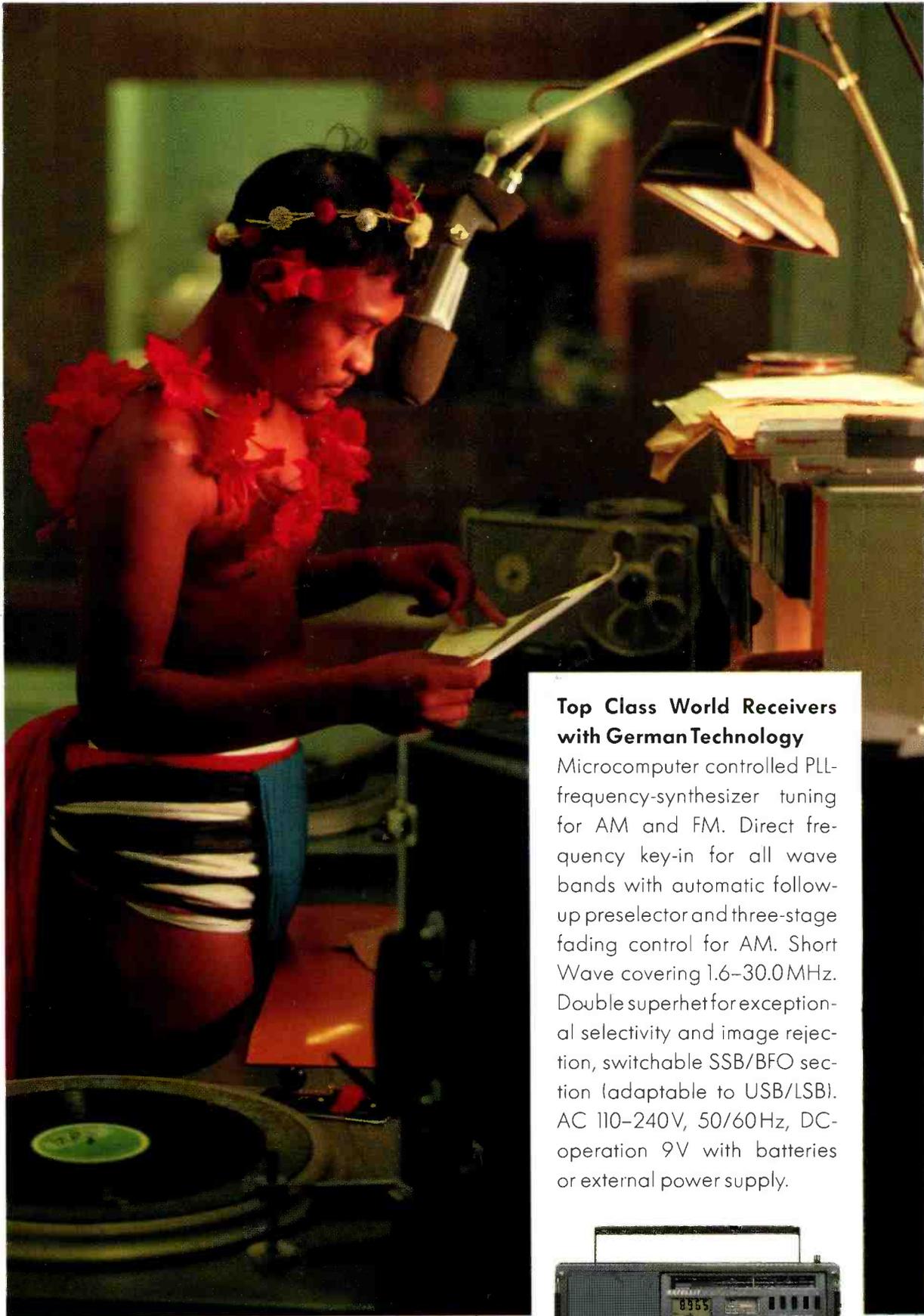


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MONITORING TIMES

Published by:
Grove Enterprises
Publisher:
Bob Grove, WA4PYQ
Editor:
Larry Miller
Technical Editor:
Ike Kerschner
Design and Production:
Rachel Baughn
Subscriptions:
Mitzi Barrett
Advertising and
Dealerships:
Judy Grove

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It's a true story and one of today's most popular movies. Now read the story of a woman who lived Robin Williams' on-screen role - without half the laughs. Maryland's Mai Lan tells her story to Monitoring Times.
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COMING IN MAY: "Code Name: Esquire" - an exclusive interview with James Bamford, author of the controversial book "The Puzzle Palace." Also, travel to a Guatemalan shortwave station with author Don Moore.

MONITORING TIMES (ISSN 0889-5341) is published monthly for \$16 per year by Grove Enterprises, Inc., PO Box 98, Brasstown, NC 28902 (ph.1-704-837-9200). Second class postage paid at Brasstown, NC, and additional mailing offices. POSTMASTER: Send address changes to Monitoring Times, PO Box 98, Brasstown, NC 28902.

ON THE COVER: Real-life DJ Mai Lan as she appeared during her broadcasting career (photo courtesy Baltimore Sun) -- A parallel role is played by Robin Williams in the movie "Good Morning, Vietnam" (XMCMLXXXVII Touchstone Pictures. All rights reserved)

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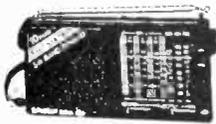
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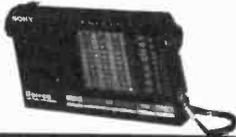
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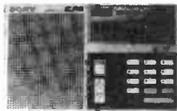
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LETTERS

Looking Back on Radio

I am a shortwave enthusiast of many years duration, since I purchased my RCA Victor "Strato World II" back in 1955. A few years ago, I purchased a Grundig Satellit 650. Since then I've had many enjoyable hours using it.

I am enclosing a picture of the two radios. The old one still gives me enjoyment when working in my basement. The Grundig, however, I turn on any time of the day or night. Being retired, my hours for listening are flexible.

Dan Kesselman
South Hadley, Massachusetts



Dan with his 1955 Strato World II and 1987 Grundig Satellit 650.

Losing the Right to Listen

I enjoy scanning federal frequencies as part of the radio hobby. The traffic ranges from the mundane to the funny with occasional flashes of "interesting" thrown in. But mostly it shows that, contrary to movies and TV, federal agents are human like the rest of us.

It would be ghastly to see sensitive frequencies in the hands of some immature and irresponsible monitors. The fact is, however, that some folks are just plain dumb and they will ruin this area of scanning for all of us.

So, yes, you do have a right to listen to federal frequencies. But you also have the responsibility as a citizen to keep your mouth shut about what you hear and not to impede the work of those sworn to protect you. If we can't show some self-discipline, then

the ban-ers will act "for our own good."

Ron Smith
Birmingham, Alabama

I want to put my few cents worth in about cellular censorship. Ladies and gentleman out there in radio land, what the cellular radio companies are looking for is full control of the whole spectrum of radio frequencies. 800 MHz was just the first step. Eventually, the cellular laws will steal the ham bands for long-range reception.

Today, our freedoms are being erased around us. Soon Americans will be a thing of the past. Hobbies and lives should not be dictated by greed or certain groups lobbying with dirty money. We need to wake up and look where this country is headed.

Chaplain Mark Widerstrom
Houston, Texas

Frankly, I don't see what all the fuss is about restricting our "rights" to eavesdrop on other people's (cellular) telephone calls. Try to imagine how you would feel if I wanted to exercise the "rights" to my "hobby", which happens to be climbing poles outside private homes, clipping on a handset and listening to you talk on the phone. Feeling a bit uncomfortable, eh? Well, too bad. It's my hobby and I have my rights.

What? You say that's weird? Not at all. The only difference between you and me is the fact you're too lazy to climb the pole.

Jim Small
Omaha, Nebraska

Go MT, Go!

I have been with Monitoring Times since it was a monochrome, unstapled tabloid. I have seen several changes in the past few years: going color, getting staples, adding Larry Miller to the staff. And now,

an 8 1/2 by 11 magazine with glossy cover which looks excellent! I can honestly say that never before have I seen a product change in so many ways, so many times, without a substantial increase in price. I commend you on an excellent service to the listening community.

Brent Taylor
Doaktown, New Brunswick

I Like Ike

I've been reading your "On the Ham Bands" column and wanted to tell you how much I like it. You're giving interesting information in a common-sense way, making a positive impression on the reader. There's no ego-tripping, no axe-grinding, or other baloney sausage. As one who came into Amateur Radio from the shortwave listening hobby, I'm glad to see a good ham radio column in Monitoring Times. Thanks for spreading the word.

Kay Craigie KC3LM
Section Manager
American Radio Relay League
Eastern Pennsylvania Section
Devon, Pennsylvania

I think you've got a real winner in Dave Jones and his Federal File column. It's a very good addition to MT.

Bernie Wimmers, Jr.
Vienna, Virginia

Radio Tallin. Who Said It's Gone?

In a recent issue of *Monitoring Times* I see that you quote [The Radio Netherlands DX program] "Media Network" as saying that Radio Tallin [Estonian SSR] is back on shortwave after a 16 year absence and with only 20 minutes of broadcasting a month!

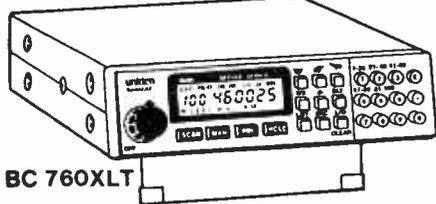
[More "Letters" on page 92]

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Radio Canada Voted Most Credible, Friendly, in Soviet Union

A survey of 10,992 shortwave listeners in the Soviet Union has ranked Radio Canada International the highest of five western stations in both credibility and the tone of its programming. The survey, carried out by Radio Free Europe/Radio Liberty between 1985 and 1987, asked listeners whether they considered RFE/RL, Voice of America, BBC, Deutsche Welle and RCI to be "propagandistic" or "credible." Scores were calculated by subtracting the percentage of "propagandistic" responses from the percentage of "credible" responses. RCI scored 56 points, higher than even the BBC. In another part of the survey, listeners were asked whether they perceived the station to be "hostile" or "friendly" (in terms of their attitude toward the listener, not the Soviet system of government). Once again, RCI came out on top with a score of 40. The BBC, ranked second, earned only 18 points.

Dayton Hamvention in April

The Dayton Hamvention -- largest convention of radio enthusiasts in the world -- is scheduled for April 29th through May 1. Over 29,000 people are expected to attend the event, located at the Hara Arena and Convention Center in Dayton, Ohio. The shortwave listener's forum part of the convention, to be held on Sunday, May 1st between 9:00 and 11:30 AM will feature Bob Grove, publisher of *Monitoring Times* and president of Grove Enterprises. Also on the agenda is former MT scanner columnist Norm Schrein and Jonathan Marks of Radio Netherland's *Media Network*.

Not All AMs Going 24 Hours

Some AM daytime-only stations in the United States are turning down the opportunity to go full time. Of the 444 stations responding to the FCC's Show Cause order, 62 said that they did not want to go full time.

Some of the declining stations said that the allowable night time power levels were too low. Maximum power for night time operation is 500 watts, reduced as necessary to avoid interference. Other stations do not think that this is a problem. WKCW, Warrenton, Virginia, for example, which runs 5,000 watts during the day, accepted 42 watts for their new night time operation. (*Radio World*)

Challenger Center for Space Science Education Needs Support

Saying that "asking generous people like you for money is still difficult for me," Dr. June Scobee, widow of former astronaut Dick Scobee, is continuing to seek support for a program designed to promote space sciences in schools. Already some \$300,000 has been raised at such events as a gala fundraiser -- attended by such notables as Walter Cronkite, Senator John Glenn and Vice President George Bush. If you'd like to contribute to this worthwhile endeavor, you can send your tax-deductible contributions to: Challenger Foundation, P.O. Box 90077, Washington, DC 20090.

HCJB to Announce Plans for Second Site

Officials of mega-power shortwave station HCJB say that they'll be making an important announcement in April. Jim Allen, special assistant to HCJB president Ron Cline, says that the station will be announcing a new transmitter site. "It will be," says Allen, "a joint effort, where HCJB and of the other stations will work together." Station officials, however, declined to say anything more.

Oddly enough, while these same station officials at the Miami headquarters were busy being evasive, printed literature distributed by the station had already confirmed the details: HCJB, together with FEBC, will install "one or more 500 kw transmitters" on the island of Saipan. FEBC is one of four shortwave stations comprising the "World by 2000" project, an effort to produce and broadcast the Gospel in 63 languages not now covered by international broadcasters.

The story that HCJB might be looking at a new transmitter site was first broken in *Monitoring Times* about a year ago. At the time, however, station officials denied the story. Saipan, apparently won out over Hawaii -- the state cited in the original article -- although another station official, who asked not to be identified, said that "Hawaii still is not necessarily out of the picture." Joe Springer, a member of HCJB's Mission Representation Group, said that station management is "praying about the Hawaii option." Continued Springer, "If the time comes when we are given the frequency and ability, I think we'd probably move into that area."

NBC Leaves Radio

General Electric, owner of NBC, announced last month that it planned to sell the networks' radio properties. Earlier, GE sold off its radio networks to Westwood One.

NBC stations, according to *Radio World*, date back to the 1920s with the formation of what is now WNBC-AM in New York. NBC's other stations include WYNY-FM in New York, KNBR-AM and KYUU-FM in San Francisco, WKQX-FM in Chicago and WJIB-FM in Boston. NBC sold WMAQ-AM to Group W/Westinghouse in late January and has announced its intentions to sell the other station it owns, WKYS-FM in Washington, DC. The reported value of the current crop of station now on the block is estimated to be in the vicinity of 195 million, including WKYS.

NAB Opposed to TV Marti

The National Association of Broadcasters has gone on record as opposed to TV Marti -- the proposed TV station beaming video from the US to Cuba -- because of concerns about increased retaliatory interference from the island nation. The broadcasters suggest that, before additional broadcasts to Cuba are authorized, the US government should resolve the existing interference problems. Cuban leader Fidel Castro has demanded a clear channel on the AM band to broadcast in English to the United States.

McDonald's Frequencies

In our March column we correctly pointed out the new frequency used by McDonald's fast-food takeout window intercom (154.600 MHz), but incorrectly listed one of the frequencies in the alternate pair (35.02/154.570 MHz).

These are only three of over one dozen frequencies set aside by the FCC for "itinerant" purposes, a general catch-all for low-power business needs where multiple coverage (store chains, branch offices) or changing locations (road shows, sports events) preclude the use of fixed call signs for a license.

Other itinerant and low-power frequencies included 30.84, 33.12, 33.14, 33.40, 35.04, 43.04, 151.490, 151.625, 158.400, 451.800, 464.500 and 464.550 MHz.

If you want a *real* challenge, try loading these into your scanner and try to figure out who's doing what, where!

'Good Morning, Vietnam'

The True Story of Mai Lan, Wartime Broadcaster

by Abby Karp

The theme of her life is radio, she says. You can almost hear her putting quotation marks around the sentence as she returns to it over and over again: "Radio really dictated my life." The statement seems an extraordinary trivialization of the life of this 40-year-old Vietnamese woman, now an American citizen sitting in a nicely furnished living room in Harford County, Maryland.

This is a woman who grew up in Saigon during the war years; who was only 18 when she created a radio personality that drew 100 letters a day from American servicemen; who as a young adult became an on-the-air propagandist for the CIA; who at 27, when the South Vietnamese government was collapsing, helped organize a skin-of-the-teeth escape for herself and her colleagues amid guns and searchlights and bombs.

Since 1975 when she arrived in America as a refugee, her life has calmed down considerably. She went to college, married a school administrator and became a mother. But despite the serenity of her home, this is a woman who has not yet taken emotional leave of Vietnam.

Until this winter, she turned down all but one request for interviews because, she says, "I was not gutsy enough to face that part of my past." Recently, however, she decided that it was time to share her memory of Vietnam, not of the military conflict but of her role as a popular wartime DJ and CIA propagandist. The memories were jogged by the movie *Good Morning, Vietnam*, in which Robin Williams played an American DJ in Saigon during the war.

Movie Brought Tears

"I couldn't help letting tears fill my eyes," she says, about watching the recently released film. "It was sad for me to open up."

Aside from the emotional stress, this mother of two has practical concerns about discussing her involvement in Vietnamese radio. She doesn't want the name she uses in America

published. As her husband explains, they were warned a few years ago by a former CIA operative to "remember that, wherever you go, there may be some who don't like what she did."

So call her Mai Lan, the pseudonym she used as a DJ during the eight years she played rock music and sent a message of support to American soldiers stationed in her country.

Or call her Mother Vietnam, the personality she assumed later as a CIA-paid announcer on a Vietnamese-language radio station. There she played a Vietnamese woman, a mother of the country, who used psychological tactics to convince the Viet Cong to lay down their arms.

And don't expect Mai Lan to say much about the 13 years since she settled in America. Talk to her instead about radio, the strand that has run from her childhood, through her days as a professional and celebrity in her native land, to her escape from Vietnam, to the interview she allowed last week.

"Radio was a lifesaver for me. I often wonder if not for my radio involvement, would we all be here together" in America, she says. "Radio really moves people."



Photo courtesy of Baltimore Sun

A Vietnamese Girlhood

"Radio is very important for people who live in a war-torn country like Vietnam. Particularly back in the '50s and early '60s, every house in Vietnam had to have radio. [It was] the main source of entertainment and escape," she says. The oldest of four children in a Saigon family, Mai Lan remembers "hoping to live a vicarious existence through the events radio brought in."

Her father was a diplomat, her mother a traditional Vietnamese housewife. The couple lived in Thailand 10 years owing to her father's job. Mai Lan remained in Vietnam but visited them frequently during school holidays, and her tie in Bangkok gave her an exposure to the world that many young Vietnamese lacked.

Although Mai Lan spoke Vietnamese, Thai, and French as a child, she was inspired also to learn English after hearing a song she loved but could not understand on a Bangkok radio station. It was Elvis Presley singing "Love Me Tender," she says, that inspired her to take up the fourth tongue, the language she would use as Mai Lan.

"As teen-agers, we didn't know what we could hope for," says Mai Lan. "I was very much against the war in Vietnam. I always had that feeling I want the war to end, but I didn't know what to do as a teen-ager." Then in 1965, via the radio, came the germ of an idea.

An Idea Born of Radio

"During my last year in my high school, as I was playing with my radio, I turned to this wonderful new program on the Vietnamese Armed Forces Radio. It was dedicated to the South Vietnamese army from the home front, with messages to the soldiers out in the battlefield," she said. "I was very turned on by this thing. It was new and creative and it was different than the regimented-type broadcasting typically heard on the government-controlled stations."

"So I talked to my girlfriends: 'Wouldn't it be wonderful if another program [like this existed] for the Americans and the Allied servicemen in Vietnam?'" They looked at me and said, 'You are capable of doing that show.' But I was a little bit afraid. That's the Army station. How can you as a little girl talk to the uniformed guys?"

The teen-ager wrote to the station, proposing the idea of an English-language show to thank the GIs for their presence and to promote a better understanding between the two cultures. The Vietnamese-run station liked the idea and put the show on but Mai Lan found the female disc jockey too stiff.

"She was reading, not talking. I said that kind of a show needed to have a younger voice, a more playful type. You've got to put some love to it. And the music. It was just too old. So I wrote back with my unsolicited observation," she says. Two months later, she was invited to audition.

"I was very reluctant. I had a feeling of inferiority, of being a young female," she recalls. "My mother, as a traditionalist, believed that I shouldn't be involved with anything military, that I shouldn't be out with the guys. But my father, as a liberal, he told me just to go ahead and try it out."

This split between her parents' advice was repeated often as the 18-year-old girl moved further and further from the



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The memories were jogged by the movie *Good Morning, Vietnam*, in which Robin Williams played an American DJ in Saigon during the war.

traditional path of a Vietnamese woman: becoming a cult figure for many American servicemen, then a student at New York University, then a CIA propagandist.

But the first step, the audition, went well, and she was chosen to be Mai Lan, the voice that greeted American GIs every morning from 6 a.m. to 7 a.m.

Good Morning, Mai Lan

Mai Lan, meaning Morning Orchid, was a pseudonym easy for Americans to remember, as well as a device to protect the girl from the fame and potential danger of being a public personality in a country at war.

Through her senior year of high school, Mai Lan put in long hours to satisfy her two roles: going to school all day, taping the next morning's show in the evening, then

doing her homework at night. She didn't get paid for her work. Nor did she get much recognition during her first six months on the air.

"Days and days go without reaction. I had no idea how it was received by the guys," she says. "In the second week of December 1965, I got the first letter. I still remember the name of the soldier. I was so thrilled."

This was the first of an avalanche of response, perhaps 100 letters a day from American servicemen who heard the friendly female voice. Most wrote to Mai Lan on the back of photographs of themselves, in fatigues, posing with their weapons or in front of their living quarters.

"To a very special girl that starts each of my days with the voice of an angel. I love you for it. Yours always, Curt."

"To Mai Lan: I wish you all the rewards you so richly deserve for all the fine work you are doing for freedom. A friend always, Joe."

Mai Lan wrote back to the soldiers, a task that extended her long days into long nights. "The reward was the guys appreciated what I did," she says, "and the feeling that I had in my own miniscule way helped bridge the cultural gap."

Not All Appreciated Her Work

But her new-found celebrity incurred the resentment of some Vietnamese, particularly men, who didn't approve of her involvement with Americans.

"They think if you've done anything that's beyond the fabric of tradition, the normal female things, you'd stepped outside the bound," she says. "They looked at you with questions. They thought, perhaps, I had sold my soul."

Mai Lan was heard throughout South Vietnam, with only a few interruptions, from 1965 to 1973. She kept up the volunteer radio work after graduating from high school later taking a job as translator of classified material for the Vietnamese army's psychological warfare department.

In 1968, she went on television as hostess of a show for American soldiers called *Let's Speak Vietnamese*. At the time, television signals were beamed down to Saigon by an American plane that circled the city every night for four hours. Along with educational shows such as Mai Lan's language lessons, the Vietnamese could see American shows including *Combat* and *Bonanza*.

Although Mai Lan anticipated possible danger in being publicly recognizable, she decided to ignore the risk and go on television. She had a sense of pride in her accomplishments and considered her work "more than a job, more or less a mission I need to do."

Meanwhile, the Tet Offensive of January 1968, an unexpected show of power by the Viet Cong, was causing an increased threat to Mai Lan, her family and other Saigon dwellers. "They would rocket every day into the city. You would never know when. You heard about friends and people getting killed in their sleep," she recalls. "The feeling at the time - it was not living. It was a constant 24-hour-a-day fear."

By that time, Mai Lan's father had risen to the No. 2 position in the Vietnamese Central Intelligence Organization. With his high-ranking job and Mai Lan's increased public exposure, she was advised by friends to be vigilant for signs of danger. She began

to take different routes to and from work each day.

In 1969, Mai Lan left Vietnam, winning a scholarship to study communications at New York University for the summer. The atmosphere in New York City's Greenwich Village at the time - the flower children, the sexual revolution - was a surprise to Mai Lan.

"My father said, 'Go, see the world.' It helped that my parents had no idea what New York was like at the time," she says. "My mother was very mad. She never wrote me a letter the whole time."

While in New York, Mai Lan took classes, apprenticed with a New York television station, traveled and appeared on the television shows *To Tell the Truth* and *What's My Line?* She returned to Saigon in the winter of 1970, and worked several more years as Mai Lan.

CIA Broadcasting Followed

Then the American CIA asked her to give up the role she'd created, and work for them as a DJ with a covert agenda: to broadcast a show of propaganda directed at North Vietnamese soldiers.

She agreed. She would play her final role in her homeland as Mother Vietnam.

The Voice of Mother Vietnam

Mother Vietnam was born in 1973 when American troops were gone but American military advisers remained in the country. The CIA created a front for the Vietnamese-language station to make it seem privately owned, with no government ties. The purpose was to demoralize the Viet Cong. The means would be the soft voice of a Vietnamese woman, who wanted only the best for her country.

"It was supposed to be the symbol of peace, the voice of love, devotion and reverence for Vietnam," says Mai Lan. "It was supposed to be the voice of a mother who defied the war and all its atrocities and callousness. It just cried out for the cessation of all the senseless killings. It just wanted to emphasize that the North and South should sit together and love each other like brothers and sisters."

This conciliatory message came from a carefully crafted script, produced by writers, including North Vietnamese army defectors and American Intelligence agents. In his book *Decent Interval*, the former CIA strategist Frank Snapp

describes the Mother Vietnam station as "most effective."

"Featuring a seductive female voice, nostalgic music and plenty of soft news, it was meant to remind the North Vietnamese trooper out in the paddies what he had left behind. The political message lay buried deep in the sentimentality - an appeal to the Vietnamese people's sense of oneness, the feeling of family ..."

Mai Lan explains her view of the job as the opposite number of "Hanoi Hannah," a North Vietnamese woman who broadcast propaganda intended to demoralize American troops. "My role was against the North Vietnamese and the Vietcong," she says, "For them to lay down their arms and go back home."

"I'd stress the casualties, the sufferings, not only on the North Vietnamese soldiers but on their loved ones," she says. "I'd tell them that life is not for killing, that there's other nice things to do besides killings, to reconsider, to go back home."

"That was the message I wanted to give to the North Vietnamese - but not what I wanted the South Vietnamese soldiers to do," she says. So Mai Lan relied on staff writers to figure out a way to get the Viet Cong who heard her to lay down their arms, while not influencing South Vietnamese to do the same. She adds, "It is difficult to measure the impact of the messages."

As Mother Vietnam, Mai Lan worked 14-hour days, six days a week. For the first time in her career, she was paid to be a DJ. For the first time she was following a script, not speaking extemporaneously from her heart.

But she never had doubts about the work.

"All I did was to volunteer my services to a cause. To me, to work as Mai Lan or as Mother Vietnam, the cause was there -- to do whatever you needed to bring about peace," she says.

"It was not fun to grow up in a war-torn country. Life was no options. So I did not regret. I accepted. You cannot afford the time to sit and ponder the possibilities. You've got to do what you've got to do."

Beyond that, she says, "I believe very much that the propaganda [was] not a propaganda, not a hardcore one. It depends on how you define propaganda. To me, it was messages to make people think - getting people to change their minds and therefore their behavior," she says.

"I really loved the show because I was the symbol of mother."

From Mother Vietnam to American Mother

"Had I not been involved in radio, particularly as the announcer for Mother Vietnam radio, I don't think I would have been given a way out of Vietnam with the support of the CIA," she says, looking back to 1975 when she and her family left their country. The end came fast for Mother Vietnam, as for the country. The South Vietnamese began to lose provinces and "the situation was about to fall apart." America began to withdraw its advisers and support, Mai Lan recalls.

Despite fears that as a CIA operative she would be a target of the Viet Cong, Mai Lan turned down a single ticket out of Vietnam in March 1975. Instead, she worked with the staff of the Mother Vietnam radio station for a plan to get them all out safely. On April 21, the CIA evacuated the group -- about 1,000 people -- to Phu Quoc, an island south of Cambodia.

Although they'd been planning an escape, Mai Lan says, "We didn't even believe we were losing Vietnam. We still had a clinging hope that perhaps the situation would restore itself and somehow we would make it back."

Her parents were to take another route out, so that morning, Mai Lan recalls, "I walked out of my house. I said goodbye to my parents as if I'd come back in the evening. There was no room to cry."

The night of April 30, more than a week after they arrived at Phu Quoc, the first half of the Mother Vietnam contingent was ferried to an American freighter in international waters. The second group, including Mai Lan, did not leave so easily. They were held hostage through the night by members of the South Vietnamese navy, who hoped to use them as leverage to guarantee their own safe passage. They sat the whole night with guns pointed at them and searchlights turned on them. Meanwhile, out in the harbor, the North Vietnamese were blowing up refugee ships attempting to reach the freighter.

Finally, Mai Lan and her group did reach the boat, arriving some time later in Guam. From there, they were taken to the United States where Mai Lan was reunited with her parents in Washington, D.C., in the summer of 1975.

GOOD MORNING VIETNAM

Mai Lan gave high marks to the film *Good Morning, Vietnam*, starring Robin Williams as Adrian Cronauer, an American serviceman who was a popular radio disc jockey in Saigon during the Vietnam War. Here are her remarks on the recent movie: "To me, that movie is so unique and different from any other films or books [about Vietnam]. It moves away from the killings, the war things. This is a non-combat film. From a Vietnamese point of view, it is a non-offensive movie.

"*Deer Hunter, Apocalypse Now, Platoon, Full Metal Jacket* - they all were the macho type of film. The Vietnamese people were not fully conveyed, [other than] the bar girls, the

prostitutes. This movie brings out the Vietnamese people.

"I couldn't help letting tears fill my eyes, among laughs. Tears of pity, of feeling for a people who were caught between the cross fire, who were victimized, who just wanted to live like any one else in the world but here they were being pulled to one side by Viet Cong and to the other side by the South Vietnamese.

"I relate to the film in more ways than one. Because I was a radio disc jockey, it brings nostalgia: the same microphone, the same tapes, the same craziness of being a DJ. Behind the scene, once the music is on, you dance your feet off. I was once like that. I was once that crazy and in love with my job.



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"The first couple of years, I was just trying to sort out my life, what I wanted to do," she says. She earned a bachelor's degree in communications at the University of Maryland, College Park, in 1982. She became a U.S. citizen. A year later, she married an American college administrator and the couple lived first in Towson, then in Harford County, Maryland. Mai Lan has not worked in radio while in the United States. Instead, she has turned to the job of raising two children, ages 1 and 3, and is thinking about resuming work on an autobiography that she began a year ago -- not necessarily to be published but "purely for sentimental reasons, for my children to know about their roots."

The impetus to resume work on her book came - not surprisingly - via radio. Approached by an independent producer putting together a documentary on Vietnam, Mai Lan agreed to tell her life story.

The program, "Vietnam Radio First Termer," was broadcast on National Public Radio. During that interview, Mai Lan came to realize that radio would once again allow her a role in shaping the public consciousness.

"At times, I thought my life story wouldn't matter. The past is the past," she says. Then she began to see that "things that would help portray Vietnam as a war-torn country are necessary."

So she has twice told this tale - of her life, her country and the power of radio - to illustrate what she thinks Americans should know about Vietnam. "I am not interested in the war side," she says. "I am interested in the humanistic side. There's a deep feeling I just want to share." ■

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215WB	15 element 2 mtr, 'Boomer'	\$81.00
220B	17 element FM 'Boomer'	\$94.00
230WB	144-148MHz, 30 element	\$216.00
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RD7	Dual conversion superhet, city/hwy, LED's, audible alarm, compact.	\$99.90
RD9	2 power cords, travel case, dual conversion superhet, city/hwy, audible & LED alerts, mini size.	\$119.90
RD55	X & K band superhet, LED's, city/hwy, audio alarm, dash/visor.	\$79.90
RD9XL	NEW, same as above with end of transmission 'Rogers Beep'	\$149.90

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3160	Dual conversion superhet, LED & audible alerts, mute, dash/visor.	\$84.90
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2045	Superhet, city/highway switch, audible & visual alarm.	\$49.90

MAXON

RD2A	Superhet, X & K band, audible & visual alert, city/highway setting.	\$49.90
RD1	Long range dual conversion, X & K band, LED's, audible alert w/volume control, antifalising, city/hwy, dash/visor.	\$59.90
RD21	Mini size, audible & visual alert, omni-polarity guard, dash/visor.	\$69.90
RD25	Deluxe mini, same as above with sequential LED's	\$89.90

MOZAMBIQUE: DXing a Troubled Land

by Robert Rian

We have watched it happen all too many times in recent decades. Watched the TV coverage, listened to the radio reports and read the newspaper descriptions of nations in great pain. Countries such as Indonesia, Cambodia, Uganda, Ethiopia, Haiti, Nicaragua, El Salvador, the Congo and others. Places that proved you don't have to have a super-power conflict to inflict super-size damage.

Oftentimes, the wounds caused by these so-called "low-intensity" conflicts run deeper in such nations because life and growth and gain is a constant struggle anyway. Fragile, essentially weak economies can, like pieces of blown glass, be shattered beyond repair by the slightest wrong move, however unintentional.

Mozambique has become such a place. Here, despair blankets the land like a burial shroud.

Troubled land, Troubled neighbors

Mozambique (officially, the People's Republic of Mozambique) sits on Africa's southeast coast, its face to the Indian Ocean, its feet at South Africa's door and various other parts of its geographical anatomy touching Zimbabwe, Zambia, Swaziland and Tanzania.

The famous Portuguese explorer Vasco da Gama discovered Mozambique in 1498. From that time onwards the country's story has followed the same script as that used all over Africa, Latin America, and Asia. First there were the traders and the gold, silver and ivory they chased, followed by a rebellion and a military campaign from outside to put it down. Eventually, the country was mastered and colonized.

The Marxist Mozambique Liberation Front (Frelimo) began fighting against the Portuguese and their administration of

Mozambique as far back as 1964. Despite Portugal's sixty thousand man army stationed in Mozambique, Frelimo, by the early 1970s, had managed to control much of the country.

When a military coup overthrew the government back home in Lisbon, the new leadership wasted no time in arranging a ceasefire and, the following year, independence for Mozambique. Indeed, the Mozambique resistance efforts - and a similar situation in Portuguese Angola -- were direct contributors to the Lisbon coup. The military was tired of these foreign wars and wanted out.

Portuguese exodus

The new Mozambique soon lost most of the quarter million or so Portuguese who had helped run the government. The new leadership allowed its territory to be used by guerrillas fighting the white government of Rhodesia (Zimbabwe) and also by the African National Congress in its much more subdued campaign against South Africa.

For its troubles, Mozambique was repeatedly buffeted by retaliatory raids from Rhodesian and South African forces.

Mozambique's independence and adoption of a marxist form of government led to creation of the anti-government Mozambique National Resistance (Renamo). Initially Renamo was largely the handiwork of Rhodesia which viewed the organization as a good tool for infiltrating Mozambique and damaging the cause of those trying to overthrow the Rhodesian government. Once white rule ended and Rhodesia became Zimbabwe the support stopped - but was soon taken over by South Africa.

Today Renamo is waging a strong guerrilla warfare campaign. Typical of guerrilla war, there are no "fronts." The fighting is spread out over about two-thirds of the country and has grown in severity over the past few

years.

Broadcasting: Deteriorating if not destroyed

Mozambique's infrastructure - its roads, bridges, railways - even its broadcasting - is being destroyed or is steadily deteriorating. The war has displaced about ten percent of Mozambique's fourteen million people and half of the population is believed to have been hit by the war in one way or another.

Agriculture has been disrupted so severely that farms have been abandoned and starvation has become a very serious problem. Relief convoys are often attacked by Renamo.

Renamo denies this, saying the government forces are behind the attacks and doing so in order to place the blame on Renamo. In any event, much of the relief never reaches its destination. Travel outside the larger cities is considered dangerous and some parts of the country can be reached only by air.

The turmoil and devastation includes many instances of brutal outrages against non-combatants which rival those of a Bokassa or Amin. Again, Renamo - headquartered in Lisbon - denies responsibility for such savage acts and insists it is government propaganda.

Like the rest of the country, broadcasting in Mozambique isn't what it was once upon a time. Some regional stations which were once on shortwave are off and perhaps half of the frequencies available to Radio Mozambique are not in use.

No private broadcasters

Unlike pre-independence days, there are no private broadcasters in Mozambique. The old Radio Clube de Mozambique is long gone (it was South African-owned and evolved into what today is the SABC's

Radio Five service). Also gone is the catholic station, Radio Pax.

The government's Radio Mozambique operates three services which, in theory anyway, can still be heard on shortwave. The main home and regional service, broadcast entirely in Portuguese, is Emissao Nacional. This is scheduled at 0255 to 2205 on 7240; 0255 to 0530, 1500 to 2205 on 4865; 0600 to 1400 on 6115; 0430 to 1745 on 9618; and 0500-1045 and 1130-1630 on 11818. Of these 6115 and 11818 were not in use at last report. Emissao Nacional has been heard recently from 0255 sign-on on 3210 and 4865.

Provincial stations fare badly

Emissao Inter-provincial de Maputa e Gaza, in Portuguese and the local Tsongo language, is scheduled at 0255 to 2205 on 7110; 0255 to 0630 and 1500 to 2205 (but 0255 straight through to 2205 during local wintertime) on 4925; and 0255 to 0530, 1500-1745 and 1830 to 2205 on 3338. 4925 is not believed to be active at present.

An English language service aimed at South Africa is scheduled from 1100 to (variously depending upon what day it is) 1130, 1135, 1140, or 1200 on 11818; and 1800 to 1830, 1845 or 1900 on 3338 or 4855.

Emissao Provincial de Sofala, located at the port of Beira in the country's middle section, is scheduled at 0255 to 0500 and 1500 to 2200 on 3370, and 0500 (occasionally from 0255) to 1500 on 6025. However, neither of these frequencies appears to be active. Instead DXers report hearing Beira from 0255 sign on on 3280 and 9638 with 10 and 100 kw respectively. Again, broadcasts are in Portuguese and local languages.

Emissao Provincial de Nampala from Nampala is listed as active from 0255 to 2215 on 7320 but this is not really believed to be the case. Nampala is not thought to be active on shortwave at all at present.

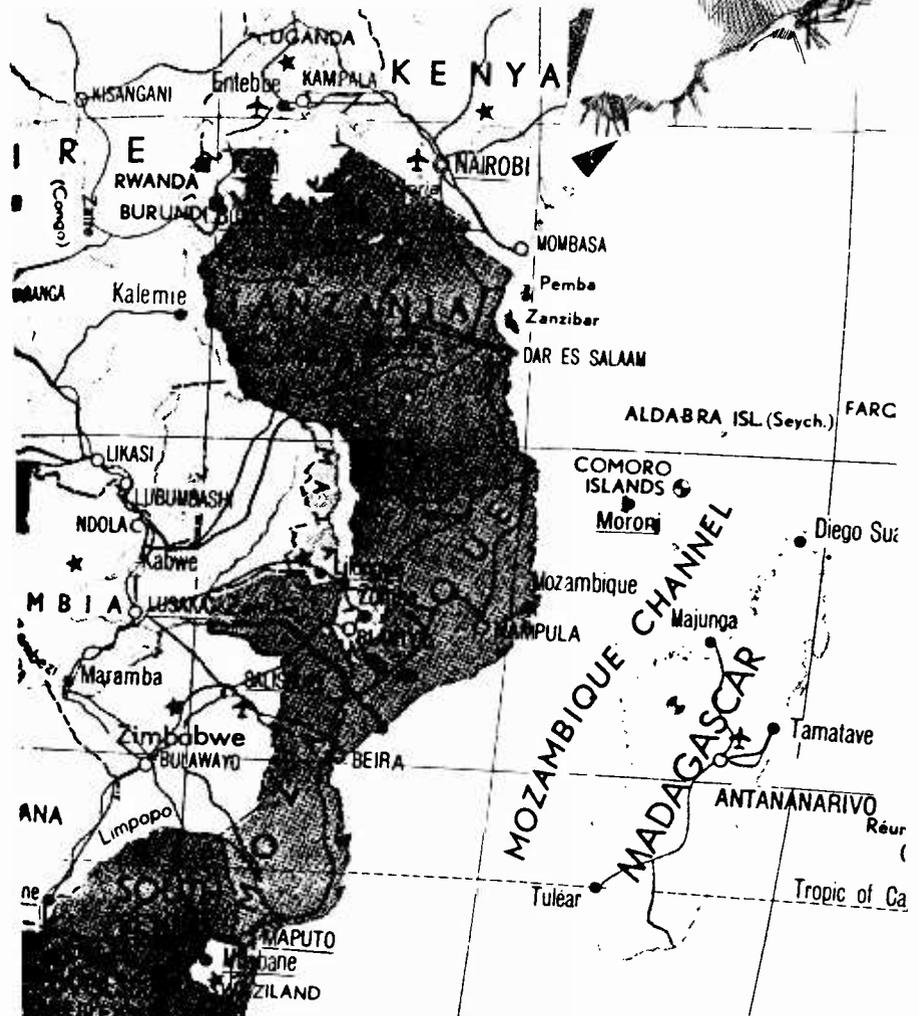
The same situation applies to the outlet at Quelimane - Emissao Provincial de Zambezia, scheduled on 4872 from 0400 to 0515, 1000-1215 and 1600-2215.

The third leg of this silent triangle is Emissao Provincial de Cabo Delgado at

Pemba, listed as operating from 0400 to 0515, 1000-1215 and 1600 to 2200. Although once active on shortwave, no frequency is even listed any longer.

In any event, all three - Nampala, Quelimane and Pemba - were extremely difficult to log in North America, even in the best of times. Nampala was heard by a few people some years back but the other two - using powers of only a few hundred watts - were never logged in North America so far as is known.

Despite the extreme difficulties being faced by Mozambique, the stations at both Maputo and Beira are still fairly reliable when it comes to answering listener's reception reports. Those listeners with a little patience and reasonably good receiving equipment should have no great difficulty in both logging and verifying this country in trouble.



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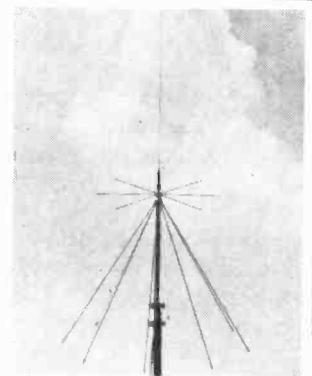
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outperforming any omnidirectional antenna we have ever used for continuous 25-1000 MHz (and above) coverage. A base-loaded, vertical top element is used as a low band (30-50 MHz) frequency extender.

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 $\frac{1}{2}$ " diameter). Included is approximately 50 feet of low loss 50 ohm coaxial cable with N connectors factory installed. Receiver adaptors available at additional cost at time of order.



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Shannon Airadio

Europe's 24-Hour Weather Radio

By Brian Nagel

Shannon Airadio. It's a vital element in the North Atlantic aero communications network. For shortwave listeners, however, it's a unique and relatively easy station to hear and one that provides a wide range of fascinating information.

Listeners can tune -- in upper sideband and using simple voice communications -- such things as communications from pilots flying the transatlantic routes between North America and Europe, and, best of all, regular weather reports for airports in more than 30 of Europe's main airports. It's not all that hard to hear -- the utility listener's equivalent of tuning in, say, Radio Sweden.

Now in its 52nd year of service as the nerve center of the transoceanic communications network, Shannon Airadio is a more complex operation than perhaps many people envision.

Even at that, Shannon is not a "stand alone" operation. It is part of the Aviation and Marine Communications Service (AMCS) which, in turn, is part of the Air Navigation Office (ANSO), itself a part of the Irish Government's Department of Transport and Tourism.

There are about 170 persons employed in the AMCS and each is capable of wearing either the "marine" or "aero" hat - handling

assignments in either area. About 105 staff work at the Shannon installation. Actually, as we'll see later, Shannon is really more than one installation and only a part of it is, in fact, located at Shannon airport!

The main operations center is at Ballygirreen in County Clair, about six miles from the airport. The station's work is split into three areas: The Shanwick Oceanic Air-Ground communications station, the Aeronautical Fixed Telecommunications Networks Station and a high frequency (shortwave) VOLMET station.

The first of these operational areas, the air-ground-air communications is actually split between Ireland and the United Kingdom -- the Oceanic control center at Ballygirreen - hence, "Shanwick."

Out of sight, not out of mind

Aircraft crossing the North Atlantic spend much of the flight out of radar contact with land so they must transmit regular position reports to Ballygirreen so they can be tracked. Most of these communications take place on shortwave frequencies. Communications are sent onward to Prestwick by teleprinter, with any required reply sent from Prestwick back to Ballygirreen for transmission to the aircraft.

In addition to communications with in-flight aircraft, the station also carries on communications with other stations which border the Shanwick Oceanic area (New York, Gander, Iceland and the Azores) - as well as with aircraft within those operational areas.

Any of 14 shortwave frequencies can be employed for these communications (see chart). Ballygirreen has eight operator positions which are manned around the clock.

Besides these operator positions there is a coordination control console, manned by three radio officers whose job it is to ensure that aircraft traffic is routed to the proper operator without delay. In

addition, the radio officers are charged with making sure position reports from aircraft arrive on schedule and, if not, to find out why and fix the problem.

Officers are responsible for re-routing the path of the transmission via other aircraft or ground stations if that becomes necessary due to poor propagational situations.

Shannon's work in the Aeronautical Fixed Service and Aeronautical Fixed Telecommunications Network is not as full of voices, human activity and potential drama. Instead, a very high grade computer system keeps track of all aviation-relevant information as well as the routing of that information to other aeronautical fixed stations.

Information from other AFS stations, meteorological information, data from airline offices and other agencies are all routed to their destinations through this computerized system which currently handles around 20 thousand messages each day.

VOLMET weather broadcasts

Perhaps most familiar to the shortwave utility monitor are the regular aviation weather broadcasts from the Shannon Airadio VOLMET station. Meteorological information covering 33 of the main European airports comes into Ballygirreen constantly. A "live" announcer sits in a glass-enclosed booth and transmits this information in a 25 minute broadcast on the hour and on the half hour over three shortwave frequencies.

The Ballygirreen center is the main receiving site at the Shannon installation and it's from here that the air-ground, VOLMET and other communications emanate. But like many broadcasters, the transmitters aren't sitting next to the studios. They are three miles closer to Shannon airport at Urlanmore.

Urlanmore has a total of two dozen transmitters in the complex. Twelve of these are used for air-ground-air communications, six are devoted to the VOLMET service (all of these are rated at 5 kw). There are two more used for a radioteletype service between Ballygirreen and Santa Maria in



Guarding and tracking planes and ships in the Atlantic, stations such as Shannon Aeradio and Gander Oceanic radio (pictured) are always on the watch.



(American Airlines Photo) Boeing 767

the Azores. Two more are kept free for use on search and rescue frequencies and the last (with a spare, just in case) is always available for the 500 kHz emergency frequency.

A third Shannon Airadio installation is a satellite station at the airport which handles messages from offices and installations not directly connected to the main message-switching system at Ballygirreen.

Shortwave listeners can tune in comprehensive weather reports for 23 main European airports.

Getting technical

In 1982 the entire installation underwent a major technical overhaul. New antenna systems for both receiving and transmitting were installed at Ballygirreen and

Urlanmore. Single channel Philips and tunable Dansk air-ground receivers were installed at Ballygirreen. Antennas are matched to the receivers by Redifon multi-couplers which can feed 24 individual receiver outputs at minimal signal loss.

The Philips receivers are kept remote from the operating consoles - which have control of only the RF gain, antenna and a "clarifier". The tunable Dansk receivers, in contrast, are accessible at the operating positions and are there to serve as a backup should a Philips receiver fail. Transmitters are remotely controlled from the operating consoles.

There are four such operating consoles, each accommodating two operating positions. As near as can be learned from the available information, each console is also termed a "family" and accesses only certain of the entire group of Shannon air-ground-air shortwave frequencies (see chart).

Activity at Shannon Airadio and its associated installations never stops. There are always aircraft in flight which need looking out for - a job superbly done by Shannon Airadio for some 52 years.

Shannon Airadio Shortwave Frequencies

(All transmissions in Upper Sideband)

VOLMET (on the hour and half hour)

Night -- 3413, 5640, 8957

Day -- 5640, 8957, 13264

AIR-GROUND-AIR

Family A -- 3016, 5598, 8825, 13306, 17946

Family B -- 2899, 5616, 8864, 13291, 17946

Family C -- 2962, 5649, 8879, 13306, 17946

Family D -- 2971, 4675, 8891, 11279, 13291, 17946

RADIOTELETYPE

Shannon to Santa Maria, Azores (SMA)
-- 3250, 5813.5, 8145, 11440

Santa Maria to Shannon (MSA)
-- 5474, 10540, 12323

SEARCH AND RESCUE

-- 2182, 5680, 3023

Most frequencies extracted from Grove's *Shortwave Directory*, 4th edition

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AD100U AC Adapter/Charger for 50 XL	12.95 ()
BP55 Ni-Cad Battery Pack for 50XL	13.99 ()
VC001 Carry Case for 50XL	11.99 (7.00)
PS001 Cigarette Lighter Adapter for 50XL/100XL	12.95 ()
BEARCAT 140 AC Programmable Scanner	94.99 (5.00)
BEARCAT 145XL AC Programmable Scanner	99.99 (5.00)
BEARCAT 175XL AC Digital Scanner	159.99 (5.00)
REGENCY TS-1 Turbo Scan AC/DC	239.99 (7.00)
REGENCY TS-2 Turbo Scan 800 AC/DC	339.99 (7.00)
BEARCAT 210XLT AC/DC Digital Scanner	199.99 (7.00)
BEARCAT 800 XLT AC/DC Digital Scanner	279.99 (7.00)
REGENCY HX-1500 Hand-Held Scanner	224.99 (7.00)
REGENCY MA-257 Cigarette cord for HX1000/1200	16.99 ()
REGENCY MA-917 Ni-cad Battery for HX1000/1200	24.99 ()
REGENCY HX-CASE Hvy Leath. case for HX1000/1200	19.99 ()
REGENCY MA-549 Drop in charger for HX1000/1200	89.99 (5.00)
REGENCY MX-3000 AC/DC Digital Scanner	160.99 (7.00)
REGENCY Z-30 AC/DC Digital Scanner	129.99 (5.50)
REGENCY Z-60 AC/DC Digital Scanner w/Air	139.99 (7.00)
Mobile Mounting Bracket for Z Scanners	5.99 ()
REGENCY ACT-R-1 AC/DC Crvs. Single Channel	75.99 (4.00)
REGENCY RH-256B High Band Transceiver	359.99 (7.75)
REGENCY UC 102 Hi-VHF Hand Transceiver	119.99 (5.50)
REGENCY RH-600B High Band Transceiver	429.99 (7.75)
REGENCY R806 AC/DC Crystal Scanner	79.99 (5.00)
REGENCY INF-1 Informant Receiver	249.99 (7.00)
REGENCY INF-2 Informant Receiver	324.99 (7.00)
REGENCY INF-3 AC informant Receiver	249.99 (7.00)
REGENCY INF-5 AC Informant Receiver	199.99 (7.00)
REGENCY R1090 Digital AC Scanner	147.99 (7.00)
COBRA SR12 Digital Hand-Held Scanner	189.99 (6.50)
COBRA SR10 Digital Hand-Held Scanner	129.99 (6.00)
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RCD MRP-1 Single Channel Hand-Held	38.99 (3.00)
FANON MB8LU DC Crystal Scanner	89.99 (5.00)
FANON PSK-1 AC Adapted for MB8LU	12.99 ()
FOX BMP-1060 AC/DC Digital Scanner	129.99 (5.50)
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ANT-1 Magnet Mount Mobile Scanner Antenna	29.99 (3.00)
ANT-6 Base Scanner Antenna w/50' cable	29.99 (3.00)
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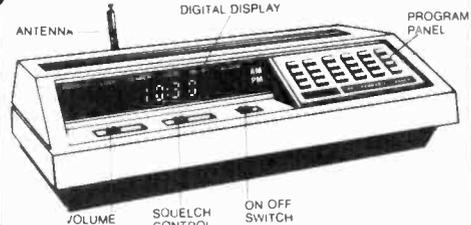
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home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10 3/4"Wx2-7/8"Hx8-3/8"D.

Sophisticated microprocess-controlled circuitry eliminates the need for crystals, instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only \$39.99, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only \$29.99, gives you a total of 3 yrs complete warranty.) Z-30 Service Manual \$5.00.



The Regency Z30 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10 3/4"Wx2-7/8"Hx8-3/8"D.

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COBRA SR-925

\$109.99

(plus \$7.00 shipping each)



Digital programmable, 16 channel, AC/DC mobile/base, with raised button keyboard for easy programming of the following frequency ranges: 29-54mhz, 118-174mhz, 406-512mhz. Covering aircraft, marine, police, fire, weather, trains, public service, plus much more. Features include: digital display, priority, scan delay, weather button, channel lockout, search, scan speed, automatic squelch, memory backup, one year factory warranty, external speaker jack. (Extended warranty 2 years extra \$29.99, 3 years extra \$39.99.)



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Digital Programmable 100 Channel Scanner

BC-600 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz. Features compact size or 6'5"16 Wx1'5"8 Hx1'3"8 D scan delay, priority, memory-backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket. Supplied one year, factory warranty, search, direct channel access, track tuning, service search including pre-programmed frequencies by pushing a single button for police, fire, emergency, aircraft, weather, and marine services. Plus exclusive optional features never available on any scanner before: First is an RF receive amplifier for boosting weak signals for only \$24.99 plus a CTCSS tone board is available for only \$59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #600MPC \$4.99.

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Same features as BC-600XLT but also receives 800-954mhz

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20 CHANNEL HAND-HELD SCANNER

Small size 6"Hx1"Dx2 3/4"W, full digital readout, priority, search, channel lockout, scan delay, key lock. Covers following frequencies: 29-54mhz, 136-174mhz, 406-512mhz. Package includes rubber antenna, rechargeable Ni-Cad battery pack, AC adapter/charger, and carry case

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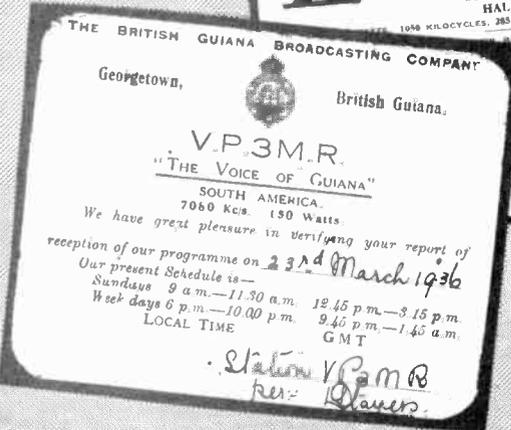
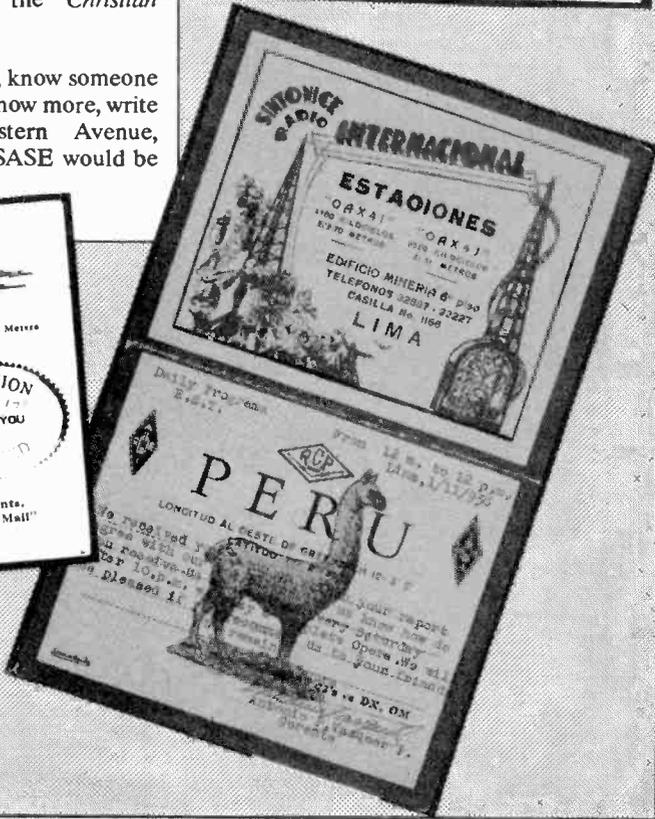
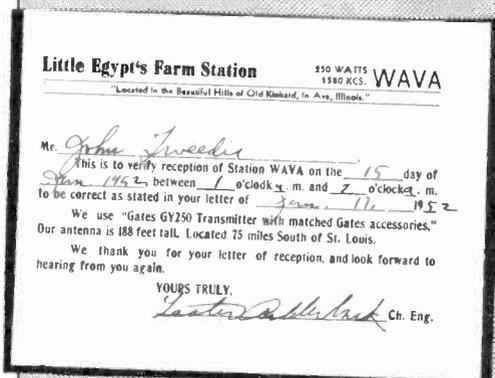
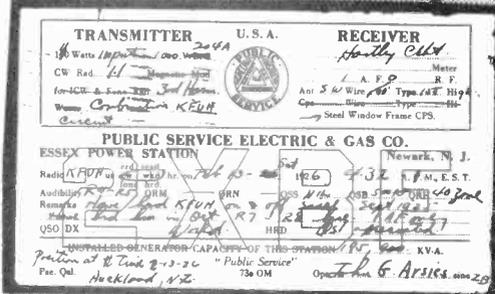
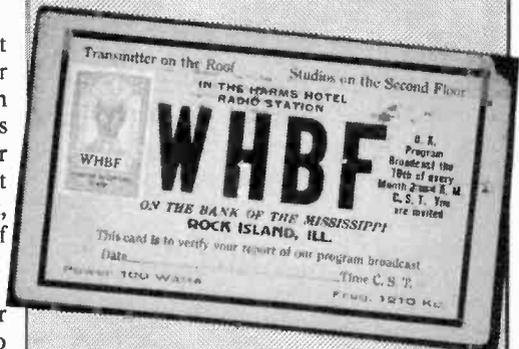
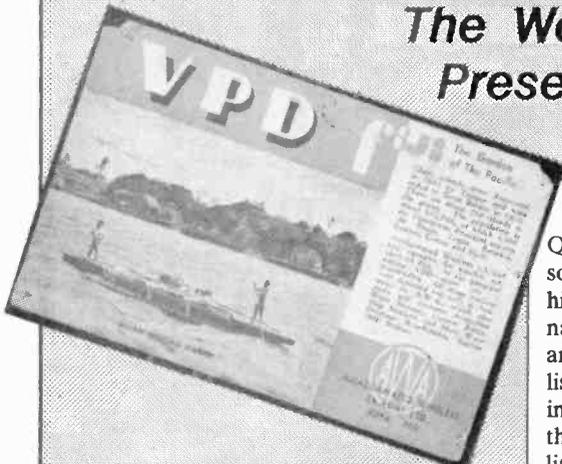
The Work of the Committee to Preserve Radio Verifications

QSL cards. They're more than just souvenirs. They're also a part of the broader history of radio, reflecting changes in national politics, broadcasters, frequencies and relations between stations and their listeners. Older QSLs never fail to prompt interest among hobbyists. At the very least, they're glimpses at the early days of listening.

But what happens when the QSL collector passes away or becomes inactive? All too often, those once-prized cards are relegated to a dusty attic, wet basement or worse, trash heap. Back in 1986, it was decided to take a major step forward in preserving these cards. And thus the Committee to Preserve Radio Verifications was established. It is hoped that, through the efforts of this committee, more QSLs will be saved from loss or destruction.

Already, the collection is approaching the 5000 mark. It is an all-wave project and the committee welcomes QSLs from shortwave broadcast, medium wave, utility and other stations as well (amateur cards only if pre-1950). The collection is located at the Boston headquarters of the *Christian Science Monitor*.

If you are leaving the hobby, know someone else who is, or just want to know more, write to Jerry Berg, 38 Eastern Avenue, Lexington, MA 02173. An SASE would be appreciated.



Season's Greetings
from
NPP
U. S. Naval Radio Station
Marine Detachment, American Embassy,
Peiping, China.
1936



ZBW
HONG KONG
Hinghong Broadcasting Station thanks you for your reception of ZBW on 80.20 Mc, 3/11/1936 & 6/22/36.

WAC
BE
RADIO DECKS 0700 & M.T. 46
XMTT P 8014 FINL 9 WATTS. G.
QSO NO. 885 UR 10 MIC. SIGS. RST. 5.79
RECV. TOOB. AC. & SPKR. CENTER FED. 33 FT. VERTICAL ANT.
COUNTRIES. WLD. 119/70 ZONES. WLD. 39/45
LICENSED SINCE 1932. I ALWAYS QSL.

EDIC TL DKO 47 LIGWELLYN ST. BRISBANE

THE SHORT WAVE VOICE OF LABOR AND FARMER
W9XAA
Thank you for your reception of W9XAA on 15.84 Mc. Sincerely,
E. N. HOOKER
MAYARD SQUARE
100 LAKE SHORE DRIVE, CHICAGO, ILL.

FAR EAST NETWORK
TOKYO JAPAN
9.605 MC (JKE)
4,860 Mc 0845-1800
9,605 Mc 2315-0830
4,860 Mc 2100-2300
GMT
CHI
FAP
APG
San
11,825 Mc 2315-0830
6,080 Mc 2100-2300
R. H. PH.
C/Enr, J

RADIO SEAC
THE FORCES BROADCASTING SERVICE
THANK YOU FOR YOUR RECEPTION REPORT
DATED 6/6/47 OF RECEPTION AT
ROCKAWAY, N.Y. ON 15.84 MCS.
AND WAVELENGTH OF 19.84 METRES.
Wesley F. Helms
Operator
FURTHER REPORTS AND SUGGESTIONS ARE WELCOME PLEASE SEND TO
RADIO SEAC

W 10 XDA
ABOARD THE SCHOONER MORRISSEY ON THE
1936 BARTLETT EXPEDITION TO
NORTHEAST GREENLAND
I am very pleased to acknowledge
your report of JULY 6 1936
Your position was BRIGGS NEWFOUNDLAND
Transmitter 100 watt Radiophone
Receiver Hammarlund Crystal Pro.
73 Clifton Pass W20J
Operator

HEREDIA
T-4 NRH
COSTA RICA
Operador: Amando Céspedes Junior.
Secretario: Lidylla Céspedes Arias.
Equipos controlados a Cristal: 47, 48, 210.
Final modulado 852 Modulación Barton.
La primera Estación que perforó en ondas cortas en idioma español, la música del Continente Americano.
Creador de la Estación NRH, 1922
Director de la UNION RADIA AMERICANA, 1932.
Miembro Correspondiente del Centro de Historia, Santander, Colombia, 1933.
Miembro Honorario de Asociación EAR, Madrid, España, 1929.
Santiago Radio Club, Cuba, 1932.
Society of Wireless Pioneers, USA, 1934.
Radio Club Venezolano, Caracas, 1934.
Chicago Short Wave Radio Club, USA, 1935.
International DXers Alliance, USA, 1935.

Muy agradecidos por habernos escuchado en esta frecuencia el día de de 193 de las a las m. (S. T.)

KILOCICLOS
980
9.670
14.428

RECUERDO PARA NUESTRO AMIGO:

2510 MAR VISTA AVE. ← NOTE → ALTADENA, CALIF.
RADIO KFUM UR 15A SIGS 1935 MR. ART. S. H. AM P. S. Time 1/18 1926
AUD. RT. FBI QSA. Mo. QSS. N14 QRN. AM. A. J. S. QRM. N14

6 DBH

TRANSMITTER: 5U-200 Pt. Ton. 150 W. Input. 100 W. Output. 100 W. C. K. ANT. ANT. 1112

RECEIVER: Remonty. CR. 12-22. Meter. D. H. at 1. SHD. Bddy. Tonas

ANTENNA: Down Mast. Type 1. Wire 17. FL. Long. 13. FL. High. N14-14

COUNTER POSE: Type 1. Wire 30. FL. Long. 7. FL. High. N14-14

DR. MODE: 90. Signal. 000. U. S. C. Dist. 100. N14-14

REMARKS: Report from... 6/1/47

Microwave Technology: --- Communication for

by David G. Ewing

You are flying a routine mission at an altitude of 50,000 feet and about to enter hostile territory. There are no enemy aircraft within sight. Suddenly the radar warning receiver (RWR) in your cockpit sounds an alert. With all your military training you try to remain cool, but you still worry that someone, yet unseen, is observing your plane on their radar screen.

While the "enemy" is deciding what to do, the electronic countermeasure (ECM) pod on your plane has already determined that the radar's signature belongs to an enemy beam by measuring its frequency and repetition rate. The plane's ECM equipment then automatically transmits signals to deceive the hostile radar.

A deep space probe has been sent out from Earth to photograph and gather data about another planet far from our own. As the probe passes around and behind the planet, it sends signals back towards home. There, scientists are able to determine, from millions of miles away, features of the planet without having to land on it.

What do Electronic Warfare (EW) and planetary spacecraft have in common? They both utilize the leading edge of microwave technology.

Microwaves

The microwave band covers from 1,000 to 300,000 MHz (although some consider the lowest frequency to be 300 MHz). The approximate wavelength at 1,000 MHz is 30 centimeters, and at 300,000 MHz is 1 millimeter of length. As the frequency increases, the dimensioning tolerances and higher loss in materials prevents the use of standard Yagi antennas, but there are alternatives.

Most coax cable and connectors that are utilized on the short wave bands won't work well at higher microwave frequencies. A low-loss alternative to normal coax for microwaves is to use waveguides which are hollow, usually rectangular or cylindrical metal tubes. Waveguides of the proper size will permit propagation of the waves. The antenna problem can then be solved by using reflector-type antennas (such as "dishes") which can be fed by waveguide structures.

World War II and Radar:

The principle of radar (RADio Detection And Ranging) was first demonstrated in the 1920s. Radar units transmit radio waves (usually in the microwave band) towards a target and, when they receive a reflected wave from the object, can determine the distance and position. Since the speed of light (and radio waves) are known to great accuracy, the time between transmitting and receiving the echo is a function of the total distance.

Microwave radar designs were feasible in the early 1940s. Utilizing these frequencies resulted in radars with increased performance and smaller antennas. In fact, radar was an important factor in the outcome of World War II.

The Doppler Effect Isn't New

Christian Doppler observed that the frequency of waves appear to change when their source and receiver are in relative motion to

each other. This apparent frequency shift occurs for audio sounds, radio and light waves. Although radio transmissions were unknown to Doppler in 1842, his effect is widely utilized in modern radar systems such as law enforcement's speed gun. The reflected Doppler-shifted radio wave is mixed with the transmit frequency and the resulting frequency difference indicates the target vehicle's speed.

Radio waves from deep space probes are also frequency shifted due to the Doppler effect because of their relative motions. By using precise frequency control of the probe's transmitter (such as the Voyager spacecraft) and the receiver on Earth, the received microwave signals can be accurately analyzed.

Stealth Is What You Make It

An aircraft trying to hide from radar should have reduced radar cross section (RCS).

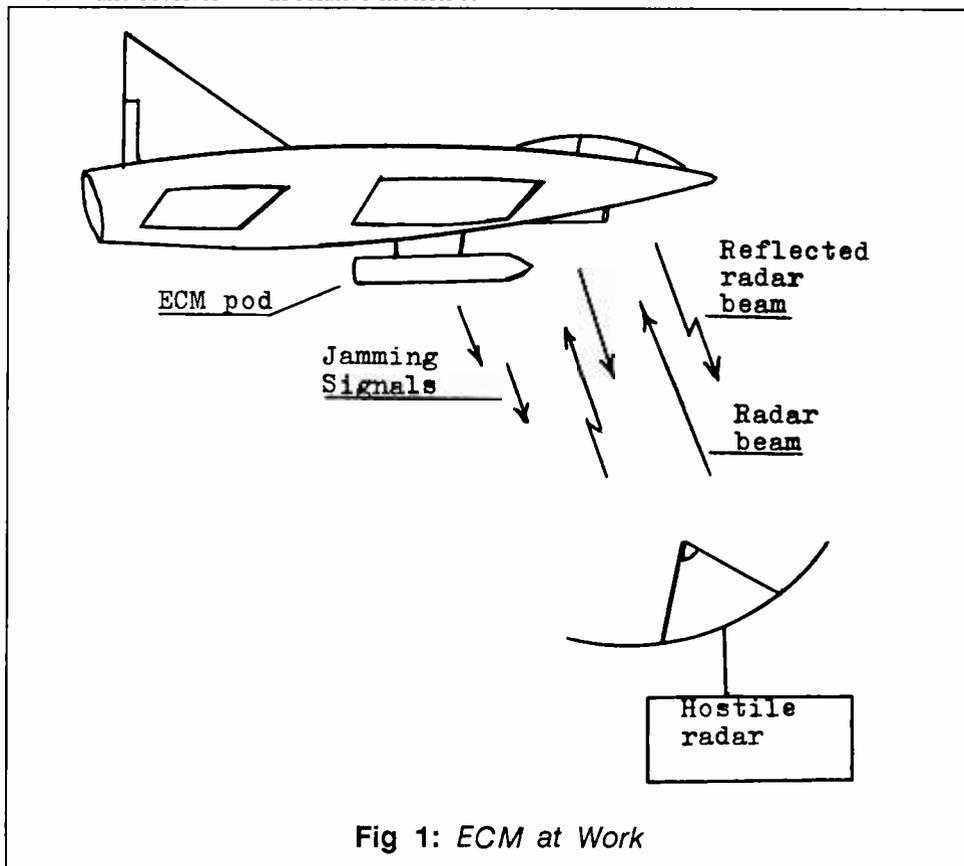


Fig 1: ECM at Work

Electronic Warfare

There has been an increase in the technical research on this subject in order to reduce the reflected radar echo from an aircraft (or other targets). One technique of "stealth" to reduce the RCS is by modifying the object's contour, using non-metallic composite materials and special paint that can reduce microwave reflections.

No Place for Alligators

Electronic countermeasure (ECM) systems can't be all mouth and no ears. The radar warning receiver (RWR) must detect an enemy radar beam before any countermeasures can be initiated. Generally, frequencies between 2 to 20 gigahertz are the prime territory of electronic warfare.

As the aircraft's ECM system generates a jamming or deceptive signal (see figure 1) to confuse the radar, the enemy's radar could attempt a counter-counter measure (ECCM) by varying the radar's transmit frequency. The ECM control logic (see figure 2) must determine the optimum signals to transmit toward the hostile radar to confuse it. The aircraft may also release active decoys which contain a radio transmitter to draw the attention of the enemy's radar away from the aircraft.

Research Continues

Microwave technology is still in a developmental stage, as its applications from deep space to electronic warfare seem to indicate. New materials, such as gallium arsenide (GaAs), will probably replace silicon in many of the solid-state microwave components of the future.

Still, there will be a limit to the capabilities of microwave technology. But we are certainly not near them yet.

Sources:

G. Leonard Tyler, "Radio Propagation Experiment in the Outer Solar System with Voyager," *Proceedings of the IEEE*, pp. 1404-1431, vol. 75, no. 10, October 1987.

Gary K. Lewis, et al., "GaAs MMIC's for Digital Radio Frequency Memory (DRFM) Subsystems," *Transactions on Microwave Theory and Techniques*, pp. 1477-1485, vol. MTT-35, no. 12, December 1987.

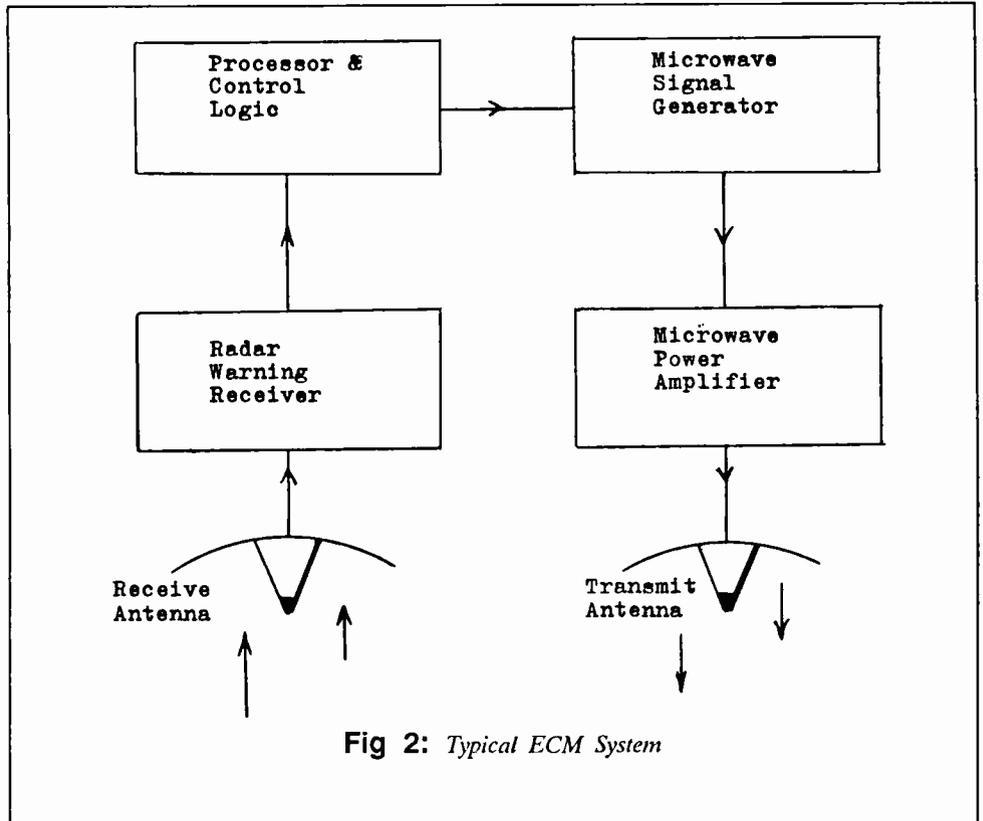


Fig 2: Typical ECM System

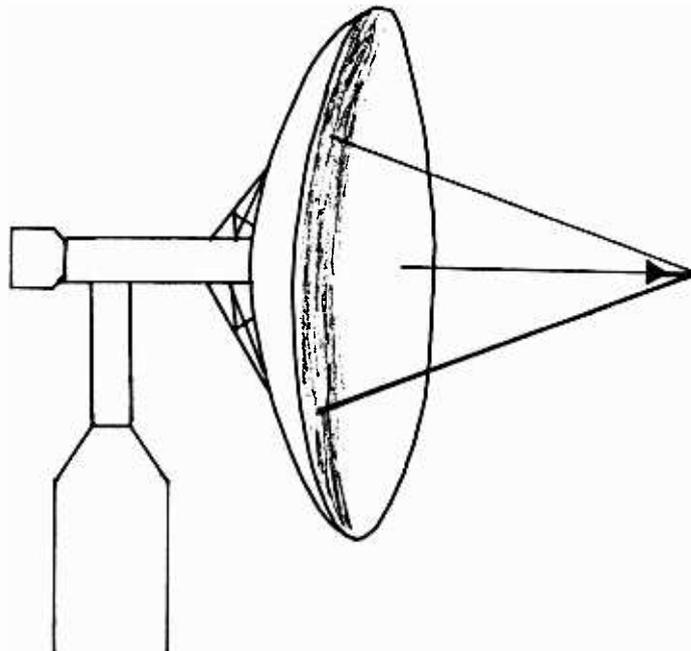


Fig 3: "Dish" Type Antenna

Scanning for, uh, Woodpeckers

by Bob Kay

As I pulled the gear shift lever into first, the transmission growled in protest. After a brief moment of hesitation and a slight belch through the carburetor, the old Jeep reluctantly began the descent into the valley.

Just ahead, a pond silently glistened in the morning sun. Two fields away, several deer were nervously leaving the security of a thick cluster of low hanging pines. To my left, squirrels were busily scurrying about the forest in search of breakfast.

Looking over at the passenger seat, my two companions were actively scanning. The Pro 2020 was programmed to the sheriff and state game warden frequencies. The Bearcat was searching 49-50 MHz for possible reception of the FM headsets that were being used by dirt bikers in the area.

Suddenly, a loud tapping sound filled the inside of the Jeep. Leaning my head out the window, the noise started again: ratatatatat. But wait a minute, that was a woodpecker! And you could hear it in the woods *and on the scanner!* Looking down at the Bearcat, it had locked on 49.8 MHz.

The engine and the Pro 2020 were turned off. In the silence, the sounds of singing birds could be heard coming from the Bearcat. In disbelief, I brought my ear closer to the speaker--ratatatatat! The unexpected noise of the woodpecker made me jump in my seat.

What was happening? How could a scanner lock onto a bird? Then as suddenly as it had all begun, it stopped. The Bearcat was searching again. The noisy woodpecker had gone silent.

That evening, sitting by the fireplace, the woodpecker was still on my mind. "Thinking about the woodpecker?", my wife gently teased. Before I could answer, Betty, who had invited us to her mountain home, quickly interrupted.

"Maybe you should call your editor", Betty began. "Just tell him that you heard a woodpecker on your scanner!"

The comment was followed by a round of laughter that filled the room. Betty continued her teasing throughout the remainder of the evening. On several occasions she would tap on the wall and exclaim, "Hey Bob, I found

your woodpecker!"

I accepted the teasing and warned her that someday I would get even. However, she ignored my warning and the teasing continued until bedtime -- when I found a small straw bird neatly tucked under my covers.

It was mid-afternoon on the following day before I could get away to do some additional woodpecker scanning. Once again, near the bottom of the valley, the Bearcat locked on to 49.8 MHz.

After parking the Jeep, I entered the woods to the left of the road. It was in this direction that the woodpecker had been heard the day before. Accompanied by my hand-held Pro 30, I began tracking one of the most bizarre signals that I had ever encountered.

Less than 50 yards into the forest, I stepped from behind a group of pine trees and discovered a small cabin. My knock on the front door was answered by an elderly gentleman who listened quite intently to my woodpecker story.

"So, you heard that woodpecker too?", he began. "Tell me, can you hear anything on that radio of yours now?"

"Sure, listen for yourself." I then turned the volume up and the old guy leaned toward the speaker.

"Hear the birds singing?" I asked.

"Sure do", was his response. "I hear them birds every morning."

"Well, hearing birds in the woods is normal", I said. "But hearing them on a scanner isn't normal."

"No, I hear them on something else. Come on in and let me show you."

After pouring two cups of coffee, he briefly left me sitting in the kitchen and then



The road less traveled by...

returned with a Fisher-Price room monitor. Placing the receiver on the table, it quickly became evident that the unit was monitoring the same frequency as my scanner.

"Where do you have the transmitter?" I asked.

"Oh, down in the springhouse."

"What is a springhouse?"

"Boy, where are you from?"

"Near Philadelphia. I'm staying with a friend over on the other side of the mountain."

"City slicker, that figures! I get my water from a spring. Where the water exits the ground, a shed is built over it to keep the leaves and animals out. The shed is called a springhouse."

"So you carry water from the springhouse to here?"

"My father did it that way. But I have a pump in the basement that pulls the water right up to the house. Just like the city, turn on the faucet and water comes out. Only it's good, clean, spring water."

"But why would you want to monitor your springhouse?"

The old fellow closed one eye, tilted his head and stared at me for a moment. "You're not the police, are you?"

"No sir, I'm not."

"OK, I'll take a chance on you. But first, you have to give me your word that you won't tell anyone about my little secret."

"What secret?"

"First give me your word."

"OK, you got it."

"Will you shake on it?"

After shaking hands, the old gentleman led me down a narrow path to the springhouse. As the lock was opened, I suddenly became very conscious of my situation. Here was an old man, concerned if I was a policeman, about to show me something that he had locked in a springhouse! I wasn't sure if I wanted to discover his "secret"!

As he opened the door he invited me to look inside. I stood back, hesitant and a little on guard.

"Boy, it's just a springhouse. It don't bite!"

"Maybe so, but why were you so concerned about me being a policeman?"

"If you just take a peek inside, you can see for yourself."

As I stepped cautiously toward the door, a squirrel started chattering on a nearby branch. The noise startled me and the old guy started laughing. "Man, I have never seen nothing like this in all my life! Don't be scared. The meanest thing in there is probably a field mouse."

Peering into the open door, I saw a pool of crystal clear water surrounded by a concrete wall about six inches high and four inches wide. Along the top of the wall were quite a number of corked glass bottles. Right next to the door was the Fisher-Price transmitter.

"This is where that woodpecker was yesterday", the old guy began. "He probably sat right on top of this springhouse, pecking away, looking for bugs in the wood."

"That explains how I picked up the sound on my scanner. The transmitter inside just sent the pecking over the air!"

"It got so bad up at the house that I turned the electric off until the darn bird flew away."

"Is there a switch in your place that controls the power out here?"

"Sure is. Had a buddy of mine run an electric line from the house to here. That way, if I do hear something, I can turn a light on inside the springhouse."

"So yesterday, when you turned the electric

off, the transmitter went off. That must have been when I lost the signal on my scanner."

"Yep, I guess that would be about right."

"But what is the secret?"

"See them bottles in there? Moonshine, boy! Mountain water, white lightning, mountain whiskey, call it whatever you like, but it will still knock your pants off!"

"You're a moonshiner!"

"Naw, I just store it here. A friend of mine makes the stuff."

After we had returned to the house, I got my first taste of "mountain water". As he lifted his glass to toast me, he said, "Here's to putting hair on your chest."

Then, with a jerk of his head and one gulp, the shot glass was empty. "Ahhh, the more I drink it, the more I like it. Your turn, Bob."

I slowly raised the glass to my lips and prepared to take a sip.

"No, don't try to sip it." he yelled. "Sipping this stuff only kills the effect. Just do it quick and easy."

"OK, here we go."

Suddenly my mouth and throat felt as if they were on fire! My eyes were watering and I was trying to ask for a glass of water, but the words wouldn't form.

"Told you that it would knock your pants off!"

"This stuff will kill you!" I finally screamed.

"Boy, you drink a bottle or two of this and bears will run and hide from you."

"You're nuts! This stuff would *kill* a bear!"

"Well, suit yourself."

He then poured himself another glass and once again drank the contents with one swallow. "Trouble with you city boys is that you don't know good 'shine' when you taste it."

My visit lasted well into the afternoon. After giving him some additional ideas for anti-theft devices, it was time to go. I once again shook the old gentleman's hand and left with a complimentary bottle of mountain water.

Arriving home, I found everyone outside, enjoying the warm spring air.

"Did you find anything?" my wife asked.

As everyone gathered to hear my story, Betty started right in with her sarcastic comments.

"Well, just where was this electronic woodpecker of yours?"

"It's sort of a secret. But I did find it."

"Sure you did," she replied. "And I bet you found some secret government hideout deep in the woods."

"What did it turn out to be?" my wife asked.

Before I could draw a breath to answer her, Betty once again cut in. "What is in that bottle you are holding?"

"Oh, just some mountain water that a fellow down the road gave me."

"I'll bet he got it from one of those springs that run over on the other side of the mountain. That water is really good."

"Boy, it sure is", I replied. "Would you like to taste it?"

"Sure. Let me run inside for a glass."

"Don't bother. Just take a swig right out of the bottle. It tastes better that way."

"Well, if you don't mind."

"No, I don't mind at all", I said smiling.



Introducing the "woodpecker"...

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 to 1,500 words and must include at least one photograph.

International DX Report

As postal rates go up and phone rates go down, it's more and more fashionable to contact stations by phone. Australia, Austria, Finland and Netherlands are among the outlets publicizing answer-phones (meaning you can speak into a recorder instead of a real human being). Now, other stations are getting into the act. Radio Vilnius, Lithuania, invites calls to 66-05-26 (William Westenhaver, *DX Listening Digest*)

It's safe to say that Greenland radio engineer Henrik Jorgensen wasn't expecting a call from a Canadian DXer, but when he did hear from Werner Funkenhauser, he kindly verified a report from fellow DXer Ron Hopkins, which had been languishing for two years in the "pending" file (DX Ontario). Azad Kashmir radio may be next, since Rowland F. Archer has noted a string of phone numbers on their letterhead: 2015, 2245, 2234, 2150, 3042, with a new one typed in: 2570. (*DXLD*)

If you find yourself in Beijing, and would like to tour Radio Beijing, just call them at 86-85-81, Ext. 2760; if no answer, the newsroom is manned 24 hours at 86-26-91.

It's unusual for a Chinese regional to use the 25-meter band, where it's relatively easy to hear abroad. Bruce MacGibbon in Oregon discovered Hohhot, Inner Mongolia (Nei Menggu) on 11705 kHz between 2300 and 0120 UTC. (*The DX Spread*)

China also has shortwave stations dedicated to weather broadcasts, including one in Hunan on 10946 kHz at 0010-0035 (Gordon Darling, Papua New Guinea, Radio Australia *Communicator*). Radio Norway has some weather-only transmissions, forecasts for Atlantic seamen, at 1455 on 15310, 2255 on 9605, 0055 on 9615, 0255 on 9650 (*Australian DX News*). Cuba's CLX [March MT] is no newcomer-- it appeared in *Radio Weather Aids to Navigation* as long ago as 1942 (David Newkirk, *DXLD* and we even heard CLX filling with music until 2315.

None of the above are in English, but their languages are easy compared to some rare ones on shortwave. Polish up your Kurdish - recognition skills by monitoring Trans World Radio, Monaco at 1600-1615 on 12025, as Bruce MacGibbon has (*DXS*).

Then you'll be ready for all those clandestines for the country which ought to exist between Iraq and a hard place. TWR and other gospel stations are hoping to speed Armageddon by adding more and more exotic languages by the year 2000. Their Sri Lanka outlet does this at 1345-1400 on 11820 or 11895--Boro on Monday and Thursday, Sora on Tuesday and Wednesday, plus two biggies: Nepali on Friday and Saturday, Tibetan on Sunday (Alok Das Gupta, India, *ADXN*) KTWR, Guam, planned special Easter broadcasts, in Mandarin April 1 at 0400-0700 on 11665 and 15225, UTC, April 2 at 2100-2200 on 11665 and 9465; in Cantonese April 1 at 0700-0900 on 11665 (Richard Lemke, *North American Shortwave Association*).

Indonesian verie-signers are now adding a 9-digit number after their name, designated "NIP" (Kirk Allen and Frank Orcutt, *Fine Tuning*). Our guess is "Indonesian Person

Number," is like social security. Here's a rarity, BBC-Singapore on the second harmonic of 3915--Ed LaCrosse in California heard 7830 with English by Radio until 1200 (*World of Radio*)

Radio Tashkent runs a "DX Club" which you can join merely by applying--if you have a call-sign. If not, you have to send in ten separate reception reports. (Kraig Krist, *DXLD*). Dear Hank: Are you still selling call-signs you make up? Think I'll make one up myself...

Soviet Georgia has a new outlet on 4875, first reported by Bob Hill in Massachusetts, January 1 at 2000-2200 relaying Mayak. At other times it carries Tbilisi Program 2.

Add another station to the 22-meter band: Radio Liberty scheduled in April on 13690 in Russian from 0700 to 1400. Ever notice how RFE/RL share many frequencies with WYFR? It's no accident, since they also share a frequency manager, Stanley Leinwoll. It's advantageous to keep "his" frequencies occupied as much of the day as possible. Colleague George Jacobs picks frequencies for many other American stations, including WHRI on 9870 at 0000-0300. Unfortunately, Radio Austria International is on its own, also picking 9870 at the same hours to replace heavily interfered 9550. It may work in the WHRI skip zone (like Kiev did on 7400) but nowhere else.

Radio Caroline, the North Sea pirate, resumed shortwave in early March, when 6210 with 5 kilowatts was heard as far away as Wisconsin between 1500 and 1800 (*Media Network*). Radio New York International vows it will be back on the air this spring (John Demmitt, PA) WCSN carefully separates its religious programming from news. April's revised schedule for the latter is: Monday-Saturday 1600-1800 on 21640; 1800-2200 on 15390; 2200-2400 on 15300; Tuesday-Friday 0000-0400 on 9850; 0400-0600 on 9870; 0600-0800 on 9495. And via KYOI, Saipan: Monday-Thursday 2000-2200 on 9495, 2200-2400 on 15405; Monday-Friday 1000-1400 on 11900; Saturday only 0000-0200 on 15405.

Montreal's private shortwave station CFCX, 6005 kHz, along with its AM and FM companions, has been sold off by CFCF-TV (*Financial Post* via Doug Copeland, *WOR*). This could mean a new format, or even re-evaluation of the value of continuing shortwave.

Aren't there enough gospel hucksters on the radio already, especially shortwave? A Nashville AM station thinks not and plans to go on shortwave July 1 as WWCR with 100 kilowatts. They're also trying to work out relay deals with ideologically acceptable foreign stations to be put on a high-angle (read:domestic coverage) antenna. (*Media Network*)

High Adventure (KVOH) is proceeding with a Far East site, either Philippines or Palau (Belau) (*Media Network*). Some free advice from USAF Capt. Gerry Bishop, familiar with both countries: It's grossly ignorant to even consider going into the Philippines under present circumstances; there's not enough power available on Palau. And do all those people who sent money for their previous idea, a

WORLD RADIO NEWS

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boat off Singapore, get it back?

Following up some items last month: The station on 9435 at 1400-1500 or so is confirmed as National Unity Radio, Sudan (Rufus Jordan, *DXLD*). Speaking of calendars, Radio Berlin International also puts out a beautiful one (William Westenhaber, *Review of International Broadcasting*)

Blame the messenger department: I mentioned the "KKK" QSL from Spain on *WOR*. Cathy Moore in Wisconsin promptly took me to task, rather than the person who said he was sure that's what it showed. Her complaint was also broadcast by Spanish Foreign Radio, blaming me. It seems Klan-style costumes are worn in Spain during Easter week, but they have no such connotations; Moore, and Dave Beauvais point out the costumes' connection with the Inquisition which may have inspired the Klan to adopt them. SFR figures it had better not send those QSLs any more to Americans although a copy of the card via Garie C. Halstead, WV, clearly captions it "Semana Santa - Procesiones." I figure, KKK aside, anything connected with Spain's greatest shame, the Inquisition, is inappropriate for commemoration.

KUSW's revised April schedule: 1700 on 15225, 1900 on 17715, 2200 on 15580, 0000 on 11665, 0300-0500 on 9815. Sundays: 0500-0700 on 6155, 0700-1100 on 6135, 1100-1600 on 9850, 1600-1800 on 15225.

RCI's Japan relay schedule is also a lot different than planned, starting April 4: 1200-1229 English on 17710 and 15385; 1300-1329 Japanese, 1330-1400 Russian and 1400-1429 Ukrainian on 6150; 1930-1959 Russian on 9650; 2200-2229 English and 2230-2259 French on 11705. Except for Japanese, all these simulcast Sackville and other sites.

April also brings a revised program schedule from Radio Japan; among the changes is a *DX Corner* expanded by four minutes. Radio Netherlands is also making some major program changes. On Mondays there's a new "Up-Tempo Science and Technology Review," *The Research File*. Repeats of *Portraits of the Past* move to Wednesdays (in April: 1969, 1973, 1975, 1980). New on Fridays is *Rembrandt Express*, a magazine show. *Shortwave Feedback* on Saturdays is renamed *Over to You!* (so you'll no longer confuse it with a Radio Korea show). *Media Network* remains on Thursdays; very tentative topics this month: 7th, Indonesia and Cushen; 14th, Ginbey's Report from Africa; 21st, John Campbell's *Clandestines*; 28th, the Dutch Broadcast Museum Archives, *World Radio TV Handbook* report, and RN will be represented at the Dayton Hamvention, May 1. (via Dick Rush and Carl Mann, *RIB*).

Radio Budapest has been featuring other stations' DX hosts on Thursdays in a program called *Hertz*, including Radio Netherlands, March 31. Summer timings from March 27 are 0200 daily, and 0100 except UTC Mondays (via Kraig Krist).

Radio Free Europe tells us its Hungarian service airs *American by Radio* language lessons Sunday at 1640, Monday at 1240, Tuesday at 1440, Wednesday at 0740, Thursday at 1040, all on 5985, 7115, 9695, 11895 and 15355. (*WOR*)

Voice of Turkey remains on 9445, but summer timing for English is now 2200 and 0300 (with lots of nice Turkish music in between) (George J. Poppin) Programs featured after the news are: Sunday, *Greece Through the Years*, *Turkish Panorama*. Monday, *The Armenian File*. Tuesday, *Ataturk*, *Turkish Album*. Wednesday, *Letter Box*. Thursday, *Call For Peace*, *What Do You Know About Turkey?* Friday, *Anatolian Legends*, *Framework*. Saturday, *Outlook or DX Corner*, *From Turkey with Love* (Chris Bagge and William Westenhaber, *RIB*).

BBC World Service is making a major change on the 49-meter band. There will no longer be any service direct from Britain to North America; 5975, which had been direct until 0430, will be from Antigua at 2000-0730, instead of after 0430 only. Antigua had been on 6175, and that frequency will be coming from New Brunswick between 2300 and 0330, instead of 6120. This switcheroo should improve the overall interference situation. (*WOR*)

Voice of the Pioneer on CBC Northern interviews old-timers such as Edith Hewson of Langbank, Sask., the last Sunday in March at 1311 UTC and the first in April at 1211 on 6065 and 9625. Stay tuned for *The Food Show* on the half-hour. (*RIB*)

Detestable DST is expected to reach Israel a bit later, April 9, causing even its external broadcasts to emanate one hour of real time earlier.

Third World Roundup: Brazil seems to have a pirate station, Radio Difusora Possense, 6250, in Santo Antonio da Posse, Sao Paulo state, heard by Antonio Ribeiro da Motta in mid-January announcing 6.3 MHz at 0930. (*DXLD*)

Don Moore in Ohio speculates now is a good time to try to QSL Bolivians, with inflation under control and incomes relatively higher (*DXLD*) However, Peruvians are no longer allowed to possess foreign currency, so sending him a buck could land your verifier in jail! (Benelux DX Club via ADXN) The best Peruvian heard in Paraguay is Estacion Huari via its second harmonic only, 6560.4, from 1000 (Tony Jones, *RCI SWL Digest*). Another new one is Radio Wuaria (?), Chota,, Cajamarca on 6093.2 variable to 6090.7 at 2100-0500 (Pedro F. Arrunategui, Lima, (*RCI SWLD*)). Last month's mystery should have read 3450.2, not 3250.2. Arrunategui is now in agreement with other monitors that it's Radio Oyon, not Poroy.

Conakry, Guinea has been wandering all over the 60-meter band from nominal 4900, including 4766, 4788, 4820, 4833.

For further information about all your editor's broadcasts and publications, send a self-addressed stamped envelope to: Glenn Hauser, Box 1684-MT, Enid, OK 73702.

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Broadcast Loggings

English broadcast unless otherwise indicated

- 0005 UTC on 9440
Clandestine: Voice of Democratic Kampuchea. Khmer. Southeast Asian pop music with brief mentions of Kampuchea between songs. Station ID by lady at 0025 as, "hini samieng dipthik Kampuchea Pracheathipatel." Sign off at 0026 UTC. Good signal level. (Guy Atkins, Issaquah, WA)
- 0029 UTC on 12120
China: CPBS. Chinese. National anthem and ID with co-channel utility interference. Heard parallel CPBS-1 on 11330 kHz. Also note 12120 kHz is a new frequency. (Bruce MacGibbon, Gresham, OR)
- 0035 UTC on 7165
USSR: Radio Kiev. Report and interview with a Canadian minister visiting with Russian Orthodox and Baptist church leaders. Also heard on parallel frequency 6200 kHz (Bob Fraser, Cohasset, MA)
- 0042 UTC on 11715
Mail: R. Beijing relay. Mail Bag show featuring the public libraries of China and the Chinese aircraft industry. (Tom Roach, San Jose, CA)
- 0105 UTC on 3253.4
Venezuela: La Voz de El Tigre. Spanish. Numerous station IDs between lively Latin tunes. Fair to good signal. (J.C. Brownlee, Laurens, SC)
- 0110 UTC on 4800
Guatemala: TGMI Buenas Nuevas. Spanish. Religious instrumentals and spiritual message. Closing ID with 0130 sign off. (Tom Sullivan, New Orleans, LA)
- 0114 UTC on 9735
Paraguay: Radio Nacional de Paraguay. Spanish. Nacional ID followed by lengthy easy-listening vocals. (Harold Frodge, Midland, MI)
- 0158 UTC on 9580
South Africa: Radio RSA. Bird interval signal with sign-on routine. International newscast and 'Letter Bag' show. (Leslie Edwards, Doylestown, PA)
- 0200 UTC on 6185
Mexico: Radio Educacion. Spanish. Music of classical violins and cultural program on Mexico. (Debby Stark, Albuquerque, NM)
- 0219 UTC on 5040
Ecuador: La Voz del Upano. Spanish. Ecuadorian music to full ID at 0232 UTC. (Harold Frodge, Midland, MI)
- 0220 UTC on 11785
Brazil: Radio Guaiba. Portuguese. Easy-listening music with time pips at 0230. Station ID which sounds like, "gwi-e-ba" at 0233 UTC. Very good signal. (J.C. Brownlee, Laurens, SC)
- 0238 UTC on 3450.8
Clandestine: Radio Venceremos. Spanish. Usual revolutionary talk and speeches. Station sign-off monitored at 0243 UTC. (Cliff Goodlet, Chattanooga, TN)
- 0250 UTC on 7375
Costa Rica: Radio for Peace International. Discussion on farming developments in the United States and religious book offer. Spanish ID at 0300 UTC. (Larry Van Horn, Orange Park, FL)
- 0300 UTC on 5030
Costa Rica: Radio Impacto. Spanish. U.S. Top 40 music from Michael Jackson and Spanish pop tunes. "Impacto" ID between music selections. (Graham K. Glover, Fairfax, VA)
- 0310 UTC on 3215
South Africa: SABC. Afrikaans, English. Local commercials in both languages with oldie song "Yellow Rose of Texas." (Harold Frodge, Midland, MI)
- 0330 UTC on 9684
Tanzania: Radio Tanzania. "You are listening to the external service of Radio Tanzania," followed by pop music. Fair signal with slight fading and considerably weaker by 0345 UTC. (Ken Kuzenski, Jackson, LA)
- 0350 UTC on 4865
Mozambique: Radio Mozambique. Portuguese. Instrumental African xylophone music and male announcer speaking about city Maputo. (Mike Mroczkowski, San Antonio, TX)
- 0420 UTC on 4880
South Africa: Radio Five. Ads for Benson and Hedges, birthday greetings and rocking music from Duran Duran and Foreigner. (Bill Traister, Covington, TN)
- 0425 UTC on 9690
Argentina: RAE. Program feature on Argentina's 1970 yellow fever outbreak. Spanish vocals past 0430. (Harold Frodge, Midland, MI)
- 0430 UTC on 4800
Lesotho: Radio Lesotho. English international newscast reporting on the Security Council, Nicaragua, and President Reagan. (Tom Roach, San Jose, CA)
- 0445 UTC on 3300
Guatemala: Radio Cultural. Soft mellow music with station ID at 0448 UTC. Fair signal with fading and occasional interference. (Tom Patterson, Wisconsin Rapids, WI)
- 0505 UTC on 5034
Central African Republic: RTV Centrafricaine. French. Two announcers trade news headlines. "Bangui" ID and native African music. (Carl Ballinger, Cocoa, FL)
- 0520 UTC on 5010
Cameroon: Radio Garoua. Today's date and time for Cameroon. Program frequency and time schedule. Local time check and African music. -ed.
- 0525 UTC on 5047
Togo: Radio Togo. French. Chime melody interval signal with Togolaise national anthem at 0528 sign-on. Children's chorus and religious sounding discussion. (Joe Reinhardt, Bristol, CT)
- 0540 UTC on 6100
Nicaragua: Voice of Nicaragua. Spanish. Station ID and English newscast at 0600 UTC. Interference from WHRI. Logged from Baton Rouge, LA > (Mike Loran, Azusa, CA)
- 0540 UTC on 7255
Nigeria: Voice of Nigeria-Lagos. Editorial on public transportation improvements and the national news of Nigeria. (Joe Reinhardt, Bristol, CT)
- 0550 UTC on 6125
Spain: Spanish Foreign Radio. National Spanish folk music and a Spanish lesson. Excellent signal with no interference. (Tom Patterson, Wisconsin Rapids, WI)
- 0600 UTC on 4782
Mail: RTV Mailenne. French. Guitar interval signal with sign-on national anthem and ID as "ici Bamako, RTVM" followed by African highlife music. (Guy Atkins, Issaquah, WA)
- 0626 UTC on 6060
Sicily: RAI-Radio Uno. Italian. Fair signal of Italian vocal music with station ID. Excessive interference from WYFR on 6065 kHz. (Tom Roach, San Jose, CA)
- 0632 UTC on 7170
New Caledonia: RFO New Caledonia. French. Male DJ format with rock and pop tunes in French and English. (Tom Roach, San Jose, CA)
- 0729 UTC on 7105
Monaco: TWR. Very good signal with ID and "30 glorious minutes" of religious programming. (Ken Kuzenski, Jackson, LA)
- 0745 UTC on 3958
Falkland Islands: FIBS. Strongest signal ever with no amateur radio interference. U.S. and British pop music to 0839 fade out. Log submitted as tentative. (Guy Atkins, Issaquah, WA)
- 0746 UTC on 6118
Peru: Radio Union. Spanish. "Buenos dias" morning greeting with nice Peruvian vocals. Good signal with ID though mixing with Radio Globo (Brazil) and Radio Tanpa (Japan). (Bruce MacGibbon, Gresham, OR)
- 0915 UTC on 6160
Germany-FRG: Radio Deutsche Welle. Music show of German pop tunes reportedly "high on the German charts." (Ralph Bowden, Mentone, CA)
- 1015 UTC on 6130
Canada: CHNX-Halifax. Great signal playing oldies and local ads every ten minutes. (Joseph K. Johnson, Savannah, GA) - great log! -ed.
- 1055 UTC on 4935
Peru: Radio Tropical. Spanish. Peruvian music with station ID and promotional "jingle." (Cliff Goodlet, Chattanooga, TN)
- 1102 UTC on 4780
Venezuela: La Voz de Carabobo. Spanish. National newscast at 1105 UTC with station ID, local time check and frequency given at 1111 UTC. (Cliff Goodlet, Chattanooga, TN)
- 1121 UTC on 3380
Guatemala: Radio Chortis. Spanish. Fair signal for Latin rhythms and lady's ID as, "transmiteme Radio Chortis emissorsa campesino." (Cliff Goodlet, Chattanooga, TN)
- 1135 UTC on 3215
Indonesia: RRI Manado. Indonesian. Bland Asian-sounding pops with considerable interference. Signal peaked by 1215 with "Radio Republik Indonesia" audible at 1220. Audible past 1300 UTC. (Ken Kuzenski, Jackson, LA)
- 1210 UTC on 2410
Papua New Guinea: Radio Enga. Pidgin. Local area announcements with ID. PNG "island music" with very weak signal! - ed.

WORLD RADIO NEWS

Let other readers know what you're enjoying.
Send your loggings to **Gayle Van Horn**
160 Lester Drive, Orange Park, FL 32073

- 1210 UTC on 3205
Papua New Guinea: Radio West Sepik. Pidgin. Local music on wooden flutes and drums-quite nice. West Sepik ID and friendly conversation.- ed.
- 1212 UTC on 6570
Burma: Mamyo Defence Forces BcSst Unit. Burmese. Oriental chorus music with drums and stringed instrument accompaniment. Male and female chat during excessive signal interference and deep fading. (Tom Roach, San Jose, CA)
- 1229 UTC on 3245
Papua New Guinea: Radio Gulf. Rock music medley from rock group Starship. Local time check for city Kerema and music titles. Pleased to discover this all English program as most are usually in Pidgin!-ed.
- 1230 UTC on 4835
Guatemala: Radio Texulutlan. Spanish. Station promotionals with morning announcements, chats, and ID. Marimba musical vocals and instrumentals. (Larry Van Horn, Orange Park, FL)
- 1231 UTC on 3375
Papua New Guinea: Radio Western Highlands. Pidgin. Lady announcer with local time check and twenty-minute music program of Ann Murray music. Station ID at 1258 followed by sign-off. -ed.
- 1235 UTC on 6060
Australia: Radio Australia-Shepparton. Weekend Magazine show on health and travel. IDs and schedules with world and Australian news. (Bruce Gilson, Silver Springs, MD)
- 1306 UTC on 17830
Switzerland: Swiss Radio International. Interesting feature on the Swiss Red Cross organization, assisting the Philippines during a devastating typhoon in 1987. (Leslie Edwards, Doylestown, PA)
- 1307 UTC on 4930
Haiti: 4VEH. Spanish. Religious organ music with station ID and spiritual message. (Tom Sullivan, New Orleans, LA)
- 1325 UTC on 15310
Norway: Radio Norway. Good signal for discussion on the Scandinavian Music Festival. (Donald P. Myra, Brooklyn, NY)
- 1330 UTC on 9840
Vietnam: Voice of Vietnam. National anthem and ID twice with news following until 13:39 UTC. Asian music and 1400 UTC sign-off. (Stephen Price, Conemaugh, PA)
- 1338 UTC on 11940
United Arab Emirates: Voice of UAE-Abu Dhabi. Arabic. Musical selections of Arabic music with ID and Islamic religious programming. Also heard on parallel frequency of 11825 kHz. (Mike Mroczkowski, San Antonio, TX)
- 1411 UTC on 6170
Philippines: Raydon Bayan. Station ID monitored as, "Raydon Bayan up-to-date on 738." Sports news with "all sports radio network" promotional heard past 1500 UTC. (Fred Carlisle, Tumwater, WA)
- 1415 UTC on 9750
South Korea: Radio Korea. News and commentary on threatened trade protectionism in the United States. (Mike Loran, Azusa, CA)
- 1417 UTC on 9560
Jordan: Radio Jordan. Arabic. Announcements with easy-listening tunes up to 1426 UTC. Station ID and continued Arabic music. (Stephen Price, Conemaugh, PA)
- 1430 UTC on 15400
Finland: Radio Finland. Report on the education system in Finland. (Bob Fraser, Cohasset, MA)
- 1430 UTC on 9780
Yemen Arab Republic: Radio San'a. Arabic. Male announcer presents Arabic vocals and ID at 1440 UTC. (Tom Sullivan, New Orleans, LA)
- 1451 UTC on 9610
Australia: A.B.C.-Wanneroo. 1930s music and harness race at 1445 UTC. Continued oldies music and lottery reports. (Bruce Gilson, Silver Springs, MD)
- 1517 UTC on 10330
India: AIR-Delhi. Hindu. Lady announcer with newscast. Parallel frequency 4860 fair and 7412 poor. English news at 1545 and ID as "this is All India Radio, the next program follows." 10330 kHz is a new frequency from former 10335 kHz. (Bruce MacGibbon, Gresham, OR)
- 1629 UTC on 9035
Clandestine: Iran's Flag of Freedom Radio. Farsi. Station interval signal with Farsi and English IDs. National anthem and presumed international newscast. (Guy Atkins, Issaquah, WA)
- 1644 UTC on 9720
Sri Lanka: SLBC. Tamil. Indian type vocals and male announcer. Station ID at 1650. Recheck of station at 1731 UTC revealed national anthem and sign-off at 1734 UTC. (Bruce MacGibbon, Gresham, OR)
- 1657 UTC on 9550
Swaziland: TWR. English station IDs with address info and African vernaculars language at 1700 UTC. (Guy Atkins, Issaquah, WA)
- 1705 UTC on 15335
Morocco: RTVM. Arabic. Middle Eastern style music with station ID. Parallel frequency 15330 kHz poor, with interference from AFRTS. (Guy Atkins, Issaquah, WA)
- 1715 UTC on 11940
Singapore: Radio Singapore. Monitored station running late on a Sunday morning call-in show. Pop songs with news and weather reports at 1800. National anthem and sign-off at 1803 UTC. (Bruce MacGibbon, Gresham, OR)
- 1800 UTC on 15451
Libya: Radio Jamahlrya. Arabic. Musical selections in Arabic and station ID at 1800 UTC with newscast. (Stephen Price, Conemaugh, PA)
- 1832 UTC on 7505
Bangladesh: Radio Bangladesh. Just caught end of an English commentary with 1834 ID as, "this is the general overseas service of Radio Bangladesh." Indian sub-continent music followed. (Guy Atkins, Issaquah, WA)
- 1845 UTC on 7345
Czechoslovakia: Radio Prague. Spanish. Station editorial commentaries on Afghanistan and President Reagan. (Juan Franco Crespo, Barcelona, Spain)
- 1850 UTC on 9670
Cuba: Radio Havana. Interview with retired Canadian couple's impression of Cuba. (Bob Fraser, Cohasset, MA)
- 2000 UTC on 9435
Israel: KOL. Newscast and Letter from Jerusalem at 2010 UTC. Religious program Thank Goodness It's Friday and French programming beginning at 2030 UTC. (Bruce Gilson, Silver Springs, MD)
- 2010 UTC on 9552.5
Equatorial Guinea: Radio Nacional-Bata. Religious programming with sermon and music. Good signal, easy to monitor. (Ken Kuzenski, Jackson, LA)
- 2030 UTC on 9720
Saudi Arabia: B.S.K.S.A. Marvelous signal of IDs, easy-listening music with song titles, local weather reports and station phone number. Station frequency schedule and sign-off 2100 UTC. (Stephen Price, Conemaugh, PA)
- 2045 UTC on 9445
Turkey: Voice of Turkey. Turkish. Great program of Turkish folk music. (Bob Fraser, Cohasset, MA)
- 2300 UTC on 6040
Germany-DDR: Radio Berlin International. Portuguese. News bulletin on Chile and Zimbabwe. (Juan Franco Crespo, Barcelona, Spain)
- 2300 UTC on 9495
U.S.A.: WCSN-Boston. Station ID and phone-in hot line number (617-450-2060) for frequency changes. Station program Kaleidoscope which featured the Bicentennial events for Australia in 1988. (Leslie Edwards, Doylestown, PA)
- 2320 UTC on 4890
Senegal: ORT du Senegal. French, African vernaculars. Arabic and native African music. Conversations among announcers, closing goodbyes, ID and national anthem at 0006 sign-off. -ed. (check also on 4890 at 0600 UTC for French and Arabic programming format.)
- 2340 UTC on 4940
Cote D'Ivoire: RTV Ivoirienne. French. Native African and pop music, news headlines and closing ID. Program schedule included and choral national anthem to 0005 sign-off. Also hear on parallel 11920 kHz. -ed. (heard also from 0600 on 4940, 7215, and 6015 kHz.)
- 2340 UTC on 3375.6
Angola: Radio Nacional-Luanda. Portuguese. Weak signal of African pops with fading. Some chat from male announcer. Parallel frequency 4952.7 weaker with fade out by 2355 UTC. (Guy Atkins, Issaquah, WA)
- 2345 UTC on 11735
North Korea: Radio Pyongyang. Frequency schedule for English service. ID at 2346, with national anthem and 2348 UTC sign-off. Signal weak, but easily audible. (J.C. Brownlee, Laurens, SC)

Scanning The Nation

Wanted- One Crystal Ball

Compiling information concerning scanning on a national level is no easy task. The largest source of information is provided by the readers. The remaining space is filled by frequent visits to the library and from my own private sources.

My mail always contains letters asking me questions like, "Why didn't you mention or do an article on the bandits that used a scanner to elude the police?" Generally, the letter originates from a remote area of the country-sometimes more remote than Brasstown, North Carolina!

While the event may have been headline news in your particular town, there is no way that I could have known about it, unless I had a crystal ball! So, if there is something happening in your neck of the woods that would be of interest to fellow scanner enthusiasts, send me the news clipping or a few notes on the event. If your article is printed, we will credit you as the contributor unless you ask otherwise.

In the meantime, if anyone does have a crystal ball, I would be interested in knowing what the numbers will be for the upcoming Pennsylvania lottery.

Scanning the U.S. Army May Get Tougher

The Army plans to spend over 5 billion dollars on 400,000 frequency hopping radios. Properly referred to as SINCGARS, Single-Channel Ground and Airborne Radio System, SINCGARS are expected to replace thousands of existing back pack, vehicle and aircraft radios.

Weighing only 13 pounds, the SINCGARS can be equipped with power packs and amplifiers to achieve long distance communication. Operating on FM, the radios have the ability to "hop" over 2,320 channels. Where the radio does pause to communicate is impossible for the casual listener to determine. Channel spacing is 25 kHz and the frequency range is 30 to 88 MHz. Power output ranges from 4 to 50 watts. The specific radios that are being replaced are the PRC-77, URC-12, and ARC-131. At this writing an unconfirmed report was received indicating that the U.S. Air Force has also contracted to spend 9.2 million in SINCGARS.

First the Army, Then the Air Force, and Now the Navy

The Collins Defense Communications plant, owned by Rockwell, has been awarded a 24.1 million dollar contract to produce UHF/VHF radio systems for the Navy. Designed for use aboard aircraft, the AN/ARC 182 can function as four radios in one, allowing the pilot to hear and communicate with ground forces, air traffic control, maritime and NATO operations.

Army Coax Cable on the Way Out

The U.S. Army awarded Fibercom Inc. 7.5 million dollars to replace the coax cable currently used in some of the tactical systems with fiber optics. The fiber optics will be used to transmit data between shelters and communications vehicles in tactical situations. For now, the concept is largely experimental. An actual large-scale upgrade to fiber optics is scheduled for 1989.

Chit-Chatting About Government Secrets

Most communications analysts agree that the most lucrative source of intelligence concerning U.S. military operations is not

the monitoring of government radio frequencies.

Surprisingly, the common telephone was the number one culprit. Within the Department of Defense there is one telephone for every three people. This fact, coupled with the general trusting nature of most Americans, allowed an Air Force telephone monitoring team to discover a unit's complete air order of battle readiness status--highly classified information.

By comparison, the Soviet defense establishment has considerably fewer phones per person and has implemented very strict communications guidelines. Severe penalties are connected with phone security violations.

No wonder the Soviets love to monitor our phone conversations from their embassy in Washington!

The Government Giveth and Taketh Away

Air traffic scanning buffs will be interested to know that in an effort to eliminate critical air traffic bottle-necks and to upgrade national airspace system capacity the FAA is considering the takeover of military airports near highly populated areas. These military facilities would then be transformed into commercial passenger terminals. In return, the government would build new military air bases in the less populated areas.

Anyone Know the Soviet Space Shuttle Frequency?

The Department of Defense "Soviet Space Challenge" report (SSCR) claims that the Soviet version of the U.S. Space Shuttle will soon be operational. To produce their shuttle, the Soviets used U.S. propulsion, computer, and airframe technology.

Although unrelated to scanning, but certainly of interest to all of us are the additional findings of the report which state: "The Soviets have already developed an anti-satellite system capable of attacking targets at altitudes greater than 5,000 kilometers.

Accordingly, the Soviets are reported to have developed ground-base lasers that have illuminated U.S. satellites orbiting the earth at maximum altitudes.

Cordless Confusion

Police in Madison, Wisconsin recently discovered what MT has been warning it's subscribers about for months--that cordless phones could be monitored with a scanner.

Officials in Madison used taped cordless conversations as evidence to obtain a warrant that allowed them to confiscate illegal drugs and other drug related paraphernalia.

However, three appellate judges dismissed the charges against the defendant. The judges said that cordless phone conversations were protected under current Wisconsin wiretapping laws. The law states: "Any communication made by the aid of wire, cable, microwave or other 'like connection' that is intercepted without a permit cannot be used as evidence at a trial."

The court stated that cordless phone conversations came under the "other like connection" clause.

The Wisconsin decision to protect cordless phones is in direct conflict with federal laws that specifically exclude cordless phone transmissions from protection in federal cases.

(Newspaper article submitted by Robert Barczak, Madison, Wisconsin).

More Phone Info

Without interfering with voice communications, a high speed computer network can be installed on existing phone lines.

The Tokenstar over-voice system can be installed in minutes

WORLD RADIO NEWS

Bob Kay
104 Bonsal Avenue
Glenolden, PA 19036

for less than \$150.00 per connection. Once connected, any user can converse with any other user, computer or device at speeds beyond that of other more complex and expensive over-the-voice systems.

The Tokenstar unit is plugged into the telephone wall plug, and conversations can still be carried out when the system is working. Nothing is added to the phone system but a small box.

Affordable Encoding

Until recently voice encoding was an expensive method of preventing the monitoring of sensitive conversations. One of the more familiar encoding systems was developed by Motorola and is commonly referred to as DVP (Digital Voice Protection). Although DVP is a crack proof way to add security to any radio conversation, the units were generally bulky and added about \$1,000 to the cost of a radio.

Extrema Systems International is introducing a new voice-encoding system. Primarily directed toward the UHF listening spectrum, the EEI system needs fewer bits to code a signal. As a result, it yields higher quality signals with more information and less noise.

The compact EEI encoder comes on a PC board or in chips. It can be tailored to suit the individual customer and the price is right, less than \$300 per unit.

According to Extrema Systems, the encoder rivals Motorola DVP in every way but price.

Cab Drivers Have All the Fun

By transmitting on their new computerized radios New York taxi cab drivers are setting off anti-theft vehicle alarms. The maker of the radios, Gandalf Technologies, Inc., says they are aware of the problem, but did not offer any solutions. Meanwhile, some cab drivers are purposely riding around New York City and looking for new locations to try out their radio gremlin.

One driver said that his favorite spot was near the parking lot of the police precinct, where officers' private cars were parked. Since a great many of these vehicles have alarms the cab driver enjoyed setting off as many as three at one time!

Another driver said that on Sunday mornings he enjoyed riding down a quiet street and setting off one alarm after another. (Newspaper article submitted by Alex McIlwain, Lakeland, Florida).

On the Horizon - the Smart Scanner

The Harris Corporation has developed an artificial intelligence that allows integrated electronic systems to perform self diagnostic checks.

Although the artificial intelligence is still on the drawing board, it is estimated that it could save billions of dollars in repair costs by allowing electrical systems to monitor, diagnose and advise the average person of the corrections needed.

Artificial intelligence is primarily directed towards government use. However, it is expected to become financially attractive to the larger radio manufacturers within a few years after development.

FREQUENCY LIST

The following list of frequencies for Little Rock, Arkansas, and the surrounding area were submitted by Dave Rocker, N5JVP, and Dave Montgomery, KAS5KU.

Little Rock P.D. primary channel	453.150
Little Rock P.D. secondary channel	453.2
Little Rock Fire Department	453.7
Little Rock Fire Department	453.9
North Little Rock P.D.	453.050
North Little Rock Fire Department	453.8
Highway Police	151.010
Ambulance	462.950
Office of Emergency Services	158.745
State Police, Troop A	44.62
Arkansas State Police, extender	154.785
Arkansas State Police, Jefferson	158.790
Statewide Hospital	155.940
Statewide Hospital	155.340
State Game and Fish Commission	151.385
State Game and Fish Commission	151.175
State Forestry	453.550
Arkansas Power and Light	37.540
Pulaski County Sheriff	159.210
Pulaski County Sheriff	155.610
Pulaski County Sheriff	156.210
Saline County Sheriff	37.260
Saline County Sheriff	37.360
Garland County Sheriff	154.845
Grant County Sheriff	37.280
HAM Weather Net Repeater, Little Rock	146.940
HAM Phone Patch, Little Rock	147.060
HAM Repeater, Little Rock	146.670, 147.150, 147.3



New York City cab drivers have been purposely setting off vehicle anti-theft alarms.

Utility World

Listening to the Mystic Star

No, Mystic Star doesn't refer to radio in outer space or a new brand of herbal tea. Mystic Star is a defense communication agency managed air-to-ground HF radio communications service for use by high-level governmental and military officials. The system consists of single-sideband voice channels and a full-duplex 75 baud teletype channel called 'India-Oscar' which is maintained continuously for each VIP mission. These channels are also used for coordination of other communication links. Frequencies for this network are chosen from a list of over 400 throughout the shortwave spectrum and are given foxtrot designators. The designators do change from time to time.

Most Mystic Star communications are in lower sideband, and aircraft communicate with Andrews, sometimes called 'Andy'.

As this presidential year gathers steam and campaigning by government officials starts in earnest, Mystic Star frequencies should get real busy.

A listener in Florida has provided the frequencies in Table 1 of the more commonly heard Mystic Star channels.

COMMONLY HEARD MYSTIC STAR FREQUENCIES
TABLE 1

3032	3046	3067	3071	3116
3144	4721	4731	4742	4760
5688	5700	5710	5760	5800
5820	6683	6715	6738	6756
6757	6760	6790	6812	6817
6830	6918	6927	6993	7316
7690	7735	7765	7813	7858
7997	8040	8060	8162	8170
8967	8992	8993	9007	9014
9017	9018	9020	9023	9026
9043	9120	9158	9180	9270
9320	9958	9991	10112	10427
10530	10583	10881	11035	11055
11118	11176	11180	11210	11226
11249	11407	11413	11441	11460
11466	11484	11488	11498	11545
11596	11615	11627	12324	12317
13201	13204	13214	13215	13241
13247	13412	13440	13455	13457
13485	13585	13710	13823	13960
14715	14902	14913	15015	15036
15048	15091	15687	16080	16117
16320	16407	17385	17480	17972
17993	18027	18218	19047	20016
20053	20154	20313	22723	23265
25578	26471			

Our Florida Mystic monitor has included a list (Table 2) of SAM aircraft bureau numbers one might encounter on Mystic frequencies. The word 'SAM' and the last three digits of the aircraft bureau number are normally heard as that aircraft's callsign on Mystic Star frequencies. These flights normally carry high-ranking U.S. government officials or high-ranking military personnel.

The only time Air Force One is used as a callsign is if the president is aboard an Air Force aircraft. This could be any aircraft in the 89th MAG fleet, however, the president normally uses 26000 or 27000. Marine One is reserved for the marine helicopter that carries the president.

As does the president's aircraft, the vice president's aircraft also carries a special designation. Any Air Force aircraft carrying the vice president will use the callsign Air Force Two.

Executive One Foxtrot indicates any aircraft that the first family would be aboard. Any flight designated Sam Zero One is an Air Force aircraft transporting heads of state of foreign countries and reigning royalty.

Spar aircraft are those Air Force special air missions designated as diplomatic including attaches, military attache assistance groups, and so forth. The spar mission designator will be followed by two digits.

SAM MILITARY AIRCRAFT BUREAU NUMBERS
TABLE 2

AIRCRAFT NUMBER	TYPE	AIRCRAFT
12668	VC-135C	Boeing 707
12671	VC-135C	Boeing 707
24125	VC-135B	Boeing 707
24126	VC-135B	Boeing 707
24127	VC-135B	Boeing 707
24129	VC-135B	Boeing 707
24130	VC-135B	Boeing 707
26000	VC-137C	Boeing 707-302B
27000	VC-137C	Boeing 707-320B
30600	VC-20A	Grumman Gulfstream III
31681	VC-9C	McDonald Douglas DC-9
31682	VC-9C	McDonald Douglas DC-9
31683	VC-9C	McDonald Douglas DC-9
60165	VC-12H	Beechcraft Super King
60166	VC-12H	Beechcraft Super King
67943	VC-6A	Beechcraft King Air
86601	VC-20A	Grumman Gulfstream III
86602	VC-20A	Grumman Gulfstream III
86603	VC-20A	Grumman Gulfstream III
86604	VC-20A	Grumman Gulfstream III
86605	VC-20A	Grumman Gulfstream III
86606	VC-20A	Grumman Gulfstream III
86607	VC-20A	Grumman Gulfstream III
86608	VC-20A	Grumman Gulfstream III
86609	VC-20A	Grumman Gulfstream III
86970	VC-137B	Boeing 707-153
86971	VC-137B	Boeing 707-153
86972	VC-137B	Boeing 707-153

86601-86609 replaced the VC-140B aircraft bureau numbers 12488-12493, 24199-24201, and 24197-24198.



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2182 kHz, A Good Frequency to Monitor

Rod Pearson, in Florida, says one of the best places to monitor marine happenings is on 2182 kHz, the marine international distress and calling channel. Rod says that on some evenings coast-to-coast reception is possible.

Ships on this frequency make contact with a shore station on 2182 KHZ and then will be referred to the shore station's normal working frequency.

Any ship in distress will utilize 2182 kHz to announce their emergencies. Ship/shore stations hearing the distress call can respond. If the ship making the distress call cannot transmit or receive on any other frequency, 2182 kHz will be the prime working frequency for the emergency. The coast guard will usually get involved to help the ship in distress.

One of the more interesting aspects of 2182 kHz, Rod says, is that U.S. and Canadian coast stations utilize this frequency to announce marine broadcasts. U.S. Coast Guard stations will announce the broadcast on 2182 kHz shortly after, commence the broadcast of local marine weather and notice to mariners on 2670 kHz. 2670 kHz broadcasts are much like that heard on 4-6-8-13 MHz high seas broadcasts from the U.S. Coast Guard only more local in nature. By staying on 2182 kHz you will have the chance to hear many smaller coast guard stations not normally encountered on the higher frequencies.

Canadian coast stations also utilize 2182 kHz in the same way as the U.S. Coast Guard does. After announcing the marine broadcast on 2182, Canadian stations commence their broadcast on 2598 kHz, the Canadian equivalent of 2670.

Two of the better receptions Rod has made from his Florida monitoring station include the Coast Guard radio stations in Astoria and North Bend, Ore.

Coast Guard Astoria-NMW was monitored at 0533 UTC and North Bend-NOE was heard at 0602 UTC, both announcing broadcasts on 2670 kHz. Rod also reported hearing the U.S. and Canadian Coast Guard stations are excellent verifiers. All 2182 kHz communications are in the upper sideband mode.

One additional note about 2182 kHz, US Military aircraft that have HF capabilities usually have this frequency in the aircraft's preset channel devoted to 2182 kHz. Don't be surprised at the surprises on 2182 kHz. It's a good frequency to monitor.

Hooked on MARS

Andy Gordon in Connecticut is in orbit over MARS. No, not the planet but the Military Amateur Service sponsored by the Navy. Andy sent several pages of Navy MARS ship intercepts he has recently monitored. Based on Andy's notes the primary ship hailing frequency in the 14 kHz range is 14441.5 kHz. In around two months Andy logged 68 Navy ships. Other frequencies he noted traffic on include: 14467.0, 14470.0, 14477.0, and 14818.5 kHz. All voice communications on Navy MARS are in upper sideband.

Illegal Marine Coms Noted

Our own Bob Grove sends a note that courtesy of an amateur radio net on 21390 kHz-KV4FZ has monitored an illegal maritime network transmitting on 4130, 4140, and 5150 kHz in USB. Discussions on this net included: Social Security checks, stock brokers, personal calls and names, boats and even the flesh trade. This bunch might be shut down by now as the FCC seems to have taken an interest in their communications. Now on with this month's loggings from the utility world.

UTILITY ABBREVIATIONS USED IN THIS COLUMN

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

AM	Amplitude Modulation
ARQ	Stop
CW	Morse Code
FAX	Facsimile
FEC	Forward Error Correction
ID	Identification
LSB	Lower sideband
RTTY	Radioteletype
USB	Upper sideband

LOGGINGS

- 2182.0 Ship Gloria calling Tampico radio at 0513 in USB. No answer from Tampico radio (Rod Pearson, St. Augustine, FL) (Welcome back Rod-Ed)
NMQ27-CG air station Los Angeles with marine broadcast callup at 0602 in USB. Moved to 2670 khz for broadcast (Rod Pearson, St. Augustine, FL)
- 2572.0 WLO-Mobile radio, AL in USB at 1200 with weather broadcast covering the Gulf of Mexico. (Rod Pearson, ST. Augustine, FL)
- 2580.0 WLO-Mobile radio, AL noted with a CW callsign followed by ARQ idler signal at 1213.
- 2670.0 NMN13-Coast Guard Cape Hatteras group with a marine broadcast at 1303. Interference from some unknown Spanish stations in Mexico in USB.
NMG-Coast Guard New Orleans in USB at 0551 with a marine broadcast. (Rod Pearson, St. Augustine, FL)
NMP-Coast Guard Boston with a marine broadcast in USB at 0603. (Rod Pearson, St. Augustine, FL)
- 2830.0 Two fishing vessels talking back and forth, no IDs. One told the other a couple of good fishing spots in the Gulf that were currently hot. Transmissions in USB ended at 1228. (Rod Pearson, ST. Augustine, FL)
- 3130.0 NG3/ORT/14B discussing a hot area (J2524) for a surface gunnery exercise. 14B also gave several side numbers of aircraft giving times and stating 'feet dry' (over land). This is a navy facsfac Jacksonville HF frequency. Transmissions in USB. (Rod Pearson, St. Augustine, FL)
- 4495.0 Trunnton passed to unknown unit that 'high tide' working channel Foxtrot 315 (5243 khz) primary and Alpha Papa (8101) secondary. Also noted 'post gold' working channels Alpha Papa-primary and Foxtrot 315-secondary. All transmissions in USB at 2305. This is SAC channel echo.
- 4601.0 Campbell Island, New Zealand in USB at 1415 with weather traffic. (Fred Carlisle, Tumwater, WA) (Nice catch Fred and welcome to the column-ed)
- 4627.1 CivilAir Patrol net, Thunderbird (AZ) is alternate net control on net. Other units noted in USB included Dogwood-4(AR), Thunderbird-309(AZ), Magnolia(LA), and Eaglenest(TX). KQ266 closed southwest net at 0328. (David Kammler, Ridgecrest, CA) (Welcome to the column David-ed)
- 5244.0 AFRTS feeder noted at 2300 in USB (Rod Pearson, St. Augustine, FL)
- 5547.0 San Francisco ATC working United at 2054 in USB, told to contact Honolulu ATC on same frequency. (David Kammler, Ridgecrest, CA)
- 5696.0 NOJ-COMSTA Kodiak working USCG aircraft 1709 at 0118. Aircraft gave airborne time and asked for frequency assignment in USB. (David Kammler, Ridgecrest, CA)
- 5737.0 Noted a USB net at 2025 from south Florida and the Bahamas. This network appears to serve an airline flying between the Bahamas and south Florida. Stations noted included: Governors Harbor, Freeport, and what could have been Bahama control. Mentioned flight 042 that would end at Fort Lauderdale. Any help on this one?
- 6221.0 Mt. Baker calling Arm Key tug Petersburg in USB at 0115. (David Kammler, Ridgecrest, CA)
- 6227.1 Spanish numbers station noted at 0700 after HCJB sign off (0659). Numbers continued until 0707. (David Kammler, Ridgecrest, CA)
- 6336.7 ZRH-South African naval radio-Cape Town in at 0057 with a DE CW marker transmission.

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- 6338.4 ZRQ-South African naval radio-Capetown with a V CW marker signal at 0058.
- 6352.0 UFB-Odessa radio, USSR on at 0103 with CW traffic for an unidentified ship.
- 6382.0 TBA6-Turkish naval radio-Ankara with a V CW marker, nice signal at 0110.
- 6393.5 Cul-Lisbon radio, Portugal with a CQ CW marker at 0326.
- 6459.0 SPE31-Szczecin radio, Poland with a CW V marker in a crowd. Noted at 0136.
- 6462.0 FUM-French naval radio-Papeete, Tahiti. Noted a CW V marker at 1216.
- 6466.0 CKN-Canadian forces radio-Vancouver, BC even with Y5M in CW with a CQ marker.
- 6470.0 JCZ-NAHA radio, Japan at 1220 in CW with a CQ marker.
- 6715.0 Possible British Royal Navy or Nato naval tactical channel. Noted several stations with British accents using letter/number tactical call signs at 1330 in USB. (Andrew Bradshaw, Chicago, IL)
- 6738.0 USAF GCCS McClellan working MAC 40621. Ran a phone patch for 621 for weather information. (Charles McVey, Norfolk, VA)
- 6750.0 CUW-Lajes field, Azores in USB at 0802 giving weather and runway conditions. (David Kammler, Ridgecrest, CA)
- 6753.0 CJX-Canadian air force-St. Johns with Volmet style weather broadcast starting at 1240 in USB. (Charles McVey, Norfolk, VA)
- 6758.0 Y7B Calling 5MX. Operator at Y7B obviously very new to military voice circuit procedures. ("5MX nothing heard, Y7B standing by") transmissions in USB at 1336. Navy tactical channel.
- 6760.0 Air Force One working Andy at 0030 in LSB (Mystic Star Foxtrot 45).
- 6761.0 Blackfly transmitting an emergency action message at 0216. Told EXXON 86 to standby during the period 0216-0220 for the Alpha monitor period. (SAC channel Quebec)
- 6890.0 RAN76-Radio Moscow feeder in USB at 0805 in Russian. (David Kammler, Ridgecrest, CA)
- 6930.0 English numbers station-Female voice giving 3 and 2 number groups at 0227.
- 7495.0 RDK33-Tbilisi Metro, Georgian, USSR noted with a FAX signal at 0357. Reproduced a weather chart of the Black Sea.
- 7520.0 FDY-French air force station in Orleans, France with a V CW marker.
- 7532.0 FSB-Interpol-Paris, France, noted at 0406 with a CW marker consisting of the station call sign only then an ARQ idler.
- 7600.0 HD210A-Guayaquil, Ecuador, time and frequency standards station with time ticks and announcements in Spanish at 0400. (Rod Pearson, St. Augustine, FL)
- 7725.0 Spanish numbers station Female voice transmitting four letter groups at 1035. (Rod Pearson, St. Augustine, FL)
- 7768.5 VOA feeder-Greenville, NC heard at 0434 using independent sideband mode with English programming broadcast on both sidebands. (Rod Pearson, St. Augustine, FL)
- 7830.0 German numbers station noted at 0400 transmitting 3/2 number groups. (Rod Pearson, St. Augustine, FL)
- 7905.5 'K' beacon - noted a Russian 'K' beacon here in CW at 0438. Signal strength only fair.
- 7918.0 English number station noted at 0439 sending Alpha Characters. Transmission ended at 0440.
- 7972.0 Center frequency of a very weird pulse type noise that stretched from 7968-7976 khz. Noted about a 1 second pulse followed by a break from 22-30 seconds variable.
- 7973.7 SPW-Warsaw radio, Poland in CW. Marker consisted of 'DE SPW' then noted an ARQ idler signal.
- 8040.0 GFA23-Bracknell meteorological, England with a FAX chart of France at 0449.
- 8437.0 7TF-Algeria, I am sending a report on this CQ marker to El Djaza'ir Radio. Might help clear up the controversy on the identity of this station I have seen in the hobby press over the last few months. Noted at 2219 with a very strong signal.
- JOS-Nagasaki radio, Japan with CW traffic mixing it up with a UNID PK call signed station, a real mess on frequency at 1224.
- 8454.0 HWN-French naval radio, Paris, France, with the usual V CW marker at 1231.
- 8473.5 A7D-DOHA Radio, Qatar at 1233 with a CW DE marker. WPD was atop the channel causing interference.
- 8475.5 FUX-French Naval Radio-Le Port, reunion sending a continuous V CW marker at 0047.
- 8478.0 VIX-Royal Australian navy, Canberra, with the customary V CW marker at 1239. TIM-Limon, Costa Rica on same frequency causing interference with its CQ marker. FUF up 500 khz bleeding over (see next log)
- 8478.5 FUF-French naval radio-Fort de France, Martinique with a super strong CW V marker signal at 1240.
- 8479.0 HLJ-Seoul radio, South Korea in ICW at 2354 with CQ marker. Probably a long path reception.
- 8490.0 AQP3-Pakistan naval radio in Karachi with a CW V marker at 1245. Nice signal this late in the morning from this area of the world.
- 8504.1 ZLB-Awarua radio, New Zealand with a nice signal at 1250 with a CQ CW marker.
- 8514.0 CFH-Canadian military-Halifax, Nova Scotia noted at 0100 in CW (25 words per minute) with traffic and weather. (Bob Grove, Brasstown, NC)
- 8520.1 PPO-Olinda radio, Brazil, at 0041 with a CW V marker transmission.
- 8521.0 VIS26-Sydney radio, Australia, in at 1252 with a V CW marker.
- 8571.5 9VG4-Singapore radio, in with a nice CW V marker signal at 2338.
- 8584.0 Y5M-Rugen radio, East Germany, with a V CW marker at 2332.
- 8618.0 Possible navy net in the Pacific. Noted Y5C/Y5Q/K4K working each other at 1309 in USB. Mentioned setting up for a RTTY test then K4K went on with encrypted RTTY. Several tests were conducted. Interesting. They were in the middle of the digital mode marine band with voice transmissions.
- 8623.0 5BA-Nicosia Radio, Cyprus, with a very nice signal at 2316 in CW with a CQ marker.
- 8625.0 FUM-French naval radio, Papeete, Tahiti at 1321 with a V CW marker.
- 8634.0 PPR-Rio de Janeiro radio, Brazil, at 2255 with a CQ CW marker.
- 8645.5 'D' Beacon-Odessa, USSR, noted at 2253 sending continuous CW Ds. Signal only fair.
- 8656.2 XFU-Veracruz radio, Mexico, sending a CW CQ marker at 2248.
- 8666.0 FUG-French naval radio, La Regina, France, with a V marker CW transmission at 2247.
- 8670.0 'K' Beacon-Continuous CW letter 'K' noted at 1325. Klingenfuss says this beacon transmits from Khabarovsk, USSR.
- 'U' beacon-Murmansk, USSR, sending continuous CW Us at 2245. No sign of the 'K' beacon noted above.
- 8674.4 VWM-Madras radio, India, Real nice surprise with a CW CQ marker at 1330.
- 8700.0 HKB-Barranquilla radio, Colombia, with a good CQ CW marker signal at 2235.
- 8843.0 Honolulu ATC working Delta 149/151 in USB at 2101. (David Kammler, Ridgecrest, CA)
- 8989.0 USAF GCCS McClellan AFB, CA, with skyking broadcast at 2214 in USB. (David Kammler, Ridgecrest, CA)
- 9057.0 Greenhand (SAC unit) calling WAR46 (FEMA) working each other at 1658 on SAC channel Papa in USB. Very interesting communications.
- 9237.0 Spanish number station Male voice transmitting five number groups at 1100. (Rod Pearson, St. Augustine, FL)
- 9809.0 Noted a station broadcasting a Skyking broadcast message at 1438/1446/1448 by an unknown station. Station did not ID, was quite strong. Any ideas who this frequency belongs to?
- 9950.0 ZLBC4-Campbell Island, New Zealand, male operator at 0647 with maritime traffic in USB. (Fred Carlisle, Tumwater, WA)
- 10051.0 New York Volmet radio with weather broadcast at 2106 in USB. (David Kammler, Ridgecrest, CA)
- 10177.0 German numbers station with 5 number groups at 0015. Broadcast ended at 0016. (David Kammler, Ridgecrest, CA)
- 10360.0 English number station transmitted by a female voice 3/2 number groups at 0430. (Rod Pearson, St. Augustine, FL)
- 11176.0 USAF GCCS Elmendorf, Alaska, noted at 2200 with a lot of activity about one dozen (plus) skyking broadcast in upper sideband. Also noted a search and rescue mission in progress. (David Kammler, Ridgecrest, CA)
- USAF GCCS Albrook, Panama, working MAC 67544 in USB at 1711. (Charles McVey, Norfolk, VA)
- 11200.0 MVU-Royal Air Force Volmet station-London, noted at 1704 (noon local) with Aero weather broadcast. Weak to fair signal strengths in USB. (Rod Pearson, St. Augustine, FL)
- 11233.0 Aircraft 3705 working Trenton military. Requested a phone patch with base operations in Ottawa at 1754 in USB (Rod Pearson, St. Augustine, FL)

Utility Loggings

- 11243.0 Ranger with short 3 letter/number/time/authentication message repeated 3 times at 1505. (Rod Pearson, St. Augustine, FL) prosecute working raindrop at 1507. Female operator was laughing quite hard over the air. Wish I could have heard the joke. (SAC channel Alpha One)
- 11267.0 9JL/E9K/E7F/2NN working each other at 1748 in USB. E9K and E7F went into the green (scrambled mode). Navy Hicom channel.
- 11282.0 San Francisco ATC working Japan Air 61 at 0028 in USB. Alrcraft told to contact Honolulu ATC on 118.5 mhz. (David Kammler, Ridgecrest, CA)
- 11300.0 African Aero stations booming in this evening, some of the action as noted in USB. Khartoum ATC working Jeddah ATC at 2140. Jeddah working Addis (Ababa) at 2155. Khartoum ATC working speedbird 56 (Boeing 747) and Air France 625 at 2203. Cairo ATC working Luxair 181 and Zimbabwe 530 at 2224. (Rod Pearson, St. Augustine, FL)
- 11474.0 KKN44-US State Department, Washington, D.C. with a CW QRA marker at 2124. Marker indicates the station was transmitting markers on 4-7-11-17 mhz.
- 12743.0 NRV-USCG Apra Harbor, Guam with a CW CQ marker at 2159. Very weak.
- 12775.0 XFU-Veracruz radio, Mexico, in CW with a CQ marker at 2154.
- 12797.0 UDK-Murmansk radio, USSR, at 2152 with ship traffic in CW.
- 12803.0 UDK-Murmansk radio, USSR, with ship traffic at 2150 in CW.
- 12823.5 CTP-Portugal naval radio, Oeiras, with a DE CW marker at 2147.
- 12824.2 GYU-Royal naval radio, Gibraltar, at 2146 in CW with a DE marker.
- 12858.0 FUE-French naval radio, Brest, France, with CW V marker at 1733.
- 12877.5 EAD-Aranjuez radio, Spain at 2134 with a strong CW signal transmitting a continuous DE marker
- 12988.5 3BM5-Mauritius (Bigara) radio with a CQ CW marker. Had to listen to this one for several minutes as LPD88 was dominant on the frequency. Finally got an ID during a LPD88 silent period between marker transmissions. First station from this African country I have heard at 0420.
- 13078.0 VIS-Sydney radio, Australia noted with callsign only followed by ARQ idler at 2121.
- 13080.0 HEC-Berne radio, Switzerland with a callsign only ID and ARQ idler at 2114.
- 13103.9 GTK52-Portishead radio, England working the ship 'Star Dancer' at 2335 in USB. Ship heard on 12333.1. (David Kammler, Ridgecrest, CA)
- 13113.2 NRV-Coast Comsta Guam in USB at 2130 giving high seas weather information. (David Kammler, Ridgecrest, CA)
- 13138.0 VCS-Canadian Coast Guard radio, Halifax, NS noted with marine weather broadcast. Gave weather forecast, gale warnings and temperature reports for the Grand Banks and Northern Banks areas. Transmission ended at 1623. (Gayle Van Horn, Orange Park, FL) (Thanks for the log Gayle, check in anytime-ed)
- 13282.0 Tokyo Volmet radio with weather information for various airports in Japan and other countries close by at 2112 in USB. (David Kammler, Ridgecrest, CA)
- 13737.0 Spanish numbers station Female transmitting 5 number groups at 2100. (Rod Pearson, St. Augustine, FL)
- 13937.0 ONY27-Rouveray, Belgium in CW with traffic for ONY24 at 1455. This is a Belgium Army network.
- 14441.5 Noted several navy ships on this MARS hailing channel working stateside stations in USB. All stations callsign began with NNN0 . . . (Andy Gordon, West Hartford, CT)
- 14470.0 USS Brunswick(ATS-3) NNNOCYQ working NNNOZLI at 2200 in USB. The Brunswick was returning to Pearl Harbor, HI from the Western Pacific. (Andy Gordon, West Hartford, CT)
- 14595.2 Unidentified stations in Spanish, Women talking mentioned radio Echo several times. Also heard Washington and Mexico mentioned. Stations moved up in frequency to 14660.0 at 1523.
- 14712.5 Radio Free Europe, Holzkirchen, West Germany. Feeder station using Independent sideband, noted ID at 1530.
- 14818.0 Y7A60-Berlin, East German embassy station with a CW V/QRA marker at 1534.
- 14818.5 USS Cape Cos (AD-43) NNNOCOH working NNNONSD (San Diego) with phone patch traffic in USB. (Andy Gordon, West Hartford, CT)
- 14900.0 CFH-Canadian military, Halifax, Nova Scotia noted at 0200 in RTTY 75/425. (Bob Grove, Brasstown, NC)
- 15035.0 CHR-Trenton military radio, Canada at 2236 giving flight weather information in USB. (David Kammler, Ridgecrest, CA)
- 16458.0 KRH50-London, England Department of State radio with a CW QRA marker at 1511.
- 16910.6 TFA-Reykjavik radio, Iceland with a CW CQ marker at 2007.
- 16935.0 A7D-Doha radio, Qatar battling with another unknown station at 1900. Noted the station sending ship traffic to an unidentified vessel.
- 16947.6 8PO-Barbadoes radio at 1858 with a continuous DE CW marker.
- 16968.5 WLO-Mobile radio in CW with ship traffic at 1855.
- 17016.5 KPH-San Francisco radio noted at 1849 with ship traffic in CW.
- 17020.0 UDK2-Murmansk radio, USSR with CW traffic to an unknown UJ ship at 1845.
- 17191.0 LSA-Boca radio, Argentina with CW traffic to an unknown ship at 1819.
- 17245.2 WOO-New York Oceangate radio in USB with open channel on channel 1605. No traffic to work at 2130. (David Kammler, Ridgecrest, CA)
- 18002.0 USAF GCCS Loring, ME transmitting an emergency action message at 1748 in USB. Fair signal.
- 18407.0 ZBP-Pitcairn Island working Wellington, New Zealand in USB at 2014. Only Pitcairn side heard. On 18710 USB (Wellington Radio) was in and both sides of the conversation were monitored. (Bruce MacGibbon, Gresham, OR) (Welcome to the column Bruce, return often-ed)
- 18710.0 Pitcairn Island telecom with traffic working Christchurch, New Zealand at 1907 in USB. Noted simplex/duplex communications. (Fred Carlisle-Tumwater, WA)
- 19261.0 VOA feeder-Greenville, NC at 1739 transmitting program in the independent sideband mode.
- 22330.5 D3E81-Luanda radio, Angola at 1638 with a continuous CQ CW marker.
- 22352.5 PPR-Rio de Janeiro radio, Brazil transmitting a continuous V CW marker signal at 1703.
- 22390.0 FUF-French naval radio, Fort de France, Martinique with the usual V CW marker at 1640.
- 22395.0 ZRQ2-South African naval radio, Capetown noted on this new frequency up from 22393.5 with a V CW marker at 1641.
- 22473.0 CBV-DGTMMM Valparaiso, Chile noted with a good signal at 1650. Transmission consisted of a CQ CW marker.
- 22565.0 PCH-Scheveningen radio, Holland sending a callsign CW marker at 1654.
- 22594.0 GKQ7-Portishead radio, England at 1656 with a callsign only marker.

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Radio Listening and the Law

"Unlike many hobbies, shortwave listening has relatively few laws that restrict its aficionados. In fact, barring the illegality of using a receiver as a murder weapon, the one law that has any direct bearing on the short-wave listener is the so-called 'secrecy law'."

When Mel Hickman wrote that in 1973, he was right. Today, however, there are other laws radio listeners must contend with.

Many states have laws restricting the use of scanners or other police band radios in moving vehicles, and in certain other circumstances. Unfortunately, the variety and number of such state laws make a comprehensive look at them impractical for this column.

What we will do is look at the main points of the two major federal laws regulating radio listening: the "secrecy law" (The Communications Act of 1934, #705) referred to above, and the recently amended Electronic Communications Privacy Act (ECPA).

The Secrecy Law

The secrecy law, technically known as 47 USCS #605, was first enacted in June of 1934, and last amended in October of 1984. (You may also see it referred to as the Communications Act of 1934, Title VII, #705). Its purpose from the beginning was to provide those using the radio to transmit private messages with a measure of security by making it illegal to disclose the contents of a transmission to anyone other than the intended party.

Nothing in this law restricts listening to private communications, only the listening and disclosure of such transmissions. Thus, it comes into play only when a listener attempts to verify (QSL) a nonbroadcast station. But in order to fully understand the law, you unfortunately will have to read it, and for Congress' purple prose, I apologize in advance!

(a) Except as authorized by chapter 119, title 18 United States Code [18 USCS ##2510 et seq.-the ECPA], no person receiving, assisting in receiving, transmitting, or assisting in transmitting any interstate or foreign communications by wire or radio shall divulge or publish the existence, contents, substance, purport, effect, or meaning thereof.... (1) to any person other than the addressee, his agent, or attorney, (2) to a person employed or authorized to forward such communication to its destina-

tion...(5) in response to a subpoena issued by a court of competent jurisdiction, or (6) on demand of other lawful authority. No person not being authorized by the sender shall intercept any radio communication and divulge or publish the existence, contents, substance, purport, effect or meaning of such intercepted communications to any person. No person not being entitled thereto shall receive or assist in receiving any interstate or foreign communication by radio and use such communication (or any information therein contained) for his own benefit or for the benefit of another not entitled thereto. No person having received any intercepted radio communication or having become acquainted with the contents, substance, purport, effect, or meaning of such communication (or any part thereof) knowing that such communications was intercepted, shall divulge or publish the existence, content, purport, effect, or meaning of such communication (or any part thereof) or use such communication (or any information therein contained) for his own benefit or for the benefit of another not entitled thereto. This section shall not apply to the receiving, divulging, publishing, or utilizing the contents of any radio communication which is transmitted by any station for the use of the general public, which relates to ships in distress, or which is transmitted by an amateur radio station operator or by a citizens band radio operator.

(d)(1) Any person who willfully violates subsection (a) shall be fined not more than \$1,000 or imprisoned for not more than 6 months, or both.

(2) Any person who violates subsection (a) willfully and for purposes of direct or indirect commercial advantage or private financial gain shall be fined not more than \$25,000 or imprisoned for not more than 1 year, or both, for the first such conviction and shall be fined not more than \$50,000 or imprisoned for not more than 2 years, or both, for any subsequent conviction.

(3) [provisions for civil litigation based on this section and providing

for remuneration of any damages suffered]

As a note, Congress uses the word "intercept" to mean "receive", not what you would expect from the common meaning of the word.

The details are there if you care to wade through the language, but in a somewhat oversimplified nutshell, #605 provides that a listener may not divulge the content or even the existence of a two-party transmission, except for distress calls, and ham and CB transmissions. Similarly, a listener receiving such transmissions may not use the information gleaned for his own benefit. In other words, while it is OK to listen to anything you want, you cannot, for example, send a reception report to a Coast Guard station disclosing you heard it while it was handling traffic. Even if you do not mention the name of the ship it was in contact with, or what was said, the mere existence of the transmission may not be disclosed. Under the law, such a report would be improper, since it would "benefit" a person other than the intended addressee, namely, the listener seeking the QSL.

On the other hand, if you waited until the Coast Guard station began reading the maritime weather report or the latest Notice to Mariners, and submitted a report on that transmission you would be doing nothing illegal, since the transmission was not meant for anyone in particular. It falls under the "communication transmitted by a station for the use of the general public" exception.

This law was meant to allow people using radio for private or semi-private communications some assurance that their words would not become front-page news, and was never intended to insure "privacy" in the absolute sense of that word. This purpose is acknowledged in the case entitled "Re Roberts Flying Service, Inc., et al." [30 FCC2d 823 (1971)]. Although that case attempts to say #605 does prohibit listening alone, it concludes by saying that the section does not protect the expectation of "full privacy" but only the user's expectation that his communication will not become "generally public" or used to his detriment.

However, the way this section has been interpreted specifically excludes a situation that the framers of the US Constitution would have been concerned about if radio had been around in 1788: reception and use of transmissions by police and other government officers, and the "unreasonable search"

ramifications of a policeman listening in, for example, on your wireless telephone. Title 18 of the US Code, and specifically the ECPA, covers such Fourth Amendment concerns.

Contrary to the impression many radio hobbyists have, the ECPA actually is designed to set forth circumstances when it is alright to "intercept" a communication - thus the reference to it in the Secrecy Law. The basic purpose behind Title 18 originally was to flesh out the requirements of the Fourth Amendment securities, and provide guidance to police and other officials about what constitutes proper behavior within the Constitution.

However, in the process of telling us - and the police - when it is OK to receive electronic signals (like when you have a search warrant issued with probable cause) the ECPA also tells us that under any other circumstances it is not OK to listen in on others' transmissions.

But that is getting ahead of the story. The ECPA, technically, 18 USCS #2510 et.seq. was first enacted in June of 1968, and dealt only with wire and oral communications. In 1986 it was modified by Congress to also include radio communications, and the name of the law was changed to the ECPA to reflect that. The text relevant to radio listeners is in #2511:

- (1) Except as otherwise provided in this chapter any person who -
 - (a) intentionally intercepts, endeavors to intercept, or procures any other person to intercept, endeavor to intercept, any wire, oral, or electronic communication... [(b) refers to oral communications only]
 - (c) intentionally discloses, or endeavors to disclose, to any other person the contents of any wire, oral, or electronic communication, knowing or having reason to know that the information was obtained through the interception of a wire, oral, or electronic communication in violation of this subsection: or
 - (d) intentionally uses, or endeavors to use the contents of any wire, oral, or electronic communication, knowing or having reason to know that the information was obtained through the interception of a wire, oral, or electronic communication in violation of this subsection; shall be punished as provided in subsection (4) [which provides for fines and

imprisonment for up to 5 years}...

Again, the way Congress uses "intercept" in this law also means "receive". Unfortunately, unlike the language of the secrecy law, Congress here did not use the phrase "and divulge" when describing what was prohibited. Therefore, under the ECPA, merely listening to a transmission is, on it's face, illegal.

But all is not so grim. Congress realized that the language above, left to itself would make listening even to a broadcast station illegal, and thus was overly broad. Subsection two goes on to list the exceptions to the general rule set out above.

(2) . . . (g) It shall not be unlawful under this chapter...for any person -

- (i) to intercept or access an electronic communication made through an electronic communication system that is configured so that such electronic communication is readily accessible to the public.

(ii) to intercept any electronic communication which is transmitted -

(I) by any station for the use of the general public, or that relates to ships, aircraft, vehicles or persons in distress;

(II) by any governmental, law enforcement, civil defense, private land mobile, or public safety communications system, including police and fire, readily accessible to the general public; (III) by a station operating on an authorized frequency within the bands allocated to the amateur, citizens band, or general mobile radio services; or

(IV) by any marine or aeronautical communications system...(or)

(iv) to intercept any wire or electronic communication the transmission of which is causing harmful interference to any lawfully operating station or consumer electronic equipment, to the extent necessary to identify the source of such interference;

There is a sentence in those exceptions that I believe Congress did not fully appreciate: "It shall not be unlawful under this chapter...for any person...to intercept or access an electronic communication made through an electronic communication system that is configured so that such electronic communication is readily accessible to the public."

To paraphrase tax specialists, that is a loophole you can drive a truck through. In my interpretation, that phrase means if it is unencoded, you can listen to it. Period. In fact, even if it is encoded, so long as you do not attempt to decode it without authorization, you can listen all you want. You are not intercepting the "communication" if you do so - you are only intercepting the transmission, which is something the ECPA does not address.

Unfortunately, Congress certainly did intend to restrict what we could listen to via the mechanism of the ECPA. That intent was made painfully clear by discussions in committee when the law was passed, and it was revealed that based on the requests of cellular telephone manufacturers and others, Congress believed it appropriate to restrict the general public's ability to legally monitor two-party transmissions. Fortunately, the law as passed (and even as originally proposed) does not do what Congress set out to do!

In short, as presently written, neither law discussed above prohibits hobbyists from listening to transmissions of any sort, provided that if they are encoded, the hobbyist cannot attempt to decode them without authorization. The Secrecy law does prohibit disclosure of the existence or content of certain transmissions, however, primarily to ensure some degree of privacy for the people using radio as a private communication medium. I believe that latter goal is appropriate - even though it does mean inconvenience for DXers seeking QSLs - given that radio is meant to be a useful technology.

I do not believe Congress is acting within the nation's best interest in attempting to prohibit *reception* of two-party transmissions, but that is a drum you will likely hear others beat. At any rate, the ECPA *as currently enacted* does not prohibit "unauthorized" monitoring of two-party communications.

Kenneth Vito Zichi is a General Practice attorney admitted to practice in both Federal and State courts in Michigan. He is a graduate of the University of Michigan Law School, and a member of the Michigan Bar and Livingston County Bar Association, as well as the American Bar Association and the Association of Trial Lawyers of America.

Summer Preview:

New Way to Monitor the Sky

Warm weather, to the scanner enthusiast, means airshows. And new technology, in the form of a scanner called the Black Jaguar, makes truly portable listening of all activities at an airshow possible.

What makes the Black Jaguar (BJ200) special is that it is a sixteen channel hand-held capable of receiving portions of the UHF military aircraft band. The owner's manual indicates that coverage of 210-260 MHz (AM or FM) with wider receiving ranges possible, depending on factory alignment of the PLL (Phase Lock Loop) circuitry. One sample showed reception in the lower-to-mid 300 MHz range. It's an especially interesting scanner for airshow fans and UHF military aircraft monitors. (Inquire with E.E.B. of Vienna, Virginia, for more details).

The United States Air Force Thunderbirds and the United States Navy Blue Angels air demonstration teams perform at many airshows throughout the country each year. They are breathtaking. Their maneuvers require split second timing and communications for successful execution.

The communication aspect is very important to the safety and success of those individuals and equipment involved as well as the general public watching the airshow. Pilots communicate quite frequently during maneuvers, especially when precise coordination is required. Also, should technical problems arise during a demonstration, the pilot can inform the other pilots as well as the ground support crew. Turn on a scanner at an airshow, and you'll be the second biggest attraction at the site -- next to, of course, the planes in the air.

Table one lists the frequencies and designators utilized by the U.S.N. Blue Angels and table two those used by the U.S.A.F. Thunderbirds and the U.S.A. Golden Knights Parachute Team. Blue Angel frequencies are all confirmed (with input from Johnny Autery of Dixon Hills, Alabama who attended the Pensacola Air Show in November of 1987). Neither of the tables are complete

listings, however. Any updates and additions (confirmed) would be greatly appreciated. The frequency of 123.400 MHz (AM) is a common airshow control frequency.

Recommended Reading

The fifth edition of *Government Radio Systems* has been recently released by Mobile Radio Resources (\$25.00 ppd, 2661 Carol Drive, San Jose, CA 95125, 408-292-4342). It is a 360 page directory of city, county, state and federal agencies for the state of California. The federal section, however, which contains some 73 pages of information, covers all agencies in detail and is highly recommend for all federal monitors, regardless of home location. It is very comprehensive. Military systems are not presented in GRS but rather in a separate text, *Military Radio Systems* (available for \$10 ppd.) which is 80 pages. The *MRS* directory contains additional data on the Blue Angels and Thunderbirds not presented in this column as well as other interesting data related to military radio operations. Both books are both 8.5 by 11 inch with dot matrix print.

Mailbag

An interesting letter was forwarded by Bob from James Webb of Leesburg, Virginia. James monitored the "TMARS" - Tidewater T-Cap Mutual Aid Radio System net on a reported frequency of 469.600 MHz during a communications check of the network. The actual frequency of the TMARS network is 453.800/458.800 MHz and what James probably monitored was an image from a receiver with an IF (Intermediate Frequency) of 10.8 MHz. Add 10.8 to 458.800 (the input to the network repeater) and the frequency of 469.600 is derived and monitored. As a note to all when a rare or quite interesting catch appears to be at hand on an unexpected frequency verify if it is an image being monitored.

I have several of these rare catches in my log book from time past. The IF for all late model Bearcat receivers is 10.8 MHz and for

Table One

U.S.N. BLUE ANGELS

121.900	Ground Support (Refueling)
123.400	Common Airshow 'control' frequency
142.000	'Alpha' Air to air Tactical, Primary
142.025	Ground Support (NBFM Repeater Out/In 142.625)
143.000	'Bravo' Air-to-air Tactical, Secondary
143.600	Maintenance - 'Channel 10'
241.400	Air-to-air
250.800	Air-to-air
251.600	Air-to-air Aircraft 5-6 'Channel 19'; also Air-to-ground
275.350	Air-to-air Aircraft 1-4; also Air-to-ground
360.400	Air-to-air
384.400	Air-to-air
395.900	Air-to-air

NOTE: All frequencies are confirmed and are AM unless noted otherwise.

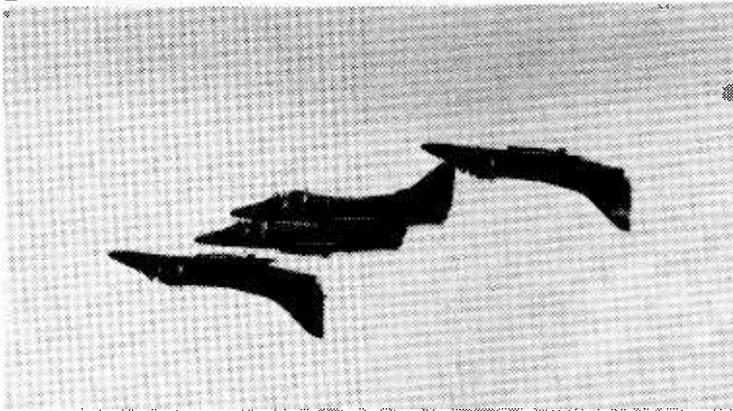
Table Two

U.S.A.F. THUNDERBIRDS

120.450	Reported operations
123.400	Common airshow 'Control'
140.400	Air-to-air Tactical
141.850	Air-to-air Tactical, Primary
236.600	Air-to-air
413.025	Ground support (NBFM), Low Power

U.S.A. GOLDEN KNIGHTS

32.30	Operations
123.400	Air coordination



Airshow acrobatics will delight and fool the eye (photo by Steve Holcomb)

most other brands 10.7 MHz. It is also possible to monitor a signal with twice the IF frequency added to the signal as well as just the IF. The twice the IF frequency is an old trick, and a successful one, used to monitor federal frequencies in the 406 - 420 MHz range on a scanner that starts coverage at 420 MHz. So if a rare catch seems at hand on an unexpected frequency check the frequencies that are one IF increment below or twice the IF below the frequency being monitored. The signal will be the strongest on the actual transmitted frequency.

TMARS consists of twenty-two agencies from city, county, state and federal agencies including the military. An exchange of call signs and local time for each station in the net occurred between the apparent net controller, Fairfax County PD, and each station. The network consists of essentially all law enforcement agencies in the metropolitan District of Columbia area. Table three lists the agencies monitored on the net. An additional net for metro DC agencies is on 453.550/458.550 (DC Metro Area Mutual Aid System). The FEMA (Federal Emergency Management Agency) also maintains a network in the metro DC area consisting of city, county, state and federal agencies on 167.975 MHz and they are listed in table four.

The metropolitan DC area is probably not the only metro area with such a communications inter-system, however, it is an example of a large system. The TMARS intersystem and others similar to it show federal monitors that there are communications between federal and local agencies and that they should not be overlooked.

Table Three

TMARS NET

Alexandria PD (VA)	Montgomery County PD (MD)
Arlington PD (VA, County?)	Prince Georges County PD (MD)
D.C. Metro PD (D.C.)	Prince William County PD (VA)
Fairfax City PD (VA)	Takoma Park PD
Fairfax County PD (VA)	U.S. Capitol Police
Falls Church PD (VA)	U.S. Park Police
Ft. Belvoir-Military Police (VA)	U.S. Secret Service-Uniformed Division
Ft. Belvoir-MDW (?)	U.S.S.S.-Washington Field Office
Loudoun County Sheriff (VA)	Vienna PD
Manassas PD (VA)	Virginia State Police (location?)
Maryland State PD-College Park	
MSP-Rockville (MD)	

Table Four

FEMA NET

DC Washington	KCI 618
MD Andrews AFB	KCI 626
MD Hyattsville	KCI 617
MD Olney	KGO 204 Net Control
VA Arlington	KCI 615
VA Alexandria	KCI 616
VA Falls Church	KCI 621
VA Fairfax County	KCI 614
VA Fairfax City	KCI 627
VA Ft. Belvoir	KCI 612
VA Lorton	KCI 624

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THE jury is still out on the current AM DX season, but most DXers agree that last year's long-haul catches, especially Trans Atlantic signals to the west coast, have not materialized this year. On the other hand, Ernie Cooper, Provincetown, Massachusetts, tells me that he heard KSL-1160 in last month -- a rare catch at his QTH. He also would like some help with Traveler Information Stations he hears on 1610. Any ideas, you MA DXers? A Memphis station on 680 surprised me around 9 pm one night. Usually, all I can hear is KFEQ, St. Joseph, with KNBR, San Francisco its constant companion. And the Salvadorian on 655 slipped in next to WSM-650 at signoff, 10 pm, with an excellent signal.

So, while things aren't *too* bad, this is obviously not going to be a banner year for AM DXing. However, there are still a couple of months (depending on where you live) before thunderstorm static tends to conquer the band. So, tune slowly across the AM band and list any channels which seem to have unidentified stations behind the ones you normally hear. Listen for hets (whistling sounds caused by the signals of often foreign stations on nearby channels "bumping" into the signal of the station you're listening to) caused by split-channel stations - the lower-pitched the sound, the closer they are to the main channel. I suppose you could compare them to the sound of a tone of known value from one to nine kHz if you wanted to pinpoint the split frequency.

More Low-Power Stations at Night

More and more stations are coming on the air with low-power night authorizations so the channel you gave up on may now begin to yield regional DX, especially on upper-band frequencies where skywave is more prevalent. The FCC recently approved limited night operation at reduced power for many former daytime-only stations, and although some are scoffing at such powers as 29 watts, others immediately began programming.

Some small-town stations have found the authorization adequate to blanket their town and into the countryside with local programming, including high school sports.

DXers who have mourned the blocking of clear-channel stations they once could hear any night are missing DX opportunities by not selectively DXing all channels, not just their favorites. And those who've favored graveyard channel DXing should find the new conditions much to their liking.

"Paralleling" for Foreign DX

In spite of crowded conditions, good foreign DX is still sneaking in, and another technique, that of parallel DXing, may help you to ID that elusive station. For example, Jim Renfrew of Rochester, New York, reported hearing Radio Caracol-850 from Bogota, Colombia, recently at 0245 UTC. He noted that it was parallel with a shortwave transmission on 4945 kHz, and although neither was heard very clearly, he was able to ID the station successfully. You'll need two receivers, or one with a memory which allows you to switch back and forth quickly, plus a current station listing, such as *Passport to World Band Radio* to confirm programs and the *World Radio TV Handbook* to check to see if a possible station has both a broadcast band and shortwave station. This method isn't foolproof, but it can give you more continuous listening time on a station which is prone to severe fading. And don't be surprised if the broadcast band station comes in more consistently than the SWer!

Beware Chanting on 1413 kHz!

Be careful of a TA signal on 1413 kHz which produces Arabic chanting. NRCer Ray Moore logged them and guessed the origin as Yugoslavia, which "International DX Digest" editor Chuck Hutton confirmed. Some DXers are fooled into believing that they have heard Oman instead. Ray also reported The Vatican on 1611 kHz the same night. So don't forget to tune above and below the band for DX. You might even hear Radio New York International. If the legal mechanism continues to slap down the FCC's actions on offshore pirates, we may be hearing more than occasional pirates in the near future.

Speaking of above-band DX, a plan by a group of businessmen to put a megawatter on the air from Bermuda to broadcast to the east coast apparently will not happen, as the initial request to the government of

Bermuda has been turned down flatly. No word on their next move.

Stereo AM

Available figures indicate that over 12 million C-QUAM receivers and only 200,000 to 300,000 Kahn receivers have been sold. And we're no closer to solving the problem than we were five years ago when *four* systems were still being broadcast, unless quality multi-system receivers, especially boom boxes for teenagers, are placed on the market.

In response to my offer to serve as an intermediary for passing on your old frequency guides to third-world countries, Roger Giannini of St. Louis sent on a box of nine WRTHs and Mrs. Leslie Edwards of Doylestown, Pennsylvania, responded specifically with a check to cover the cost of a new 1988 *Passport to World Band Radio* to be forwarded to the Belize DXer I mentioned in the December column. Thanks folks, and may the recipients get the enjoyment out of radio listening that Mrs. Edwards does: "Shortwave radio - what an invention! The ionosphere was always there! One stands in awe. It is an education along with a hobby - and universal caring for people and our dear world." And that's what it's all about, isn't it?

Mike Riordan of Goleta, California, was excited over his FM DX catches -- all rare E-skip, which rarely seems to get into the SoCA area. Mike was using a GE Superadio II and Panasonic RF 2200, neither of which have digital readouts, and had to estimate the frequencies, but by using my "FM Atlas" and his descriptions, I suspect that his three catches were KZIN-96.3 Shelby, MT; KENB-96.1 Worland, WY (which may simulcast KWOR, explaining why he heard those AM calls on FM), and KOLL-96.9 Gillette, WY. Mike says that these are the best FM DX catches in his life.

An anonymous *MT* reader from Milwaukee sent me a page from the venerable *Milwaukee Journal*, and I had fun reading about the days of border radio when the likes of XER/XERF and XERB blasted the air waves on this side of the Mexican border. The excerpt was from Bill Crawford and Gene Fowler's book *Border Radio: Quack, Yodelers, Psychics and other*

Amazing Broadcasters of the Airwaves. I remember some of those old programs on XERF-1570, including the hawking of religious items, baby chicks, and seaweed pills, but I somehow missed the debut years of Wolfman Jack on XERF in the '60s. I was on the air, too, trying to work my way through college, and did little DXing from then until the mid-'70s, unfortunately. *Border Radio* is available, incidentally, from Imprime for \$18.95 plus \$2.64 UPS shipping.

New Signals

KGDP-660 in Orcutt-Santa Maria, California, may be on the air by now, as IRCA member Jim Hilliker phoned them and confirmed that their power will be 10 kw days, 1 kw nights. That night allocation seems a little strange, considering the strength of KTNN at 50 kw from Window Rock, AZ which sends nearly all of its signal at California and on to Asia, where DXers there report it with boring regularity. But then the same situation exists on adjacent 670 kHz with KWNK, Simi Valley, CA and 50 kw KBOI, Boise, ID which gives "Valley Radio" fits. But apparently this planning will continue to be the rule on "clear" channels and not the exception.

Update on Capitol Tapes

In our March column we expressed our concern that Audiopack broadcast tape cartridges would no longer be available now that the Capitol Industries had disbanded the product line last December. A call from one of our readers was reassuring.

Apparently, two former employees purchased the division last month and the entire Audiopack distribution network should remain unchanged.

We appreciate your input on items of interest and are pleased to share them with our readers.

Keep sending those AM/FM/TV loggings in. Next month we'll preview the FM/TV E-skip season. Until then, 73s!

NOTE: *In our March column we employed an artistic rendering of various towers "cracking" to emphasize an adjacent item concerning tall, ground-mounted broadcasting towers. Because of the resemblance of our rendering to a roof-mounted communications tower made by Orion Hi-Tech (PO Box 8771, Calabasas, CA 91302), we would hasten to assure our readers that the quality of the Orion product has never been in question.*

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Mid-Air Emergencies

It happened only a few months ago, December 14, 1987. A winter storm was building and the weather in South-Central Indiana was closing in rapidly. The worst of the storm was centered above the Morgan-Monroe State Forest, where, a mere half a mile above the tree tops, a student pilot was flying a small Tomahawk Piper aircraft through the dark, snow-swept skies. Panic had begun to set in as she realized her situation: she was hopelessly lost.

Landing at Bloomington, the airport nearest to her, was impossible because only instrument-rated pilots were being allowed to come in with the assistance of navigational aids. And there was no other field nearby where she could attempt a VFR landing in the blinding snow storm. The only chance that she had was to try and outrace the storm to Indianapolis International Airport and complete a landing there under the guidance of the radar controllers.

John R. Reel, a veteran controller of 35 years, was appraised of the situation. Over the next few hours, he would pour all of that experience -- both as a controller and as a qualified pilot -- into the microphone. He knew that his steady, strong voice was the only thing standing between the terrified pilot -- known to him only as "November Six-four -- and disaster.

Reel's first action was to make the pilot familiar with his voice, help get her mind off her predicament, and then reassure her that the situation could be controlled if they worked together. Reel had used this strategy in three previous "talk downs." Unfortunately, when he attempted to get pertinent information about the Tomahawk's airspeed, direction, and altitude, the tension the pilot was under gave way to sheer panic. At times, it was virtually impossible to understand her as she screamed into her microphone for assistance.

Reel finally got her calmed down by giving her clear, concise--but simple--directions in regard to watching her airspeed, keeping her wings straight and level, repeating them over and over until she regained her composure and was able to answer him in an even, almost steady voice. The controller praised her over and over and continually reassured her as to her position.

Time seemed to pass like centuries for the two as both pilot and controller worked to keep the plane on course. Every move had to be smooth, every turn gradual. Again, Reel's main concern was to keep the student watching her airspeed and making sure that her wings were level as she corrected her course and attempted to stay on the heading he gave her as he brought her closer to Indianapolis International.

The next few moments were quiet, but the aircraft was traveling at the front edge of the snowstorm and began to pick up ice in the instrument used to measure speed! Nine miles from the airport, the instrument failed completely. The pilot told Reel: "Airspeed indicator says zero!"

By then, Reel had another controller, one who was familiar with the controls and design of the Tomahawk Piper, working with him. Together, they told her not to worry, but the pilot, still in the clouds, needed some idea of her motion. "Can you tell me what my airspeed is, sir?" she asked. "Yes," replied Reel, calmly, "you're doing about 90 on both air and ground speed. Does that make you feel better? Just keep it level and the speed will take care of itself. You are now at 80 knots."

When she was five miles out, the other controllers held off all incom-

ing and departing flights as Reel sent her into one final turn, then he told her that she was cleared to land. Controllers in the tower notified Reel in the radar room as she touched down. Together, they had outraced the storm!

The identity of the pilot was withheld pending FAA investigation. Even John Reel only knew her as November Six-Four; however, he has seen her. A few hours after the flight, she was at the Indianapolis Airport Authority Safety Office where she had been taken after her unnerving experience.

Reel walked across the lawn from the terminal radar facility to the office. When he saw the young woman, he introduced himself as just a controller who wanted to check on her condition. She didn't recognize his voice and he didn't tell her who he really was.

There are others, of course, who are not so lucky as the student pilot in the Tomahawk. This was contributed by Rolf Kohler, who monitored it as it happened on the seventeenth of November, 1987, on 3016 kHz:

A Lufthansa Airlines captain picked up a mayday call on the international distress frequency of 121.5 at 2340 UTC. It was from the pilot of a Cessna Centurion (a single-engine aircraft), at the position of 49°01'6" N and 17°34'7" W (over the Atlantic Ocean).

The pilot of the Cessna who was flying from St. John, Newfoundland to London, was completely lost and had no idea of his position. He reported that he was at 14,000 feet with fuel for 2 hours, and was on a heading of 090°. The Lufthansa pilot reported this mayday transmission to Santa Maria and after a while, Santa Maria confirmed that the Cessna was actually flying to Santa Maria, and not to London after all!

A few moments later, the Cessna pilot reported that he was descending to 9,000 feet due to icing.

After another 10 minutes, the Cessna requested the cloud base at St. Maria (which was 1,600 feet) and at that time, Shanwick suggested give them a callup on 132.25 VHF. Then St. Maria asked the Lufthansa pilot to tell the Cessna to press his mike button so a satellite could eventually locate him, and also, did he have an ELT (emergency locator transmitter) on board?

Yes, there was an ELT on board, answered the pilot; however, it was installed in the very back of the plane and could not be reached during flight (Editor's note: If he had been able to reach it, he could have set it off by banging on it. Such devices are usually activated by impact of a crash under normal-- if that word can be used in this context -- situations.)

At 0010 UTC, the Lufthansa flight was at the position of 49°N and 24°30'W, and the captain suggested that the Cessna should be in a radius of 300 miles, due to the propagation of his VHF transmitter.

0025 UTC: The Lufthansa flight reported the position of 49°N and 25°W and relayed from St. Maria the instructions to the Cessna pilot (on VHF) that he should descend to as low an altitude as he could safely assume in order to save on fuel. He was also told to try St. Maria on the VHF freqs of 135.0 or 118.1.

At 0033, St. Maria called the captain of the Lufthansa flight to ask the Cessna pilot his true airspeed, his heading, and remaining fuel on

board. Now, however, the Lufthansa flight was unable to raise the tiny Cessna! The last transmission exchange between the two aircraft had been at 0015 when the Cessna pilot had changed his heading from 090 to 120°, at a speed of 120 mph and an altitude of 9,000 feet. The captain of the Lufthansa flight said that he had the feeling that the Cessna should be somewhere between 45°N/20°W to 49°N/21°W.

0040 UTC: At this point, somebody had finally gotten the idea to ask if the Cessna was also equipped with a high frequency (short-wave) transmitter. The captain of the Lufthansa flight had no answer to this because he had not checked with the Cessna's pilot. . . .

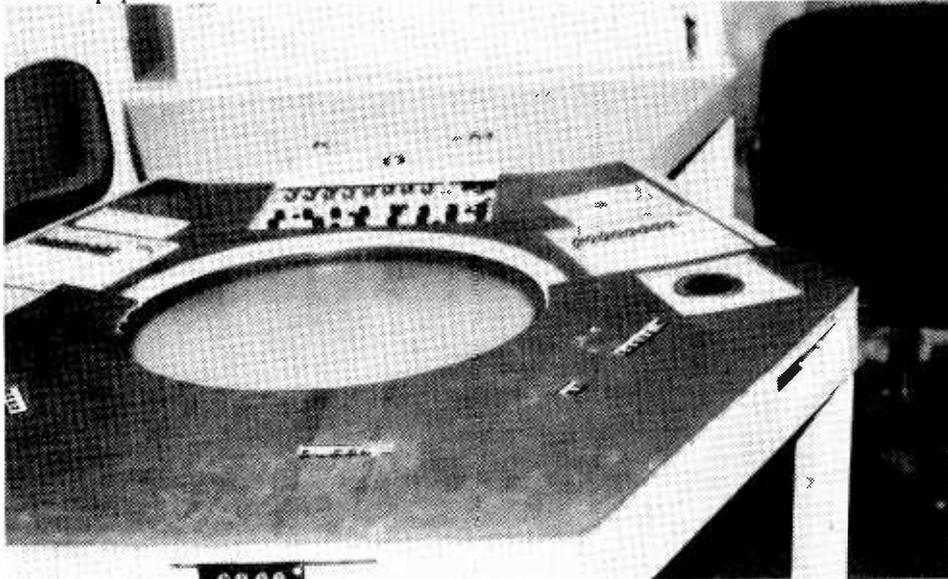
Rolf goes on to say that he wonders if anyone else had monitored this incident and if they have, what happened to the pilot of the Cessna and his aircraft? He also says that he himself is a pilot of small aircraft and cannot imagine that a pilot would be foolish enough to attempt to cross the Atlantic without a HF transceiver aboard and the ELT closer within reach of the pilot's seat.

For obvious reasons, I have not mentioned the Cessna's callsign nor tail number, and have also deleted the Lufthansa's flight

number. In addition to agreeing with Rolf in regard to wondering how any pilot could be dumb enough to try to fly over an ocean with-

(see photo). The horizontal radarscope is utilized mainly for approaches, while the vertical scope is used for departures. However, they

Radar Equipment Utilized in TRACONS



out a HF transceiver aboard, I question any pilot who tries the same stunt in an aircraft of that type. The pilot of the Cessna in the above story obviously either wasn't playing with a full deck to begin with, or had his senses addled by drink or perhaps drugs. The buck has to stop there.

An air traffic controller who works an approach or departure position sees the aircraft under his control as computer-generated data blocks representing an aircraft's flight number, altitude, and ground speed (providing that each plane's transponder is equipped with "Mode C", which generates the information. However, just about every commercial airliner has some configuration of Mode C, especially those who fly into and across countries with complete radar coverage).

He (or she, as the case may be) is situated in a facility called a TRACON - which is an acronym for terminal radar approach control - although, departures are handled in this facility also. The TRACON may be located adjacent to the Tower facility at an airport, or it may be situated on the other side of the field. However, at most airports, tower controllers and approach/departure controllers rotate duties as each must learn to be proficient on every position during their training.

Note the equipment utilized in a TRACON:

are interchangeable when necessary.

Separation standards must be maintained between aircraft, both coming in to an airport (approach) and leaving (departure). Between aircraft of similar types, three miles of separation can be maintained. There must, however, be five to eight miles distance between a heavy jet (747, L-1011, DC10, Airbus, etc.) and a lighter one behind it.

If this buffer is broken, the computer triggers an aural alarm to alert the supervisor on duty and the controller on whose scope this has occurred is pulled off the position until an investigation of the incident is completed. Air traffic controllers have nicknamed the aural alarm the "snitch box". It is utilized by both ATC facilities at airports and at enroute ARTCCs (centers).

That's all for this month. Next time, we'll look at the operations of a flight service station. Also, watch for a MT interview with Dick Covell, Air Ground Operations Manager of ARINC.

Worldwide Operational Control

All worldwide aeronautical HF voice communications are upper sideband and are authorized every 3 kHz in the following ranges:

2851- 3019
3401- 3497
4651- 4696
5451- 5475
5481- 5676
6526- 6682
8816- 8960
10006-10096
11276-11396
13261-13357
17901-17967
21940-21997

Worldwide Search and Rescue
(Scene of Action)

3023 5680

Courtesy, *SHORTWAVE DIRECTORY*

As witnessed above Radio Impacto does QSL

More on the Enhanced Novice Privileges

For those of you who wrote requesting information about the 10 and 15 meter Novice bands, here it is.

15 Meters

The 15 meter band is ideal for Novice DXing. Amateurs in every country on Earth operate this band giving Novices the opportunity to earn awards such as WAC (worked all continents) and DXCC (worked 100 countries). Except during extremely poor conditions this band is open to some area of the world daily.

Normally, propagation will follow the sun. As the sun rises, stations to the east of you will become audible; then, as daylight progresses, stations in a more westerly direction will begin to come through. Under normal conditions signals will remain strong until an hour or two after sunset when the band quiets down with openings occurring over a north-south path most days.

Static is not much of a problem on 15; consequently, DX can be worked the year round on this band. Often the DX signals you hear will sound just like U.S. stations. Listen carefully for the calls of station on this band as some will be very exotic. Often a station will call "CQ DX"; if the station is on a different continent than the one you are on, he is calling for you!

Answer him as you would any other station. Most DX amateurs understand enough English to complete a simple contact. If he gives you a signal report, QTH, name, then indicates he wants to terminate the contact, don't try to "chew the rag" with him; he probably doesn't understand that much English or he wants to work more stations. Either way, give him a break.

Many DX amateurs love to work Novices; they know what a thrill it is to work someone in another country. Sometimes you will run across a DX station who does want to chat and get to know you--go to it! This is the true spirit of hamming. Simply talk to him as you would anyone you meet for the first time. Tell him about yourself, the area you live in and what your other hobbies are. Discuss your

family; ask him questions. Most foreign amateurs are very friendly and interesting.

10 Meters

Ten meters is similar to 15 except that conditions tend to be a bit spotty, with signals being either non-existent or blowing your socks off! As with 15, propagation progresses from east to west, although ten will normally peak a bit later than 15 during the day. Ten meters requires better conditions to open for DX than does 15 but, with the improving sunspot cycle, that should not be a problem for the next ten years or so.

When ten meters is open the phone segment of the Novice band is loaded with DX signals anxious to encourage you in the hobby and rather easy to work.

How To Get His Card

If you want a QSL from an overseas amateur the best thing to do is request a card through the QSL bureau and send yours to him via his bureau. The bureaus are fixed addresses where amateurs for an entire country or call area receive their cards.

To receive QSL cards from overseas you must register with your local bureau. Most U.S. bureaus want you to keep an SASE on file with them; then when they receive cards for you, they drop them in the mail to you. For full information on your local bureau contact the ARRL at 225 Main St., Newington, CT 06111.

The address of overseas QSL bureaus can be found in the Call Book. If you are a member of the ARRL you can send cards anywhere in the world through the ARRL outgoing QSL manager. When the DX operator sends his QSL info he will say something like "Please QSL via (call sign)."

To QSL this chap you will send your card to the QSL manager at his Call Book address and include an SASE or the correct number of international reply coupons (IRCs) for return postage. The DX station will send a copy of his log to his QSL manager who will check the log to see if the station did work you as per the information on your QSL, then the

manager will make out a card and send it to you.

A little side note concerning QSLing DX stations: Often a station or a manager will send a note requesting a donation. The first time this happened to me I was a bit surprised and not quite sure if it was legal.

I questioned the manager making the request and he explained it this way: "The stations I manage QSLs for make thousands of contacts in a short period of time; even if they pay for the cards to be mailed out the cost is extremely high. There is no obligation to make a donation, but keep in mind that if you had to send out several thousand QSL cards every few months, soon you would either stop sending cards or go off the air."

In order to keep these difficult-to-work DX stations on the air, it is worth sending a buck to the manager to keep the system working. More about QSLing can be found in the *ARRL Operating Manual*, reviewed in this month's *What's New* column.

Notes of Interest

Ronald Hester of Winston Salem, North Carolina, writes to tell us about an amateur net on 7240 kHz at 9:00 a.m. Sundays. The net provides SWLs information about tuning the shortwave bands, all modes and all services, particularly international broadcasting. Check it out.

A special event amateur station using the call WA3EOP will be on the air April 18 through the 24th to celebrate Maryland Odd Fellow Week. The station will be operated from Williamsport, Maryland, in the Mother Jurisdiction of Odd Fellowship. Members of the Odd Fellows ham club, radio amateurs worldwide and shortwave listeners are invited to participate in activities on 3870, 7240, 14265, 21375, and 28375 kHz USB; 147.090 MHz FM voice; and 7120 kHz CW.

Special commemorative certificate will be offered for an amateur contact if you send a QSL card and an SASE. Accurate reception reports from non-hams (SWLs)

The Jamming War on Shortwave

COSTA RICA:

We have two "radio wars" to report on this month and the first involves Cuba, the Contras, and Costa Rica. For several years Cuba's Radio Rebelde network has had a shortwave relay on 5025 kHz. Recently it has gotten itself a "new neighbor." The Costa Rican station Radio Impacto is now transmitting on 5030 kHz. Most North American listeners should have little trouble receiving Impacto during early morning or evening hours, although the signal is not quite as strong as that of Rebelde.

The transmission on 5030 is parallel to Impacto's usual signal on 6150 (varies between 6140 to 6160) kHz, which also is not difficult to receive, especially in the mornings. While the selection of 5038 might be a coincidence, that is not likely.

Impacto a CIA Front?

The Sandinista government in Nicaragua has long claimed that Impacto was a CIA front. Regardless of whether this is true or not, Impacto formerly carried extensive programming produced by ARDE (Alianza Revolucionaria Democratica), the Contra organization which operated primarily from northern Costa Rica. At present ARDE is no longer a major force in the Contra movement, but Impacto still carries programming which is anti-Sandinista and also anti-Castro.

Impacto's presence on 5030 does not appear to be an attempt to jam Rebelde, but it would seem to be aimed at giving the Cubans some anti-Marxist competition. Listeners tuning in Rebelde might easily come across Impacto.

While you will find political commentary on Impacto, it is for the most part rather low key. There is a considerable amount of pleasant music. The station is not the easiest to verify, but replies are sometimes received. If you want to try, the address is Apartado 497, 2050 San Pedro de Montes de Oca, Costa Rica. A prepared card and, if possible, a Spanish report are suggested.

The Other War

The other broadcasting conflict involves the United States and Cuba. Radio Marti's AM signal on 1180 kHz is now originating from Saddlebunch Key in the Florida Keys rather than from the old site at Marathon. It is audible here in Central Florida but just barely due to extensive Cuban jamming.

John Demmitt reports that the jammer on 1180 formerly was a simple 60 Hz AC hum with a 1,000 watt transmitter. It has now been replaced with a 100,000 watt transmitter that can do standard audio, a motor boat, or other types of noise. This and the original jammer are located at Guanabacoa.

If current Cuban activity on the medium wave band is considered good behavior, what in the world would constitute bad behavior?

The shortwave transmissions of Radio Marti on 6075, 9525, 9590, and 11930 are at present free of jamming. Apparently the Cubans do not believe they have enough of an audience to be a threat. However, several years ago it was reported that the island was flooded with cheap shortwave sets provided by the Russians in the hopes that residents would tune in Radio Moscow.

A search of the medium wave band reveals a considerable amount of hostile Cuban activity. A jammer on 1142 kilohertz has long been believed to be aimed at WQBA Miami, a Spanish language, often anti-Castro station on 1140 kHz in Miami. Demmitt offers the possibility that the now 5,000 watt jammer may actually be seeking HRQN in Honduras (1145 kHz) and that it is really on 1143 kHz. Perhaps its ultimate purpose is to provide some harassment to both stations.

In *DX South Florida* Terry Krueger reports the presence of what seem to be Cuban jammers on both 960 and 1360 kHz. Krueger states that ferrite bearings point to a location in the west-central or central part of the island. The 960 jammer has been heard here, and similar bearings tend to confirm Krueger's findings. From his Pennsylvania location Demmitt has also monitored both of these frequencies. The mystery is what is it that the Cubans are seeking to block. There would seem to be no hostile traffic on either frequency.

The situation on 710 kHz remains as it has for quite some time. At least in much of

Florida during the daylight hours WAQI Miami, which openly claims to be broadcasting to Cuba and the Caribbean, is easily heard. However, during the hours of darkness the frequency is dominated by Cuba's Radio Rebelde. The 1988 *WORLD RADIO HANDBOOK* lists two Rebelde transmitters on 710, one 50 kw and the other 30. A 1 kw transmitter is on 702 and another 1 kw one is noted for 720 kHz. Given the fact that some of the most powerful stations Cuba controls are in the Rebelde network (up to 150 kw) and easily heard throughout the island, the only reasonable conclusion one can reach is that those between 702 and 720 kilohertz are intended as jammers of WAQI.

Recently there has been considerable speculation that the Cubans were on their "good behavior" because they wanted American recognition of their rights to 1040 kHz where from time to time they have run Radio Taino broadcasts as well as their regular relay of Radio Moscow via a powerful 300 kw transmitter, which is actually capable of a potential 500 kw. However, one has to wonder, if current Cuban activity on the medium wave band is considered good behavior, what in the world would constitute bad behavior.

The Mailbag

We have a nice variety of mail this month. First of all, Mike Adams reports that he teaches at a vocational-technical center in North Florida. The school has established a monitoring post, and recently he and some of the students logged their first pirate. It was Radio Free Will with its announced "International Music Service" on 7415-16 kHz. The station was heard at 0835 UTC and featured mostly banjo music.

Several months ago California's Carl Smith informed us of a pirate which had been operating in the Fresno area until shut down by the FCC. It was FM station Zoom Black Magic on 100.5 MHz, which was aimed primarily at a black audience. Recently station operator Walter Dunn, known as the Black Rose, has reactivated his transmitter, although he plans periodic moves to avoid another FCC bust. If any of our readers are able to log this station let us know. Dunn plays all kinds of black music including rap, soul, and gospel.

State Department's KN39 Out of Band

We have received another report of an out-of-band transmission by State Department CW station KKN39. This one comes from David Cohen of Maryland who wonders why the State Department cannot keep these things in band. That is a good question.

Numbers monitors continue to be active. In South Carolina Paul Williams logged 5-digit Spanish numbers on 8250 kHz at 0530. He

reports Spanish numbers also on 4165 at 0613, 4380 at 0614, and 8150 at 0744. German numbers were found on 7045 at 0300 UTC.

Finally, from Maine, David White sends an extensive amount of material in regard to the mysterious "K" and "U" beacons. A good place to search for these is 7905 kHz. In addition to their identifier these CW beacons transmit traffic, usually but not always in a 5-digit format. White believes the K and U beacons are related and feels they are not Russian, as is sometimes

claimed. In his monitoring of these David has found some rather interesting configurations.

I have found one vague report dating from the mid-1970s which puts the K beacon near Kure Island in the Hawaiian chain. However, no evidence is offered for this claim. If readers have any information on these beacons David and I would like to hear from you.

That is it for this month. Thanks for your interest and support.



feliz viaje



escucho IMPACTO 980 Kilohercios



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Meet the BBC Twenty-Four Hours Team



John Eidenow



Tudor Lomas



Nick Worrall



Kathryn Davies



Geoffrey Stern



David Lay

The problem confronting anyone trying to describe the *Twenty-Four Hours* operation is: "Where do I start?" Its title could not be more appropriate. Along with External Services News and World Service Presentation, *Twenty-Four Hours* is a 24-hour a day operation, every day of the year. With regular transmissions at 0509, 0709, 1309 and 2009, the opportunity exists to reach the widest possible audience around the world. So there is always at least one producer working towards the next deadline.

Let us imagine that the working day begins at 7 o'clock in the morning with the arrival of the first member of the day shift. Having stolen a march on the bulk of London's rush hour travelers, he or she will enter the office clutching the obligatory cup of Bush House canteen coffee and a sheaf of daily newspapers in time to tune in to the fruits of colleagues' overnight labors, broadcast in the 0709 edition.

The objective for the new arrival is the 1309 edition (lunchtime in London) only six hours away. At that time, World Service can be heard well in the Far East (thanks to the new Hong Kong relay station), the Middle East, Europe and parts of the Americas. Relevance of program content to a regional audience is an important consideration for the producer of each respective edition as is the news bulletin which immediately precedes it.

In this latter respect, the electronic age offers a helping hand. Each program department in Bush House is linked to the newsroom by a computerized news access system which can, at a touch, display all news stories, correspondents' dispatches, even the reports of foreign broadcasts collected by the BBC's Monitoring Service at Caversham. Armed with all this evidence, the rest is down to intuition, experience, luck, and persistence.

So how does a program item grow from the tiniest seed in a producer's mind to a fully researched interview or report on *Twenty-Four Hours*? The considerations are straightforward enough. First, there is its journalistic legitimacy: does the news item on which an interview is to be based come from a reliable source? Can it be developed into an interesting three minutes or so? Is it relevant

to the audience?

Then there are the limitations: Can the material be assembled in time? Is there an expert willing to be interviewed? Can he or she come to the studio? Is the quality of the telephone line good enough?

It goes without saying that producers are not expected to develop all their ideas on their own. Reverting to the timetable, by 8:30 the day's producer is joined by an editor so that by 9:15, when ideas are formally proposed at a meeting with representatives from other World Service current affairs programs such as *Outlook*, *The World Today* and *Commentary*, a good deal of discussion and planning has already taken place.

And more help is at hand. By 10 o'clock the team is joined by the day's presenter, one of a regular group of journalists and specialists in international affairs whose voices are familiar to regular listeners. David Lay has extensive knowledge of the Arab world; John Eidenow specializes in European and British politics and can also be heard regularly presenting *People and Politics* at weekends on the World Service.

Nick Worrall has traveled and reported widely in Africa. Kathryn Davies takes in the Far East and South-east Asia, as well as the Middle East. Tudor Lomas is also involved with *Development '88*. John Hooper is an energy specialist with contacts in the financial world. Oliver Scott is also closely involved in international business affairs and Geoffrey Stern specializes in Eastern Europe and the Soviet Union. All add their expertise, offering advice on contributors and suggesting lines of questioning.

Having invited guests to the studio - sometimes an easy task, often an extremely time-consuming one ("Is no one in Oxford answering their phone? Why didn't you tell me it was a national holiday in South Korea?") the only tasks remaining are to conduct the interviews and prepare them for transmission.

That is not as simple and logical a task as it at first seems. News changes rapidly. Material recorded at 10:30 might well be out of date by 12 noon - or even by 10:45. While concentrating on an incoming line from Dacca, a producer could well receive a call

from a contributor invited to take part in a discussion on the nuclear arms negotiations, wanting to know who else would be involved and expecting a full briefing.

The tension rises as the deadline approaches: "How are the scripts coming along? Have we heard from Dr. So-and-So yet? Shall we take the Gulf live?" Until at 1309.15 the measured tones of the World Service newsreader cues: "...and that is the end of the News from London." Then follows the familiar 20 minutes of news-related analysis that has taken six hours, 20 phone calls, as many cups of coffee and much nail-biting to assemble. And at 1329.10 comes the knowledge that it all has to be gone through again at the same time tomorrow.

Meanwhile, colleagues are preparing a similar enterprise for 2009, when listeners in Europe, Africa and Latin America can receive a better signal. While that is being broadcast, the night shift producers (one of whom will present the early morning edition) arrive to continue the cycle.

Twenty-Four Hours is a program with a relatively small staff, a huge list of international contacts and a wide, influential audience. Contributors tell of having the remarks they made during interviews in *Twenty-Four Hours* repeated to them and discussed during subsequent visits to Government officials and academic colleagues around the world.

Foreign embassies in London frequently offer the program interviews with distinguished visiting personalities, and there are daily requests for transcripts from students of politics and international relations.

For a program which has been on the air uninterrupted for more than 15 years, and which counts among its former presenters the present managing director of External Broadcasting, John Tusa, we believe *Twenty-Four Hours* is a vital source of authoritative comment and speedy analysis for a world audience hungry for reliable information.

-- Bill Kendall, Jr.

frequency SECTION

Last month, many stations changed frequencies for the spring. Still others are to make their changes this month. As well, some countries changed over to daylight savings time last month, others will do so this month. While every effort is made to predict the effect of these variables on station schedules, changes in the list are inevitable. Your assistance, in the form of loggings, directed to frequency manager Greg Jordan, will be appreciated.

0000 UTC [7:00 PM EST/4:00 PM PST]

0000-0015	Voice of Kampuchea, Phnom-Penh	9693	11938		
0000-0030	BBC, London, England	5965	5975	6005	6120
		6175	6195	7135	7325
		9515	9570	9580	9590
		9915	11945	11955	15435
0000-0030	Kol Israel, Jerusalem	7462	9435	9845	
0000-0030	Radio Berlin Int'l, East Germany	6080	9730		
0000-0030	Radio Korea, Seoul, South Korea	15575			
0000-0030	M Radio Norway Int'l, Oslo	9605	9625		
0000-0030	S,M WINB, Red Lion, Pennsylvania	15145			
0000-0045	WYFR, Oakland, California	5950	6085	9680	
0000-0050	Radio Pyongyang, North Korea	15115	15160		
0000-0055	Radio Beijing, PR China	9665	9770	11715	
0000-0100	(US) Armed Forces Radio and TV	6030	15345		
0000-0100	All India Radio, New Delhi	6055	7215	9535	9910
		11715	11745	15110	
0000-0100	CBC Northern Quebec Service	6195	9625		
0000-0100	CBN, St. John's, Newfoundland	6160			
0000-0100	CBU, Vancouver, British Columbia	6130			
0000-0100	CFCF, Montreal, Quebec	6005			
0000-0100	CFCN, Calgary, Alberta	6030			
0000-0100	CBN, St. John's, Newfoundland	6160			
0000-0100	CBN, St. John's, Newfoundland	6160			
0000-0100	CBU, Vancouver, British Columbia	6160			
0000-0100	CFCF, Montreal, Quebec	6005			
0000-0100	CFCN, Calgary, Alberta	6030			
0000-0100	CHNS, Halifax, Nova Scotia	6130			
0000-0100	CKWX, Vancouver, British Columbia	6080			
0000-0100	CFRB, Toronto, Ontario	6070			
0000-0100	FEBC, Manila, Philippines	15445			

0000-0100	(US) Far East Network, Tokyo	3910			
0000-0100	KSDA, Guam	15125			
0000-0100	T-A KVOH, Rancho Simi, California	9495			
0000-0100	KYOI, Saipan	15405			
0000-0100	Radio Australia, Melbourne	15140	15160	15240	15320
		15395	17750	17795	
0000-0100	Radio Baghdad, Iraq	6110			
0000-0100	Radio Havana Cuba	6090	6140		
0000-0100	Radio Luxembourg	6090			
0000-0100	Radio Moscow, USSR	5915	5940	6000	6045
		6130	7115	7130	7150
		7185	7215	7310	9720
		12050	13665	15425	15455
		17880			
0000-0100	Radio New Zealand, Wellington	15150	17705		
0000-0100	Radio for Peace, Costa Rica	7375			
0000-0100	Radio Thailand, Bangkok	9655	11905		
0000-0100	SBC Radio One, Singapore	5010	5052	11940	
0000-0100	Spanish Foreign Radio, Madrid	6125	9630		
0000-0100	T-S Superpower KUSW, Utah	11665			
0000-0100	Voice of America, Washington	5995	6130	9455	9650
		9775	9815	11580	11695
		11740	15185	15205	17740
0000-0100	T-A Voice of Nicaragua, Managua	6015			
0000-0100	WCSN, Boston, Massachusetts	9850			
0000-0100	WHRI, Noblesville, Indiana	7400	9870		
0000-0100	WRNO New Orleans, Louisiana	7355			
0000-0100	T-A WYFR Satellite Net, California	9505			
0030-0045	BBC, London, England*	6195	7235	9570	11820
		15435			
0030-0055	BRT, Brussels, Belgium	5910	9925		

MT Monitoring Team

EAST COAST:

Greg Jordan,
Frequency Manager

1855-I Franciscan Terrace
Winston-Salem, NC 27127

Joe Hanlon, PA

WEST COAST:

Bill Brinkley, CA

LEGEND

- * The first four digits of an entry are the broadcast start time in UTC. The second four digits represent the end time.
- * In the space between the end time and the station name is the broadcast schedule.

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

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

- * [ML] after a frequency indicates a multi-lingual transmission containing English-language programs.
- * The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "V" for a frequency that varies. [ML] after a frequency indicates a multi-lingual transmission containing English-language programs.
- * v after a frequency indicates that it varies
- * Notations of USB and LSB (upper and lower sideband transmissions) usually refer only to the individual frequency after which they appear.
- * Listings followed by an asterisk (*) are for English lessons and do not contain regularly scheduled programming.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

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 (the 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.

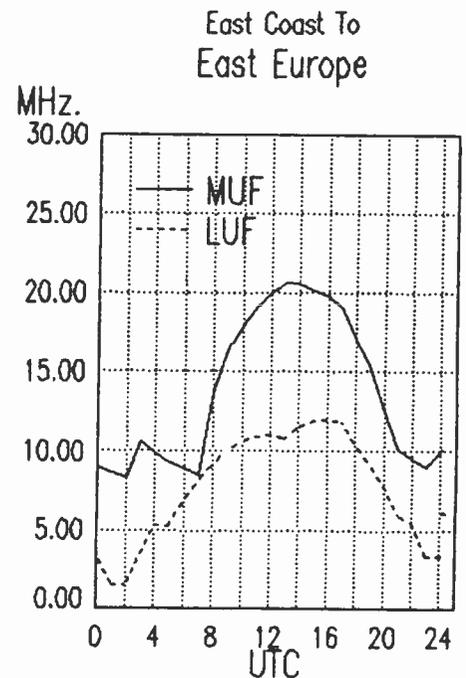
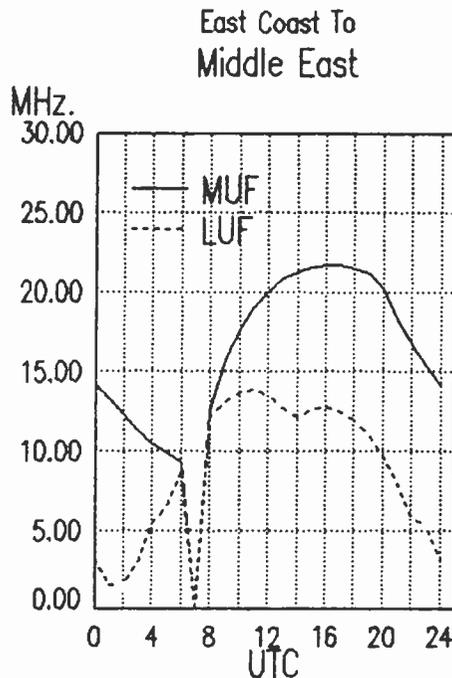
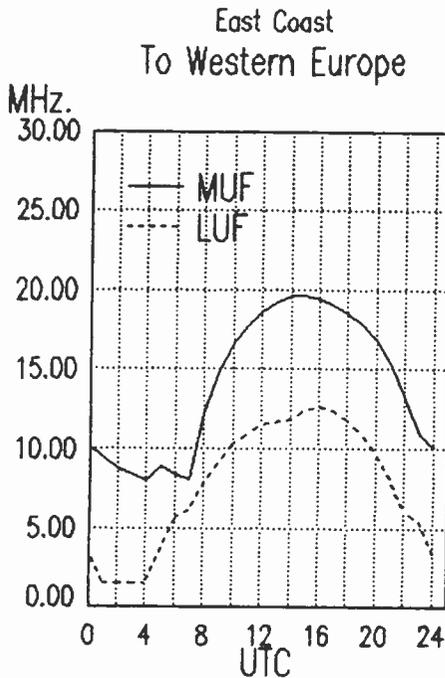
Once you've located the correct charts, look along the horizontal axis of the graph for the time that you are listening. The top line of the graph shows the Maximum Useable Frequency [MUF] and the lower line the Lowest Useable Frequency [LUF] as indicated on the vertical axis of the graph.

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!

frequency SECTION

0030-0100	BBC, London, England	5965	5975	6005	6120	0100-0200	CFCF, Montreal, Quebec	6005						
		6175	7135	7325	9515	0100-0200	CFCN, Calgary, Alberta	6030						
		9580	9915	9590	11955	0100-0200	CHNS, Halifax, Nova Scotia	6130						
		15435				0100-0200	CKWX, Vancouver, British Columbia	6080						
0030-0100	HCJB, Quito, Ecuador	9720	11775	11910	15155	0100-0200	CFRB, Toronto, Ontario	6070						
0030-0100	SLBC, Colombo, Sri Lanka	6005	9720			0100-0200	(US) Far East Network, Tokyo	3910						
0030-0100	WINB, Red Lion, Pennsylvania	15145				0100-0200	FEBC, Manila, Philippines	15445						
0035-0040	All India Radio, New Delhi	3925	4860			0100-0200 T-A	KVOH, Rancho Simi, California	9495						
0045-0100 A	Radio New Zealand, Wellington	15150	17705			0100-0200	KYOI, Saipan	15405						
0045-0100	WYFR, Oakland, California	5950	9660	9680		0100-0200	Radio Australia, Melbourne	15160	15180	15240	15320			
0050-0100	Vatican Radio, Vatican City	6150	7315	9605	11780			15395	17715	17795				
								17750						
								6140						
								6090						
								Radio Moscow, USSR	5915	5940	6000	6045		
									6130	7115	7150	7185		
									7215	7310	12050	13665		
									15455					
									0100-0200	Radio Moscow World Service	15130	15210	17825	17880
									0100-0200	Radio New Zealand, Wellington	15150	17705		
									0100-0200	Radio for Peace, Costa Rica	7375			
									0100-0200	Radio Prague, Czechoslovakia	5930	6055	7345	9540
											9630	9740	11990	
									0100-0200	Radio Thailand, Bangkok	9655	11905		
									0100-0200	SBC Radio One, Singapore	5010	5052	11940	
									0100-0200	SLBC, Colombo, Sri Lanka	6005	9720	15425	
									0100-0200	Spanish Foreign Radio, Madrid	6125	9630		
									0100-0200 T-S	Superpower KUSW, Utah	11665			
									0100-0200	Voice of America, Washington	5995	6130	7205	9455
											9650	9740	9775	9815
											11580	11740	15205	15425
											17735			
											21540			
									0100-0200	Voice of Indonesia, Jakarta	9680	11790		
									0100-0200	WCSN, Boston, Massachusetts	9850			
									0100-0200	WINB, Red Lion, Pennsylvania	15145			
									0100-0200	WHRI, Noblesville, Indiana	7400	9870		
									0100-0200	WRNO, New Orleans, Louisiana	7355			
									0100-0200 T-S	WYFR Satellite Net, California	9505			
									0130-0140 T-S	Voice of Greece, Athens	7430	9395	9420	

0100 UTC [8:00 PM EST/5:00 PM PST]



Imprime: The World Radio Marketplace BOX 241, RADNOR STATION, RADNOR, PA 19087

The Shortwave Directory by Bob Grove

If ever two books went together, Shortwave Directory and Passport to World Band Radio, do. While Passport covers the 1100-plus shortwave broadcast channels, Shortwave Directory covers the rest of the spectrum.

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A Guide to the Numbers Stations



Bob Grove

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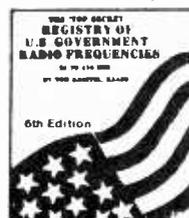
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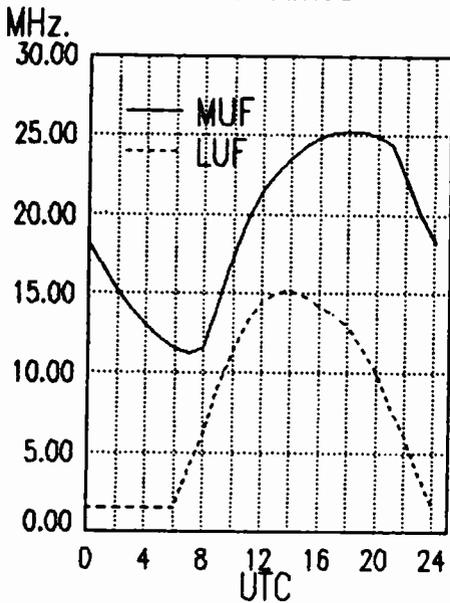
frequency SECTION

0130-0155	Radio Austria Int'l, Vienna	9870			
0130-0200	HCJB, Quito, Ecuador	9720	11775	11910	15155
0130-0200	Radio Berlin Int'l, East Germany	6080	9730		
0130-0200	Radio Veritas Asia, Philippines	15305	15330		
0145-0200	Radio Berlin Int'l, East Germany	6125	6165		
0145-0200	Radio Korea, Seoul, South Korea	7275	15375		
0145-0200	WYFR, Oakland, California	5950	7440	9680	

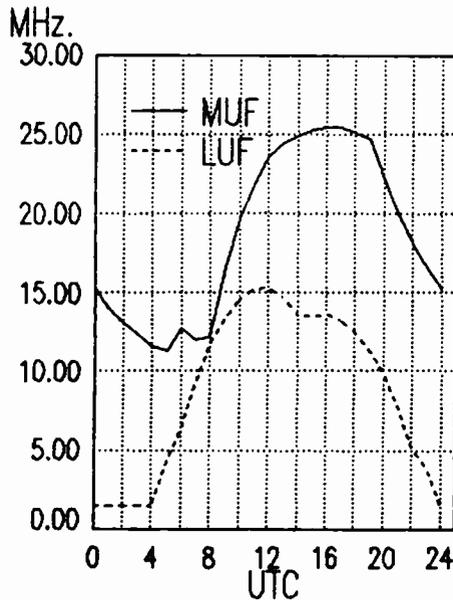
0200 UTC [9:00 PM EST/6:00 PM PST]					
0200-0210	Radio France Int'l, Paris	3965	5950	6055	9790
0200-0215	Vatican Radio, Vatican City	7125	9650		
0200-0225	Radio Budapest, Hungary	6025	6110	9520	9585
		9835	11910		
0200-0230	BBC, London, England	5975	6005	6120	6175
		7325	9515	9590	
		9915			
0200-0230	Burma Bcating Service, Rangoon	7185			
0200-0230	M Radio Austria Int'l, Vienna	9870			
0200-0230	Radio Kiev, Ukrainian SSR	6200	7165	7400	11790
		13645	15180		
0200-0230	Swiss Radio Int'l, Berne	5965	6135	9725	9885
		12035			
0200-0230	La Voz de Mosquitia, Honduras	4910.4			
0200-0230	WINB, Red Lion, Pennsylvania	15145			
0200-0245	Radio Berlin Int'l, East Germany	6080	9560		
0200-0250	Deutsche Welle, West Germany	5995	6035	7285	9615
		9690			
0200-0250	Radio Bras. Brasilia, Brazil	11745v			
0200-0255	Radio Bucharest, Romania	5990	6155	9510	9570
		11810	11940		
0200-0255	RAE, Buenos Aires, Argentina	9690	11710		
0200-0300	(US) Armed Forces Radio and TV	6030	15345		
0200-0300	CBC Northern Quebec Service	6195	9625		
0200-0300	CBN, St. John's, Newfoundland	6160			
0200-0300	CBU, Vancouver, British Colombia	6160			
0200-0300	CFCF, Montreal, Quebec	6005			
0200-0300	CFCN, Calgary, Alberta	6030			

0200-0300	CFRB, Toronto, Ontario	6070			
0200-0300	CHNS, Halifax, Nova Scotia	6130			
0200-0300	CKWX, Vancouver, British Colombia	6080			
0200-0300	(US) Far East Network, Tokyo	3910			
0200-0300	HCJB, Quito, Ecuador	6230	9720	11775	
0200-0300	T-A KVOH, Rancho Simi, California	9495			
0200-0300	KSDA, Guam	17865			
0200-0300	Radio Australia, Melbourne	15180	15240	15320	17715
		17750	17795		
0200-0300	Radio Cairo, Egypt	9475	9675		
0200-0300	Radio Havana Cuba	6140			
0200-0300	Radio Korea (South), Seoul	7275	15575		
0200-0300	Radio Luxembourg	6090			
0200-0300	Radio Moscow, USSR	5915	5940	6000	6045
		6070	7115	7150	7215
		7250	7310	9580	9635
		11770	12050	13665	
0200-0300	Radio Orion, South Africa	3955			
0200-0300	Radio for Peace, Costa Rica	7375			
0200-0300	A Radio New Zealand, Wellington	15150	17705		
0200-0300	Radio Polonia, Warsaw, Poland	6095	6135	7145	7270
		9525	11815	15120	
0200-0300	Radio RSA, South Africa	9580	9615	11730	
0200-0300	Radio Thailand, Bangkok	9655	11905		
0200-0300	SBC Radio One, Singapore	5010	5052	11940	
0200-0300	SLBC, Colombo, Sri Lanka	6005	9720	15425	
0200-0300	T-S Superpower KUSW, Utah	11665			
0200-0300	Voice of America, Washington	5995	6130	7205	9650
		9740	9775	9815	11580
		15205			
0200-0300	Voice of Asia, Taiwan	7285			
0200-0300	Voice of Free China, Taiwan	5950	5985	7445	9555
		9755	11740	11745	11860
		15345			
0200-0300	Voice of Kenya, Nairobi	6045			
0200-0300	WCSN, Boston, Massachusetts	9850			
0200-0300	WHRI, Noblesville, Indiana	7400	9870		
0200-0300	WRNO, New Orleans, Louisiana	7355			
0200-0300	WYFR, Oakland, California	5950	7440	9680	
0200-0300	T-S WYFR Satellite Net, California	9505			

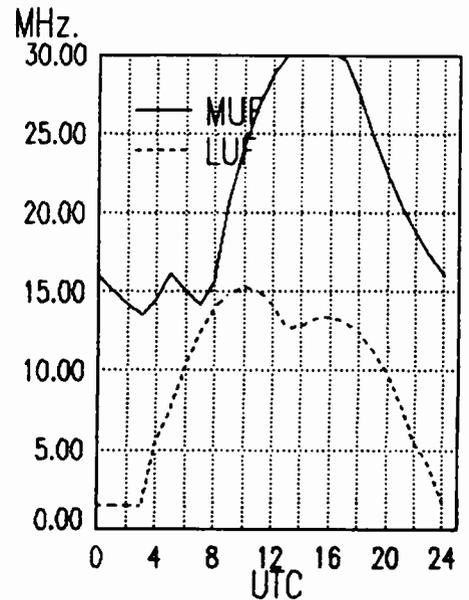
East Coast To West Africa



East Coast To Central Africa



East Coast To East Africa



frequency SECTION

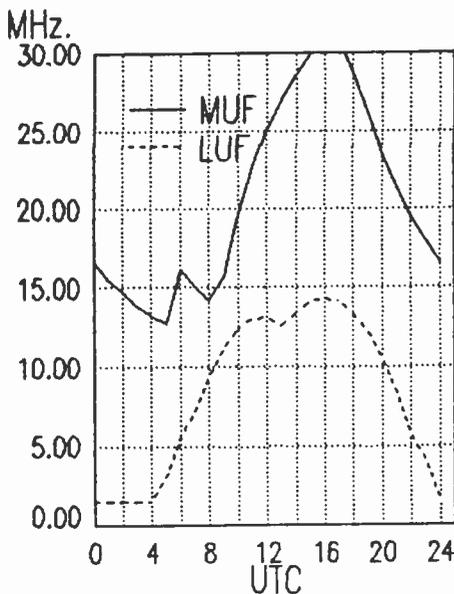
0215-0220	Radio Nepal, Kathmandu	5005	7165		
0230-0240	Port Moresby, Papua New Guinea	3925	4890	5960	5985
		6020	6040	6080	6140
		9520			
0230-0245	Radio Pakistan, Islamabad	7010	11570	15115	15580
		17660			
0230-0300	BBC, London, England	5975	6005	6120	6175
		7325	9515	9590	9660
		9845	9915	11955	
0230-0300	Radio Netherland, Hilversum	6020	6165	9590	9895
0230-0300 T-A	Radio Portugal, Lisbon	6060	9635	9680	9705
		9705	11840		
0230-0300	Radio Sweden, Stockholm	9695	11950	[USB]	
0230-0300	Radio Tirana, Albania	7065	9760		
0230-0300 S,M	WINB, Red Lion, Pennsylvania	15145			
0240-0250	All India Radio, New Delhi	3905	4860	4880	4895
		5960	5990	6110	6120
		7195	7295	9550	9610
		11830	11870	15305	
0250-0300	Radio Yerevan, Armenian SSR	11790	13645	15180	

0300-0345 A	Radio New Zealand, Wellington	15150	17705		
0300-0350	Deutsche Welle, West Germany	6010	6045	9545	9605
		9700			
0300-0350	Voice of Turkey, Ankara	9445	17760		
0300-0355	Radio Beijing, PR China	9645	9770	11715	11980
		15455			
0300-0355	Radio Polonia, Warsaw, Poland	6095	6135	7145	7270
		9525	11815	15120	
		9580	9615	11730	
0300-0356	Radio RSA, South Africa	6030	11730		
0300-0400	(US) Armed Forces Radio and TV	6160			
0300-0400	CBN, St. John's, Newfoundland	6160			
0300-0400	CFCF, Montreal, Quebec	6005			
0300-0400	CFCN, Calgary, Alberta	6030			
0300-0400	CHNS, Halifax, Nova Scotia	6130			
0300-0400	CKWX, Vancouver, British Columbia	6080			
0300-0400	CFRB, Toronto, Ontario	6070			
0300-0400	(US) Far East Network, Tokyo	3910			
0300-0400	HCJB, Quito, Ecuador	6230	9720	11775	
0300-0400 T-A	KVOH, Rancho Simi, California	9495			
0300-0400	La Voz Evangelica, Honduras	4820			
0300-0400	Radio Australia, Melbourne	11945	15160	15240	15320
		15395	17750	17715	17795
		7375			
0300-0400	Radio for Peace, Costa Rica	6115	6140		
0300-0400	Radio Havana Cuba	5960	117810	17870	
0300-0400	Radio Japan, Tokyo	5915	5940	6000	6045
0300-0400	Radio Moscow, USSR	6045	6070	7115	7150
		7165	7260	7310	9490
		9580	12050		
0300-0400	Radio Prague, Czechoslovakia	5930	6055	7345	9540
		9630	9740	11990	
0300-0400	Radio Sofia, Bulgaria	7115	9560	9595	11735
0300-0400	Radio Thailand, Bangkok	9655	11905		
0300-0400	Radio Tirana, Albania	7065	9755		
0300-0400	SBC Radio One, Singapore	5010	5052	11940	
0300-0400	SLBC, Colombo, Sri Lanka	6005	9720	15425	
0300-0400 T-S	Superpower KUSW, Utah	9815			
0300-0400	Trans World Radio, Bonaire	9535			

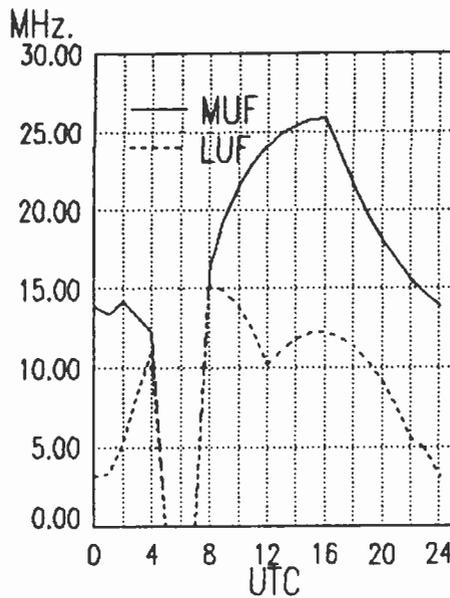
0300 UTC [10:00 PM EST/7:00 PM PST]

0300-0307	Radio Pakistan, Islamabad	5090	5930	7095	
0300-0310	CBC Northern Quebec Service	6195	9625		
0300-0315	BBC, London, England	3955	5975	6005	6050
		6105	6120	6155	6175
		6195	7125	7160	7185
		7210	7325	9410	9515
		9600	9660	9915	11740
		11955	15380		
0300-0315 W,A	Radio Budapest, Hungary	6025	6110	9520	9585
		9835	11910		
0300-0325	Radio Netherland, Hilversum	6020	6165	9590	9895
0300-0330	Radio Cairo, Egypt	9475	9675		
0300-0330	Radio Japan, Tokyo	11870	17825	21610	
0300-0330 S,M	WINB, Red Lion, Pennsylvania	15145			

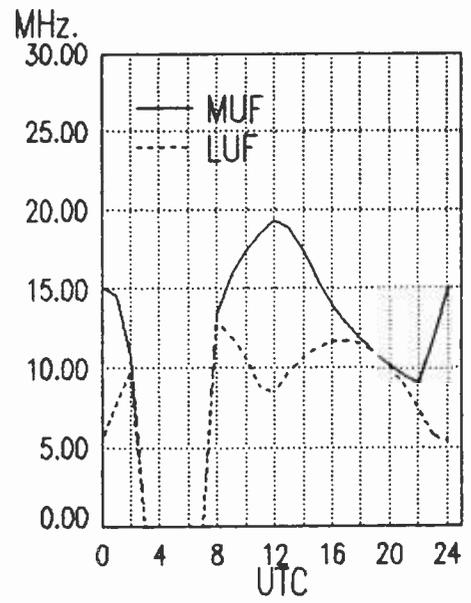
East Coast To South Africa



East Coast To Indian Ocean



East Coast To South and Central Asia



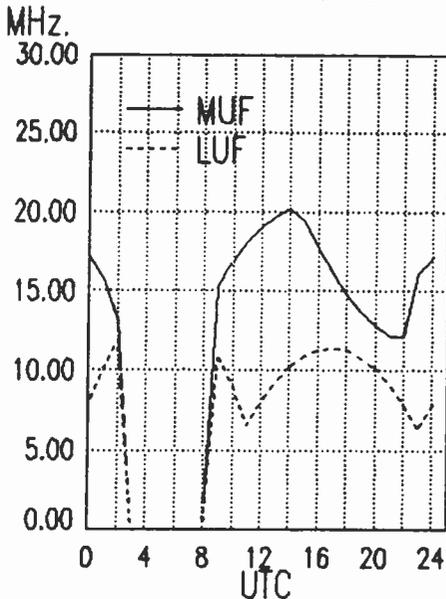
frequency SECTION

0300-0400	Voice of America, Washington	6035	7200	7280	9525
		9550	9575	9740	11835
0300-0400	Voice of Free China, Taiwan	5950	5985	7445	9555
		11745	15345		
0300-0400	Voice of Kenya, Nairobi	6045			
0300-0400	Voice of Nicaragua, Managua	6100			
0300-0400	WCSN, Boston, Massachusetts	9850			
0300-0400	WHRI, Noblesville, Indiana	7355			
0300-0400	WRNO, New Orleans, Louisiana	6185			
0300-0400	WYFR, Oakland, California	5950	7440	9680	
0310-0330	Vatican Radio, Vatican City	6150			
0313-0400	Radio France Int'l, Paris	6055	6175	7135	7175
		9550	9790	9800	11995
0315-0330	BBC, London, England	3955	5975	6005	6105
		6120	6155	6175	6195
		7125	7160	7185	7210
		7325	9410	9515	9600
		9660	9915	11955	15380
0300-0355	Radio Finland, Helsinki	9635	11945		
0330-0340 S-F	Port Moresby, Papua New Guinea	3925	4890	5960	5985
		6020	6040	6080	6140
		9520			
0330-0400	BBC, London, England	3955	5975	6155	6175
		6195	6120	7185	9410
		9570	9600	11955	
0330-0400	Radio Berlin Int'l, East Germany	6080	9560		
0335-0400	Radio New Zealand, Wellington	11790	15150		
0330-0400	Radio Tanzania, Dar es Salaam	9684			
0330-0400	Radio Tirana, Albania	7065	9755		
0330-0400	Radio Sweden, Stockholm	11705			
0330-0400	United Arab Emirates Radio	9640	11940	15435	17775
0335-0340	All India Radio, New Delhi	3905	4860	9610	11830
		11870	11890	15305	
0340-0350 T-S	Voice of Greece, Athens	7430	9395	9420	
0345-0400	Radio Berlin Int'l, East Germany	5965	9620	11920	
0350-0400	RAI, Rome, Italy	9710	11905	15330	

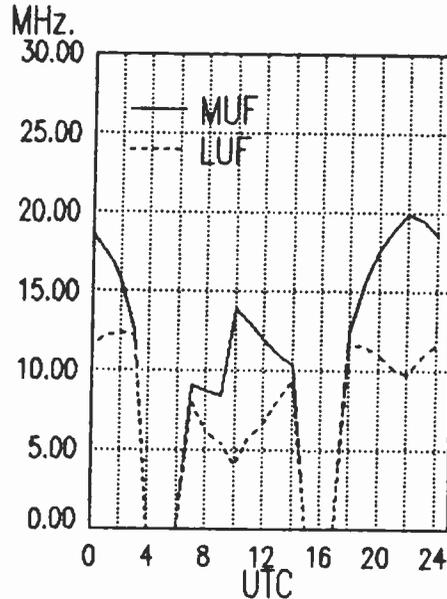
0400 UTC [11:00 PM EST/8:00 PM PST]

0400-0405	Radio Uganda, Kampala	4976	5026		
0400-0410	Radio Thailand, Bangkok	9655	11905		
0400-0410	RAI, Rome, Italy	9710	11905	15330	
0400-0415	Kol Israel, Jerusalem	7410	9385	9435	9460
		11655			
0400-0415 T-A	KVOH, Rancho Simi, California	9495			
0400-0415	Radio Berlin Int'l, East Germany	6080	9560		
0400-0420	Radio Botswana, Gaborone	4820			
0400-0420 T-S	Radio Zambia, Lusaka	3345	6165		
0400-0425	Radio Bucharest, Romania	6155			
0400-0425	Radio Netherland, Hilversum	7210	9850		
0400-0426	Radio RSA, South Africa	7270	9580		
0400-0430	BBC, London, England	5975	6005	6120	6155
		6175	6180	6195	7105
		7185	9410		
		9600			
0400-0430	La Voz Evangelica, Honduras	4820			
0400-0430	Radio Berlin Int'l, East Germany	5965	9620	11920	
0400-0430 M	Radio Norway Int'l, Oslo	9650	9655	9730	
0400-0430	SLBC, Colombo, Sri Lanka	6005	9720	15425	
0400-0430	Radio Sofia, Bulgaria	7115			
0400-0430	Radio Tanzania, Dar es Salaam	9684			
0400-0430	Swiss Radio Int'l, Berne	6135	9725	9885	12035
0400-0430	Trans World Radio, Bonaire	9535			
0400-0450	Radio Havana Cuba	5965	6035	6115	6140
0400-0450	Radio Pyongyang, North Korea	15160	15180		
0400-0455	Radio Beijing, PR China	9645	11980		
0400-0455	RAE, Buenos Aires, Argentina	9690	11710		
0400-0500	(US) Armed Forces Radio and TV	6030	11730		
0400-0500	CBC Northern Quebec Service	6195	9625		
0400-0500	CBN, St. John's, Newfoundland	6160			
0400-0500	CBU, Vancouver, British Columbia	6160			
0400-0500	CFCF, Montreal, Quebec	6005			
0400-0500	CFCN, Calgary, Alberta	6030			
0400-0500	CHNS, Halifax, Nova Scotia	6130			

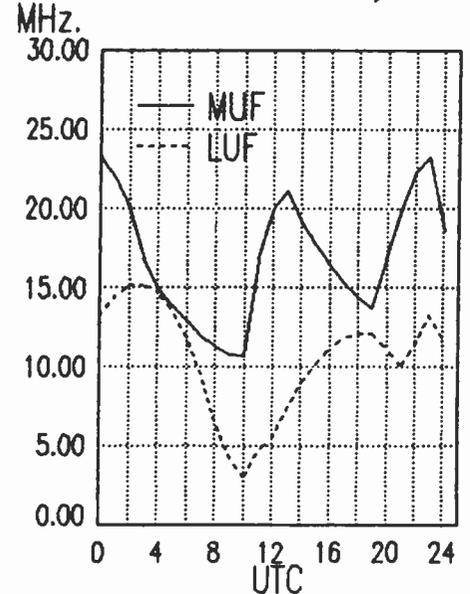
East Coast To
Southeast Asia



East Coast To
Far East



East Coast To
Australia & Malaysia



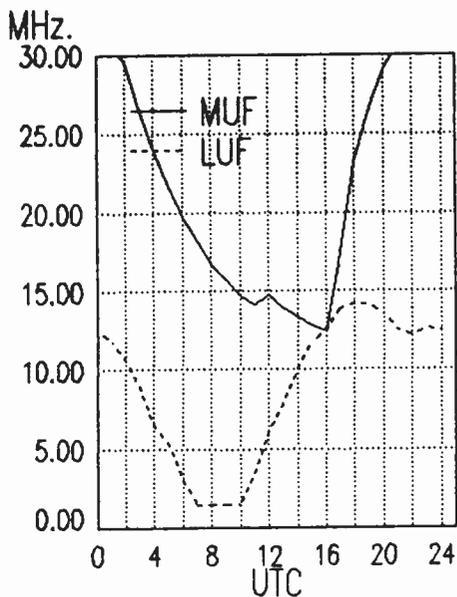
frequency SECTION

0400-0500	CKWX, Vancouver, British Columbia	6080			
0400-0500	CFRB, Toronto, Ontario	6070			
0400-0500	(US) Far East Network, Tokyo	3910			
0400-0500	FEBC, Manila, Philippines	11850			
0400-0500	HCJB, Quito, Ecuador	6230	9720	11775	
0400-0500	KYOI, Saipan	17780			
0400-0500	Radio Australia, Melbourne	11910	11945	15160	15240
		15320	17715	17795	
0400-0500	Radio Moscow, USSR	5915	5940	6000	6140
		6150	6160	7150	7165
		7195	7310	7320	7345
		9490	11790	12050	
0400-0500	Radio New Zealand, Wellington	11780	15150		
0400-0500	SBC Radio One, Singapore	5010	5052	11940	
0400-0500	T-S Superpower KUSW, Utah	9815			
0400-0500	United Nations Radio, Honduras	4820			
0400-0500	Voice of America, Washington	5995	6035	7280	9525
		9575	11835		
0400-0500	Voice of Kenya, Nairobi	6045			
0400-0500	WCSN, Boston, Massachusetts	9870			
0400-0500	WHRI, Noblesville, Indiana	7400			
0400-0500	M-A WMLK, Bethel, Pennsylvania	9455			
0400-0500	WRNO, New Orleans, Louisiana	6185			
0400-0500	WYFR, Satellite Net, California	9520			
0400-0500	WYFR, Oakland, California	5950	7355	9680	
0425-0440	RAI, Rome, Italy	5980	7275		
0430-0455	Radio Austria Int'l, Vienna	6000	6015	6155	
0430-0500	BBC, London, England	5975	6005	6155	6180
		6195	7105	9510	9600
0430-0500	Deutsche Welle, West Germany	6065	7150	7225	9565
		9765			
0430-0500	Radio Tirana, Albania	9480	11835		
0430-0500	S,M Trans World Radio, Bonaire	9535			
0430-0500	Trans World Radio, Swaziland	3205	7205		
0430-0500	Voice of Nigeria, Lagos	7255			
0440-0450	Radio France Int'l, Paris	4890	5990	6055	6175
		7135	7175	7280	9550
		9790	9800	11955	
0450-0500	Radio Havana Cuba	5965	6035	6140	

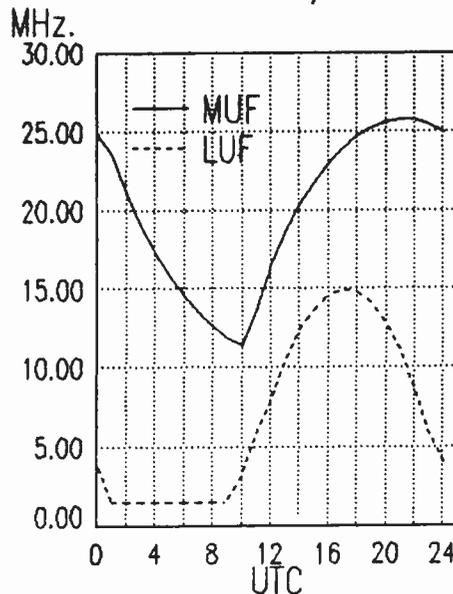
0500 UTC [12:00 AM EST/9:00 PM PST]

0500-0510	CBC Northern Quebec Service	6195	9625		
0500-0510	Radio Lesotho, Maseru	4800			
0500-0510	M-A Radio Zambia, Lusaka	3345	6165		
0500-0515	Deutsche Welle, West Germany	6065	6120	6130	9565
		9635	9765		
0500-0515	? Radio Garoua, Cameroon	5010			
0500-0515	Vatican Radio, Vatican City	11725	15190		
0500-0530	Deutsche Welle, West Germany	5960	6120	6130	9635
0500-0530	M Radio Norway Int'l, Oslo	6015	11735	11865	
0500-0530	S,M Trans World Radio, Bonaire	9535			
0500-0530	Trans World Radio, Swaziland	3205	5055	7210	
0500-0555	Radio Beijing, China	9690			
0500-0600	(US) Armed Forces Radio and TV	6030	11730		
0500-0600	BBC, London, England	3955	5975	6005	6155
		6180	6195	7105	9410
		9510			
		9600			
0500-0600	CBC Northern Quebec Service	6195	9625		
0500-0600	CBU, Vancouver, British Columbia	6160			
0500-0600	CFCF, Montreal, Quebec	6005			
0500-0600	CFCN, Calgary, Alberta	6030			
0500-0600	CHNS, Halifax, Nova Scotia	6130			
0500-0600	CKWX, Vancouver, British Columbia	6080			
0500-0600	CFRB, Toronto, Ontario	6070			
0500-0600	(US) Far East Network, Tokyo	3910			
0500-0600	FEBC, Manila, Philippines	11850			
0500-0600	HCJB, Quito, Ecuador	6230	9720	11775	
0500-0600	Radio Australia, Melbourne	11910	15160	15240	15395
		17715	17750	17795	
0500-0600	Radio Cameroon, Yaounde	4850			
0500-0600	Radio Havana Cuba	5965	6035	6090	6115
		6140			
0500-0600	Radio Japan, Tokyo	5990	15235	17810	
0500-0600	Radio Kuwait	15345			

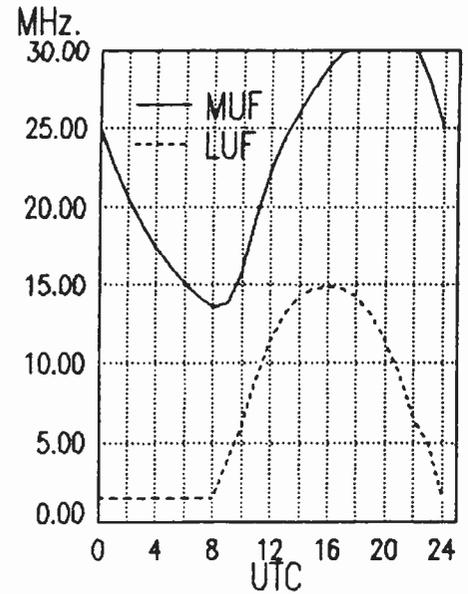
East Coast To
Pacific



East Coast To
Central America/Caribbean



East Coast To
South America



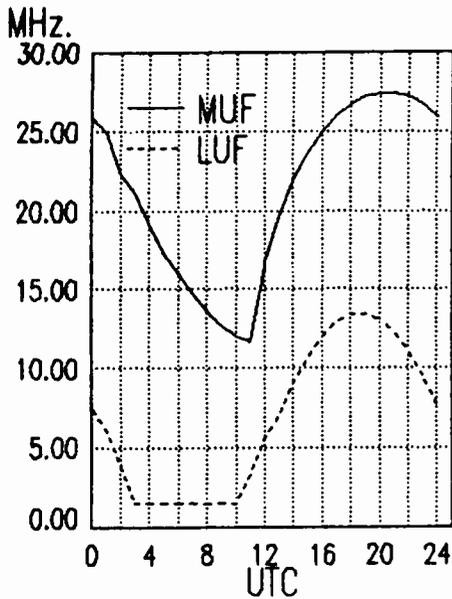
frequency SECTION

0500-0600	Radio Moscow, USSR	5915	5940	6095	
		6150	6160	7105	7150
		7165	7195	7240	7260
		7310	7320	7345	9580
		9635			
0500-0600	Radio New Zealand, Wellington	11780	15150		
0500-0600	Radio Thailand, Bangkok	9655	11905		
0500-0600	S Radio Zambia, Lusaka	11880			
0500-0600	SBC Radio One, Singapore	5010	5052	11940	
0500-0600	Spanish Foreign Radio, Madrid	6125			
0500-0600	S Superpower KUSW, Utah	6155			
0500-0600	S Swaziland Commercial Radio	6155	9705		
0500-0600	Voice of America, Washington	3990	5995	6035	6125
		7280	9530	9575	9670
		9740	11835		
0500-0600	Voice of Kenya, Nairobi	6045			
0500-0600	Voice of Nigeria, Lagos	7255	15120	15185	
0500-0600	WCSN, Boston, Massachusetts	9870			
0500-0600	WHRI, Noblesville, Indiana	7400			
0500-0600	M-A WMLK, Bethel, Pennsylvania	9455			
0500-0600	WRNO, New Orleans, Louisiana	6185			
0500-0600	WYFR, Oakland, California	5950	11580		
0500-0600	T-S WYFR Satellite Net, California	9520			
0510-0520	Radio Botswana, Gaborone	3356	4820	7255	
0530-0545	BBC, London, England*	3990	6050	6140	7210
		9750			
0530-0555	Radio Bucharest, Romania	9640	11840	11940	15340
		15380	17720		
0530-0555	Radio Finland, Helsinki	6120	9605	11755	
0530-0600	Radio Netherland, Hilversum	6165	9715		
0530-0600	Trans World Radio, Swaziland	5055	7210		
0530-0600	UAE Radio, United Arab Emirates	15435	17775	21700	
0545-0600	Radio Berlin Int'l, East Germany	15240	17880	21540	21645
0555-0600	Ghana Broadcasting Corp., Accra	4915			
0555-0600	Voice of Malaysia, Kuala Lumpur	6175	9750	15295	

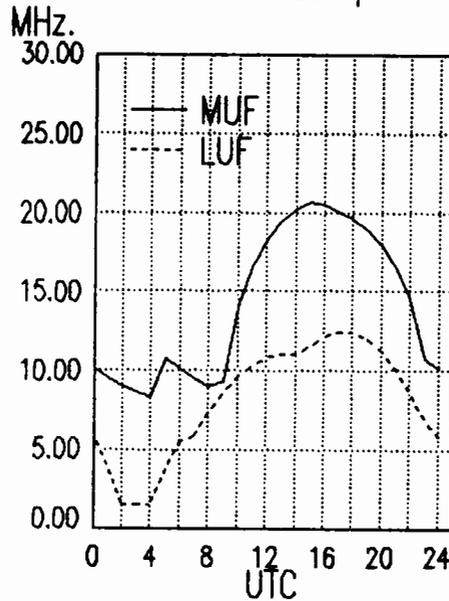
0600 UTC [1:00 AM EST/10:00 PM PST]

0600-0615	Radio Ghana, Accra	3366	4915		
0600-0615	M-A Radio Zambia, Lusaka	6165	7235		
0600-0620	Vatican Radio, Vatican City	6185	9645		
0600-0625	Radio Netherland, Hilversum	6165	9715		
0600-0630	Laotian National Radio	7113			
0600-0630	Radio Australia, Melbourne	11910	11945	15160	15240
		15315	15395	17715	17750
		17795			
0600-0630	Radio Berlin Int'l, East Germany	15240	17880	21540	21645
0600-0630	Trans World Radio, Swaziland	5055	6070	7210	
0600-0630	Voice of Kenya, Nairobi	6045			
0600-0645	HCJB, Quito, Ecuador	6230	9720	11775	
0600-0645	Radio Berlin Int'l, East Germany	5965	11810		
0600-0645	S Radio Cameroon, Yaounde	4850			
0600-0650	Radio Pyongyang, North Korea	9530	15160	15180	
0600-0700	(US) Armed Forces Radio and TV	6030	11730		
0600-0700	BBC, London, England	5975	6180	6195	7105
		7150	9410	9600	9640
		11835			
0600-0700	CBC Northern Quebec Service	6195			
0600-0700	CBU, Vancouver, British Columbia	6160			
0600-0700	CFCF, Montreal, Quebec	6005			
0600-0700	CFCN, Calgary, Alberta	6030			
0600-0700	CHNS, Halifax, Nova Scotia	6130			
0600-0700	CKWX, Vancouver, British Columbia	6080			
0600-0700	CFRB, Toronto, Ontario	6070			
0600-0700	(US) Far East Network, Tokyo	3910			
0600-0700	F FEBA, Mahe, Seychelles	17855			
0600-0700	King of Hope, South Lebanon	6215			
0600-0700	KYOI, Saipan	17780			
0600-0700	Radio Havana Cuba	6035	6190	9525	
0600-0700	Radio Korea, Seoul, South Korea	6060	7275	9570	
0600-0700	Radio Kuwait	15345			
0600-0700	Radio Moscow, USSR	5905	5915	5925	5940
		6095	6105	6150	6190

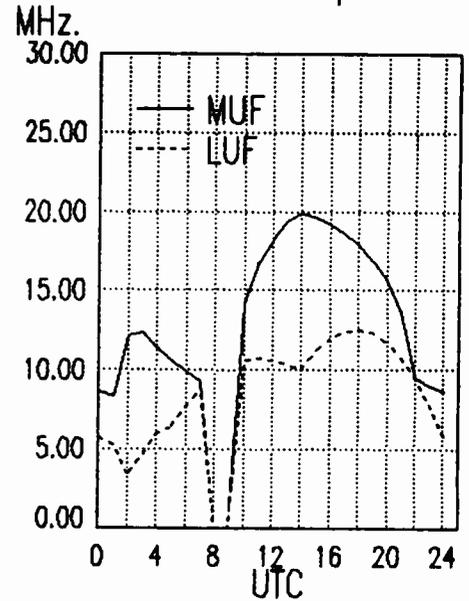
East Coast To
West Coast



Midwest To
Western Europe



Midwest To
East Europe



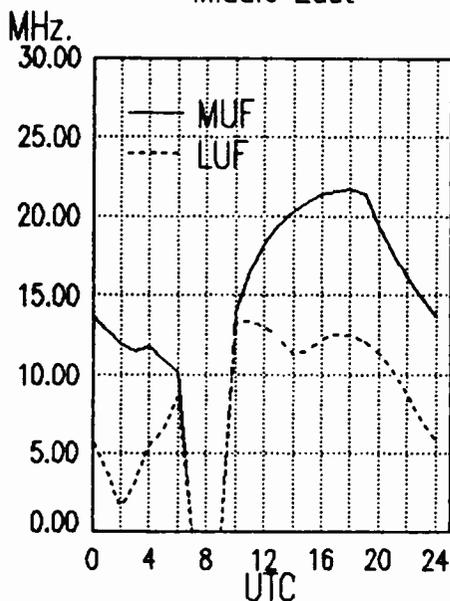
frequency SECTION

0600-0700	Radio New Zealand, Wellington	11780	15150		
0600-0700	A S Radio Thailand, Bangkok	9655	11905		
0600-0700	S Radio Zambia, Lusaka	11880			
0600-0700	SBC Radio One, Singapore	5010	5052	11940	
0600-0700	S Superpower KUSW, Utah	6155			
0600-0700	Voice of America, Washington	6035	6060	6080	6125
		7200	7280	9540	9550
		11915			
0600-0700	Voice of Asia, Taiwan	7285			
0600-0700	Voice of Malaysia, Kuala Lumpur	6175	9750	15295	
0600-0700	Voice of Nigeria, Lagos	15185			
0600-0700	WCSN, Boston, Massachusetts	9495			
0600-0700	WHRI, Noblesville, Indiana	6100	7400		
0600-0700	M-A WMLK, Bethel, Pennsylvania	9455			
0600-0700	WYFR, Oakland, California	5950	6065	7355	9815
		9852.5			
0615-0630	Radio Korea, Seoul, South Korea	13670			
0615-0630	M-A Vatican Radio, Vatican City	15190	17730		
0615-0700	Deutsche Welle, West Germany	9610	9700	11765	15185
0630-0700	A CPBS-1, China*	11330	15550	15590	17605
0630-0655	Radio Austria Int'l, Vienna	6000	6155	15410	
0630-0655	Radio Netherland, Hilversum	9895	11930		
0630-0700	Radio Australia, Melbourne	11945	15160	15240	15315
		15395	17715	17750	
0630-0700	Radio Polonia, Warsaw, Poland	6135	7270	15120	
0630-0700	Radio Tirana, Albania	7205	9500		
0630-0700	Swiss Radio Int'l, Berne	12030	15430	17570	
0630-0700	Trans World Radio, Swaziland	5055	6070	7210	9725
0630-0700	A S Voice of Kenya, Nairobi	7270			
0645-0700	BBC, London, England*	6150	7260	11945	
0645-0700	HCJB, Quito, Ecuador	6130	6230	9720	11775
0645-0700	Radio Bucharest, Romania	11940	15250	15335	17790
		17805	21665		
0645-0700	M-F Radio Canada Int'l, Montreal	6050	6140	7155	9740
		9760	11840	15235	
0645-0700	Radio Ghana, Accra	6130			
0650-0656	Radio Chile, Santiago (?)	7205			

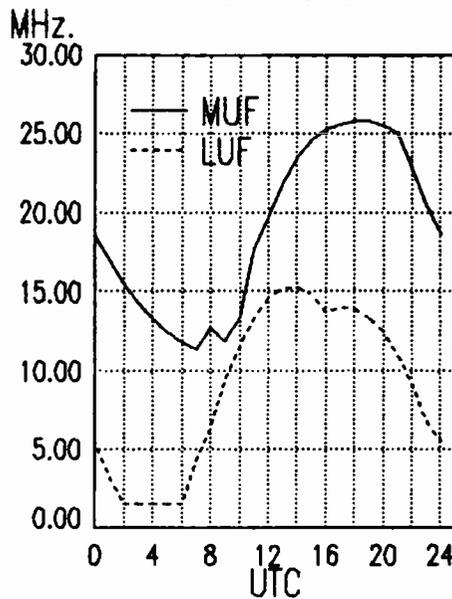
0700 UTC [2:00 AM EST/11:00 PM PST]

0700-0703	Port Moresby, Papua New Guinea	3925	4890	5960	5985
		6020	6040	6080	6140
		9520			
700-0710	Radio Bucharest, Romania	11940	15250	15335	17790
		17805	21665		
0700-0710	Radio Sierra Leone, Freetown	5980			
0700-0715	Radio Ghana (HS), Freetown	3366	4915		
0700-0730	BBC, London, England	5975	6195	7120	7150
		7180	9410	9600	9640
		9680	11860	15400	
0700-0730	Burma Bcating Service, Rangoon	9730			
0700-0730	Radio New Zealand, Wellington	11780	15150		
0700-0730	S Radio Zambia, Lusaka	11880			
0700-0745	WYFR, Oakland, California	6065	7355	9852.5	
0700-0750	Radio Pyongyang, North Korea	13750	15340		
0700-0800	CBU, Vancouver, British Columbia	6130			
0700-0800	CFCF, Montreal, Quebec	6005			
0700-0800	CFCN, Calgary, Alberta	6030			
0700-0800	CHNS, Halifax, Nova Scotia	6130			
0700-0800	CKWX, Vancouver, British Columbia	6080			
0700-0800	CFRB, Toronto, Ontario	6070			
0700-0800	ELWA, Monrovia, Liberia	11830			
0700-0800	(US) Far East Network, Tokyo	3910			
0700-0800	HCJB, Quito, Ecuador	6130	6205	9675	9745
		11835	11925		
0700-0800	King of Hope, South Lebanon	6215			
0700-0800	KYOI, Salpan	17780			
0700-0800	Radio Australia, Melbourne	5995	9655	9845	15160
		15240	15395	17715	17750
0700-0800	Radio Ghana, Accra	6130			
0700-0800	Radio Havana Cuba	9525			
0700-0800	Radio Japan, Tokyo	5990	15195	15235	17810
		21695			
0700-0800	Radio Kuwait	15345			
0700-0800	Radio Moscow, USSR	5905	6020	6095	6150
		6160	6190	7175	7290

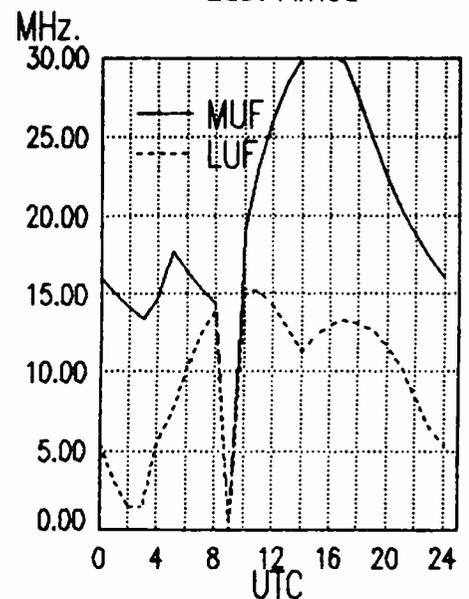
Midwest To Middle East



Midwest To West Africa



Midwest To East Africa

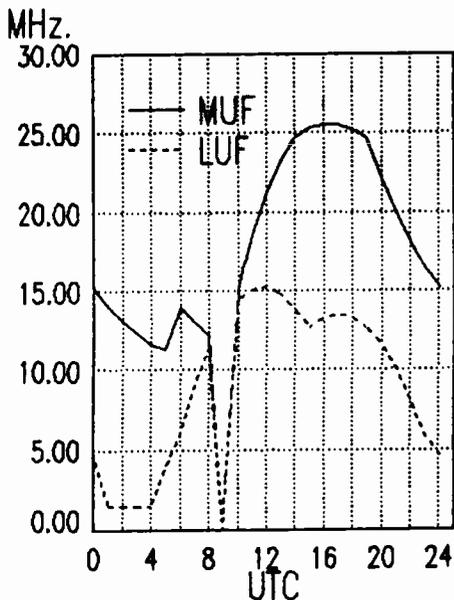


frequency SECTION

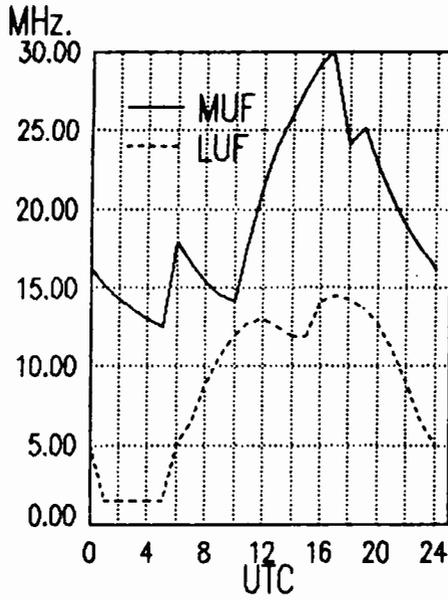
0700-0800	A,S	Radio Thailand, Bangkok	7345	9580		
0700-0800	S	Superpower KUSW, Utah	9655	11905		
0700-0800		Trans World Radio, Swaziland	6135			
0700-0800		Voice of Free China, Taiwan	6070	9725		
0700-0800	A,S	Voice of Kenya, Nairobi	5985			
0700-0800		Voice of Malaysia, Kuala Lumpur	7270			
0700-0800		Voice of Nigeria, Lagos	6175	9750	15295	
0700-0800		WCSN, Boston, Massachusetts	15120	15185		
0700-0800		WHRI, Noblesville, Indiana	9495			
0700-0800		WYFR, Oakland, California	6100	7400		
0715-0800	A,S	Radio Berlin Int'l, East Germany	6065	7355	9815	
			6040	7185	9730	21465
			21540			
0715-0730	M-A	Vatican Radio, Vatican City	11725	15190		
0715-0800	S	FEBA, Mahe, Seychelles	15325	17785		
0720-0730	M-A	Vatican Radio, Vatican City	6248	9645	11740	
0725-0800		Trans World Radio, Monte Carlo	7105			
0730-0800		ABC, Alice Springs, Australia	2310	[ML]		
0730-0800		ABC, Katherine, Australia	2485			
0730-0800		ABC, Tennant Creek, Australia	2325	[ML]		
0730-0800		Radio Australia, Melbourne	11720			
0730-0735		All India Radio, New Delhi	5990	6010	6020	7110
			7205	9610	9675	11850
			11935	15235	15250	17705
0730-0745		BBC, London, England*	3975	6010	7230	9915
0730-0755		Radio Finland, Helsinki	6120	9560	11755	
0730-0800		BBC, London, England	5975	9640		
0730-0800		Radio Netherland, Hilversum	9630	9715		
0730-0800		Radio Prague, Czechoslovakia	11685	17840	21705	
0730-0800		Radio Sofia, Bulgaria	9700	11720		
0730-0800		Soloman Islands Broadcasting Corp	9545			
0730-0800		Swiss Radio Int'l, Berne	3985	6165	9535	
0740-0750	W	Radio Free Europe, Munich*	5985	7115	9695	9725
			11895	15355		
0745-0800		Radio Prague, Czechoslovakia	6055	7345	9505	

0800 UTC [3:00 AM EST/12:00 AM PST]					
0800-0805	M-F	Port Moresby, Papua New Guinea	3925	4890	5960 5985
			6020	6040	6080 6140
			9520		
0800-0805		Soloman Islands Broadcasting Corp	9545		
0800-0815	M-A	Radio Zambia, Lusaka	6165	7235	
0800-0825	M-F	BRT, Brussels, Belgium	9860	21810	
0800-0825		Radio Netherland, Hilversum	9630	9715	
0800-0825		Voice of Malaysia, Kuala Lumpur	6175	9750	15295
0800-0830		HCJB, Quito, Ecuador	6205	9675	9745 11835
			11925		
0800-0830		Radio Bangladesh, Dhaka	12030	15525	
0800-0830		Radio Tirana, Albania	9500	11835	
0800-0830		Voice of Islam, Pakistan	15525	17870	
0800-0835	S	FEBA, Mahe, Seychelles	15325	17785	
0800-0835		Trans World Radio, Swaziland	6070	9725	
0800-0850		Radio Pyongyang, North Korea	9530	11830	15160 15180
0800-0900		ABC, Alice Springs, Australia	2310	[ML]	
0800-0900		ABC, Katherine, Australia	2485		
0800-0900		ABC, Tennant Creek, Australia	2325	[ML]	
0800-0900		BBC, London, England	9410	9640	
0800-0900		CBN, St. John's, Newfoundland	6160		
0800-0900		CBU, Vancouver, British Columbia	6160		
0800-0900		CFCF, Montreal, Quebec	6005		
0800-0900		CFCN, Calgary, Alberta	6030		
0800-0900		CHNS, Halifax, Nova Scotia	6130		
0800-0900		CKWX, Vancouver, British Columbia	6080		
0800-0900		CFRB, Toronto, Ontario	6070		
0800-0900		(US) Far East Network, Tokyo	3910		
0800-0900		HCJB, Quito, Ecuador	6130	9745	11925
0800-0900		King of Hope, South Lebanon	6215		
0800-0900		KNLS, Anchor Point, Alaska	6150		
0800-0900		KTWR, Guam	11805		
0800-0900		YOI, Saipan	11900		
0800-0900		Radio Australia, Melbourne	5995	6080	9580 9655
			9710	11720	
0800-0900		Radio Korea, Seoul, South Korea	7550		

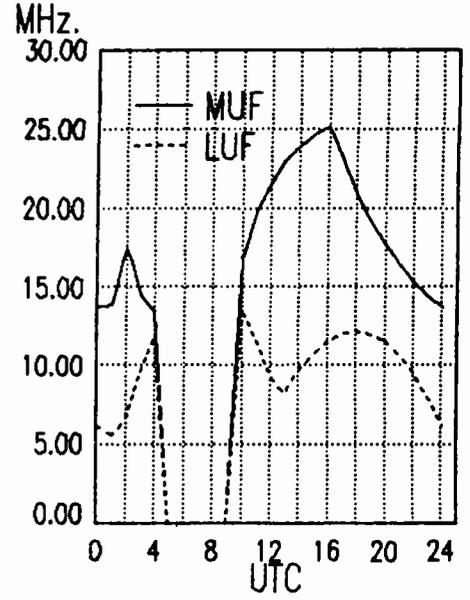
Midwest To
Central Africa



Midwest To
South Africa



Midwest To
Indian Ocean

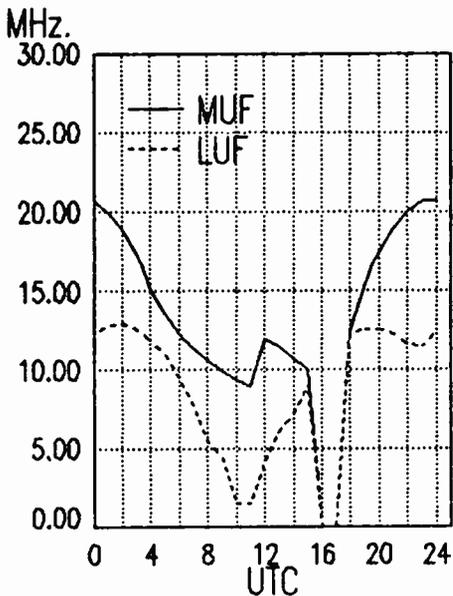


frequency SECTION

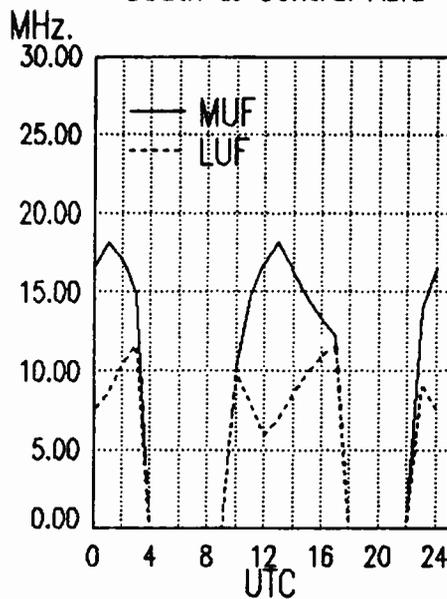
0800-0900	SBC Radio One, Singapore	5010	5052	11940
0800-0900	S Superpower KUSW, Utah	6135		
0800-0900	Trans World Radio, Monte Carlo	7105		
0800-0900	Voice of Indonesia, Jakarta	11790	15105	
0800-0900	A,S Voice of Kenya, Nairobi	7270		
0800-0900	Voice of Nigeria, Lagos	7255	15185	
0800-0900	WCSN, Boston, Massachusetts	7355		
0800-0900	WHRI, Noblesville, Indiana	7355		
0800-0900	WYFR, Oakland, California	6175		
0805-0900	KTWR, Agana, Guam	11805		
0815-0830	S Radio Austria Int'l, Vienna	17870		
0815-0830	Radio Korea, Seoul, South Korea	9570		
0815-0845	M-F Voice of America, Washington DC	7175	9575	9750 11710
		11915	15600	17715 21500
		[ML]		
0830-0840	All India Radio, New Delhi	5960	5990	6010 6020
		6050	6065	6100 6140
		7110	7140	7160 7250
		7280	7295	9610 11850
		15235	15250	17705
0830-0855	Radio Austria Int'l, Vienna	6155	11915	15410 15415
0830-0855	M-A Radio Netherland, Hilversum	9630		
0830-0900	S Bhutan Bcating Service, Thimpu	6035		
0830-0900	FEBC, Manila, Philippines	11850	15350	
0830-0900	Radio Beijing, China	9700	11755	15440
0830-0900	Radio Netherland, Hilversum	9630	21486	
0830-0900	Radio Prague, Czechoslovakia	11685	17840	21705
0830-0900	Swiss Radio Int'l, Berne	9560	9885	17830 21695
0830-0900	Voice of Nigeria, Lagos	15120		
0840-0850	M-A Voice of Greece, Athens	9855	15630	
0845-0900	Radio Berlin Int'l, East Germany	21540		
0845-0900	Radio Prague, Czechoslovakia	6055	7345	9505
0850-0900	All India Radio, New Delhi	5960	5990	6010 6020
		6050	6065	6100 6140
		7110	7140	7150 7160
		7250	7280	7295 9610
		11850	15235	15250 17705

0900 UTC [4:00 AM EST/1:00 AM PST]				
0900-0905	Africa No. 1, Gabon	7200	15200	
0900-0910	All India Radio, New Delhi	5960	5990	6010 6020
		6050	6065	6100 6140
		7110	7140	7150 7160
		7250	7280	7295 9610
		11850	15235	15250 17705
0900-0910	Port Moresby, Papua New Guinea	3295	4890	5960 5985
		6020	6040	6080 6140
		9520		
		6548		
0900-0910	Voice of Lebanon, Beirut	17595	21810	
0900-0925	M-F BRT, Brussels, Belgium	11850	15350	
0900-0930	FEBC, Manila, Philippines	11850	15350	
0900-0930	KTWR, Agana, Guam	11805		
0900-0930	Nippon Broadcasting Corp.	3925		
0900-0930	Radio Beijing, China	9700	11755	15440
0900-0930	Radio Berlin Int'l, East Germany	21540		
0900-0930	Radio Netherland, Hilversum	21485		
0900-0930	A,S Radio Prague, Czechoslovakia	11685	17840	21705
0900-0930	Deutsche Well, West Germany	6160	17780	21650 21680
0900-1000	ABC, Alice Springs, Australia	2310	[ML]	
0900-1000	ABC, Katherine, Australia	2485		
0900-1000	ABC, Tennant Creek, Australia	2325	[ML]	
0900-1000	S Adventist World Radio, Portugal	9670		
0900-1000	(US) Armed Forces Radio and TV	6030	9530	
0900-1000	BBC, London, England	7180	9410	9720 9740
		9750	11860	
0900-1000	CFCF, Montreal, Quebec	6005		
0900-1000	CFCN, Calgary, Alberta	6030		
0900-1000	CHNS, Halifax, Nova Scotia	6130		
0900-1000	CKWX, Vancouver, British Columbia	6080		
0900-1000	CFRB, Toronto, Ontario	6070		
0900-1000	(US) Far East Network, Tokyo	3910		
0900-1000	HCJB, Quito, Ecuador	6130		
0900-1000	King of Hope, South Lebanon	6215		
0900-1000	KNLS, Anchor Point, Alaska	6150		
0900-1000	KTWR, Guam	11805		

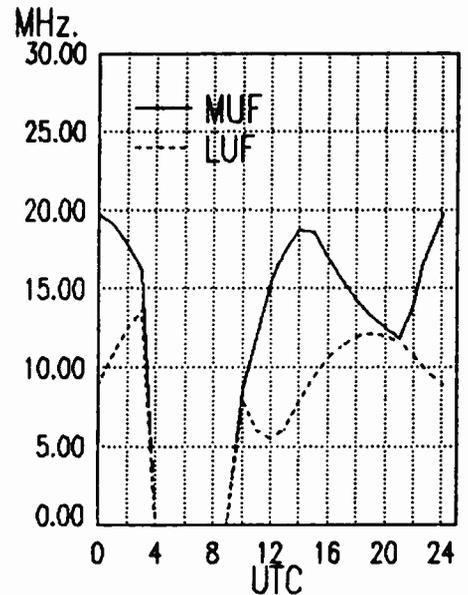
Midwest To Far East



Midwest To South & Central Asia



Midwest To Southeast Asia



frequency SECTION

1030-1100	HCJB, Quito, Ecuador	6130	11925		
1030-1100 M-F	Radio Budapest, Hungary	9585	9835	11910	15160
		15220			
1030-1100	Radio Netherlands, Hilversum	6020	9650		
1030-1100 A,S	Radio Tanzania, Dar es Salaam	7165			
1030-1100	SLBC, Colombo, Sri Lanka	11835	15120	17850	[ML]
1030-1100	UAE Radio, United Arab Emirates	15435	17865	21605	
1040-1050 H	Radio Free Europe, Munich*	5985	7115	9695	9725
		11895	15355		
1040-1050 M-A	Voice of Greece, Athens	11645	15630		
1045-1100 M-A	Radio Prague, Czechoslovakia	6055	7345	9505	
1055-1100 S	Trans World Radio, Monte Carlo	7105			

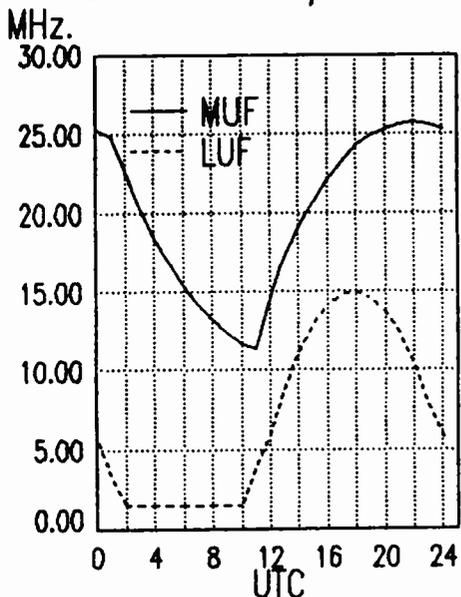
1100-1200	(US) Armed Forces Radio and TV	6030	6125	15430	
1100-1200	BBC, London, England	5965	6195	11750	11775
		15070			
1100-1200	CBN, St. John's, Newfoundland	6160			
1100-1200	CFCF, Montreal, Quebec	6005			
1100-1200	CFCN, Calgary, Alberta	6030			
1100-1200	CHNS, Halifax, Nova Scotia	6130			
1100-1200	CKWX, Vancouver, British Columbia	6080			
1100-1200	CFRB, Toronto, Ontario	6070			
1100-1200	(US) Far East Network, Tokyo	3910			
1100-1200	KYOI, Saipan	11900			
1100-1200	Radio Australia, Melbourne	5995	6060	6080	7215
		9580	9645	9710	9770
		11705	11800		

1100 UTC [6:00 AM EST/3:00 AM PST]

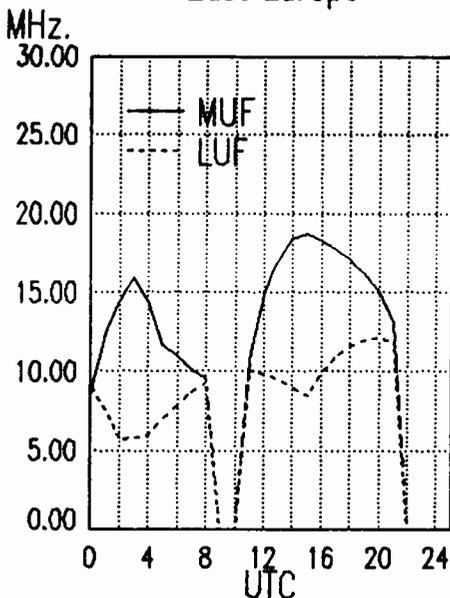
1100-1105	Radio Pakistan, Islamabad	6090	7290		
1100-1105 A	Port Moresby, Papua New Guinea	3295	4890	5960	5985
		6020	6040	6080	6140
		9520			
1100-1110 S	Port Moresby, Papua New Guinea	3295	4890	5960	5985
		6020	6040	6080	6140
		9520			
1100-1115	Radio New Zealand, Wellington	9540	11780		
1100-1120	Radio Pakistan, Islamabad	15606	17760		
1100-1125	Radio Netherland, Hilversum	6020	9650		
1100-1130	HCJB, Quito, Ecuador	6130	11925		
1100-1130 TES	Radio Caroline, Offshore, Europe	5955			
1100-1130	Radio Japan, Tokyo	5990	6120	7210	17810
1100-1130	Radio Mozambique, Maputo	9525	11818	11835	
1100-1130	Radio Sweden Int'l, Stockholm	6065	9630	21690	
1100-1130	SLBC, Colombo, Sri Lanka	11835	15120	17850	[ML]
1100-1130	Swiss Radio Int'l, Berne	9885	11935	15570	17830
1100-1130	Voice of Vietnam, Hanoi	7430	9732		
1100-1150	Radio Pyongyang, North Korea	6576	9600	11735	
1100-1155	Radio Beijing, China	9665			
1100-1200	ABC, Alice Springs, Australia	2310	[ML]		
1100-1200	ABC, Katherine, Australia	2485			
1100-1200	ABC, Tennant Creek, Australia	2325	[ML]		

1100-1200	Radio Korea, Seoul, South Korea	15575			
1100-1200	Radio Moscow, USSR	6000	11670	11900	13790
		15225	15475		
1100-1200	Radio RSA, South Africa	17755	21590		
1100-1200 A,S	Radio Tanzania, Dar es Salaam	7165			
1100-1200 S	Radio Zambia, Lusaka	11880	[IRR]		
1100-1200 S	Superpower KUSW, Utah	9850			
1100-1200	Voice of America, Washington	5975	5985	5990	6110
		6160	9590	9760	
1100-1200	Voice of Asia, Taiwan	5980	7445		
1100-1200	Voice of Kenya, Nairobi	7270			
1100-1200	Voice of Nigeria, Lagos	7255	15120		
1100-1200	WHRI, Noblesville, Indiana	5995	11790		
1100-1200	WYFR, Oakland, California	5950	6010		
1110-1120 M-F	Radio Botswana, Gaborone	4820	5955	7255	
1115-1200	Radio Berlin Int'l, East Germany	15445	17880	21465	21540
1115-1125	Radio France Int'l, Paris	6175	9790	9805	11670
		11700	11845	15155	15195
		15300	15315	15435	17620
		17850	21620		
1115-1130	Radio Korea, Seoul, South Korea	7275	11740		
1115-1130	Vatican Radio, Vatican City	11840	21485		
1115-1145	Radio Nepal, Kathmandu	5005			
1115-1200	Trans World Radio, Bonaire	11815			
1115-1200	Voice of Islamic Republic Iran	11790			
1130-1200	Deutsche Welle, West Germany	15410	17765	17800	21600

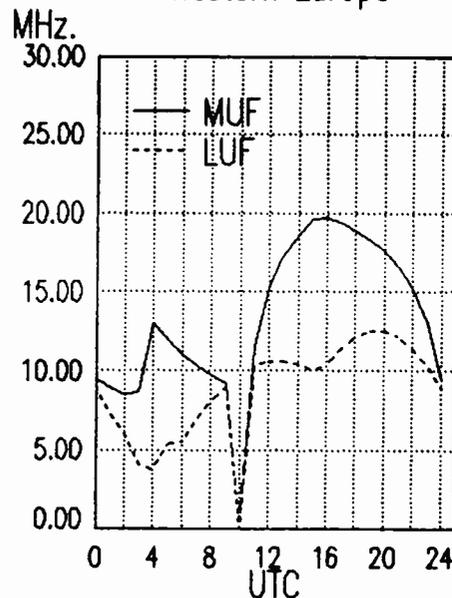
Midwest To
Central America/Caribbean



West Coast To
East Europe



West Coast To
Western Europe



frequency SECTION

1130-1200	HCJB, Quito, Ecuador	11740			
1130-1200	Radio Japan, Tokyo	5990	6120	7210	
1130-1200	Radio Netherland, Hilversum	5995	9715	15560	17575
		17605	21480		
1130-1200	Radio Thailand, Bangkok	9655	11905		
1130-1200	Radio Tirana, Albania	9480	11855		
1135-1140	All India Radio, New Delhi	6065	7110	9610	9675
		11850	15320		
1140-1145	M-A Vatican Radio, Vatican City	6248	9645	11740	
1145-1200	BBC, London, England*	5995	7180		
1145-1200	Radio Prague, Czechoslovakia	6055	7345	9505	

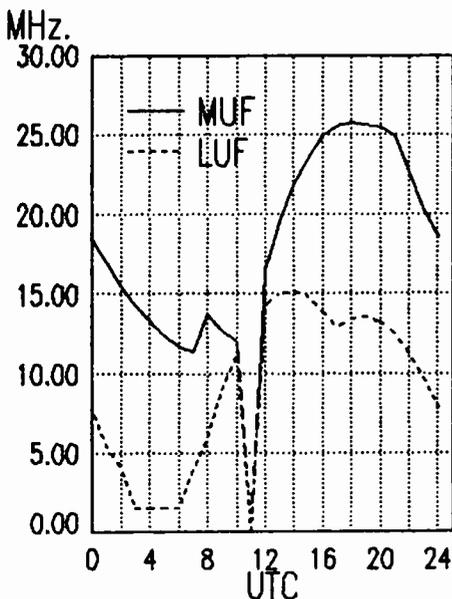
1200-1300	ABC, Alice Springs, Australia	2310	[ML]		
1200-1300	ABC, Katherine, Australia	2485			
1200-1300	ABC, Tennant Creek, Australia	2325	[ML]		
1200-1300	S Adventist World Radio, Africa	17890			
1200-1300	(US) Armed Forces Radio and TV	6030	6125	15430	
1200-1300	BBC, London, England	5965	6195	9740	11750
		11775	12095	15070	18080
1200-1300	CBN, St. John's, Newfoundland	6160			
1200-1300	CFCF, Montreal, Quebec	6005			
1200-1300	CFCN, Calgary, Alberta	6030			
1200-1300	CHNS, Halifax, Nova Scotia	6130			
1200-1300	CKWX, Vancouver, British Columbia	6080			
1200-1300	CFRB, Toronto, Ontario	6070			
1200-1300	(US) Far East Network, Tokyo	3910			
1200-1300	HCJB, Quito, Ecuador	11740	15115	17890	
1200-1300	KYOI, Saipan	11900			
1200-1300	Radio Australia, Melbourne	5995	6060	6080	7205
		7215	9580	9645	9710
		9770	11705		

1200 UTC [7:00 AM EST/4:00 AM PST]

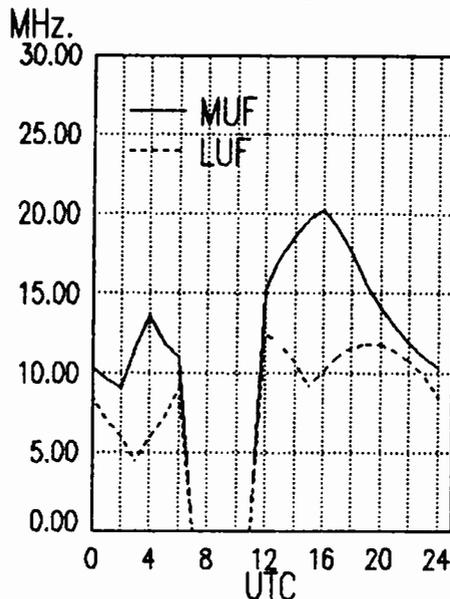
1200-1205	M-A Port Moresby, Papua New Guinea	3295	4890	5960	6020
		6040	6080	6140	9520
1200-1215	BBC, London, England*	3915	6065	7275	
1200-1215	Radio New Zealand, Wellington	6100	9540		
1200-1215	Vatican Radio, Vatican City	15190	17865		
1200-1215	Voice of Kampuchea, Phnom-Penh	9693	11938		
1200-1220	Radio Bucharest, Romania	17720	21665		
1200-1220	M-F Radio Budapest, Hungary	9585	9835	11910	15160
		15220			
1200-1225	M-F Radio Finland, Helsinki	11945	15400		
1200-1225	Radio Polonia, Warsaw, Poland	6095	7285		
1200-1230	S Radio Austria Int'l, Vienna	6155	9685	11915	15320
1200-1230	Radio Netherland, Hilversum	5995	9715	15560	17575
		17605	21480		
1200-1230	Radio Somalia, Mogadishu	6095			
1200-1230	Radio Tashkent, Uzbek, USSR	5945	7275	9540	9600
		11785			
1200-1230	Radio Thailand, Bangkok	9655	11905		
1200-1230	S Radio Zambia, Lusaka	11880	[IRR]		
1200-1235	M-A Radio Ulan Bator, Mongolia	9615	12015		
1200-1236	HCJB, Quito, Ecuador	6075			
1200-1250	Radio Pyongyang, North Korea	9600	9555	11735	
1200-1255	Radio Beijing, China	7335	9530	9635	9665
		9770	11600	11715	11755

1200-1300	Radio Moscow, USSR	6000	7135	11670	11900
		13790	15140	15150	15225
		15420	15460	15475	15490
		15540	15585	15595	17655
		17820			
1200-1300	Radio RSA, South Africa	21590			
1200-1300	A,S Radio Tanzania, Dar es Salaam	7165			
1200-1300	SBC Radio One, Singapore	5010	5052	11940	
1200-1300	S Superpower KUSW, Utah	9850			
1200-1300	Trans World Radio, Bonaire	11815			
1200-1300	Trans World Radio, Sri Lanka	11920			
1200-1300	Voice of America, Washington	6110	9760	11715	
1200-1300	Voice of Kenya, Nairobi	7270			
1200-1300	Voice of Nigeria, Lagos	7255	15120		
1200-1300	WCSN, Boston, Massachusetts	5980			
1200-1300	WHRI, Noblesville, Indiana	5995	11715		
1200-1300	WYFR, Oakland, California	5950	6175	6185	
1200-1300	WYFR Satellite Net, California	13695			
1215-1300	Radio Berlin Int'l, E. Germany	15445	17880	21465	21540
1215-1300	Radio Cairo, Egypt	17675			

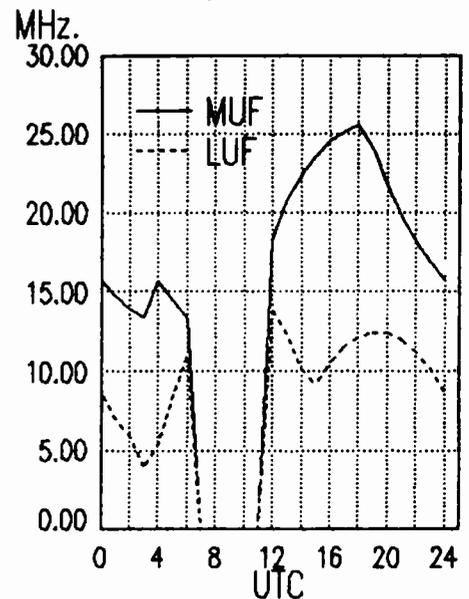
West Coast To West Africa



West Coast To Middle East



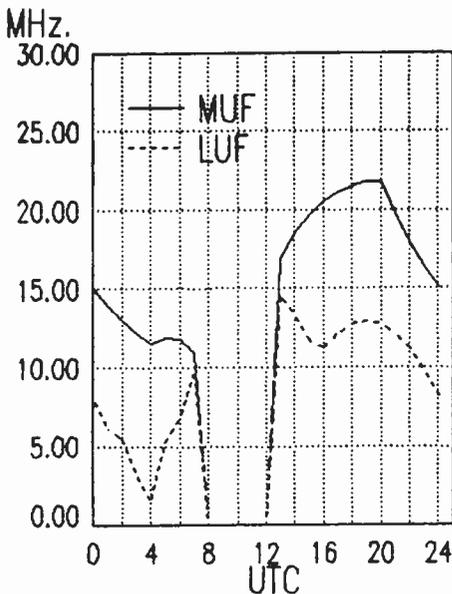
West Coast To East Africa



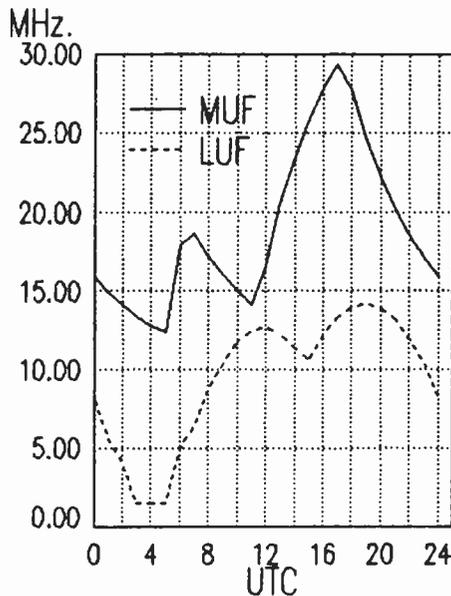
frequency SECTION

1230-1235	All India Radio, New Delhi	3905 4800 4920 7280 9565 9615 11620 11735 15120		1300-1330	Voice of Kenya, Nairobi	7270	
1230-1245	Radio Korea, Seoul, South Korea	7275 11740		1300-1332 A,S	Trans World Radio, Bonaire	11815	
1230-1255	Radio Austria Int'l, Vienna	6155 9685 11915 15320		1300-1350	Radio Pyongyang, North Korea	9325 9345	
1230-1300	BBC, London, England*	6125 7255 6195 9635 9660 11780 12040 15270 15390 15435 17695 11750 15525		1300-1355	Radio Beijing, China	7335 9530 11600 11755	
1230-1300	Radio Bangladesh, Dhaka	11750 15525		1300-1400	ABC, Alice Springs, Australia	2310 [ML]	
1230-1300	Radio Sweden, Stockholm	15190 15430		1300-1400	ABC, Katherine, Australia	2485	
1240-1250 M	Radio Free Europe, Munich*	5985 7115 9695 9725 11895 15355		1300-1400	ABC, Tennant Creek, Australia	2325 [ML]	
1245-1255	Radio France Int'l, Paris	9805 11670 11845 15155 15195 15300 15315 15365 21620 21645		1300-1400	(US) Armed Forces Radio and TV	6030 6125 15330 15330	
1245-1300	Radio Berlin Int'l, E. Germany	9665 11705 11785 15170 15240		1300-1400	CBN, St. John's, Newfoundland	6160	
1300 UTC [8:00 AM EST/5:00 AM PST]				1300-1400	CBU, Vancouver, British Columbia	6160	
1300-1305	Port Moresby, Papua New Guinea	3295 4890 5960 5980 6020 6040 6080 6140 9520		1300-1400	CFCF, Montreal, Quebec	6005	
1300-1315	Radio Berlin Int'l, East Germany	21465 21540		1300-1400	CFCN, Calgary, Alberta	6030	
1300-1325	Radio Bucharest, Romania	9690 11940 16405 17720		1300-1400	CHNS, Halifax, Nova Scotia	6130	
1300-1330	BBC, London, England	5965 5995 6195 7160 9510 9740 9750 9760 11750 11775 12095 15070 17705 18080		1300-1400	CKWX, Vancouver, British Columbia	6080	
1300-1330	Radio Berlin Int'l, E. Germany	9665 11705 11785 15170 15240		1300-1400	CFRB, Toronto, Ontario	6070	
1300-1330	Radio Cairo, Egypt	17675		1300-1400 S	ELWA, Monrovia, Liberia	11830	
1300-1330	Radio Finland, Helsinki	11945 15400		1300-1400	(US) Far East Network, Tokyo	3910	
1300-1330	Radio Ghana, Accra	4915 7295		1300-1400	FEBC, Manila, Philippines	11850	
1300-1330 S	Radio Norway Int'l, Oslo	9590 15190 15310 21700 25730		1300-1400	HCJB, Quito, Ecuador	11740 15115 17890	
1300-1330	Swiss Radio Int'l, Berne	6165 9535 12030		1300-1400 M-A	KYOI, Salpan	11900	
1300-1330	Trans World Radio, Sri Lanka	11920		1300-1400	Radio Australia, Melbourne	5995 6060 6080 7205 9580 9560	
				1300-1400	Radio Jordan, Amman	6050 7135 7185 9820 9830 11670 11840 11900	
				1300-1400	Radio Moscow, USSR	12040 13625 13790 15225 15540 15585 15595 17655 17820	
				1300-1400	Radio SPLA (Sudanese clandestine)	4666 9550 11710	
				1300-1400 A,S	Radio Tanzania, Dar es Salaam	7165	
				1300-1400	SBC Radio One, Singapore	5010 5052 11940	
				1300-1400 S	Superpower KUSW, Utah	9850	
				1300-1400	Voice of America, Washington	6110 7230 9455 9760 11715	
				1300-1400	Voice of Nigeria, Lagos	7255 15120	
				1300-1400	WCSN, Boston, Massachusetts	5980	
				1300-1400	WHRI, Noblesville, Indiana	9455 11790	
				1300-1400	WYFR, Oakland, California	5950 6010 6175 11580 15170 13695	

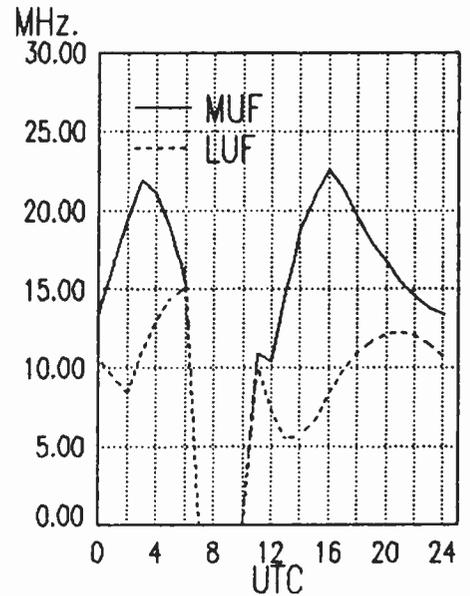
West Coast To
Central Africa



West Coast To
South Africa



West Coast To
Indian Ocean



frequency SECTION

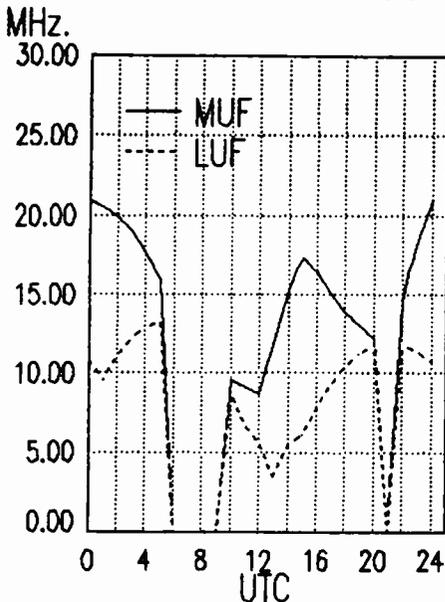
1300-1400	WYFR Satellite Net, California	13695		1400-1430	Radio Tirana, Albania	9500 11985	
1305-1315	Radio France Int'l, Paris	6175 9790 9805 11670		1400-1430	Voice of Ethiopia, Addis Ababa	9550 11710	
		11845 15155 15195 15300		1400-1430	Voice of Republic of Iran	15085	
		15315 15365 17620 17720		1400-1450 T	Radio Free Europe, Munich*	5985 7115 7695 9725	
		17850 21645				11895 15355	
1315-1325	Voice of Lebanon, Beirut	6548		1400-1450	Radio Pyongyang, North Korea	6576 11735	
1330-1355 M-A	BRT, Brussels, Belgium	15590 17600		1400-1455	Radio Beijing, China	11600 15165	
1330-1400	BBC, London, England	5995 6195 7160 9510		1400-1500	ABC, Katherine, Australia	2485	
		9740 11750 11775 12095		1400-1500	ABC, Perth, Australia	9610	
		15070		1400-1500	Adventist World Radio, Italy	7275	
1330-1400	All India Radio, New Delhi	9545 10330 11810 15335		1400-1500	All India Radio, New Delhi	9545 11810 15335	
1330-1400 M-A	Bhutan Bcsting Service, Thimpu	6035		1400-1500	(US) Armed Forces Radio and TV	6125 15330 15430	
1330-1400	Laotian National Radio	7113		1400-1500	BBC, London, England	5995 6195 7160 9740	
1330-1400	Radio Korea, Seoul, South Korea	7275				11705 11750 12095 15070	
1330-1400	Radio Tashkent, Uzbek, USSR	5945 7275 9540 9600		1400-1500	CBN, St. John's, Newfoundland	6160	
		11785		1400-1500 M-A	CBU, Vancouver, British Columbia	6160	
1330-1400	Swiss Radio Int'l, Berne	11695 11955 15135 15570		1400-1500	CFCF, Montreal, Quebec	6005	
		17830 21695		1400-1500	CFCN, Calgary, Alberta	6030	
1330-1400	UAE Radio, United Arab Emirates	15435 17865 21605		1400-1500	CHNS, Halifax, Nova Scotia	6130	
1330-1400	Voice of Kenya, Nairobi	6100		1400-1500	CKWX, Vancouver, British Columbia	6080	
1330-1400	Voice of Turkey, Ankara	15255		1400-1500	CFRB, Toronto, Ontario	6070	
1330-1400	Voice of Vietnam, Hanoi	9840 12020		1400-1500 S	ELWA, Monrovia, Liberia	11830	
1332-1400 A	Trans World Radio, Bonaire	11815		1400-1500	(US) Far East Network, Tokyo	3910	
1345-1400	Radio Korea, Seoul, South Korea	6135 7275 11740 15575		1400-1500	FEBC, Manila, Philippines	9670 11850	
				1400-1500	HCJB, Quito, Ecuador	11740 15115 17890	
				1400-1500	KYOI, Saipan	11900	
				1400-1500	Radio Australia, Melbourne	5995 6035 6060 6080	
						7205 9580	
				1400-1500 S	Radio Canada Int'l, Montreal	9625 11720 11955 15440	
						17820	
				1400-1500	Radio Japan, Tokyo	5990 7210 9695 11815	
				1400-1500	Radio Jordan, Amman	9560	
				1400-1500	Radio Korea, Seoul, South Korea	9570 9750 15575	
				1400-1500	Radio Moscow, USSR	5905 5920 5980 6020	
						6050 6095 6185 7105	
						7135 7185 7315 7345	
						9530 9830 11670 11840	
						13790 15225 15475 15540	
						15595 17655	
						17820	

1400 UTC [9:00 AM EST/6:00 AM PST]

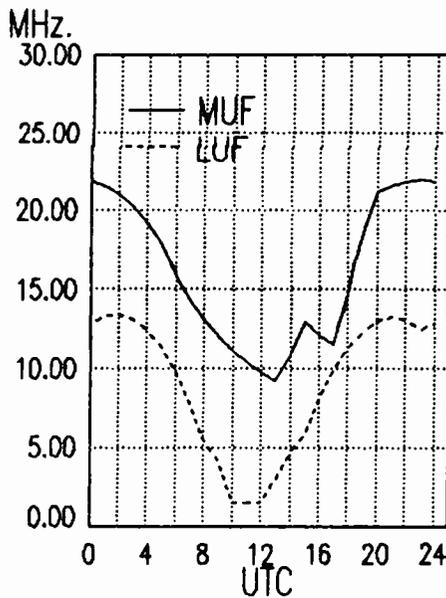
1400-1405 A	Trans World Radio, Bonaire	11815
1400-1425	Radio Austria Int'l, Vienna	9665 12010 15320
1400-1425	Radio Finland, Helsinki	11945 15400
1400-1427	Voice of Nigeria, Lagos	15120
1400-1430	ABC, Alice Springs, Australia	2310 [ML]
1400-1430	ABC, Tennant Creek, Australia	2325 [ML]
1400-1430 S	Radio Norway Int'l, Oslo	15300 15305 15310
1400-1430	Radio Peace and Progress, USSR	7440 9550 9635 9790
		11835 15470 17560
1400-1430	Radio Polonia, Warsaw, Poland	6095 7285
1400-1430	Radio Sweden, Stockholm	9695 11785 15345

1400-1500	Radio Canada Int'l, Montreal	9625 11720 11955 15440
		17820
1400-1500	Radio Japan, Tokyo	5990 7210 9695 11815
1400-1500	Radio Jordan, Amman	9560
1400-1500	Radio Korea, Seoul, South Korea	9570 9750 15575
1400-1500	Radio Moscow, USSR	5905 5920 5980 6020
		6050 6095 6185 7105
		7135 7185 7315 7345
		9530 9830 11670 11840
		13790 15225 15475 15540
		15595 17655
		17820

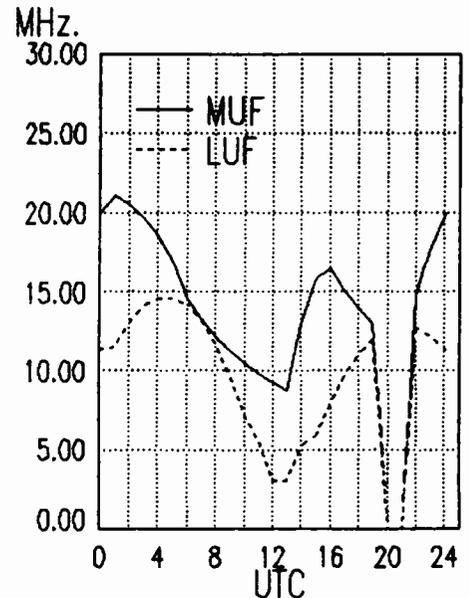
West Coast To
South & Central Asia



West Coast To
Far East



West Coast To
Southeast Asia



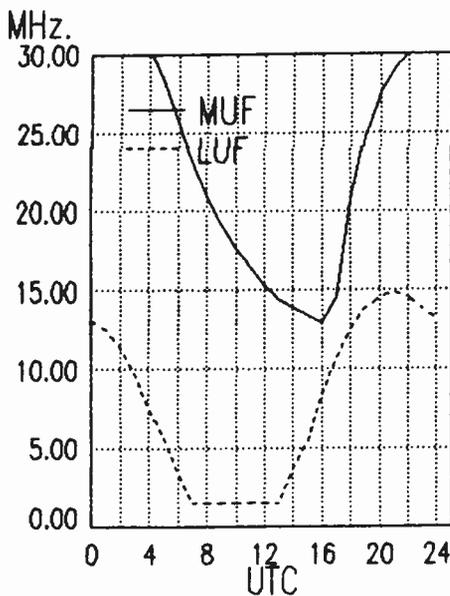
frequency SECTION

1400-1500	Radio RSA, South Africa	9655	15125	17755	21590
1400-1500 A,S	Radio Tanzania, Dar es Salaam	7165			
1400-1500	SBC Radio One, Singapore	5010	5052	11940	
1400-1500 S	Superpower KUSW, Utah	9850			
1400-1500	Voice of America, Washington	6110	7230	9645	9760
1400-1500	Voice of Kenya, Nairobi	6100			
1400-1500	Voice of Malaysia, Kuala Lumpur	4950			
1400-1500	Voice of Nigeria, Lagos	7255			
1400-1500	WCSN, Boston, Massachusetts	13760			
1400-1500	WHRI, Noblesville, Indiana	9455	11790		
1400-1500	WRNO, New Orleans, Louisiana	11965			
1400-1500	WYFR, Oakland, California	5950	6015	6175	11580
		15050	15170		
1415-1420	Radio Nepal, Kathmandu	3230	5005		
1415-1425 T,F	Radio Budapest, Hungary	6110	9535	9585	11910
		15160			
1415-1500	Radio Berlin Int'l, East Germany	15240	17880		
1425-1500 S	Radio Austria Int'l, Vienna	9665	12010	15320	
1425-1500 S	Radio Finland, Helsinki	11945	15400		
1430-1455 M-A	Radio Budapest, Hungary	9585	9835	11910	15160
		15220			
1430-1500 F	ABC, Alice Springs, Australia	2310	[ML]		
1430-1500 F	ABC, Tennant Creek, Australia	2325	[ML]		
1430-1500	Burma Broadcasting Service	5985			
1430-1500	King of Hope, Southern Lebanon	6260			
1430-1500	KTWR, Agana, Guam	9780			
1430-1500	Radio Australia, Melbourne	6060	7205	9580	
1430-1500	Radio Netherland, Hilversum	5955	11735	13770	15560
		17575			
1430-1500	Radio Prague, Czechoslovakia	9605	11685	13715	15110
		15155	17705	21505	
1430-1500	Radio Sofia, Bulgaria	7245	9740	11735	
1430-1500	Radio Yugoslavia, Belgrade	7240	15240	15415	
1445-1500	Radio Berlin Int'l, East Germany	11785	15170	15255	
1445-1500 M-A	Radio Ulan Bator, Mongolia	9575	15305		
1445-1500	Vatican Radio, Vatican City	6248	7250	9645	11740
		11960	15090	17870	

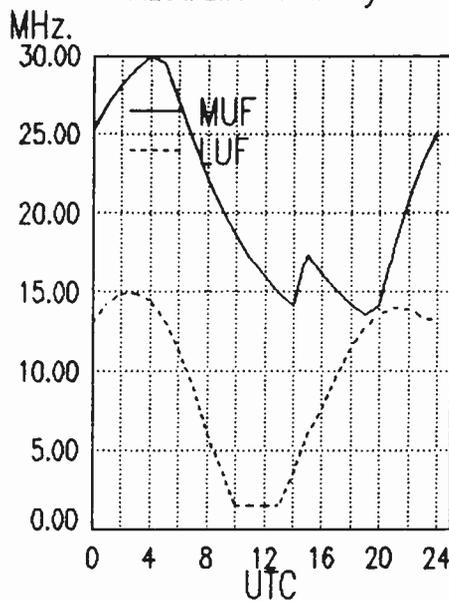
1500 UTC [10:00 AM EST/7:00 AM PST]

1500-1505	Africa No. 1, Gabon	7200	15200		
1500-1510	Vatican Radio, Vatican City	11960	15090	17870	
1500-1515	FEBA, Mahe, Seychelles	15325			
1500-1520	Radio Ulan Bator, Mongolia	9575	15305		
1500-1525	Radio Bucharest, Romania	9510	9690	11775	11940
		15250	15335		
1500-1525	Radio Netherland, Hilversum	5955	11735	13770	15560
		17575			
1500-1530	Radio Berlin Int'l, East Germany	11785	15170	15255	
1500-1530	Radio Sofia Bulgaria	7245	9560	11735	15310
1500-1530 A,S	Radio Tanzania, Dar es Salaam	7165			
1500-1530	Radio Veritas Asia, Philippines	9770	15215		
1500-1545	WYFR, Oakland, California	5950	6175	11830	15170
		15375	17612		
1500-1550	Deutsche Welle, West Germany	7225	9735	17765	15135
		21600			
1500-1550	KTWR, Agana, Guam	9820			
1500-1550	Radio Pyongyang, North Korea	6576	7290	9325	9640
		9977			
1500-1555	Radio Beijing, China	11600	15165		
1500-1600 F	ABC, Alice Springs, Australia	2310	[ML]		
1500-1600	ABC, Perth, Australia	9610			
1500-1600 F	ABC, Tennant Creek, Australia	2325	[ML]		
1500-1600	(US) Armed Forces Radio and TV	9700	15330	15430	
1500-1600	AWR, Alajuela, Costa Rica	15460			
1500-1600	BBC, London, England	5995	6195	7160	9515
		9740	11750	12095	15070
		15260	15400	15420	17705
		17885			
1500-1600	Burma Broadcasting Service	5985			
1500-1600	CBC Northern Quebec Service	9625	11720		
1500-1600	CBN, St. John's, Newfoundland	6160			
1500-1600	CBU, Vancouver, British Columbia	6160			
1500-1600	CFCF, Montreal, Quebec	6005			
1500-1600	CFCN, Calgary, Alberta	6030			
1500-1600	CHNS, Halifax, Nova Scotia	6130			
1500-1600	CKWX, Vancouver, British Columbia	6080			

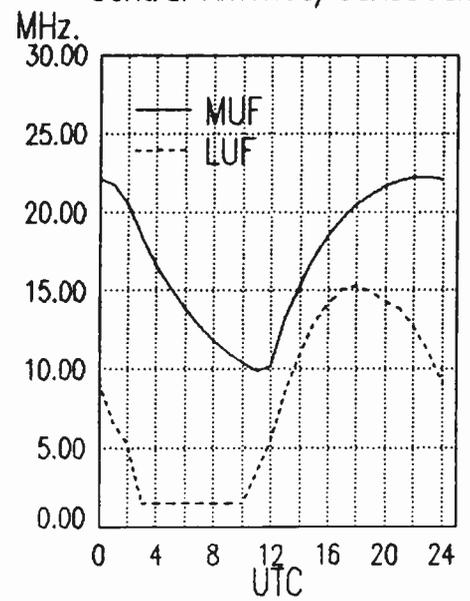
West Coast To Pacific



West Coast To Australia & Malaysia



West Coast To Central America/Caribbean



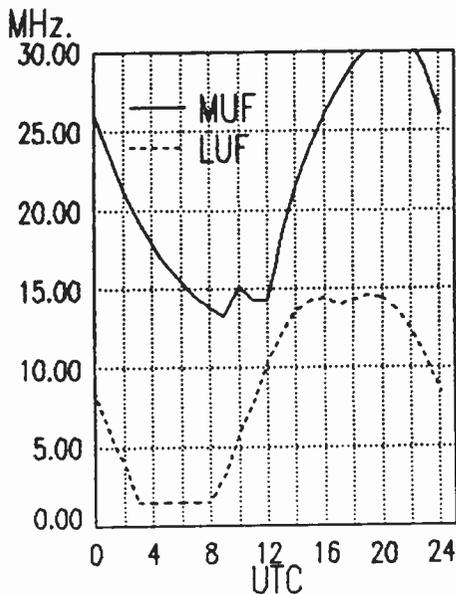
frequency SECTION

1500-1600	CFRB, Toronto, Ontario	6070							
1500-1600	S ELWA, Monrovia, Liberia	11830							
1500-1600	(US) Far East Network, Tokyo	3910							
1500-1600	FEBC, Manila, Philippines	9670							
1500-1600	HCJB, Quito, Ecuador	11740	15115	17890					
1500-1600	King of Hope, Southern Lebanon	6280							
1500-1600	KSDA, Agat, Guam	11980							
1500-1600	KYOI, Saipan	11900							
1500-1600	Radio Australia, Melbourne	5995	6035	6060	6080				
		7205	7215	9580					
1500-1600	S Radio Canada Int'l, Montreal	9555	9625	11720	11915				
		11955	15315	15440	17820				
1500-1600	Radio Japan, Tokyo	5990	7210	11815	21700				
1500-1600	Radio Jordan, Amman	9560							
1500-1600	Radio Moscow, USSR	5905	5920	5980	6020				
		6050	6095	6165	7135				
		7185	7315	7345	11670				
		11705	11840	11900	13790				
		15475	15585						
1500-1600	Radio RSA, South Africa	9655	15125	17755	21590				
1500-1600	SBC Radio One, Singapore	5010	5052	11940					
1500-1600	S Superpower KUSW, Utah	9850							
1500-1600	Voice of America, Washington	9000	9760	15205					
1500-1600	Voice of Ethiopia, Addis Ababa	7165	9560						
1500-1600	Voice of Indonesia, Jakarta	11790	15150						
1500-1600	Voice of Kenya, Nairobi	6100							
1500-1600	Voice of Malaysia, Kuala Lumpur	4950							
1500-1600	Voice of Nigeria, Lagos	7255	11770						
1500-1600	WCSN, Boston, Massachusetts	13760							
1500-1600	WHRI, Noblesville, Indiana	15105	21640						
1500-1600	WRNO, New Orleans, Louisiana	11965							
1500-1600	WYFR, Oakland, California	5950	6175	13695					
		15170							
1500-1600	M-A WYFR Satellite Net, California	15375	17612						
1505-1530	Radio Finland, Helsinki	13695	15375						
1515-1600	Radio Berlin Int'l, East Germany	11850	15185						
1515-1600	FEBA, Mahe, Seychelles	6115	7295	9730					
1530-1545	All India Radio, New Delhi	11865	15325						
		3905	3925	4860	6160				
		7160	7412	9545	9950				
1530-1555	M-A BRT, Brussels, Belgium	17595	15510	21810					
1530-1555	Radio Austria Int'l, Vienna	6155	11780	11915					
1530-1600	Radio Prague, Czechoslovakia	6055	7345	9605	11665				
		11685	11990	15110	13715				
		17705	21505						
1530-1600	Radio Tanzania, Dar es Salaam	9684							
1530-1600	Radio Tirana, Albania	9480	11835						
1530-1600	Swiss Radio Int'l, Berne	9885	15430	17830	13685				
1530-1600	Voice of Asia, Taiwan	5980	7445						
1530-1600	Voice of Nigeria, Lagos	15120							
1540-1550	M-A Voice of Greece, Athens	9855	11645	15630					
1545-1600	Radio Canada Int'l, Montreal	9555	11915	11935	15315				
		15325	17820						
1545-1600	Radio Korea, Seoul, South Korea	7275	9870						
1545-1600	Vatican Radio, Vatican City	11810	15120	17730					
1550-1600	H-S KTWR, Agana, Guam	9780							

1600 UTC [11:00 AM EST/8:00 AM PST]

1600-1610	FEBA, Mahe, Seychelles	11865	15325		
1600-1610	Radio Lesotho, Maseru	4800			
1600-1610	SBC Radio One, Singapore	5010	5052	11940	
1600-1625	Radio Budapest, Hungary	6110	9585	9835	11910
		15160			
1600-1625	Radio Prague, Czechoslovakia	6055	7345	9605	11665
		11685	11990	15110	13715
		15110	17705	21505	
1600-1630	ELWA, Monrovia, Liberia	11830			
1600-1630	S Radio Norway Int'l, Oslo	9660	11850	11870	15310
1600-1630	Radio Pakistan, Islamabad	7365	9465	9785	11615
		11625	15125		
1600-1630	Radio Polonia, Warsaw, Poland	6135	9540		
1600-1630	M-F Radio Portugal, Lisbon	15245			
1600-1630	Radio Sweden, Stockholm	6065	11855		
1600-1630	SLBC, Colombo, Sri Lanka	6075	9720		
1600-1630	Trans World Radio, Swaziland	5055	9525		
1600-1630	Voice of Asia, Taiwan	5980	7445		
1600-1630	Voice of Vietnam, Hanoi	9840	12020		
1600-1645	H-A KTWR, Agana, Guam	9820			

West Coast To South America



QSLs courtesy of Paul Williams, Shaw Air Force Base.



Radio Cairo



frequency SECTION

1600-1645	Radio Nacional Angola, Luanda	7245	9535	11955	
1600-1645	UAE Radio, United Arab Emirates	11730	15320	17865	
1600-1655	Radio Beijing, China	7295	9570	11715	15130
1600-1700	F ABC, Alice Springs, Australia	2310	[ML]		
1600-1700	ABC, Perth, Australia	9610			
1600-1700	F ABC, Tennant Creek, Australia	2325	[ML]		
1600-1700	(US) Armed Forces Radio and TV	9700	15330	15430	
1600-1700	AWR, Alajuela, Costa Rica	15460			
1600-1700	BBC, London, England	5975	5995	6195	7105
		7180	9515	9605	9740
		11705	11820	12095	15070
		15260	15400	17885	
1600-1700	CBC Northern Quebec Service	9625	11720		
1600-1700	CBN, St. John's, Newfoundland	6160			
1600-1700	CBU, Vancouver, British Colombia	6160			
1600-1700	CFCF, Montreal, Quebec	6005			
1600-1700	CFCN, Calgary, Alberta	6030			
1600-1700	CHNS, Halifax, Nova Scotia	6130			
1600-1700	CKWX, Vancouver, British Colombia	6080			
1600-1700	CFRB, Toronto, Ontario	6070			
1600-1700	(US) Far East Network, Tokyo	3910			
1600-1700	HCJB, Quito, Ecuador	11740	15115	17890	
1600-1700	S KCBI, Dallas, Texas	11735			
1600-1700	Radio Australia, Melbourne	5995	6035	6060	6080
		7205	7215	9580	
1600-1700	Radio Beijing, China	15130			
1600-1700	Radio Canada int'l, Montreal	9625	11720	11955	15440
		17820			
1600-1700	Radio France int'l, Paris	6175	9860	11705	11995
1600-1700	Radio Jordan, Amman	9560			
1600-1700	Radio Korea, Seoul, South Korea	5975	9870		
1600-1700	Radio Malawi, Blantyre	3380	5995		
1600-1700	Radio Moscow, USSR	5905	5920	5980	6020
		6050	6095	6165	7105
		7115	7135	7150	7315
		7345	7440	9565	11670
		11840			
1600-1700	Radio Riyadh, Saudi Arabia	9705	9720		
1600-1700	Radio Tanzania, Dar es Salaam	9684			
1600-1700	Radio Zambia, Lusaka	9580			
1600-1700	S Superpower KUSW, Utah	15225			
1600-1700	Voice of America, Washington	9575	9700	9760	15205
		15410	15445	15580	15600
		17785	17800	17870	
1600-1700	Voice of Kenya, Nairobi	6100			
1600-1700	Voice of Nigeria, Lagos	7255	15120		
1600-1700	WCSN, Boston, Massachusetts	21640			
1600-1700	WHRI, Noblesville, Indiana	15105	21550		
1600-1700	WRNO, New Orleans, Louisiana	11965			
1600-1700	WYFR, Oakland, California	11830	13695	15170	15440
		21525	15566	17612	17750
		21615			
1600-1700	M-A WYFR Satellite Net, California	13695	15395		
1602-1700	WINB, Red Lion, Pennsylvania	15295			
1610-1615	M-A Vatican Radio, Vatican City	6248	7250	9645	11740
1610-1620	M-F Radio Botswana, Gaborone	3356	4820		
1610-1625	M-F FEBA, Agana, Guam	15325			
1610-1650	Deutsche Welle, West Germany	9745	11785	15105	17875
		15510			
1630-1645	Trans World Radio, Swaziland	5055	7285	9525	
1630-1700	M-A ELWA, Monrovia, Liberia	11830			
1630-1700	Radio Netherland, Hilversum	6020	15570		
1630-1700	Radio Peace and Progress, USSR	9470	9490	9515	9760
		9860	11980	12030	12050
1630-1700	Radio Polonia, Warsaw, Poland	7125	9525	11840	
1630-1700	SLBC, Colombo, Sri Lanka	6075			
1630-1700	Swaziland Commercial Radio	6155			
1630-1700	Voice of Africa, Egypt	15255			
1630-1700	M-A Voice of Namibia (Angola)	11955			
1640-1650	S Radio Free Europe, Munich*	5985	7115	9695	9725
		11895	15355		
1645-1700	BBC, London, England*	6195	7180	9605	
1645-1700	Radio Bujumbura, Burundi	3300			
1645-1700	Trans World Radio, Swaziland	7285	9525		

1700 UTC [12:00 PM EST/9:00 AM PST]

1700-1705	Radio Uganda, Kampala	4976	5026		
1700-1715	Kol Israel, Jerusalem	9385	9640	9925	11585
1700-1715	M-A Voice of Namibia (Angola)	11955			
1700-1725	Radio Netherland, Hilversum	6020	15570		
1700-1730	Radio Australia, Melbourne	5995	6060	6080	7205
		9580			
1700-1730	Radio Berlin Int'l, East Germany	6115	7260	9730	
1700-1730	Radio Japan, Tokyo	5990	11815		
1700-1730	S Radio Norway Int'l, Oslo	9655	15220	15310	
1700-1745	BBC, London, England	5975	5995	9515	9740
		11820	12095	15070	15260
		15400	17885		
1700-1750	Radio Pyongyang, North Korea	7290	9325	9640	9977
1700-1755	Radio Beijing, China	7295	9570		
1700-1800	F ABC, Alice Springs, Australia	2310	[ML]		
1700-1800	ABC, Tennant Creek, Australia	2325	[ML]		
1700-1800	(US) Armed Forces Radio and TV	9700	15330	15430	
1700-1800	CBC Northern Quebec Service	9625	11720		
1700-1800	CBN, St. John's, Newfoundland	6160			
1700-1800	CBU, Vancouver, British Colombia	6160			
1700-1800	CFCF, Montreal, Quebec	6005			
1700-1800	CFCN, Calgary, Alberta	6030			
1700-1800	CHNS, Halifax, Nova Scotia	6130			
1700-1800	CKWX, Vancouver, British Colombia	6080			
1700-1800	CFRB, Toronto, Ontario	6070			
1700-1800	(US) Far East Network, Tokyo	3910			
1700-1800	A,S KCBI, Dallas, Texas	11735			
1700-1800	Radio Havana Cuba	11920			
1700-1800	Radio Jordan, Amman	9560			
1700-1800	M-F Radio Malabo, Equatorial Guinea	9553	[ML]		
1700-1800	Radio Moscow, USSR	5920	5980	6020	6165
		7115	7135	7150	7260
		7315	7345	9470	9490
		9565	9740	9760	11840
		12050			
1700-1800	Radio Riyadh, Saudi Arabia	9705	9720		
1700-1800	Radio Tanzania, Dar es Salaam	9684			
1700-1800	Radio Zambia, Lusaka	9580			
1700-1800	SBC Radio One, Singapore	5052	11940		
1700-1800	A,S Swaziland Commercial Radio	6155			
1700-1800	S Superpower KUSW, Utah	15225			
1700-1800	Voice of Africa, Egypt	15255			
1700-1800	Voice of America, Washington	6110	9575	9645	11760
		11920	15410	15445	15580
		15600	17785	17800	17870
1700-1800	Voice of Kenya, Nairobi	6100			
1700-1800	Voice of Nigeria, Lagos	11770			
1700-1800	WCSN, Boston, Massachusetts	21640			
1700-1800	WHRI, Noblesville, Indiana	15105			
1700-1800	WINB, Red Lion, Pennsylvania	15295			
1700-1800	S-F WMLK, Bethel, Pennsylvania	9455			
1700-1800	WRNO, New Orleans, Louisiana	15420			
1700-1800	WYFR, Oakland, California	11580	11830	13695	13760
		15170	17612	17845	
1700-1800	WYFR Satellite Net, California	13695	15375		
1715-1730	Radio Korea, Seoul, South Korea	9870	15575		
1715-1745	BBC, London, England*	3975	6185	7165	
1715-1800	Radio Berlin int'l, East Germany	9665	15145	15255	
1718-1800	Radio Pakistan, Islamabad	6210	11570		
1725-1740	Radio Suriname Int'l, Paramibo	7835v			
1725-1800	Radio New Zealand, Wellington	11780	15150		
1730-1735	All India Radio, New Delhi	4840	4860	4920	6160
		7412	9950		
1730-1800	KNLS, Anchor Point, Alaska	7355			
1730-1755	Radio Bucharest, Romania	7105	9530	9685	11790
		11940			
1730-1800	Radio Australia, Melbourne	5995	6035	6060	6080
		7205	9580		
1730-1800	Radio Berlin Int'l, E. Germany	6115	7260	9730	
1730-1800	Radio Polonia, Warsaw, Poland	6135	9540		
1730-1800	Radio Prague, Czechoslovakia	9605	11685	11695	11990

frequency SECTION

1730-1800	Radio Sofia, Bulgaria	3715	15110		
1730-1800	Radio Yugoslavia, Belgrade	7245	9560	11735	15310
1730-1800	RAE, Buenos Aires, Argentina	5980	6100	7240	11735
1734-1800	FEBA, Mahe, Seychelles	15345			
1745-1800	BBC, London, England	11760			
		9515	9740	12095	15070
		15260	15400		
1745-1800	SLBC, Colombo, Sri Lanka	11800			

1800-1900	WRNO, New Orleans, Louisiana	15420			
1800-1900	WYFR, Oakland, California	11380	11560	13695	15170
		15566	17612	17845	
1800-1900	WYFR Satellite Net, California	13695	15375		
1805-1830 A,S	Radio Austria Int'l, Vienna	5945	6155	11825	12015
1815-1825	Voice of Lebanon, Beirut	6548			
1815-1900	Radio Bangladesh, Dhaka	6240	7505		
1830-1855	Radio Austria Int'l, Vienna	5945	6155	11825	12015
1830-1855	BRT, Brussels, Belgium	5910	9860	11695	
1800-1855	Radio Polonia, Warsaw, Poland	5995	6135	7125	7285
		9525	11840		
		9740	11820	12095	15400

1830-1900	BBC, London, England	15260	17820		
1830-1900 A,S	Radio Canada Int'l, Montreal	9670			
1830-1900	Radio Havana Cuba	3265	4855	9618	
1830-1900 M,W,F	Radio Mozambique, Maputo	6020	15175	17605	21685
1830-1900	Radio Netherland, Hilversum	11845			
1830-1900	Radio Sweden, Stockholm	7120	9480		
1830-1900	Radio Tirana, Albania	7275	9765	11840	15375
1830-1900	Spanish Foreign Radio, Madrid	9885	11955		
1830-1900	Swiss Radio Int'l, Berne	15185			
1830-1900	WINB, Red Lion, Pennsylvania	11645	12045	15630	
1840-1850 M-A	Voice of Greece, Athens	4950			
1840-1900	Radio Senegal, Dakar	4833	4900	7125	
1845-1855	Radio Nacional, Conakry, Guinea	7412	11620		
1845-1900	All India Radio, New Delhi	6070			
1845-1900	BBC, London, England*	9665	119200	15255	
1845-1900	Radio Berlin Int'l, East Germany	6130			
1845-1900	Radio Ghana, Accra	4830	15475		
1855-1900	Africa No. 1, Gabon				

1800 UTC [1:00 PM EST/10:00 AM PST]

1800-1804	FEBA, Mahe, Seychelles	11760			
1800-1805 A	SBC Radio One, Singapore	11940			
1800-1815	Radio Cameroon, Yaounde	3970	4750	4795	4850
		5010			
1800-1815	SLBC, Colombo, Sri Lanka	11800			
1800-1825	Radio Prague, Czechoslovakia	9605	11685	11990	13715
		15110	21505		
1800-1825	RAE, Buenos Aires, Argentina	15345			
1800-1830	BBC, London, England	9740	11820	12095	15070
		15400			
1800-1830 S	Radio Bamako, Mali	4835	5995		
1800-1830	Radio Canada Int'l, Montreal	15260	17820		
1800-1830	Radio Mozambique, Maputo	3265	4855	9618	
1800-1830	Radio Prague, Czechoslovakia	5930	7345		
1800-1830	Radio Sofia Bulgaria	7245	7155	9700	
1800-1830	Swiss Radio Int'l, Berne	3985	6165	9535	
1800-1830	Voice of Africa, Egypt	15255			
1800-1830	Voice of Vietnam, Hanoi	9840	12020		
1800-1845	Radio Abdjan, Ivory Coast	7215			
1800-1845	Trans World Radio, Swaziland	9525			
1800-1850	Deutsche Welle, West Germany	7225	9745	11785	13790
1800-1850	Radio Bras, Brasilia, Brazil	15265			
1800-1856	Radio RSA, South Africa	17880			
1800-1900 F	ABC, Alice Springs, Australia	2310 [ML]			
1800-1900 F	ABC, Tennant Creek, Australia	2325 [ML]			
1800-1900	All India Radio, New Delhi	11935	15360		
1800-1900	(US) Armed Forces Radio and TV	9700	15330	15430	
1800-1900	CBC Northern Quebec Service	9625	11720		
1800-1900	CBN, St. John's, Newfoundland	6160			
1800-1900	CBU, Vancouver, British Columbia	6160			
1800-1900	CFCF, Montreal, Quebec	6005			
1800-1900	CFCN, Calgary, Alberta	6030			
1800-1900	CHNS, Halifax, Nova Scotia	6130			
1800-1900	CKWX, Vancouver, British Columbia	6080			
1800-1900	CFRB, Toronto, Ontario	6070			
1800-1900	(US) Far East Network, Tokyo	3910			
1800-1900 A,S	KCBI, Dallas, Texas	11735			
1800-1900	KNLS, Anchor Point, Alaska	7355			
1800-1900	Radio Australia, Melbourne	5995	6035	6060	6080
		7205	7215	9580	
1800-1900	Radio Jamahiriya, Libya	15450			
1800-1900	Radio Korea, Seoul, South Korea	15575			
1800-1900	Radio Kuwait, Kuwait	11665			
1800-1900 M-F	Radio Malabo, Equatorial Guinea	9553 [ML]			
1800-1900	Radio Moscow, USSR	5920	5980	7115	7135
		7150	7195	7260	7345
		9565	11840		
1800-1900	Radio New Zealand, Wellington	11780	15150		
1800-1900	Radio Riyadh, Saudi Arabia	9705	9720		
1800-1900	Radio Tanzania, Dar es Salaam	9684			
1800-1900	Radio Zambia, Lusaka	9580			
1800-1900 M-A	Superpower KUSW, Utah	15225			
1800-1900 A,S	Swaziland Commercial Radio	6155			
1800-1900	Voice of America, Washington	9700	9760	11760	15410
		15445	15580	15600	17785
		17800	17870	21485	
1800-1900	Voice of Kenya, Nairobi	6100			
1800-1900	Voice of Nigeria, Lagos	11770	15120		
1800-1900	WCSN, Boston, Massachusetts	21515			
1800-1900	WHRI, Noblesville, Indiana	13760	15105		
1800-1900	WINB, Red Lion, Pennsylvania	15295			
1800-1900 S-F	WMLK, Bethel, Pennsylvania	9455			

1900 UTC [2:00 PM EST/11:00 AM PST]

1900-1903	Africa No. 1, Gabon	15475			
1900-1915	Radio Bangladesh, Dhaka	6240	7505		
1900-1915	Radio Tanzania, Dar es Salaam	9684			
1900-1925	Radio Budapest, Hungary	6110	7220	9585	9835
		11910			
1900-1925	Radio Netherland, Hilversum	6020	15175	17605	21685
1900-1930 F	ABC, Alice Springs, Australia	2310 [ML]			
1900-1930 F	ABC, Tennant Creek, Australia	2325 [ML]			
1900-1930	Kol Israel, Jerusalem	7355	7462	9435	9815
		9845	9855	11655	11700
1900-1930	Radio Afghanistan, Kabul	4760	6020	9635	
1900-1930	Radio Berlin Int'l, East Germany	9665	11920	15255	
1900-1930	Radio Japan, Tokyo	9505			
1900-1930	Radio Kiev, Ukraine, USSR	6010	6090	6165	7170
1900-1930 S	Radio Norway Int'l, Oslo	9590	9590	15230	
1900-1930 M-F	Radio Portugal, Lisbon	11870	15250		
1900-1930	Radio Sofia, Bulgaria	7245	9560	11735	15310
1900-1930	Radio Yugoslavia, Belgrade	5980	7240	9620	
1900-1930	Spanish Foreign Radio, Madrid	7275	9765	11840	15375
1900-1930	Voice of Vietnam, Hanoi	9840	12020		
1900-1955	Radio Beijing, China	6860	9470		
1900-2000	All India Radio, New Delhi	7412	11620	11935	15360
1900-2000	(US) Armed Forces Radio and TV	9700	15330	15430	
1900-2000	BBC, London, England	6180	9410	9740	11820
		12095	15400		
1900-2000	CBC Northern Quebec Service	9625	11720		
1900-2000	CBN, St. John's, Newfoundland	6160			
1900-2000	CBU, Vancouver, British Columbia	6160			
1900-2000	CFCF, Montreal, Quebec	6005			
1900-2000	CFCN, Calgary, Alberta	6030			
1900-2000	CHNS, Halifax, Nova Scotia	6130			
1900-2000	CKWX, Vancouver, British Columbia	6080			
1900-2000	CFRB, Toronto, Ontario	6070			
1900-2000	(US) Far East Network, Tokyo	3910			
1900-2000	HCJB, Quito, Ecuador	11790	15270	17790	
1900-2000 A,S	KCBI, Dallas, Texas	11735			
1900-2000	KNLS, Anchor Point, Alaska	7355			
1900-2000	KYOI, Saipan	9495			
1900-2000	Radio Algiers, Algeria	9509	9685	15215	17745
1900-2000	Radio Australia, Melbourne	6035	6060	6080	7205
		7215	9580		

frequency SECTION

1900-2000	Radio Ghana, Accra	6130			
1900-2000	Radio Havana Cuba	9670			
1900-2000	Radio Kuwait, Kuwait	11665			
1900-2000	M-A Radio Malabo, Equatorial Guinea	9553 [ML]			
1900-2000	Radio Moscow, USSR	7115	7150	7195	7260
		7290	9565	9580	9865
		11840			
1900-2000	Radio New Zealand, Wellington	11780	15150		
1900-2000	Radio Prague, Czechoslovakia	5930	7345		
1900-2000	Radio Riyadh, Saudi Arabia	9705	9720		
1900-2000	Radio Zambia, Lusaka	9580			
1900-2000	M-A Superpower KUSW, Utah	17715			
1900-2000	A,S Swaziland Commercial Radio	6155			
1900-2000	Trans World Radio Swaziland	3205			
1900-2000	Voice of America, Washington	9700	9760	11760	15410
		15445	15580	17785	17800
		17870	21485		
1900-2000	Voice of Ethiopia, Addis Ababa	9595			
1900-2000	Voice of Kenya, Nairobi	6100			
1900-2000	Voice of Nigeria, Lagos	7255	11770		
1900-2000	WCSN, Boston, Massachusetts	21515			
1900-2000	WHRI, Noblesville, Indiana	13760	17830		
1900-2000	WINB, Red Lion, Pennsylvania	15295			
1900-2000	S-F WMLK, Bethel, Pennsylvania	9455			
1900-2000	WRNO, New Orleans, Louisiana	15420			
1900-2000	WYFR, Oakland, California	13695	15170	15566	17612
		17845	21525		
1900-2000	M-A WYFR Satellite Net, California	13695	15395		
1910-1920	Radio Botswana, Gaborone	3356	4820		
1920-1930	M-A Voice of Greece, Athens	7430	9425	11645	
1930-1940	Radio Togo, Lome	5047			
1930-2000	ABC, Katherine, Australia	2485			
1930-1955	Radio Finland, Helsinki	6120	9530	11755	
1930-2000	Radio Beijing, China	6955	7480	9440	
1930-2000	Radio Bucharest, Romania	5990	6105	7145	7195
1930-2000	M-F Radio Canada Int'l, Montreal	5995	7235	11945	15325
		17875			
1930-2000	Voice of Republic of Iran	9022	9770		
1935-1955	RAI, Rome, Italy	7275	7290	9575	
1940-2000	M-A Radio Ulan Bator, Mongolia	9575	11790		
1945-2000	All India Radio, New Delhi	9755	11860		

2000 UTC [3:00 PM EST/12:00 PM PST]

2000-2005	S-F Port Moresby, Papua New Guinea	3295	4890	5960	5985
		6020	6040	6080	6140
		9520			
2000-2005	Radio Zambia, Lusaka	3345	6165		
2000-2005	M-A Vatican Radio, Vatican City	6190	6248	7250	9625
		9645	11700	15120	
2000-2010	A Radio Zambia, Lusaka	3345	6165		
2000-2010	Voice of Kenya, Nairobi	6100			
2000-2015	Radio Togo, Lome	3220	5047		
2000-2015	Radio Ulan Bator, Mongolia	9575	11790		
2000-2015	Trans World Radio, Swaziland	3205			
2000-2025	Radio Beijing, China	6955	7480	9440	
2000-2025	Radio Bucharest, Romania	5990	6105	7145	7195
2000-2030	KNLS, Anchor Point, Alaska	7355			
2000-2030	Radio Australia, Melbourne	6035	7205	7215	9580
		9620			
2000-2030	Radio Ghana, Nairobi	3366	4915		
2000-2030	Radio Norway International, Oslo	6000	7125	9525	15310
2000-2030	Radio Polonia, Warsaw, Poland	7125	7145	9525	
2000-2030	Swaziland Commercial Radio	6155			
2000-2030	Voice of Nigeria, Lagos	7255			
2000-2030	Voice of Republic of Iran	9022	9770		
2000-2045	All India Radio, New Delhi	7412	9755	9910	11620
		11860			
2000-2045	WYFR, Oakland, California	9455	13695	15170	15566
		17612	17845		
2000-2050	Radio Pyongyang, North Korea	6576	9345	9640	9977
2000-2056	Radio RSA, South Africa	7270	11900	15252	
2000-2100	M-A ABC, Alice Springs, Australia	2310 [ML]			



Too bad we're not in color; A. Correja of Reheboth, Massachusetts, sent this colorful card from Radio Prague.

2000-2100	ABC, Katherine, Australia	2485			
2000-2100	M-A ABC, Tennant Creek, Australia	2325 [ML]			
2000-2100	BBC, London, England	6005	6175	6180	7325
		9410	9580	11820	12095
		15070	15400		
2000-2100	CBN, St. John's, Newfoundland	6160			
2000-2100	CBU, Vancouver, British Columbia	6160			
2000-2100	CFCF, Montreal, Quebec	6005			
2000-2100	CFCN, Calgary, Alberta	6030			
2000-2100	CHNS, Halifax, Nova Scotia	6130			
2000-2100	CKWX, Vancouver, British Columbia	6080			
2000-2100	CFRB, Toronto, Ontario	6070			
2000-2100	(US) Far East Network, Tokyo	3910			
2000-2100	Radio Kuwait, Kuwait	11665			
2000-2100	King of Hope, Southern Lebanon	6280			
2000-2100	M-F KVOH, Rancho Simi, California	17775			
2000-2100	KYOI, Salpan	9495			
2000-2100	Radio Baghdad, Iraq	9875			
2000-2100	M-F Radio Malabo, Equatorial Guinea	9553			
2000-2100	Radio Moscow, USSR	5905	7115	7150	7185
		7195	7840	9735	11840
2000-2100	Radio New Zealand, Wellington	11780	15150		
2000-2100	Radio Riyadh, Saudi Arabia	9705	9720		
2000-2100	Radio Zambia, Lusaka	9580			
2000-2100	Superpower KUSW, Utah	17715			
2000-2100	Voice of America, Washington	9670	9760	11760	15410
		15445	15580	17785	17800
		17870			
2000-2100	Voice of Turkey, Ankara	7130	7165	7215	9445
2000-2100	Voice of Nigeria, Lagos	11770			
2000-2100	WCSN, Boston, Massachusetts	15390			
2000-2100	WHRI, Noblesville, Indiana	13760	17830		
2000-2100	WRNO, New Orleans, Louisiana	15420			
2003-2100	WINB, Red Lion, Pennsylvania	15295			
2005-2100	Radio Damascus, Syria	9950	11625		
2010-2100	A,S Voice of Kenya, Nairobi	6100			
2015-2100	ELWA, Monrovia, Liberia	11830			
2015-2100	Radio Cairo, Egypt	9670			
2025-2045	RAI, Rome, Italy	7235	9575	9710	
2030-2055	Radio Polonia, Warsaw, Poland	6095	7285		
2030-2100	Radio Australia, Melbourne	9580	9620		
2030-2100	Radio Beijing, China	6955	7480	9440	9745
		11790			
2030-2100	Radio Korea, Seoul, South Korea	6480	7550	15575	
2030-2100	Radio Netherland, Hilversum	9540	9715	9895	11740
2030-2100	M-F Radio Portugal, Lisbon	7155	9740		
2030-2100	Radio Sofia Bulgaria	7115	7155	9700	
2030-2100	Radio Tirana, Albania	9480	11835		
2030-2100	Voice of Africa, Cairo, Egypt	15375			

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2030-2100	Voice of Vietnam, Hanoi	9840	12020		
2030-2100	Spanish Foreign Radio, Madrid	7275	9765		
2040-2100	Radio Havana Cuba	15230	15300		
2045-2100	All India Radio, New Delhi	7412	9550	9910	11620
		11715			
2045-2100	IBRA Radio, Malta	6100			
2045-2100	Radio Berlin Int'l, East Germany	5965	6125		
2045-2100	Radio Korea, Seoul, South Korea	5975			
2045-2100	Vatican Radio, Vatican City	9625	11700	11760	15120
2045-2100	WYFR, Oakland, California	11830	13695	15170	15566
		17612	17845		
2050-2100	Vatican Radio, Vatican City	6190	7250	9645	

2100-2200	WRNO, New Orleans, Louisiana	15420			
2110-2200	Radio Damascus, Syria	9950	11625		
2125-2155	S Radio Austria Int'l, Vienna	5945	6155	7205	9655
2125-2200	A,S Radio Canada Int'l, Montreal	5995	7130	11945	15325
2130-2145	BBC, London, England*	5965	7160		
2130-2200	BBC, London, England*	6030	7230	9635	
2130-2200	HCJB, Quito, Ecuador	11790	15270	17790	
2130-2200	Radio Canada Int'l, Montreal	5995	11880	11945	15150
		15325	17820		
2130-2200	Radio Sofia, Bulgaria	6070	7115	7155	
2135-2150	S-F ELWA, Monrovia, Liberia	11830			
2145-2200	Radio Berlin Int'l, E. Germany	5965	6125		
2145-2200	WYFR, Oakland, California	11830	13695	17612	17845
2150-2200	M-F ELWA, Monrovia, Liberia	11830			

2100 UTC [4:00 PM EST/1:00 PM PST]

2100-2105	Radio Damascus, Syria	9950	11625		
2100-2105	Radio Zambia, Lusaka	3345	6165		
2100-2110	Vatican Radio, Vatican City	6190	7250	9645	
2100-2110	A,S Voice of Kenya, Nairobi	6100			
2100-2115	IBRA Radio, Malta	6100			
2100-2125	Radio Austria Int'l, Vienna	5945	6155	9585	9870
2100-2125	Radio Beijing, China	6955	7480	9440	9745
		11790			
2100-2125	Radio Bucharest, Romania	5990	6105	7145	7195
2100-2125	Radio Netherland, Hilversum	9540	9715	9895	11740
2100-2130	Radio Berlin Int'l, East Germany	5965	6125		
2100-2130	Radio Japan, Tokyo	5965	7140	7280	17835
2100-2130	Radio Korea, Seoul, South Korea	6480	7550	15575	
2100-2130	Radio Moscow, USSR	7150	7195	11840	
2100-2130	Radio Sweden, Stockholm	6065	9700		
2100-2130	Spanish Foreign Radio, Madrid	7275	9765		
2100-2130	Swiss Radio Int'l, Berne	9885	12035	15570	
2100-2135	ELWA, Monrovia, Liberia	11830			
2100-2140	Radio Havana Cuba	15230	15300	15340	
2100-2145	Radio Cairo, Egypt	9670			
2100-2145	WYFR, Oakland, California	9852	11905	13695	15170
		17612	17845		
2100-2150	Deutsche Welle, West Germany	7130	9765		
2100-2150	Radio Baghdad, Iraq	9875			
2100-2150	Voice of Turkey, Ankara	7215			
2100-2155	Radio Beijing, China	6860	9470	9860	
2100-2200	M-A ABC, Alice Springs, Australia	2310	[ML]		
2100-2200	M-A ABC, Katherine, Australia	2485			
2100-2200	M-A ABC, Tennant Creek, Australia	2325	[ML]		
2100-2200	All India Radio, New Delhi	9550	9910	11715	
2100-2200	(US) Armed Forces Radio and TV	15330	15345	15430	
2100-2200	BBC, London, England	3995	6005	6175	6180
		7325	9410	15260	
2100-2200	CBC Northern Quebec Service	9625	11720		
2100-2200	CBN, St. John's, Newfoundland	6160			
2100-2200	CBU, Vancouver, British Columbia	6160			
2100-2200	CFCF, Montreal, Quebec	6005			
2100-2200	CFCN, Calgary, Alberta	6030			
2100-2200	CHNS, Halifax, Nova Scotia	6130			
2100-2200	CKWX, Vancouver, British Columbia	6080			
2100-2200	CFRB, Toronto, Ontario	6070			
2100-2200	(US) Far East Network, Tokyo	3910			
2100-2200	King of Hope, Southern Lebanon	6280			
2100-2200	KSDA, Agat, Guam	11965			
2100-2200	M-A KUSW, Salt Lake City, Utah	17715			
2100-2200	KVOH, Rancho Simi, California	17775			
2100-2200	Radio Baghdad, Iraq	9875			
2100-2200	A,S Radio Malabo, Equatorial Guinea	9552.5			
2100-2200	Radio RSA, South Africa	7295	9580	11900	
2100-2200	A,S Radio Zambia, Lusaka	9580			
2100-2200	Voice of Africa, Cairo, Egypt	15375			
2100-2200	Voice of America, Washington	6040	6045	9700	11760
		15410	15445	15580	17785
		17800	17870		
2100-2200	Voice of Nigeria, Lagos	15120			
2100-2200	WCSN, Boston, Massachusetts	9495			
2100-2200	WHRI, Noblesville, Indiana	9770	17830		
2100-2200	WINB, Red Lion, Pennsylvania	15185			

2200 UTC [5:00 PM EST/2:00 PM PST]

2200-2205	M-F ELWA, Monrovia, Liberia	3993	11830		
2200-2210	M-H Port Moresby, Papua New Guinea	3925	4890	5960	5985
		6020	6040	6080	6140
		9520			
2200-2210	Radio Damascus, Syria	9950	11625		
2200-2210	Radio Sierra Leone, Freetown	5980			
2200-2215	M-A ABC, Alice Springs, Australia	2310	[ML]		
2200-2215	M-A ABC, Tennant Creek, Australia	2325	[ML]		
2200-2215	BBC, London, England*	5965	7160		
2200-2215	M-F Voice of America, Washington	9640	11740	15120	15160
		17730			
2200-2225	BRT, Brussels, Belgium	5910			
2200-2225	Radio Finland, Helsinki	6120	9670		
2200-2225	RAI, Rome, Italy	5990	9710	11800	
2200-2225	Vatican Radio, Vatican City	6015	9615	11830	
2200-2230	ABC, Katherine, Australia	2485			
2200-2230	All India Radio, New Delhi	9550	9910	11620	11715
2200-2230	BBC, London, England	5975	6005	6175	7325
		9915	15260		
		9625	11720		
2200-2230	S KGEI, San Francisco, California	15280			
2200-2230	M-A KUSW, Salt Lake City, Utah	15580			
2200-2230	Radio Berlin Int'l, E. Germany	15965	6125		
2200-2230	S Radio Norway Int'l, Oslo	9605	9525	11860	
2200-2230	Radio Prague, Czechoslovakia	6055			
2200-2245	WINB, Red Lion, Pennsylvania	15185			
2200-2245	WYFR, Oakland, California	13695	15170	17612	17845
2200-2250	Radio Baghdad, Iraq	9875			
2200-2255	RAE, Buenos Aires, Argentina	6060	9690	11710	
2200-2300	(US) Armed Forces Radio and TV	6030	15345	15430	
2200-2300	CBN, St. John's, Newfoundland	6160			
2200-2300	CBU, Vancouver, British Columbia	6160			
2200-2300	CFCF, Montreal, Quebec	6005			
2200-2300	CFCN, Calgary, Alberta	6030			
2200-2300	CHNS, Halifax, Nova Scotia	6130			
2200-2300	CKWX, Vancouver, British Columbia	6080			
2200-2300	CFRB, Toronto, Ontario	6070			
2200-2300	(US) Far East Network, Tokyo	3910			
2200-2300	King of Hope, Southern Lebanon	6280			
2200-2300	KVOH, Rancho Simi, California	17775			
2200-2300	Radio Australia, Melbourne	15160	15240	15320	15395
		17795			
2200-2300	M-F Radio Canada Int'l, Montreal	9760	11945		
2200-2300	Radio Havana Cuba	6165			
2200-2300	Radio Moscow, USSR	5915	5945	6045	6200
		7115	7195	7310	9490
		9515	12050	13665	15455
2200-2300	SBC Radio One, Singapore	5010	5052	11940	
2200-2300	Voice of America, Washington	15120	15185	15290	15305
		15320	17740		
2200-2300	Voice of Free China, Taiwan	7355	9955	11805	15370
2200-2300	WCSN, Boston, Massachusetts	9495			
2200-2300	WHRI, Noblesville, Indiana	9770	17830		
2200-2300	WRNO, New Orleans, Louisiana	13760			
2215-2230	BBC, London, England*	11820	15390		
2215-2230	Radio Yugoslavia, Belgrade	5980	7240	9620	

2230-2300	BBC, London, England	5975	6005	6175	7325
		9410	9915	15070	
2230-2300 A.S	CBC Northern Quebec Service	9625	11720		
2230-2300	Kol Israel, Jerusalem	7355	7462	9010	9435
		9815	9845	11655	
2230-2300	Radio Beijing, China	3985	6165		
2230-2300	Radio Jamahlriya, Libya	7245	11815		
2230-2300	Radio Mediterran, Malta	6110			
2230-2300	Radio Polonia, Warsaw, Poland	5995	6135	7125	7270
2230-2300	Radio Sofia, Bulgaria	6070	11720		
2230-2300	Radio Tirana, Albania	7215	9480		
2230-2300	Radio Vilnius, Lithuania, USSR	6100			
2230-2300	Swiss Radio Int'l, Berne	6190			
2230-2300	Voice of Vietnam, Hanoi	9840	12020		
2245-2300	All India Radio, New Delhi	6055	7215	9535	9910
		11715	11745		
2245-2300	Radio Ghana, Accra	3366	4915		
2245-2300	Radio New Zealand, Wellington	15150	17705		
2245-2300	WYFR, Oakland, California	13695	15170	17612	17845
2248-2300	WINB, Red Lion, Pennsylvania	15145			

2300-0000	CBN, St. John's, Newfoundland	6160			
2300-0000	CBU, Vancouver, British Columbia	6160			
2300-0000	CFCF, Montreal, Quebec	6005			
2300-0000	CFCN, Calgary, Alberta	6030			
2300-0000	CHNS, Halifax, Nova Scotia	6130			
2300-0000	CKWX, Vancouver, British Columbia	6080			
2300-0000	CFRB, Toronto, Ontario	6070			
2300-0000	(US) Far East Network, Tokyo	3910			
2300-0000 M-A	KUSW, Salt Lake City, Utah	15580			
2300-0000	KVOH, Rancho Simi, California	17775			
2300-0000	Radio Australia, Melbourne	15160	15240	15320	15395
		17795			
2300-0000	Radio Jamahlriya, Libya	7235			
2300-0000	Radio Japan, Tokyo	7280	11800	15195	15280
		15300			
2300-0000	Radio Moscow, USSR	5915	6045	7115	7150
		7215	7310	11770	12050
		15425	15445		
		13665			
2300-0000	Radio New Zealand, Wellington	15150	17705		
2300-0000	Radio Thailand, Bangkok	9655	11905		
2300-0000	Voice of America, Washington	6045			
2300-0000	WCSN, Boston, Massachusetts	9495			
2300-0000	WHRI, Noblesville, Indiana	9770	11770		
2300-0000	WRNO, New Orleans, Louisiana	13760			
2300-0000	WYFR, Oakland, California	9660	9680	15170	15440
		17612			
2315-2330	BBC, London, England*	11820	15390		
2315-0000	BBC, London, England	5975	6005	6175	7325
		9515	9590	9915	11955
		15435			
2320-2325 M-A	Radio Prague, Czechoslovakia	6055	9630		
2330-0000	Radio Korea, Seoul	15575			
2330-0000	Radio Tirana, Albania	6200	7065	9762	
2330-0000	Voice of Vietnam, Hanoi	9840	12020		
2335-2345 M-A	Voice of Greece, Athens	9395	11645		
2345-0000	BBC, London, England*	3915	6080	7180	9580
2348-0000	WINB, Red Lion, Pennsylvania	15145			

2300 UTC [8:00 PM EST/3:00 PM PST]

2300-2315	BBC, London, England	5975	6005	6120	6175
		6195	7325	9515	9590
		9915	15260		
2300-2330	Radio Canada Int'l, Montreal	9755	11730		
2300-2330	Radio Mediterran, Malta	6110			
2300-2330	Radio Sofia, Bulgaria	6070	11720		
2300-2330	Radio Sweden, Stockholm	6045	9695		
2300-2330	Radio Vilnius, Lithuania, USSR	6200	7165	7400	11790
		11860	13645		
2300-2345	WINB, Red Lion, Pennsylvania	15145			
2300-2350	Radio Pyongyang, North Korea	11735	13650		
2300-2350	Voice of Turkey, Ankara	7135	7160	9445	17760
2300-0000	All India Radio, New Delhi	6055	7215	9535	9910
		11715	11745		
2300-0000	(US) Armed Forces Radio and TV	6030	15345		
2300-0000	CBC Northern Quebec Service	9625	11720		

CANADIAN DX RELAY
OFFICIAL VERIFICATION CARD

Dear CDXR Member: **VE9EK**

This will verify your reception of Radio Station

Nov 4 - 3M

We have checked your report with our station log of that date and are pleased to inform you that it is correct.

Remarks:

Signed **Jamarquis**

Radio Station WEXL, November 2, 1934
Royal Oak, Michigan
1310 Kc. - 50 Watts

Dear Sir:

This will verify your reception of Station WEXL on October 30, 1934, at 2:15 a.m. E.S.T.

Thank you for your report.

Very truly yours,

Garnet G. Sparks
Garnet G. Sparks
Moonlight Broadcaster

Dear Friend:

We thank you sincerely for your report of reception of

KFPM on **February 2nd**

This report, we are glad to verify.

enable to verify for lack of sufficient information

Ekko stamp attached

Ekko stamp supplied for 10c and proof of reception

KFPM uses 15 watts on 1810 kilocycles

Next DX program

RADIO STATION KFPM

March 2nd

W. H. B. Williams

270-2-2007-72 C. S. S.

In line with this month's photoplay on old QSL archives (see page 18), Harold Bower of Sunbury, Pennsylvania, sent along these CB cards reminiscent of bygone days. He notes that VE9EK was using 10 watts at the time. Send us your special QSLs and we'll copy and return them promptly, to be used as space permits (QSL editor, PO Box 98, Brasstown, NC 28902).

Your Guide to Shortwave Listening in April

Day to Day Shortwave

How to Use This Section

Day to Day Shortwave is your daily guide to the programs being broadcast on the international bands. Wherever possible, actual advance program details for the listed stations are included. To use this section, simply look up the day on which you are listening, check the time, and decide which program interests you. Then go to the frequency section in order to locate the frequency of the station/program on the dial.

All days are in UTC. Keep in mind that the new UTC day begins at 0000 UTC. Therefore, if you are listening to the shortwave at 7:01 PM [EST] on your local Thursday night, that's equal to 0001 UTC and therefore *Friday* UTC.

We invite broadcast stations to submit advance program details for publication in *Monitoring Times*. Copy deadline is the 10th of the month preceding publication [i.e. details for programs to be broadcast in February must be received at *Monitoring Times* by January 10th. Information can be FAXed via 1-704-837-6416 and must include the following information at the top of the first page: To: Monitoring Times, Brasstown, North Carolina. Phone: 1-704-837-9200.

We also invite readers to submit information about their favorite programs. These must be in UTC day and time and can be sent to: Program Editor, Monitoring Times, 140 Dog Branch Road, Brasstown, North Carolina 28902.

Sunday

0000 BBC: *World News*
0000 KVOH: *World News*
0009 BBC: *News About Britain*
0015 BBC: *Radio Newsreel*
0030 BBC: *Musical Masters of the Baroque* (except 10th, Play of the Week: *Tartuffe*)
0030 KVOH: *Sportscast*
0050 Vatican Radio: *With Heart and Mind*
0053 KVOH: *World News*
0100 BBC: *News Summary* (except 10th)
0100 Deutsche Welle: *News*
0102 BBC: *Play of the Week* (3rd: *Albert's Bridge*, 10th: *Tartuffe*, 17th: *The Lion in Winter*, 24th: *Sarcophagus*)
0130 Voice of Greece: *News*
0200 BBC: *World News*
0200 Radio Austria International: *DX Program*
0209 BBC: *The Sunday Papers*

0215 BBC: *Cannery Row*
0230 BBC: *Album Time*
0230 Radio Netherlands: *World News*
0235 Radio Netherlands: *Newsline*
0250 Radio Netherlands: *Over to You!* (Listener letters)
0300 BBC: *World News*
0300 Deutsche Welle: *News*
0300 Voice of Nicaragua: *Nicaragua Today* (News)
0309 BBC: *News About Britain*
0315 BBC: *From Our Own Correspondent*
0330 BBC: *Jazz Score*
0340 Voice of Greece: *News*
0345 Voice of Nicaragua: *Nicaragua Today* (News)
0400 BBC: *Newsdesk*
0430 BBC: *The Seven Ages of Man*
0445 BBC: *Reflections* (Religion)
0450 BBC: *Financial Review*
0500 BBC: *World News*
0500 Deutsche Welle: *News*
0509 BBC: *Twenty-Four Hours* (News Summary)
0510 Radio Botswana: *News*
0530 BBC: *Big Bands - The Singers* (except 3rd: *The Wonderous Cross*)
0530 Radio Netherlands: *World News*
0535 Radio Netherlands: *Newsline* (See 0235)
0545 BBC: *Letter from America* (Alstaire Cook)
0550 Radio Netherlands: *Over to You!* (See 0250)
0600 BBC: *Newsdesk*
0600 Vatican Radio: *With Heart and Mind*
0600 Voice of Nicaragua: *Nicaragua Today* (News)
0630 BBC: *Jazz for the Asking*
0645 Voice of Nicaragua: *Nicaragua Today* (News)
0700 BBC: *World News*
0709 BBC: *Twenty-Four Hours* (News Summary)
0730 BBC: *From Our Own Correspondent*
0745 BBC: *Book Choice*
0750 BBC: *Waveguide* (SWL tips)
0800 BBC: *World News*
0809 BBC: *Reflections*
0815 BBC: *The Pleasure's Yours* (Record requests)
0900 BBC: *World News*
0909 BBC: *The Sunday Papers*
0915 BBC: *Science in Action*
0945 BBC: *Squaring the Triangle* (except 3rd: *Education Today*)
1000 BBC: *News Summary*
1002 BBC: *Short Story*
1015 BBC: *Classical Record Review*
1030 BBC: *Religious Service*
1100 BBC: *World News*

1109 BBC: *News About Britain*
1115 BBC: *From Our Own Correspondent* (except 3rd: *The Wonderous Cross*)
1125 Radio Botswana: *News*
1130 BBC: *Musical Masters of the Baroque* (except 10th: *Play of the Week - Tartuffe*)
1200 BBC: *News Summary* (except 10th)
1202 BBC: *Play of the Week* (3rd: *Albert's Bridge*, 10th: *Tartuffe*, 17th: *Lion in Winter*, 24th: *Sarcophagus*)
1235 Voice of Greece: *News*
1300 BBC: *World News*
1309 BBC: *Twenty-Four Hours* (News summary)
1330 BBC: *Sports Roundup*
1345 BBC: *The Tony Myatt Request Show*
1400 BBC: *News Summary*
1430 BBC: *Jazz Score*
1500 BBC: *Radio Newsreel*
1515 BBC: *Concert Hall* (except 24th: *Sportsworld*)
1540 Voice of Greece: *News*
1600 BBC: *World News*
1609 BBC: *Commentary*
1615 BBC: *Can Communism Cope?* (except 3rd: *Why Should This Happen to Me?*)
1645 BBC: *Letter from America* (Alstaire Cook)
1700 BBC: *World News*
1709 BBC: *Reflections* (Religion)
1715 BBC: *Jazz for the Asking*
1745 BBC: *Sports Roundup*
1800 BBC: *Newsdesk*
1800 BBC: *My Word*
1840 Voice of Greece: *News*
1900 BBC: *News Summary*
1902 BBC: *Classical Record Review*
1910 Radio Botswana: *News*
1915 BBC: *Feature* (3rd: *Kingfisher - Pt. 2*, 17th: *The Drum*, 24th: *The Mormon Conquest*)
2000 BBC: *World News*
2000 KVOH: *World News*
2009 BBC: *Twenty-Four Hours* (News summary)
2012 KVOH: *Sportscast*
2030 BBC: *Sunday Half Hour*
2030 KVOH: *Unshackled* (Religious drama)
2100 BBC: *News Summary*
2100 KVOH: *World News*
2102 BBC: *Short Story* (except 3rd: *The Wonderous Cross*)
2105 KVOH: *Wonderful Words of Life*
2115 BBC: *The Pleasure's Yours* (Record Requests)
2120 KVOH: *Sportscast*
2130 KVOH: *New Horizons*
2200 BBC: *World News*

Your Guide to Shortwave Listening in April

2200 KVOH: *World News*
 2209 BBC: *Cannery Row*
 2220 KVOH: *Sportscast*
 2225 BBC: *Book Choice*
 2230 BBC: *Financial Review*
 2230 KVOH: *Living by Giving*
 2240 BBC: *Reflections (Religion)*
 2245 BBC: *Sports Roundup*
 2245 KVOH: *U.S. Presidential Message*
 2300 BBC: *World News*
 2300 KVOH: *World News*
 2309 BBC: *Commentary*
 2315 BBC: *Letter from America (Alstaire Cook)*
 2320 KVOH: *Sportscast*
 2330 BBC: *Six Cities*
 2335 Voice of Greece: *News*

Monday

0000 BBC: *World News*
 0000 KVOH: *World News*
 0009 BBC: *News about Britain*
 0015 BBC: *Radio Newsreel*
 0020 KVOH: *Sportscast*
 0030 BBC: *Religious Service*
 0050 Vatican Radio: *The Pope, The Church, The World*
 0053 KVOH: *World News*
 0100 BBC: *News Summary*
 0100 Deutsche Welle: *News*
 0102 BBC: *Feature (3rd: The Kingfisher, 18th: The Drum, 25th: The Mormon Conquest)*
 0130 KVOH: *World News*
 0130 Voice of Greece: *News*
 0145 BBC: *Virtuoso (except 25th: Rhythms of the Sun)*
 0200 BBC: *World News*
 0209 BBC: *Commentary*
 0215 BBC: *Peeble's Choice*
 0230 BBC: *Science in Action*
 0230 Radio Netherlands: *Happy Station (Informal music/talk)*
 0300 BBC: *World News*
 0300 Deutsche Welle: *News*
 0309 BBC: *News about Britain*
 0315 BBC: *Good Books*
 0330 BBC: *Anything Goes*
 0340 Voice of Greece: *News*
 0400 BBC: *Newsdesk*
 0430 BBC: *Augustus Carp Esq By Himself (except 25th: Behind the Walls)*
 0445 BBC: *Reflections (Religion)*
 0450 BBC: *Waveguide (Listening Tips)*
 0500 BBC: *World News*
 0500 Deutsche Welle: *News*
 0509 BBC: *Twenty-Four Hours (News summary)*
 0510 Radio Botswana: *News*
 0530 BBC: *Nature Notebook*
 0530 Radio Netherlands: *Happy Station*

(See 0230)
 0545 BBC: *Recording of the Week*
 0600 BBC: *Newsdesk*
 0600 Vatican Radio: *The Pope, The Church, The World*
 0630 BBC: *Six Cities*
 0700 BBC: *World News*
 0709 BBC: *Twenty-Four Hours (News summary)*
 0730 BBC: *Can Communism Cope? (except 4th: Why Should This Happen to Me?)*
 0800 BBC: *World News*
 0809 BBC: *Reflections*
 0815 BBC: *Augustus Carp Esq By Himself (except 25th: Behind the Walls)*
 0830 BBC: *Anything Goes*
 0840 Voice of Greece: *News*
 0900 BBC: *World News*
 0909 BBC: *British Press Review*
 0915 BBC: *Good Books*
 0930 BBC: *Financial News (except 4th: Through My Window)*
 0945 BBC: *Peeble's Choice*
 1000 BBC: *News Summary*
 1002 BBC: *Six Cities*
 1030 BBC: *The Vintage Chart Show*
 1040 Voice of Greece: *News*
 1100 BBC: *World News*
 1109 BBC: *News About Britain*
 1110 Radio Botswana: *News*
 1115 BBC: *Tech Talk*
 1120 Radio Botswana: *University of Botswana*
 1115 BBC: *Health Matters*
 1130 BBC: *Album Time*
 1200 BBC: *Radio Newsreel*
 1215 BBC: *My Word!*
 1235 Voice of Greece: *News*
 1245 BBC: *Sports Roundup*
 1300 BBC: *World News*
 1309 BBC: *Twenty-Four Hours (News summary)*
 1330 BBC: *Anything Goes*
 1400 BBC: *News*
 1405 BBC: *Outlook*
 1445 BBC: *Cannery Row*
 1500 BBC: *Radio Newsreel*
 1515 BBC: *Six Cities (except 4th: Sportsworld)*
 1540 Voice of Greece: *News*
 1545 BBC: *Cannery Row*
 1600 BBC: *World News*
 1609 BBC: *Commentary*
 1610 Radio Botswana: *News*
 1615 BBC: *Squaring the Triangle (except 4th: A Journey Round My People)*
 1630 BBC: *Big Bands - The Singers*
 1645 BBC: *The World Today*
 1645 Radio Botswana: *Around the World Today*
 1700 BBC: *World News*

1709 BBC: *Book Choice*
 1745 BBC: *Sports Roundup*
 1800 BBC: *Newsdesk*
 1830 BBC: *Multitrack 1 (Top 20)*
 1840 Voice of Greece: *News*
 1900 BBC: *News Summary*
 1902 BBC: *Outlook*
 1910 Radio Botswana: *News*
 1932 BBC: *Stock Market Report*
 1945 BBC: *Peeble's Choice*
 2000 BBC: *World News*
 2000 KVOH: *World News*
 2005 KVOH: *Our Daily Bread*
 2009 BBC: *Twenty-Four Hours (News Summary)*
 2020 KVOH: *Business Report*
 2030 BBC: *Sports International*
 2030 KVOH: *World News*
 2035 KVOH: *Business Report*
 2045 KVOH: *Globalcast*
 2100 BBC: *News Summary*
 2100 KVOH: *World News*
 2102 BBC: *Network UK*
 2112 KVOH: *Sportscast*
 2115 BBC: *Journey Round My People*
 2120 KVOH: *Joni and Company*
 2130 BBC: *The Vintage Chart Show*
 2130 KVOH: *World News*
 2200 BBC: *World News*
 2200 KVOH: *World News*
 2205 KVOH: *Marilyn Hickey*
 2209 BBC: *The World Today*
 2225 BBC: *Book Choice*
 2225 KVOH: *Sportscast*
 2230 BBC: *Financial News*
 2230 KVOH: *World News*
 2235 KVOH: *Today with Derek Prince*
 2240 BBC: *Reflections*
 2245 BBC: *Sports Roundup*
 2300 BBC: *World News*
 2300 KVOH: *World News*
 2309 BBC: *Commentary*
 2310 KVOH: *Sportscast*
 2315 BBC: *Education Today*
 2315 KVOH: *Way of Faith*
 2330 BBC: *Multitrack 1 (Top 20)*
 2330 KVOH: *World News*
 2335 Voice of Greece: *News*
 2350 KVOH: *Religion Report*

Tuesday

0000 BBC: *World News*
 0000 KVOH: *World News*
 0005 KVOH: *Point of View*
 0009 BBC: *News about Britain*
 0015 BBC: *Radio Newsreel*
 0050 Vatican Radio: *A Many Splendored Thing*
 0100 BBC: *News Summary*
 0100 Deutsche Welle: *News*
 0100 KVOH: *World News*

Your Guide to Shortwave Listening in April

- 0102 BBC: *Outlook*
 0105 KVOH: *Our Daily Bread*
 0120 KVOH: *Sportscast*
 0130 BBC: *Short Story*
 0130 KVOH: *World News*
 0130 Voice of Greece: *News*
 0200 BBC: *World News*
 0200 KVOH: *World News*
 0205 KVOH: *High Adventure's Hall of Fame*
 0209 BBC: *Commentary*
 0215 BBC: *Network UK*
 0230 BBC: *Sports International*
 0230 Radio Netherlands: *World News*
 0235 Radio Netherlands: *Newsline*
 0250 Radio Netherlands: *Research File (Science)*
 0300 BBC: *World News*
 0300 Deutsche Welle: *News*
 0300 Voice of Nicaragua: *Nicaragua Today (News)*
 0309 BBC: *News about Britain*
 0315 BBC: *The World Today*
 0330 BBC: *John Peel (Progressive rock)*
 0340 Voice of Greece: *News*
 0345 Voice of Nicaragua: *Nicaragua Today (News)*
 0400 BBC: *Newsdesk*
 0445 BBC: *Reflections (Religion)*
 0450 BBC: *Financial News*
 0500 BBC: *World News*
 0500 Deutsche Welle: *News*
 0509 BBC: *Twenty-Four Hours (News summary)*
 0510 Radio Botswana: *News*
 0530 BBC: *New Ideas (British products)*
 0530 Radio Netherlands: *World News*
 0535 Radio Netherlands: *Newsline (See 0235)*
 0545 BBC: *The World Today*
 0550 Radio Netherlands: *Research File (See 0250)*
 0600 BBC: *Newsdesk*
 0600 Vatican Radio: *A Many Splendored Thing*
 0600 Voice of Nicaragua: *Nicaragua Today (News)*
 0630 BBC: *Rock Salad*
 0645 Voice of Nicaragua: *Nicaragua Today (News)*
 0700 BBC: *World News*
 0709 BBC: *Twenty-Four Hours (News summary)*
 0745 BBC: *Network UK*
 0800 BBC: *World News*
 0809 BBC: *Reflections*
 0815 BBC: *Health Matters*
 0830 Radio Japan: *Godzilla Conquers Brasstown*
 0840 Voice of Greece: *News*
 0900 BBC: *World News*
 0909 BBC: *British Press Review*
 0915 BBC: *The World Today*
 0930 BBC: *Financial News*
 0940 BBC: *Sports Roundup*
 1000 BBC: *News Summary*
 1030 BBC: *Sports International*
 1040 Voice of Greece: *News*
 1100 BBC: *World News*
 1109 BBC: *News about Britain*
 1110 Radio Botswana: *News*
 1115 BBC: *Waveguide (Listening tips)*
 1125 BBC: *A Letter from Scotland*
 1130 BBC: *Citizens*
 1200 BBC: *Radio Newsreel*
 1215 BBC: *Multitrack 1 (Top 20)*
 1235 Voice of Greece: *News*
 1245 BBC: *Sports Roundup*
 1300 BBC: *World News*
 1309 BBC: *Twenty-Four Hours (News summary)*
 1330 BBC: *Network UK*
 1345 BBC: *Recording of the Week*
 1400 BBC: *World News*
 1405 BBC: *Outlook*
 1500 BBC: *Radio Newsreel*
 1515 BBC: *A Jolly Good Show*
 1515 Radio Budapest: *DX program*
 1540 Voice of Greece: *News*
 1600 BBC: *World News*
 1609 BBC: *Commentary*
 1610 Radio Botswana: *News*
 1615 BBC: *Omnibus*
 1645 BBC: *The World Today*
 1700 BBC: *World News*
 1709 BBC: *A Letter from Scotland*
 1715 BBC: *Citizens*
 1745 BBC: *Sports Roundup*
 1800 BBC: *Newsdesk*
 1830 BBC: *Development '88*
 1840 Voice of Greece: *News*
 1900 BBC: *News Summary*
 1902 BBC: *Outlook*
 1910 Radio Botswana: *News*
 1939 BBC: *Stock Market Report*
 1945 BBC: *Report on Religion*
 2000 BBC: *World News*
 2000 KVOH: *World News*
 2005 KVOH: *Our Daily Bread*
 2009 BBC: *Twenty-Four Hours (News summary)*
 2020 KVOH: *Business Report*
 2030 BBC: *Midian*
 2030 KVOH: *World News*
 2035 KVOH: *Business Report*
 2045 KVOH: *Globalcast*
 2100 BBC: *News Summary*
 2100 KVOH: *World News*
 2112 KVOH: *Sportscast*
 2120 KVOH: *Joni and Company*
 2130 KVOH: *World News*
 2200 BBC: *World News*
 2200 KVOH: *World News*
 2205 KVOH: *Marilyn Hickey*
 2209 BBC: *The World Today*
 2225 BBC: *A Letter from Scotland*
 2225 KVOH: *Sportscast*
 2230 BBC: *Financial News*
 2230 KVOH: *World News*
 2235 KVOH: *Today with Derek Prince*
 2240 BBC: *Reflections*
 2245 BBC: *Sports Roundup*
 2300 BBC: *World News*
 2300 KVOH: *World News*
 2309 BBC: *Commentary*
 2310 KVOH: *Sportscast*
 2315 KVOH: *Way of Faith*
 2330 KVOH: *World News*
 2335 Voice of Greece: *News*
 2350 KVOH: *Religion Report*

Wednesday

- 0000 BBC: *World News*
 0000 KVOH: *World News*
 0005 KVOH: *Point of View*
 0009 BBC: *News about Britain*
 0015 BBC: *Radio Newsreel*
 0030 BBC: *Omnibus*
 0050 Vatican Radio: *Talking Point*
 0100 BBC: *News Summary*
 0100 Deutsche Welle: *News*
 0100 KVOH: *World News*
 0102 BBC: *Outlook*
 0105 KVOH: *Our Daily Bread*
 0120 KVOH: *Sportscast*
 0130 BBC: *Report on Religion*
 0130 KVOH: *World News*
 0130 Voice of Greece: *News*
 0145 BBC: *Country Style*
 0200 BBC: *World News*
 0200 KVOH: *World News*
 0205 KVOH: *High Adventure's Hall of Fame*
 0209 BBC: *Commentary*
 0230 BBC: *Citizens*
 0230 Radio Netherlands: *World News*
 0235 Radio Netherlands: *Newsline*
 0250 Radio Netherlands: *Images (Arts)*
 0300 BBC: *World News*
 0300 Deutsche Welle: *News*
 0300 Voice of Nicaragua: *Nicaragua Today (News)*
 0309 BBC: *News about Britain*
 0315 BBC: *The World Today*
 0330 BBC: *Discovery*
 0340 Voice of Greece: *News*
 0345 Voice of Nicaragua: *Nicaragua Today (News)*
 0400 BBC: *Newsdesk*
 0400 Radio Budapest: *DX Program*
 0440 BBC: *Book Choice*
 0445 BBC: *Reflections*
 0450 BBC: *Financial News*
 0500 BBC: *World News*
 0500 Deutsche Welle: *News*

Your Guide to Shortwave Listening in April

- 0509 BBC: *Twenty-Four Hours* (News summary)
 0510 Radio Botswana: *News*
 0530 BBC: *Report on Religion*
 0530 Radio Netherlands: *World News*
 0535 Radio Netherlands: *Newsline* (See 0235)
 0545 BBC: *The World Today*
 0550 Radio Netherlands: *Images* (See 0250)
 0600 BBC: *Newsdesk*
 0600 Vatican Radio: *Talking Point*
 0600 Voice of Nicaragua: *Nicaragua Today* (News)
 0630 BBC: *Meridian* (Arts)
 0645 Voice of Nicaragua: *Nicaragua Today* (News)
 0700 BBC: *World News*
 0709 BBC: *Twenty-Four Hours* (News summary)
 0730 BBC: *Development '88*
 0800 BBC: *World News*
 0809 BBC: *Reflections*
 0815 BBC: *Classical Record Review*
 0840 Voice of Greece: *News*
 0900 BBC: *World News*
 0909 BBC: *British Press Review*
 0915 BBC: *The World Today*
 0930 BBC: *Financial News*
 0940 BBC: *Financial News*
 1000 BBC: *News Summary*
 1002 BBC: *Omnibus*
 1100 BBC: *World News*
 1109 BBC: *News about Britain*
 1110 Radio Botswana: *News*
 1125 BBC: *A Letter from Wales*
 1130 BBC: *Meridian* (Arts)
 1200 BBC: *Radio Newsreel*
 1215 BBC: *Time for Verse*
 1225 BBC: *The Farming World*
 1235 Voice of Greece: *News*
 1245 BBC: *Sports Roundup*
 1300 BBC: *World News*
 1309 BBC: *Twenty-Four Hours* (News summary)
 1330 BBC: *Development '88*
 1400 BBC: *World News*
 1405 BBC: *Outlook*
 1445 BBC: *Report on Religion*
 1500 BBC: *Radio Newsreel*
 1540 Voice of Greece: *News*
 1600 BBC: *World News*
 1609 BBC: *Commentary*
 1610 Radio Botswana: *News*
 1615 BBC: *Rock Salad*
 1645 BBC: *The World Today*
 1700 BBC: *World News*
 1709 BBC: *A Letter from Wales*
 1730 BBC: *New Ideas* (British products)
 1740 BBC: *Book Choice*
 1745 BBC: *Sports Roundup*
 1800 BBC: *Newsdesk*
 1830 BBC: *Multitrack 2* (Pop music)
 1840 Voice of Greece: *News*
 1900 BBC: *News Summary*
 1902 BBC: *Outlook*
 1910 Radio Botswana: *News*
 1939 BBC: *Stock Market Report*
 1945 BBC: *Good Books*
 2000 BBC: *World News*
 2000 KVOH: *World News*
 2005 KVOH: *Our Daily Bread*
 2009 BBC: *Twenty-Four Hours* (News summary)
 2030 BBC: *Assignment*
 2030 KVOH: *World News*
 2035 KVOH: *Business Report*
 2045 KVOH: *Globalcast*
 2100 BBC: *News Summary*
 2100 KVOH: *World News*
 2102 BBC: *Network UK*
 2112 KVOH: *Sportscast*
 2115 BBC: *Rock Salad*
 2120 KVOH: *Joni and Company*
 2130 KVOH: *World News*
 2145 BBC: *Recording of the Week*
 2200 BBC: *World News*
 2200 KVOH: *World News*
 2205 KVOH: *Marilyn Hickey*
 2209 BBC: *The World Today*
 2225 BBC: *A Letter from Wales*
 2225 KVOH: *Sportscast*
 2230 BBC: *Financial News*
 2230 KVOH: *World News*
 2240 BBC: *Reflections*
 2235 KVOH: *Today with Derek Prince*
 2245 BBC: *Sports Roundup*
 2300 BBC: *World News*
 2300 KVOH: *World News*
 2309 BBC: *Commentary*
 2310 KVOH: *Sportscast*
 2315 KVOH: *Way of Faith*
 2330 BBC: *Multitrack 2* (Pop music)
 2330 KVOH: *World News*
 2335 Voice of Greece: *News*
 2350 KVOH: *Religion Report*
- Thursday**
- 0000 BBC: *World News*
 0000 KVOH: *World News*
 0005 KVOH: *Point of View*
 0009 BBC: *News about Britain*
 0015 BBC: *Radio Newsreel*
 0050 Vatican Radio: *Vatican Week*
 0100 BBC: *News Summary*
 0100 Deutsche Welle: *News*
 0100 KVOH: *World News*
 0102 BBC: *Outlook*
 0105 KVOH: *Our Daily Bread*
 0110 KVOH: *Sportscast*
 0120 KVOH: *World News*
 0205 KVOH: *High Adventure's Hall of Fame*
 0130 BBC: *Waveguide* (Listening tips)
 0130 KVOH: *World News*
 0130 Voice of Greece: *News*
 0140 BBC: *Book Choice*
 0145 BBC: *The Story of English*
 0200 BBC: *World News*
 0200 KVOH: *World News*
 0209 BBC: *Commentary*
 0215 BBC: *Network UK*
 0230 BBC: *Assignment*
 0230 Radio Netherlands: *World News*
 0235 Radio Netherlands: *Newsline*
 0250 Radio Netherlands: *Portraits of the Past*
 0300 BBC: *News*
 0300 Deutsche Welle: *News*
 0300 Voice of Nicaragua: *Nicaragua Today* (News)
 0309 BBC: *News about Britain*
 0315 BBC: *The World Today*
 0340 Voice of Greece: *News*
 0345 Voice of Nicaragua: *Nicaragua Today* (News)
 0400 BBC: *Newsdesk*
 0430 BBC: *Classical Record Review*
 0445 BBC: *Reflections*
 0450 BBC: *Financial News*
 0500 BBC: *World News*
 0500 Deutsche Welle: *News*
 0509 BBC: *Twenty-Four Hours* (News Summary)
 0510 Radio Botswana: *News*
 0530 BBC: *Peeble's Choice*
 0530 Radio Netherlands: *World News*
 0535 Radio Netherlands: *Newsline* (See 0235)
 0545 BBC: *The World Today*
 0550 Radio Netherlands: *Portraits of the Past*
 0600 BBC: *Newsdesk*
 0600 Vatican Radio: *Vatican Week*
 0600 Voice of Nicaragua: *Nicaragua Today* (News)
 0640 BBC: *Farming World*
 0645 Voice of Nicaragua: *Nicaragua Today* (News)
 0700 BBC: *World News*
 0709 BBC: *Twenty-Four Hours* (News summary)
 0745 BBC: *Network UK*
 0800 BBC: *World News*
 0809 BBC: *Reflections*
 0815 BBC: *Country Style*
 0830 BBC: *John Peel* (Progressive rock)
 0840 Voice of Greece: *News*
 0900 BBC: *World News*
 0909 BBC: *British Press Review*
 0915 BBC: *The World Today*
 0930 BBC: *Financial News*
 0940 BBC: *Sports Roundup*
 0945 BBC: *The Story of English*
 1000 BBC: *News Summary*
 1002 BBC: *Assignment*

Your Guide to Shortwave Listening in April

1040 Voice of Greece: News
 1100 BBC: World News
 1109 BBC: News about Britain
 1110 Radio Botswana: News
 1115 BBC: New Ideas (British products)
 1125 BBC: Letter from England
 1130 BBC: Citizens
 1200 BBC: Radio Newsreel
 1215 BBC: Multitrack 2 (Pop music)
 1235 Voice of Greece: News
 1245 BBC: Sports Roundup
 1300 BBC: World News
 1309 BBC: Twenty-Four Hours (News summary)
 1330 BBC: Network UK
 1345 BBC: Stuart Colman's Record Hop
 1400 BBC: World News
 1405 BBC: Outlook
 1445 BBC: Write On... (Mailbag)
 1500 BBC: Radio Newsreel
 1515 BBC: The Pleasure's Yours
 1540 Voice of Greece: News
 1600 BBC: World News
 1609 BBC: Commentary
 1610 Radio Botswana: News
 1615 BBC: Assignment
 1645 BBC: The World Today
 1700 BBC: World News
 1709 BBC: Letter from England
 1715 BBC: Citizens
 1745 BBC: Sports Roundup
 1800 BBC: Newsdesk
 1830 BBC: Discovery
 1840 Voice of Greece: News
 1900 BBC: News Summary
 1902 BBC: Outlook
 1910 Radio Botswana: News
 1939 BBC: Financial Report
 2000 BBC: World News
 2000 KVOH: World News
 2005 KVOH: Our Daily Bread
 2009 BBC: Twenty-Four Hours (News summary)
 2020 KVOH: Business Report
 2030 BBC: Meridian (Arts)
 2030 KVOH: World News
 2035 KVOH: Business Report
 2045 KVOH: Globalcast
 2100 BBC: News Summary
 2100 KVOH: World News
 2112 KVOH: Sportscast
 2115 BBC: A Jolly Good Show
 2120 KVOH: Joni and Company
 2130 KVOH: World News
 2200 BBC: World News
 2200 KVOH: World News
 2205 KVOH: Marilyn Hickey
 2209 BBC: The World Today
 2225 BBC: A Letter from England
 2225 KVOH: Sportscast
 2230 BBC: Financial News
 2230 KVOH: World News

2235 KVOH: Today with Derek Prince
 2240 BBC: Reflections
 2245 BBC: Sports Roundup
 2300 BBC: World News
 2300 KVOH: World News
 2309 BBC: Commentary
 2310 KVOH: Sportscast
 2315 BBC: Seven Seas
 2315 KVOH: Way of Faith
 2330 BBC: A time for Verse
 2330 KVOH: World News
 2335 Voice of Greece: News
 2340 BBC: The Farming World
 2350 KVOH: Religion Report

Friday

0000 BBC: World News
 0000 KVOH: World News
 0005 KVOH: Point of View
 0009 BBC: News about Britain
 0015 BBC: Radio Newsreel
 0030 BBC: Music Now
 0050 Vatican Radio: Vatican Viewpoint
 0100 BBC: News Summary
 0100 Deutsche Welle: News
 0100 KVOH: World News
 0102 BBC: Outlook
 0105 KVOH: Our Daily Bread
 0120 KVOH: Sportscast
 0130 BBC: Stuart Colman's Record Hop
 0130 KVOH: World News
 0130 Voice of Greece: News
 0145 BBC: Talking From...
 0200 BBC: World News
 0200 KVOH: World News
 0205 KVOH: High Adventure's Hall of Fame
 0209 BBC: BBC: Commentary
 0215 BBC: Health Matters
 0230 BBC: Citizens
 0230 Radio Netherlands: World News
 0235 Radio Netherlands: Newslines
 0250 Radio Netherlands: Media Network
 0300 BBC: World News
 0300 Deutsche Welle: News
 0300 Voice of Nicaragua: Nicaragua Today (News)
 0309 BBC: News about Britain
 0315 BBC: The World Today
 0330 BBC: The Vintage Chart Show
 0340 Voice of Greece: News
 0345 Voice of Nicaragua: Nicaragua Today (News)
 0400 BBC: Newsdesk
 0430 BBC: Country Style
 0445 BBC: Reflections (Religion)
 0450 BBC: Financial News
 0500 BBC: World News
 0500 Deutsche Welle: News
 0509 BBC: Twenty-Four Hours (News summary)

0510 Radio Botswana: News
 0530 Radio Netherlands: World News
 0535 Radio Netherlands: Newslines (See 0235)
 0545 BBC: The World Today
 0550 Radio Netherlands: Media Network See 0250
 0600 BBC: Newsdesk
 0600 Vatican Radio: Vatican Viewpoint
 0600 Voice of Nicaragua: Nicaragua Today (News)
 0630 BBC: Meridian (Arts)
 0645 Voice of Nicaragua: Nicaragua Today (News)
 0700 BBC: World News
 0709 BBC: Twenty-Four Hours (News summary)
 0730 BBC: Write On... (Mailbag)
 0745 BBC: Seven Seas
 0800 BBC: World News
 0809 BBC: Reflections
 0830 BBC: Music Now
 0840 Voice of Greece: News
 0900 BBC: World News
 0909 BBC: British Press Review
 0915 BBC: The World Today
 0930 BBC: Financial News
 0935 BBC: Sports Roundup
 1000 BBC: News Summary
 1015 BBC: Seven Seas
 1030 BBC: Jazz for the Asking
 1040 Voice of Greece: News
 1100 BBC: World News
 1110 Radio Botswana: News
 1109 BBC: News about Britain
 1115 BBC: Talking From...
 1130 BBC: Meridian (Arts)
 1200 BBC: Radio Newsreel
 1215 BBC: Business Matters
 1235 Voice of Greece: News
 1245 BBC: Sports Roundup
 1300 BBC: World News
 1309 BBC: Twenty-Four Hours
 1330 BBC: John Peel
 1400 BBC: News
 1405 BBC: Outlook
 1445 BBC: Nature Notebook
 1500 BBC: Radio Newsreel
 1515 Radio Budapest: DX Program
 1540 Voice of Greece: News
 1600 BBC: World News
 1609 BBC: Commentary
 1610 Radio Botswana: News
 1615 BBC: Science in Action
 1645 BBC: The World Today
 1700 BBC: World News
 1709 BBC: Letter from Northern Ireland
 1715 BBC: Music Now
 1745 BBC: Sports Roundup
 1800 BBC: Newsdesk
 1830 BBC: Multitrack 3 (Pop music)
 1840 Voice of Greece: News

Your Guide to Shortwave Listening in April

- 1900 BBC: *News Summary*
 1902 BBC: *Outlook*
 1910 Radio Botswana: *News*
 1939 BBC: *Stock Market Report*
 1945 BBC: *Personal View*
 2000 BBC: *World News*
 2000 KVOH: *World News*
 2005 KVOH: *Our Daily Bread*
 2009 BBC: *Twenty-Four Hours* (News summary)
 2020 KVOH: *Business Report*
 2030 BBC: *Science in Action*
 2030 KVOH: *World News*
 2035 KVOH: *Business Report*
 2045 KVOH: *Globalcast*
 2100 BBC: *News Summary*
 2100 KVOH: *World News*
 2102 BBC: *Network UK*
 2112 KVOH: *Sportscast*
 2115 BBC: *Business Matters*
 2120 KVOH: *Joni and Company*
 2130 KVOH: *World News*
 2200 BBC: *World News*
 2200 KVOH: *World News*
 2205 KVOH: *Marilyn Hickey*
 2209 BBC: *The World Today*
 2225 BBC: *A Letter from Northern Ireland*
 2225 KVOH: *Sportscast*
 2230 BBC: *Financial News*
 2230 KVOH: *World News*
 2235 KVOH: *Today with Derek Prince*
 2240 BBC: *Reflections* (Religion)
 2245 BBC: *Sports Roundup*
 2300 BBC: *World News*
 2300 KVOH: *World News*
 2309 BBC: *Commentary*
 2310 KVOH: *Sportscast*
 2315 BBC: *From the Weeklies*
 2315 KVOH: *Way of Faith*
 2330 BBC: *Multitrack 3* (Pop music)
 2330 KVOH: *World News*
 2335 Voice of Greece: *News*
 2350 KVOH: *Religion Report*
- Saturday**
- 0000 BBC: *World News*
 0000 KVOH: *World News*
 0005 KVOH: *Point of View*
 0009 BBC: *News about Britain*
 0015 BBC: *Radio Newsreel*
 0030 BBC: *Personal View*
 0045 BBC: *Recording of the Week*
 0050 Vatican Radio: *The Church Today*
 0100 BBC: *News Summary*
 0100 Deutsche Welle: *News*
 0100 KVOH: *World News*
 0102 BBC: *Outlook*
 0105 KVOH: *Our Daily Bread*
 0120 KVOH: *Sportscast*
 0130 KVOH: *World News*
 0130 Voice of Greece: *News*
- 0145 BBC: *Nature Notebook*
 0200 BBC: *World News*
 0200 KVOH: *World News*
 0205 KVOH: *High Adventure's Hall of Fame*
 0209 BBC: *Commentary*
 0215 BBC: *Network UK*
 0230 BBC: *People and Politics*
 0230 Radio Netherlands: *World News*
 0235 Radio Netherlands: *Newsline*
 0250 Radio Netherlands: *Rembrandt Express* (Magazine show)
 0300 BBC: *World News*
 0300 Deutsche Welle: *News*
 0300 Voice of Nicaragua: *Nicaragua Today* (News)
 0309 BBC: *News about Britain*
 0315 BBC: *The World Today*
 0330 BBC: *Business Matters*
 0340 Voice of Greece: *News*
 0345 Voice of Nicaragua: *Nicaragua Today* (News)
 0400 BBC: *Newsdesk*
 0400 Radio Budapest: *DX Program*
 0445 BBC: *Reflections*
 0450 BBC: *Financial News*
 0500 BBC: *World News*
 0500 Deutsche Welle: *News*
 0509 BBC: *Twenty-Four Hours* (News summary)
 0510 Radio Botswana: *News*
 0530 BBC: *Personal View*
 0530 Radio Netherlands: *World News*
 0535 Radio Netherlands: *Newsline* (See 0235)
 0545 BBC: *The World Today*
 0550 Radio Netherlands: *Rembrandt Express* (See 0250)
 0600 BBC: *Newsdesk*
 0600 Vatican Radio: *The Church Today*
 0600 Voice of Nicaragua: *Nicaragua Today* (News)
 0630 BBC: *Meridian* (Arts)
 0645 Voice of Nicaragua: *Nicaragua Today* (News)
 0700 BBC: *World News*
 0709 BBC: *Twenty-Four Hours* (News summary)
 0730 BBC: *From the Weeklies*
 0745 BBC: *Network UK*
 0800 BBC: *World News*
 0809 BBC: *Reflections*
 0815 BBC: *A Jolly Good Show*
 0840 Voice of Greece: *News*
 0900 BBC: *World News*
 0909 BBC: *British Press Review*
 0915 BBC: *The World Today*
 0930 BBC: *Financial News*
 0940 BBC: *Sports Roundup*
 0945 BBC: *Personal View*
 1000 BBC: *News Summary*
 1015 BBC: *Letter from America* (Alstaire Cook)
- 1030 BBC: *People and Politics*
 1040 Voice of Greece: *News*
 1100 BBC: *World News*
 1109 BBC: *News about Britain*
 1115 BBC: *Chain Reaction*
 1125 Radio Botswana: *News*
 1130 BBC: *Meridian* (Arts)
 1200 BBC: *Radio Newsreel*
 1215 BBC: *Multitrack 3* (Pop music)
 1235 Voice of Greece: *News*
 1245 BBC: *Sports Roundup*
 1300 BBC: *World News*
 1309 BBC: *Twenty-Four Hours* (News summary)
 1330 BBC: *Network UK*
 1345 BBC: *Good Books*
 1400 BBC: *News Summary*
 1402 BBC: *Album Time*
 1430 BBC: *Sportsworld*
 1500 BBC: *Radio Newsreel*
 1515 BBC: *Sportsworld*
 1540 Voice of Greece: *News*
 1600 BBC: *World News*
 1609 BBC: *Commentary*
 1615 BBC: *Sportsworld*
 1700 BBC: *News Summary*
 1702 BBC: *Sportsworld*
 1745 BBC: *Sports Roundup*
 1800 BBC: *Newsdesk*
 1840 Voice of Greece: *News*
 1900 BBC: *News Summary*
 1910 Radio Botswana: *News*
 2000 BBC: *World News*
 2000 KVOH: *U.S. Presidential Message*
 2009 BBC: *Twenty-Four Hours* (News Summary)
 2015 KVOH: *Teen Scene*
 2030 BBC: *Meridian* (Arts)
 2030 KVOH: *Children's Bible Hour*
 2100 BBC: *World News*
 2100 KVOH: *World News*
 2130 BBC: *People and Politics*
 2130 KVOH: *Sportscast*
 2140 KVOH: *New Horizons*
 2200 BBC: *World News*
 2200 KVOH: *World News*
 2209 BBC: *From Our Own Correspondent*
 2215 KVOH: *U.S. Presidential Message*
 2225 BBC: *Book Choice*
 2230 BBC: *New Ideas* (New British Products)
 2232 KVOH: *Sportscast*
 2240 BBC: *Reflections*
 2245 BBC: *Sports Roundup*
 2300 BBC: *World News*
 2300 KVOH: *The Pat Boone Show*
 2309 BBC: *Commentary*
 2315 BBC: *Nature Notebook*
 2330 BBC: *Anything Goes*
 2335 Voice of Greece: *News*

Questions sent to MT are answered in this column as space permits. If you prefer an answer by return mail, you must include a self-addressed, stamped envelope.

Q. Can I monitor packet transmissions on conventional SWL receiving equipment? (Sim Lambrecht, Tallahassee, FL)

A. Yes, but along with a demodulator which is advertised as having packet capability. Standard RTTY and TOR equipment is not compatible.

Q. Would it be possible to add a clarifier control to the Sony ICF2010 for fine tuning SSB? (Ken Bale, Raymond, WA)

A. Probably, but it would not work in the synchronous detection mode which requires a carrier to be present. Nevertheless, it would provide closer signal resolution than the 100 hertz increments now provided. Possibly a simple varactor on the crystal would do it, tuned by a small potentiometer.

Q. Could a VCR be used to record the audio RTTY signal from my receiver for later replay to a demodulator? Could the VCR also be used to record the demodulator output so that the text could be replayed later? (Jim Valentine, Streetsboro, OH)

A. Either a VCR or audio cassette recorder could be used to record the audio output from a receiver and played back later into an RTTY demodulator, provided that the mark and space tones are correct for the demodulator's filters.

If the VCR is equipped with a composite video input, then the demodulator output could be recorded for later playback on a TV monitor, assuming the signal levels are correctly adjusted between the two.

Q. What is the 1750 meter band? Could you use it as a private paging system? (Dan Birkner, Spokane, WA)

A. The 1750 meter band refers to a license-free portion of the low

frequency spectrum, 160-190 kHz, where virtually any kind of low power transmission is allowed, including paging. Users range from hams with CW propagation beacons to wireless intercoms and from electric power company telemetry to the military ground wave emergency network (GWEN).

For more information on uses and equipment, read Ken Cornell's "Low and Medium Frequency Radio Scrap Book", available for \$12.95 from the author: 225 Baltimore Avenue, Pt. Pleasant Beach, NJ 08742.

Q. What scanner antenna do you recommend for all-band monitoring? (David Smith, Killeen, TX)

A. While this question might seem akin to "What automobile should I buy?", there are some guidelines. If you are interested primarily in local reception, virtually any scanner antenna on the market will suffice.

For the greatest distance, a directional (beam) antenna is the answer, but it should be rotated with an inexpensive TV rotator for best performance; then it can be aimed at the target area.

In actual practice, a high-gain beam like the Grove Scanner Beam favors the forward direction for best pickup, although there is considerable pickup off the back as well. Only signals directly off the sides will be substantially reduced (by about 30 dB).

High quality discones like the Diamond D-130 (which, disappointingly, comes with lossy RG-58/U coax) and the ICOM AH-7000 (which comes with low-loss RG-8/U cable, but is equipped with type N connectors, unused in the scanner industry) make very good omnidirectional (non-directional) receiving and transmitting antennas as well.

Generally speaking, a beam will approximately double your receiving range when compared to a reasonably good omnidirectional antenna, but be sure to use good quality coax, not RG-58/U. The best cable available is Belden 9913 and RG-11/U foam, followed by RG-6/U, RG-8/U foam (including RG-8/mini), RG-59/U foam.

Don't use RG-58/U for scanner listening except in short runs (less than

50 feet). Don't splice coax and don't be concerned with impedance, only loss characteristics. No antenna made--and no scanner made--maintains 50 ohms impedance throughout its operational range.

Q. How far is the average range of a low power TV station? (Dan Birkner, Spokane, WA)

A. Normally, LPTV licensees envision surrounding neighborhoods; that's about it. Range can be extended, however, by careful antenna planning and by adding satellite transmitters at remote locations.

Q. What battery-operated booster would you recommend for a scanner? (David Smith, Killeen, TX)

A. I don't recommend any booster (RF preamplifier) if you are in a metropolitan environment. Commercial preamps designed for scanners are easily overloaded by strong signals, resulting in intermodulation (phantom signals are generated which are heard on channels not really in use) and desensitization (the "booster" may become an attenuator!).

Use the best antenna you can install; then, if all signals continue to be weak, consider a preamplifier from a reputable manufacturer.

Q. Now that Grove has discontinued carrying microfiche frequency listings, where are they available? (Dan Birkner, Spokane, WA)

A. Request a catalog entitled, "FCC Data Files on Microfiche" from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161 (phone 703-487-4650).

Q. Can I use my CB radio with the Grove indoor Hidden Antenna System? (Ernest Paterson, Evergreen park, IL)

A. For listening, yes, but not for transmitting. The Hidden Antenna System is intended for use with receivers only, not with transmitters. The TUN-3 MiniTuner which is part of the system is a passive preselector--a tunable filter, so to speak--designed to extract one narrow portion of the spectrum at a time and present it to the receiver; this prevents receiver overload from off-frequency powerhouses which interfere with desired reception.

The system is not designed for impedance matching, only frequency preselection and boosting of received signals. In fact, transmitting through the system is likely to damage the delicate transistor in the preamplifier (although it is protected from accidental exposure to strong nearby signals and static voltages).

Q. Please settle this contradiction: Larry Magne's "Passport to World Band Radio" says the JRC NRD525 receiver does not include synchronous detection, while Rainer Lichte's "Radio Receiver--Chance or Choice" (Volume 2) refers to the 525's "ingenious synchronous AM detector". Which is correct? (Brian Jones, San Antonio, TX)

A. The NRD525 does not have synchronous detection; rather, it has synchrophase detection, developed many years ago by Motorola and utilized by R. L. Drake Company in their high performance R7 series receivers.

While both attempt to reduce distortion, they do it in different ways: Synchronous detection locks in on the transmitter's carrier to cancel receiver frequency drift, while synchrophase does not; it works in the receiver's detector circuit.

Q. How does the Radio Shack discone compare with the Diamond D-130 and ICOM AH-7000 discones? (Norman Alexander, Diamond Springs, CA)

A. Basically, it is a carbon copy--with one exception: no low band vertical element. As a result, even though the Radio Shack discone is advertised as having 25-1300 MHz coverage, 100-1300 MHz is more accurate.

Q. Why, on a cellular transmitting tower, is one antenna shorter than the other two? Michael Bucko, Independence, MO)

A. Characteristically, the familiar triangular cellular platform has two receiving and one transmitting antenna, thus accounting for the apparent difference. The two receiving antennas are sampled continuously and the stronger signal determines which antenna is maintained for the call.

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The Grundig Yacht Boy 215 Portable

Six months ago, if you asked the average shortwave listener about a Grundig, chances are he'd give you a blank stare, pause for a moment, and say, "Isn't that a German dish made out of cow tongues?" Savvy travelers to Europe, however, had already caught on and many brought back Grundig radios. Word spread and a few independent retail outlets in Canada and the U.S. would quietly import them for resale over here. But these few sales weren't authorized by Grundig. What this meant was that there was no factory warranty or assurance of parts and service.

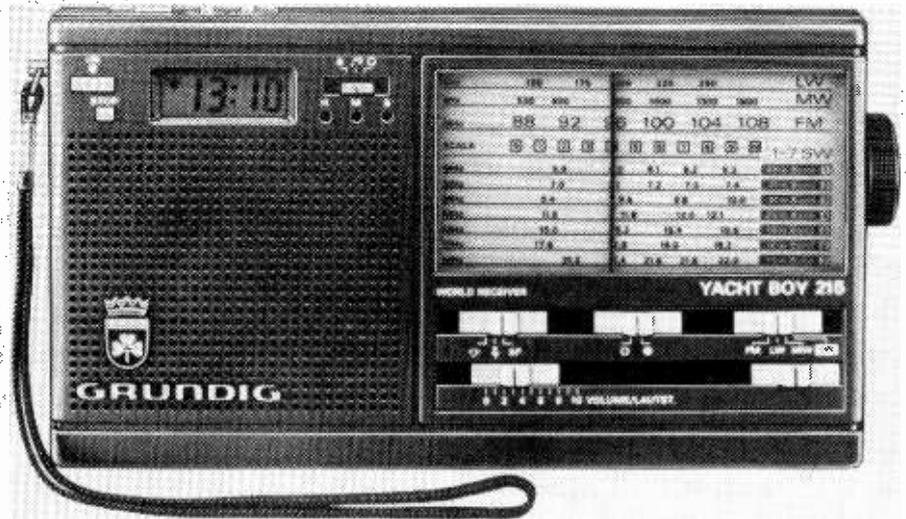
Grundig Comes to North America — with Vigor

Last year, all that changed when Grundig appointed Lextronix, Inc., of California as its sole agent in the U.S. and Canada. Nothing has been the same since. First, the Grundig Satellit 650 -- Europe's finest world band portable -- then the Satellit 400 were introduced and promoted with a splash in such media as the Cable News Network, the Financial News Network and The Wall Street Journal. Almost overnight, the American public was made aware of the Grundig name.

More recently, a line of Grundig high-tech audio products, the Fine Arts series, was introduced. Grundig will also be offering a digital cassette tape recorder and one or more exotic TV's. For those you'll have to wait until later this year. Those interested in shortwave radio, however, need not wait so long. Lextronix is now offering two more world band portables: the Yacht Boy 210 and 215. It's the compact '215 that I've been poring over the past few weeks both at the usual Penn's Park location and while on a trip to Barbados.

Cheaper and Smaller

The Yacht Boy series differ from the Grundig's Satellits in four essential respects. First, you have price. The Yacht Boys are less costly than Satellit models. Second, there's size. The Yacht Boys are



The Grundig Yacht Boy 215 - compact, affordable, and a good performer

compact, lightweight travel portables. Third, is performance which correlates to some extent with price. Finally, the country of manufacture is different. Satellit models are manufactured in Europe -- specifically, Portugal -- whereas the Yacht Boy series is manufactured in Taiwan.

Key Items Featured

Technologically, the Yacht Boy radios are hardly in the same league as the more advanced Satellit models. Tuning is not synthesized, and the '215 doesn't even have digital readout. In fact, the '215 doesn't cover the entire world band radio spectrum -- just the key parts. Of course, there aren't any programmable channel memories, synchronous detection or any of the other bells and whistles you'd expect to find on the best of the pricier models.

What the '215 does have is bandspreaded analog frequency readout with a poorly marked switch for seven world band segments. There's also a three-position tone control and a 24-hour clock. The clock doesn't display seconds, but it does come equipped with handy alarm, timer and sleep-delay functions. There's also a push-button light for nighttime use, but it's only

for the clock, not the frequency readout.

Four "AA" batteries, along with a small mercury clock battery, are used to power the set. In Europe 220 Volt ac power supplies are available as options, but for North America Grundig doesn't offer anything for 117 Volts. Too, there's no power safety switch to prevent either the radio or the clock light from going on accidentally in your luggage.

Multiband Coverage

The '215 covers the usual mediumwave AM band, FM, longwave, plus much of the world band radio spectrum. AM coverage is from roughly 510-1650 kHz, which makes it just shy of including the proposed expanded upper parameter for the Americas of 1705 kHz.

The '215's longwave coverage, of course, is of no use whatsoever in North America -- there simply aren't any longwave broadcasts here. But this coverage is a handy bonus if you live or travel in those parts of the world, such as Europe and North Africa, where longwave is commonly used and can be heard for hundreds of miles. This is, after all, a travel radio.

The '215's FM band covers the usual 88-108 MHz range. This means it works properly everywhere except the Soviet Union and Eastern Europe (66-73 MHz) plus, to a limited extent, Japan (76-90 MHz). Even in Eastern Europe the tuning range will probably be appropriate in due course as FM stations there are already shifting over to the worldwide 88-108 MHz standard.

As to world band reception, the '215 covers roughly 5.86-6.35, 6.96-7.47, 9.35-10.1, 11.54-12.2, 14.93-15.67, 17.55-18.3, 21.0-22.1 MHz in the 49, 41, 31, 25, 19, 16 and 13 meter ranges. This is typical of travel portables in the '215's price class and is adequate for the traveler and casual listener.

But the '215 doesn't receive the 120, 90 and 60 meter tropical ranges, the 75 and 21 meter international ranges, or various lesser segments, such as 9-9.03 MHz, that contain world band broadcasts. Of these, the only one that qualifies as a serious omission is the new 21 meter range between 13.6-13.8 MHz. Although this range doesn't come into official existence until next year, it's already being used by a growing number of powerful broadcasters worldwide.

If you want to ensure that the '215's world band coverage won't be an immediate problem for the type of listening you do, compare its frequency coverage with the material in the Worldscan section of the 1988 Passport to World Band Radio. These pages give full frequency usage and schedule details of all world band stations.

Performance parallels price

The world band performance of the '215 is about what you would expect from a travel portable in this price class. Sensitivity is good, so faraway stations have a sporting chance of being heard. But selectivity -- there's only one bandwidth, and it's a bit wide for world band reception -- and image rejection are only fair. This means that there's more racket from competing signals than you'll find with costlier, more advanced models in the Satellit series.

Automatic gain control (AGC) action is only fair, too, so fading is not so well

smoothed out as it can be with more elaborate units. As you would expect, single-sideband and CW can't be demodulated with these inexpensive models.

FM performance is adequate for a small set. It uses automatic frequency control (AFC). This makes accurate tuning easier, but also makes listening to weak stations difficult or impossible if they're located alongside powerful stations.

The '215's audio, while it's hardly hi-fi or of Satellit series caliber -- mainly, bass response tends to be thin -- is quite reasonable for such a small radio. Audio power is fairly healthy, as well. So the '215 tends to sound pretty good -- a positive characteristic found in virtually all Grundig world band radios, and one reason they're popular with the general listening public. This is a plus whether you're listening to FM from down the road or to an exotic broadcaster from halfway around the world.

Even more economy in the '210

In all, the \$119.95 Grundig Yacht Boy 215 complements its heftier Satellit-series cousins nicely. Its performance is clearly not in the same league; but, then, neither is its price or size. Value-conscious listeners will be pleased to know that another Yacht Boy model, the '210, goes for the somewhat lower price of \$99.95. It's virtually identical to the '215, except that the 210 lacks clock and timer facilities. ■

You can hear Larry Magne's equipment reviews the first Saturday night each month over Radio Canada International's immensely popular SWL DIGEST. For North America, it's 8:10 PM Eastern Time on 5960 and 9755 kHz; for Europe, 2008 UTC on 5995, 9670, 11945, 15325, 17820 and 17875 kHz. Larry's "What's New in Equipment" is also featured various other Saturdays throughout the month, while Passport editors Don Jensen and Tony Jones report on world broadcasting the third Saturday night each month.

Passport's "RDI White Paper" equipment reports are carried in the U.S. by Imprime, EEB and Universal Shortwave; in Canada by PIF Book-by-Mail; and in Europe by Interbooks and the Swedish DX Federation. A free catalogue of the latest editions of these exhaustive laboratory and "hands-on" reports may be obtained by sending a self-addressed stamped envelope to Publications Information, International Broadcasting Services, Ltd., Box 300, Penn's Park PA 18943 USA.

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Kenwood TS-140S General Coverage Transceiver

Over the last few years, a remarkable new generation of amateur transceivers has emerged from prominent off-shore manufacturers. Inevitably, the "big three" (Kenwood, ICOM and Yaesu) grab the lion's share of the market. This month we take a look at one of the newest entries, Kenwood's TS-140S HF transceiver.

The TS-140 may be considered a scaled-down version of two more costly rigs, the TS-440S and TS-940S, standards of the industry for quality and performance. This doesn't mean the 140 is not as satisfactory for most applications; it is just not as flexible.

A Feature-Filled Package

But what the new Kenwood rig does offer is impressive by itself: 100 kHz-30 MHz general coverage receiver; AM/FM/SSB/CW transmit and receive modes; 10 Hz increments for frequency tuning, plus infinite signal resolution with RIT (receiver incremental tuning—fine tuning); wide or narrow IF filter; fast or slow AGC (automatic gain control); 31 scannable memory channels which can be scrolled and which store frequency, mode and selectivity; 10 memories which hold split-frequency information for transmit and receive; dual noise blanker; S-meter which shows output power and ALC (automatic level control) during transmit; full or semi break-in for CW; VOX (voice-operated transmit); IF shift for adjustable adjacent-channel interference rejection; speech processor for SSB transmit "talk power"; non-volatile operating system (memory won't be lost during power dropout); and a bright blue fluorescent display which shows frequency, mode, VFO or memory choice.

While the cluster of knobs, dials and switches is an imposing sight, the proof is in the specifications. After all, you can put wings on a tricycle, but it doesn't mean it's gonna fly!

Talk Power

Output power is rated at 110 watts SSB, 100 watts CW, 50 watts FM, and 40 watts AM. With a decent antenna system, this is adequate power for nearly every contingency in ham radio. The measurable difference between 110 watts and 500 watts is only about one S unit on an S-meter!

Frequency stability is superb: better than +/- 10 Hz per megahertz over a temperature range of -10 to +50 degrees Celsius. Transmit carrier suppression in SSB mode is at least 40 dB and the unwanted sideband is suppressed by at least 50 dB.

How Well Does It Hear?

On receive, the 140 claims excellent dynamic range: 102 dB for intermod and an intercept point of +12 dBm. Shortwave SSB signal sensitivity is typically 0.25 microvolts, rising to 0.35 microvolts on narrow band FM and 2.5 microvolts on AM.

Because of vulnerability of most radios to nearby AM broadcast station interference, sensitivity below 1.6 MHz (1600 kHz) is attenuated; sensitivity in the 500-1600 kHz medium wave AM band is about 40 microvolts! Undoubtedly, enterprising experimenters will find a way to defeat the attenuator, allowing full sensitivity in this range as well.

The Circuit Scheme

The receiver is a conventional dual up-conversion superheterodyne with a first IF of

.next area

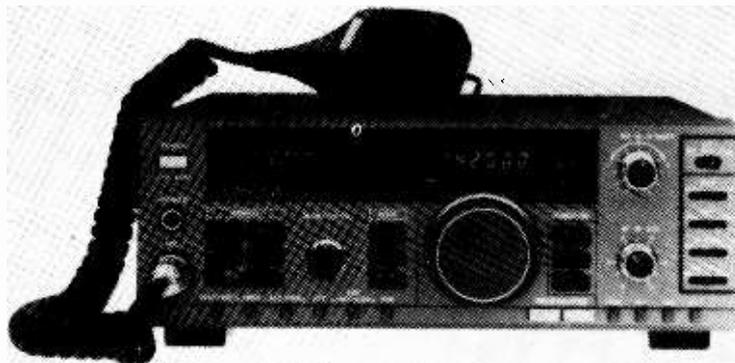
45.055 MHz and a second IF of 455 kHz. This should allow for a generous selection of optional filters on the aftermarket.

But the filters provided are quite good for SSB--2.2/4.4 kHz @ -6/-60dB (2:1 shape factor); acceptable for AM (but without AM narrow)--6/18 kHz @ -6/-50 dB; and reasonable for narrow band FM--12/25 kHz @ -6/-50. The IF shift allows the receiver passband to be moved 1.28 kHz either side of center carrier during SSB/CW reception.

Audio power is 1.5 watts full output at 10% harmonic distortion (8 ohms) and will accommodate a speaker or headphones with an impedance of 8-16 ohms.

Operating power of the transceiver is 12 VDC at 1.5 A receive, 20 A transmit; an optional AC power supply is available. The rig measures 10-1/2"W x 3-3/4"H x 10-1/2"D and weighs 14 pounds.

Kenwood's recommended amateur net price is \$929.95, but it is available from some MT advertisers for under \$850.



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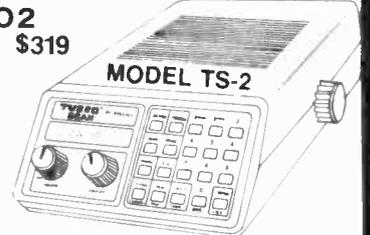
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R-5000	100khz 30mhz, Digital, 100 Memorys, Scans	799.00
R-2000	150khz 30mhz, 10 Memorys, Digital, Scans	559.00
SONY 2010	150khz 30mhz, 76-108, 116-136mhz	319.00
SONY 2003	150khz 30mhz, 76-108, Memorys	234.00
PRO-80	150khz 216mhz, 40 Memorys, Scans	389.00

POLICE/FIRE SCANNERS

BC-800XLT	40ch, 29-54, 118-174, 406-512, 806-912	279.00
BC-600XLT	100ch, 29-54, 118-174, 406-512, S/Search	223.00
BC-100XLT	100ch, 29-54, 118-174, 406-512	225.00
BC-210XLT	40ch, 29-54, 118-174, 406-512, AC/DC	219.00
REGENCY		
TS-2	75ch, 29-54, 118-174, 406-512, 806-956, AC/DC	319.00
TS-1	35ch, 29-54, 118-174, 406-512, AC/DC	249.00
HX-850	55ch, 29-54, 118-174, 406-512 Handheld	239.00
Z-60	50ch, 30-50, 88-108, 118-174, 406-512, *Special*	164.00

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Mobile Monitoring Post Tunes in the World

Heads turn when this van takes to the highways. Sprouting no fewer than eight rooftop antennas, this Dodge is fully outfitted with amateur, shortwave and VHF/UHF monitoring equipment.

The owner (who, for obvious reasons, wishes to remain anonymous) operates 80-10 meters on the ham bands with his Yaesu FT757GX and Kenwood TS520 transceivers, monitors all of the shortwave bands with the Yaesu and covers the VHF/UHF spectrum (60-900 MHz) with his Yaesu FRG9600.

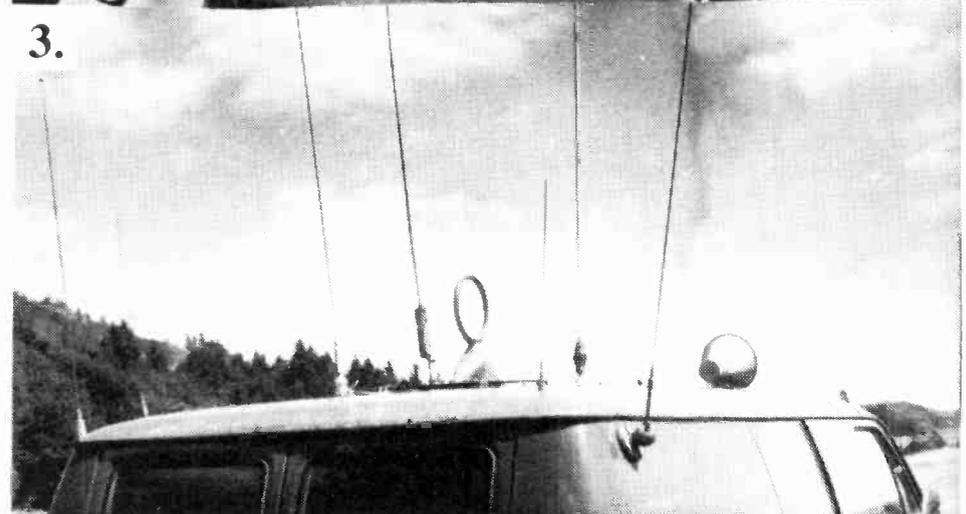
Since in his home state of Washington all overhead obstructions must clear fourteen feet, six inches, the antennas are equipped to fold over. An additional quad antenna for two meter DXing clamps on the side door. The same arrangement is used with this listener's HF radio direction finding (RDF) antenna consisting of 120 feet of wire wound on a wooden frame.



1. This high-tech porcupine is the business end of a private communications van owned by a serious listener in Washington state.

2. Clockwise, this photo shows the rigs used in the mobile van: a Yaesu FT757GX transceiver, Yaesu FRG9600 receiver and Kenwood TS520 transceiver. A straight key provides a hint of this operator's hamming preference.

3. Too unwieldy to be left in place while moving, this tunable HF loop provides RDF capability throughout the shortwave spectrum.



WHAT'S NEW?

Police Call Scanner Directory

1988 edition by Gene Hughes

(8-1/2" x 11", perfect bound; 150-200 pages, depending upon volume; specify your state when ordering. \$7.95 plus \$1.50 shipping from Grove Enterprises, PO Box 98, Brasstown, NC 28902)

For 25 years, the Police Call Radio Guide guide has maintained its reputation as the most accurate and widely distributed scanner directory available in the country; its licensee records come directly from FCC files.

Separated into nine regional volumes with over 250,000 total line entries, listings include federal, state and local government; police, fire and emergency units; aircraft; and maritime.

Cross referenced by state, municipality and frequency, each directory also includes a VHF/UHF allocation chart which lists all frequencies covered by most scanners and to what service they are typically assigned.

An informative introductory chapter provides information on scrambling, radio systems, equipment and accessories for monitoring, and how trunking systems work.

Revised and expanded, no directory on the market offers so much accurate information for so little expense.

Technician Class Course

by Gordon West

(Study package available for \$19.95 plus \$2 shipping from Radio School, 2414 College Drive, Costa Mesa, CA 92626).

Last year's release of the Novice study package, followed by Radio Shack's decision to carry the Novice materials in their own catalog, have spurred an unprecedented growth in the amateur radio ranks. Getting into ham radio has never been easier.

It is logical that the new Novice begins to look ahead to expand his operating horizons as his proficiency and interest grow; that is where the Technician Class license takes over. With this next grade license, the newcomer can operate two meters, immensely popular all over the country among walkie-talkie enthusiasts and repeater inhabitants.

The vinyl package contains two cassettes (not code--just interesting ham-related topics), a theory book (available separately for \$4.95 plus \$1 shipping), form 610 FCC application, sample test, and a variety of related ham promotional materials.

Sneak Preview of a Carefully Guarded Secret

Imagine, if you will, a receiver, slightly wider than a general coverage short-wave radio, with enormous frequency range--from below the AM broadcast band to above the upper reaches of a scanner. A tuning dial allows fast or slow control of the entire frequency range, a crisp display revealing the precise frequency of the received signal to four decimal places (100 Hz).

On the left side of the panel, a green line on the face of a cathode ray tube displays a wide chunk of radio spectrum graphically, up to 10 MHz wide. As a signal comes on the air anywhere in that chunk of spectrum a "spike" appears on the line, alerting the listener who may immediately tune to that frequency without waiting for the laborious search or scan process that scanner owners are so familiar with.

A bargraph signal strength indicator shows relative signal strengths while a center frequency indicator visually acknowledges perfect tuning.

Special filters and signal processors invite your adjustments for optimum reception. Frequencies of interest may be stored in any one of one hundred memory slots for instant

recall.

Longwave, shortwave, VHF, UHF; domestic and international broadcasters; SSB, FM, AM, and CW communicators; continuous frequency coverage in all reception modes; and a spectrum display as well. That's the new SR-1000 spectrum surveillance receiver from Grove Enterprises. See it at the Dayton Hamvention, booth 333. Available late summer.

The following reviews are presented by Ike Kerschner, MT's "On the Ham Bands" editor.

ARRL Operating Manual

After being an amateur for 35 years I was not at first impressed with a book title like "*The ARRL Operating Manual*"; come on, now; I know all about operating! WOW! Was I wrong!

After taking a glance at the book it took me about three hours before I could put it down. Let me tell you about some of the things I learned from this fantastic book (I was impressed!).

The first chapter deals with SWLing, subjects like how to use a receiver, what the various signals sound like, who is on what frequencies, utilities, clubs, verifications, special articles on DXing 60 meters, tuning China, and more.

Basic amateur practices are covered in subsequent chapters: 2, The Amateur Radio Spectrum; 3, Basic Operating; and 4, Antenna Orientation. These chapters are real meat and potatoes to the amateur and should be required reading for every newcomer to the ham radio ranks.

The next four chapters cover DX, contesting and operating awards. The authors take you step by step to show you exactly how to work the rare DX station, plan contest strategy and work for the many operating awards that are available to the amateur and SWL. Most important of all, the techniques

for obtaining the required QSL cards are carefully outlined.

Special modes--RTTY, packets, FM and repeaters, VHF/UHF, satellites and image modes (TV, FAX)--are all given their own chapters--fat, informative chapters. Do you know how to handle traffic in an emergency? Read chapters 14 and 15; you will never be in the dark again.

Each chapter of this book was written by an expert in the field of that topic and it belongs in the hands of everyone who uses radio, ham or SWL. The price is \$15 plus handling direct from the ARRL or through your local dealer.

VHF/UHF Operating

The January "On the Ham Bands" column carried information on the Novice class VHF/UHF bands. I did not realize how little information was available for the newcomer to these bands until your letters started rolling in. It would require a book to answer all the queries.

A look over the books in my library revealed that most of the books available were not written on a level for the beginner. Imagine my surprise when I received in the mail a copy of the book, "The Basic Guide to VHF/UHF Ham Radio" by none other than Edward M. Noll, W3FQJ.

Ed is a well-known author of many radio books for the amateur and commercial operator. The book reads easy and it introduces the newcomer to every aspect of VHF/UHF operating, making getting started on these bands a snap. I like the book very much.

Equipment, antennas, propagation, awards, operating practices and more make this book worth the modest \$6.95 price (plus \$1 postage and handling). You can obtain the book from Ed Noll, P.O. Box 75, Chalfont, PA 18914.

DAYTON HAMVENTION

Each year more than 20,000 stalwart hams, SWLs, scanner enthusiasts, electronics experimenters, and computer buffs storm the Hara Arena in Dayton, Ohio, to participate in the world's largest amateur radio convention. Acres of indoor exhibitor space and outdoor flea market vendors boggle the mind of even the most veteran attendee.

This year the convention, to be held April 29, 30 and May 1, will have even more to offer the listener. A forum on monitoring the spectrum will begin promptly at 9AM Sunday morning, May 1, hosted by the Association of North American Radio Clubs (ANARC).

Featured speakers and their topics will include *MT's* Bob Grove (you ask the questions; Bob will provide the answers); ANARC's own Bob Horvitz (the Electronic Communications Privacy Act); Radio Netherlands' "Media Network" host Jonathan Marks (world broadcasting); "Mr. Scanner" Norm Schrein (trunked communications systems); and consummate SWL Don Moore (slide presentation on Central and South American broadcasters).

All motel rooms in the area are booked, traffic is horrendous, parking is an experience, and admission tickets are \$10, but the pilgrimage is worth the sacrifice.

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Scanner Models: the Numbers Game

by Bob Grove

Major manufacturers are fond of model numbers; a casual glance at an MT advertiser's merchandise list will prove the point. But what happens when the same radio comes out with two different numbers? That's when the fun begins.

While Uniden advertises their newest models, the BC200XLT, BC580XLT, BC760XLT--identical-appearing lookalikes, the BC205XLT, BC600XLT, BC950XLT, are hawked by various vendors and importers. Cobra's SR10, SR12 and SR15 look suspiciously similar to Bearcat's BC70XL, BC100XL and BC100XLT. Are they the same?

We posed that question recently to a Uniden engineer. Even he seemed confused, but ventured the following information to help clear the issue.

While Cobra is a Uniden competitor, Cobra does buy their radio hardware from Uniden; the customer can expect the three models listed above to have identical performance to their Bearcat counterparts.

Similarly, the BC760XLT is identical to the BC950XLT--including the microprocessor chip-- and will accept the same CTCSS decoder, preamplifier and switch assembly. Both models have cellular coverage defeated at the factory, but restorable by the procedure outlined in last month's MT.

While the long-awaited BC200XLT has not yet arrived, Uniden's spokesman says that it has been delayed again until at least June and that it does have the same microprocessor as the BC205XLT, so cellular restoration capability is expected on both models.

The BC580XLT has the same basic design as the BC600XLT, but will not accept the preamp or CTCSS decoder of the latter.



The TMT-6F Photo Radar System

Escalation of Electronic Warfare on the Highways:

New Police Radars Operate on Unusual Frequencies

by Jeffrey Krauss

Just when you thought it was safe to venture out on the highways, the police have escalated their electronic warfare. Two new police radars have recently received FCC Type Acceptance. Not only are they undetectable by current radar detectors, but to add insult to injury they take your picture as you speed by!

The traditional police radar frequencies are 10.525 GHz (X-band) and 24.125 GHz (K-band). The new units operate at 13.45 GHz and 34.3 GHz! At these frequencies, today's radar detectors are blind, deaf and dumb.

The 13 GHz and 34 GHz technology is practically identical to 10 GHz and 24 GHz. The radars use Gunn diodes to generate RF energy; the same Gunn diodes which, when

used in radar detectors, can detect radar beams!

The 13.45 GHz unit, the LeMarquis Micro Speed, is marketed by LeMarquis Audio International of Garden City, New York and manufactured by Traffipax Vertriebs of Dusseldorf, West Germany. It is microprocessor controlled and automatically displays the measured speed on the photo.

As soon as a car speeds through the radar beam above the speed limit, the Micro Speed automatically trips the camera shutter. If two vehicles enter the beam at the same time, traveling at different speeds, the radar is smart enough the cancel the measurement and the photo. It can be aimed either at oncoming or departing traffic and can take two photo measurements per second.

The 34.3 GHz unit, called the TMT-6F Photo Radar System, is marketed by Traffic Monitoring Technologies of Friendswood, Texas, and is manufactured by Zollweger of Uster, Switzerland. This system also incorporates a microprocessor-controlled Doppler radar to operate a camera. Here again, the photo will include the measured speed. Galveston County, Texas, is one of the first municipalities using the TMT-6F for speed limit enforcement.

The TMT-6F appears to be identical to another radar, the Multinova-6F radar being marketed by the Compiegne Corporation of Galveston, Texas. The Multinova-6F can be mounted in the grille of a police car so that it looks like an additional headlight.

What does this all mean for the consumer? In the near term, watch your speed--especially near Galveston! And for the longer term, who knows what the radar detector manufacturers may have ready for next Christmas?!

Jeffrey Krauss is a telecommunications consultant who specializes in "monitoring" the spectrum management activities of the FCC.

Monitoring Times assumes no liability for damage or injury resulting from alterations to equipment attempted by readers.

More Diodes for the PRO2004

by Bob Grove

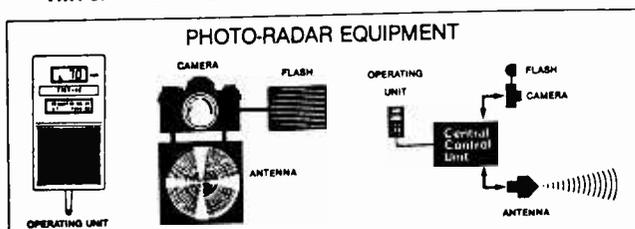
The great debate on what all those diodes do in the Realistic PRO2004 continues. Apparently, according to one adventurous experimenter, the installation of D514 will increase scanning speed another five channels per second. Whether this will make the receiver less responsive to weak

signals during the scanning sequence we don't know.

There appears to be a way of restoring the missing frequency range between 520 and 760 MHz (UHF TV) according to one report which has not been verified here. There are two processor chips, one of which has a shield underneath. Removal of the shield will reveal a diode which, when cut, ostensibly enables the additional coverage.

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TMT-6F PHOTO RADAR - BASIC TECHNICAL EQUIPMENT



ON SITE MONITORING VEHICLE

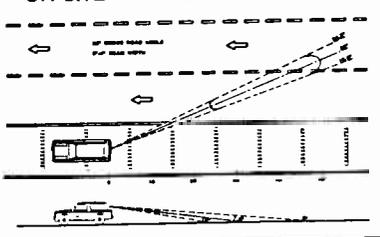


PHOTO DOCUMENTATION



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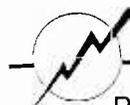
SPRING SPECIALS --

AR-2002 scanner, the only compact with military UHF and cellular	\$435
Bearcat BC-100XLT, 100 channel with aircraft	\$215
Collins R-390A - reconditioned	\$525
Japan Radio NRD-525 - YOW!	\$1140
Sony ICF-2010	\$300
Kenwood R-5000	\$780

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Occasionally, in this column, I ask if you are familiar with one or another of the many antennas with unusual names. Call it a specialized "antenna trivia," if you will, but it's fun to reminisce back over the interesting, or sometimes downright hilarious, names that antenna engineers, radio operators, and communications aficionados have attached to their favorite skywires. This month, let's really let go and see how many odd, unusual, funny, or even weird antenna names we can pack into the column. And, strange as some of them may sound, the names given below are all names of actual antennas or antenna feed systems.

Belaboring the Obvious

Most antennas' names can be traced to their shape or some aspect of their appearance. The way the V, inverted-V, J, inverted-L, and lazy-H antennas got their names is obvious. But it *is* sometimes a surprise to hear of a hyperboloidal reflector antenna or an Archemedian spiral antenna. And how about the zig-zag? That's a great name, isn't it? All of those antennas mentioned so far take their name from their shape.

Brush up on your geometry for these next ones as we consider the rhombic (shaped like a rhombus), the helical beam (shaped in the form of a helix), the discone (a disk and a cone connected), and the cubical quad (two quadrilateral loops of wire spaced to form the outline of a cube).

Then there is the delta quad, in which the quad design is varied by making the loop elements in the shape of a delta (triangle), rather than a square. Other variations on the quad design give us the lazy quad, the X-Q (expanded quad), and the monster quad. Wow!

Of course, if the lazy quad gets too lazy, we could call in an active-antenna to get things livened up again.

Meanwhile, Down at the Ranch

Creativity in the naming of antennas has by no means been limited to their geometry. For instance, the plant kingdom has the cloverleaf and the pine tree antennas. And our feathered friends have come in for their share of antenna names with batwing, wingtip, rubber ducky, and even a double ducky. Not to be outdone, the four-legged critters have the beavertail, hog trough, hog horn, rocking horse, ramshorn, and ratrace

antennas.

And neither have our slimy, slithery friends been forgotten: named for them are the fish spine reflector and fishbone antennas, as well as the serpentine feed, and the Cobra and snake antennas. In case you'd like to catch one of these varmints and have it for your very own, try one of the trap antennas. After you catch one, and want to take it home, don't forget your cage antenna.

The Gourmet's Delight

Yes, the antenna aficionado's creativity in naming antennas seems never to wane. If you're hungry, there's the cheese antenna, with the mushroom antenna for a garnish. For help in getting your eating done there's the feed-horn. And if you eat too much, there's the pillbox antenna. But you really shouldn't overeat, or you may begin to look like one of the fat-dipole antennas!

After eating, you may wish to enjoy a beverage, the broadcast band listener's favorite DX antenna. But, speaking of drinking, watch out for the "gin" pole, that strong third-arm which helps us on our difficult antenna raising jobs. If all the exertion of putting up a new antenna makes you perspire, you can use the fan antenna to cool off. Then, to get a bit of rest, you can pull down the curtain antenna, lie down on the bedspring antenna and listen to sweet music played on the organ pipe antenna. Or, if you're not really tired yet, with all that music you can try a dance or two with the hula-hoop antenna. (See next page for a "hoop").

Dressing with Style

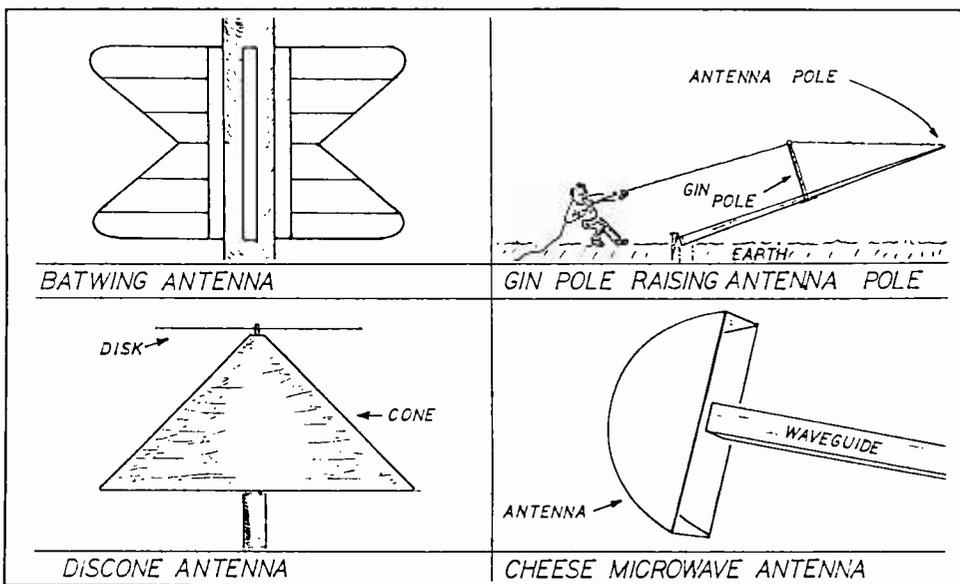
Have you ever wondered why the antenna aficionado is always so well-dressed? Well, it's because of all the clothing in the antenna world: there are the cap-type and top hat antennas, pocket, sleeve, and boot-lace antennas. Specially for the ladies, there is the skirt antenna. If it is raining when you wear these fine clothes outside, don't forget the umbrella antenna. But, if you do accidentally get wet, you can always hang your clothes out to dry on the clothesline antenna.

Next Fourth of July we might want to use a flagpole antenna. And perhaps that day would also be especially appropriate for use of a patriot antenna.

And On and On...

And there are yet other ways of naming antennas. It seems that violence isn't only on television, for in our world of antennas we find the bullet probe antenna, blade antenna, and the end-fire, and broadside antennas. Then for the real sadists among us, there are the very well-known whip antennas.

Well, we haven't even come close to exhausting all the antenna names which we could cover. Unfortunately, within the size limit of one month's column, I can't give you the names of all of the antennas mentioned above, and also tell you what sort of antenna each one is. But, many of them are common enough, so that most of us probably recognize them by name. But others



are more obscure. If any of them peak your curiosity, drop me a line (and a SASE) and I'll tell you a bit about them.

Last Month's Radio Riddle

Last month we discussed various kinds of feedline such as coaxial cable and open-wire feeders. Then I asked you: "What kind of antenna feed system uses no line at all?" Well, do you recall ever seeing a tower which appeared to be a microwave antenna tower, but had only a flat rectangular plate mounted at the top, with no feedline running down the tower? The plate was probably tilted at something like a 45 degree angle from the vertical.

Such plates are reflectors which reflect the signals which they receive down to an antenna at the base of the tower. The small increase in signal path-length thus added by the tower's height does not noticeably attenuate the signal's strength. But at microwave frequencies, the attenuation which would be caused by sending the signal down the tower in a cable feedline is sometimes more than the system can tolerate. These "lineless" antenna feed systems are used in such cases to provide a higher signal level than would be possible. Nice trick, eh?

This Month's Radio Riddle

In the column above, I mentioned the "active" type antenna, which is a short antenna with a very high-gain amplifier. The use of the amplifier allows the antenna to perform, in some ways, as well as much longer antennas. The "active" antenna was contrasted to a "lazy" antenna such as the lazy-H, or the lazy-quad. Just what does it mean when we say that an antenna is "lazy?"

Tune in next month for the exciting answer!

We are pleased to present the following article, extracted from the G-QRP club's newsletter "SPRAT #50". The antenna detailed by John McDonnell, G3DOP, has been around for many years but has received little attention due to the difficult construction methods previously used.

The antenna is basically a DDRR (directional discontinuity ring radiator) which can be installed just inches above the ground and still provide excellent results. Its bandwidth is rather narrow, but given the choice of an effective antenna or a makeshift wire, the DDRR is the winner.

The antenna lies flat, parallel to the earth, but its pattern is vertically polarized. It is a worthwhile project for those with limited space and, for those with zoning or leasing restrictions, the antenna can be disguised in many ways; it is almost invisible and does not look like a radio antenna.

I Have to Mow the Grass to Find My Antenna

by John McDonnell G3DOP

I recently received a 559 report from VO1KO (Nova Scotia) when I was running 8 watts. Nothing very remarkable about that, except that my antenna here in England was on the front lawn only six inches above ground! The same antenna has been used to work all round Europe on 14 MHz and around the UK and over to France on 7 MHz.

My version of the DDRR, also known as the "Hula Hoop", is simply a circle of RG174 coaxial cable 4-1/2 feet in diameter, supported by short wooden stakes lashed to the cable with twine. The center conductor of the cable is not used, just the outside braid for conductive area. Figure 1 shows how the loop is fed with 50 ohm coax and series-tuned by a 50pf capacitor.

Although my ground plane consisted of two large sheets of aluminum, I would recommend galvanized wire netting (chicken wire or hardware cloth) with an area slightly larger than the loop. The variable capacitor and connectors may be mounted in any convenient metal project box. Both feeder connections should utilize 14 gauge insulated wire.

Points of Note

The capacitor must be of high quality; use heavy wire or braid throughout and secure connections to insure the lowest possible ohmic losses. All exposed connectors, and the free end of the coax, must be thoroughly waterproofed to avoid serious degradation of the signal due to moisture.

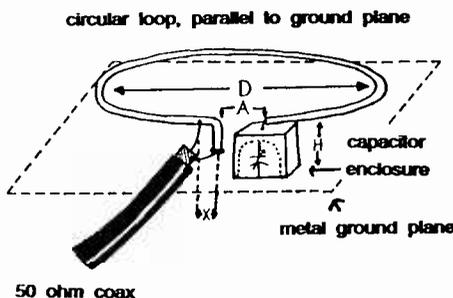


Figure One

It's Tuneup Time

To adjust the loop, feed it with a low-powered signal at 14 MHz and check the VSWR reading. If it is not low enough, move the position of the feeder tap until the lowest VSWR is obtained, resonating the capacitor after each change.

Although the response at 14 MHz is about 4 dB down compared to a 16 foot vertical mounted over the same ground plane, it is more efficient at 21 MHz. On 7 MHz the DDRR will be about 14 dB down compared to a 33 foot vertical, but a nine-foot-diameter version, two feet above ground, should only be 4dB down.

I am using the loop under difficult environmental conditions; local obstructions like small plants are higher than the antenna, yet it still gives remarkable results. Performance should be considerably improved by mounting the antenna and ground plane on much higher stakes so that it clears obstructions, or by mounting it horizontally on a roof.

My 20 meter version is designed to be portable, so I used thin RG174 coax; the efficiency of a fixed version would be higher if RG8 cable were used and if the diameter of the loop were greater. Even better, try 1/8" copper plumbing pipe gently shaped into an octagon using a conduit bending tool.

The 50 ohm feeder is connected as shown. The following 14 MHz dimensions will also work on 7 and 21 MHz: A = 3 inches; D = 4-1/2 feet; H = 6 inches; X = 1.5 inches (adjusted for best output).

TABLE OF DIMENSIONS FOR OTHER BANDS

Band	A	D	H	X
160	16in.	36ft.	48in.	12in.
80	7in.	18ft.	24in.	6in.
40	5in.	9ft.	11in.	6in.
15	2.5in.	3ft.4in.	4.75in.	1.5in.
10	2in.	2ft.4in.	3in.	1.5in.
6	1.5in.	16.25in.	1.5in.	1in.

More information on the DDRR antenna can be found on page 10.7 in the ARRL "Antenna Book".

Play it Again

My piece, "EM?" in the February issue was a bit of a 'flyer' as it didn't pertain to monitoring as such. It definitely was a technical topic though. And my mail runneth over. It seems a lot of you have firmly established yourselves as the electronic genius of the family, perhaps even up-grading your position in old Uncle Bill's will by doing the things I outlined. That's what I love to hear. I forgot one thing, however.

On Dolby

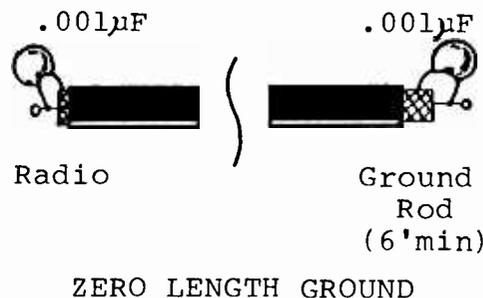
If you have a cassette deck with Dolby B, or preferably C, *always* record with the best Dolby you have. Then, on playback, turn the Dolby OFF. This gives you an upward 'swing' of up to 15 dB from about 4 kHz. If you use good quality tape, the hiss isn't all that bad. If it is annoying and you recorded in Dolby C, Dolby B will generally eliminate it on playback while still giving you an edge.

On Being Profound

You know, when I write something that I subjectively feel is profound, it usually draws a blank as far as reader feedback goes. Then I rip off a little ditty and the crowd goes wild. That's why your input is so important. If you have a comment that doesn't require an answer, an SASE isn't needed. Let me know what you're interested in hearing about - it really helps me but more importantly, *you*. So don't be shy. Beginner or expert, drop me a line and let me know what you want to see in future columns.

Zero Length Ground Revisited

I repeatedly get inquiries about the "zero length ground." It usually goes, "a friend told me that you wrote something about this, but has no information." To save space, as it's been printed in 73 magazine twice and once each in the old *International Radio* and more recently, in *Monitoring Times*, I've just drawn it up in Fig. 1 and will skip the rationale. Believe me, it *really* works.



Speed up

I get many requests on how to increase the scanning speed on older units. This can be done by changing the value of a capacitor. There's an important point though. The industry is very competitive and usually the scan rate is set as fast as the unit can reliably go. Increasing it almost always causes the set to miss the weak ones, so it isn't advisable. The newer scanners, while scanning like a machine gun, can have the speed increased as has been covered exhaustively in the last few issues of *MT*. I suggest you leave your 1970 vintage Regency or Bearcat alone, as it's doing about as well as it ever will. "If it ain't broke, don't fix it."

The DX-300

In the January issue, I advised you to snip the brown wire from the A1 terminal and wrap it loosely around the jumper or capacitor going to the coax jack. Feedback shows the jumper or capacitor isn't always there. If not, just solder a wire from A1 to the coax jack and you'll be in fat city.

The FRG-7000

This was probably the first really good digital SWL receiver. I had one and outside of replacing the 3SK51-03 (it's usually a 3SK40) 1st RF transistor with a good old 3N211, it was a real hummer. These things come in bunches: I've received several letters complaining that the dial read-out has become inaccurate. The culprit is the fifth overtone crystal, X-01 (63.2 mhz) in the BPF unit. These things are 10 years old now and are starting to go south. A replacement can be obtained from Yaesu at 9070 Gold Park Drive, Hamilton, OH 45011, or from any of the large U.S. manufacturers (International, Savoy, Sentry). After doing this, it's advisable to tighten *every* screw in the radio as they are usually loose and can cause problems. This applies to *every* radio from the Orient. They're assembled by lovely little girls in white bandannas who believe when the screw stops, they stop.

Negative light

The existence of anti-matter has been proven, but only recently was an astonishing event declassified for the public and scientific community. It seems, in 1971 at the British Royal Observatory at Greenwich, Sir Humphrey Viscount Mornay was examining some detailed micro-photography with a 'high intensity' lamp, the type that uses a 12 volt auto tail light bulb that one can get anywhere.

Well, the unit failed and replacing the bulb didn't help. The problem was in the small transformer in the lamp base. Not having a replacement and eager to complete his work, he attached the unit to a dual brising oceanographic can and changed just a few components.

Upon activating the unit, he was quite rightly astonished to find a "cone" of utter darkness where the light should have been. Placing objects, including his hand into the area caused total invisibility.

In quite explainable haste, he went and got a five cell flashlight that he, himself, had just recently replaced the batteries with premium alkaline units. To his fright, shining that big flashlight right at the cone of darkness didn't penetrate it 1/1000th of an inch. In fact, sticking the flashlight directly into the area darkened by the "lamp" caused it to disappear, as had the objects on the first attempt.

He was beside himself at this point and summoned his assistant, Geoffrey Blight. After a careful explanation of the events and causative points, he sat back and let Mr. Blight repeat what he had done (the scientific method!), while recording the event on a high speed 8 mm movie camera.

After this had been done, they both sat, shaken, discussing what should be done. It was finally agreed upon that one of them should look directly into the bulb to see if possibly an answer could be found.

Sir Humphrey lost the coin toss and with perspiration soaking his hair and shirt, gingerly picked up the lamp. Blight looked on in horrified fascination. Terror beyond anything he had ever known gripped him as Sir Humphry screamed and slumped over the lab table.

Blight retrieved the unit just as it was about to fall and, in so doing, inadvertently looked straight into the bulb, as had his mentor. A chill stabbed through him and he clenched it as he passed out.

When the shift change found them in the morning, a Dr. Cobscot gently pried the lamp from Blight's fingers and upon examining it, he, too looked into the bulb. To say he was incredulous would be an understatement as was what he saw, in very tiny, but vividly readable letters was

(concluded next page)

April Fool!

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Tomcat's Big CB Handbook. Everything they never told you about CB by Tom Kneitel! An up-to-date, irreverent and thorough look at CBing. Equipment, antennas, great stories -- as only Kneitel can tell them!. Everything they never told you! Was \$13.95 plus shipping. Now just \$9.95 plus \$2.00 UPS shipping.

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Experimenting with RDF Loops

by Bob Grove

One of the most promising areas of home experimentation is in the field of radio direction finding (RDF). For the two-meter ham it is a productive method of finding repeater jammers; for the SWL it is an excellent way to determine the source of interference. For Civil Air Patrol it is an excellent project to find emergency locator transmitters (ELTs).

At VHF and UHF frequencies, small Yagi and log-periodic "beam" antennas are good for fixed locations, but they are large and awkward to use in portable/mobile applications. Below 3-4 MHz circular loops have been used with success by maritime interests for decades, often in the configuration known impressively as the "Bellini-Tossi fixed-loop, balanced bridge goniometer"! Large Adcock arrays work well in the HF (3-30 Mhz) spectrum to counter the false readings resulting from downcoming sky waves.

The Ideal RDF Antenna

The perfect RDF antenna would be miniature, possess wide bandwidth and good signal output at a reasonable impedance, be simple and inexpensive to build, and have symmetrical unidirectional response. In the real world, loop antennas are typically bidirectional (often with unsymmetrical patterns) and have low output due to their

Figure A: A balanced loop enclosed by a Faraday shield (the top is open so as not to comprise a closed turn).



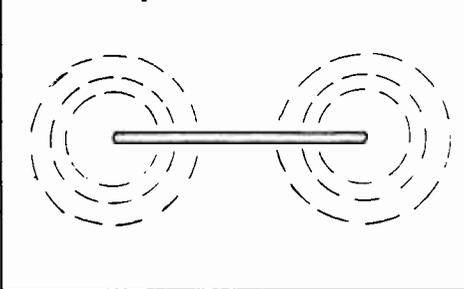
Figure B: The Grove VHF/UHF unbalanced loop. The trimmer may be placed in either side of the line.



small size, aggravated by extremely low impedance mismatching to the receiver.

The literature strongly recommends enclosing an electrically-balanced loop (for symmetrical response) in a Faraday shield (see illustration A), eliminating the electric portion of the radio field which is influenced by nearby objects such as hand capacity. Theoretically, such a loop has "bidirectional ambiguity"; that is, it has a figure-eight pattern which exhibits two maxima and two minima (see figure C).

Figure C: Looking down on vertically-mounted loop of Figure A showing bidirectional pattern.



Some Promising Results on VHF

We recently devised a small, tuned, unbalanced loop which has high signal output, very small size, extremely simple design, unidirectional response, and no shield required! Sound good? Read on.

Construction is extremely simple: solder a trimmer capacitor to one end of a 1/8-wavelength piece of wire, bend it into a loop, and solder the remaining ends to an RF connector (see illustration B).

For our test we used a nine-inch piece of stiff wire and a 2-18 pF (approximately) trimmer capacitor soldered to an SO-239 chassis-mount UHF connector. This combination allowed signal peaking from approximately 100 to 200 MHz.

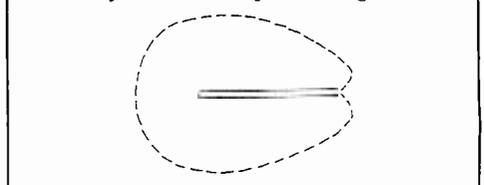
A six foot length of RG58/U with a PL-259 on one end and a BNC on the other was used to connect the loop to a Bearcat BC-100XL scanner. After selecting a moderately-strong signal, the trimmer was adjusted for maximum signal level.

The Tell-Tale Test

Holding the loop vertically by its connector base and lifted high, the contrivance was rotated in a circle, noting changes in signal strength. Remarkably, the signal nulled

sharply when the grounded (connected to the coax shield) edge faced the signal, and broadly peaked when the "hot" (connected to the coax center conductor) edge faced the signal (see illustration D).

Figure D: Looking down on the Grove unbalanced loop of Figure B showing signal null at left and broad peak at right.



Signal levels were excellent as well, possibly superior to those heard with the rubber duckie whip and definitely louder than those provided by an untuned loop several times larger!

Since we are in a mountainous area, signal reflections are a problem; multiple readings from different locations must be taken to resolve inconsistencies in bearings. The same precaution would hold true for cities with their buildings.

Weak and moderate signals are easily resolved by noting the background hiss level; strong signals cannot be easily resolved without an attenuator, or by adjusting the receiver's frequency slightly high or low to weaken signal strength.

Many Questions Remain

While preliminary test results have been very encouraging, results from other experimenters are sought. Can this loop design be scaled down to HF (3-30 MHz)? Can the concept be used with ferrite-rod loops? Should ferrite beads be placed at the junction of the loop and cable to isolate them electrically? Does the cable act as a counterpoise or sense antenna, encouraging the unidirectional response? What would a metal handle do to the response, especially if the handle were 1/4 wavelength? What is the best length/capacitance ratio for various frequencies?

Perhaps the biggest question of all, how would such a loop appeal to the commercial market? Are there users out there who would like to see this concept professionally manufactured? Let us know!

Balanced Loops for Direction Finding & LW/MW DXing

Extracted from a paper by Wilfred N. Caron

This article describes the construction of several loop antennas for both direction finding and LW and MW DXing. Use of loop antennas provides several interesting advantages to the MW/LW listener. Aside from being used for direction finding, loops tend to be very quiet on receive; this same quality allows the listener to null or peak a given station, avoiding interference from other stations broadcasting on the same frequency.

All of the loops are constructed using a 12 inch ferrite core which allows us to construct it very small. Despite the small size, the loop can be as effective as a much larger air wound loop. Note: ferrite is extremely fragile and care should be exercised when working with this material to prevent breakage.

The first loop is illustrated in figure 1; this basic loop is simply placed in close proximity to a portable broadcast receiver.

The loop of figure 2 is an illustration of a loop using reversed winding techniques. The major advantage of this reversed winding loop is that it permits us to use a one-turn loop of wire to hardwire the antenna into a communications radio. A second advantage is very much improved performance of the antenna for direction finding (accuracy with this type of loop is typically within 0.6 degrees).

A Word on Construction

Both loops are constructed on an Amidon R33-075-1200 ferrite core 12 inches long and 0.75 inch in diameter (permeability of 800). Use number 10/44 Litz wire to wind the antenna. Plastic covered or enamel wire can be used; however the Q will be lower and more turns will be required to tune the same frequency range. The capacitor specified is a 10 to 500 pF unit. If a smaller capacitor is used (i.e. 10 to 365 pF), again, more turns of wire will be required to tune the same range, perhaps as many as 40.

When constructing the reversed winding loop, it is important to remember to wind each coil in a different direction; if the left side coil is wound clockwise, the right side must be wound counterclockwise.

Model # 3

Figure 3 illustrates the reversed wound loop mounted in a Faraday shield to minimize stray capacitance and improve DFing accuracy. Be sure to support the ferrite loop at both ends with a foam block.

A Remote Tuned Loop

Using the reversed winding technique, we can construct a remote tuned loop that can be mounted at a high location some distance from the receiver. Use an Amidon R61-050-750 ferrite core. DI is an NTE 618 varactor tuning diode.

Control is achieved by varying a voltage to the diode via the coax

Figure 1: Broadband balun using reversed winding arrangement to achieve balance.

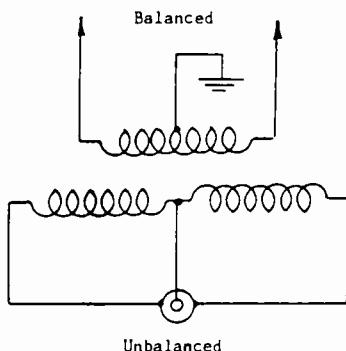


Figure 2: Broadcast band ferrite loop antenna. Magnetic field coupled to a portable radio. Performance dependent upon proximity of radio to rod.

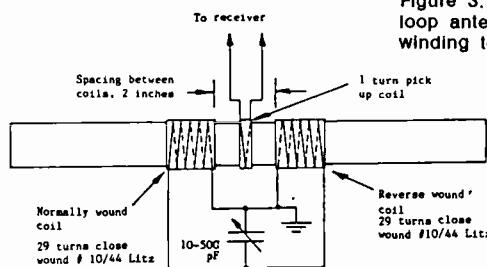
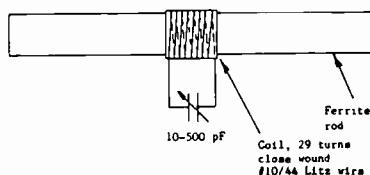


Figure 3: Signal Corps ferrite loop antenna using reversed winding technique.

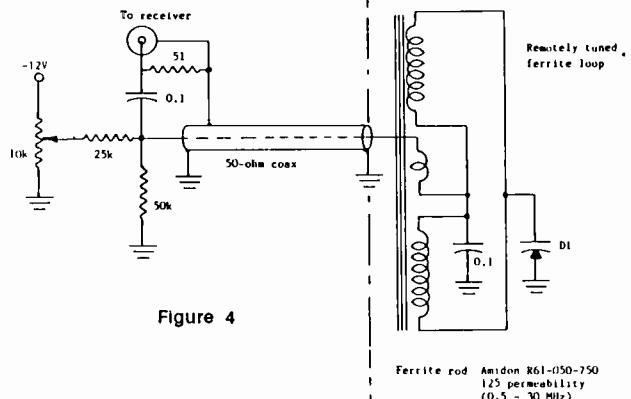


Figure 4

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feedline as shown in Figure 4. All resistors in the control circuit should be carbon (wirewound will add inductance).

You may wish to experiment with this loop on various shortwave frequencies. If so, it will be necessary to experiment with the windings to get the correct number of turns to cover the frequency range you are interested in.

Materials

Both the ferrite cores and Litz wire can be obtained from Amidon Associates, 12033 Otsego Street, North Hollywood, CA 91067. Write to them for prices.

(con't. from page 3)

Tallin is on shortwave in Swedish daily at 2105 and on Sundays at 0800 on 5925 kHz -- without interruption and at least since 1981. Transmissions are in Swedish, Finnish and Estonian. I suppose that Radio Netherlands meant that they were back in Esperanto?!

Sven Ohlsson
Swedish DX Federation
Astorp, Sweden

Comments on the "New" MT

My comments on the "new and improved" Monitoring Times? In a word, excellent. There are several reasons for this opinion and given time I expect I could find more. For now, though, they are as follows:

1) Appearance. The new format gives it more of a "take me seriously" impression and looks good. 2) It is now a whole lot easier to handle and use. People with shorter arms will bless you. 3) Storage and filing. No explanation needed. 4) Travels far better. No longer arrives looking like it was used to paper train the mailman. Keep 'em coming.

Al Rayment
Nelson, British Columbia

Just a note to let you know that I am very happy that you have again expanded the "Frequency Section" of Monitoring Times. While the annual editions of *Passport to World Band Radio* and the *World Radio TV Handbook* are excellent sources of information, your magazine provides an invaluable service in keeping us up-to-date on frequency changes and changes in program content.

I do have a suggestion: Could you please include more articles on the use of computers as aids in shortwave listening?

Koert Koelman
Belmont, California

The popularity of computers in the radio hobby has been a topic of considerable debate for some time. Add to that the non-compatibility of the various computers used by listeners and you've got an editorial headache of incredible proportions. Still, we are interested in the idea and welcome both feedback and manuscripts for examination. In the meantime, perhaps you might want to "tune in" a bulletin board for radio enthusiasts from ACOM. Their number is 1-713-879-1448.

More on Auto Shortwave Radios

After reading Larry Magne's article on automobile shortwave converters, I'd like to pass along this simple solution. I have a digital Sony ICF-7600 D (2002/3 in the U.S.) which I plugged into a CB antenna via a coax cable. A Radio Shack 12v-6v cigarette socket transformer is used for power.

The set up works fine on strong stations like

the BBC and AFRTS. They don't bang in like they do on my ICF-6800W at home, but given the right conditions, it can be a God-send on a long trip.

Patrick V. Farrow
Rutland, Vermont



(We thought you would like to meet the Osgood Volunteer Fire Department team from the March article "The Day the Baby Stopped the Races".) MT

For some time I have been aware of a pair of car tuners that can pick up the entire shortwave spectrum. The units are made by Carver, a company whose tuners are considered by many reviewers and audiophiles to be the best on the market. They are relatively expensive, especially after you add the required amplifier and speakers, but should be well worth it if you have the money.

Robert Grimsley
Ladson, South Carolina

The two models that receive shortwave (and longwave!) are called the TX-Seven and TX-Nine. You can get more information on Carver car shortwave radios by writing to the firm at Box 1237, Lynwood, Washington 98046. Be sure to tell them that you read about their product in Monitoring Times.

Disagreeing with Michael

It seems that Michael McCloskey KB6DQG of Placerville, California, is rather self-centered in his attitude about MT. He wants more specialized columns and less on international broadcasting and ham radio. What he does not realize is that there are many people who enjoy all different types of radio, especially potential ham operators on the way up or just beginning.

Continue MT as it is. There is something for everyone. Sure, enlarge on various topics from time to time, but don't drop any one subject, ham radio included. You have a fine magazine. Keep it coming.

Fred Chappell
Windsor, Ontario

QRP Amateur Radio Club International

Thanks for the mention of the QRP ARC in

Monitoring Times. Please point out that a membership information packet, including a copy of the QRP Quarterly, is available for \$1.00 from Joe Sullivan WA1WLU, 267 Sutton Street, North Andover, Massachusetts 01847.

Fred Bonavinita, W5QOM
Austin, Texas

Don't Support CB

Please don't support Citizen Band (CB) or the so-called "pirate" stations. They are a waste of time.

Kenny R. Johns
Jackson, Tennessee

Support CB

I would like to see at least one article on CB if possible.

Paul A. Foust
Moreno Valley, California

Support Choo Choo

I would like to see articles about trains and their frequencies -- especially for Arizona, California, Oregon and Washington state as well as UHF military channels, and fire frequencies for the Lake Oswego, Oregon, region.

Robert E. Brock
Phoenix, Arizona

What did I Hear?

I heard a broadcast station on 15345 kHz in the 19 meter band broadcasting ABC and CBS news. In your frequency list, you say it's AFRTS. Could you tell me what this is all about?

Barry

AFRTS is short for the Armed Forces Radio and Television Service. Based in Sun Valley California, it re-broadcasts domestic news, sports and current affairs programming from the major networks for the benefit of US military personnel and their dependents overseas. The shortwave programs you hear originate from a worldwide network of transmitters that are targeted primarily for military vessels at sea. All broadcasts are in English. For the complete schedule, please consult the frequency section in this magazine. - - ed.

Nothing Makes Sense

I tuned to 6005 kHz around 0300 UTC and heard Spanish. A few days later I tuned to the same frequency and heard Radio Moscow in English. Other times on 6100 kHz I hear "beep beep beep" then "Daniel Ortega so and so" then "The Bible tells us..." What a mess! Everything sounds garbled. What gives?

Aren't there any rules governing the international broadcast bands?

Robert R. Covington
Baltimore, Maryland

By their very nature, shortwave radio signals are very unpredictable. Theoretically, a station can be on the same frequency as another, at the same time, but beaming to different target areas, and not interfere with one another. But, being unpredictable, theory is not the same as reality and interference does often occur. Further, although the international broadcast bands are nominally governed out of Geneva, Switzerland by the International Telecommunications Union (ITU), the results are far from impressive. For now, such frequency pile-ups are just part of shortwave's "charm." -- ed.

Radio Beijing Predicts US Invasion?

Late last year, an official shortwave radio broadcast was made from Communist China to target area North America on frequency 5985 at 0213 UTC. The broadcast warned that "Peking will be able to launch an invasion [of the United States of America] in seven years."

Donald Michael Choleva
United States Marine Corp., Ret.
Euclid, Ohio

Error! Error!

In your recent article, "Scanner Games," there was an error. Runway 27 is 270 degrees due west, not 27 degrees. All runway designations for pilots drop the second or third digit. In other words, runway 2 is 20 degrees, 30 is 300 degrees and so forth. 0 degrees is north, 90 degrees is east. All headings are magnetic, not true.

An Old Pilot
Al Taylor
Whitehorn, California

Say It Again, Terry

I read with great interest Mr. Terry Staudt's article, "Eh?" as I am also hearing impaired. The modifications he suggests were, however, inappropriate for me as I do not have a loss in the "treble" range. He may, however, have shown poor judgment in discouraging those who need medical attention from seeking it. People cannot, unfortunately, boost the treble of their voices and the social and emotional effects of even a mild hearing loss should not be under-estimated.

A different approach would be to acknowledge that the hearing aid is an imperfect device that can not (as yet) render hi-fidelity sound so it would seem logical to compensate at the source where possible. The graphic equalizer referred to in the article is an ideal way to do this. The graph used for hearing test results can be used as a guide to set the equal-

izer.

Bob Forrester
Philadelphia, Pennsylvania

I'm a 63 year old shortwave listener and hi-fi bug. I just rekindled my long ago love affair with shortwave and just recently subscribed to *Monitoring Times*. I'm also hard of hearing. That's why I was surprised and excited to read Terry Staudt's article, "Eh?"

I say surprised because in all these years, I've never seen a word written about this problem. Not only was the article excellent, pertinent, warm and humorous, but Terry's follow-up phone call and detailed advice was as inspiring as it was helpful.

Thanks for an excellent magazine and a very dedicated staff!

Michael J. Faraon
Phillips Mills, California

Staudt is one of the best. -- ed.

Scanner Picnic

Please let the readers of *Monitoring Times* know about the second annual North East Scanning News picnic on July 23, 1988. This event is open to all readers of *Monitoring Times* and anyone else interested in scanning. The event will be held at the Red Bank Battlefield, Riverfront Pavilion, 100 Hessian Avenue, National Park, New Jersey 08063 (Glouster County). The contact is Les Mattson, 212 West Broad Street, Paulsboro, NJ 08066.

Mark your calendar, folks!

Information Wanted

Would you please publish a performance field text on the Cobra SR-15 handheld scanner and also on the Bearcat 200 with cellular coverage as soon as you can?

justify 3 1
Terry Dietrich

The Cobra SR-15 is essentially the same as the Bearcat 100 XLT, which was reviewed in the February, 1988 Monitoring Times. The Bearcat 200-205 is expected to become available this summer. A review will appear in MT shortly thereafter. --ed.

Editor's note: Ken Cornell, whose article on license-free broadcasting appeared in January, 1988 edition of *Monitoring Times* (P. 72-73), has been receiving some remarkable results. Ken's beacon is on the air almost every night (sunset to local midnight) from his home in Point Pleasant, New Jersey, on 1652 kHz. Operating in Morse code and using only one watt, he recently received a reception report from a monitor located near Toronot. That, says the author, "looks like about a 4000 mile haul -- not bad for a half loafer."

Can you beat that reception? Ken welcomes your report via *Monitoring Times*.

Monitoring Times welcomes by your considered comments, questions and opinions on the world of radio. Address them to "Letters," P.O. Box 98, Brasstown, North Carolina 28902.

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JRC/NRD-515 General Coverage Receiver, 500 kHz filter for CW/narrow shift RTTY, speaker and 96-channel memory. Excellent condition, \$800.00. Steve Rutledge, 48 Pine Court, Grosse Pointe, MI 48236. 313/884-2382 after 2300 UTC.

For Sale: ICOM R71A shortwave receiver, FM board and FL63 CW filter. Includes Ameco tuner/preamp, shortwave books, USA

UPS shipping. Cert. Check or Money Order. Call 201/467-2128. \$725.

Sale - BEARCAT 175XL scanner, 2 months old in original box, \$135.00. Will pay postage. Money order only. Mahoney, 102 Oakland Avenue, Pawtucket, RI 02861.

J.I.L.-SX400 VHF/UHF communications receiver. Frequency range 26-520 MHz. Suggested list \$899.95, retail new price \$599.95. Will sacrifice at \$450 with power supply. F. Wilson, 7918 Briaridge, Dallas, TX 75248. Call collect 214/387-8517 or 214/880-1136.

Wanted: HANDHELD PROGRAMMABLE scanner like Bearcat XL-100, etc. Also want 40 channel handheld CB radio. State model and price wanted. Include SASE. Wm. Coolbaugh, 1304 Fairlane, Bettendorf, IA 52722.

Wanted: SONY CRF320A, excellent condition. Bill Cress, 201/694-5154, 28 Worcester Drive, Wayne, NJ 07470.

TWO BEARCAT 800XLT scanners for sale used \$175 each. M.O./certified check. John Hart, 9926 Haldeman Ave. Apt. 129A, Philadelphia, PA 19115, 215/673-4146.

For Sale: ICOM R71A receiver with FM. About 100 hours use. Mint condition. \$595. Greg Dzurisin, 1207 Thomas Drive, Champaign, IL 61821, 217/359-8174.

For Trade: AMECO TPA in excellent condition, original box. Looking for good, working scanner with manual. Ed Cichorek, 82 Rodney Ave., Somerset, NJ 08873. 201/545-2999.

Wanted: HEATH GD-1B, HD-1250 Grid Dip, HD-10 keyer, key, "SB" Series equipment, Realistic DX-100, 5 MHz scope, 30 MHz counter, tube type novice transmitter and receiver. Please give details and delivered price. Bill Downs, 4805 Sullivan, Wichita, Kansas 67204.

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Communications Satellite (3rd edition) slight cosmetic damage. 12 only for \$9.50 each including UPS; **World Radio TV Handbook, 1988**, 1 only \$10.

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CONVENTION CALENDAR

Date	Location	Club/Contact Person
Apr 2	Marietta, GA	Kennebec ARC/Gene Clay WA4JXB 4021 N. Cooper Rd. Smyrna, GA 30080
Apr 2	Grandville MI	Spare Time ARS/Russ Shearer N8HNR 1135 Ruddy Dr NW, Grand Rapids MI 49504
Apr 8-10	Kansas City, MO	MO Stat Conv/ Chuck Miller 7000 NE 120th St, Kansas City, MO 64166
Apr 9	Charleston WV	Kanawha ARC/Wm. Kibler, Sr. K8WMX 182 Monterey Dr, St. Albans WV 25177
Apr 9	Spokane, WA	Inland Empire VHF/Edward Ferrel W7EQU 318 E Courtland, Spokane, WA 99207
Apr 9	Clarkville TN	Clkvl Amat. Trsmt. Soc./Larry Burns Rt 1 Box 162A, Indian Mound TN 37079
Apr 9	Rochester MN	Rochester ARC/W.C. McGurk, W80YEE 2253 Nordic Ct NW, Rochester, MN 55901
Apr 9	Alexandria, LA	Central LA ARC/ Ed Crump KB5CX 6035 Navaho Trail, Alexandria, LA 71301
Apr 10	Raleigh, NC	NC State/ Chuck Littlewood K4HF 2005 Quail Ridge Rd, Raleigh, NC 27609
Apr 10	Madison WI	Madison Area Rpt Assc. Clyde Downing 2230 Allied Dr #5 Madison, WI 53711
Apr 15-17	Kansas City MO	Missouri State Conv. Chuck Miller WA0KUH 7000 NE 120th St., Kansas City MO 64166
Apr 16	Fergus Falls, MN	Lake Region ARC/ Rod Scheel 1215 N Concord St, Fergus Falls, MN 56537
Apr 16	Flemington NJ	Cherryville Rpt Assc. Donald Mazak NR2H 2 Meadowrun Way, Flemington, NJ 08822
Apr 16	Angleton, TX	Brazosport ARC/Rory Burke KA5MBH PO Box 291, Lake Jackson, TX 77566
Apr 16	Fergus Falls MN	Lake Region ARC/Rod Scheel, N0DVO 1215 N Concord St, Fergus Falls MN 56537
Apr 17	Southington, CT	Southington ARC/ Milton Chaffee 28 Reussner Rd, Southington, CT 06489
Apr 17	Columbia, TN	Maury ARC/George T. Russell WB4JCR PO Box 832, Columbia, TN 38402
Apr 17	Sullivan IL	Moultrie ARC/ Vernon Jack, K9SWY 916 W. Strain, Sullivan, IL 61951
Apr 22-24	Visalia, CA	Int'l DX Convention/ Bill Kendrick WK6V 1677 W 256th St, Harbor City, CA 90710
Apr 24	Hays, KS	Hays ARC/Andrew Oldham, N0FBS 117 N 8th St. Wakeeney, KS 67672
Apr 24	Pennsauken, NJ	Willingboro Rptr Grp/José Alvarez K2KMO 1343 Thornwood Dr, Mt Laurel, NJ 08054
Apr 29-May 1	Dayton, OH	Dayton Hamvention/ DARA Box 44, Bayton, OH 45402
Apr 30-May 1	Grnvl SC	Blue Ridge ARS/John Chism, ND4N 203 Lanewood Dr, Greenville, SC 29607
Apr 30-May 1	Sierra V AZ	Cochise ARA/Pete LaCont WBUXD 3064 Meadow Lark, Sierra Vista, AZ 85635
May 1	Upper Darby PA	Delaware City ARC/Mary Ann Tatum 10 Greentree Ln, Malvern, PA 19355
May 1	Suffolk Cty NY	Suffolk Cty Radio Cb/David Potter W2GZD 51 Bayport Ave., Bayport NY 11705
May 6-8	Fresno, CA	Fresno ARC/Glen Caine, N6HEW 5957 E. Pontiac Way, Fresno, CA 93727
May 7	Cedarburg WI	Ozaukee Radio Club/James Douglas KA9DDN 101 E. Clay St., Saukville WI 53080
May 7	Owego, NY	Southern Tier ARC/Bill Thompson W2MTA RD1 Rock Rd, Newark Valley, NY 13811

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May 8	Bluefield WV	East River ARC/Jim Perdue KC8NG Rt 5, Box 457, Bluefield, WV 24701
May 8	Medina, OH	Medina M2M Group/Clerence Miller WA8JLA 620 Oak St., Medina, OH 44256
May 13-15	Tulsa, OK	Broken Arrow & Tulsa ARC/Ron Gamel N5WX 8217 E. 38th St., Tulsa, OK 74145
May 14-15	Birmingham AL	AL State Conv./Mildred Cullen AA4XF 2331 Ivy Lane, Birmingham, AL 35226
May 15	Kankakee, IL	Kankakee Area Rad. Soc./Frank Dal Canton RR 1 Box 361, Chebanse, IL 60922
May 15	Athens, OH	Athens County ARS/J.A. Haas KABZYN 24 Woodward Av. Athens, OH 45701
May 15	Knoxville IL	Knox County ARC/Kelth Watson WB9KHL 119 S. Cherry St, #3, Galesburg, IL 61401
May 15	Wrightstown PA	Warmminster ARC/Chris Dahl, N13J 3417 Stafford Pl, Holland, PA 18966
May 15	Tamaqua, PA	Tamaqua Trans. Soc./Allen Breiner, K3NXX 212 Race St., Tamaqua, PA 18252
May 15	Old Westbury NY	LI Mobile ARC/Henry Wener, WB2ALW 535 Sherrad St., East Hills, NY 11577
May 15	Evansville IN	Tri State ARS/George Utley N9FMO 6017 Oakhill Rd, Evansville, IN 47711

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