland's Ozone Radio showed up on 6820, while Delta Radio was discovered on 6230. Best time to try for these would be UTC Sunday mornings.

Proof that UK pirates can be heard over here is furnished by Florida's Terry Krueger. He bagged Live Wire Radio on 6317 at 0326 UTC.

The Rise and Fall of WJDI

Well, this column was the first to let you know about WJDI's 5000 watt experiment on 1620 kHz. Several "Outer Limits" readers did send us logs of WJDI transmissions. We expect no more. Jud Mansbach and the FCC struck again. WJDI is no more. The operator, located in New York state, was fined $2,000.

Ironically we understand he had plans to go out of the broadcasting business anyway. This may have been a case of just one broadcast too many. You can read more about the background of this powerhouse pirate in this month's "American Bandscan."



Steve Rogovich is the proud owner of a Radio Wolf International QSL.

Middle East Update

The Middle East war produced a number of radio casualties, nearly all Iraqi. Gone from the airwaves are such Iraqi clandestines as Holy Mecca Radio, Voice of Arabist Egypt, Voice of the Jihad, and Mother of Battles Radio. Allied bombing also took care of nearly all regular Iraqi shortwave transmissions. However, Baghdad can still be heard signing on in Arabic on 4600 kHz sometime after 0230. Signal strength usually is mediocre at best. Most likely this is some sort of emergency portable transmitter.

As long as Saddam Hussein remains in power look for clandestine Voice of Free Iraq between 1300 and 0100 UTC. Other frequencies are in use, but by far the best reception is on 17960, especially after 2300 UTC. This transmits from Egypt. Allegations have been made that CIA and possibly British intelligence money are behind it.

We Get Letters

A large number of nice pirate loggings flooded the mail box recently. So, let's see what "Outer Limits" readers have been hearing.

Hope Radio International, one of the most widely heard pirates these days, made it all the way out to California where Norman Alexander found them on 7415 kHz.

In Pennsylvania, Mike Waylonis reports reception of his first pirate. Mike started out on quite a note. He got the **Voice of Bob** on 7415 at 0013 UTC. As noted before in this column, the Voice of Bob is not exactly standard programming even in pirate circles.

Radio Mauser World Wide has turned up again after not being reported for quite a while. Preston Sewell found them on 7495 in USB at 2130. They announced an address of P.O. Box 55553, Trenton, NJ 08638.

From Ohio S. Marsh reports quite a few nice catches. Among them were Scotland's **Weekend Music Radio** on 7420 at 0435, **WORK**'s final broadcast, which was on 7415 at 2320; **Radio Mexico** on 7435, and **WJDI** on 1620. Up in

CQSL

NO music
NO commercials
NO news
NO sports
NO weather
NO announcers

"We don't waste our time broadcasting... we just verify!"

Energy efficient!
Environmentally friendly!
We pass the savings on... to you!

This will confirm that:

Pat Murphy

did not hear CQSL!

Thanks from:

MM

M. Marceau (Station Manager)

CQSL
'The Pirate Voice of Mime'

Pat Murphy got this verification for nonreception of CQSL!

Massachusetts Phyllis Werlin also logged **WJDI** a little before 0500.

I loved Pat Murphy's QSL from **CQSL**. Appropriately it calls itself "The Pirate Voice of Mime." CQSL does not bother to broadcast; It just verifies! From stations that do actually bother to transmit Pat got QSLs from all-female staffed **WYMN**, **KNBS**, and the pirate **CKLW**.

In Tennessee Gary Inman has had a nice variety of pirate activity. He reports reception of **KUSA Wisconsin** at 0345, the pirate **WGAR** on 0225, and a third station IDing only as **Steve**. All of these were on 7415 kHz.

It is a rare month that we do not hear from Alan Masyga in Minnesota. Alan continues to have lots of success. Canadian pirate **CFBN** turned up on 7415 at 2020 UTC. Also on that same frequency were **Radio Free North America** at 0105, **Action Radio** at 2320, and **WHO** at 0001. Among Alan's more unusual catches was **Pirate Station 417** on 7415.5 USB with the National Anthem at 0048 UTC.

Skip Harwood is one of the West Coast's best pirate chasers. Recently from his California location he had a new one. This was **WKRX** on 7420 at 0500. However, Skip says the station was having serious technical problems.

From Illinois David Sutton logged **East Coast Beer Drinker** on 7415 at 0715. David was able to verify via the Box 109, Blue Ridge Summit, PA 17214 drop.

And it appears no one has had more success recently than Michigan's Harold Frodge. Among his more exotic catches were the **Voice of Pancho Villa** on 7416 USB at 2341, **WHDA We Hate Dead Air** at 0028 on 7415, and Commander John of the **Revolutionary Voice of Plainville**, also on 7415.

A Few Final Comments

Bob Thomas suggests listening to Lithuania's Radio Vilnius in English between 2300 and 2330. Frequencies in use include 7400, 15180, 17720, and 17690 from the USSR and 6100 and 9750 within Lithuania. This does make very fascinating monitoring.

Recently on 7400 I heard Radio Vilnius being relayed by a Soviet transmitter and not only claiming to be broadcasting from the "independent republic of Lithuania" but also reporting on the "atrocities of the Soviet Army" inside Lithuania. One has to wonder how long Moscow will tolerate this sort of thing.

And thanks are in order to Thomas Flanigan of California who sent us a newspaper report on FM pirate KKLR. It has only 15 watts, but a staff of four plus 1,400 cassettes and 2,300 single records!

mt

RTTY on a Budget

Cheap RTTY?

At least once a month I'll get a letter from a reader who wants to get into RTTY with a limited budget. A hamfest is a good source for such equipment, but you need to know what to look for. You can find deals on Commodore 64 computers or the '80s vintage RTTY gear such as the Kantronics interface II or the C64 Hamtext cartridge. Of course, there's the old model 15 or 28 teletype.

Sometimes Universal Shortwave (1280 Aida Drive, Reynoldsburg, OH 43068; 800-431-3939) will have used (trade in) M600s or M6000s available. You can also find deals in the classified section of this magazine.

RTTY Software

If you already own an IBM or IBM PC clone, the PC SWL is an inexpensive way to go. It is a software package that includes a cassette demo disk, a floppy disk, an interface and a very well written manual.

I found the PC SWL an impressive package. It has just about everything a beginner would need and the cassette is very helpful. It walks you through the commands and has sample RTTY traffic that you can play into your PC from a cassette player.

An interface, which simply plugs into the PC's comm port, connects to the receiver's speaker output. It has a small circuit board which is built into a D25 connector housing and contains a single micro-chip. The hookup is easier than connecting a printer to your PC. The only thing you have to know is which comm port the interface is connected to.

Tuning screen

To start out, install the software and select the setup menu. The main menu has a "tuning scope" selection which is an on-screen tuning display. When your radio is connected to the interface, a base line and a scanning line are displayed. You tune your receiver for the correct tones (see Figure 1).

When the wave form is on top of the base line, the signal is correctly tuned. The tuning display is similar to an oscilloscope but when you change the receiver's frequency, the trace moves up and down.

The software

After the receiver is properly tuned, you press return and then "R" for receive. A blank screen begins to display the characters. If the text is garbled, you can play with the baud rate or the shift until the screen is readable.

The PC SWL package also supports CW, ASCII and SITOR (mode B only). It also has a digital scope for the pros, an Automatic Signal Analysis (if you can't get a good copy) and a text capture buffer.

Test results

The software is very good. However, it doesn't support Sitor mode "A" which is used extensively in ham radio. The interface probably uses a technique known as "zero crossing detection." It's used to decode the mark and space tones using the computer software instead of complex filter circuits.

The single chip on the interface board is probably an audio amplifier which boosts the weak signal from the receiver's speaker output. A zero crossing detector doesn't work very well when noise is present on the signal and that's something you always have on HF.

I compared the PC SWL to my Kantronics KAM, the Infotech M7000 or my homebrew tuning unit. I found that the PC SWL produced garble with the slightest noise pulse or speaker "pop"; The other units performed okay.

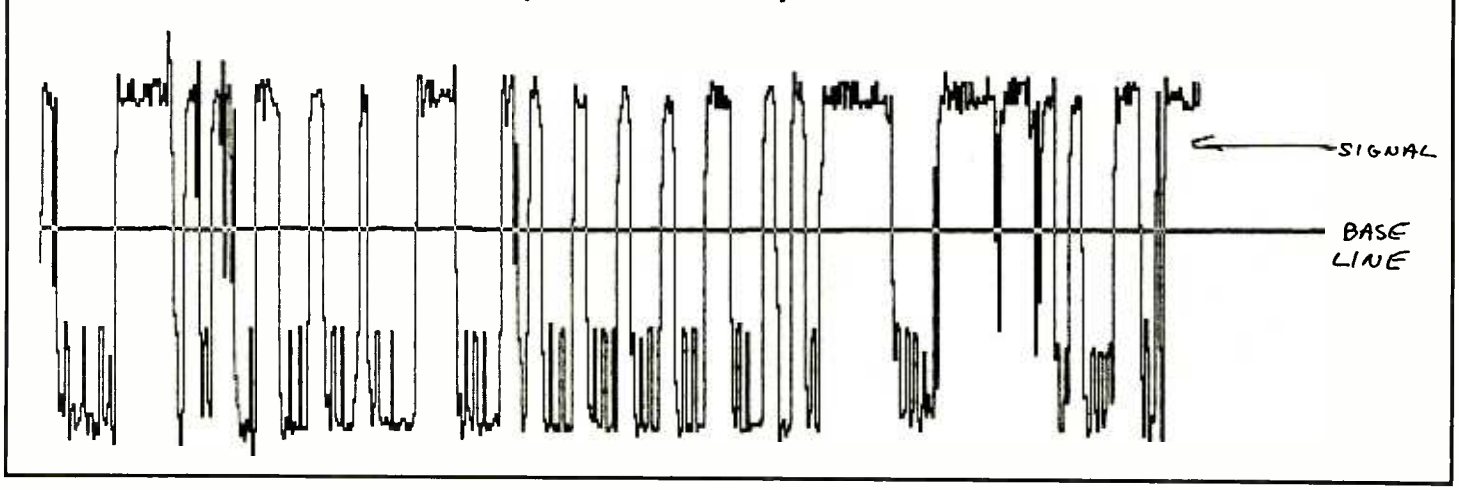
Conclusion

The PC SWL is a very inexpensive software package that's great for the beginner, but don't expect it to work as well as an expensive system like the Universal M7000. I think the package should have an interface upgrade available that would improve reception by adding mark/space filters.

You can purchase PC SWL from Software Systems Consulting, 150 Avenida Cabrillo, Suite C, San Clemente, CA 92672.

NNN

Figure 1: Filter Level, 1410 Hz. Adjust with arrow keys.



Don't forget about sending reception reports to AM stations -- Here are a few from Karl Zuk's collection.

CANADA

CKBC-Radio Atlantic 1360 AM. Full data QSL letter, verified by Kevin Chamberlain, station engineer. Received in 20 days for an English AM report and one Canadian mint stamp. Station address: P.O. box 1360, 176 Main Street, Bathurst, N.B,, Canada. (Holbrook, MD)

CBGA-1250 AM. Full data QSL letter, verified by Claude Duberger. Received in 15 days for an English AM report and one Canadian mint stamp. Station address: 155 St. Sacrement St., Box 2000, Matane, Quebec G4W 3P7 Canada. (Holbrook, MD)

CLANDESTINE

Voice of Unity-Radio Muslim Mujahideen, 15685 kHz. Full data map card, with illegible signature. Received in 170 days for an English report and one IRC. QSL address: P.O. Box 2605, 2000 Hamburg 60, Federal Republic of Germany. (Hardester, NC)

GABON

Africa No. 1, 15475 kHz. Partial data letterhead, verified by La Directeur Technique. Also received station promotional souvenirs. Received in 781 days for an English report and one U.S. dollar. Station address: Boite Postal 1, Libreville, Gabon. (Frodge, MI) (Heath, OH) (Davis, AL) (Wilson, NC) (Cavenaugh, LA)

HUNGARY

Radio Budapest, 9835 kHz. Full data scenery QSL card, without verification signer. Received in 47 days for an English report. Station address: Brody Sandor u. 5-7, H-1800 Budapest, Hungary. (Adams, NJ) (Wright, MS) (Law, LA) (Davis, AL) (Bagwell, MO)

NETHERLANDS

Radio Netherlands, 6020 kHz. Full data scenery QSL card, without verification signer. Received in 32 days for an English report and two IRCs. Station address: P.O. Box 222, Hilversum, Holland, Netherlands. (Carson, OK) (Fields, CA) (Jackson, NY)

PARAGUAY

Radio Nacional de Paraguay, 9735 kHz. Partial data prepared form QSL card, stamped with station seal and friendly letter, verified by Augusto Ocampos Caballero, director general. Received in 21 days for a Spanish report, a souvenir postcard and one U.S. dollar. Station address: c/o Oliva y Alberdi, 6 to piso M.O.P.C., Asuncion, Paraguay. (Albright, CA) (Johnson, IL) (Bagwell, MO)

PERU

Radio Atlantida, 4790 kHz. Full data station card, verified by Pablo Rojas Bardales. Received for a Spanish report. Station address: Bermudez 445, Iquitos, Peru. (Robinson, TN)

PIRATE

Voice of Bob, 7410 kHz. Full data "Technobordom" QSL letter, without verification signer. Received in 53 days for an English report and three U.S. mint stamps. QSL address: P.O. Box 452, Wellsville, New York 14895. (Johnson, IL)

POLAND

Radio Polonia, 7270 kHz. Full data color QSL card, without verification signer. Received in 87 days for an English report. Station address: P.O. Box 46, 00-950 Warsaw, Poland. (Adams, NJ)

UNITED STATES

WKKQ-650 AM Nashvauk, Minnesota. Report returned "Verified," with illegible signature. Also received station promotional souvenirs. Received in 17 days for an English AM report and a self-addressed-stamped envelope (not used). Station address: P.O. Box 1060, Hibbing, MN 55748. (Frodge, MI)

WZAP-690 AM Bristol, Virginia. Partial data letterhead, verified by John J. Faniola, C.E. Also received station promotional souvenirs. Received in 11 days for an English AM report and a self-addressed-stamped envelope. Station address: P.O. Box 369, Bristol, Virginia 24203. (Frodge, MI)

KWPN-840 AM West Point, Nebraska. Report returned "Confirm receipt," verified by David M. Kelly. Received in seven days for an English AM report and a self-addressed-stamped envelope. Station address: P.O. Box 84, West Point, Nebraska 68788. (Frodge, MI)

WIRJ-740 AM Humbolt, Tennessee. Partial data letterhead verified by R.S. Little Jr. Received in 14 days for an English AM report and a self-addressed-stamped envelope. Station address: 310 N. 22nd St., Humbolt, Tennessee 38343. (Frodge, MI)

WHAP-1340 AM Hopewell, Virginia. Full data QSL letter, verified by Bruce J. Connon, vice president and general manager. Received in six days for an English AM report and one U.S. mint stamp. Station address: 150 Mesa Drive, P.O. Box 621, Hopewell, Virginia 23860. (Holbrook, MD)

WIXZ-1360 AM McKeesport, Pennsylvania. Full data station letter, verified by Richard J. Ruby, chief engineer. Received in 12 days for an English AM report and one U.S. mint stamp. Station address: 400 Lincoln Highway, McKeesport, Pennsylvania 15035. (Holbrook, MD)

WNNJ-1360 AM Newton, New Jersey. Full data QSL letter, verified by Frank Truatt, program director. Received in 24 days for an English AM report and one U.S. mint stamp. Station address: Box 40, Newton, New Jersey 07860. (Holbrook, MD)

USSR

Lithuanian SSR-Radio Vilnius, 15485 kHz. Full data flag/logo QSL card, without verification signer. Also received station promotionals and souvenirs. Received in 123 days for an English report. Station address: Vilnius, Lithuania, USSR. (Landau, NJ) (Cavenaugh, LA)

SHIP TRAFFIC

RFA GREY ROVER (A-269) GYXM, 22015 kHz USB (Royal Fleet Auxiliary supply ship). Full data prepared form card stamped with ship's seal, brochures, ship photo, and RFA cap. Received in 64 days for an English utility report, a souvenir postcard, and one U.S. dollar. Ship address: c/o BFPO Ships, London, United Kingdom. (Albright, CA)

HMS INVINCIBLE (R-05) GUCL, 16463 kHz USB (British aircraft carrier). Full data prepared form card stamped with the Main Signal Office and Chief Radio Supervisor seals. Received in 230 days for an English utility report, a souvenir postcard and one U.S. dollar. Ship address: c/o BFPO Ships, London, United Kingdom. (Albright, CA)

CHARLES E. WILSON (WZE 4539), 4075 kHz USB (bulk carrier). Full data prepared form card, verified by James N. Van Dongen, captain. Received in 19 days for an English utility report and a self-addressed-stamped envelope. Ship address: c/o Marine Post Office, Detroit, Michigan 48222. (Hill, MI)

CAPT. HENRY JACKMAN (VCTV), 156.5 MHz (bulk carrier). Full data prepared form card, verified and stamped with ship's seal by J. Vanos, captain. Received in 28 days for an English utility report and a self-addressed-stamped envelope. Ship address: c/o Marine Post Office, Detroit, Michigan 48222. (Hill, MI)

NICOLET (WA 6379), 156.5 MHz. (bulk carrier). Full data prepared form card, verified and stamped with ship's seal by Henry A. Leinonen, captain. Received in 13 days for an English utility report and a self-addressed-stamped envelope. Ship address: c/o Marine Post Office, Detroit, Michigan 48222. (Hill, MI)

UNITED KINGDOM

British Forces Broadcasting Service, 13745/11760 (Oman). Partial data "Gulf" logo/map card, verified by Richard Astbury, station manager. Received in 39/46 days for one IRC/U.K. mint stamps. Station address: P.O. Box 1234, North Wharf Road, London, W21LA, United Kingdom. (Johnson, IL) (Battles, NH) (Frodge, MI)

USSR

Radio Moscow, 15290/11730/11930/9655 kHz. Full data scenery cards, without verification signers. Received for English reports. Station address: Moscow, USSR. (Carson, OK) (Fields, CA) (Jackson, NY)

how to use the shortwave guide

The all-new, totally revamped frequency section of *Monitoring Times* is a professional-level tool designed to help you hear more stations. You'll find three main elements: frequencies, propagation charts, and programming. The frequencies will tell you where to tune; the propagation charts will help you to use your listening time more effectively by predicting the likelihood of hearing a stations from a particular part of the world; and the programming section will give you some idea of what to expect when you tune the station in.

The frequency section now includes virtually every English language transmission in the world including those directed to other parts of the world as well as North America. Do not be disappointed if you do not hear some of these on your first time out. Their level of difficulty ranges from "middling" to, literally, "once-in-a-lifetime." If such challenges frustrate you, stick to the frequencies directed solely to your target area.

The first four digits of a listing are the start time in UTC or "Universal Time Coordinated." Because this so-called "world time" can be confusing, we have provided corresponding local time for the Eastern ("EST") and Pacific ("PST") time zones.

The second four digits of the listing represent the closing time of the transmission. All stations are listed in order of their start time, end time and alphabetical standing.

The space between the transmission end and the name of the station is the broadcast schedule. If there is no entry here (as is most often the case), the transmission is made every day. In other cases, the following letters represent the days of the week the transmission can be heard:

S (Sunday)
M (Monday)
T (Tuesday)
W (Wednesday)
H (THursday)
F (Friday)
A (SAturday)

Other schedule codes are **"ten"** which means that the schedule is tentative, **"tes"** which means that it is a test transmission and **"war"** which means that the station's schedule has been disrupted by armed conflict.

The next listing is the station's name and location. Occasionally, you will find one of the following codes after the station name:

1 the transmission is multi-lingual, containing both English and another language(s)
2 the broadcast contains nothing but music
3 the English broadcast is transmitted irregularly
4 the transmission is an English language lesson

Frequencies are listed in ascending order, from lowest to highest. We suggest that you begin with the lowest frequency and work your way up to the highest frequency. Of course, keep in mind that the lower frequencies generally work better at night; the higher ones during the day. Not all frequencies will be audible at any given time.

Shortwave, or "world band" transmissions are often targeted to specific areas of the world. Following each frequency is a code indicating the area of the globe to which the frequency is "officially" directed. While such a scheme often gives listeners a fair idea of the likelihood of receiving a particular broadcast, remember that in shortwave, there are no hard and fast rules. Voice of America shows sent to Africa in our late evening, for example, are easily heard in North America. Do not hesitate to try and hear any transmission listed in this section.

For easy-going, look for frequencies directed to:
na (North America)
ca (Central America or Caribbean)
am (Americas)

Other codes include:
af (Africa)
as (Asia)
au (Australia)
eu (Europe)
me (Middle East)
pa (Pacific)
sa (South America)

If a transmission is directed to North America and some other area, we list it as North America-bound. If it is directed to a number of different (non-American) targets, we list it as "va" (various). Transmissions marked "do" are for domestic or local consumption. Again, it is possible that you can hear these. Finally, you will occasionally see a transmission listed as "om" (omnidirectional -- sent out in all directions simultaneously), or "?? (we don't know where it is supposed to be going).

Remember, this is a list of all English language transmissions to the world. It includes not only the powerhouse, easy-to-hear stations from the United States, Canada, Germany and the Soviet Union, but tiny local broadcasters like the 40 watt Tristan Radio, located on a tiny island located in the middle of the South Atlantic. Your chances of hearing such a station are, quite frankly, near nil.

Desiring, however, to provide you with every possible tool so that you can effectively search out such rare fare, we also include propagation charts with this section. These are found at the conclusion of the frequency/program list and are designed to give you an idea of the best time to try for a particular station or region. Instructions for using the propagation charts are found at the beginning of that section.

A list of suggested programs can be found under the frequencies for most hours. They are listed in order of their start time in UTC. This list of programs changes every month in order to give you a wide familiarity with what shortwave's over 1,100 frequencies can bring you.

Please note that some program listings may be followed by "See X 0000. The letter stands for a day of the week (see day code legend for the frequency section). The four digits stand for a time in UTC. Listeners should check back to that date and time to find out more about that particular program.

Remember that, unlike many other publications, *Monitoring Times* makes changes to this list up to two weeks before press time and is thus able to keep this list among the most accurate in the world. Errors will naturally occur and we ask your assistance in correcting them.

You may address your corrections, additions and suggestions to Frequency Manager, P.O. Box 98, Brasstown, NC 28902. You may also fax changes to us at 1-704-837-2216 24 hours a day.

English language

shortwave guide

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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 brackets enclosing the day codes.

0000 UTC

BBC
Christian Science Monitor
Kol Israel
Radio Australia
Radio Beijing
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Korea
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Thailand
Radio Yugoslavia
Spanish Foreign Radio
Voice of America
WWCR (USA Radio News) [T-S]
0005
Radio Pyongyang
0010
Radio Beijing*
0030
Christian Science Monitor (Asia) [M]
Christian Science Monitor [T-F]
HCJB*
Radio Budapest
Radio Havana Cuba [T-S]
Radio Netherlands [T-S]
Voice of America (Americas, East Asia) (Special English) [T-S]
Voice of America (East Asia) (Special English) [M]
0045
Radio Korea (News Service)
0055
WRNO (ABC News) [W, A]

0100 UTC

All India Radio
BBC
Christian Science Monitor
Deutsche Welle
Kol Israel
Radio Australia
Radio Belize
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Japan
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Sofia
Radio Thailand
Radiotelevisione Italiana
Spanish Foreign Radio
Voice of America
Voice of Indonesia
WWCR (USA Radio News) [T-A]
0115
Radio for Peace Int'l (UN Radio) [T-A]
Radio Havana Cuba* [T-S]
0125
HCJB
0130
Christian Science Monitor (Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Portugal [T-A]
Voice of Greece [M-A]
0155
Voice of Indonesia

0200 UTC

BBC
Christian Science Monitor
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 Prague Int'l
Radio Romania Int'l
Radio Thailand
RAE, Buenos Aires [T-A]
Swiss Radio Int'l
Voice of America
Voice of Free China
WWCR (USA Radio News) [T-S]
0215
BBC (Asia)
Radio Cairo
0230
Christian Science Monitor (Africa, Europe) [M]
Christian Science Monitor [T-F]
HCJB*
Radio Havana Cuba [T-S]
Radio Pakistan (Special English)
Radio Tirana, Albania
0245
Radio for Peace Int'l (UN Radio) [T-A]
Radio Korea (News Service)
0250
Radio Yerevan

0300 UTC

BBC
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Beijing
Radio Belize
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Thailand
Voice of America
Voice of Free China
Voice of Turkey
WRNO (ABC News) [F]
WWCR (USA Radio News) [M-A]
0305
Radio New Zealand Int'l* [M-F]
0309
BBC*
0310
Radio Beijing*
0315
Radio Cairo
Radio Havana Cuba* [T-S]
0325
HCJB
0330
BBC (Africa)*
Christian Science Monitor (Africa, Europe) [M]
Christian Science Monitor [T-F]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Netherlands [T-S]
Radio Tirana, Albania
UAE Radio, Dubai
0340
Voice of Greece [M-A]
0350
Radiotelevisione Italiana
0355
Radio Japan [M-F]
WYFR (Network) [T-A]

0400 UTC

BBC
Christian Science Monitor
Deutsche Welle
Kol Israel
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Romania Int'l
Radio RSA
Radio Tanzania
Radio Thailand
Swiss Radio Int'l
Voice of America
WWCR (USA Radio News) [T-A]
0405
Radio Pyongyang
0410
Radio Beijing*
0425
Radiotelevisione Italiana
0430
BBC (Africa)*
Christian Science Monitor (Africa, Europe, NE Asia) [M]
Christian Science Monitor [T-F]
Radio Botswana
Radio Canada Int'l [M-F]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Tirana, Albania
0450
Radio RSA

0500 UTC

BBC
Christian Science Monitor
Deutsche Welle
HCJB*
Radio Australia
Radio Beijing
Radio Havana Cuba [T-S]
Radio Japan
Radio Lesotho
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Thailand
Spanish Foreign Radio
Voice of America
0505
Radio New Zealand Int'l* [M-F]
0510
Radio Beijing*
Radio Botswana
0515
Radio Canada Int'l [M-F]
Radio Havana Cuba* [T-S]
0530
Christian Science Monitor (Africa, Europe, NE Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Jordan
Radio Moscow (World Service)
Radio Romania Int'l
Radio Thailand
UAE Radio, Dubai
Voice of Nigeria
0540
Radio Prague Int'l
0545
Radio for Peace Int'l (UN Radio) [T-A]
Voice of Nigeria*
0555
HCJB

0600 UTC

BBC
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-F]
Voice of America
0605
Radio Pyongyang

newsline

0610
Voice of Malaysia
0630
BBC (Africa)*
BRT, Brussels [M-F]
Christian Science Monitor [M-F]
Radio Finland [T-A]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Polonia
Radio Prague Int'l
Radio Sofia
Radio Tirana, Albania
Swiss Radio Int'l
Voice of the Congolese Revolution [M-F]
0645
Radio Romania Int'l

0700 UTC

BBC
Christian Science Monitor
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow (World Service)
Radio Tirana, Albania
Voice of Free China
0715
Radio for Peace Int'l (UN Radio) [T-A]
Radio Havana Cuba* [T-S]
0730
BBC (Africa)*
Christian Science Monitor [M-F]
HCJB*
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Netherlands [M-A]
0755
Radio Japan [M-F]

0800 UTC

BBC
Christian Science Monitor
Radio Australia
Radio Finland [T-A]
Radio Jordan
Radio Korea
Radio Moscow (World Service)
Voice of Indonesia
0805
Radio Pyongyang
0810
Voice of Malaysia
0825
HCJB
0830
Christian Science Monitor [M-F]
Radio Beijing
Radio Finland [T-A]
Radio Moscow (World Service)
Radio Netherlands [M-A]
Swiss Radio Int'l
0840
Radio Beijing*
Voice of Greece [M-A]
0855
Voice of Indonesia

0900 UTC

BBC
BRT, Brussels [M-F]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Japan
Radio Moscow (World Service)
0915
Radio Korea (News Service)
0930
Christian Science Monitor [M-F]
Deutsche Welle (Africa)* [M-F]
Radio Beijing
Radio Moscow (World Service)
0940
Radio Beijing*
0955
Radio Japan [M-F]

1000 UTC

All India Radio
BBC
Christian Science Monitor
HCJB*
Kol Israel
Radio Australia
Radio Jordan
Radio Moscow (World Service)
Radio Tanzania
Swiss Radio Int'l
Voice of America
1030
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Moscow (World Service)
Radio Netherlands [M-A]
UAE Radio, Dubai
1040
Voice of Greece [M-A]
1050
Radio Finland [T-F]
1055
All India Radio
HCJB

1100 UTC

BBC
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Beijing
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow (World Service)
Radio RSA
Swiss Radio Int'l
Trans World Radio, Bonaire [M-F]
Voice of America
1105
Radio Pakistan (Special English)
Radio Pyongyang
1109
BBC*
1110
Radio Beijing*
Radio Belize [T-A]
Radio Botswana [M-F]
1115
Radio Korea (News Service)
1125
Radio Belize [M]
Radio Botswana [A-S]
1130
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l [M-F]
Radio Korea [M-S]
Radio Lesotho
Radio Moscow (World Service)
Radio Netherlands [M-A]
1135
Radio Thailand
1150
Radio RSA

Tim Whewell is the BBC's correspondent in Moscow. These days he's kept so busy, he considers cooking his hobby!

1155
Radio Japan [M-F]

1200 UTC

BBC
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Bras, Brasilia [M-A]
Radio Canada Int'l [M-F]
Radio Finland [T-F]
Radio Jordan
Radio Moscow (World Service)
Radio Polonia
Radio Romania Int'l
Radio Tashkent
Radio Thailand
Radio Yugoslavia
Swiss Radio Int'l
Voice of America
WWCR (USA Radio News) [S-F]
1210
Radio Beijing*
1215
Radio Korea
1230
Christian Science Monitor [M-F]
Radio Cairo
Radio France Int'l
Radio Moscow (World Service)
Trans World Radio, Bonaire [M-A]
Voice of Turkey
1235
Voice of Greece
1255
WYFR (Network) [M-F]

1300 UTC

BBC
BRT, Brussels [M-F]
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Belize
Radio Canada Int'l
Radio Finland [T-A]
Radio Moscow (World Service)
Radio Peace and Progress
Radio Romania Int'l
Radio Tanzania [A-S]
Radio Tirana, Albania
Trans World Radio, Bonaire [S]
Voice of America
WWCR (USA Radio News) [M-F]
1305
Radio Pyongyang
1310
Radio Beijing*
1325
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Korea (News Service)
Radio Moscow (World Service)
Radio Tashkent
Swiss Radio Int'l
UAE Radio, Dubai
Voice of America (Special English)
1346
All India Radio (UN News) [A]

1400 UTC

BBC
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Belize [M-F]
Radio Finland [T-A]
Radio France Int'l
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow (World Service)
Voice of America
WWCR (USA Radio News)
1405
Radio Pyongyang
1410
Radio Beijing*
1415
Radio Canada Int'l (Europe)
1425
HCJB [M-F]
Radio Finland
1430
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Polonia
1455
All India Radio

1500 UTC

BBC
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Beijing
Radio Belize [M-A]
Radio Japan
Radio Moscow (World Service)
Radio Portugal [M-F]
Radio Romania Int'l
Radio RSA
Voice of America
WWCR (USA Radio News) [M-F]
1505
Radio Pyongyang
1510
Radio Beijing*
1530
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
Radio Moscow (World Service)
Radio Tirana, Albania
Swiss Radio Int'l
Voice of Greece [M-A]
1545
Radio Korea (News Service)
1555
WYFR (Network) [A]

1600 UTC

BBC
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Beijing
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Moscow (World Service)
Radio New Zealand Int'l [M-F]
Radio Polonia
Radio RSA
Radio Tanzania
Voice of America
1605
Radio New Zealand Int'l* [M-F]
1609
BBC*
1610
Radio Beijing*
Radio Botswana [M-F]
1615
Radio Canada Int'l
1630
Christian Science Monitor [M-F]

newsline

Radio Austria Int'l
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Peace and Progress
Radio Polonia
UAE Radio, Dubai
Voice of America (except Africa) (Special English)
1635
WYFR (Network) [M-F]

1700 UTC

BBC
Christian Science Monitor
Kol Israel
Radio Australia
Radio Beijing
Radio Belize [M-F]
Radio Japan
Radio Jordan [S-H]
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Prague Int'l
Radio RSA
Voice of America
WWCR (USA Radio News) [A]
1705
Radio Pyongyang
1709
BBC (Africa)* [A-S]
1710
Radio Beijing*
1715
Radio Korea (News Service)
1725
WYFR (Network) [A]
1730
BRT, Brussels [M-F]
Christian Science Monitor [M-F]
Radio Moscow (World Service)
Radio Romania Int'l
Swiss Radio Int'l
1740
BBC (Africa)*
1750
Radio RSA

1800 UTC

All India Radio
BBC
Christian Science Monitor
KVOH (UPI News)
Radio Australia
Radio Belize [M-F]
Radio Bras, Brasilia [M-A]
Radio Canada Int'l
Radio Korea
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Tanzania
Voice of America
WWCR (USA Radio News) [M-F]
1830
Christian Science Monitor [M-F]
Radio Belize
Radio Budapest
Radio Canada Int'l [M-F]
Radio Finland [M-F]
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Polonia
Radio Prague Int'l
Radio Sofia
Radio Tirana, Albania
Radio Yugoslavia
Swiss Radio Int'l
Voice of America (Special English)
1840
SLBC, Sri Lanka
Voice of Greece
1855
BBC (Africa)* [M-F]
Radio Finland
WYFR (Network) [M-A]

1900 UTC

All India Radio
BBC
Christian Science Monitor [M-A]
Deutsche Welle
HCJB*
Kol Israel
KVOH (UPI News)
Radio Australia
Radio Beijing
Radio Canada Int'l [M-F]
Radio Havana Cuba [M-A]
Radio Japan
Radio Jordan [S-H]
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Tanzania
RAE, Buenos Aires [M-F]
Spanish Foreign Radio
Swiss Radio Int'l
Voice of America
1905
Radio New Zealand Int'l* [S-H]
1910
Radio Beijing*
Radio Botswana
1920
Voice of Greece
1930
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l
Radio Havana Cuba [M-A]
Radio Moscow (World Service)
Radio Romania Int'l
1935
Radiotelevisione Italiana
1945
Radio Korea (News Service)
1955
HCJB

2000 UTC

BBC
Christian Science Monitor
KVOH (UPI News)
Radio Australia
Radio Beijing
Radio Belize [M-F]
Radio Havana Cuba [M-A]
Radio Jordan [S-H]
Radio Kiev
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Polonia
Radio Portugal [M-F]
Radio Prague Int'l
Voice of America
Voice of Indonesia
Voice of Turkey
2005
Radio Pyongyang
2010
Radio Beijing*
2025
Radio Havana Cuba* [M-A]
Radiotelevisione Italiana
WYFR (Network) [M-F]
2030
Christian Science Monitor [M-F]
Radio Budapest
Radio Havana Cuba [M-A]
Radio Korea
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Sofia
2045
Radio for Peace Int'l (UN Radio) [M-F]
Radio Korea (News Service)
2055
Voice of Indonesia

2100 UTC

All India Radio
BBC
BRT, Brussels [M-F]
Christian Science Monitor [M-A]
Deutsche Welle
KVOH (UPI News)
Radio Australia
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Finland [M-F]
Radio Japan
Radio Jordan [S-H]
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Peace and Progress
Radio Portugal [M-F]
Radio Prague Int'l
Radio Romania Int'l
Radio Yugoslavia
Spanish Foreign Radio
Swiss Radio Int'l
Voice of America
2110
Radio Beijing*
2130
Christian Science Monitor [M-F]
Kol Israel
Radio Cairo
Radio Canada Int'l (Africa)
Radio Moscow (World Service)
Radio Sofia
Radio Vilnius
Swiss Radio Int'l
WYFR (Network) [M-F]
2155
WYFR (Network) [M-A]

2200 UTC

All India Radio
BBC
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Vilnius
Radiotelevisione Italiana
Voice of America
Voice of Free China
Voice of Turkey
2206
Voice of America (Caribbean)* [M-F]
2210
Radio Beijing*
2215
Radio for Peace Int'l (UN Radio) [M-F]
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio New Zealand Int'l [S-H]
Radio Polonia
Radio Tirana, Albania
Voice of America (Special English)
2245
Voice of Greece

2300 UTC

BBC
Christian Science Monitor [M-A]
Kol Israel
Radio Australia
Radio Belize [M-F]
Radio Canada Int'l (Caribbean)
Radio Finland [M-F]
Radio Japan
Radio Kiev
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Prague Int'l
Radio Sofia
Voice of America
WWCR (USA Radio News) [M-F]
2305
Radio Polonia
Radio Pyongyang
2315
All India Radio
2320
Radio Thailand
2330
BRT, Brussels [M-F]
Christian Science Monitor [M-F]
Radio Budapest [M-A]
Radio Canada Int'l (USA) [A-S]
Radio Tirana, Albania
2355
Radio Japan [M-F]
WRNO (ABC News) [W, F]

THANK YOU!

The verdict is in, and you've almost unanimously supported the new format for the *MT* Shortwave Guide! Thanks for all your comments over the past few months. We're not resting on our laurels by any means, and we'll be working to implement your suggestions over the next few months.

Many of our readers write in to ask about why there are no program details between 0700-1100 and 1700-2300 Coordinated Universal Time (UTC). In fact, this has actually been the case for the program guide for almost two years! There are two answers to why this is the case: these are off-peak listening hours here in North America, so few people are actually tuning in, and in addition there are fewer stations on the air anyway during these hours.

If you're an exceptional night owl or afternoon listener, however, there's no need to worry: we still give you 24-hour frequency and news information.

English language

shortwave guide

0000 UTC [7:00 PM EST/4:00 PM PST]

FREQUENCIES

0000-0015		Voice of the People of Cambodia, Phnom-Penh	9695$_{as}$	11938$_{as}$	
0000-0030		Radio Australia, Melbourne	11880$_{va}$	13605$_{va}$	15240$_{va}$
			15465$_{va}$	17630$_{va}$	17750$_{va}$
			17795$_{va}$	17855$_{va}$	
0000-0030	stwhfa	Radio Prague, Czechoslovakia	7345$_{na}$	9540$_{na}$	11990$_{na}$
0000-0030		BBC London, England	5965$_{va}$	5975$_{va}$	6005$_{va}$
			6175$_{va}$	6195$_{va}$	7145$_{va}$
			7325$_{va}$	9580$_{va}$	9590$_{va}$
			9670$_{va}$	9915$_{va}$	11750$_{va}$
			11945$_{va}$	11955$_{va}$	12095$_{va}$
			15070$_{va}$	15260$_{va}$	15360$_{va}$
			17830$_{va}$		
0000-0030		Kol Israel, Jerusalem	7495$_{na}$	9435$_{na}$	11605$_{na}$
			12025$_{na}$		
0000-0035		BRT, Brussels, Belgium	9925$_{na}$	13675$_{sa}$	
0000-0100		All India Radio, Delhi	9535$_{as}$	9910$_{as}$	11715$_{as}$
			11745$_{as}$	15110$_{as}$	
0000-0100		ABC Brisbane, Australia	4920$_{do}$	9660$_{do}$	
0000-0100		ABC Perth, Australia	9610$_{do}$		
0000-0100		CFRB, Montreal	6070$_{do}$		
0000-0100		CBN, Canada	6160$_{do}$		
0000-0100		FEBC Radio Int'l, Philippines	15490$_{as}$		
0000-0100		Radio Beijing, China	9770$_{am}$	11655$_{am}$	11715$_{am}$
			17705$_{am}$		
0000-0100		Christian Science World Service	7395$_{na}$	9850$_{na}$	13760$_{na}$
0000-0100		Radio Havana Cuba	11820$_{am}$		
0000-0100		Radio Moscow World Service	7370$_{va}$	17655$_{va}$	17890$_{va}$
0000-0100		Radio Moscow N. American Svc.	9530$_{na}$	9685$_{na}$	9720$_{na}$
			11735$_{na}$	11850$_{na}$	11860$_{na}$
			11950$_{na}$	12050$_{na}$	15425$_{na}$
			17605$_{na}$	17665$_{na}$	17700$_{na}$
			21480$_{na}$		
0000-0100		Radio Korea, Seoul, S. Korea	15575$_{na}$		
0000-0100		Radio Luxembourg	6090$_{om}$	15350$_{om}$	
0000-0100	smtwhf	Radio New Zealand Int'l	17770$_{pa}$		
0000-0100		Radio Pyongyang, North Korea	11335$_{na}$	13775$_{na}$	15115$_{na}$
0000-0100		Radio Sofia, Bulgaria	11660$_{am}$	15330$_{am}$	
0000-0100		RTV Malaysia, Radio 4	7295$_{do}$		
0000-0100		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
0000-0100		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0000-0100		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0000-0100		Spanish Foreign Radio, Madrid	9630$_{na}$	11880$_{na}$	
0000-0100		Voice of America, Washington	6125$_{as}$	7120$_{as}$	9770$_{as}$
			11760$_{as}$	11805$_{as}$	15185$_{as}$
			15225$_{as}$	15290$_{as}$	15405$_{as}$
			17735$_{as}$	17820$_{as}$	
0000-0100		KTBN Salt Lake City, Utah	15590$_{am}$		
0000-0100		Radio for Peace Int'l, Costa Rica	7375	13630	21566
0000-0100		WRNO New Orleans, Louisiana	7355$_{am}$		
0000-0100		WHRI Noblesville, Indiana	7315$_{am}$	9495$_{am}$	
0000-0100		WINB Red Lion, Pennsylvania	15145$_{eu}$		
0000-0100		WYFR, Okeechobee, Florida	5985$_{am}$	15440$_{am}$	
0000-0100		WWCR Nashville, Tennessee	15690$_{am}$		
0000-0100		Radio Kiev, The Ukraine	7400$_{am}$	9750$_{am}$	15180$_{am}$
			17690$_{am}$	17720$_{am}$	
0000-0100		Voice of America, Washington	5995$_{ca}$	6130$_{ca}$	9455$_{ca}$
			9775$_{ca}$	9815$_{ca}$	11580$_{ca}$
			11695$_{ca}$		
0015-0030	m	Radio Prague, Czechoslovakia	7345$_{na}$	9540$_{na}$	11990$_{na}$
0030-0100	twhfas	Radio Budapest, Hungary	6110$_{am}$	9520$_{am}$	9585$_{am}$
			9835$_{am}$	11910$_{am}$	15160$_{am}$
0030-0100		BBC London, England	5975$_{va}$	6005$_{va}$	6175$_{va}$
			7325$_{va}$	9580$_{va}$	9670$_{va}$
			9915$_{va}$	11750$_{va}$	11945$_{va}$
			11955$_{va}$	12095$_{va}$	15070$_{va}$
			15260$_{va}$	15360$_{va}$	
0030-0100		BRT Brussels, Belgium	13685$_{na}$	13720$_{na}$	
0030-0100		HCJB Quito, Ecuador	9745$_{am}$	15155$_{am}$	21455$_{am}$
			25950$_{am}$		
0030-0100		Radio Australia, Melbourne	11880$_{va}$	13605$_{va}$	15240$_{va}$
			15465$_{va}$	17630$_{va}$	17750$_{va}$
			17795$_{va}$	17855$_{va}$	21740$_{va}$
0030-0100		Hunan PBS, Changs ha, China[4]	4990$_{do}$		
0030-0100		Radio Netherlands, Hilversum	6020$_{am}$	6165$_{am}$	15560$_{am}$
0030-0100		Sri Lanka B'casting Corp.	6005$_{as}$	9720$_{as}$	15425$_{as}$
0050-0100		Vatican Radio, Vatican City	6150$_{na}$	9605$_{na}$	

PROGRAMS

Sundays

0000 KSDA, Guam: Your Story Hour. Dramatized children's stories.
0010 Voice of America(VOA) (Americas, Caribbean): American Viewpoints. Experts discuss provocative magazine and newspaper articles.
0010 VOA (East Asia): VOA Morning. Sports, science, business, music, and features about America.
0030 BBC: The Ken Bruce Show. A mix of popular music and entertainment news.
0030 KSDA, Guam: Voice of Prophecy. H.M. Richards' devotional program.
0030 VOA (Caribbean): Weekend Magazine. Music, conversations with correspondents, and talks about the arts.
0040 VOA (Americas, East Asia): Words and Their Stories (Special English). Explanations of the origins of American expressions.
0045 VOA (Americas): American Stories (Special English). Fictional tales by great American writers.
0045 VOA (East Asia): VOA Morning. See S 0010.

Mondays

0000 KSDA, Guam: Family Matters. See S 2300.
0010 VOA (Americas, Caribbean): Encounter. See S 1210.
0010 VOA (East Asia): Newsline. See S 2310.
0015 KSDA, Guam: Bible in Living Sound. See S 2315.
0030 BBC: In Praise of God. A half-hour program of worship.
0030 KSDA, Guam: Greatest Story Ever Told. A Bible reading.
0030 VOA (Americas, Caribbean): Spotlight. Reports and interviews on people, places, and events of interest to listeners in the Caribbean and Latin America.
0040 VOA (East Asia): Science Report (Special English). Developments in the world of science and technology.
0045 KSDA, Guam: Voice of Prophecy. See S 0030.
0045 VOA (East Asia): VOA Morning. See S 0010.

Tuesdays

0000 KSDA, Guam: Family Matters. See S 2300.
0010 VOA (Americas, East Asia): Newsline. See S 2310.
0010 VOA (Caribbean): Caribbean Report. The latest news, sports, financial news, and weather reports for the Caribbean.
0015 KSDA, Guam: Bible in Living Sound. See S 2315.
0030 BBC: Megamix. A compendium of music, sport, fashion, health, travel, news and views for young people.
0030 KSDA, Guam: Greatest Story Ever Told. See M 0030.
0030 VOA (Caribbean): Music, U.S.A. (Standards). See M 1130.
0040 VOA (Americas, East Asia): Science Report (Special English). See M 0040.
0045 KSDA, Guam: Voice of Prophecy. See S 0030.
0045 VOA (Americas): This is America (Special English). See M 1115.
0045 VOA (East Asia): VOA Morning. See S 0010.

Wednesdays

0000 KSDA, Guam: Family Matters. See S 2300.
0010 VOA (Americas, East Asia): Newsline. See S 2310.
0010 VOA (Caribbean): Caribbean Report. See T 0010.
0015 KSDA, Guam: Bible in Living Sound. See S 2315.
0030 BBC: Omnibus. See T 1615.
0030 KSDA, Guam: Greatest Story Ever Told. See M 0030.
0030 VOA (Caribbean): Now Music, U.S.A. See T 1130.
0040 VOA (Americas): Agriculture Report (Special English). See T 1110.
0040 VOA (East Asia): Science Report (Special English). See M 0040.
0045 KSDA, Guam: Voice of Prophecy. See S 0030.
0045 VOA (Americas): Science in the News (Special English). See T 1115.
0045 VOA (East Asia): VOA Morning. See S 0010.

Thursdays

0000 KSDA, Guam: Family Matters. See S 2300.
0010 VOA (Americas, East Asia): Newsline. See S 2310.
0010 VOA (Caribbean): Caribbean Report. See T 0010.
0015 KSDA, Guam: Bible in Living Sound. See S 2315.
0030 BBC: Comedy. See W 1530.
0030 KSDA, Guam: Greatest Story Ever Told. See M 0030.
0030 VOA (Caribbean): Now Music, U.S.A. See T 1130.
0040 VOA (Americas, East Asia): Science Report (Special English). See M 0040.
0045 KSDA, Guam: Voice of Prophecy. See S 0030.
0045 VOA (Americas): Space and Man (Special English). See W 1115.
0045 VOA (East Asia): VOA Morning. See S 0010.

Fridays

0000 KSDA, Guam: Family Matters. See S 2300.
0010 VOA (Americas, East Asia): Newsline. See S 2310.
0010 VOA (Caribbean): Caribbean Report. See T 0010.
0015 KSDA, Guam: Bible in Living Sound. See S 2315.
0030 BBC: Music Feature. Musical programming on various subjects.
0030 KSDA, Guam: Greatest Story Ever Told. See M 0030.
0030 VOA (Caribbean): Now Music, U.S.A. See T 1130.
0040 VOA (Americas, East Asia): Science Report (Special English). See M 0040.
0045 KSDA, Guam: Voice of Prophecy. See S 0030.
0045 VOA (Americas): The Making of a Nation (Special English). See H 0045.
0045 VOA (East Asia): VOA Morning. See S 0010.

Saturdays

0000 KSDA, Guam: Your Story Hour. See S 0000.
0010 VOA (Americas, Caribbean): Newsline. See S 2310.
0010 VOA (East Asia): VOA Morning. See S 0010.
0030 BBC: From the Weeklies. A review of the weekly British press.
0030 KSDA, Guam: Voice of Prophecy. See S 0030.
0030 VOA (Caribbean): Country Music, U.S.A. See F 1130.
0040 VOA (Americas): Science Report (Special English). See M 0040.
0040 VOA (East Asia): Words and Their Stories (Special English). See S 0040.
0045 BBC: Recording of the Week. See M 0545.

0100 UTC [8:00 PM EST/5:00 PM PST]

FREQUENCIES

0100-0105	Vatican Radio, Vatican City	6150_{na} 9605_{na}
0100-0115	All India Radio, Delhi	9535_{as} 9910_{as} 11715_{as} 11745_{as} 15110_{as}
0100-0120	RAI, Rome, Italy	9575_{am} 11800_{am}
0100-0125	Kol Israel, Jerusalem	7495_{na} 9435_{na} 11605_{na} 12025_{na}
0100-0125	Radio Netherlands, Hilversum	6020_{am} 6165_{am} 15560_{am}
0100-0130	Nat'l Radio of Laos, Vientiane	7112_{as}
0100-0130	Radio Australia, Melbourne	11880_{va} 15240_{va} 15530_{va} 17630_{va} 17750_{va} 17795_{va} 17855_{va} 21525_{va} 21740_{va} 21775_{va}
0100-0130	Radio Canada Int'l, Montreal	5960_{na} 9755_{na}
0100-0130	Radio Prague, Czechoslovakia	5930_{na} 7345_{na} 9540_{na}
0100-0130	Radio Sweden, Stockholm	9770_{as}
0100-0145	Radio Yugoslavia, Belgrade	9620_{na} 11735_{na}
0100-0150	Deutsche Welle, Koln, Germany	6040_{na} 6085_{na} 6145_{na} 6155_{na} 9565_{na} 11865_{na} 11890_{na} 13610_{na} 13770_{na} 15440_{na}
0100-0200 twhfa	RAE, Buenos Aires, Argentina	11710_{na}
0100-0200	ABC Brisbane, Australia	4920_{do} 9660_{do}
0100-0200	ABC Perth, Australia	9610_{do}
0100-0200	CFRB, Montreal	6070_{do}
0100-0200	CBN, Canada	6160_{do}
0100-0200	FEBC Radio Int'l, Philippines	15490_{as}
0100-0200	Radio Moscow World Service	7370_{va} 17655_{va} 17890_{va} 21690_{as} 21790_{as}
0100-0200	Radio Moscow N. American Svc	9530_{na} 9685_{na} 9720_{na} 11735_{na} 11850_{na} 11860_{na} 11950_{na} 12050_{na} 15425_{na} 17605_{na} 17665_{na} 17700_{na} 21480_{na}
0100-0200	Radio for Peace Int'l, Costa Rica	7375 13630 21566
0100-0200	Radio Havana Cuba	11820_{am}
0100-0200	Radio Luxembourg	6090_{om} 15350_{om}
0100-0200 smtwhf	Radio New Zealand Int'l	17770_{pa}
0100-0200	Radio Thailand, Bangkok	4830_{as} 9655_{as} 11905_{as}
0100-0200 smtwh	RTV Malaysia, Radio 4	7295_{do}
0100-0200	SBC Radio 1, Singapore	5052_{do} 11940_{do}
0100-0200	WRNO New Orleans, Louisiana	7355_{na}
0100-0200	KVOH Los Angeles, Califirnia	17775_{na}
0100-0200	KTBN Salt Lake City, Utah	15590_{na}
0100-0200	Christian Science World Service	7395_{na} 9850_{na} 13760_{na}
0100-0200	WYFR Okeechobee, Florida	6065_{na} 9505_{na} 9680_{na} 15440_{na}
0100-0200	WINB Red Lion, Pennsylvania	15145_{na}
0100-0200	WWCR Nashville, Tennessee	7520_{na}
0100-0200	BBC London, England	5965_{va} 5975_{va} 6175_{va} 7325_{va} 9580_{va} 9590_{va} 9915_{va} 11750_{va} 11955_{va} 15260_{va} 15280_{va} 15360_{va} 21715_{va}
0100-0200	Radio Canada Int'l, Montreal	9535_{ca} 11845_{sa} 11940_{sa} 13720_{ca}
0100-0200	Spanish Foreign Radio, Madrid	9630_{na} 11880_{na}
0100-0200	HCJB Quito, Ecuador	9745_{am} 15155_{am} 21455_{am} 25950_{am}
0100-0200	SLBS, Freetown, Sierra Leone	3316_{do}
0100-0200	Sri Lanka B'casting Corp.	6005_{as} 9720_{as} 15425_{as}
0100-0200	Voice of America, Washington	6095_{va} 6125_{va} 7115_{as} 7205_{as} 9740_{va} 11705_{as} 11805_{va} 15225_{va} 15250_{as} 15405_{va} 17740_{as} 21550_{as}
0100-0200	Radio Luxembourg	15350_{om}
0100-0200	Voice of America, Washington	5995_{ca} 6130_{ca} 9455_{ca} 9775_{ca} 9815_{ca} 11580_{ca} 15205_{ca}
0100-0200	Voice of Indonesia, Jakarta	11752_{as} 11785_{as}
0130-0140 mtwhfa	Voice of Greece, Athens	9395_{am} 9420_{am} 11645_{am}
0130-0200	Peace & Progress,Moscow,USSR	7400_{na} 9750_{na} 15180_{na} 17690_{na} 17720_{na}
0130-0200	Radio Australia, Melbourne	11880_{va} 15160_{va} 15240_{va} 15530_{va} 17630_{va} 17750_{va} 17795_{va} 17855_{va} 17890_{va} 21525_{va} 21740_{va} 21775_{va}
0130-0200	Radio Austria Int'l, Vienna	9870_{sa} 9875_{na} 13730_{na}
0130-0200 sm	Radio Canada Int'l, Montreal	5960_{na} 9755_{na}
0130-0200	United Arab Emirates R., Dubai	11795_{na} 13695_{eu} 15320_{eu} 15435_{eu}
0130-0200	Radio Budapest, Hungary	6110_{am} 9520_{am} 9585_{am} 9835_{am} 11910_{am} 15160_{am}
0145-0200	Vatican Radio, Vatican City	7125_{as} 9650_{as} 11750_{as}

PROGRAMS

Sundays

0101 BBC: Play of the Week. Hour-long drama selections.
0110 Voice of America (Americas, Caribbean): Communications World. A look at modern telecommunications.
0110 Voice of America (South Asia): VOA Morning. See S 0010.
0130 Voice of America (Americas, Caribbean): Press Conference, U.S.A. Correspondents ask questions of newsmakers.

Mondays

0101 BBC: Feature/Drama. Program details to be announced (except April 1st, 8th: From Manna To Microwave, Madhur Jeffrey's history of food).
0110 Voice of America (Americas, Caribbean): New Horizons. See S 1110.
0110 Voice of America (South Asia): Newsline. See S 2310.
0130 Voice of America (Americas, Caribbean): Issues in the News. See S 1130.
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0145 BBC: On The Record. What goes on behind the scenes in the music industry (except April 22nd, 29th: Classical Music, a topical program on classical music subjects).

Tuesdays

0101 BBC: Outlook. See M 1405.
0110 Voice of America (Americas, Caribbean): Report to the Americas. News, correspondent reports, interviews, and opinion.
0110 Voice of America (South Asia): Newsline. See S 2310.
0125 BBC: Financial News. See M 2310.
0130 BBC: Personal View. See S 0445.
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0145 BBC: Europe's World. A magazine program reflecting life in Europe and its links with other parts of the world.
0155 Voice of America (Americas, Caribbean): Editorial.

Wednesdays

0101 BBC: Outlook. See M 1405.
0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
0110 Voice of America (South Asia): Newsline. See S 2310.
0125 BBC: Financial News. See M 2310.
0130 BBC: Talk. A short talk on any subject under the sun.
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0145 BBC: Country Style. David Allan presents British country music.
0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.

Thursdays

0101 BBC: Outlook. See M 1405.
0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
0110 Voice of America (South Asia): Newsline. See S 2310.
0125 BBC: Financial News. See M 2310.
0130 BBC: Waveguide. See M 0530.
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0140 BBC: Book Choice. See S 0225.
0145 BBC: The Farming World. Developments and issues in the world of agriculture.
0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.

Fridays

0101 BBC: Outlook. See M 1405.
0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
0110 Voice of America (South Asia): Newsline. See S 2310.
0125 BBC: Financial News. See M 2310.
0130 BBC: Jazz Now and Then or Folk in Britain. See H 1345.
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0145 BBC: Global Concerns. Issues of an environmental nature.
0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.

Saturdays

0101 BBC: Outlook. See M 1405.
0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
0110 Voice of America (South Asia): VOA Morning. See S 0010.
0125 BBC: Financial News. See M 2310.
0130 BBC: Short Story. See S 1115.
0145 BBC: Here's Humph! All that jazz with Humphrey Lyttelton.
0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.

English language **shortwave guide**

0200 UTC [9:00 PM EST/6:00 PM PST]

FREQUENCIES

0200-0225		Kol Israel, Jerusalem	7495$_{na}$	9435$_{na}$	11605$_{na}$
0200-0230		FEBC Radio Int'l, Philippines	15490$_{as}$		
0200-0230	sm	Radio Norway, Oslo	9615$_{na}$	11925$_{na}$	
0200-0230		Radio Sweden, Stockholm	9695$_{na}$	11705$_{na}$	
0200-0230	s	Radio Budapest, Hungary	6110$_{am}$	9520$_{am}$	9585$_{am}$
			9835$_{am}$	11910$_{am}$	15160$_{am}$
0200-0230		Sri Lanka B'casting Corp.	6005$_{as}$	9720$_{as}$	15425$_{as}$
0200-0230		Swiss Radio Int'l, Bern	6125$_{am}$	6135$_{am}$	9650$_{am}$
			9885$_{am}$	12035$_{am}$	17730$_{am}$
0200-0230	mtwhf	Voice of America, Washington	5995$_{ca}$	9775$_{ca}$	9815$_{ca}$
			11580$_{ca}$	15205$_{ca}$	
0200-0230	mtwhfa	Voice of Kenya, Nairobi	6075$_{do}$		
0200-0250		Deutsche Welle, Koln, Germany	6035$_{as}$	7285$_{as}$	9615$_{as}$
			9690$_{as}$	11945$_{as}$	11965$_{as}$
0200-0300		Radio Cairo, Egypt	9475$_{na}$	9675$_{na}$	
0200-0300		Radio Havana Cuba	9505$_{am}$	11820$_{am}$	
0200-0300		ABC Brisbane, Australia	4920$_{do}$	9660$_{do}$	
0200-0300		ABC Perth, Australia	9610$_{do}$		
0200-0300		CFRB, Montreal	6070$_{do}$		
0200-0300		CBN, Canada	6160$_{do}$		
0200-0300		Radio Australia, Melbourne	11880$_{pa}$	15160$_{pa}$	15240$_{as}$
			15530$_{as}$	17630$_{va}$	17750$_{as}$
			17795$_{pa}$	17855$_{va}$	21525$_{va}$
			21740$_{na}$	21775$_{na}$	
0200-0300		Radio for Peace Int'l, Costa Rica	7375	13630	21566
0200-0300		HCJB Quito, Ecuador	9745$_{na}$	15155$_{na}$	17875$_{sa}$
0200-0300		WRNO New Orleans, Louisiana	7355$_{am}$		
0200-0300		KTBN Salt Lake City, Utah	7510$_{am}$		
0200-0300		WHRI Noblesville, Indiana	7315$_{na}$	9495$_{sa}$	
0200-0300		WINB Red Lion, Pennsylvania	15145$_{eu}$		
0200-0300		WWCR Nashville, Tennessee	7520$_{na}$		
0200-0300		WYFR Okeechobee, Florida	6065$_{na}$	9505$_{na}$	
0200-0300		Radio Luxembourg	6090$_{om}$	15350$_{om}$	
0200-0300	m	Radio New York Intl.(via WWCR)	7435$_{va}$		
0200-0300	smtwhf	Radio New Zealand Int'l	17770$_{pa}$		
0200-0300		BBC London, England	5975$_{va}$	6005$_{va}$	6175$_{va}$
			7325$_{va}$	9410$_{va}$	9515$_{va}$
			9590$_{va}$	9915$_{va}$	11750$_{va}$
			12095$_{va}$	15260$_{va}$	15390$_{va}$
			21715$_{va}$		
0200-0300		Radio Romania Int'l, Bucharest	5990$_{am}$	9510$_{am}$	9570$_{am}$
			11830$_{am}$	11940$_{am}$	15380$_{am}$
0200-0300		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0200-0300	smtwh	RTV Malaysia, Radio 4	7295$_{do}$		
0200-0300		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0200-0300		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0200-0300		Radio Moscow N. American Svc	9530$_{na}$	9685$_{na}$	9720$_{na}$
			11735$_{na}$	11850$_{na}$	11860$_{na}$
			11950$_{na}$	12050$_{na}$	15425$_{na}$
			17605$_{na}$	17665$_{na}$	17700$_{na}$
			21480$_{na}$		
0200-0300		Radio Cultura, Guatemala	3300$_{do}$		
0200-0300		Radio Moscow World Service	7370$_{va}$		
0200-0300		Christian Science World Service	9465$_{eu}$	9850$_{eu}$	13720$_{eu}$
			13760$_{eu}$		
0200-0300		Voice of America, Washington	5965$_{va}$	6125$_{va}$	7115$_{as}$
			7205$_{as}$	9740$_{va}$	11705$_{as}$
			11805$_{va}$	15225$_{va}$	15250$_{as}$
			17740$_{as}$	17895$_{va}$	21550$_{as}$
0200-0300		Voice of Free China, Taiwan	5950$_{na}$	9680$_{na}$	9765$_{pa}$
			11740$_{ca}$	11860$_{as}$	15345$_{as}$
0230-0300		Sri Lanka B'casting Corp.	9720$_{as}$	15425$_{as}$	
0230-0245	whas	Radio Budapest, Hungary	6110$_{am}$	9520$_{am}$	9585$_{am}$
			9835$_{am}$	11910$_{am}$	15160$_{am}$
0230-0245		Radio Pakistan, Islamabad	9545$_{as}$	15115$_{as}$	17640$_{as}$
			17725$_{as}$	21730$_{as}$	
0230-0300		Radio Sweden, Stockholm	9695$_{na}$	11705$_{na}$	
0230-0300	war	Radio Baghdad, Iraq	11860$_{na}$		
0230-0300		Radio Tirana, Albania	9760$_{na}$	11825$_{na}$	
0230-0300	s	Voice of Kenya, Nairobi	6075$_{do}$		
0240-0300		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0245-0300		Radio Korea, Seoul	15575$_{va}$		

PROGRAMS

Sundays

0200 KSDA, Guam: AWR Magazine. Stories about science, nature, discoveries, and health matters.
0209 BBC: British Press Review. Editorial opinion in the British press.
0210 Voice of America: VOA Morning. See S 0010.
0215 BBC: They Made Our World. Scientists who shaped the future of mankind.
0225 BBC: Book Choice. Short reviews of current or future best-sellers.
0230 BBC: Feature. Topical programming on various subjects.
0230 KSDA, Guam: DX Aslawaves. News from the world of shortwave radio.
0245 KSDA, Guam: Probe. A Bible study program.

Mondays

0209 BBC: British Press Review. See S 0209.
0210 Voice of America: Newsline. See S 2310.
0215 BBC: Andy Kershaw's World of Music. Exotic and innovative music from the world over.
0230 BBC: Composer of the Month. A month-long series on a particular classical music composer.
0230 Voice of America: VOA Morning. See S 0010.

Tuesdays

0209 BBC: British Press Review. See S 0209.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): Newsline. See S 2310.
0215 BBC: Network UK. A look at the issues and events that affect the lives of people throughout the UK.
0230 BBC: Sports International. Feature program on a topic or person making sports headlines.
0230 Voice of America (South Asia): VOA Morning. See S 0010.

Wednesdays

0209 BBC: British Press Review. See S 0209.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): Newsline. See S 2310.
0215 BBC: Health Matters. See M 1115.
0230 BBC: Feature. Topical programming on various subjects.
0230 Voice of America (South Asia): VOA Morning. See S 0010.

Thursdays

0209 BBC: British Press Review. See S 0209.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): Newsline. See S 2310.
0215 BBC: Network UK. See T 0215.
0230 BBC: Assignment. Examinations of current topical issues.
0230 Voice of America (South Asia): VOA Morning. See S 0010.

Fridays

0209 BBC: British Press Review. See S 0209.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): Newsline. See S 2310.
0215 BBC: Seven Seas. A weekly program about ships and the sea.
0230 BBC: Not As Far As Velma (except April 19th, 26th: Drama). See H 1130.
0230 Voice of America (South Asia): VOA Morning. See S 0010.

Saturdays

0200 KSDA, Guam: Listener Mailbox. Responses to listener leters.
0209 BBC: British Press Review. See S 0209.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): VOA Morning. See S 0010.
0215 BBC: Network UK. See T 0215.
0215 KSDA, Guam: Focus on Living. Life's problems and their solutions.
0230 BBC: People and Politics. Background to the British political scene.
0230 KSDA, Guam: Power to Cope. See S 1630.

Several staffers at KSDA, Adventist World Radio's Asia outlet: Alan Carlson, Elvin Vance, Brook Powers, and Don Myers.

English language **shortwave guide**

0300 UTC [10:00 PM EST/7:00 PM PST]

FREQUENCIES

0300-0330		Radio Cairo, Egypt	9475$_{na}$	9675$_{na}$	
0300-0330		Radio Japan, Tokyo	5960$_{na}$	15325$_{na}$	17825$_{na}$
			21610$_{na}$		
0300-0330		Radio Australia, Melbourne	11880$_{pa}$	15160$_{pa}$	15240$_{pa}$
			15530$_{as}$	17630$_{as}$	17750$_{pa}$
			17795$_{as}$	17855$_{va}$	21525$_{va}$
			21740$_{na}$	21775$_{na}$	
0300-0330		Radio Prague, Czechoslovakia	5930$_{na}$	7345$_{na}$	9540$_{na}$
0300-0330		Voice of America, Washington	5965$_{va}$	11905$_{va}$	15160$_{va}$
			17810$_{va}$	17895$_{va}$	
0300-0350		Deutsche Welle, Koln, Germany	6040$_{na}$	6085$_{na}$	6120$_{na}$
			9545$_{na}$	9605$_{na}$	11890$_{na}$
			13610$_{na}$	13770$_{na}$	15440$_{na}$
0300-0400		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0300-0400	war	Radio Baghdad, Iraq	11860$_{na}$		
0300-0400		Radio Beijing, China	9690$_{am}$	9770$_{am}$	11715$_{am}$
0300-0400		Radio Havana Cuba	9505$_{am}$	11820$_{am}$	
0300-0400		BBC London, England	5975$_{va}$	6175$_{va}$	7325$_{va}$
			9410$_{va}$	9600$_{va}$	9915$_{va}$
			11750$_{va}$	12095$_{va}$	15260$_{va}$
			21715$_{va}$		
0300-0400		Radio Luxembourg	15350$_{om}$		
0300-0400		ABC Brisbane, Australia	4920$_{do}$	9660$_{do}$	
0300-0400		ABC Perth, Australia	9610$_{do}$		
0300-0400		CFRB, Montreal	6070$_{do}$		
0300-0400		CBN, Canada	6160$_{do}$		
0300-0400	m	Radio New York Intl,(via WWCR)	7435$_{va}$		
0300-0400	smtwhf	Radio New Zealand Int'l	17770$_{pa}$		
0300-0400		Radio for Peace Int'l, Costa Rica	7375	13630	21566
0300-0400		Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
0300-0400		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0300-0400		HCJB Quito, Ecuador	9745$_{na}$	15155$_{na}$	21545$_{sa}$
			25950$_{am}$		
0300-0400		WRNO New Orleans, Louisiana	7355$_{am}$		
0300-0400		KTBN Salt Lake City, Utah	7510$_{am}$		
0300-0400		WHRI Noblesville, Indiana	7315$_{na}$	9495$_{sa}$	
0300-0400		Christian Science World Service	9455$_{na}$	13760$_{na}$	
0300-0400		Radio Cultura, Guatemala	3300$_{do}$		
0300-0400		WWCR Nashville, Tennessee	7520$_{na}$		
0300-0400		WYFR Okeechobee, Florida	6065$_{na}$	9505$_{na}$	
0300-0400		Radio Moscow N. American Svc	9530$_{na}$	9685$_{na}$	9720$_{na}$
			11735$_{na}$	11850$_{na}$	11860$_{na}$
			11950$_{na}$	12050$_{na}$	15425$_{na}$
			17605$_{na}$	17665$_{na}$	17700$_{na}$
			21480$_{na}$		
0300-0400		Radio Moscow World Service	15140$_{as}$	15280$_{as}$	15420$_{as}$
			17570$_{as}$	17610$_{as}$	17675$_{as}$
			17890$_{as}$	21635$_{as}$	21690$_{as}$
			21790$_{as}$		
0300-0400		Radio Luxembourg	15350$_{eu}$		
0300-0400		Trans World Radio Bonaire	9535$_{am}$	11930$_{am}$	
0300-0400	smtwh	RTV Malaysia, Radio 4	7295$_{do}$		
0300-0400		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0300-0400		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0300-0400		Sri Lanka B'casting Corp.	9720$_{as}$	15425$_{as}$	
0300-0400		Voice of America, Washington	6035$_{af}$	9575$_{af}$	9585$_{af}$
			9655$_{af}$	11835$_{af}$	15350$_{af}$
			17715$_{af}$	21600$_{af}$	
0300-0400		Voice of Free China, Taiwan	5950$_{na}$	9680$_{na}$	9765$_{as}$
			11745$_{as}$	15345$_{as}$	
0300-0400		Voice of Kenya, Nairobi	6075$_{do}$		
0310-0325		Vatican Radio, Vatican City	9635$_{na}$		
0325-0400	mtwhfa	Zimbabwe BC Corp., Harare	3396$_{do}$		
0330-0400		Radio Netherlands, Hilversum	9590$_{am}$	11720$_{am}$	
0330-0400		Radio Sweden, Stockholm	9695$_{na}$	11705$_{na}$	
0330-0400		Radio Tirana, Albania	9760$_{na}$	11825$_{na}$	
0300-0400		Radio Australia, Melbourne	11880$_{pa}$	15160$_{pa}$	15240$_{as}$
			15530$_{va}$	17630$_{va}$	17750$_{pa}$
			17795$_{pa}$	17855$_{va}$	21525$_{va}$
			21775$_{va}$		
0330-0400		UAE Radio, Dubai	11945$_{na}$	13675$_{na}$	15400$_{na}$
			15435$_{na}$		
0340-0345	mtwhfa	Voice of Greece, Athens	9395$_{am}$	9420$_{am}$	11645$_{am}$
0350-0400	varies	Radio Yerevian, Armenia	7400$_{am}$	9750$_{am}$	
0350-0400		RAI, Rome, Italy	11905$_{as}$	15330$_{as}$	17795$_{as}$
0355-0400		Voice of Turkey, Ankara	9445$_{na}$	17760$_{pa}$	

PROGRAMS

Sundays
0310 Voice of America: VOA Morning. See S 0010.
0315 BBC: Society Today. A weekly look at changes in Britain.
0330 BBC: From Our Own Correspondent. In-depth news stories from correspondents worldwide.
0350 BBC: Write On.... Paddy Feeny presents listener letters.

Mondays
0310 Voice of America: Daybreak Africa. Correspondent reports, news features, and background reports.
0315 BBC: Cooking the Books. A historical look at cookbooks (except April 22nd, 29th: Good Books, a recommendation of a book to read).
0330 BBC: Anything Goes. See S 1430.

Tuesdays
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: The World Today. See M 1645.
0330 BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.

Wednesdays
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: The World Today. See M 1645.
0330 BBC: Discovery. An in-depth look at scientific research.

Thursdays
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: The World Today. See M 1645.
0330 BBC: Ned Sherrin's Counterpoint. See M 1215.

Fridays
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: The World Today. See M 1645.
0330 BBC: Focus on Faith. Comment and discussion on the major issues in the worlds of faith.

Saturdays
0310 Voice of America: VOA Morning. See S 0010.
0315 BBC: The World Today. See M 1645.
0330 BBC: The Vintage Chart Show. Paul Burnett presents top ten hits from the music charts of yesteryear.

Some of the presenters and technicians who produce KSDA's Indonesian programs.

0400 UTC [11:00 PM EST/8:00 PM PST]

FREQUENCIES

0400-0410		RAI, Rome, Italy	11905$_{as}$	15330$_{as}$	17795$_{as}$
0400-0415		Radio Prague, Czechoslovakia	5930$_{na}$	7345$_{na}$	9540$_{na}$
0400-0425		Radio Cultura, Guatemala	3300$_{do}$		
0400-0425		Radio Netherlands, Hilversum	9590$_{am}$	11720$_{am}$	
0400-0430	war	Radio Baghdad, Iraq	11860$_{na}$		
0400-0430		Radio Romania Int'l, Bucharest	5990$_{am}$	9510$_{am}$	9570$_{am}$
			11830$_{am}$	11940$_{am}$	15380$_{am}$
0400-0430		Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
0400-0430		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0400-0430		Sri Lanka B'casting Corp.	9720$_{as}$	15425$_{as}$	
0400-0430		Swiss Radio Int'l, Bern	6135$_{am}$	9650$_{am}$	9885$_{am}$
			12035$_{am}$		
0400-0430		Voice of America, Washington	6035$_{af}$	9575$_{af}$	11835$_{af}$
			15350$_{af}$	17715$_{af}$	21600$_{af}$
0400-0450		Deutsche Welle, Koln, Germany	6040$_{af}$	7150$_{af}$	7225$_{af}$
			9565$_{af}$	9765$_{af}$	11763$_{af}$
			11890$_{af}$	13610$_{af}$	13770$_{af}$
			13965$_{af}$	15265$_{af}$	15440$_{af}$
0400-0450		Radio Havana Cuba	9505$_{am}$	9750$_{am}$	11760$_{am}$
			11820$_{am}$		
0400-0500		Radio for Peace Int'l, Costa Rica	7375	13630	21566
0400-0500		BBC London, England	5975$_{va}$	6175$_{va}$	6195$_{va}$
			7120$_{va}$	9410$_{va}$	9600$_{va}$
			9610$_{va}$	9915$_{va}$	12095$_{va}$
			15070$_{va}$	15280$_{va}$	15400$_{va}$
			15420$_{va}$		
0400-0500		Radio Cultura, Guatemala	3300$_{do}$		
0400-0500		ABC Brisbane, Australia	4920$_{do}$	9660$_{do}$	
0400-0500		ABC Perth, Australia	9610$_{do}$		
0400-0500		CFRB, Montreal	6070$_{do}$		
0400-0500		CBN, Canada	6160$_{do}$		
0400-0500		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0400-0500		Radio Beijing, China	11695$_{am}$		
0400-0500		HCJB Quito, Ecuador	9745$_{na}$	15155$_{na}$	
0400-0500		WRNO New Orleans, Louisiana	6185$_{am}$		
0400-0500		KVOH Los Angeles, California	9785$_{am}$		
0400-0500		KTBN Salt Lake City, Utah	7510$_{am}$		
0400-0500		WHRI Noblesville, Indiana	7315$_{na}$	9495$_{sa}$	
0400-0500		Radio Australia, Melbourne	11880$_{va}$	15160$_{va}$	15240$_{va}$
			15320$_{va}$	15530$_{va}$	17750$_{va}$
			17795$_{va}$	17855$_{va}$	21525$_{va}$
			21775$_{va}$		
0400-0500		Christian Science World Service	9455$_{eu}$	9840$_{eu}$	13720$_{eu}$
			13760$_{eu}$		
0400-0500		WWCR Nashville, Tennessee	7520$_{na}$		
0400-0500		WYFR Okeechobee, Florida	6065$_{na}$	9505$_{na}$	
0400-0500		Radio Luxembourg	15350$_{om}$		
0400-0500		Radio Moscow N. American Svc	9580$_{na}$	12050$_{na}$	15180$_{na}$
			15240$_{na}$	17605$_{na}$	17665$_{na}$
			17690$_{na}$	17700$_{na}$	17720$_{na}$
0400-0500		Radio Moscow World Service	7150$_{va}$	7310$_{va}$	7420$_{va}$
			9685$_{va}$	9750$_{va}$	9765$_{va}$
			9895$_{va}$	15420$_{va}$	17570$_{va}$
			17590$_{va}$	17610$_{va}$	17655$_{va}$
			17775$_{va}$	17825$_{va}$	17890$_{va}$
			21790$_{VA}$		
0400-0500	m	Radio New York Intl,(via WWCR)	7435$_{va}$		
0400-0500	smtwhf	Radio New Zealand Int'l	17770$_{pa}$		
0400-0500		Radio Pyongyang, North Korea	15180$_{as}$	15230$_{as}$	17765$_{as}$
0400-0500		Radio Sofia, Bulgaria	7115$_{am}$	9700$_{am}$	
0400-0500		Radio Sofia, Bulgaria	11735$_{af}$	11765$_{af}$	15160$_{af}$
0400-0500		Radio RSA, South Africa	7270$_{af}$	11900$_{af}$	11920$_{af}$
0400-0500	smtwh	RTV Malaysia, Radio 4	7295$_{do}$		
0400-0500		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0400-0500		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0400-0500		Voice of America, Washington	5995$_{va}$	6140$_{va}$	7170$_{va}$
			7200$_{va}$	9715$_{va}$	
0400-0500		Voice of Kenya, Nairobi	6075$_{do}$		
0400-0500		Voice of Turkey, Ankara	9445$_{na}$	17760$_{pa}$	
0400-0500		Trans World Radio, Bonaire	9535$_{am}$	11930$_{am}$	
0400-0500		Radio Canada Int'l, Montreal	11925$_{as}$		
0400-0500	smtwhf	WMLK Bethel, PA	9465$_{eu}$		
0400-0500	mtwhfa	Zimbabwe BC Corp., Harare	3396$_{do}$		
0400-0425		RAI, Rome, Italy	5990$_{me}$	7275$_{me}$	
0430-0500		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0430-0500	mtwhf	Radio Southwest Africa, Namibia	3270$_{af}$	3290$_{af}$	
0430-0500		Radio Tirana, Albania	9480$_{af}$	11835$_{af}$	
0430-0500	s	Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
0430-0500		TWR Swaziland	9655	11750	
0430-0500		Voice of America, Washington	6035$_{af}$	9575$_{af}$	15350$_{af}$
			17715$_{af}$	17755$_{af}$	21600$_{af}$
0450-0500		Radio Havana Cuba	9750$_{am}$	11760$_{am}$	11820$_{am}$

PROGRAMS

Sundays

0410 Voice of America: VOA Morning. See S 0010.
0430 BBC: A Taste of Soul. Robbie Vincent presents the best of the British soul and dance scene (except April 28th: Pop Music, topical programming on popular music subjects).
0445 BBC: Personal View. A personal opinion on topical issues in British life.

Mondays

0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off the Shelf. A reading selected from the best of world literature.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: The People of South Africa. Everyday life in the troubled RSA (except April 22nd, 29th: Talk, a short talk on any subject under the sun).

Tuesdays

0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off the Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: Europe's World. See T 0145.

Wednesdays

0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off the Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: Country Style. See W 0145.

Thursdays

0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off the Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: Andy Kershaw's World of Music. See M 0215.

Fridays

0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off the Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: Jazz Now and Then or Folk in Britain. See H 1345.

Saturdays

0410 Voice of America: VOA Morning. See S 0010.
0430 BBC: Here's Humph! See A 0145.
0445 BBC: Worldbrief. See F 2315.

Francoise Borel and Ian McFarland present "Listeners' Corner" on Radio Canada International.

0500 UTC [12:00 AM EST/9:00 PM PST]

FREQUENCIES

0500-0510		Radio Lesotho, Maseru	4800do		
0500-0510	w	Malawi B'casting Corp., Blantyre	3381do		
0500-0515		Kol Israel, Jerusalem	7410na	7495na	9435na
			11605na	17575as	
0500-0530		CRTV Buea, Cameroon	3970do		
0500-0530		TWR Swaziland	9655do	11750do	
0500-0530		Vatican Radio, Vatican City	17710af	17730af	21650af
0500-0530	mtwhfa	Zimbabwe BC Corp., Harare	3396do		
0500-0545	smtwhf	Radio New Zealand Int'l	17770pa		
0500-0550		Deutsche Welle, Koln, Germany	5960na	6120na	9760na
			9700na	11890na	13610na
			13770na	15440na	
0500-0600		Christian Science World Service	9455eu	9840eu	13720eu
			13760eu		
0500-0600		Radio 2, Lusaka, Zambia	6165do	7235do	
0500-0600		Spanish Foreign Radio, Madrid	9630na		
0500-0600		Radio Beijing, China	11840am		
0500-0600	sa	Radio E.Africa, Equatorial Guinea	9585af		
0500-0600		Radio Havana Cuba	9750am	11760am	11820am
0500-0600		Radio Luxembourg	15350om		
0500-0600	m	Radio New York Intl,(via WWCR)	7435va		
0500-0600		Radio Nigeria, Lagos	3326do	4990do	
0500-0600	mtwhf	Radio Southwest Africa, Namibia	3270af	3290af	
0500-0600		Radio Japan, Tokyo	17810na	17825na	17890na
0500-0600		HCJB Quito, Ecuador	9745na	15155na	
0500-0600		WRNO New Orleans, Louisiana	6185am		
0500-0600		KTBN Salt Lake City, Utah	7510am		
0500-0600		ABC Brisbane, Australia	4920do	9660do	
0500-0600		ABC Perth, Australia	9610do		
0500-0600		Radio for Peace Int'l, Costa Rica	7375	13630	21566
0500-0600		CFRB, Montreal	6070do		
0500-0600		CBN, Canada	6160do		
0500-0600		KVOH Los Angeles, California	9785am		
0500-0600		WHRI Noblesville, Indiana	7315na	9495sa	
0500-0600		WINB Red Lion, Pennsylvania	15145eu		
0500-0600		WWCR Nashville, Tennessee	7520na		
0500-0600		Radio Moscow N. American Svc	9580na	12050na	13665na
			15180na	15240na	15405na
			17665na	17690na	17720na
0500-0600		Radio Australia, Melbourne	11880va	15160va	15240va
			15320va	15530va	17630va
			17750va	17795va	17855va
			21525va	21775va	
0500-0600		Radio Moscow World Service	7130va	7150va	
0500-0600		WYFR Okeechobee, Florida	9505na	11915am	
0500-0600		Radio Thailand, Bangkok	4830as	9655as	11905as
0500-0600	s	Radio Zambia Int'l, Lusaka[1]	9505af	11880af	17895af
0500-0600		RTV Malaysia, Radio 4	7295do		
0500-0600		SBC Radio 1, Singapore	5052do	11940do	
0500-0600		SLBS, Freetown, Sierra Leone	3316do		
0500-0600		Voice of America, Washington	6035af	9575af	15350af
			17715af		
0500-0600		Voice of America, Washington	5995va	6060va	6140va
			7170va	7200va	9670va
			9700va	9715va	11825va
			15205va		
0500-0600		BBC London, England	3955va	5975va	6005va
			6180va	6190va	6195va
			7120va	7230va	9410va
			9600af	9640af	9915na
			11760eu	11940af	11955pa
			15070eu	15280pa	15310me
			15400af	15420af	15590me
			21715af		
0500-0600		Voice of Kenya, Nairobi	6075do		
0500-0600		Voice of Nigeria, Lagos	7255af		
0510-0515	w	Radio Botswana, Gaborone	5955af	7255af	
0524-0600	f	Radio 2, Accra, Ghana	3366do		
0526-0600		Radio 1, Accra, Ghana[1]	4915do		
0530-0545		BBC English by Radio, London	6050eu	7210eu	9750eu
0530-0600		Cameroon Radio-TV, Yaounde	4850do		
0530-0600		Radio Austria Int'l, Vienna	6015na	6155eu	13730eu
			15410me	21490me	
0530-0600		Guizhou PBS, Guiyang, China[4]	3260do	7275do	
0530-0600		Radio Romania Int'l, Bucharest	15340af	15380af	17720af
			17745af	17790af	21665af
0530-0600		UAE Radio, Dubai, United Arab Emirates	15435as	17830as	21700as
0530-0600	mtwhfa	Zimbabwe BC Corp, Harare	3396do	7283do	
0545-0600		Radio Buea, Cameroon[1]	3970do		
0545-0600	smtwhf	Radio New Zealand Int'l	17770pa	9700-Sat.	only
0555-0600		Voice of Malaysia,Kuala Lumpur	6175as	9750as	15295as

PROGRAMS

Sundays

0509 BBC: Twenty-Four Hours. Analysis of the main news of the day.
0510 Voice of America: VOA Morning. See S 0010.
0530 BBC: Financial Review. A look back at the financial week.
0540 BBC: Words of Faith. People share how their scripture gives meaning to their lives.
0545 BBC: Letter from America. Alistair Cooke's distinctly British view of America.

Mondays

0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: Waveguide. How to hear the BBC better.
0530 Voice of America: VOA Morning. See S 0010.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: Recording of the Week. A personal choice from the latest classical music releases.

Tuesdays

0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: Financial News. See M 2310.
0530 Voice of America: VOA Morning. See S 0010.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.

Wednesdays

0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: Financial News. See M 2310.
0530 Voice of America: VOA Morning. See S 0010.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.

Thursdays

0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: Financial News. See M 2310.
0530 Voice of America: VOA Morning. See S 0010.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.

Fridays

0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: Financial News. See M 2310.
0530 Voice of America: VOA Morning. See S 0010.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.

Saturdays

0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: VOA Morning. See S 0010.
0530 BBC: Financial News. See M 2310.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.

Gregoire N'Gwa Mintsa presents jazz music on Gabon's Africa Number One.

0600 UTC [1:00 AM EST/10:00 PM PST]

FREQUENCIES

0600-0610	s	Malawi B'casting Corp., Blantyre	3381$_{do}$		
0600-0620		Vatican Radio, Vatican City	6185$_{eu}$	6248$_{eu}$	
0600-0625		Cameroon Radio-TV, Yaounde	4850$_{do}$		
0600-0625		Voice of Kenya, Nairobi	6075$_{do}$		
0600-0630		Nat'l Radio of Laos, Vientiane	7112$_{as}$		
0600-0630	smtwhf	Radio New Zealand Int'l	17770$_{pa}$	9700-Sat. only	
0600-0630		Radio Australia, Melbourne	11880$_{pa}$	15240$_{pa}$	15320$_{as}$
			17630$_{pa}$	17795$_{as}$	17855$_{af}$
			21525$_{na}$	21775$_{na}$	
0600-0630	s	Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
0600-0630		Voice of America, Washington	5995$_{va}$	6060$_{va}$	6095$_{va}$
			6140$_{va}$	7170$_{va}$	7200$_{va}$
			9670$_{va}$	9700$_{va}$	9715$_{va}$
			11825$_{va}$	15205$_{va}$	
0600-0645	s	Radio Douala, Cameroon	4795$_{do}$		
0600-0650		Deutsche Welle, Koln, Germany	11765$_{af}$	13610$_{af}$	13790$_{af}$
			15185$_{af}$	15440$_{af}$	17875$_{af}$
0600-0700		King of Hope, Lebanon	6280$_{me}$		
0600-0700		Radio 1, Accra, Ghana[1]	4915$_{do}$		
0600-0700	f	Radio 2, Accra, Ghana	3366$_{do}$		
0600-0700		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0600-0700	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
0600-0700		Radio Havana Cuba	11835$_{am}$		
0600-0700		Radio Luxembourg	15350$_{om}$		
0600-0700		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0600-0700		Radio Pyongyang, North Korea	15180$_{as}$	15230$_{as}$	
0600-0700	sa	Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0600-0700	smtwha	RTV Malaysia, Radio 4	7295$_{do}$		
0600-0700		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0600-0700		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0600-0700		BBC London, England	3955$_{eu}$	6180$_{na}$	6190$_{as}$
			6195$_{as}$	7120$_{pa}$	7230$_{af}$
			9410$_{af}$	9600$_{af}$	11760$_{eu}$
			11940$_{eu}$	12095$_{af}$	15070$_{af}$
			15310$_{as}$	15400$_{af}$	15420$_{af}$
			15590$_{me}$	17885$_{me}$	21470$_{af}$
0600-0700		Radio Moscow N. American Svc	17720$_{na}$		
0600-0700		Radio Moscow World Service	7310$_{na}$	12055$_{va}$	13705$_{va}$
			15280$_{va}$	15295$_{va}$	15455$_{va}$
			15560$_{va}$	17570$_{va}$	17590$_{va}$
			17600$_{va}$	17610$_{va}$	17675$_{va}$
0600-0700		Christian Science World Service	9455$_{eu}$	9840$_{eu}$	11705$_{na}$
			13720$_{eu}$		
0600-0700		WYFR Okeechobee, Florida	5985$_{na}$	7355$_{eu}$	9680$_{na}$
			13695$_{eu}$		
0600-0700		WHRI Noblesville, Indiana	7315$_{eu}$	949$_{sa}$	
0600-0700		WWCR Nashville, Tennessee	7520$_{na}$		
0600-0700	smtwhf	WMLK Bethel, Pennsylvania	9465$_{eu}$		
0600-0700		KTBN Salt Lake City, Utah	7510$_{na}$		
0600-0700		R. For Peace Int'l, Costa Rica	7375$_{na}$	13630$_{na}$	
0600-0700		Voice of America, Washington	6035$_{af}$	6125$_{af}$	9530$_{af}$
			15350$_{af}$	17715$_{af}$	
0600-0700		Voice of Malaysia,Kuala Lumpur	6175$_{as}$	9750$_{as}$	15295$_{as}$
0600-0700		Zimbabwe BC Corp, Harare	3396$_{do}$	7283$_{do}$	
0615-0630	s	Radio Bertoua, Cameroon	4750$_{do}$		
0618-0700	mtwhf	Radio Canada Int'l, Montreal	6050$_{eu}$	6150$_{eu}$	7155$_{eu}$
			9740$_{eu}$	9760$_{eu}$	11840$_{eu}$
			17840$_{eu}$		
0625-0700		Voice of Kenya, Nairobi	7140$_{do}$		
0630-0635	mtwhf	RTV Congolaise, Brazzaville	7105$_{do}$	9610$_{do}$	
0630-0700	mtwhf	Radio New Zealand Int'l	9700$_{pa}$		
0630-0700		Radio Polonia, Warsaw	6135$_{eu}$	7270$_{eu}$	9675$_{eu}$
			15120$_{eu}$		
0630-0700		Radio Tirana, Albania	7205$_{eu}$	9500$_{eu}$	
0630-0700		Swiss Radio Int'l, Bern	15430$_{af}$	17570$_{af}$	21770$_{af}$
0630-0700		Vatican Radio, Vatican City	11710$_{af}$	17730$_{af}$	21650$_{af}$
0630-0700		Radio Australia, Melbourne	11880$_{va}$	13705$_{va}$	15240$_{va}$
			15320$_{va}$	17630$_{va}$	17795$_{va}$
			17855$_{va}$	21525$_{va}$	21775$_{va}$
0630-0700		Voice of America, Washington	3980$_{va}$	5995$_{va}$	6060$_{va}$
			6095$_{va}$	6140$_{va}$	7170$_{va}$
			7325$_{va}$	11805$_{va}$	11825$_{va}$
			15205$_{va}$		
0645-0700		Ghana B'casting Corp., Accra	6130$_{af}$		

SELECTED PROGRAMS

Sundays
0610 Voice of America: VOA Morning. See S 0010.
0630 BBC: Jazz for the Asking. A jazz music request show.

Mondays
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Feature. See S 1401.
0630 Voice of America: VOA Morning. See S 0010.

Tuesdays
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Rock/Pop Music. Topical programming on popular and rock music subjects.
0630 Voice of America: VOA Morning. See S 0010.

Wednesdays
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Meridian. The world of the arts, including music, drama, and books.
0630 Voice of America: VOA Morning. See S 0010.

Thursdays
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Growing Points In Medicine. See M 2315.
0630 Voice of America: VOA Morning. See S 0010.
0645 BBC: The Farming World. See H 0145.

HCJB's "Happiness Is" team is made up of (front l to r): Jan Shober, Anne Cliffe, Imogene Booker, (back l to r) Jaime Cuello (operator), Chuck Howard, Dee Baklenko, Leonard Booker.

Fridays
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Meridian. See W 0630.
0630 Voice of America: VOA Morning. See S 0010.

Saturdays
0610 Voice of America: VOA Morning. See S 0010.
0630 BBC: Meridian. See W 0630.

0700 UTC [2:00 AM EST/11:00 PM PST]

FREQUENCIES

0700-0710	w	Malawi B'casting Corp., Blantyre	3381$_{do}$	5995$_{do}$	
0700-0710		Radio Bafoussam, Cameroon[1]	4000$_{do}$		
0700-0715		Radio Romania Int'l, Bucharest	11810$_{au}$	11940$_{au}$	15250$_{au}$
			15365$_{au}$	17720$_{au}$	17805$_{au}$
			21665$_{au}$		
0700-0710	mtwhf	Vatican Radio, Vatican City[ml]	6185$_{eu}$	6248$_{eu}$	9645$_{eu}$
			11740$_{eu}$		
0700-0730	s	Radio Riga Int'l, Latvia, USSR	5935$_{eu}$		
0700-0800		Ghana B'casting Corp., Accra	6130$_{af}$		
0700-0800		King of Hope, Lebanon	6280$_{me}$		
0700-0800		Radio 1, Accra, Ghana[1]	4915$_{do}$		
0700-0800	f	Radio 2, Accra, Ghana	3366$_{do}$		
0700-0800		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0700-0800	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
0700-0800		Radio Havana Cuba	11835$_{am}$		
0700-0800		Radio Luxembourg	15350$_{om}$		
0700-0800		R. for Peace Int'l, Costa Rica	7375$_{na}$	13630$_{na}$	
0700-0800	mtwhf	Radio New Zealand Int'l	9700$_{pa}$		
0700-0800		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0700-0800		Radio Pyongyang, North Korea	15340$_{as}$	17765$_{as}$	
0700-0800	sa	Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0700-0800	smtwha	RTV Malaysia, Radio 4	7295$_{do}$		
0700-0800		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0700-0800		KVOH Los Angeles, California	9785		
0700-0800		BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
			6190$_{af}$	6195$_{as}$	7120$_{eu}$
			7150$_{af}$	7230$_{eu}$	7325$_{me}$
			9410$_{as}$	9600$_{as}$	9640$_{as}$
			11760$_{eu}$	11940$_{af}$	11955$_{as}$
			12095$_{me}$	15070$_{me}$	15280$_{pa}$
			15310$_{me}$	15360$_{af}$	15400$_{af}$
			15420$_{af}$	15590$_{me}$	17640$_{af}$
			17790$_{me}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
0700-0800		Radio Moscow World Service	15280$_{va}$	17600$_{va}$	17615$_{va}$
			17710$_{va}$	17790$_{va}$	17810$_{na}$
0700-0800		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0700-0800		Voice of Free China, Taiwan	5950$_{na}$		
0700-0800		Voice of Kenya, Nairobi	7140$_{do}$		
0700-0800		Voice of Malaysia,Kuala Lumpur	6175$_{as}$	9750$_{as}$	15295$_{as}$
		BBC London, England			
0700-0800		Christian Science World Service	9455$_{eu}$	9840$_{eu}$	11705$_{pa}$
			13720$_{as}$		
0700-0800		WYFR Okeechobee, Florida	6065$_{na}$	7355$_{eu}$	9680$_{eu}$
			13695$_{na}$		
0700-0800		Radio Australia, Melbourne	11880$_{va}$	11930$_{va}$	15240$_{va}$
			15320$_{va}$	17630$_{va}$	17795$_{va}$
			17855$_{va}$	21525$_{va}$	21775$_{va}$
			25750$_{me}$		
0700-0800		WHRI Noblesville, Indiana	7315$_{eu}$	9495$_{sa}$	
0700-0800		KTBN Salt Lake City, Utah	7510$_{na}$		
0700-0800		HCJB Quito, Ecuador	6205$_{va}$	9610$_{va}$	11840$_{va}$
0700-0800		Zimbabwe BC Corp., Harare	3396$_{do}$	7283$_{do}$	
0705-0800	a	Radio Douala, Cameroon	4795$_{do}$		
0709-0800	mtwhf	Tristan Radio, Tirstan da Cunha	3290$_{do}$		
0730-0745		Radio Finland, Helsinki	9560		
0730-0755		BRT, Brussels, Belgium	6035$_{eu}$	11695$_{au}$	13675$_{eu}$
0730-0800		Radio Netherlands, Hilversum	9630$_{au}$	15560$_{au}$	
0730-0800		Radio Sofia, Bulgaria	11765$_{eu}$	15160$_{eu}$	17825$_{eu}$
0730-0800		Swiss Radio Int'l, Bern	3985$_{eu}$	6165$_{eu}$	9535$_{eu}$
0740-0800		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$
0740-0800		TWR Monte Carlo	9480		

0800 UTC [3:00 AM EST/12:00 AM PST]

FREQUENCIES

0800-0810	w	Malawi B'casting Corp., Blantyre	3381$_{do}$		
0800-0810		Radio Bafoussam, Cameroon[1]	4000$_{do}$		
0800-0815	mtwhf	Tristan Radio, Tirstan da Cunha	3290$_{do}$		
0800-0825		Radio Netherlands, Hilversum	9630$_{au}$	15560$_{au}$	
0800-0825		Voice of Malaysia,Kuala Lumpur	6175$_{as}$	9750$_{as}$	15295$_{as}$
0800-0830		Voice of America, Washington	15195$_{va}$	21570$_{va}$	21700$_{va}$
0800-0830		Radio Tirana, Albania	9500$_{as}$	11835$_{as}$	
0800-0830		Voice of America, Washington	11735$_{va}$	15160$_{va}$	15195$_{va}$
			21570$_{va}$		
0800-0830		TWR Monte Carlo	9480		
0800-0830		Radio Australia, Melbourne	13705$_{va}$	15160$_{va}$	15240$_{vs}$
			17630$_{va}$	17750$_{va}$	21525$_{va}$
			21775$_{va}$	25750$_{me}$	
0800-0830		Voice of Islam, Bangladesh	15195$_{as}$	17815$_{as}$	
0800-0900		King of Hope, Lebanon	6280$_{me}$		
0800-0900		HCJB Quito, Ecuador	6205$_{pa}$	9610$_{pa}$	9745$_{pa}$
			11835$_{pa}$	11925$_{pa}$	
0800-0900		KNLS Anchor Point, Alaska	7365$_{as}$		
0800-0900		Radio 1, Accra, Ghana[1]	4915$_{do}$		
0800-0900	f	Radio 2, Accra, Ghana	3366$_{do}$		
0800-0900		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0800-0900	a	Radio Douala, Cameroon	4795$_{do}$		
0800-0900	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
0800-0900		Radio Korea, Seoul, S. Korea	7550$_{eu}$	13670$_{eu}$	
0800-0900		Radio Luxembourg	15350$_{om}$		
0800-0900	mtwhf	Radio New Zealand Int'l	9700$_{pa}$		
0800-0900		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0800-0900		Radio Pyongyang, North Korea	15180$_{as}$	15230$_{as}$	
0800-0900	smtwha	RTV Malaysia, Radio 4	7295$_{do}$		
0800-0900		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0800-0900		SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
0800-0900		BBC London, England	5975$_{na}$	6180$_{na}$	6190$_{va}$
			6195$_{va}$	7150$_{va}$	7325$_{na}$
			9410$_{eu}$	9640$_{af}$	9660$_{af}$
			11760$_{me}$	11940$_{af}$	11955$_{pa}$
			12095$_{eu}$	15070$_{va}$	15280$_{pa}$
			15310$_{me}$	15360$_{me}$	15420$_{af}$
			15590$_{me}$	17640$_{va}$	17705$_{va}$
			17790$_{af}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
0800-0900		Christian Science World Service	9455$_{va}$		
0800-0900		WYFR Okeechobee, Florida	5985$_{na}$		
0800-0900		WHRI Noblesville, Indiana	7315$_{eu}$	9495$_{sa}$	
0800-0900		VOA Europe, Washington	11735$_{eu}$	15160$_{eu}$	15195$_{eu}$
			21570$_{eu}$	21700$_{eu}$	
0800-0900		Voice of Indonesia, Jakarta	11752$_{as}$	11785$_{as}$	
0800-0900		Voice of Kenya, Nairobi	7140$_{do}$		
0800-0900		Voice of Nigeria, Lagos	7255$_{af}$		
0800-0900		Zimbabwe BC Corp., Harare	3396$_{do}$	7283$_{do}$	
0830-0900		Radio Austria Int'l, Vienna	6155$_{eu}$	13730$_{eu}$	15450$_{au}$
			21490$_{va}$		
0830-0855		Radio Netherlands, Hilversum	15560$_{au}$		
0830-0900		Radio Netherlands, Hilversum	17575$_{as}$	21485$_{as}$	
0830-0900		Swiss Radio Int'l, Bern	9560$_{as}$	13685$_{as}$	17670$_{as}$
			21695$_{as}$		
0830-0900		Radio Australia, Melbourne	9580va	13705va	15240va
			15160va	17630va	17715va
			17750va	21525va	21775va
			25750$_{me}$		
0830-0900		Voice of Amercia, Washington	11735$_{va}$	15160$_{va}$	15195$_{va}$
			21570$_{va}$	21700$_{va}$	
0840-0850	mtwhfa	Voice of Greece, Athens	15650$_{au}$	17535$_{au}$	
0840-0900		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$

0900 UTC [4:00 AM EST/1:00 AM PST]

FREQUENCIES

0900-0905		Radio 1, Accra, Ghana[1]	4915$_{do}$		
0900-0905	f	Radio 2, Accra, Ghana	3366$_{do}$		
0900-0910		Malawi B'casting Corp., Blantyre	5995$_{do}$		
0900-0915		Radio Voice of Lebanon, Beirut	6549.5$_{me}$		
0900-0925		Radio Netherlands, Hilversum	17575$_{as}$	21485$_{as}$	
0900-0930		Radio Australia, Melbourne	9580$_{na}$	13705$_{va}$	15160$_{va}$
			15240$_{va}$	17630$_{va}$	17715$_{va}$
			17750$_{va}$	21775$_{va}$	25750$_{me}$
0900-0950		Deutsche Welle, Koln, Germany	9565$_{af}$	15410$_{af}$	21600$_{af}$
0900-0950		Deutsche Welle, Koln, Germany	6160as	11740as	11780as
			17820as	21465as	21540as
			21650as	21680as	
0900-1000	s	BBS, Thimphu, Bhutan	5023$_{do}$		
0900-1000		TWR Monte Carlo	9480		
0900-1000		BBC London, England	5975$_{na}$	6180$_{na}$	6190$_{va}$
			6195$_{va}$	7150$_{va}$	7325$_{na}$
			9410$_{eu}$	9640$_{af}$	9660$_{af}$
			11760$_{me}$	11940$_{af}$	11955$_{pa}$
			12095$_{eu}$	15070$_{va}$	15280$_{pa}$
			15310$_{me}$	15360$_{me}$	15420$_{af}$
			15590$_{me}$	17640$_{va}$	17705$_{va}$
			17790$_{af}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
0900-1000		FEBC Radio Int'l, Philippines	9800$_{as}$	11845$_{as}$	
0900-1000		King of Hope, Lebanon	6280$_{me}$		
0900-1000		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0900-1000		Radio Beijing, China	11755$_{au}$	15440$_{au}$	17710$_{au}$
0900-1000	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
0900-1000		Radio Japan, Tokyo	15270$_{pa}$	17890$_{pa}$	
0900-1000		Radio Luxembourg	15350om		
0900-1000		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0900-1000		Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
0900-1000		RTV Malaysia, Radio 4	7295$_{do}$		
0900-1000		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0900-1000		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0900-1000		VOA Europe, Washington	11735$_{eu}$	15160$_{eu}$	15195$_{eu}$
0900-1000		Voice of Kenya, Nairobi	7140$_{do}$		
0900-1000		Voice of Nigeria, Lagos	7255$_{af}$		
0900-1000		Zimbabwe BC Corp., Harare	3396$_{do}$	7283$_{do}$	
0905-1000		Cameroon Radio-TV, Yaounde	4850$_{do}$		
0905-1000	sa	Radio 1, Accra, Ghana[1]	4915$_{do}$		
0905-1000	sa	Radio 2, Accra, Ghana	3366$_{do}$		
0905-1000	mtwhf	Radio 2 (Schools Program), Ghana	7295$_{do}$		
0910-0940	smwha	Ulaanbaatar Radio, Mongolia	11850$_{pa}$	12015$_{pa}$	
0920-1000		BFBS (British Forces), London	15245$_{me}$	17830$_{me}$	21745$_{me}$
0930-0940		RTV Togo, Lome	7265$_{do}$		
0930-1000		Radio Australia, Melbourne	9580$_{na}$	15240$_{va}$	17630$_{va}$
			17715$_{va}$	17750$_{va}$	21775$_{va}$
			21825$_{va}$	25750$_{me}$	
0930-1000		Radio Afghanistan, Kabul	4940as	9635as	17655as
			21600as		
0940-1000		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$

1000 UTC [5:00 AM EST/2:00 AM PST]

FREQUENCIES

1000-1015	mtwhf	Radio Budapest, Hungary	6110$_{as}$	9585$_{as}$	9835$_{as}$
			11925$_{as}$	15160$_{as}$	15220$_{as}$
1000-1025	mtwhf	BRT, Brussels, Belgium	6035$_{eu}$	13675$_{eu}$	21810$_{af}$
1000-1030		Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
1000-1030		Radio Australia, Melbourne	6080$_{va}$	9580$_{na}$	9760$_{va}$
			15240$_{va}$	17715$_{va}$	21775$_{va}$
1000-1030		Radio Afghanistan, Kabul	4940as	9635as	17655as
			21600as		
1000-1030		Voice of Vietnam, Hanoi	9755as	12020as	
1000-1100		All India Radio, Delhi	15050as	15335as	17387as
			17865as	21735as	
1000-1100		Cameroon Radio-TV, Yaounde	4850$_{do}$		
1000-1100	sa	Radio 1, Accra, Ghana[1]	4915$_{do}$		
1000-1100	sa	Radio 2, Accra, Ghana	3366$_{do}$		
1000-1100	mtwhf	Radio 2 (Schools Program), Ghana	7295$_{do}$		
1000-1100		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
1000-1100		Radio Beijing, China	11755$_{au}$	15440$_{au}$	17710$_{au}$
1000-1100	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
1000-1100		Radio Luxembourg	15350om		
1000-1100		BBC London, England	5975$_{na}$	6180$_{na}$	6190$_{va}$
			6195$_{va}$	7150$_{va}$	7325$_{na}$
			9410$_{eu}$	9640$_{af}$	9660$_{af}$
			11760$_{me}$	11940$_{af}$	11955$_{pa}$
			12095$_{eu}$	15070$_{va}$	15280$_{pa}$
			15310$_{me}$	15360$_{me}$	15420$_{af}$
			15590$_{me}$	17640$_{va}$	17705$_{va}$
			17790$_{af}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1000-1100		Christian Science World Svc	9455$_{eu}$	9495$_{eu}$	9530$_{pa}$
1000-1100		WYFR Okeechobee, Florida	11900$_{am}$		
1000-1100		KTBN Salt Lake City Utah	7510$_{am}$		
1000-1100		TWR Costa Rica	9725$_{ca}$		
1000-1100		Radio Nigeria, Lagos	4990$_{do}$	7285$_{do}$	
1000-1100	mtwh	RTV Malaysia, Radio 4	7295$_{do}$		
1000-1100		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
1000-1100		SLBS, Freetown, Sierra Leone	3316$_{do}$		
1000-1100	s	Tristan Radio, Tirstan da Cunha	3290$_{do}$		
1000-1100		Voice of America, Washington	5985$_{as}$	11720$_{as}$	11735$_{va}$
			15160$_{va}$	15225$_{va}$	15425$_{as}$
			21570$_{va}$	21705$_{va}$	
1000-1100		Voice of America, Washington	6075$_{ca}$	9590$_{ca}$	11915$_{ca}$
1000-1100		Voice of Kenya, Nairobi	7140$_{do}$		
1000-1100		Voice of Nigeria, Lagos	7255$_{af}$		
1000-1100		Zimbabwe BC Corp., Harare	3396$_{do}$	7283$_{do}$	
1000-1015	mtwhf	Radio Budapest, Hungary	6110$_{as}$	9585$_{as}$	9835$_{as}$
			11925$_{as}$	15160$_{as}$	15220$_{as}$
1030-1040	mtwhf	Malawi B'casting Corp., Blantyre	5995$_{do}$		
1030-1045	mtwhf	Radio Budapest, Hungary	6110$_{as}$	9585$_{as}$	9835$_{as}$
			11925$_{as}$	15160$_{as}$	15220$_{as}$
1030-1100		Radio Australia, Melbourne	6080$_{va}$	9580$_{na}$	9760$_{va}$
			11715$_{va}$	21775$_{va}$	
1030-1100		Radio Korea, Seoul, South Korea	11715$_{na}$		
1030-1100		Radio Netherlands, Hilversum	6020$_{am}$	11890$_{am}$	
1030-1100	sa	Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
1030-1100		Sri Lanka B'casting Corp.	11835$_{as}$	15120$_{as}$	17850$_{as}$
1030-1100		Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
1030-1100		UAE Radio, Dubai, United Arab Emirates	15435$_{eu}$	21605$_{eu}$	
1040-1050	mtwhfa	Voice of Greece, Athens	15650$_{as}$	17535$_{as}$	
1040-1100		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$
1045-1100	s	Radio Budapest, Hungary	7220$_{eu}$	9585$_{eu}$	9835$_{eu}$
			11910$_{eu}$	15160$_{eu}$	15220$_{eu}$

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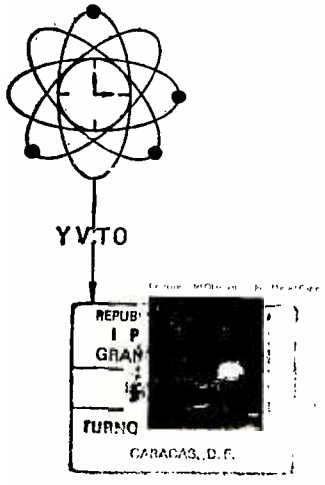
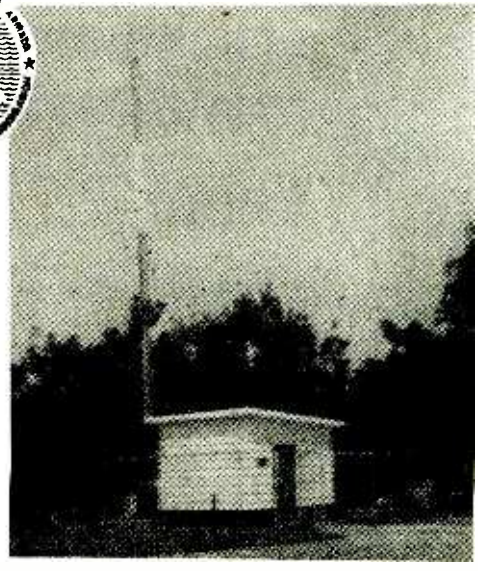
1100 UTC [6:00 AM EST/3:00 AM PST]

FREQUENCIES

1100-1110 sa	Malawi B'casting Corp., Blantyre	5995do		
1100-1110 mtwhf	Radio 2 (Schools Program), Ghana	7295do		
1100-1120	Radio Pakistan, Islamabad	17565eu	21520eu	
1100-1125	Radio Netherlands, Hilversum	6020am	11890am	
1100-1130	Kol Israel, Jerusalem	11585na	17575na	17590eu
		21790na		
1100-1130	Radio Mozambique, Maputo	9525af	11818af	11835af
1100-1130	Sri Lanka B'casting Corp.	11835as	15120as	17850as
1100-1130	Swiss Radio Int'l, Bern	13635as	15570as	17830as
		21770as		
1100-1130	Voice of Vietnam, Hanoi	7416as	9732as	
1100-1150	Deutsche Welle, Koln, Germany	11890af	15410af	17765af
		17800af	21600af	
1100-1200	Radio Australia, Melbourne	6080va	7240va	9580na
		9710va	9760va	11930va
		15160va	17715va	21775va
		21825va		
1100-1200	Radio 1, Accra, Ghana[1]	4915do		
1100-1200 sa	Radio 2, Accra, Ghana	3366do		
1100-1200	TWR Bonaire	11815am	15345am	
1100-1200	Radio Japan, Tokyo	6120na	11815sa	11840na
		12070pa		
1100-1200	WYFR Okeechobee, Florida	5950na	7355na	11900ca
1100-1200	KTBN Salt Lake City, Utah	7510na		
1100-1200	Radio Beijing, China	15135eu		
1100-1200	Christian Science World Svc	9455eu	9495eu	9530pa
1100-1200	HCJB Quito, Ecuador	11740am		
1100-1200	BBC London, England	5975na	6180na	6190va
		6195va	7150va	7325na
		9410eu	9640af	9660af
		11760me	11940af	11955pa
		12095eu	15070va	15280pa
		15310me	15360me	15420af
		15590me	17640va	17705va
		17790af	17830af	17885af
		21470af	21660af	21715af
1100-1200	Radio 2, Lusaka, Zambia	6165do	7235do	
1100-1200 mtwhf	Radio Douala, Cameroon	4795do		
1100-1200	Radio Japan, Tokyo	6120na	11815na	11840na
1100-1200	WYFR Okeechobee, Florida	5950na	7355na	
1100-1200	Radio Moscow World Service	6000va	9705va	9780va
		9875va	11920va	15175va
		15280va	15345va	15435va
		15465va	15520va	17565va
		17605va	17780va	17790va
		17810va	17840va	17870va
		17880va	21785va	
1100-1200	Trans World Radio, Bonaire	11815na	15345na	
		15465va	15520va	17565va
		17605va	17780va	17790va
		17810va	17840va	17870va
		17880va	21785va	
1100-1200	Radio Korea, Seoul	15575na		
1100-1200	HCJB Quito, Ecuador	11740na		
1100-1200	Christian Science World Svc	9455eu	9495eu	9530pa
1100-1200 sa	Radio E.Africa, Equatorial Guinea	9585af		
1100-1200	Radio Korea, Seoul, S.Korea	15575af		
1100-1200	Radio Luxembourg	15350om		
1100-1200	Radio Nigeria, Lagos	4990do	7285do	
1100-1200	Radio Pyongyang, North Korea	6576na	9977na	11335na
1100-1200	Radio RSA, South Africa	9565af	11805af	11900af
		17835af		
1100-1200 sa	Radio Tanzania, Dar es Salaam	5985af	9685af	11765af
1100-1200	Radio Zambia Int'l, Lusaka[1]	9505af	11880af	17895af
1100-1200	RTV Malaysia, Radio 4	7295do		
1100-1200	SBC Radio 1, Singapore	5010do	5052do	11940do
1100-1200	SLBS, Freetown, Sierra Leone	3316do		
1100-1200 s	Tristan Radio, Tristan da Cunha	3290do		
1100-1200	Voice of America, Washington	5985as	6110as	9760as
		11720as	15155as	15425as
1100-1200	Voice of America, Washington	6075ca	9590ca	11915ca
1100-1200	Voice of Asia, Kaohsiung, Taiwan	7445as		
1100-1200	Voice of Kenya, Nairobi	7140do		
1100-1200	Voice of Nigeria, Lagos	7255af		
1100-1200 war	Voice of Peace, Baghdad, Iraq	11860me	21675me	
1100-1200	Zimbabwe BC Corp., Harare	3396do	7283do	
1110-1115 mtwhf	Radio Botswana, Gaborone	5955af	7255af	
1115-1145	Voice of Radio Nepal, Kathmandu	5005as	7165as	
1120-1140	Hunan PBS, Changs ha, China[4]	4990do		
1125-1130 sa	Radio Botswana, Gaborone	5955af	7255af	
1130-1140	Radio Lesotho, Maseru	4800do		
1130-1145 mtwhf	Vatican Radio, Vatican City[ml]	6248eu	9645eu	11740eu
		15210eu		
1130-1145 a	Radio Budapest, Hungary	7220eu	9585eu	9835eu
		11910eu	15160eu	15220eu
1130-1145	RTV Malaysia-Sarawak, Red Network	5950do	7160do	
1130-1200	Radio Austria Int'l, Vienna	6155eu	13730eu	15430as
		15450au	21490na	
1130-1200	Radio Netherlands, Hilversum	5955eu	9715eu	17575eu
		21480eu	21520eu	
1130-1200	Radio Thailand, Bangkok	4830as	9655as	11905as
1130-1200	Radio Tirana, Albania	9480as	11835as	
1130-1200	Voice of America, Washington	11735me	15160me	15225me
		21550me	21705me	
1130-1200	Voice of the Islamic Republic of Iran, Tehran	9525va	9685va	9705va
		11745va	11790va	
1140-1200	Radio Prague Inter-Program	6055eu	7345eu	9505eu
1145-1200	Radiodiffusion Nationale de la Republique du Burundi, Bujumbura	6140af		





Mike Maxson of Toledo, Ohio, received a generous packet of information from standard time station YVTO in Caracas, Venezuela. They even had their own stamp (left) commemorating the observatory. Pictures are (l to r): The transmitting station for YVTO showing part of the bipolar antenna; the main entrance to the Naval Observatory; the equipment that maintains Venezuela's standard time system; the Harris RF 727 transmitter.

SELECTED PROGRAMS

Sundays

1110 Voice of America (Caribbean): Critic's Choice. News from the world of the arts.
1110 Voice of America (East Asia): New Horizons. The world of science, medicine, and technology.
1115 BBC: Short Story. Brief tales written by BBC listeners.
1130 BBC: The Ken Bruce Show. See S 0030.
1130 Voice of America (Caribbean): Studio One. Dramatized and narrative documentaries.
1130 Voice of America (East Asia): Issues in the News. Members of the Washington press corps discuss current topics.

Mondays

1110 Voice of America (Caribbean): Focus. A look at the major figures and issues that shape contemporary life.
1110 Voice of America: Science Report (Special English). See M 0040.
1115 BBC: Health Matters. New developments in the world of medical science and fitness.
1115 Voice of America: This Is America (Special English). A look at various unique aspects of American culture.
1130 BBC: Composer of the Month. See M 0230.
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Music, U.S.A. (Standards). Classics of American popular music.

Tuesdays

1110 Voice of America (Caribbean): Focus. See M 1110.
1110 Voice of America (Special English): Agriculture Report. Developments in agriculture.
1115 BBC: Waveguide. See M 0530.
1115 Voice of America (Special English): Science in the News. The role of science in everyday life.
1125 BBC: Book Choice. See S 0225.
1130 BBC: Megamix. See T 0030.
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Now Music, U.S.A. Rock and soul music from old favorites to the latest hits, and profiles of the stars.

Wednesdays

1110 Voice of America (Caribbean): Focus. See M 1110.
1110 Voice of America: Science Report (Special English). See M 0040.
1115 BBC: Country Style. See W 0145.
1115 Voice of America: Space and Man (Special English). Various aspects of life in space.
1130 BBC: Meridian. See W 0630.
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Now Music, U.S.A. See T 1130.

Thursdays

1110 Voice of America (Caribbean): Focus. See M 1110.
1110 Voice of America: Science Report (Special English). See M 0040.
1115 BBC: The Farming World. See H 0145.
1115 Voice of America: The Making of a Nation (Special English). See H 0045.
1130 BBC: Not As Far As Velma. The last two parts of Nicholas Freeling's detective drama (except April 18th, 25th: Drama, a serialization by the BBC's crack theatre team).
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Now Music, U.S.A. See T 1130.

Fridays

1110 Voice of America (Caribbean): Focus. See M 1110.
1110 Voice of America: Science Report (Special English). See M 0040.
1115 BBC: Global Concerns. See F 0145.
1115 Voice of America: American Mosaic (Special English). A feature program in s-l-o-w English.
1130 BBC: Meridian. See W 0630.
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Country Music, U.S.A. Current popular country music tunes with a sprinkling of old favorites.

Saturdays

1110 Voice of America (Caribbean): American Viewpoints. See S 0010.
1110 Voice of America: Focus. See M 1110.
1115 BBC: Worldbrief. See F 2315.
1130 BBC: Meridian. See W 0630.
1130 Voice of America (Caribbean): Music, U.S.A. (Jazz). Willis Conover looks at jazz of yesterday and today, in the U.S.A. and abroad.
1130 Voice of America: Press Conference, U.S.A. See S 0130.

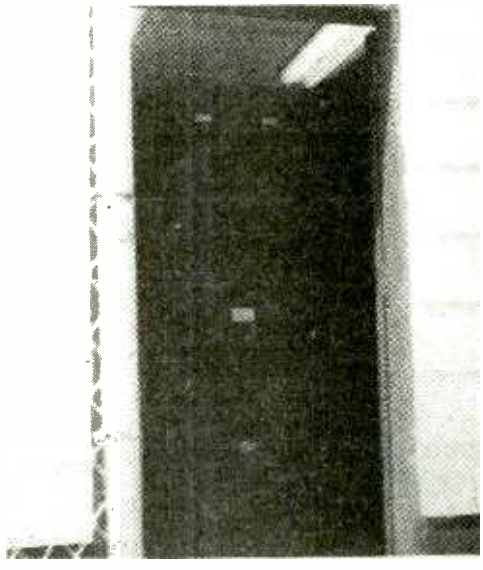
BBC INFORMATION:

Here are details for BBC programs in April; remember that many of these programs could be preempted if there are late-breaking news developments.

The BBC's foodfest, begun in March, continues this month with two programs. Madhur Jeffrey, the Indian actress who is better known for her cookbooks, presents the last two episodes in her series on the history of food, "From Manna To Microwave." The program airs on Mondays (through the 8th) at 0101 UTC (Sunday evenings in North America), with repeats at 1515 UTC.

"Cooking The Books" looks at a different sort of gastronomic history -- the history of cookbooks! The series rolls on at 0315 UTC on Mondays (again Sunday evenings in North America, through the 15th), with reruns on Wednesdays at 2315 UTC.

"Growing Points In Medicine" takes a look at medical developments on Mondays at 2315 UTC, with reruns Wednesdays at 1515 UTC and late Wednesday nights (Thursdays UTC) at 0630 UTC. Finally, Robbie Vincent's wonderful program, presenting "A Taste of Soul," airs on Sundays at 0430 UTC ("Saturday Night Live" time in North America!) with reruns at 1345 UTC on Tuesdays, through April 21st. R-E-S-P-E-C-T!



English language

shortwave guide

1200 UTC [7:00 AM EST/4:00 AM PST]

FREQUENCIES

1200-1210	w	Malawi B'casting Corp., Blantyre	3381$_{do}$	5995$_{do}$	
1200-1215		Voice of the People of Cambodia, Phnom-Penh	9695$_{as}$	11938$_{as}$	
1200-1225	sa	Radio 2, Accra, Ghana	3366$_{do}$		
1200-1225		Radio Netherlands, Hilversum	5955$_{eu}$	9715$_{eu}$	17575$_{eu}$
			21480$_{eu}$	21520$_{eu}$	
1200-1225		Voice of the Islamic Republic of Iran, Tehran	9525$_{va}$	9685$_{va}$	9705$_{va}$
			11745$_{va}$	11790$_{va}$	
1200-1230		Radio Tashkent, Uzbekistan	9540$_{as}$	9600$_{as}$	15420$_{as}$
1200-1230		Radio Mogadishu, Somalia	6095$_{af}$		
1200-1230		Radio Romania Int'l, Bucharest	15365$_{as}$	15380$_{as}$	17720$_{as}$
1200-1230		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
1200-1230	s	Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
1200-1230	smwha	Ulaanbaatar Radio, Mongolia	11850$_{as}$	12015$_{as}$	
1200-1230	mtwhf	Vatican Radio, Vatican City	17865$_{as}$	21515$_{as}$	
1200-1230		Voice of America, Washington	6110$_{as}$	9760$_{as}$	11715$_{as}$
			15155$_{as}$	15425$_{as}$	
1200-1300		Radio 1, Accra, Ghana[1]	4915$_{do}$		
1200-1300		Radio Beijing, China	15110$_{am}$	17715$_{am}$	
1200-1300		Radio Beijing, China	8425$_{as}$	11660$_{as}$	
1200-1300	mtwhf	Radio Douala, Cameroon	4795$_{do}$		
1200-1300	sa	Radio E. Africa, Equatorial Guinea	9585$_{af}$		
1200-1300		Radio Jordan, Amman	13655??		
1200-1300		Radio Luxembourg	15350$_{om}$		
1200-1300		Radio Nigeria, Lagos	4990$_{do}$	7285$_{do}$	
1200-1300	sa	Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1200-1300		ABC Perth	9610		
1200-1300		BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
			6190$_{af}$	6195$_{as}$	7120$_{eu}$
			7150$_{af}$	7230$_{eu}$	7325$_{me}$
			9410$_{as}$	9600$_{as}$	9640$_{as}$
			11760$_{eu}$	11940$_{af}$	11955$_{as}$
			12095$_{me}$	15070$_{me}$	15280$_{pa}$
			15310$_{me}$	15360$_{af}$	15400$_{af}$
			15420$_{af}$	15590$_{me}$	17640$_{af}$
			17790$_{me}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1200-1300		TWR Bonaire	11815$_{am}$	15345$_{am}$	
1200-1300		WYFR Okeechobee, Florida	7355$_{am}$	11830$_{am}$	
1200-1300		KTBN Salt Lake City, Utah	7510$_{am}$		
1200-1300		Christian Science World Service	9475$_{am}$	9495$_{am}$	13625$_{am}$
			13760$_{am}$		
1200-1300		HCJB Quito, Ecuador	11740$_{am}$	15115$_{am}$	17890$_{am}$
1200-1300		Radio Moscow World Service	6000	7305	9705
			9875	11920	13705
			15280	15345	15465
			15520	15550	17565
			17665	17780	17790
			17810	17870	17880
			21680	21725	21785
1200-1300		RTV Malaysia, Radio 4	7295$_{do}$		
1200-1300		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
1200-1300		SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
1200-1300		Voice of Kenya, Nairobi	7140$_{do}$		
1200-1300		Voice of Nigeria, Lagos	7255$_{af}$		
1200-1300	war	Voice of Peace, Baghdad, Iraq	11860$_{me}$	21675$_{me}$	
1215-1230		Radio Bayrak, Cyprus	6150$_{va}$		
1215-1300		Radio Cairo, Egypt	17595$_{as}$		
1215-1300		Radio Korea, Seoul, S. Korea	9750$_{na}$		
1226-1300		Radio 2, Accra, Ghana	7295$_{do}$		
1230-1255	S	BRT, Brussels, Belgium	21810$_{na}$		
1230-1300		Radio Bangladesh, Dhaka	15647$_{as}$	17750$_{as}$	
1230-1300		Radio Sweden, Stockholm	11715$_{as}$	17740$_{as}$	21570$_{as}$
1230-1300		Sri Lanka B'casting Corp.	6075$_{as}$	9720$_{as}$	
1230-1300	mtwhf	Tristan Radio, Tristan da Cunha	3290$_{do}$		
1230-1300		Voice of America, Washington	6110$_{as}$	9760$_{as}$	11715$_{as}$
			11735$_{va}$	15155$_{as}$	15225$_{va}$
			15400$_{as}$	15425$_{as}$	21550$_{va}$
			21700$_{va}$		
1230-1300		Voice of Vietnam, Hanoi	9840$_{as}$	12020$_{as}$	15010$_{as}$
1235-1245		Voice of Greece, Athens	15625$_{am}$	15650$_{am}$	17535$_{am}$
1240-1300		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$

PROGRAMS

Sundays

1201 BBC: Play of the Week. See S 0101.
1210 Voice of America: Encounter. A discussion program presenting opinions on world issues.
1230 Voice of America: Studio One. See S 1130.

Mondays

1210 Voice of America: Newsline. See S 2310.
1215 BBC: Ned Sherrin's Counterpoint. The wide-ranging musical game show.
1230 Voice of America: Magazine Show. Features about culture, science, sports, medicine, and the arts in America.
1245 BBC: Sports Roundup. See S 1345.

Tuesdays

1210 Voice of America: Newsline. See S 2310.
1215 BBC: Multitrack 1: Top 20. See M 2330.
1230 Voice of America: Magazine Show. See M 1230.
1245 BBC: Sports Roundup. See S 1345.

Wednesdays

1210 Voice of America: Newsline. See S 2310.
1215 BBC: New Ideas. See M 1615.
1230 Voice of America: Magazine Show. See M 1230.
1235 BBC: Talk. See M 1635.
1245 BBC: Sports Roundup. See S 1345.

Thursdays

1210 Voice of America: Newsline. See S 2310.
1215 BBC: Multitrack 2. See W 2330.
1230 Voice of America: Magazine Show. See M 1230.
1245 BBC: Sports Roundup. See S 1345.

Fridays

1210 Voice of America: Newsline. See S 2310.
1215 BBC: Feature. Topical programming on various subjects (except April 5th: King Sugar, a rerun of the two-part series on how sweet it is -- sugar, that is).
1230 Voice of America: Magazine Show. See M 1230.
1245 BBC: Sports Roundup. See S 1345.

Saturdays

1210 Voice of America: Communications World. See S 0110.
1215 BBC: Multitrack 3. See F 2330.
1230 Voice of America: Weekend Magazine. See S 0030.
1245 BBC: Sports Roundup. See S 1345.

A visitor speaks with Radio Beijing staff.

1300 UTC [8:00 AM EST/5:00 AM PST]

FREQUENCIES

1300-1315		Radio Korea, Seoul, S. Korea	9750$_{na}$		
1300-1325		Voice of Kenya, Nairobi	7140$_{do}$		
1300-1330		Radio Canada Int'l, Montreal	11955$_{as}$		
1300-1330		Radio Yugoslavia, Belgrade	21715$_{am}$		
1300-1330		Radio Cairo, Egypt	17595$_{as}$		
1300-1330		Radio Beijing, China	11600$_{as}$	11660$_{as}$	
1300-1330	mtwhf	Radio Douala, Cameroon	4795$_{do}$		
1300-1330		Voice of America, Washington	6110$_{as}$	9760$_{as}$	11715$_{as}$
			15155$_{as}$	15245$_{as}$	
1300-1400		FEBC Radio Int'l, Philippines	11850$_{as}$		
1300-1400		Radio 1, Accra, Ghana[1]	4915$_{do}$		
1300-1400		Radio 2, Accra, Ghana	7295$_{do}$		
1300-1400	sa	Radio E. Africa, Equatorial Guinea	9585$_{af}$		
1300-1400		Radio Jordan, Amman	13655??		
1300-1400		BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
			6190$_{af}$	6195$_{as}$	7120$_{eu}$
			7150$_{af}$	7230$_{eu}$	7325$_{me}$
			9410$_{as}$	9600$_{as}$	9640$_{as}$
			11760$_{eu}$	11940$_{af}$	11955$_{as}$
			12095$_{me}$	15070$_{me}$	15280$_{pa}$
			15310$_{me}$	15360$_{af}$	15400$_{af}$
			15420$_{af}$	15590$_{me}$	17640$_{af}$
			17790$_{me}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1300-1400		Radio Moscow World Service	6000$_{va}$	9705$_{va}$	9780$_{va}$
			9875$_{va}$	11920$_{va}$	15175$_{va}$
			15280$_{va}$	15345$_{va}$	15435$_{va}$
			15465$_{va}$	15520$_{va}$	17565$_{va}$
			17605$_{va}$	17780$_{va}$	17790$_{va}$
			17810$_{va}$	17840$_{va}$	17870$_{va}$
			17880$_{va}$	21785$_{va}$	
1300-1400		Radio Luxembourg	153500m		
1300-1400		Radio Nigeria, Lagos	4990$_{do}$	7285$_{do}$	
1300-1400		Radio Pyongyang, North Korea	9325$_{eu}$	9345$_{eu}$	9640$_{as}$
			13650$_{as}$	15230$_{as}$	
1300-1400		Radio Romania Int'l, Bucharest	11940$_{eu}$	15365$_{eu}$	17720$_{eu}$
			21665$_{eu}$		
1300-1400	sa	Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1300-1400		ABC Perth	9610		
1300-1400		Christian Science World Svc	9495	13625	13760
1300-1400		HCJB Quito, Ecuador	11740	15115	17890
1300-1400		Radio Luxembourg	15350		
1300-1400		WHRI Noblesville, Indiana	9465	11790	
1300-1400		WWCR Nashville, TN	15690		
1300-1400		WYFR Okeechobee, Florida	5950	9705	11830
			17640		
1300-1400	war	British Forces Broadcasting Svc	17695	21735	
1300-1400		RTV Malaysia, Radio 4	7295$_{do}$		
1300-1400		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
1300-1400		SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
1300-1400		Sri Lanka B'casting Corp.	6075$_{as}$	9720$_{as}$	
1300-1400		Voice of Nigeria, Lagos	7255$_{af}$		
1300-1400		KTBN Salt Lake City, Utah	7510		
1300-1400	war	Voice of Peace, Baghdad, Iraq	11860$_{me}$	21675$_{me}$	
1300-1330		Swiss Radio Int'l, Bern	6165$_{eu}$	9535$_{eu}$	12030$_{eu}$
1305-1315	s	Radio Riga, Latvia	15330		
1315-1330		Radio Voice of Lebanon, Beirut	6549.5$_{me}$		
1325-1400	mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
1330-1400		All India Radio, Delhi	9565$_{as}$	11760$_{as}$	15335$_{as}$
1330-1400		BFBS (British Forces), London	15390$_{me}$	17695$_{me}$	21735$_{me}$
1330-1400		Nat'l Radio of Laos, Vientiane	7112$_{as}$		
1330-1400		Radio Austria Int'l, Vienna	6155$_{eu}$	13730$_{eu}$	15430$_{as}$
			21490$_{va}$		
1330-1400		Radio Douala, Cameroon	4795$_{do}$		
1330-1400	a	Radio Republik Indonesia Jayapura	3385$_{do}$	6070$_{do}$	
1330-1400		Swiss Radio Int'l, Bern	7480$_{as}$	11695$_{as}$	13635$_{as}$
			15570$_{as}$	17830$_{as}$	21695$_{as}$
1330-1400		Radio Tashkent, Uzbekistan	9540	9600	15470
1330-1400		UAE Radio, Dubai	15320$_{eu}$	15435$_{eu}$	21605
			21675		
1330-1400		Voice of America, Washington	6110$_{as}$	9760$_{as}$	11905$_{va}$
			15155$_{as}$	15225$_{va}$	15400$_{va}$
			15425$_{as}$	21550$_{va}$	21700$_{va}$
1330-1400		Voice of Turkey, Ankara	17785$_{as}$		
1330-1400		Voice of Vietnam, Hanoi	9840$_{as}$	12020$_{as}$	15010$_{as}$

PROGRAMS

Transmitters for Radio Japan

Sundays

1310 Voice of America: Critic's Choice. News from the world of the arts.
1340 Voice of America: Words and Their Stories (Special English). See S 0040.
1345 BBC: Sports Roundup. The day's sports news.
1345 Voice of America: People in America (Special English). A feature program about America's diverse people.

Mondays

1309 BBC: Twenty-Four Hours. See S 0509.
1310 Voice of America: Focus. See M 1110.
1330 BBC: Andy Kershaw's World of Music. See M 0215.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 BBC: Personal View. See S 0445.
1345 Voice of America: This is America (Special English). See M 1115.

Tuesdays

1309 BBC: Twenty-Four Hours. See S 0509.
1310 Voice of America: Focus. See M 1110.
1330 BBC: Network UK. See T 0215.
1340 Voice of America (Special English): Agriculture Report. See T 1110.
1345 BBC: A Taste of Soul. See S 0430.
1345 Voice of America (Special English): Science in the News. See T 1115.

Wednesdays

1309 BBC: Twenty-Four Hours. See S 0509.
1310 Voice of America: Focus. See M 1110.
1330 BBC: Development '91. Aid and development issues.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 Voice of America: Space and Man (Special English). See W 1115.

Thursdays

1309 BBC: Twenty-Four Hours. See S 0509.
1310 Voice of America: Focus. See M 1110.
1330 BBC: Network UK. See T 0215.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 BBC: Jazz Now and Then or Folk in Britain. A look at jazz or folk music on the British Isles.
1345 Voice of America: The Making of a Nation (Special English). See H 0045.

Fridays

1309 BBC: Twenty-Four Hours. See S 0509.
1310 Voice of America: Focus. See M 1110.
1330 BBC: Panel Game. Test your wits in a game show of the airwaves.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 Voice of America: American Mosaic (Special English). See F 1115.

Saturdays

1309 BBC: Twenty-Four Hours. See S 0509.
1310 Voice of America: American Viewpoints. See S 0010.
1330 BBC: Network UK. See T 0215.
1340 Voice of America: Words and Their Stories (Special English). See S 0040.
1345 BBC: Good Books. See M 0315.
1345 Voice of America: American Stories (Special English). See S 0045.

1400 UTC [9:00 AM EST/6:00 AM PST]

FREQUENCIES

1400-1410		Malawi B'casting Corp., Blantyre	3381$_{do}$		
1400-1410		Radio Juba, Sudan	9540$_{do}$	9550$_{do}$	
1400-1415		Radio Jordan, Amman	13655$_{??}$		
1400-1425	mtwhf	BRT, Brussels, Belgium	21810$_{na}$		
1400-1430		Radio Douala, Cameroon	4795$_{do}$		
1400-1430		Radio Sweden, Stockholm	9765$_{as}$	17740$_{as}$	21570$_{as}$
1400-1430		Radio Tirana, Albania	9500$_{as}$	11985$_{as}$	
1400-1500		All India Radio, Delhi	9565$_{as}$	11760$_{as}$	15335$_{as}$
1400-1500		Cameroon Radio-TV, Yaounde	4850$_{na}$		
1400-1500		BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
			6190$_{af}$	6195$_{as}$	7120$_{eu}$
			7150$_{af}$	7230$_{eu}$	7325$_{me}$
			9410$_{as}$	9600$_{as}$	9640$_{as}$
			11760$_{eu}$	11940$_{af}$	11955$_{as}$
			12095$_{me}$	15070$_{me}$	15280$_{pa}$
			15310$_{me}$	15360$_{af}$	15400$_{af}$
			15420$_{af}$	15590$_{me}$	17640$_{af}$
			17790$_{me}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1400-1500	s	Radio Canada Int'l, Montreal	11955	17820	
1400-1500		Radio Moscow World Service	6000$_{va}$	9705$_{va}$	9780$_{va}$
			9875$_{va}$	11920$_{va}$	15175$_{va}$
			15280$_{va}$	15345$_{va}$	15435$_{va}$
			15465$_{va}$	15520$_{va}$	17565$_{va}$
			17605$_{va}$	17780$_{va}$	17790$_{va}$
			17810$_{va}$	17840$_{va}$	17870$_{va}$
			17880$_{va}$	21785$_{va}$	
1400-1500		FEBC Radio Int'l, Philippines	11850$_{as}$		
1400-1500		King of Hope, Lebanon	6280$_{me}$		
1400-1500		Radio 1, Accra, Ghana[1]	4915do		
1400-1500		Radio 2, Accra, Ghana	7295$_{do}$		
1400-1500		Radio Beijing, China	7405$_{am}$		
1400-1500		Radio Beijing, China	4200$_{as}$	11815$_{as}$	15135$_{as}$
			15165$_{as}$		
1400-1500		BBC London, England	12095$_{va}$	15070$_{va}$	
1400-1500		Radio Korea, Seoul, S. Korea	9570$_{as}$		
1400-1500		Radio Luxembourg	15350$_{om}$		
1400-1500		Radio Nigeria, Lagos	4990$_{do}$	7285$_{do}$	
1400-1500	sa	Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1400-1500		KTBN Salt Lake City, Utah	7510		
1400-1500		WYFR Okeechobee, FLorida	9505	9705	11830
			17640		
1400-1500		Christian Science World Svc	15610	13760	21780
1400-1500		HCJB Quito, Ecuador	11740	15115	17890
			21455		
1400-1500		WHRI Noblesville, Indiana	9465	11790	
1400-1500		VLW6 Wanneroo, Australia	6140		
1400-1500		RTV Malaysia, Radio 4	7295$_{do}$		
1400-1500		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
1400-1500		SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
1400-1500		Sri Lanka B'casting Corp.	6075$_{as}$	9720$_{as}$	
1400-1500		Voice of America, Washington	6110$_{as}$	7125$_{as}$	9645$_{as}$
			9760$_{as}$	11905$_{va}$	15160$_{as}$
			15205$_{as}$	15300$_{va}$	15395$_{as}$
			15425$_{as}$	17885$_{va}$	21540$_{va}$
			21700$_{va}$		
1400-1500	mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
1400-1500		Voice of Nigeria, Lagos	7255$_{af}$		
1415-1500		BBS, Thimphu, Bhutan	5023$_{do}$		
1420-1500		Radio Jordan, Amman	9560$_{??}$		
1430-1500		Radio Austria Int'l, Vienna	6155$_{eu}$	13730$_{eu}$	21490$_{va}$
1430-1500	mtwhfa	Radio Douala, Cameroon	4795$_{do}$		
1430-1500		Radio Netherlands, Hilversum	5955$_{eu}$	9715$_{eu}$	17575$_{eu}$
			21480$_{eu}$	21520$_{eu}$	
1430-1500		Guizhou PBS, Guiyang, China[4]	3260$_{do}$	7275$_{do}$	
1435-1450		Nei Mongol PBS, Hohot, China	3970$_{do}$	7105$_{do}$	
1445-1500	smwha	Ulaanbaatar Radio, Mongolia	9575$_{as}$	13780$_{as}$	
1445-1500		Vatican Radio, Vatican City	6248$_{eu}$	9645$_{eu}$	11740$_{eu}$

PROGRAMS

Sundays

1401 BBC: Feature. Topical programming on various subjects.
1410 Voice of America: The Concert Hall. Classical music and interviews with America's great artists and conductors.
1430 BBC: Anything Goes. Bob Holness presents a variety of odd recordings.
1455 Voice of America: Editorial. American opinion.

Mondays

1405 BBC: Outlook. Conversation, controversy, and color from Britain and the rest of the world.
1410 Voice of America: Asia Report. News, correspondent reports, interviews, and opinion.
1430 BBC: Off the Shelf. See M 0430.
1445 BBC: They Made Our World. See S 0215.
1455 BBC: Book Choice. See S 0225.
1455 Voice of America: Editorial. See S 1455.

Tuesdays

1405 BBC: Outlook. See M 1405.
1410 Voice of America: Asia Report. See M 1410.
1430 BBC: Off the Shelf. See M 0430.
1445 BBC: On The Record. See M 0145.
1455 Voice of America: Editorial. See S 1455.

Wednesdays

1405 BBC: Outlook. See M 1405.
1410 Voice of America: Asia Report. See M 1410.
1430 BBC: Off the Shelf. See M 0430.
1445 BBC: Business Matters. A weekly survey of commercial and financial news.
1455 Voice of America: Editorial. See S 1455.

Thursdays

1405 BBC: Outlook. See M 1405.
1410 Voice of America: Asia Report. See M 1410.
1430 BBC: Off the Shelf. See M 0430.
1445 BBC: Recording of the Week. See M 0545.
1455 Voice of America: Editorial. See S 1455.

Fridays

1405 BBC: Outlook. See M 1405.
1410 Voice of America: Asia Report. See M 1410.
1430 BBC: Off the Shelf. See M 0430.
1445 BBC: The People of South Africa (except April 26th: Talk). See M 0445.
1455 Voice of America: Editorial. See S 1455.

Saturdays

1401 BBC: John Peel. See T 0330.
1410 Voice of America: Music, U.S.A. (Jazz). See A 1130.
1430 BBC: Sportsworld. The weekly sports magazine.
1455 Voice of America: Editorial. See S 1455.

UTC SWITCHEROO:

Daylight savings time begins this month in many countries around the world; however, UTC does not observe daylight savings time, so many programs will appear to "shift" by one hour. We've updated all our program listings this month with an automated computer program; however, there's always the possibility that one or two listings have slipped through the cracks, so we appreciate your assistance in catching these. Thanks!

1500 UTC [10:00 AM EST/7:00 AM PST]

FREQUENCIES

1500-1515	smwha	Ulaanbaatar Radio, Mongolia	9575as	13780as	
1500-1525		Radio Netherlands, Hilversum	5955eu	9715eu	17575eu
			21480eu	21520eu	
1500-1530		Radio Romania Int'l, Bucharest	11775as	11940as	15250as
			15335as	17720as	17745as
1500-1530	sa	Radio Tanzania, Dar es Salaam	5985af	9684af	11765af
1500-1530		Voice of America, Washington	6110as	7125as	9645as
			9700va	15205va	15395as
1500-1550		Deutsche Welle, Koln, Germany	9735af	9760af	11965af
			13610af	17765af	21600af
1500-1600	s	Radio Canada Int'l, Montreal	11955	17820	
1500-1600		BBC London, England	3955eu	5955na	5975af
			6190af	6195as	7120eu
			7150af	7230eu	7325me
			9410as	9600as	9640as
			11760eu	11940af	11955as
			12095me	15070me	15280pa
			15310me	15360af	15400af
			15420af	15590me	17640af
			17790me	17830af	17885af
			21470af	21660af	21715af
1500-1600		Radio Moscow World Service	6000va	9705va	9780va
			9875va	11920va	15175va
			15280va	15345va	15435va
			15465va	15520va	17565va
			17605va	17780va	17790va
			17810va	17840va	17870va
			17880va	21785va	
1500-1600		Cameroon Radio-TV, Yaounde	4850do		
1500-1600		FEBC Radio Int'l, Philippines	11850as		
1500-1600		FEBA, Mahe, Seychelles	9590as	11865as	15330as
1500-1600		Radio 1, Accra, Ghana[1]	4915do		
1500-1600		Radio 2, Accra, Ghana	7295do		
1500-1600		Radio Beijing, China	7405am		
1500-1600		Radio Beijing, China	4200as	11815as	15165as
1500-1600		Radio Jordan, Amman	9560??		
1500-1600		Radio Luxembourg	15350om		
1500-1600		Radio Nigeria, Lagos	4990do	7285do	
1500-1600		Radio Pyongyang, North Korea	9325va	9640va	9977va
			11760va		
1500-1600		Christian Science World Svc	13760	15610	21780
1500-1600		Radio Bangladesh	4880		
1500-1600		KTBN Salt Lake City, Utah	7510		
1500-1600		WYFR Okeechobee, Florida	9505	11830	15215
			17640		
1500-1600		WHRI Noblesville, Indiana	15105	21840	
1500-1600		Radio Australia, Melbourne	11720		
1500-1600		Radio RSA, South Africa	7230af	15210af	15270af
1500-1600		RTV Malaysia, Radio 4	7295do		
1500-1600		SBC Radio 1, Singapore	5010do	5052do	11940do
1500-1600		SLBS, Freetown, Sierra Leone	3316do	5980do	
1500-1600		Sri Lanka B'casting Corp.	6075as	9720as	
1500-1600		Voice of Ethiopia, Addis Ababa	9560af		
1500-1600	mtwhf	Voice of Kenya, Nairobi	4934do		
1500-1600		Voice of Nigeria, Lagos	7255af		
1530-1540	mtwhfa	Voice of Greece, Athens	11645am	15650am	17535am
1530-1600		Radio Zambia Int'l, Lusaka[1]	9505af	11880af	17895af
1530-1600		Radio Sofia, Bulgaria	11735af	11840af	15370af
1530-1600		Radio Sweden, Stockholm	17880na	21500na	
1530-1600		Radio Tanzania, Dar es Salaam	5985af	9684af	11765af
1530-1600		Radio Tirana, Albania	9500af	11835af	
1530-1600		Swiss Radio Int'l, Bern	13685af	15430af	17830af
			21630af		
1530-1600		Sudan Nat'l B'casting Corp.	9540do	9550do	11635do
1530-1600	mtwha	Vatican Radio, Vatican City	6185eu		
1530-1600		Voice of America, Washington	9700va	15205va	
1545-1600	mtwhf	Radiodiffusion Nationale de la Republique du Burundi, Bujumbura	6140af		
1545-1600		Vatican Radio, Vatican City	11715as	15090as	17870as

PROGRAMS

Sundays

1500 KNLS: Weekend Special. Dale Ward presents music, news, and religious comments.
1510 Voice of America: New Horizons. See S 1110.
1515 BBC: Concert Hall. Recorded classical music selections from the world's concert halls.
1530 Voice of America: Studio One. See S 1130.

Mondays

1510 Voice of America: Newsline. See S 2310.
1515 BBC: Feature/Drama (except April 1st, 8th: From Manna To Microwave). See M 0101.
1530 Voice of America: Magazine Show. See M 1230.

Tuesdays

1500 KNLS: Swingin' Years. A rare source of big-band music on shortwave.
1510 Voice of America: Newsline. See S 2310.
1515 BBC: A Jolly Good Show. Dave Lee Travis presents requests, the Record of the Month, and the album charts.
1530 Voice of America: Magazine Show. See M 1230.
1545 KNLS: Faith for Today. A religious message.

Wednesdays

1500 KNLS: Swingin' Years. See T 1500.
1510 Voice of America: Newsline. See S 2310.
1515 BBC: Growing Points In Medicine. See M 2315.
1530 BBC: Comedy. A series of -- you guessed it -- comedy programs.
1530 Voice of America: Magazine Show. See M 1230.
1545 KNLS: American Magazine. Articles on various occurrences in American and Alaskan history.

Thursdays

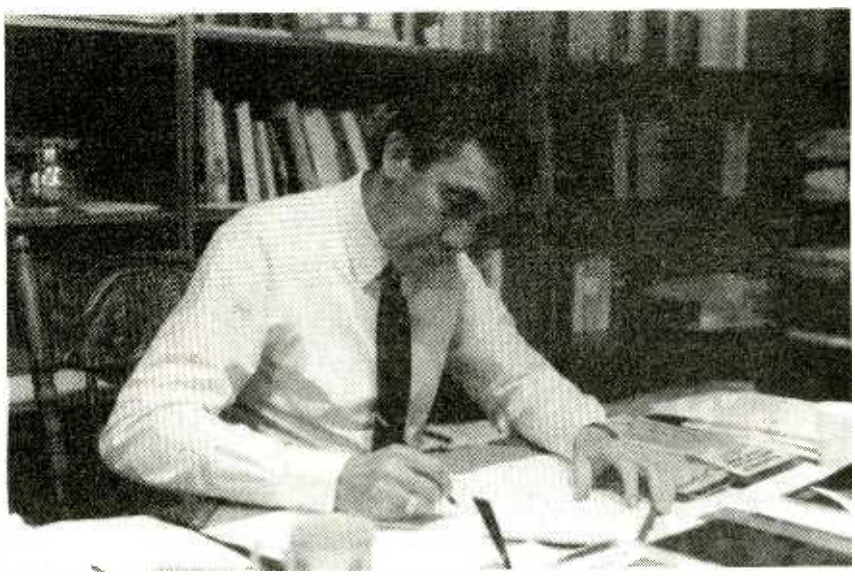
1500 KNLS: Swingin' Years. See T 1500.
1510 Voice of America: Newsline. See S 2310.
1515 BBC: Music for a While with Richard Baker. Classical music with the well-known broadcaster.
1530 Voice of America: Magazine Show. See M 1230.
1545 KNLS: Advanced English. English language lessons.

Fridays

1500 KNLS: Swingin' Years. See T 1500.
1510 Voice of America: Newsline. See S 2310.
1515 BBC: Music Review. See H 2315.
1530 Voice of America: Magazine Show. See M 1230.
1545 KNLS: American Magazine. See W 1545.

Saturdays

1500 KNLS: Weekend Special. See S 1500.
1510 Voice of America: Focus. See M 1110.
1515 BBC: Sportsworld. See A 1430.
1530 Voice of America: Press Conference, U.S.A. See S 0130.



John Fisk is the program director at KNLS, the religious station in Alaska.

1600 UTC [11:00 AM EST/8:00 AM PST]

FREQUENCIES

1600-1605		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
1600-1610		Malawi B'casting Corp., Blantyre	3381$_{do}$		
1600-1610		Radio Lesotho, Maseru	4800$_{do}$		
1600-1610		Vatican Radio, Vatican City	11715$_{as}$	15090$_{as}$	17870$_{as}$
1600-1615	sa	Radiodiffusion Nationale de la Republique du Burundi, Bujumbura	6140$_{af}$		
1600-1630		Radio Pakistan, Islamabad	13665$_{me}$	15605$_{me}$	17555$_{me}$
			17895$_{af}$	21480$_{af}$	21530$_{me}$
1600-1630		Radio Sofia, Bulgaria	11735$_{af}$	11840$_{af}$	15370$_{af}$
1600-1630	mtwhf	Vatican Radio, Vatican City[ml]	6248$_{eu}$	7250$_{eu}$	9645$_{eu}$
			11740$_{eu}$	15210$_{eu}$	
1600-1630		Voice of America, Washington	6110$_{as}$	7125$_{as}$	9645$_{as}$
			9700$_{va}$	15205$_{va}$	15395$_{as}$
1600-1630		Voice of Vietnam, Hanoi	9840$_{eu}$	12020$_{eu}$	15010$_{eu}$
1600-1640		UAE Radio, Dubai, United Arab Emirates	15320$_{af}$	15435$_{eu}$	21605$_{eu}$
1600-1650		Deutsche Welle, Koln, Germany	6170$_{as}$	7225$_{as}$	9615$_{as}$
			11785$_{as}$	15105$_{as}$	15240$_{as}$
			15595$_{as}$	17995$_{as}$	
1600-1700	s	Radio Canada Int'l, Montreal	11955	17820	
1600-1700		BSKSA Saudi Arabia	9705$_{eu}$	9720$_{eu}$	
1600-1700		Radio 1, Accra, Ghana[1]	4915$_{do}$		
1600-1700		Radio 2, Accra, Ghana	7295$_{do}$		
1600-1700		Radio Beijing, China	4130$_{af}$	9570$_{af}$	15110$_{af}$
			15130$_{af}$		
1600-1700		BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
			6190$_{af}$	6195$_{as}$	7120$_{eu}$
			7150$_{af}$	7230$_{eu}$	7325$_{me}$
			9410$_{as}$	9600$_{as}$	9640$_{as}$
			11760$_{eu}$	11940$_{af}$	11955$_{as}$
			12095$_{me}$	15070$_{me}$	15280$_{pa}$
			15310$_{me}$	15360$_{af}$	15400$_{af}$
			15420$_{af}$	15590$_{me}$	17640$_{af}$
			17790$_{me}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1600-1700		Radio Moscow World Service	6000$_{va}$	9705$_{va}$	9780$_{va}$
			9875$_{va}$	11920$_{va}$	15175$_{va}$
			15280$_{va}$	15345$_{va}$	15435$_{va}$
			15465$_{va}$	15520$_{va}$	17565$_{va}$
			17605$_{va}$	17780$_{va}$	17790$_{va}$
			17810$_{va}$	17840$_{va}$	17870$_{va}$
			17880$_{va}$	21785$_{va}$	
1600-1700		Radio Jordan, Amman	9560??		
1600-1700		Radio Korea, Seoul, S. Korea	5975$_{om}$	9870$_{af}$	
1600-1700		Radio Luxembourg	15350$_{om}$		
1600-1700		Radio Nigeria, Lagos	4990$_{do}$		
1600-1700		Radio RSA, South Africa	7230$_{af}$	15210$_{af}$	15270$_{af}$
1600-1700		Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1600-1700		Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
1600-1700		SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
1600-1700		Sri Lanka B'casting Corp.	6075$_{as}$	9720$_{as}$	
1600-1700	mtwhf	Tristan Radio, Tristan da Cunha	3290$_{do}$		
1600-1700		Voice of America, Washington	9575$_{af}$	11920$_{af}$	15410$_{af}$
			15580$_{af}$	17800$_{af}$	21625$_{af}$
1600-1700		WRNO New Orleans, Louisiana	15420		
1600-1700		KTBN Salt Lake City, Utah	15590		
1600-1700		WWCR Nashville, Tennessee	15690		
1600-1700		WHRI Noblesville, Indiana	15105	17830	
1600-1700		WYFR Okeechobee, Florida	15170	15215	17640
1600-1700		CHristian Science World Svc	21640		
1600-1700	mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
1600-1700		Voice of Nigeria, Lagos	7255$_{af}$		
1610-1615	mtwhf	Radio Botswana, Gaborone	5955$_{af}$	7255$_{af}$	
1615-1630	s	Radiodiffusion Nationale de la Republique du Burundi, Bujumbura	6140$_{af}$		
1615-1630	mh	Radio Budapest, Hungary	7220$_{eu}$	9585$_{eu}$	9835$_{eu}$
			11910$_{eu}$	15160$_{eu}$	15220$_{eu}$
1615-1700		Swiss Radio Int'l, Bern[1]	11955$_{eu}$		
1630-1700		Radio Cairo, Egypt	15255$_{af}$		
1630-1700		HCJB Quito, Ecuador	21455	21480	25950
1630-1700		RTV Rwandiase, Kigali, Rwanda	3330	6055	
1630-1700	mtwhf	RTV Morocco, Rabat	15335$_{af}$	15360$_{af}$	17595$_{af}$
1630-1700		Voice of America, Washington	6110$_{as}$	7125$_{as}$	9645$_{as}$
			9700$_{va}$	9760$_{va}$	11710$_{va}$
			15205$_{va}$	15245$_{va}$	15395$_{as}$

PROGRAMS

Sundays

1600 KSDA, Guam: AWR Magazine. See S 0200.
1610 Voice of America (Africa): Nightline Africa. News and reports on world and African issues.
1610 Voice of America: Encounter. See S 1210.
1615 BBC: Feature. See S 0230.
1630 KSDA, Guam: Power to Cope. Advice for coping with life's problems.
1640 Voice of America: Words and Their Stories (Special English). See S 0040.
1645 BBC: Letter from America. See S 0545.
1645 Voice of America: People in America (Special English). See S 1345.

Mondays

1600 KSDA, Guam: Family Matters. See S 2300.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
1615 BBC: New Ideas. A look at new products and technological developments.
1615 KSDA, Guam: Bible in Living Sound. See S 2315.
1630 KSDA, Guam: Greatest Story Ever Told. See M 0030.
1630 BBC: Talk. A short talk on any subject under the sun.
1645 Voice of America: Science Report (Special English). See M 0040.
1645 BBC: The World Today. News analysis on a selected location or event in the news.
1645 KSDA, Guam: Voice of Prophecy. See S 0030.
1645 Voice of America: This is America (Special English). See M 1115.

Tuesdays

1600 KSDA, Guam: Family Matters. See S 2300.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
1615 BBC: Omnibus. A half-hour program on practically any topic.
1615 KSDA, Guam: Bible in Living Sound. See S 2315.
1630 KSDA, Guam: Greatest Story Ever Told. See M 0030.
1640 Voice of America (Special English): Agriculture Report. See T 1110.
1645 BBC: The World Today. See M 1645.
1645 KSDA, Guam: Voice of Prophecy. See S 0030.
1645 Voice of America (Special English): Science in the News. See T 1115.

Wednesdays

1600 KSDA, Guam: Family Matters. See S 2300.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
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.
1640 Voice of America: Science Report (Special English). See M 0040.
1645 BBC: The World Today. See M 1645.
1645 KSDA, Guam: Voice of Prophecy. See S 0030.
1645 Voice of America: Space and Man (Special English). See W 1115.

Thursdays

1600 KSDA, Guam: Family Matters. See S 2300.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
1615 BBC: Assignment. See H 0230.
1615 KSDA, Guam: Bible in Living Sound. See S 2315.
1630 KSDA, Guam: Greatest Story Ever Told. See M 0030.
1640 Voice of America: Science Report (Special English). See M 0040.
1645 BBC: The World Today. See M 1645.
1645 KSDA, Guam: Voice of Prophecy. See S 0030.
1645 Voice of America: The Making of a Nation (Special English). See H 0045.

Fridays

1600 KSDA, Guam: Family Matters. See S 2300.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
1615 BBC: Science in Action. The latest in scientific developments.
1615 KSDA, Guam: Bible in Living Sound. See S 2315.
1630 KSDA, Guam: Greatest Story Ever Told. See M 0030.
1640 Voice of America: Science Report (Special English). See M 0040.
1645 BBC: The World Today. See M 1645.
1645 KSDA, Guam: Voice of Prophecy. See S 0030.
1645 Voice of America: American Mosaic (Special English). See F 1115.

Saturdays

1600 KSDA, Guam: Micronesian Snapshots. The news, music, and culture of Micronesia.
1610 Voice of America (Africa): Nightline Africa. See S 1610.
1610 Voice of America: American Viewpoints. See S 0010.
1615 BBC: Sportsworld. See A 1430.
1615 KSDA, Guam: Listener Mailbox. See A 0200.
1630 KSDA, Guam: DX Asiawaves. See S 0230.
1640 Voice of America: Words and Their Stories (Special English). See S 0040.
1645 KSDA, Guam: Probe. See S 0245.
1645 Voice of America: American Stories (Special English). See S 0045.

1700 UTC [12:00 PM EST/9:00 AM PST]

FREQUENCIES

1700-1705	Radio 2, Accra, Ghana	7295$_{do}$		
1700-1710	Radio Bafoussam, Cameroon[1]	4000$_{do}$		
1700-1725	Radio Netherlands, Hilversum	6020$_{af}$	15570$_{af}$	
1700-1728	SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
1700-1730	Radio Norway, Oslo	17760		
1700-1730	Radio Jordan, Amman	9560??		
1700-1730	Sri Lanka B'casting Corp.	6075$_{as}$	9720$_{as}$	
1700-1730	Voice of America, Washington	3980$_{va}$	6040$_{va}$	6110$_{as}$
		7125$_{as}$	9645$_{as}$	9700$_{va}$
		9760$_{va}$	15205$_{va}$	15395$_{as}$
1700-1800	B'casting Service of the Kingdom of Saudi Arabia, Riyad	9705$_{eu}$	9720$_{eu}$	
1700-1800	Radio 1, Accra, Ghana[1]	4915$_{do}$		
1700-1800	Radio Africa, Equatorial Guinea	7190$_{af}$		
1700-1800	Radio Beijing, China	4130$_{af}$	7405$_{af}$	8260$_{af}$
		9570$_{af}$	11575$_{af}$	
1700-1800	Radio Cairo, Egypt	15255$_{af}$		
1700-1800	Radio Luxembourg	15350$_{om}$		
1700-1800	BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
		6190$_{af}$	6195$_{as}$	7120$_{eu}$
		7150$_{af}$	7230$_{eu}$	7325$_{me}$
		9410$_{as}$	9600$_{as}$	9640$_{as}$
		11760$_{eu}$	11940$_{af}$	11955$_{as}$
		12095$_{me}$	15070$_{me}$	15280$_{pa}$
		15310$_{me}$	15360$_{af}$	15400$_{af}$
		15420$_{af}$	15590$_{me}$	17640$_{af}$
		17790$_{me}$	17830$_{af}$	17885$_{af}$
		21470$_{af}$	21660$_{af}$	21715$_{af}$
1700-1800	WRNO New Orleans, Louisiana	15420		
1700-1800	WWCR Nashville, Tennessee	15690		
1700-1800	KTBN Salt Lake City, Utah	15590		
1700-1800	WHRI Noblesville, Indiana	15105	17830	
1700-1800	WYFR Okeechobee, Florida	17640		
1700-11800	Christian Science World Svc	21640		
1700-1800	Radio Moscow World Service	6000$_{va}$	9705$_{va}$	9780$_{va}$
		9875$_{va}$	11920$_{va}$	15175$_{va}$
		15280$_{va}$	15345$_{va}$	15435$_{va}$
		15465$_{va}$	15520$_{va}$	17565$_{va}$
		17605$_{va}$	17780$_{va}$	17790$_{va}$
		17810$_{va}$	17840$_{va}$	17870$_{va}$
		17880$_{va}$	21785$_{va}$	
1700-1800	Radio RSA, South Africa	7230$_{af}$	15210$_{af}$	15270$_{af}$
		17790$_{af}$	17835$_{af}$	
1700-1800	Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1700-1800	Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
1700-1800 mtwhfa	RTV Morocco, Rabat	15335$_{af}$	17595$_{af}$	17815$_{af}$
1700-1800	Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
1700-1800	Radio Pyongyang, North Korea	9325$_{va}$	9640$_{va}$	9977$_{va}$
		11760$_{va}$		
1700-1800	Voice of America, Washington	9575$_{af}$	11920$_{af}$	15410$_{af}$
		15580$_{af}$	17800$_{af}$	21625$_{af}$
1700-1800 mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
1700-1800	Voice of Nigeria, Lagos	7255$_{af}$		
1700-1800 war	Voice of Peace, Baghdad, Iraq	6055$_{me}$	11860$_{me}$	21675$_{me}$
1706-1800	Radio 2, Accra, Ghana	3366$_{do}$		
1715-1730	Radio Buea, Cameroon[1]	3970$_{do}$		
1715-1800	Radio Pakistan, Islamabad	11570$_{eu}$	15605$_{eu}$	
1728-1800	SLBS, Freetown, Sierra Leone	3316$_{do}$		
1730-1745	Radio Bayrak, Cyprus	6150$_{va}$		
1730-1745 a	Radio Douala, Cameroon	4795$_{do}$		
1730-1800	Radio Austria Int'l, Vienna	5945$_{eu}$	6155$_{eu}$	12010$_{me}$
		13730$_{af}$		
1730-1800	Radio Romania Int'l, Bucharest	15365$_{af}$	17720$_{af}$	17805$_{af}$
1730-1800	Vatican Radio, Vatican City	17710$_{af}$	17730$_{af}$	21650$_{af}$
1730-1800	HCJB Quito, Ecuador	15270	21455	21480
		25950		
1730-1800	Voice of America, Washington	6040$_{va}$	6110$_{as}$	6180$_{va}$
		7125$_{as}$	9645$_{as}$	9700$_{va}$
		9760$_{va}$	11710$_{va}$	11960$_{va}$
		15205$_{va}$	15395$_{as}$	
1740-1800	Cameroon Radio-TV, Yaounde	4850$_{do}$		
1745-1800 mtwhfa	Radio Douala, Cameroon	4795$_{do}$		
1745-1800	RTV Madagascar, Antananarivo	3232$_{do}$	3286$_{do}$	5005$_{do}$

1800 UTC [1:00 PM EST/10:00 AM PST]

FREQUENCIES

1800-1810		Malawi B'casting Corp., Blantyre	3381$_{do}$		
1800-1830		Radio Canada Int'l, Montreal	13670	15260	17820
1800-1830		Radio Cairo, Egypt	15255$_{af}$		
1800-1830		Radio Sweden, Stockholm	6065$_{va}$	9655$_{va}$	11900$_{va}$
1800-1830		RTV Congolaise, Brazzaville[1]	3265$_{af}$	4765$_{af}$	
1800-1830		Voice of Vietnam, Hanoi	9840$_{eu}$	12020$_{eu}$	15010$_{eu}$
1800-1840	w	Radio Bertoua, Cameroon	4750$_{do}$		
1800-1845	mtwhfa	Radio Douala, Cameroon	4795$_{do}$		
1800-1900		All India Radio, Delhi	11935$_{af}$		
1800-1900		B'casting Service of the Kingdom of Saudi Arabia, Riyad	9705$_{eu}$	9720$_{eu}$	
1800-1900		Cameroon Radio-TV, Yaounde	4850$_{do}$		
1800-1900		Radio 1, Accra, Ghana[1]	4915$_{do}$		
1800-1900		Radio 2, Accra, Ghana	7295$_{do}$		
1800-1900		Radio Africa, Equatorial Guinea	7190$_{af}$		
1800-1900		Radio Luxembourg	15350$_{om}$		
1800-1900		Radiobras, Brasilia, Brasil	15265$_{eu}$		
1800-1900		KTBN Salt Lake City, Utah	15590		
1800-1900		WHRI Noblesville, Indiana	15105	17830	
1800-1900		Voice of Ethiopia. Addis Ababa	9662		
1800-1900		WRNO New Orleans, Louisiana	15420		
1800-1900		WWCR Nashville, Tennessee	15690		
1800-1900		Christian Science World Svc	13720	21780	
1800-1900		WYFR Okeechobee, Florida	11580		
1800-1900		Radio Mozambique, Maputo	3265$_{af}$	4855$_{af}$	9618$_{af}$
1800-1900		BBC London, England	5975	9410	9740
			11750	12095	15070
			15310	15400	17880
1800-1900		Radio Moscow World Service	7170	7235	7315
			9765	9795	9830
			9875	11630	11840
			15475	17570	
			21660	21715	
1800-1900	smtwhf	Radio New Zealand Int'l	15130$_{pa}$		
1800-1900		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
1800-1900		Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1800-1900		Radio for Peace Int'l, Costa Rica	13660	21566	25945 all am
1800-1900		Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
1800-1900		SLBS, Freetown, Sierra Leone	3316$_{do}$		
1800-1900		Voice of America, Washington	9575$_{af}$	11920$_{af}$	15410$_{af}$
			15580$_{af}$	17800$_{af}$	21625$_{af}$
1800-1900	mtwhf	RAE Buenos Aires, Argentina	11710		
1800-1900		Voice of America, Washington	6040$_{va}$	6180$_{va}$	9700$_{va}$
			9760$_{va}$	15205$_{va}$	
1800-1900	mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
1800-1900		Voice of Peace, Baghdad, Iraq	6055$_{me}$	11860$_{me}$	21675$_{me}$
1800-1830	a	Radio Riga Int'l, Latvia, USSR	5935$_{eu}$		
1815-1830		Kol Israel, Jerusalem	11585$_{eu}$	11655$_{eu}$	
1815-1900		Radio Bangladesh, Dhaka	12030$_{as}$	15255$_{as}$	
1815-1830		Radio Voice of Lebanon, Beirut	6549.5$_{me}$		
1830-1855		BRT, Brussels, Belgium	5910$_{eu}$	17550$_{eu}$	21810$_{af}$
1830-1900		Radio Afghanistan, Kabul	7310$_{eu}$	9635$_{eu}$	
1830-1900	as	Radio Canada Int'l, Montreal	13670	15260	17820
1830-1900		Radio Netherlands, Hilversum	6020$_{af}$	15570$_{af}$	17605$_{af}$
			21685$_{af}$		
1830-1900		Radio Kuwait (speculative)	11675/13610		
1830-1900		Radio Sofia, Bulgaria	11735$_{af}$	11840$_{af}$	15370$_{af}$
1830-1900		Radio Tirana, Albania	7120$_{eu}$	9480$_{eu}$	
1830-1900		Sri Lanka B'casting Corp.	9720$_{eu}$	15120$_{eu}$	
1830-1900		Swiss Radio Int'l, Bern	9885$_{af}$	11955$_{af}$	
1840-1845		Voice of Greece, Athens	11645$_{af}$	12105$_{af}$	15650$_{af}$
1845-1900		Ghana B'casting Corp., Accra	6130$_{af}$		
1845-1900		RTV Guinea, Conakry	4900$_{af}$	7125$_{af}$	
1845-1900	s	RTV Mali, Bamako[3]	4783$_{do}$	5995$_{do}$	7285$_{do}$
			11960$_{do}$		

1900 UTC [2:00 PM EST/11:00 AM PST]

FREQUENCIES

1900-1915		Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1900-1925		Radio Netherlands, Hilversum	6020$_{af}$	15570$_{af}$	17605$_{af}$
			21685$_{af}$		
1900-1930	mtwhf	Radio Canada Int'l, Montreal	13670	15260	17820
1900-1930		Radio Afghanistan, Kabul	7310$_{eu}$	9635$_{eu}$	
1900-1930	t	Radio Budapest, Hungary	6110eu	7220eu	9520eu
			9585eu	9835eu	11910eu
1900-1930		Radio Sofia, Bulgaria	11735$_{af}$	11840$_{af}$	15370$_{af}$
1900-1930		Voice of Vietnam, Hanoi	9840$_{eu}$	12020$_{eu}$	15010$_{eu}$
1900-1945		Cameroon Radio-TV, Yaounde	4850$_{na}$		
1900-1950		Deutsche Welle, Koln, Germany	9760$_{af}$	11785$_{af}$	11810$_{af}$
			13790$_{af}$	15350$_{af}$	15390$_{af}$
			17810$_{af}$		
1900-2000		All India Radio, Delhi	11935$_{af}$		
1900-2000		B'casting Service of the Kingdom of Saudi Arabia, Riyad	9705$_{eu}$	9720$_{eu}$	
1900-2000		Ghana B'casting Corp., Accra	6130$_{af}$		
1900-2000		Radio for Peace Int'l, Costa Rica	13660	21566	25945 all am
1900-2000		Radio 1, Accra, Ghana[1]	4915$_{do}$		
1900-2000		Radio 2, Accra, Ghana	7295$_{do}$		
1900-2000		Radio Africa, Equatorial Guinea	7190$_{af}$		
1900-2000		Radio Algiers, Alger, Algeria	9640	15215	
1900-2000		Radio Kuwait (speculative)	11675/13610		
1900-2000		Radio Beijing, China	6955$_{af}$	9440$_{af}$	11515$_{af}$
1900-2000		Radio Havana Cuba	15435$_{eu}$		
1900-2000		Radio Luxembourg	15350$_{om}$		
1900-2000	smtwhf	Radio New Zealand Int'l	15130$_{pa}$		
1900-2000		KTBN Salt Lake City, Utah	15590		
1900-2000		WHRI Noblesville, Indiana	13760	17830	
1900-2000		WRNO New Orleans, Louisiana	15420		
1900-2000		WWCR Nashville, Tennessee	15690		
1900-2000		Christian Science World Svc	13720	21780	
1900-2000		WYFR Okeechobee, Florida	11830	15215	15440
			15355	15566	21615
1900-2000		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
1900-2000		Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
1900-2000	s	RTV Morocco, Rabat	15335$_{af}$		
1900-2000		SLBS, Freetown, Sierra Leone	3316$_{do}$		
1900-2000		Sri Lanka B'casting Corp.	9720$_{eu}$	15120$_{eu}$	
1900-2000		Voice of America, Washington	9575$_{af}$	11920$_{af}$	15410$_{af}$
			15580$_{af}$	17800$_{af}$	21625$_{af}$
1900-2000		BBC London, England	5975$_{va}$	7325$_{va}$	9410$_{va}$
			12095$_{va}$	15070$_{va}$	17885$_{va}$
1900-2000		Voice of America, Washington	6040$_{va}$	6180$_{va}$	9525$_{as}$
			9700$_{va}$	9760$_{va}$	11710$_{va}$
			11870$_{as}$	15180$_{as}$	15205$_{va}$
1900-2000	mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
1900-2000		Radio Moscow World Service	7170	7235	7315
			9765	9795	9830
			9875	11630	11840
			15475	17570	
1900-2000		Voice of Nigeria, Lagos	7255$_{af}$		
1910-1915		Radio Botswana, Gaborone	3356$_{af}$		
1920-1930		Voice of Greece, Athens	7430	9395	
1920-1930		Radio Buea, Cameroon[1]	3970$_{do}$		
1930-1940		Radio Austria Int'l, Vienna	5945$_{eu}$	6155$_{eu}$	12010$_{me}$
			1370$_{af}$		
1930-1940	irr	Radio Burkina, Burkina Faso	4815$_{af}$	7230$_{af}$	
1930-2000	mtwhf	Radio Canada Int'l, Montreal	11945	15325	17875
1930-2000		Radio Budapest, Hungary	6110$_{eu}$	7220$_{eu}$	9520$_{eu}$
			9585$_{eu}$	9835$_{eu}$	11910$_{eu}$
1930-2000		Radio Romania Int'l, Bucharest	5990$_{eu}$	7195$_{eu}$	9690$_{eu}$
1930-2000		Radio Sofia, Bulgaria	6070$_{eu}$	7155$_{eu}$	15370$_{eu}$
1930-2000		Radio Sweden, Stockholm	6065$_{va}$	7265$_{va}$	
1930-2000		Voice of the Islamic Republic of Iran, Tehran	6030$_{eu}$	9022$_{eu}$	
1935-1955		RAI, Rome, Italy	7275$_{eu}$	9710$_{eu}$	11800$_{eu}$
1935-1945		RTV Togo, Lome	5047$_{af}$		
1940-2000	smwha	Ulaanbaatar Radio, Mongolia	11850$_{eu}$	12015$_{eu}$	
1945-2000	mwf	Tristan Radio, Tristan da Cunha	3290$_{do}$		
1950-2000		Sudan Nat'l B'casting Corp.	9540$_{do}$	9550$_{do}$	11635$_{do}$

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Tune in the World (book only) covers the basics of the electronics and FCC regulations covered in the first part of the exam. **The Technician Class License Manual** emphasizes the more advanced material found on the second part of the exam. **The FCC Rule Book** has all of the amateur radio regulations and important interpretations of the rules.

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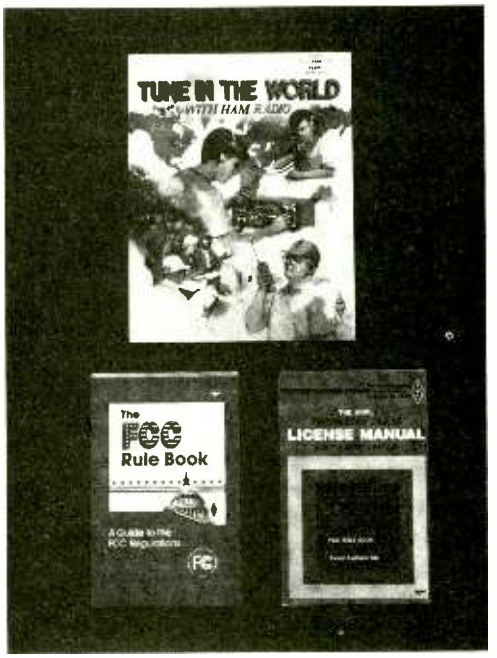

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I would like to order the following:

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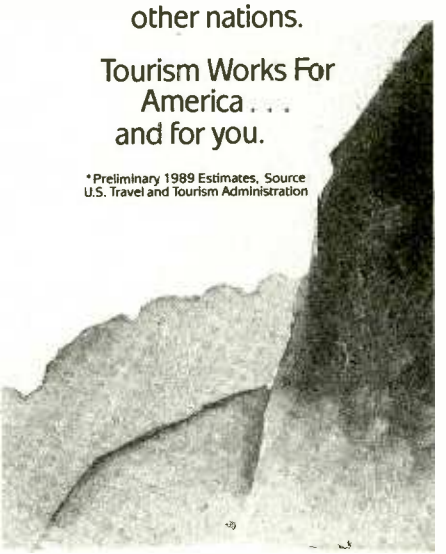

2000 UTC [3:00 PM EST/12:00 PM PST]

FREQUENCIES

2000-2010	w	Malawi B'casting Corp., Blantyre	3381$_{do}$		
2000-2010	mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
2000-2010	smwha	Ulaanbaatar Radio, Mongolia	11850$_{eu}$	12015$_{eu}$	
2000-2030		Kol Israel, Jerusalem	7465$_{na}$	9435$_{na}$	11605$_{na}$
			11630$_{af}$		
2000-2030		Radio Romania Int'l, Bucharest	5990$_{eu}$	7195$_{eu}$	9690$_{eu}$
2000-2030		Swiss Radio Int'l, Bern[1]	3985$_{eu}$	6165$_{eu}$	9535$_{eu}$
2000-2030		Voice of Nigeria, Lagos	7255$_{af}$		
2000-2100		B'casting Service of the Kingdom of Saudi Arabia, Riyad	9705$_{eu}$	9720$_{eu}$	
2000-2100		King of Hope, Lebanon	6280$_{me}$		
2000-2100		Radio 1, Accra, Ghana[1]	4915$_{do}$		
2000-2100		Radio 2, Accra, Ghana	7295$_{do}$		
2000-2100		KNLS Anchor Point, Alaska	11880$_{as}$		
2000-2100		Radio Africa, Equatorial Guinea	7190$_{af}$		
2000-2100		Radio Kuwait (speculative)	11675/13610		
2000-2100		Radio Beijing, China	9440$_{af}$	11715$_{af}$	15110$_{af}$
2000-2100		Radio Beijing, China	4130$_{eu}$	8260$_{eu}$	9920$_{eu}$
			11500$_{eu}$		
2000-2100		BBC London, England	5975$_{va}$	7325$_{va}$	9410$_{va}$
			12095$_{va}$	15070$_{va}$	17885$_{va}$
2000-2100		Radio Havana Cuba	11850$_{eu}$	15435$_{eu}$	
2000-2100		Radio Luxembourg	15350om		
2000-2100	smtwhf	Radio New Zealand Int'l	15130$_{pa}$		
2000-2100		Radio for Peace Int'l, Costa Rica	13660	21566	25945 all am
2000-2100		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
2000-2100		Radio Moscow World Service	7170	7235	7315
			9765	9795	9830
			9875	11630	11840
			15475	17570	
2000-2100		Radio Pyongyang, North Korea	9345$_{va}$	9640$_{va}$	9977$_{va}$
2000-2100		KTBN Salt Lake City, Utah	15590		
2000-2100		WHRI Noblesville, Indiana	15105	17830	
2000-2100		WRNO New Orleans, Louisiana	15420		
2000-2100		WWCR Nashville, Tennessee	15690		
2000-2100		Christian Science World Svc	13770	15610	17555
2000-2100		KVOH Los Angeles, California	17775		
2000-2100		WYFR Okeechobee, Florida	9680	11830	15215
			15355	15440	21525
2000-2100	s	Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
2000-2100		SLBS, Freetown, Sierra Leone	3316$_{do}$		
2000-2100	mwf	Tristan Radio, Tristan da Cunha	3290$_{do}$		
2000-2100		Voice of America, Washington	9570$_{af}$	15410$_{af}$	15580$_{af}$
			17800$_{af}$	21485$_{af}$	21625$_{af}$
2000-2100		Voice of America, Washington	6040$_{va}$	6180$_{va}$	9700$_{va}$
			9760$_{va}$	11710$_{va}$	15205$_{va}$
2000-2100		Voice of Indonesia, Jakarta	7125$_{as}$	9675$_{as}$	11752$_{as}$
			11785$_{as}$		
2005-2100		Radio Damascus, Syria	12085$_{na}$	15095$_{na}$	
2010-2100	sa	Voice of Kenya, Nairobi	4934$_{do}$		
2015-2030		Voix de la Revolution Benin	4870$_{af}$	5025$_{af}$	
2015-2045	sth	Voice of Resistance of Black Cockerel (Angolan clandestine)	9700$_{af}$		
2025-2045		RAI, Rome, Italy	7235$_{me}$	9575$_{me}$	11800$_{me}$
2030-2100		Radio Cairo, Egypt	15375$_{af}$		
2030-2100		Radio Korea, Seoul, s.Korea	6480$_{eu}$	7550$_{af}$	15575$_{eu}$
2030-2100		Radio Netherlands, Hilversum	9895$_{af}$	11660$_{af}$	13700$_{af}$
2030-2100		Voice of Vietnam, Hanoi	9840$_{eu}$	12020$_{eu}$	15010$_{eu}$
2045-2100		All India Radio, Delhi	7412$_{eu}$	9665$_{eu}$	9910$_{eu}$
			11620$_{eu}$	11715$_{eu}$	15265$_{eu}$
2050-2100		Vatican Radio, Vatican City	6248$_{eu}$	7250$_{eu}$	

2100 UTC [4:00 PM EST/1:00 PM PST]

FREQUENCIES

2100-2105		Radio Damascus, Syria	12085$_{na}$	15095$_{na}$	
2100-2110		Malawi B'casting Corp., Blantyre	3381$_{do}$		
2100-2110		Vatican Radio, Vatican City	6248$_{eu}$	7250$_{eu}$	
2100-2111	smtwhf	Radio New Zealand Int'l	15130$_{pa}$		
2100-2125		Radio Netherlands, Hilversum	9895$_{af}$	11660$_{af}$	13700$_{af}$
2100-2130		King of Hope, Lebanon	6280$_{me}$		
2100-2130		Radio Norway, Oslo	11855$_{na}$		
2100-2130		Radio Budapest, Hungary	6110$_{eu}$	7220$_{eu}$	9520$_{eu}$
			9585$_{eu}$	9835$_{eu}$	11910$_{eu}$
2100-2130		Radio Romania Int'l, Bucharest	5990$_{eu}$	6105$_{eu}$	7105$_{eu}$
			7195$_{eu}$	9690$_{eu}$	
2100-2130		Swiss Radio Int'l, Bern	12035$_{af}$	13635$_{af}$	15525$_{af}$
2100-2130		Vatican Radio, Vatican City	17710$_{af}$	17730$_{af}$	21650$_{af}$
2100-2150		Deutsche Welle, Koln, Germany	9760$_{as}$	9765$_{as}$	11785$_{as}$
			13780$_{as}$	15350$_{as}$	
2100-2200		Radio Kiev, Ukranian SSR	6185$_{eu}$		
2100-2200		Radio 1, Accra, Ghana[1]	4915$_{do}$		
2100-2200		Radio 2, Accra, Ghana	7295$_{do}$		
2100-2200		Radio Africa, Equatorial Guinea	7190$_{af}$		
2100-2200		Radio Baghdad, Iraq	13660$_{eu}$		
2100-2200		Radio Beijing, China	4130$_{eu}$	9920$_{eu}$	11500$_{eu}$
2100-2200		Radio Cairo, Egypt	15375$_{af}$		
2100-2200		SLBC Sri Lanka	15120$_{as}$		
2100-2200		Radio Luxembourg	15350om		
2100-2200		Radio for Peace Int'l, Costa Rica	13660	21566	25945 all am
2100-2200		R. Nacional de Angola, Luanda	3355$_{af}$	9535$_{af}$	
2100-2200		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
2100-2200		Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
2100-2200		SLBS, Freetown, Sierra Leone	3316$_{do}$		
2100-2200	mwf	Tristan Radio, Tristan da Cunha	3290$_{do}$		
2100-2200		Radio Moscow World Service	7170	7235	7315
			9765	9795	9830
			9875	11630	11840
			15475	17570	
2100-2200		Voice of America, Washington	15410$_{af}$	15580$_{af}$	17800$_{af}$
			21485$_{af}$	21625$_{af}$	
2100-2200		BBC London, England	5975$_{va}$	7325$_{va}$	9410$_{va}$
			12095$_{va}$	15070$_{va}$	17885$_{va}$
2100-2200		KTBN Salt Lake City, Utah	15590		
2100-2200		WHRI Noblesville, Indiana	13760	17830	
2100-2200		WRNO New Orleans, Louisiana	15420		
2100-2200		WWCR Nashville, Tennessee	15690		
2100-2200		Christian Science World Svc	9495	13625	13770
			15310	15610	17555
2100-2200		WYFR Okeechobee, Florida	9455	11830	15215
			15355	15440	17612
			21525		
2100-2200		KVOH Los Angeles, California	17775		
2100-2200		Voice of America, Washington	6040$_{va}$	6180$_{va}$	9700$_{va}$
			9760$_{va}$	11710$_{va}$	11870$_{as}$
			11960$_{va}$	15185$_{as}$	15205$_{va}$
			17735$_{as}$		
2100-2200		Voice of Peace, Baghdad, Iraq	6055$_{me}$	11860$_{me}$	21675$_{me}$
2100-2200		Voice of Turkey, Ankara	9795$_{eu}$		
2110-2200		Radio Damascus, Syria	12085$_{na}$	15095$_{na}$	
2111-2200	mtwhfa	Radio New Zealand Int'l	17770$_{pa}$		
2115-2200		Radio Cairo, Egypt	9900$_{eu}$		
2115-2130	s	R. Republik Indonesia Jayapura	6070$_{do}$		
2130-2145		Radio Buea, Cameroon[1]	3970$_{do}$		
2130-2200		UAE RAdio, Dubai	11795$_{na}$	13675$_{na}$	15320$_{na}$
			15400$_{na}$		
2130-2200		HCJB Quito, Ecuador	21455$_{eu}$	21480$_{eu}$	
2130-2200	smtwhf	King of Hope, Lebanon	6280$_{me}$		
2130-2200		Radio Sofia, Bulgaria	6070$_{eu}$	7155$_{eu}$	9700$_{eu}$
2145-2200		Cameroon Radio-TV, Yaounde	4850$_{na}$		

2200 UTC [5:00 PM EST/2:00 PM PST]

FREQUENCIES

2200-2210		Radio Bafoussam, Cameroon[1]	4000$_{do}$		
2200-2210		Radio Damascus, Syria	12085$_{na}$	15095$_{na}$	
2200-2215		Cameroon Radio-TV, Yaounde	4850$_{na}$		
2200-2215		Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
2200-2218		RTV Congolaise, Brazzaville	4765$_{do}$	5985$_{do}$	
2200-2225		BRT, Brussels, Belgium	5910$_{eu}$	9925$_{eu}$	15515$_{af}$
2200-2225		RAI, Rome, Italy	5990$_{as}$	9710$_{as}$	11800$_{as}$
2200-2230		All India Radio, Delhi	7412$_{eu}$	9665$_{eu}$	9910$_{eu}$
			11620$_{eu}$	11715$_{eu}$	15265$_{eu}$
2200-2230		Radio Beijing, China	3985$_{eu}$		
2200-2230	a	Radio Republik Indonesia Kupang	3385$_{do}$	4805$_{do}$	
2200-2230		Radio Prague, Czechoslovakia	5930$_{eu}$	6055$_{eu}$	7345$_{eu}$
2200-2230	s	KGEI San Fransisco, California	15280$_{sa}$		
2200-2230		Radio Sweden, Stockholm	6065$_{va}$		
2200-2230		Voice of the UAE, Abu Dhabi United Arab Emirates	9600$_{??}$	11985$_{??}$	13605$_{??}$
2200-2245		Radio Cairo, Egypt	9900$_{eu}$		
2200-2300		DZAS,Metro-Manila,Philippines[1]	6030$_{do}$		
2200-2300		Radio 1, Accra, Ghana[1]	4915$_{do}$		
2200-2300		Radio 2, Accra, Ghana	7295$_{do}$		
2200-2300		Radio for Peace Int'l, Costa Rica	13660	21566	25945 all am
2200-2300	sa	Radio Africa, Equatorial Guinea	7190$_{af}$		
2200-2300		Radio Baghdad, Iraq	13660$_{eu}$		
2200-2300		Radio Havana Cuba	7215$_{eu}$		
2200-2300		Radio Luxembourg	15350$_{om}$		
2200-2300	smtwhf	Radio New Zealand Int'l	17770$_{pa}$		
2200-2300		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
2200-2300	smtwha	RTV Malaysia, Radio 4	7295$_{do}$		
2200-2300		Radio Canada Int'l, Montreal	9760	11705	11945
2200-2300		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
2200-2300		KTBN Salt Lake City, Utah	15590		
2200-2300		WHRI Noblesville, Indiana	13760	17830	
2200-2300		WRNO New Orleans, Louisiana	15420		
2200-2300		WWCR Nashville, Tennessee	15690		
2200-2300		Christian Science World Svc	9465	15300	15610
			17555		
2200-2300		WYFR Okeechobee, Florida	15215	15440	17612
2200-2300		SLBS, Freetown, Sierra Leone	3316$_{do}$		
2200-2300		Radio Moscow World Service	7170	7235	7315
			9765	9795	9830
			9875	11630	11840
			15475	17570	
2200-2300		Voice of America, Washington	7120$_{as}$	9530$_{va}$	9770$_{as}$
			11760$_{as}$	11905$_{va}$	11960$_{va}$
			15185$_{as}$	15225$_{va}$	15290$_{as}$
			15305$_{as}$	15445$_{va}$	17735$_{as}$
			17820$_{as}$	17885$_{va}$	
2200-2300		BBC London, England	5975$_{va}$	7325$_{va}$	9410$_{va}$
			12095$_{va}$	15070$_{va}$	17885$_{va}$
2200-2300		Voice of Free China, Taiwan	5950$_{na}$	9852$_{eu}$	11805$_{eu}$
			11740$_{ca}$	11860$_{as}$	15345$_{as}$
2200-2300		Voice of Peace, Baghdad, Iraq	6055$_{me}$	11860$_{me}$	21675$_{me}$
2205-2300		Vatican Radio, Vatican City	7125$_{as}$	9615$_{as}$	11830$_{as}$
2230-2300		Capital Radio, Abu Dhabi United Arab Emirates	9600$_{??}$	11985$_{??}$	13605$_{??}$
2230-2300		Kol Israel, Jerusalem	7465$_{na}$	9435$_{na}$	11605$_{na}$
			11655$_{na}$	17575$_{sa}$	
2230-2300		Radio Sofia, Bulgaria	9700$_{eu}$	11680$_{eu}$	
2230-2300		Radio Tirana, Albania	7215$_{eu}$	9480$_{eu}$	
2230-2300		Radio Vilnius, Lithuania, USSR	6100$_{eu}$	9675$_{eu}$	
2230-2300		Swiss Radio Int'l, Bern[1]	6190$_{eu}$		
2245-2300		Voice of Greece, Athens	9425$_{am}$	12105$_{am}$	

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English language

shortwave guide

2300 UTC [6:00 PM EST/3:00 PM PST]

FREQUENCIES

2300-2315		DZAS, Metro-Manila, Philippines[1]	6030$_{do}$			
2300-2305		Radio 1, Accra, Ghana[1]	4915$_{do}$			
2300-2305		Radio 2, Accra, Ghana	7295$_{do}$			
2300-2330		Radio Sofia, Bulgaria	9700$_{eu}$	11680$_{eu}$		
2300-2330		Radio Vilnius, Lithuania, USSR	6100$_{am}$	7400$_{am}$	9750$_{am}$	
			15180$_{am}$	17690$_{am}$	17720$_{am}$	
2300-2330		Vatican Radio, Vatican City[mu]	6185$_{eu}$			
2300-0000		Radio Luxembourg	15350$_{om}$			
2300-0000	smtwhf	Radio New Zealand Int'l	17770$_{pa}$			
2300-0000		Radio Pyongyang, North Korea	11700$_{na}$	13650$_{na}$		
2300-0000		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$	
2300-0000	smtwha	RTV Malaysia, Radio 4	7295$_{do}$			
2300-2000		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$	
2300-0000		SLBS, Freetown, Sierra Leone	3316$_{do}$			
2300-0000		KTBN Salt Lake City, Utah	15590			
2300-0000		WHRI Noblesville, Indiana	9495	13760		
2300-0000		WRNO New Orleans, Louisiana	15420			
2300-0000		WWCR Nashville, Tennessee	15690			
2300-0000		KSDA Guam	15610$_{as}$			
2300-0000		Radio for Peace Int'l, Costa Rica	13660	21566	25945	all am
2300-0000		Radio Japan, Tokyo	11735$_{eu}$	11815$_{am}$	15195$_{as}$	
			15230$_{am}$	17810$_{pa}$	21610$_{as}$	
2300-0000		Christian Science World Svc	9465	15275	15300	
			15610	17555		
2300-0000		WYFR Okeechobee, Florida	5985$_{na}$	11915$_{na}$		
2300-0000		Radio Moscow North American S	9530$_{na}$	9685$_{na}$	972$_{na}$	
			11735$_{na}$	11860$_{na}$	11950$_{na}$	
			12050$_{na}$	15425$_{na}$	17605$_{na}$	
			17665$_{na}$	17700$_{na}$	21480$_{na}$	
2300-0000		BBC London, England	5975$_{va}$	7325$_{va}$	9410$_{va}$	
			12095$_{va}$	15070$_{va}$	17885$_{va}$	
2300-0000		Voice of America, Washington	7120$_{as}$	9530$_{va}$	9770$_{as}$	
			11760$_{as}$	11905$_{va}$	11960$_{va}$	
			15185$_{as}$	15225$_{va}$	15290$_{as}$	
			15305$_{as}$	15445$_{va}$	17735$_{as}$	
			17820$_{as}$	17885$_{va}$		
2300-0000		Voice of Turkey, Ankara	9445$_{na}$	9665$_{me}$	9685$_{eu}$	
			17760$_{as}$			
2300-0000		UAE Radio, Dubai	11795$_{na}$	13675$_{na}$	15320$_{na}$	
			15400$_{na}$			
2305-2355		Radio Polonia, Warsaw	7270$_{eu}$			
2315-0000		All India Radio, Delhi	9535$_{as}$	9910$_{as}$	11715$_{as}$	
			11745$_{as}$	15110$_{as}$		
2330-0000		Radio Sweden, Stockholm	9695$_{la}$	11705$_{la}$		
2330-0000		Radio Tirana, Albania	6120$_{na}$	9760$_{na}$	11825$_{na}$	
2330-0000		Voice of Vietnam, Hanoi	9840$_{as}$	12020$_{as}$	15010$_{as}$	
2335-2345	smtwhf	Voice of Greece, Athens	9425	11645	12105	

PROGRAMS

Sundays

2300 KSDA, Guam: Family Matters. Advice for dealing with family life in today's culture.
2305 BBC: Words of Faith. See S 0540.
2310 BBC: Book Choice. See S 0225.
2310 Voice of America: Newsline. News, correspondent reports, interviews, and opinion.
2315 BBC: Letter from America. See S 0545.
2315 KSDA, Guam: Bible in Living Sound. Dramatized Bible stories.
2330 BBC: Feature. See S 1401.
2330 KSDA, Guam: Voice of Prophecy. See S 0030.
2330 Voice of America: VOA Morning. See S 0010.

Mondays

2300 KSDA, Guam: Family Matters. See S 2300.
2305 BBC: Commentary. Background to the news from a wide range of specialists.
2310 BBC: Financial News. News of commodity prices and significant moves in currency and stock markets.
2310 Voice of America: Newsline. See S 2310.
2315 BBC: Growing Points in Medicine. Developments in medical technology.
2315 KSDA, Guam: Bible in Living Sound. See S 2315.
2330 BBC: Multitrack 1: Top 20. Tim Smith presents what's hot on the British pop music .e
charts.
2330 KSDA, Guam: Voice of Prophecy. See S 0030.
2330 Voice of America: VOA Morning. See S 0010.

Tuesdays

2300 KSDA, Guam: Family Matters. See S 2300.
2305 BBC: Commentary. See M 2305.
2310 BBC: Financial News. See M 2310.
2310 Voice of America: Newsline. See S 2310.
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.
2330 Voice of America: VOA Morning. See S 0010.

Wednesdays

2300 KSDA, Guam: Family Matters. See S 2300.
2305 BBC: Commentary. See M 2305.
2310 BBC: Financial News. See M 2310.
2310 Voice of America: Newsline. See S 2310.
2315 BBC: Cooking the Books (except April 24th: Good Books). See M 0315.
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.
2330 Voice of America: VOA Morning. See S 0010.

Thursdays

2300 KSDA, Guam: Family Matters. See S 2300.
2305 BBC: Commentary. See M 2305.
2310 BBC: Financial News. See M 2310.
2310 Voice of America: Newsline. See S 2310.
2315 BBC: Music Review. Classical music events and developments from around the world.
2315 KSDA, Guam: Bible in Living Sound. See S 2315.
2330 KSDA, Guam: Voice of Prophecy. See S 0030.
2330 Voice of America: VOA Morning. See S 0010.

Fridays

2300 KSDA, Guam: Family Matters. See S 2300.
2305 BBC: Commentary. See M 2305.
2310 BBC: Financial News. See M 2310.
2310 Voice of America: VOA Morning. See S 0010.
2315 BBC: Worldbrief. A roundup of the week's news headlines and human-interest happenings.
2315 KSDA, Guam: Bible in Living Sound. See S 2315.
2330 BBC: Multitrack 3. Sarah Ward surveys the British alternative music scene.
2330 KSDA, Guam: Voice of Prophecy. See S 0030.

Saturdays

2300 KSDA, Guam: Micronesia Snapshots. See A 1600.
2305 BBC: Words of Faith. See S 0540.
2310 BBC: Book Choice. See S 0245.
2310 Voice of America: Newsline. See S 2310.
2315 BBC: A Jolly Good Show. See T 1515.
2315 KSDA, Guam: Focus on Living. See A 0215.
2330 KSDA, Guam: DX Aslawaves. See S 0230.
2330 Voice of America: VOA Morning. See S 0010.
2345 KSDA, Guam: Probe. See S 0245.

The head of the BBC's German Service, Michael Kaye.

The Scan-tastic Duo!

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ICOM R7000

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The elements are arranged on a 24-inch support pipe equipped with two strong mounting brackets to accommodate any standard mast-pipe (1" to 2-1/4" diameter).

Coax must be ordered separately.

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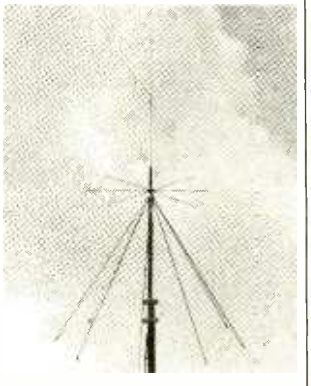

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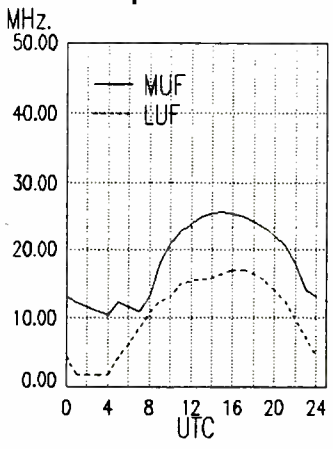
shortwave guide

How to use the propagation charts

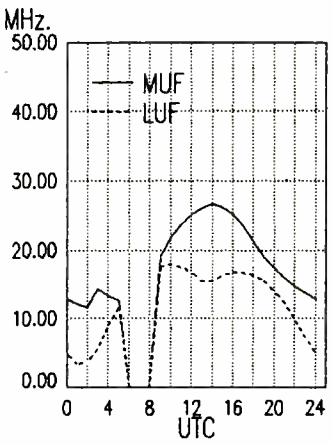
Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location (they are divided into east coast, midwest and west coast of North America). Then look for the one most closely describing the geographic location of the station you want to hear.

Conditions for areas EAST of the Mississippi and ...

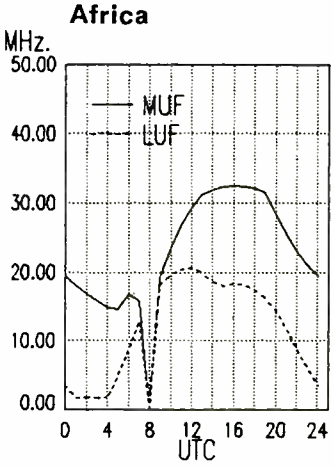
Europe



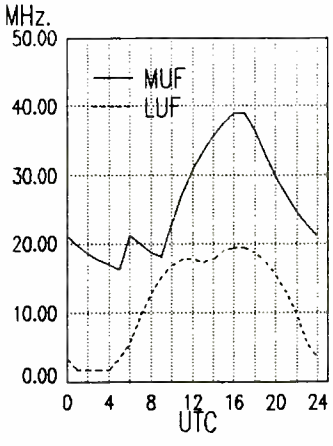
Middle East



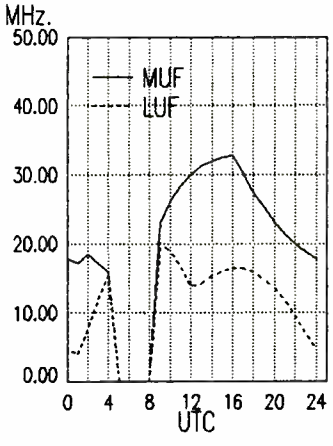
Africa



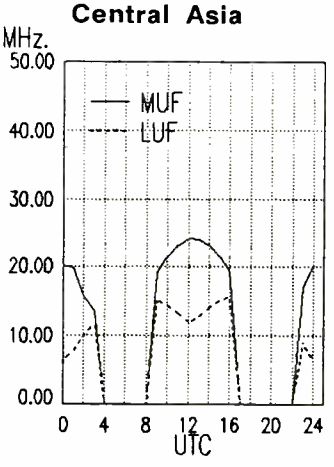
South Africa



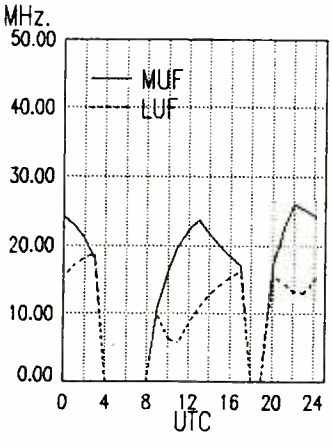
Indian Ocean



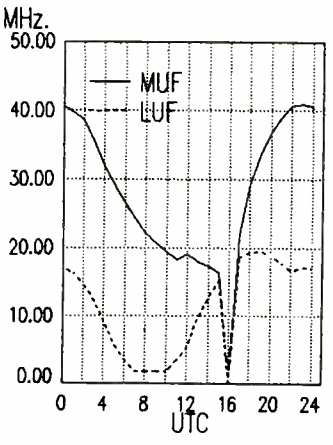
Central Asia



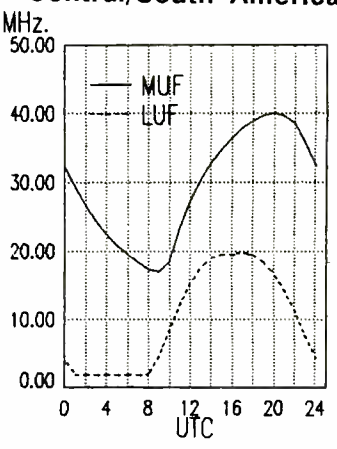
Far East



Australia/Pacific



Central/South America

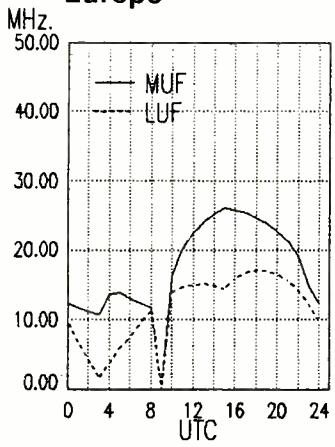


Once you've located the correct charts, look along the horizontal axis of the graph for the time that you are listening. The top line of the graph shows the Maximum Usable Frequency (MUF) and the lower line the Lowest Usable Frequency (LUF) as indicated on the vertical axis of the graph.

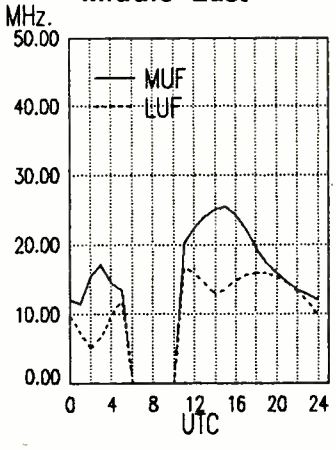
While there are exceptions to every rule (especially those regarding shortwave listening), you should find the charts helpful in determining the best times to listen for particular regions of the world. Good luck!

Conditions for areas WEST of the Mississippi and ...

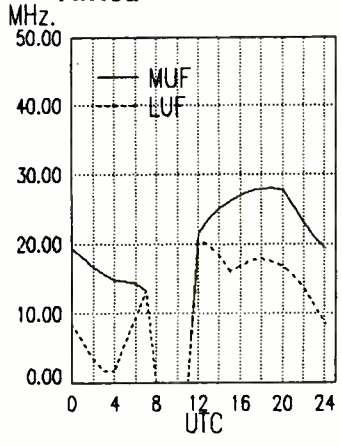
Europe



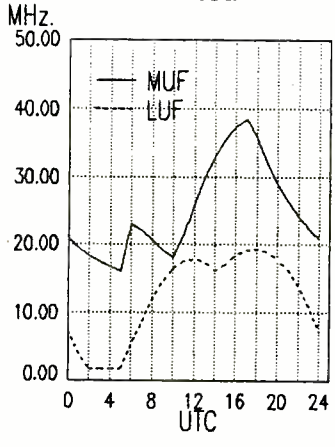
Middle East



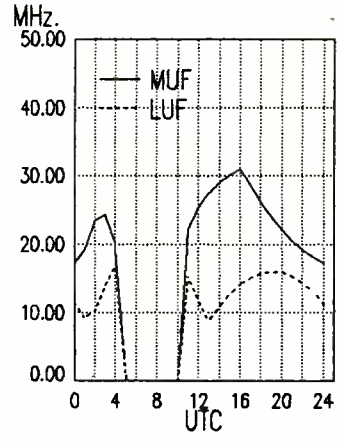
Africa



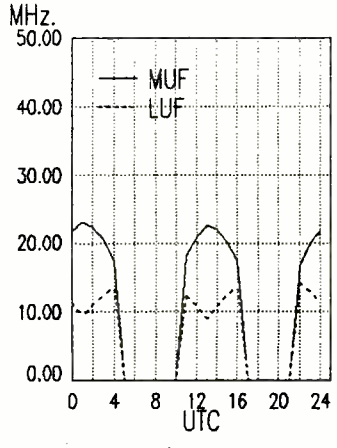
South Africa



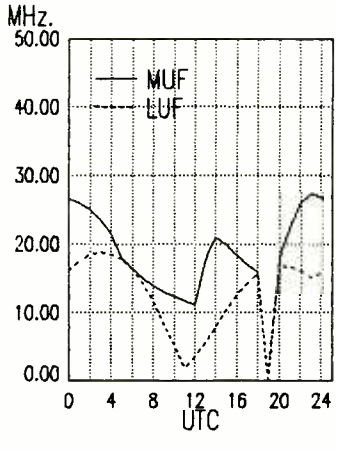
Indian Ocean



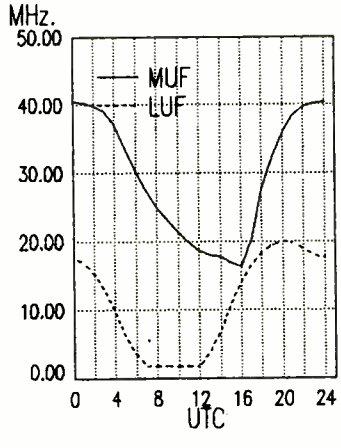
Central Asia



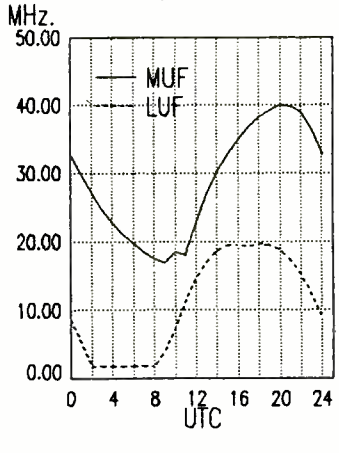
Far East



Australia/Pacific



Central/South America



Lawrence Magne

Editor-in-Chief
Passport to World Band Radio

The Cheapest Shortwave Portable

"How cheap is it?"

While lots of us are willing to cough up $200 or more for a good digital portable, many other folks decide beforehand what they're willing to spend, then find a radio to fit that price.

These often are newcomers, unfamiliar with the rigors of shortwave. Fast-buck merchants cater to their naivete, with the result that we've seen plenty of el cheapo world band clunkers emerge as of late.

Some well-meaning radio enthusiasts don't help matters, either, when in their missionary zeal they emphasize the availability of models under $100. You know how this reasoning goes: If people can just hear some of those wonderful, squeaky signals, they'll become converts to the "hobby."

Some do. But for every radio hobbyist, there are probably 100 world band program listeners who think of shortwave as just another source of information. These program listeners aren't enticed by noisy reception or vague dials that don't show them where the radio's tuned. Instead, they're turned off by these shortcomings, and after they've encountered them tend to walk away from the medium for good once the novelty has worn off.

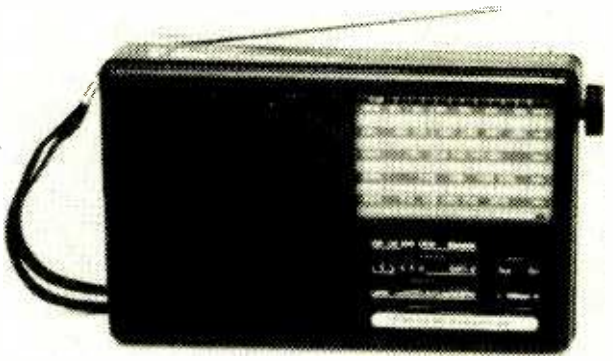
Under $32, Delivered

Still, we all hope to come across a world band radio that does a nice, serviceable job for under $100. With this in mind, at *Passport to World Band Radio* we just completed testing of a really cheap new Chinese-made compact portable, sold in the United States as the Pomtrex model 120-00300.

We ordered one from the only firm we know of that sells them, a group called "For the People." For the People is a populist consumers organization that broadcasts over world band station WWCR in Nashville. So their motive in selling radios appears to be not only to make money, but also to attract and hold listeners.

We ordered a Pomtrex from For the People on October 26th of last year, but it was a full three months before we received it. For the People explained to *Passport* that the radios had been temporarily out of stock, which is understandable. But they had gone ahead and charged our credit card, anyway. In effect, this put us and their other their customers in the position of having provided them with an interest-free three-month loan.

For the People sells the Pomtrex for the princely sum of $31.45, including shipping, so the extra buck in interest isn't hard to swallow. And once a shipment of radios finally comes in from China, they whisk them off to customers by no less than Priority Mail.



Simple Radio, Decent Performance

So, what do you get for $31 and change?

The Pomtrex covers longwave, FM, and AM up to around 1650 kHz, so it misses the upper five channels or so of the forthcoming expanded AM band in the Americas. As to the shortwave spectrum, world band coverage is approximately from 5800-6300, 7000-7600, 9420-9950, 11400-11990, 15050-15650 and 17400-18200 kHz in the 49, 41, 31, 25, 19 and 16 meter bands.

For a radio in this price range, that's good coverage, but you'll miss the 22 and 13 meter bands, which aren't covered at all, plus the upper 100 kHz or so of the 25 meter band. Too bad they don't offer a version with 22 meter coverage in lieu of the useless (in America) longwave band.

The controls are downright basic -- power, hi-lo tone, volume, a tuning knob, and a pair of band selector switches. There's also the usual earpiece socket and a socket for an outboard 6V power supply, although it doesn't come with an earpiece or that supply. To top it off, there's a carrying strap and a single LED signal indicator. Again, for the price this is all quite reasonable.

The Pomtrex is a bandspreaded analog model, so you tune using a traditional needle and dial -- not a digital readout. That's hardly high tech, but again for the price it's at least what you would expect, although some of the dial numbers -- gold on grey -- are hard to read. In fact, most other models in this price range don't have bandspreaded dials at all, which forces you to poke blindly through the shortwave spectrum with virtually no indication of where you're tuned.

So far, so good, and now you're probably waiting for the shoe to drop. Well, like Saddam Hussein's huge counteroffensive that we all expected but never came, there's no shoe to drop. The Pomtrex works pretty well, all considered.

Sensitivity, while no great shakes, is perfectly acceptable for most program listening, and better than some models we've tested that cost nearly twice as much. Selectivity fares less well, with strong stations 10 kHz, or two channels, away sometimes bothering the station you're trying to hear. As with virtually all cheap sets, the Pomtrex is single-conversion, which means that the dih-dih-dah interference from "images," or ghost signals, is a real nuisance. Audio quality is only fair, but it's better than some miniature models we've tested costing several times as much.

So, the bottom line is that while the Pomtrex is no Lamborghini, it's no Yugo, either. Overall, it's the best model we've tested at *Passport to World Band Radio* that sells for under $50, and better than some costing around $100.

While there's no dropping shoe, there is a falling sock or two. First, the telescopic antenna doesn't rotate at its swivel. This is a nuisance, and also makes the antenna more susceptible to breaking. Next, the battery clips are really flimsy, and it's hard to install the four "AA" batteries the set requires. And while we have no frequency-of-repair data on this model, other cheap Chinese-made sets have tended to act up more than most.

14-Day Free Trial Period

Fortunately, if the set comes dead on arrival, For the People will exchange it for a new one within 30 days of when you bought it. More good news: If you are not satisfied with the radio for any reason, you can return it for a full refund within 14 days. One can but wish that most other vendors would provide such equitable terms for their customers!

Unfortunately, after those first 30 days you're pretty much on your own, as the U.S. distributor's warranty is a joke. The set is warranted by the distributor, MCE Industries, Inc., of Hallandale, Florida, for 90 days which, although brief, is acceptable.

But to get it fixed during the 60 days between For the People's 30-day exchange period and the expiration of the distributor's 90-day warranty period, you have to send in $14, plus pay for shipping to MCE. That's at least half the cost of the set just to have it repaired during the warranty!

Bottom Line: A Reasonable Second Set for Traveling

It's hard to recommend any radio without digital tuning, and with mediocre selectivity and image rejection, to boot. But the Pomtrex is about as close to a cheapskate's world band Volksradio as we've seen. Listening to this radio day-in-and-day-out might make for tough sledding.

But if you need a second radio to take on trips, for example, it makes good sense. If it gets lost or stolen, or falls in the pool, it's no big deal. And these days, you have to reckon on the possibility that eager airport security personnel might pry open your set and mess it up. (This has happened to a number of international travelers in recent months.)

For the People isn't the easiest organization to reach, but we have managed to track it down at its new offices in Florida. You can order by telephone from World Band Sales at 904/397-4145 (or fax 904/397-4149) by credit card, or send a check to World Band Sales, For the People, Telford Hotel, 3 River Street, White Springs FL 32096. As we go to press, they inform me that the factory in China is slowly chewing away at their back orders. So, they tell us, expect delivery within 6-8 weeks.

You can hear Larry Magne's equipment reviews the first Saturday of each month, plus PASSPORT editors Don Jensen and Tony Jones the third Saturday, over Radio Canada's "SWL Digest." For North America, "SWL Digest" is heard at 7:35 PM ET on 5960 and 9755 kHz, with a repeat Tuesday at 8:30 AM ET on 9635, 11855 and 17820 kHz.

PASSPORT'S "RDI White Paper" equipment reports contain everything found during its exhaustive tests of communications receivers, antennas and advanced portables. These reports are now available in the U.S. from Universal Shortwave, EEB and DX Radio Supply; in Canada from PIF, C.P. 232, L.d.R., Laval PQ H7N 4Z9; in Europe from Interbooks, 8 Abbot Street, Perth PH2 0EB, Scotland, and Lowe Electronics stores; and in Japan from IBS-Japan, 5-31-6 Tamanawa, Kamakura 247. For a complete list of reports, send a self-addressed stamped envelope to RDI White Papers, Box 300M, Penn's Park PA 18943 USA.

Bob Grove, WA4PYQ

Trident "Driver's Information System"

Monitoring Times has always stayed away from reviews of non-listening-related accessories like CB transceivers and radar detectors, but a new product has crossed this desk that was so tantalizing that it required further investigation.

The following review in no way condones radar speed detecting devices as a means of escaping legitimate law enforcement attempts to control highway safety. If a driver purposely ignores the rules of safe driving he deserves to be caught. The Trident is a scanning receiver which just happens to have a radar detector in it--and that's hard to ignore!

One more caveat: There are states which ban the use of radar detectors in a motor vehicle, and there are states which ban police scanners as well (see the new Grove Listener's Lawbook). This product is a double threat on the highways!

* * * * * * *

For the highway traveler, few electronic accessories offer the flexibility of the new $384 Trident "Driver's Information System (formerly manufactured by Trycomm Information Systems, now owned and distributed by Ace Communications, 10707 E. 106th St., Indianapolis, IN 46038; ph. 1-800-445-7115)

A compact composite of CB receiver, police monitor, weather radio and radar detector, the Trident measures a scant 5-1/2"W x 1-1/2"H x 5"D and weighs in at 2 pounds. Its rugged metal cabinet mates with a slide-in mount for dashboard or sun visor installation. A soft fabric-texture storage pouch is included.

The unit is powered by the vehicle's 12 volt system (cigarette lighter coil-cord included). While the Trident has its own internal two-inch speaker, a rear-apron jack is provided for an external 8-ohm speaker.

There is also a jack which is intended to drive an external alarm device for radar detection; when connected to an appropriate accessory, the Trident will put +5 volts DC on the terminal of this jack to activate the external alarm. In the meantime, however, the Triden will also signal through its own speaker and indicate relative signal strength of the detected radar signal by a row of LEDs.

A right-angle, BNC-base flex whip is included for short-range operation; plan on reception under ideal conditions of only a few miles with this configuration. For longer distance radio reception, a standard mobile scanner antenna should be used; it will offer remarkably better range.

FUNCTIONS:

CB Monitoring

To monitor CB, simply press the CB key; the unit defaults to channel 19 for highway monitoring, but may be moved up and down in frequency to cover the full 40 CB channels by pressing the arrow keys.

Weather Broadcasts

All NOAA National Weather Service channels are preprogrammed into the Trident. To hear the nearest weather broadcast, simply press the POLICE key, then the appropriate arrow key until WE appears alphabetically in the display window.

Law Enforcement Listening

The Trident comes preprogrammed for all police frequencies--city, county and state--for the fifty states. To activate this capability for monitoring, the user presses POLICE, then the appropriate arrow keys until his two-letter state abbreviation illuminates the display window.

At this point, sequential pressing of the POLICE key will select state, state plus county, and state plus county plus city.

ICOM UPDATE

Sources close to the industry report no new developments in the stalemated negotiations between ICOM America and Uniden Corporation of America which have prevented the sales of the new R1, R100 and R72 scanning receivers. ICOM has never distributed or sold units in the United States and even the small number of evaluation units sent to corporate headquarters for approval has been returned.

A number of importers are advertising R1 scanner units for sale in the United States; buyers should be aware that ICOM will not service these units. Be sure to get a written guarantee for replacement during the warranty period since defective units must be returned to their overseas dealers for warranty repair.

Channels are scanned at a brisk 60 per second.

If an interesting channel comes up during scan, simply press HOLD to secure that channel; when you wish to resume scanning, press CONT to continue.

We are all bothered from time to time by interference on various channels. To skip a channel in the scan sequence which is experiencing interference, or merely to avoid having to listen to an active channel which holds no interest for your monitoring, a delete key is pressed, temporarily removing the unwanted channel from the scan sequence. Deleted channels are automatically restored when the Trident is switched off, then on again.

For the specialized listening task of watching for mobile repeaters which are often used by state law enforcement agencies running radar, the arrow keys are used to select MR. All FCC-allocated mobile repeater channels, stored permanently in the Trident's indelible memory, are then rapidly scanned for any sign of activity.

Speed Radar Detection

Pressing RADAR activates the dual-band (X and K) radar detector; a second press reduces the range for using it in high falsing areas (interference which causes false radar alarms). The radar function may be chosen to operate simultaneously with other modes and will override when it detects a signal.

A logical question that readers may ask at this point is, "How does the Trident radar detector compare with a conventional radar detector?" According to *Roundel* magazine's new products editor, Dick Lewis, the Trident's sensitivity and duration was virtually identical to the famous Escort.

While no specifications are included in the otherwise excellent user's manual, actual off-the-air monitoring in the *MT* lab showed the Trident to be as sensitive as most scanners. The audio quality excellent for such a small speaker, but it was only loud enough for our acoustically quiet environment. In a noisy vehicular environment, an external speaker would be almost mandatory.

For the consummate collector of automotive electronics, the little Trident will prove itself a pleasing and useful addition.

SKIPPING DVP CHANNELS

Scanner enthusiasts often complain that it's bad enough they can't hear DVP-scrambled law enforcement transmissions, but the scanner stops on those channels anyway, battering their eardrums with the digital noise. Victor Gadzik of North Tonawanda, New York, has a partial solution.

His Realistic PRO2005 squelch uses a combination of carrier and sound squelch. By rotating the squelch control fully clockwise, the scanner interprets the DVP as random noise and skips the channel when DVP is present. This trick should work with the PRO2004 and 2006 as well, but keep in mind that this squelch setting only allows strong signals to be detected. It won't work at all on scanners with conventional carrier squelch.

Doug DeMaw

A Double Sideband/CW Module

The heart of a single-sideband (SSB) transmitter is actually a double-sideband (DSB) suppressed-carrier generator. The principal difference in the circuits is that in an SSB generator we have a sideband filter that follows the balanced modulator. This filter generally has a 3 dB bandwidth of 2.2 to 2.7 kHz.

The filter rejects the unwanted sideband (upper or lower) by placing the carrier-generator signal approximately 20 dB down on the upper or lower frequency slope of the filter curve (Figure 1). Although this may seem a bit complicated for those of you who are not electronics wizards, the principle is quite old. In simple language we can consider the filter as a device that shears off the unwanted sideband during voice transmissions.

Mechanics of a DSB generator

It is important to suppress the carrier in a DSB or SSB transmitter. This is done by using a *balanced modulator* that contains diodes, discrete transistors or ICs. A well-designed SSB transmitter exhibits 50 dB or greater carrier suppression when the balance is correct. The SSB filter helps to suppress the carrier. It is possible to have up to 40 dB of carrier suppression in a DSB system if attention is paid to physical and electrical symmetry.

DSB transmitters provide two advantages over SSB and AM transmitters: 1. The interfering carrier is practically eliminated and 2. the circuit is simple and inexpensive to build. The disadvantage of DSB is that you transmit upper and lower sideband energy at the same time. This causes the signal to be twice as wide as that of an SSB transmitter. It can create unnecessary interference to stations that are nearby in frequency.

It is for this reason that I restrict my DSB activity to low-power (QRP) communications and to emergency operations. Interference from a low-power transmitter (10 watts or less) is seldom a problem for others who share an amateur band with us. On the other hand, it is perfectly legal to use high power DSB in the ham bands. The same is true of AM (amplitude modulation) transmissions.

This month's circuit

Figure 2 shows the schematic diagram of a practical DSB generator. U1 serves as the microphone amplifier. A 600-ohm mic is used with this circuit. A PTT (push to talk) mic is used. D1, D2 and T1 form a singly balanced modulator. The diodes should be matched with an ohmmeter for equal forward resistance. R8 is adjusted to minimize the carrier level. This may be done by attaching a 56-ohm resistor between C12 and ground, then observing the output waveform with a scope. Adjust R8 for minimum waveform amplitude. Alternatively, you may sample the output from Q2 and feed it into a receiver. Adjust R8 for minimum S-meter reading.

Q2 serves as a broadband linear amplifier. It uses negative and degenerative feedback and has a gain of 15 dB. It has an input impedance of 50 ohms and an output impedance of 200 ohms. The overall figure 1 circuit may be used, without changes, from 900 kHz to 40 MHz.

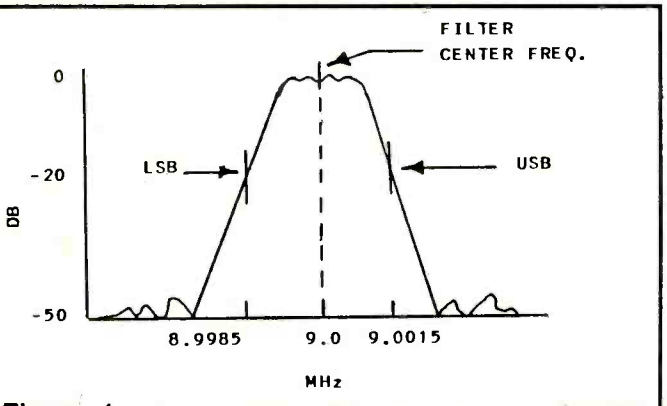


Figure 1 -- Representation of the response for a typical SSB filter. Points are indicated on the response curve for the upper and lower sideband carrier-generator frequencies. The 20 dB points on the curve are approximate. The actual carrier frequencies are dependent upon the characteristics of the filter.

Q1 is a PNP DC keying switch. When R16 is grounded by a key or the control line of the mic, Q1 turns on and provides +12-V for amplifier Q2. This control line may be tied into other controlled circuits of a composite DSB transmitter provided the additional circuits do not draw more than 50 mA. S1 is used to remove the operating voltage from U1 during CW operation. R7 is adjusted for maximum undistorted output from Q2 (monitor the signal with earphones and a receiver that is set for SSB reception).

Applying the DSB module

It is necessary to apply local-oscillator (LO) energy to terminal 1 of T2. The frequency of the VFO or crystal oscillator is chosen for the desired operating frequency (1.9, 3.9, 7.2 MHz, etc). The output of the VFO or crystal oscillator should be between 5.0 and 10 milliwatts (0.5 to 0.7 V rms across 50 ohms) to ensure ample LO injection power. An ideal injection level for diode mixers and balanced modulators is +7 dBm. Terminal 1 of T1 presents a 50-ohm impedance to the carrier-generator oscillator.

SSB operation may be realized by following Q2 with an appropriate SSB crystal or mechanical filter. If this is done, the LO frequency for injecting the balanced modulator (terminal 1 of T1) is set for upper or lower sideband. A simple crystal oscillator may be used. The carrier frequency is approximately 1.5 kHz above or below the filter center frequency, depending upon which sideband (upper or lower) is desired. A mixer must then follow the sideband filter. It is supplied with energy from the output of the filter, plus VFO injection that permits tuning the desired amateur band. The frequency relationship is explained in the *ARRL Handbook* and *Solid State Design for the Radio Amateur* (ARRL).

Increasing the output power

Additional stages of linear amplification are required after Q2 of Figure 2. I would duplicate Q2 as the first stage of the amplifier strip, then employ linear power amplifiers that provide sufficient excitation (about 1 watt) to excite a solid state final amplifier that delivers up to 10 watts of peak output power. Data for such amplifiers is also contained in *Solid State Design for the Radio Amateur*. A harmonic filter should be used at the output of the RF power amplifier.

Construction notes

Most of the parts for this project are available from Oak Hills Research, 20879 Madison St., Big Rapids, MI 49307 (KE8KL owner). Send $1 for his catalog of surplus parts and kits. A drilled PC board for this project is available from FAR Circuits,

18N640 Field Court, Dundee, IL 60118. Ask for a parts-placement guide when you order your PC board (phone: 312-426-2431 for information).

T1 is a broadband trifilar-wound toroidal transformer. Wind three no. 28 wires that have been twisted about eight turns per inch (prior to winding the core) on an Amidon Associates FT-37-43 ferrite toroid. This is a 3/8 inch OD ferrite core with a permeability of 850. Make sure the windings are connected for the proper phasing as indicated by the black dots over T1.

Closing remarks

This can be a project that is fun and educational. It may be your start toward building an SSB transmitter. None of the parts are expensive or hard to locate. In fact, you may build this circuit on a piece of perf board if you wish. Be sure to keep all of the leads short and direct if you do this, and make an effort to provide good symmetry for the D1, D2, T1 and R8 circuitry.

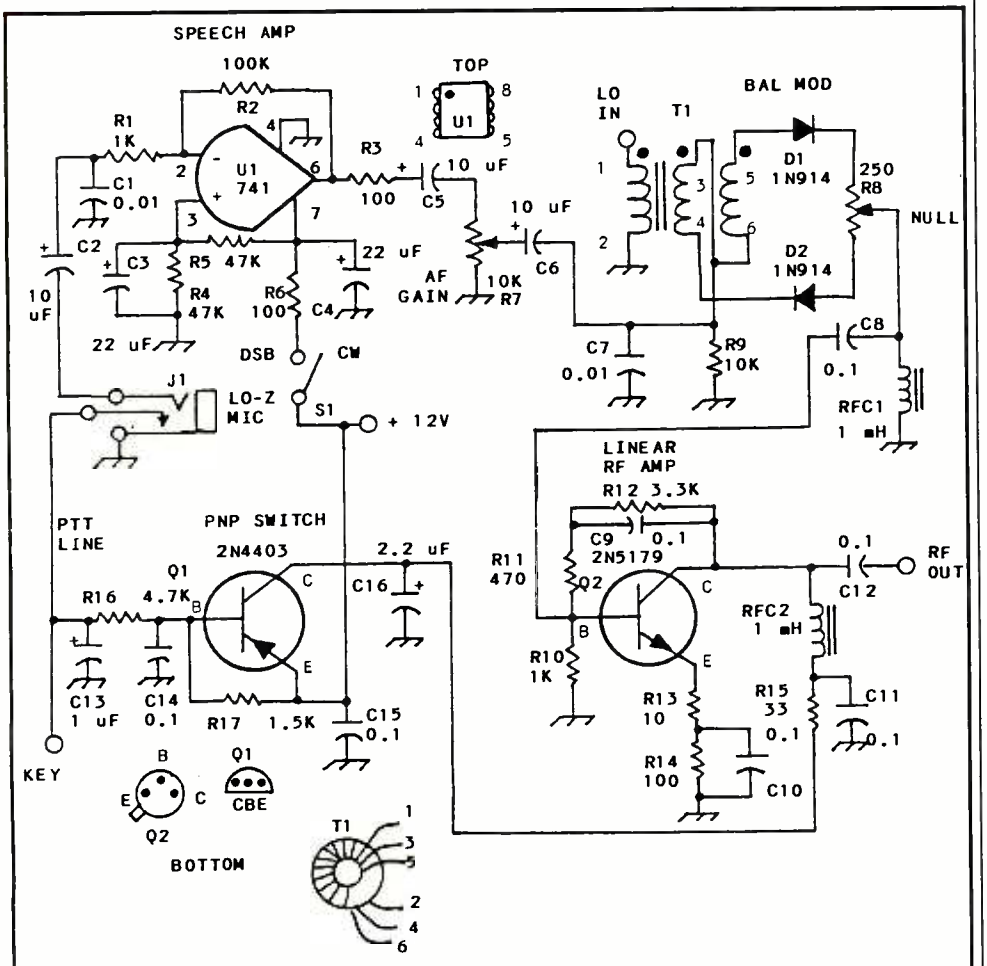


Figure 2 -- DSB Module

Capacitors without polarity marked are disc ceramic. Polarized capacitors are 25-V electrolytic or tantalum. Fixed-value resistors are 1/4-W carbon or carbon film. D1 and D2 are matched 1N914s (see text) or HP-2800 hot-carrier diodes. J1 is a three-circuit mic jack. For R7 use a panel-mounted audio-taper carbon control. R8 is a PC-mount trimmer resistor. RFC1 and RFC2 are miniature 1-mH RF chokes (Mouser Electronics or Oak Hills Research). S1 is a SPST toggle switch. See text for data about T1.

When requesting help from MT columnists, be sure to enclose an SASE (self-addressed, stamped envelope) for their reply.

Rich Arland, K7YHA

A Crystal Set with VOLUME

Taking care of business

Before we get into this month's project, cast your mind back to the December EW column in which I detailed some avenues to get technical data and maintenance manuals for your favorite radio. I also put out a call for assistance in obtaining some schematics and tech data on the older rigs, especially scanners made by Bearcat and Regency (prior to the Uniden takeover), and others.

Jerry Callam of Mt. Vernon, Ohio (yeah, THE Jerry Callam who founded the All Ohio Scanner Club about 10 years ago) wrote to me saying that he had a stockpile of schematics for older scanners and would be willing to help any of our readers.

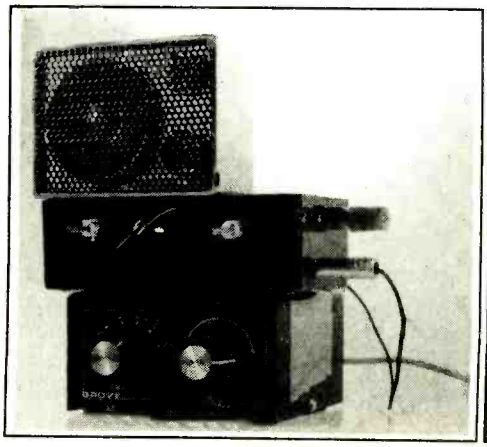
PAY ATTENTION FOLKS. Here is how this will work. Send Jerry a letter indicating the schematic/tech data you need and an SASE. Jerry will then research his stack of tech data and if he has the schematic/tech info you need, he will tell you how much it cost to copy the data plus mailing costs via the SASE. You can then send Jerry a check or money order for the reproduction and mailing costs and Jerry will do the rest.

Nice gesture, Jerry. I thank you for your generosity on behalf of all the readers of this column. Jerry's address is: 10 Avalon Road, Mt. Vernon, Ohio 43050. BE SURE TO INCLUDE AN SASE WITH YOUR REQUEST FOR TECH DATA.

Now on with new business. Have you ever been tempted to build a crystal set, but figured you'd never use it tied to those umbilical earphones? Pay attention to this project built by Pete Haas of Kent, Ohio. It may give the "boost" you needed to finally get back into your experimenter's workshop.

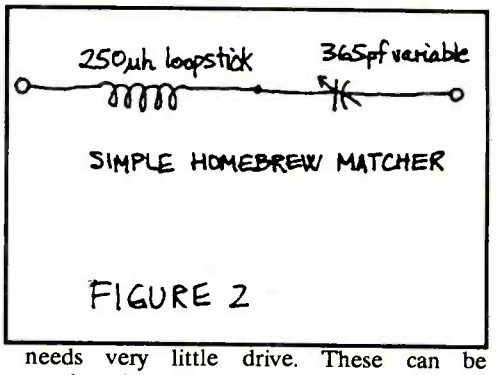
Speaker Driving Crystal Set

Is it really possible? Pete's answer is "Yes!"



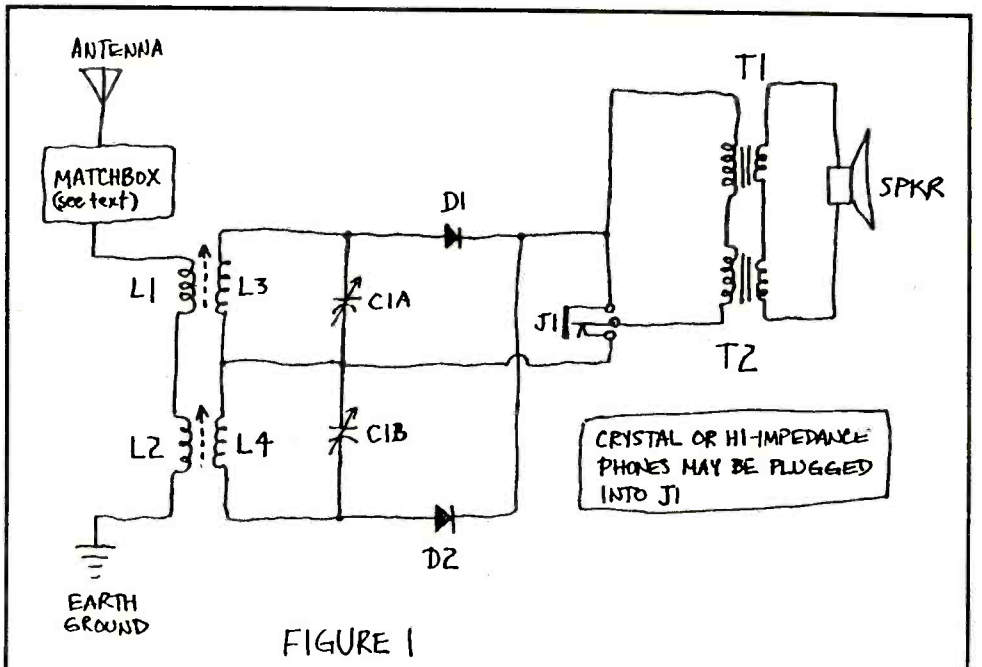
This circuit uses dual tuning tank circuits that have an additive effect like connecting two batteries in series. Plus it incorporates a full wave rectifier which doubles the available current.

You can tell when you've constructed an especially sensitive crystal radio -- the strong stations will actually distort when using headphones and you'll have to actually detune the tank circuits or the antenna matching device for clearest audio. The antenna tuner can be a commercial unit (such as the easily obtainable Minituner-3) or something as simple as figure 2, which is just right for the Speaker Driving Crystal Set since it resonates at the AM broadcast band.



The loudspeaker is a Walkman type that needs very little drive. These can be purchased at discount department stores at the pegboard rack where audio adapter connectors and related accessories are sold.

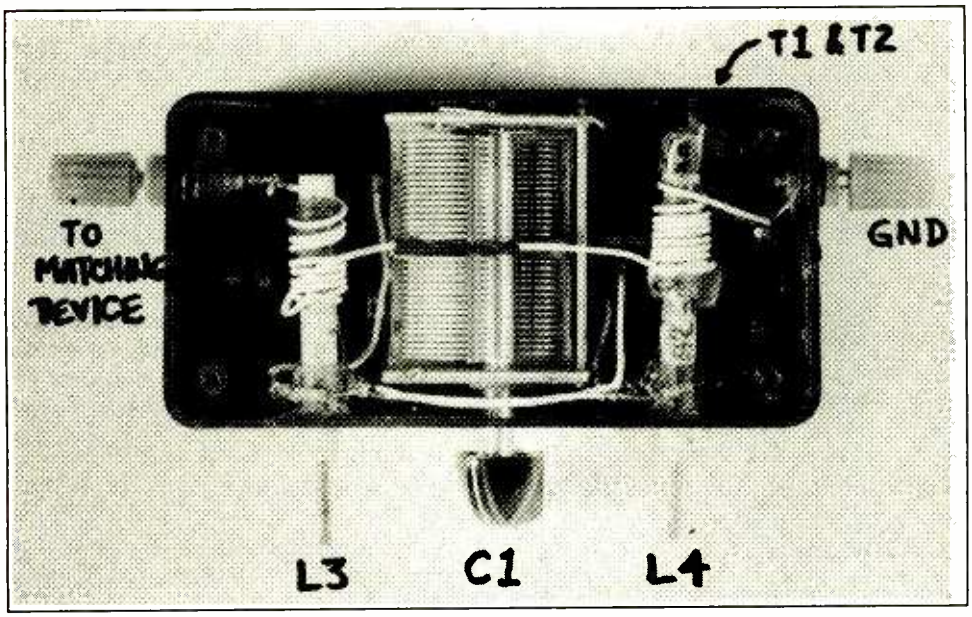
The dual 365pf variable, while difficult to



Parts List

L2,L2-4 to 8 turns 22ga hookup wire over L3 & L4
L3,L4-Miller 6300 loopstick antenna coil (250 uh adjustable)
Or 11'2" of 5/44 Litz wire* scramble wound on a 1/4" to 5/16" OD slug tuned form. Coil should be 3/4" long.
C1-Dual 365pf variable capacitor
D1,D2-germanium diodes
T1,T2-4800/3.2 ohm audio transformer or similar
(try cat no. JT-19, 75 cents each from John Meshna Jr, P.O. Box 62, E. Lynn, MA 01904 $20 min order)
Matchbox-see text

*Litz wire available from Midco, 660 N. Dixie Highway, Hollywood, FL 33020 or Amidon Associates, 12033 Otsego St., N. Hollywood, CA 91607



order by mail is commonly available at hamfests and occasionally show up for sale by parts suppliers in *Nuts & Volts* magazine. Alternately, two single 365's could be used with fine results.

To get the most efficient diodes check a number of them with an ohm meter and select ones with the lowest forward resistance. The audio transformer isn't critical -- just obtain ones with the highest impedance possible. The higher the impedance the less loading on the radio's output and hence the louder the audio.

Since store bought loopsticks are hard to find and expensive these days, rolling your own from recycled slug-tuned forms (readily available from old tube-type TV sets) and your own Litz wire is highly recommended and dirt cheap. You can also remove the threaded collars from the loopsticks and glue the coils in place. This way you can quickly just slide the ferrite slugs in and out for easy tuning.

Construction

Use the photo as a guide although parts placement isn't critical at these frequencies. The author's model was constructed with a slant towards being compact, but any size cabinet on hand will do nicely. Also, observe proper coil hookup (phasing) so signals won't end up canceling each other out. Be sure to wind L1 and L2 in the same direction as the wire on L3 and L4 for similar reasons.

The Tryout

A good earth ground is essential for loudest reception -- for comparison try the set with and without it. Use at least 50 feet (preferably more) of wire for an antenna. Spend some time tweaking the antenna tuner (matchbox) controls and the slug-tuned coils for loudest reception. Instead of a strong local station spreading out over the dial (like in your first crystal set) tuning will be quite sharp. Strong signals will snap in and out as you tune across the band.

So have fun -- you can even pick up some of the longwave band below 540 kHz and don't be surprised if you hear the older 1.7 MHz portaphones at the high end of the tuning range!

Well, that's a wrap for this month. Thanks to Pete for sharing his project with us. Next month, more good stuff. Till then, 73, and good DX.

Monitoring Times invites you to submit your favorite projects for publication. For more information, contact Rich Arland, c/o MT, P.O. Box 98, Brasstown, NC 28902

W. Clem Small, KR6A, CET

The Space-Saving Inverted-L Antenna

You may have heard that vertical antenna polarization, a condition which exists when the major portion of your antenna is vertically oriented, is good for DX reception. You may have also heard that horizontal antenna polarization, which exists when most of your skywire is horizontally oriented, is less responsive to noise, giving a better chance to hear weak signals.

You may have also heard that in long-haul shortwave reception the polarization of a signal you are receiving is likely to continually be swinging from vertical to horizontal polarization as the ionospheric conditions continually shift.

To optimally follow these polarization shifts would take a sophisticated set-up known as "polarization diversity." But we can get some of the effects of polarization diversity through the use of this month's antenna. Let's see just what that antenna is.

A Page from Antenna History

Marconi, the developer of wireless communication, and his engineers invented several antennas, one of which is called the "inverted-L." It is so-named due to its appearance, with a vertical portion going up and then a run at the top in a horizontal orientation, as shown in Figure 1.

At the long wave, low frequencies which Marconi used, those old-time inverted-L antennas were often literally miles long. The inverted-L we are going to design is a bit different, and a much more reasonable length, because the wavelengths we employ today for transoceanic communications are much shorter -- that is, short waves.

Why It Works Diversely

Since the inverted-L has significant portions of its length in both the horizontal and in the vertical orientations, it can respond well to either vertically or horizontally polarized signals. So if, for instance, the signal which you are monitoring is vertically polarized, the vertical portion of the antenna is the primary source of signal input to your receiver.

But, if the incoming signal's polarization shifts, as is common in shortwave work, to horizontal, the horizontal portion of the antenna is ready to respond and help maintain the signal input to your receiver. As you can see, this is a sort of polarization diversity built in to the antenna's design.

On the other hand, this antenna's main claim to most hobbyists' attention is that it can be put up in less space than many other antenna designs. This is because the antenna's vertical rise is less than that of a nonbent vertical antenna, and the horizontal run is also less due to the fact that the ground-plane elements may be shortened by being made "L" shaped also.

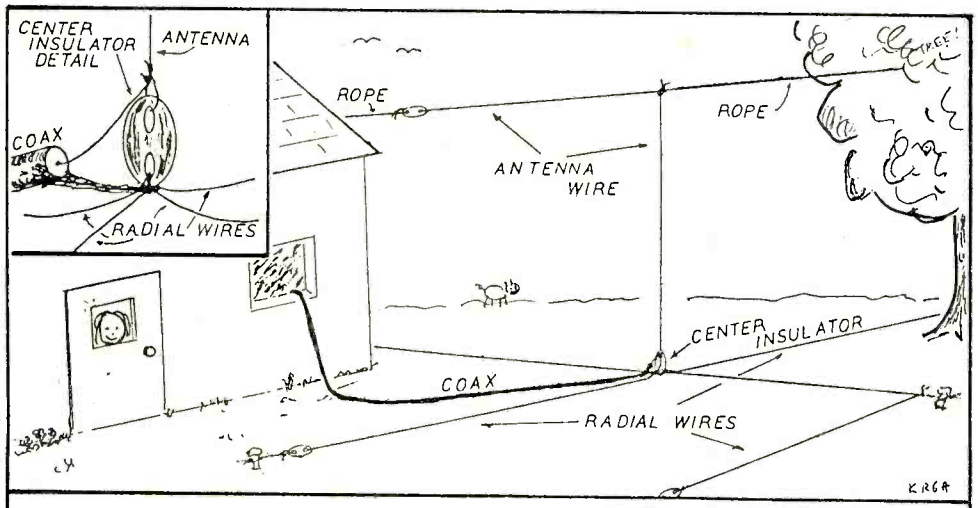


FIG. 1. AN INVERTED-L ANTENNA.

So Let's Build One

The lengths indicated in Figure 1 are determined by the formula L=234/F, where L is length in feet, and F is frequency in megahertz. Thus, L for 10 megahertz would be 234/10=23.4 feet. So, decide the frequency you want to use, compute the L you will need, and multiply that by five, as there are five runs which are each equal to L. Add 2-1/2 feet or so to this total to allow for the extra length needed to attach to the insulators.

Most any type of electrical or radio wire you wish can be utilized. It can be insulated or bare, but it should be strong enough to take the stresses of wind and weather.

1. Cut the wire to five pieces, each equal to L plus six inches.
2. For each wire, put an antenna insulator at one end and solder it in place as shown in Figure 1.
3. Take four of the wires and bring together their ends which have no insulator. Scrape them bright for perhaps four inches and attach them all to the bottom hole of the center insulator as shown in Figure 1. Solder the wires together.
4. In the other end of the center insulator put the free end of the one remaining wire. Scrape it bright where the wire wraps around itself and solder the wire to itself.
5. You may now attach the antenna feedline. 50-ohm coaxial is theoretically preferred, but for receive-only antennas the impedance of the line is not too important. Wind a bit of the outer shield to the four wires on one end of the center insulator and solder it there. Wind the end of the center conductor of the feedline to the wire in

the top hole of the center conductor and solder it in place.

6. The four wires attached to the bottom hole of the center conductor of the feedline form the groundplane for this antenna. They should (a) be mounted above ground so that they do not contact the ground. If you don't have enough space to run them straight, they may each be made in an "L" shape or zigzagged to fit the space you have. Don't put the wires where they can cause a problem by tripping people, etc.

   (b) An alternative is to leave the insulators off, and bury these wires just below the surface of the ground. If they are buried, they should not be insulated: just bare wire.

   (c) A third alternative is to omit the four groundplane wires entirely, and substitute a ground rod for them. Just drive the ground rod into the earth at the antenna's base and attach it to the bottom hole of the center insulator. Attach the coax outer shield to it. This does work, but some people feel that it is not as effective as a groundplane.

7. Adjust the vertical and horizontal portions of the upper element to fit your site, and tie them in place.

8. Use your preferred type of lightning-induced damage protection. As always, the *minimum* here is never using the antenna during storms, and disconnecting and grounding the antenna when it is not in use.

This antenna is relatively nondirectional. Enjoy.

RADIO RIDDLES

Last Month: If you get into many discussions about antennas, the topic of "SWR" or standing wave ratio is bound to come up. This is especially true for hams and CBers, who are very concerned with getting a low SWR with their antenna systems. On the other hand, many people knowledgeable in radio monitoring theory and practice never worry much about the SWR of their antenna system. Why this difference in concern for SWR?

Well, when we are transmitting we worry about power losses in the cable. These losses turn a portion of our transmitter's output into heat rather than radiating it into space for communications. A low SWR tends to reduce these losses and see that more of the signal is radiated.

When we are receiving only, the amount of power delivered down the feedline is not so important, as long as a usable amount comes down the line. The readability of the signals is mainly due to how well the signal stands above the noise level picked up by the antenna, not on how much power there is delivered to the receiver.

Our receivers have sufficient gain to boost the level of a signal to readable levels as long as it is well above the noise level. The feedline doesn't significantly affect the signal-to-noise ratio. Thus, SWR is not so important in receiving as it is in transmitting.

This Month: We've mentioned "polarization diversity" in this month's column. There are other useful kinds of diversity. What are they and how do they help you receive radio signals better?

Get an answer to this question and much more in your next month's *Monitoring Times*. Till then, Peace, DX, and 73.

mt

ask bob

Bob Grove, WA4PYQ

Q. *Why isn't there a scanner frequency directory for Alaska? (Art Cassel, Wasilla, AK)*

A. Scanner directories are published to make money; apparently there just aren't enough scanner listeners in Alaska to whet a prospective publisher's appetite. I'd be willing to bet, however, that someone has put together an exhaustive list of frequencies for much of Alaska which he'd be willing to sell. Readers?

Q. *Is there any other way to properly tune single sideband (SSB) other than tuning for most natural sound? (John Hilton, Houston, TX)*

A. No. Unless some residual carrier remains, there is no reference frequency in the signal to alert the receiver's detector when it is right on center. Commercial and broadcast single-sideband stations will often leave some residual carrier for perfect tuning; this is called "reduced carrier" SSB, rather than "suppressed" in which the carrier is totally eliminated.

Q. *When is a grounded soldering iron tip necessary and when is it not? (John Myers, Spokane, WA)*

A. It is always a good idea to use a grounded-tip soldering iron, especially when you are working with static-electricity-sensitive devices like CMOS ICs. In cool, dry weather hundreds or even thousands of volts can build up on your body as you move along a carpeted floor or slide across a vinyl-covered stool or chair.

The chassis of the electronic equipment as well as the soldering iron are grounded together by a length of wire. In production lines, the workers may even wear conductive wrist straps connected to the common ground system to prevent any electrical potential (voltage) building up between them, the iron and the equipment.

Such precautions are not necessary when working with more voltage-tolerant equipment like relays, vacuum tubes, motors and so on.

Q. *I am interested in learning more about rules and regulations regarding the two-way radio industry. How can I get a copy of these from the FCC? (Uli Kia, Santa Ana, CA)*

A. You could contact the FCC Private Radio Bureau in Washington, DC, and request a copy of part 90 of the FCC Rules and Regulations. It may be easier, however, to contact the Superintendent of Documents (1-202-783-3238) to order volume 5 of the Code of Federal Regulations, Title 47 (approximately $20). The 1990 revised edition was expected to be available in the first quarter of 1990.

Q. *Our local police department claims that their new 800 MHz radio system can't be monitored because it switches to a new frequency every time the mike button is pressed. True or false? (Numerous readers)*

A. Essentially false. In a conventional trunking system, frequencies are assigned in groups by the FCC and, if you know all of the frequencies, you simply put them all into your scanner to track the switching. Since several different departments share the same frequencies, you may listen to the police one moment, then the road department the next. Agencies use a subaudible tone (CTCSS or "PL") to monitor only their own kind.

You can track your quarry by using the Uniden BC760XLT scanner with the tone board option--provided you can determine the frequency of the tone used by the police. If the speech is scrambled, of course, this prevents monitoring, as would the use of digital modes like computers and mobile data terminals.

Q. *Are firefighters paged by the same CTCSS tones programmable into the optional tone board of the Uniden BC760XLT? (Dave Christener, Cortland, OH)*

A. No. The majority of firefighters are paged out by two tones in sequence which activate the squelch on their pagers; the tones cease when the voice dispatch begins. CTCSS, on the other hand, remains on beneath the voice all during the communication. It prevents the repeater from being keyed up by other licensees on the same frequency.

Q. *Can rechargeable batteries be used in the Sony ICF2010 portable radio?*

A. Yes, provided they are recharged externally--there is no provision for recharging the batteries by the radio's own AC power supply.

Q. *Why do airlines allow laptop computers in flight, but not radio receivers? (Douglas Wilson, Lafayette, LA)*

Bob's Tip of the Month:

MULTICHANNEL AND PREDETECTION RECORDING

In our February 1991 column a reader asked if there were a way to get 100 channels or more of audio by multiplexing on a video tape. *MT* reader Gary Mitchelson of Silver Spring, Maryland, sent literature from RACAL Recorders (18 Technology Drive, Irvine, CA 92718) along with this explanation.

RACAL's Wordsafe permits up to 36 separate channels to be recorded for up to 25 continuous hours on a standard VHF videotape utilizing time division multiplexing (TDM) which modulates a 1 MHz carrier which is recorded on the tape. Even more channels could be recorded by using a higher carrier frequency, but this requires faster tape speed, reducing the recording length.

Gary also comments on predetection recording by stating that in a typical application, any swath of spectrum up to 5 MHz wide may be recorded in real time using an IF to tape converter with a receiver which lowers the receiver's frequency range to that of the recorder.

To look for a signal which transmitted in the past, the operator simply plugs the video tape which corresponds to that time period and conversion frequency into the antenna connector of a 0-5 MHz receiver and tunes for the signal.

Questions or tips sent to "Ask Bob," c/o MT, are printed in this column as space permits. If you desire a prompt, personal reply, mail your question along with a self-addressed, stamped envelope (no telephone calls, please) in care of MT.

A. The radiation from a small computer is low and randomized and has apparently been determined not to pose a hazard to the radionavigation equipment of an aircraft. Radio receivers, on the other hand, have oscillators which may generate signals strong enough to interfere with such instrumentation. FAA rules and regulations prohibit the use of such devices on board commercial aircraft without expressed consent of the pilot.

Q. On 419.275 MHz I hear a constant "beep beep," rarely interrupted by a voice transmission. What is this? (Brian Percifiul, Seattle, WA)

A. This is a point-to-point (intercity) link used by the FBI. The tones simply reassure the radio system that it is working in the absence of voices.

Q. Can the 116-136 MHz air band on my Sony ICF2010 be modified to receive 162 MHz weather broadcasts? (R. Kroenke, Mt. Shasta, CA)

A. No. The frequency limits are indelibly controlled by the microprocessor. Even if the new frequency range could be substituted, the weather transmissions are in narrowband FM, not AM like the aircraft band, so the sound would be distorted (although intelligible).

Q. When I'm using my shortwave receiver with a digital demodulator for RTTY reception, I cause interference on my TV. Any cures? Also, do I use USB, LSB or CW modes for digital reception? (David Schoenecker, Valparaiso, IN)

A. Demodulators have microprocessors, so they generate interference like any computer. Use shielded cable between the receiver and the receiver; install interference chokes like the Radio Shack 273-104 and 273-105 on your cables; ground all equipment together with a common heavy gauge wire like the shielding from a piece of coax.

So far as the reception mode for digital signals, use either USB or LSB.

Q. Recently, while mobiling on 10 meters, I heard Radio Havana Cuba on 28.515 MHz USB from 1500-1530 UTC. What gives? (Bill Herman, Indianapolis, IN)

A. I would opt for the third harmonic of a feeder in the 9 MHz band. Feeders relay broadcast programs from point to point using single sideband.

Q. Besides the Philips DC777 and DC794, what other mobile shortwave radios are available? What is the best antenna to use? (Allan Fredrickson, Rochester Hills, MI)

A. Automotive receivers with shortwave are tough to find. The Philips units are about it. Universal Shortwave, an *MT* advertiser, sells the 777 for $399.95; it's an excellent choice and has unusually good audio. It is designed to work with the standard 31" automotive whip.

Q. Describe the walkie-talkie of WWII fame. (Lt. Arnal Cook, USS Nimitz)

A. The venerable BC611 walkie-talkie was an AM voice transmitter-receiver using 1.5 volt-filament tubes and operated on a single crystal-controlled channel, typically in the 6 MHz range. A telescoping whip could be retracted back into the set, protected by a protruding, screw-on cap. Range of a mile or so was possible with this under-1 watt radio which had a carbon microphone and a dynamic earphone.

A similar device, the BC745 "horsey-talkie," was mounted on a pointed metal pole which was pushed into the ground for operation, then the whip pulled up. A hand-cranked generator provided power for this AM voice rig. Frequency changes for these rigs were accommodated by plug-in tuning units which contained the receiver and transmitter crystals as well as tuning circuitry for the transmitter.

Q. Can I add a digital frequency display external to my old analog-dial tube receiver? (Al Phillips, Keremeos, BC)

A. The former Torrestronics display accessory was taken over by Communications Concepts, Inc. of 508 Millstone Drive, Xenia, Ohio 45385 (phone 1-513-426-8600); their updated version is now available.

A comprehensive list of questions and answers regarding monitoring may be found in Bob Grove's "Scanner and Shortwave Answerbook," $12.95 plus $3 shipping from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902.

LETTERS

continued from page 3

The ham radio operator was not surprised. Seems that he had one of the same type of lamp -- the kind where you just touch the base to turn it on -- and his got "possessed" every time he fired up his 100 watt Kenwood 440 to send Morse code.

MT publisher Bob Grove, who also owns a Kenwood TS 440s, had the same problem until he installed bypass capacitors on the lamp control unit. Grove's lamps reacted differently, though, since he was not sending code. His lamps would go up and down in brightness as he talked!

Ralph Marx of Canoga Park, California, writes to say that he enjoyed the article on Radio Tahiti by Dr. Edward J. Pyatt. Ralph says that he had a very similar experience to Dr. Pyatt's. "When I first heard Radio Tahiti back in 1951, I got a QSL letter from the station. The engineer who signed it, Mr. Leon Siquin, wrote a note explaining that the station was using an old CW transmitter converted to voice as a test transmission to the South Pacific area.

"When I visited the station five years ago, I took the letter with me to Papeete. No one at the station spoke English except Mr. Siquin. Leon and I became fast friends and we still correspond with each other. I send him occasional copies of *Monitoring Times* and he visits once or twice a year when he stops over in Los Angeles on his way to Paris. I usually meet him at the airport and we have lunch.

"Little did either of us realize in 1952 that 45 years later we would meet personally."

A lot of really fine friendships have been known to grow out of this hobby. In the case of *Monitoring Times* readers, sometimes we get to meet personally. Other times it's through correspondence. And sometimes it's just a feeling.

Survey Results:

We've had a chance to look over the results of the *Monitoring Times* reader survey and we've gotten to know some of you a little better. Here's some of the information we gleaned from your responses.

Since *Monitoring Times* isn't generally found on newsstands -- that's a corporate decision not to pursue that avenue of sales -- and there are limited places where we advertise, we often wonder how people hear about us. According to the survey, *MT* propagates a great deal via word-of-mouth. And that's nice. Not only is the bill for word-of-mouth advertising considerably cheaper than comparable mediums, it shows that you think enough about the magazine to recommend it to others.

Surprising were the demographics of the survey. The last time we did one of our "annual" surveys was 1987. And if memory serves, the readership was concentrated on the upper end of the age scale. Today, while we had virtually no subscribers under 20, the distribution of readership was much more like a standard bell curve with lots of people in the 30-39 and 40-49 age brackets.

Total family income was, like age, reasonably distributed across the board.

This year, too, we saw a greater diversity of interests among individual hobbyists. In past years, there was a very solid "them or us" mentality. You were either a scanner freak or a shortwave nut. Period. This time there were a lot more people who do both.

One "aside" on "your choices for utility or scanning listening:" There were an incredible number of people who listed "weather" as one of their top three scanning or utility targets. That, one shortwave staffer joked, is equivalent to shortwave listeners specializing in standard time and frequency station WWV.

Two things remained the same in this year's survey when compared to the last.

The first is that the BBC was rated as the number one station. However, this year we saw a lot more "close contenders" to the position than in years past. Radio Canada International was often mentioned, nipping at the Beeb's heel. Strange that the pinheads in Ottawa would choose now to emasculate RCI.

Also interesting was the number of people who said that Radio Moscow was the favorite station. Or Radio Havana. Or one of the Eastern European stations.

Undoubted and uncontested is the choice for favorite shortwave broadcaster. We'll give you three chances: Ian McFarland, Ian McFarland, or Ian McFarland.

The favorite article category went to Larry and Gayle Van Horn's epic October 1990 Persian Gulf feature. That one was pretty much hands-down.

And here's one of the things that gave me a chuckle -- the one thing in my life that no one will let me forget. What was the "least favorite" article in *Monitoring Times?* A good fifty percent of you said, "The Last Radio Signal on Earth." O.K. so I was wrong about putting fiction in a radio magazine.

We had our share of unusual comments. One person wrote, "Stop commenting about that damn child molester/rapist/murderer in [deleted] prison. He should have something else cut off besides his shortwave radio!" Perhaps the reader has us confused with the *American Penal Journal.*

Another pointed out that we were instrumental in creating "a mind-police state" whereby the readership "is firmly led down the path to socialism by their radios." We here at *Monitoring Times* are, the comment concluded, "quite skilled in this area." Another communist cell uncovered.

In all, the survey was *highly* complimentary -- we couldn't ask for better ratings -- yet filled with helpful hints as well. In short, the survey was an editor's dream.

A Letter from the Editor:

Speaking of editors, while I was reading through the survey cards, I noticed a good number of people who said that they first became acquainted with *Monitoring Times* through *The Shortwave Guide*, a publication I founded back in 1982 and which later merged with *Monitoring Times*. It was quite gratifying -- not to mention surprising -- to find that there have been people who have stuck with us all that time. (Haven't you been punished *enough?*)

The nearly ten years that I've spent working on this magazine have been the most challenging of my life. I remember quitting my job to start the *The Shortwave Guide* -- on my kitchen table and with a bankroll of $50.00. It was an incredible task but we had a *blast!*

We went for five years before we were able to draw our first paycheck, selling radio books on the side in order to pay for the magazine's printing bill. The merger of *The Shortwave Guide* with *Monitoring Times* back in 1986 took some of the financial pressure off. Still, the cost of the venture remained enormous. There were years of eighteen hour days, a schedule that failed to let up even after *MT* had clearly made it to the top. Eventually, it all began to take its toll on my health.

To make matters worse, once *MT* did make it to the top, it just wasn't challenging anymore. And most disturbing, the job had ceased to be fun.

Resigning a post that has been such a large part of your life for so long is never easy. But I have decided that it's time for me to go and have turned in my resignation to Bob and Judy Grove. July will be my final issue.

What will I do? I'll continue my involvement with our bookstore, DX Radio Supply, and I'd appreciate your support of that venture. As with *Monitoring Times*, I promise you a square deal with DXRS. Send me a stamp and I'll send you a copy of our catalogue.

I'll also be editing the *National Scanning Report*, the publication of the Bearcat Radio Club. You can get a sample by sending $2.00 cash to P.O. Box 360, Wagontown, PA 19376.

OK. I know this sounds like an Academy Awards program. But give me a minute.

I'd like to thank the staff. You know from reading *MT* that these people are the best and you've given them the ultimate vote of confidence by making *Monitoring Times* America's leading hobby radio publication. What you may not know is that they are also great people, thoroughly professional -- and my friends. I will miss them all.

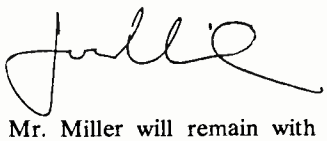
I'd like to tell you, too, about Bob and Judy Grove, the publishers of this fine journal. You may read some of the advertising "hype" in their catalogues and wonder if these people could really be that nice. I'm here to tell you that they are.

In fact, I wish that I had the space to tell you all that they have done for me over the years. More than employers, these two people have been like mother and father to me, helping me through some very bad times; sharing with me some very good times. I thank them both from the bottom of my heart. I will never forget them.

Finally, I'd like to thank you, the reader, for coming along with me on this fantastic voyage. In ten years, we've visited tiny shortwave stations tucked high in the Andes mountains, toured marine facilities on the coast of Japan and scanned for action right here in our own neighborhoods.

Thank you all for sharing your remarkable lives with me. More than anything else, *you* are *Monitoring Times*. And I have been richly rewarded by having had the opportunity to know you.

Good listening... and goodbye.



Editor's note: Mr. Miller will remain with *Monitoring Times* for the next few issues to assist with the transition to another editor. Fortunately, he is leaving the publication in good hands. His good friend and associate editor, Rachel Baughn, has accepted the position of editor.

We'd like to hear your comments, opinions, and experiences concerning the world of radio. Please understand that personal replies are not always possible.

Letters should be addressed to ***Letters to the Editor****, Monitoring Times, P.O. Box 98, Brasstown, NC 28902. Please include your name and address (may be withheld at your request).*

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Apr 5-7	Kansas City,MO	MO State Convention/ Chuck Miller WA0KUH 7000 NE 120th St, Kansas City, MO 64166
Apr 6	Little Rock,AR	AR State Conv/ Bob Hancock KB5IDB 6116 Nicole Dr, N.Little Rock, AR 72218
Apr 7	Charleston, WV	Charleston Area Hamfest/ Wm Kibhler K8WMX 182 Monterey Dr, St. Albans, WV 25177
Apr 6-7	Timonium, MD	Baltimore ARC/ Jim Schmidt, N3FFB 5 Bantry Ct, Baltimore, MD 21237
Apr 12-14	Visalia, CA	Int'l DX Convention/ Edwin Stephenson W6MKM 230 West 42nd Ave, San Mateo, CA 94403
Apr 12-13	Warner Robins,GA	Central GA ARC/ Jessie4 Kirkham WB4KQA 110 Brown Dr, Warner Robins, GA 31093
Apr 13	Lebanon, PA	Appalachian Amateur Rptr Group/ Homer Luckenbill WA3YMU 105 Walnut St, Pine Grove, PA 17963; 717-345-3788 Location: Lebanon Area Fairgrounds; admission $4 (XYL's, YL's & kids free); 8:00 am - until ? Talk-in 146.04/.64, 146.52/.52
Apr 14	Rockford, IL	Rockford ARA/ Joe Roling N9HEZ 5850 Strathmore #3, Rockford, IL 61107
Apr 14	Raleigh, NC	Raleigh ARS/ Chuck Littlewood K4HF 2005 Quail Ridge Rd, Raleigh, NC 27609 Talk-in on 146.04/64 and 146.28/88 Location: Jim Green Bldg, NC State Fairgrounds; $5 pre-registration, $6 at door
Apr 20	Bowling Green,KY	Kentucky Colonel's ARC/ Denver Eadens N4WWA KCARC, PO Box 9781, Bowling Green, KY 42102-9781; 502-777-3681 Location: National Guard Armory; 7:00 a.m.
Apr 21	Cleveland, OH	North Coast ARC/ Ron Nichols N8LZA 5402 Velma Ave, Parma, OH 44129; 216-351-7787 after 6 Location: LDA of Cuyahoga Co (5360 Brookpark Rd, Cleveland); 8 a.m.-2 p.m.
Apr 21	Wellesley, MA	Wellesley ARS/ Gerard Driscoll NV1T 101 Whiting Way, Needham, MA 02192
Apr 21	Sullivan, IL	Moultrie AR/ Ralph Zancha WC9V 502 E State St, Lovington, IL 61937
Apr 26-28	Dayton, OH	Dayton ARA/ William Schmid WD8LOI 820 Dartmouth Rd, Troy, OH 45373
May 3-4	Sioux City, NE	3900 ARC/ Dick Pitner W0FZO 2931 Pierce St, Sioux City, IA 51104
May 3-5	Fresno, CA	Fresno ARC/ Jeff Barrett N6SIV P.O. Box 783, Fresno, CA 93712
May 4-5	Anderson, SC	Blue Ridge ARS/ Sue Chism N4ENX Rt 6 203 Lakewood Dr, Greenville, SC 29607
May 5	Yonkers, NY	Metro 70 cm Net ARC/ Otto Supliski WB2SLQ 53 Hayward St, Yonkers, NY 10704
May 12	Medina, OH	Medina M2M Club/ Gary Chamberlain KA8DJZ 755 Shaker Dr, Medina, OH 44256
May 17-19	Rochester, NY	Atlantic Div/NY State/ Harold Smith K2HC 153 Mason Ave, Rochester, NY 14626
May 17-19	Tulsa, OK	Oklahoma State Conv/ Merlin Griffin WB5OSM 5332 S. Irvington, Tulsa, OK 74135
May 18	DeWitt, IA	Clinton ARC/ James Beakey NI0Q 1817 N. 10th St, Clinton, IA 52732
May 18-19	Yakima, WA	E. Washington Section Conv/ Roger Wilson N7NPL 112 N. 30th Ave, Yakima, WA 98902
May 18-19	Birmingham, AL	Alabama State Convention/ Mildred Cullen AA4XF 2331 Ivy Lane, Birmingham, AL 35226
May 19	Wrightstown,PA	Warminster ARC/ Mark Kempisty N3GNW 3854 Moosewood Ave, Trevose, PA 19047
May 31-Jn 2	Seaside, OR	NW Div Conv/ Ken Hart N7JAS 16632 SW Rosa Rd, Beaverton, OR 97007

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 Convention Calendar, P.O. Box 98, Brasstown NC 28902.

STOCK EXCHANGE

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word - *Subscribers only.* All ads must be paid in advance to *Monitoring Times.*

All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word payable with ad

1-3/4" SQUARE DISPLAY AD: $50 per issue, payable in advance. Send camera-ready copy or copy to be typeset (reverse type not available).

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Monitoring Times assumes no responsibility for misrepresented merchandise.

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WANTED: REGENCY TURBO SCAN 2 scanner 75 channel must be in excellent condition. Dennis Ruda, 42 Harry L Drive, Johnson City, NY 13790.

WANTED: Information on audio surveillance/counter surveillance devices and computer control for ICOM R7000. W. Fischer, 65-31 Avenue SW, Calgary, AB Canada T2S 2Y7.

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Closing Comments

FCC Considers More Monitoring Restrictions!

In a surprise move, the Federal Communications Commission has begun a formal inquiry into the feasibility of removing police, fire and emergency medical frequencies from all amateur transceivers. Introduced by attorney Eric Malinen at a public meeting on February 13, 1991, the measure was approved unanimously by FCC commissioners James Quello, Sherrie Marshall, Erwin Duggan, Alfred Sikes and Andrew Barrett.

Manufacturers must reply before June 7, 1991, as to the cost of excluding public safety frequencies from their radios. Of particular note was commissioner Marshall's comments revealing the Commission's bias: "...(opponents of) anti-scanner laws will have to demonstrate that it would be prohibitively expensive to design and manufacture scanners that comply with those laws."

Issued as PR Docket No. 91-36, the Notice of Inquiry (NOI) was prompted by an American Radio Relay League (ARRL) Request for Issuance of Declaratory Ruling on November 14, 1989, asking the FCC to override state laws prohibiting mobile amateur radio transceivers which include public safety reception.

To quote the NOI, "These state and local laws appear to be aimed at promoting the health, safety and general welfare of the citizenry." It would appear that the FCC's poor record in the courts regarding preempting state laws, notably telephone tariffs, has led our commissioners to take the easier path -- scanner censoring.

During natural disasters -- as with Hurricane Hugo -- amateur radio provided life-saving communications. Without the ability to monitor public safety channels, these mobilized amateurs would be deaf to emergency operations.

Citizens' community watch teams and other vigilant residents monitor police channels in high crime risk areas, often providing vital information to law enforcement agencies which leads to the apprehension of criminals. Criminal elements would certainly benefit from anti-police-scanning laws.

The issue is quite clear out here in the real world. Regulation of the public airwaves is a federal, not state, responsibility. Just as states do not regulate those who transmit, they should not regulate those who receive. We also believe that existing federal regulations are sufficient to protect the public interest.

Bob Grove, WA4PYQ
-- Publisher

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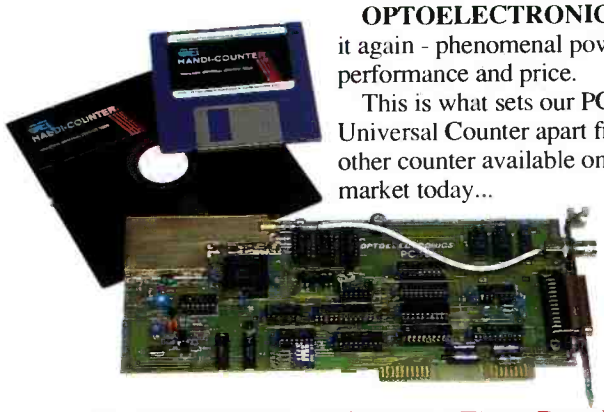

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