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MONITORING TIMES

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Inside This Issue:

- ★ ACARS: New Aeronautical Technology
- ★ DXing the Brown Water Coast Guard
- ★ The Day the Baby Stopped The Races
- ★ MT Reviews the BC-950XLT and Kenwood TS-140S

CELLULAR FIX FOR BC950XLT PG. 81

International Voices of Faith

Is Religion Taking Over The Shortwave Bands?

A Report by Rev. Ken MacHarg

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MT's Monthly Program Guide

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Inside this Issue

NEW! Exclusive day to day programming guide on p.70!

DEPARTMENTS

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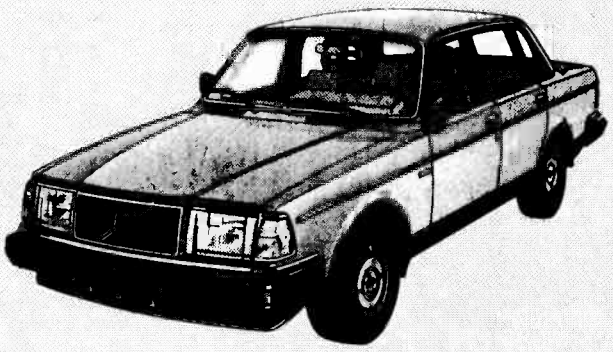
ON THE COVER: HCJB's huge European antenna array dwarfs Phill Sandahl, HCJB's research director (photo by Ken MacHarg). The studio gates, seen here at night, are 20 miles away in Quito, Ecuador. The Quechua Indians regularly tune to HCJB broadcasts in their native language (photos courtesy HCJB).

LETTERS



Installing shortwave radios in cars is still not a booming business. Most people, it seems, would rather have a CD player.

The World on Wheels

As someone involved in automobile radio repair, I very much enjoyed Larry Magne's review of car shortwave converters. In the late 1970s and early 80s, Delco Cadillac/Corvette radios offered Citizens Band or Weather Band. These have, however, gone the way of 8-Track and Quadraphonic. Even AM stereo has gone stale. Today, Dolby and Compact Disc are the norm, not shortwave. But that's not to say shortwave listeners and AM DXers shouldn't keep the faith.

Walt McCrystal
Beiter Electronics
Rochester, NY

Bringing Down the House

There has been some discussion in the pages of *Monitoring Times* regarding the use of scanners on in-flight aircraft. I must comment that, while using a Radio Shack PRO-2010 aboard a ship, the unit produced such excessive noise that our 460 MHz handy-talkies were effecively jammed. This phenomenon may be peculiar only to the PRO-2010, but I doubt it. Therefore, it is recommended that you do not run scanners on aircraft as you may cause interference with the communications, or worse, navigation systems.

A.W. Edwards
Fort Davis, TX

Half Loafers only Half Successful

The low power AM transmitters mentioned in the February issue [DXing the Teeny-Tiny AMS] do have their uses in the real estate industry. Their success, however, is not for the reasons one might think. Few people actually pull over and listen to the descriptions of the houses that are broadcast from them. They do, however, give us the edge over other agents in getting listings. It's a sales gimmick -- not for the buyer but rather, for us to get the seller.

Bill Campbell
Re-Max Blue Ribbon Associates
[Address withheld]

Inside Stuff

Monitoring Times is so authoritative and timely that it is frequently quoted by others in the industry. Having already read "Superpower KUSW Worldwide Radio" and "Goodbye AFRTS" in the January issue, I felt like a privileged insider when I heard a live interview with [KUSW owner] Ralph Carlson and a discussion of the AFRTS situation [on a DX program]. Keep up the good work!

Buell R. Snyder
Beachwood, NJ

AFRTS Report Disputed

Your report about the exit of AFRTS from shortwave (January, 1988) was incorrect in almost every detail. AFRTS officials informed me that the station has not yet made any firm decision about leaving shortwave.

As *Monitoring Times* readers are no doubt aware, VOA broadcasts to foreign audiences, while AFRTS is intended for Americans overseas (and on the seas). Even though AFRTS can be heard by some foreign audiences, research shows that AFRTS is not "far more popular" than VOA. The writer's confusion is no doubt attributable to a few foreign cities where local AFRTS medium wave outlets have had more listeners than VOA.

Kim Andrew Elliott
VOA Research Officer

The AFRTS target audience is not, as Mr. Elliott states, "Americans overseas (and on the seas)" which would include tourists, businessmen and so forth. AFRTS is specifically for personnel of the American Armed Forces and their dependents (1988 World Radio TV Handbook, p.276). Any other audience, while quite possibly appreciated, is clearly outside their charter. An AFRTS official told Monitoring Times that they would be leaving shortwave. In the interim, however, they appear to have softened their stand, saying that they will remain on the air until at least the end of the year. MT stands by its story that research has shown AFRTS to be more popular than VOA in some parts of the world, specifically north Africa, and this is not related to medium wave transmissions. The information was, in fact, obtained from Mr. Elliott's own department some years ago. --ed.

[More "Letters" on page 92]

NEW! CB Radios & Scanners

Communications Electronics,™ the world's largest distributor of radio scanners, introduces new models of CB & marine radios and scanners.

NEW! Regency® TS2-RA

Allow 30-90 days for delivery after receipt of order due to the high demand for this product.

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12-Band, 75 Channel • Crystalless • AC/DC

Frequency range: 29-54, 118-175, 406-512, 806-950 MHz.

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Regency® Z60-RA

List price $299.95/**CE price $148.95/SPECIAL**

8-Band, 60 Channel • No-crystal scanner

Bands: 30-50, 88-108, 118-136, 144-174, 440-512 MHz.

The *Regency* Z60 covers all the public service bands plus aircraft and FM music for a total of eight bands. The Z60 also features an alarm clock and priority control as well as AC/DC operation. Order today.

Regency® Z45-RA

List price $259.95/**CE price $139.95/SPECIAL**

7-Band, 45 Channel • No-crystal scanner

Bands: 30-50, 118-136, 144-174, 440-512 MHz.

The *Regency* Z45 is very similar to the Z60 model listed above however it does not have the commercial FM broadcast band. The Z45, now at a special price from Communications Electronics.

Regency® RH256B-RA

List price $799.95/**CE price $329.95/SPECIAL**

16 Channel • 25 Watt Transceiver • Priority

The *Regency* RH256B is a sixteen-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to 16 frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH256 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A *60 Watt* VHF 150-162 MHz. version called the **RH606B-RA** is available for $459.95. A UHF 15 watt, 10 channel version of this radio called the **RU150B-RA** is also available and covers 450-482 MHz. but the cost is $439.95.

Bearcat® 50XL-RA

List price $199.95/**CE price $114.95/SPECIAL**

10-Band, 10 Channel • Handheld scanner

Bands: 29.7-54, 136-174, 406-512 MHz.

The *Uniden Bearcat* 50XL is an economical, handheld scanner with 10 channels covering ten frequency bands. It features a keyboard lock switch to prevent accidental entry and more. Also order the new double-long life rechargeable battery pack part # **BP55** for $29.95, a plug-in wall charger, part # **AD100** for $14.95, a carrying case part # **VC001** for $14.95 and also order optional cigarette lighter cable part # **PS001** for $14.95.

PC 22

NEW! Scanner Frequency Listings

The new Fox scanner frequency directories will help you find all the action your scanner can listen to. These new listings include police, fire, ambulances & rescue squads, local government, private police agencies, hospitals, emergency medical channels, news media, forestry radio service, railroads, weather stations, radio common carriers, AT&T mobile telephone, utility companies, general mobile radio service, marine radio service, taxi cab companies, tow truck companies, trucking companies, business repeaters, business radio (simplex) federal government, funeral directors, veterinarians, buses, aircraft, space satellites, amateur radio, broadcasters and more. Fox frequency listings feature call letter cross reference as well as alphabetical listing by licensee name, police codes and signals. All Fox directories are $14.95 each plus $3.00 shipping. State of Alaska–**RL019-1**; Baltimore, MD/Washington, DC–**RL024-1**; Chicago, IL–**RL014-1**; Cleveland, OH–**RL017-1**; Columbus, OH–**RL003-2**; Dallas/Ft. Worth, TX–**RL013-1**; Denver/Colorado Springs, CO–**RL027-1**; Detroit, MI/ Windsor, ON–**RL008-2**; Fort Wayne, IN /Lima, OH– **RL001-1**; Houston, TX–**RL023-1**; Indianapolis, IN–**RL022-1**; Kansas City, MO/ KS–**RL011-2**; Los Angeles, CA–**RL016-1**; Louisville/Lexington, KY–**RL007-1**; Milwaukee, WI/Waukegan, IL–**RL021-1**; Minneapolis/St. Paul, MN–**RL010-2**; Nevada/E. Central CA–**RL028-1**; Oklahoma City/Lawton, OK–**RL005-2**; Pittsburgh, PA/Wheeling, WV–**RL029-1**; Rochester/ Syracuse, NY–**RL020-1**; Tampa/St. Petersburg, FL–**RL004-2**; Toledo, OH–**RL002-3**. A regional directory which covers police, fire ambulance & rescue squads, local government, forestry, marine radio, mobile phone, aircraft and NOAA weather is available for $19.95 each. **RD001-1** covers AL, AR, FL, GA, LA, MS, NC, PR, SC, TN & VI. For an area not shown above call Fox at 800-543-7892 or in Ohio 800-621-2513.

Regency® Informant™ Scanners

Frequency coverage: 35-54, 136-174 406-512 MHz.

The new *Regency* Informant scanners cover virtually all the standard police, fire, emergency and weather frequencies. These special scanners are preprogrammed by state in the units memory. Just pick a state and a category. The Informant does the rest. All Informant radios have a feature called *Turbo Scan*™ to scan up to 40 channels per second. The **INF1-RA** is ideal for truckers and is only $249.95. The new **INF2-RA** is a deluxe model and has ham radio, a weather alert and other exciting features built in for only $324.95. For base station use, the **INF5-RA** is only $199.95 and for those who can afford the best, the **INF3-RA** at $249.95, is a state-of-the-art, receiver that spells out what service you're listining to such as Military, Airphone, Paging, State Police, Coast Guard or Press.

Regency® HX1500-RA

List price $369.95/**CE price $218.95**

11-Band, 55 Channel • Handheld/Portable Search • Lockout • Priority • Bank Select Sidelit liquid crystal display • EAROM Memory Direct Channel Access Feature • Scan delay

Bands: 29-54, 118-136, 144-174, 406-420, 440-512 MHz.

The new handheld *Regency* HX1500 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 55 channels at the same time including the AM aircraft band. The LCD display is even sidelit for night use. Includes belt clip, flexible antenna and earphone. Operates on 8 1.2 Volt rechargeable Ni-cad batteries (not included). Be sure to order batteries and battery charger from the accessory list in this ad.

Bearcat® 100XL-RA

List price $349.95/**CE price $178.95/SPECIAL**

9-Band, 16 Channel • Priority • Scan Delay Search • Limit • Hold • Lockout • AC/DC

Frequency range: 30-50, 118-174, 406-512 MHz.

Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA ni-cad batteries and flexible antenna. Order your scanner now.

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PRO520E-RA *Uniden* 40 channel CB Mobile $59.95
PRO540E-RA *Uniden* 40 channel CB Mobile $119.95
PRO710E-RA *Uniden*40 channel CB Base $119.95
PC22-RA *Uniden* remote mount CB Mobile $99.95
PC55-RA *Uniden*mobile mount CB transceiver. $59.95

★★★ *Uniden Marine Radios* ★★★

Now the finest marine electronics are available through CEI. The *Unimetrics* **SH66-RA** has 50 transmit and 60 receive frequencies with 25 or 1 watt power output. Only $169.95. The *Unimetrics* **SH 88-RA** is a deluxe full function marine radiotelephone featuring 55 transmit and 90 receive channels and scanning capability for only $259.95. The *Unimetrics* **SH3000-RA** is an excellent digital depth sounder, good for 300 feet. It has an LCD continuously backlit with red light display and a 5 ft. or 10 ft. alarm. Only $189.95. Order today.

Bearcat® 800XLT-RA

List price $499.95/**CE price $289.95/SPECIAL**

12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC

Bands: 29-54, 118-174, 406-512, 806-912 MHz.

The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9¼" x 4½" x 12½."

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RD9-RA *Uniden* "Passport" size Radar Detector . . . $169.95
***NEW!* BC70XLT-RA** *Bearcat* 20 channel scanner . . . $168.95
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BC 175XL-RA *Bearcat* 16 channel scanner $156.95
BC 210XLT-RA *Bearcat* 40 channel scanner. $196.95
BC-WA-RA *Bearcat* Weather Alert™ $35.95
R1080-RA *Regency* 30 channel scanner $118.95
R1090-RA *Regency* 45 channel scanner $148.95
UC102-RA *Regency* VHF 2 ch. 1 Watt transceiver . . . $117.95
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MA549-RA Drop-in charger for HX1200 & HX1500 . . . $84.95
MA518-RA Wall charger for HX1500 scanner $14.95
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MA257-RA Cigarette lighter cord for HX12/1500 . . . $19.95
MA917-RA Ni-Cad battery pack for HX1000/1200 . . . $34.95
SMMX7000-RA Svc. man. for MX7000 & MX5000 . . . $19.95
B-4-RA 1.2 V AAA Ni-Cad batteries (set of four) $9.95
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Add $3.00 shipping for all *accessories* ordered at the same time.
Add $12.00 shipping per shortwave receiver.
Add $7.00 shipping per radio and $3.00 per antenna.

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Possible Cancer Link Suggested

According to epidemiologists, amateur radio operators appear to die from cancer at abnormally high rates. According to Dr. Samuel Milham, Jr. of the Washington Department of Social and Health Service, his study of 2,485 hams "indicates that amateur radio operator licensees in Washington and California have significant excess mortality due to acute myloid leukemia, multiple myeloma and perhaps certain types of malignant lymphoma."

All of these diseases are forms of cancer and suggest a possible link between cancer and electromagnetic fields. Milham said that even more disturbing studies have come from other scientists who have found unusually high levels of leukemia among children who live near power lines. Still others caution that evidence of such a link has been inconsistent and that other factors may be involved.

Coming Up Next: Marti TV

A couple of years ago, Cuban leader Fidel Castro was, according to the press, amused by the Voice of America's radio station for Cuba but was outraged that the US government would name it after Cuban patriot Jose Marti. That outrage led to the scuttling of a 1985 refugee exchange agreement between the two countries.

Now comes word that Radio Marti may very well be followed by TV Marti. According to Florida Democrat Lawton Chiles, an appropriation for $100,000 dollars to study the feasibility of the project was included in a year-end budget. The study for the TV station, beamed to Cuba, should be completed by the end of this year. By that time the latest exchange -- one in which 2,500 undesirable Cubans now jailed in the US will be exchanged to 27,000 Cuban citizens wanting to leave their country -- will be completed.

The idea for TV Marti was originally considered in 1985 when Radio Marti was set up. The idea was abandoned, however, when it was discovered that a very large and very expensive broadcasting tower would have to be built. Technological advances since 1985 now obviate the need for the tower, clearing the way for the project.

Cuban hero Jose' Marti already had a radio station named after him. Is TV Marti far behind?

It's No Fair to Listen

As a followup on an article which appeared in our March 1987 issue (page 4), a Fairfax County, Virginia, high school football coach who lost his job because of listening into communications of an opposing team has lost his bid for reinstatement.

Mike Weaver was fired October 8, 1986, when it was disclosed that Weaver had tuned in on conversations among rival coaches during a football game and used the information against the other team. Weaver's team lost anyway.

It is common for high school football teams to use license-free frequencies in the 49.83-49.890 MHz range for calling plays. Some larger schools use itinerant frequencies like 151.625, 154.570 and 154.600 MHz.

"Fries and a Big Mac"

Speaking of license-free frequencies, look for a new McDonald's drive-in window frequency: 154.600 MHz. This itinerant frequency has recently popped up as an alternative to the common 35.06/154.570 pair heard around the country.

VOA May Move in '91

Despite ongoing efforts to renovate two dozen studios in its Washington, D.C. headquarters, there is increasing talk that the Voice of America may abandon its existing facility and move to a new location in three years.

According to VOA sources, there is a desire within the United States Information Agency (USIA), which oversees the VOA's operations, to consolidate all of the agency's operations under one roof. "Yes, there is talk to that effect," said a VOA official who asked not to be identified.

The talk of a move comes just as the VOA is spending $6.6 million to renovate 19 studios at its headquarters; however insiders indicate that the USIA has been offered other space in downtown Washington by the General Accounting Office. Says Gary Marcos, president of the National Federation of Federal Employees, the local representing VOA technicians, "It's not just idle talk." Says another VOA official, "By the time we have the current renovation project completed...we'll have to start all over again."

WBZ: On the Air, Everywhere

When Anne Scully of Hull, Massachusetts, picks up her telephone, she hears Diana Ross singing, "Stop! in the name of love..." News and talk shows spew from her toaster. All over this suburban Boston town, residents hear voices coming out of radiators, plumbing, ovens, toilets and even aluminum siding. And it's all courtesy of WBZ's pair of twin 520- foot transmitting towers down the street.

"It comes through my pipes downstairs when I'm washing my clothes," said Francis Gentilucci, a neighbor of

Scully's. Her eight year old daughter can't use her tape recorder because even without a tape in it, out comes the voice of a disc jockey reminiscing about golden oldies.

"It's all over town," says Patrolman John Buchler, who complains he can't hear the television in the police station for all the noise coming over the police radio. Says a disgusted Scully, "I hear talk shows all night long. I'd at least like to have some say in what I listen to."

Warning: Made in the USA

"Made in the USA" should be a warning label, says Lester C. Thurow, dean of the School of Management at the Masachusetts Institute of Technology (MIT). It often means poor productivity, bad quality, high cost, poor workmanship, excessive defect and resistance to innovation. Thurow's research was reported in the Journal of the Association for the Advancement of Science.

FCC Says "No" to Instant Novices

The Federal Communications Commission denied a petition from Frederick Hambrecht (KJ4JE) of Jamestown, Tennessee, seeking to authorize immediate operating privileges for new amateur radio Novice licensees. At present, applicants must wait until the arrival of their license in the mail before they can go on the air. Hambrecht claimed that the waiting time between the examination and receipt of the license is so long that the operator's skills are diminished.

The FCC countered, saying that the waiting period was not unreasonable and that it served a useful purpose by giving the new Novice time to build a station, erect antennas and prepare for actual on the air operations. The FCC has denied many requests over the years for immediate ham band privileges, but since they had accepted Hambrecht's petition for public comment, many people thought it would be enacted this time.

Radio Beacons Cause "Electron Rain" in Space

Powerful radio waves generated by low frequency navigational beacons are causing "electron rain" to fall into the Earth's upper atmosphere from the Van Allen radiation belt. No one knows if the effects are harmful, but they are thought to be the first "environmental" effects in space traceable to human activities on Earth.

The group of four researchers from four universities launched a sounding rocket from Wallops Island, Virginia, that rose about 257 miles during a 10 minute flight. At its highest point, detectors in the nose cone of the vehicle revealed showers of electrons raining in patterns correlating with beacons from the transmitters. The high energy particles are charged and are known to be dangerous to space travelers.

Whatever Became of White's Radio Log?

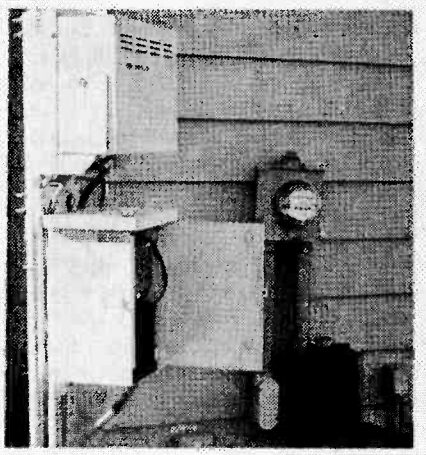
For decades, since 1921, *White's Radio Log* was a familiar publication found on the desk of virtually every broadcast listener. It gradually fell on hard times, going through several publishers, and was last seen in print as a handy pocket-size guide about three or four years ago.

We recently contacted Don Gabree, the most recent owner of the rights (C&E Hobby Handbooks, PO Box 5148, North Branch, NJ 08876), who reassured us that he has full intention to reprint an updated edition of the popular book within the next year.

Too Painful to Endure

When Luther J. Wells, a convicted murderer living in the St. Louis County Jail, had his radio taken away by a social worker, it was too much. So he filed a court challenge saying that the loss was "a punishment almost too painful to endure." Wells lost.

In his decision, U.S. District Judge Clyde S. Cahill -- obviously no DXer -- said that depriving someone of their radio "is what is to be expected in a prison," and could "hardly be in violation of civil rights." Had Wells filed a complaint about other inmates' radios, said the judge, he might have had a case. Then the "sheer cacophony" alone would be grounds for a claim of "inhumane treatment."



Rural Phone Service Gets Radio Boost

The U.S. Federal Communications Commission has approved the use of radio for linking rural homes with telephone switchboards. Under the Basic Exchange Telecommunications Radio Service, 450,000 previously phone-less Americans will soon have the option of radiophone service at one-third to one-half the cost of conventional service. The radio links will operate on 26 channels at 450 MHz, 18 at 150 MHz and 50 at 800 MHz.

More than 100 telephone companies in mountain and desert regions west of the Mississippi have expressed interest in the service. According to Gerald Shrage of the Rural Electrification Administration, nearly 1 million homes and businesses could be "on the air" within the next five years.

Credits: *Christian Science Monitor*; *Insight* magazine; Bridgeport (CT) Sunday *Post* (D. Wilson); *World Broadcast Information*; W5YI *Report*; Robert Eisner, Germantown, MD.

International

A report on the explosion of Christian broadcasting by Kenneth MacHarg

To those unable or unwilling to discern the difference, international Christian broadcast stations may seem like an extension of the maligned TV evangelists in the United States and thus subject to the same scepticism. But to the sensitive ear, a distinction can (and should) be made among all religious broadcasters and between specific programs.

For the most part, Christian broadcasting on the international bands is carried out by church-related groups which transmit programming as a part of their mission to the people of the world. This is in stark contrast to numerous Christian stations in the U.S. which are operated solely as business ventures and return a handsome profit.

Those stations heard internationally which broadcast religion on a profit basis are also few, but include WRNO in New Orleans (which reportedly generates the majority of its revenue from this type of programming), Africa # 1 in Gabon and the Sri Lanka Broadcasting Company. Broadcasting internationally on the AM band is the Atlantic Beacon, heard widely over the Southern United States from the Turks and Caicos Islands at 1570 kHz. It is owned by the Coit Drapery and Carpet Cleaners firm.

There are even a few government stations which broadcast religious programming primarily because it reflects a part of the culture of the host nation. This style can be found on the BBC World Service, Radio RSA, the Voice of South Africa, and the Voice of America.

The Pope's Radio a First

Missionary broadcasting on the international bands goes back to February of 1931 when the inventor of radio, Guglielmo Marconi assisted the Vatican in establishing "The Pope's Radio." Vatican Radio, as it is known, has existed primarily for service to the faithful. It has never been particularly interested in evangelization. The heyday of Vatican Radio was during and after World War II when the station was instrumental in helping reunite separated families. In more recent years, however, Vatican Radio has been criticized for being rather stale, theological and not open to the exploration of dissent within the Catholic Church.

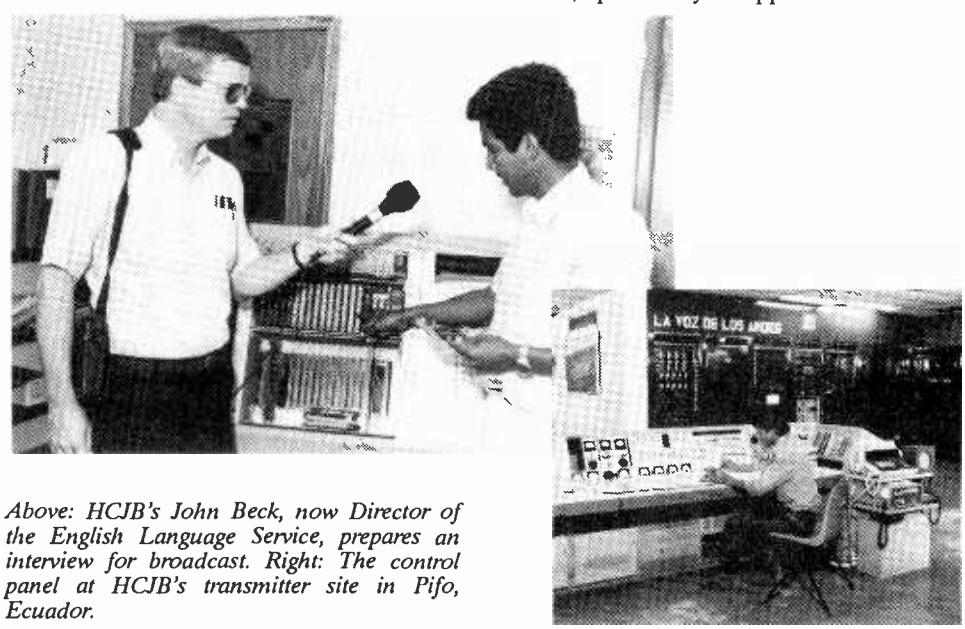
Another Roman Catholic station is Radio Veritas, operated by Philippine Catholics with financial help from supporters in Europe. Veritas, perhaps because of its distance from Rome, is a little less staid and more prone to delve into issues of the moment. Much has been made of the role of Veritas during the overthrow of former Philippine President Ferdinand Marcos.

With the exception of a few small stations in the Third World like Radio Catolica Nacional in Ecuador, the remainder of the major international Christian stations are Evangelical Protestant operations. But even then there are theological and stylistic differences.

Ecuador Giant Reaches the World

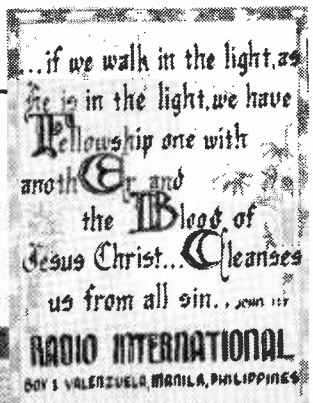
The oldest, best known and probably most progressive of the missionary stations is Quito, Ecuador's HCJB. Known as "The Voice of the Andes," this giant reaches 80% of the world's population from one transmitter site. Cumulative power is over a million watts. In addition to offering traditional Christian programming from outside sources, HCJB has led the way in developing innovative shows containing a Christian atmosphere and message but which emphasize other topics.

Typical is the *DX Party Line*, a thrice weekly program for shortwave enthusiasts which devotes but a few minutes to any overtly Christian message. Other popular releases such as *Musica del Ecuador*, *Passport*, *Musical Mailbag*, and *Saludos Amigos* follow the same philosophy. The people at HCJB who develop these programs believe that such offerings will attract a larger audience. Listeners, they feel, will be more receptive to a "soft sell" approach



Above: HCJB's John Beck, now Director of the English Language Service, prepares an interview for broadcast. Right: The control panel at HCJB's transmitter site in Pifo, Ecuador.

Voices of Faith



than to the more traditional "sermon sandwich" (a sermon surrounded by two hymns). The format has proven to be effective. HCJB regularly ranks within the top ten stations in listener popularity polls.

HCJB (the call letters stand for "Heralding Christ Jesus' Blessings") was founded by the late Dr. Clarence Jones. Jones felt called to use radio on the mission field, and, on Christmas Day, 1931, signed on the air with a 250 watt AM transmitter and an audience estimated in the dozens. Later, shortwave was added in an effort to reach the more rural parts of Eucador. The station soon discovered that it began receiving reception reports from other parts of the world and later expanded its international efforts. HCJB still broadcasts on AM and FM in Ecuador, and today has two stations in Panama and a string of AM/FM stations along the Texas-Mexico border.

In all of its language services, the Voice of the Andes seeks both to carry its message to the non-Christian and provide education and nurture to the believer.

Among the firsts from HCJB were: the cubical quad antenna, initial Christian broadcasts into the Soviet Union, and the discovery of the "Quito effect"--the principle that the equator -- despite early predictions -- is one of the most efficient locations for reaching the entire world by radio.

Seventeen years lapsed until the next international Christian voice came on the air. Shortly after World War II in 1948, three men joined forces in California to establish the Far East Broadcasting Company.

Far East Broadcasting Company

The three originally planned to start their work with a facility in China (which would have eventually been confiscated during the Chinese revolution). Instead they received an unlimited permit to construct their station in the Philippines. Thus, FEBC-Manila took to the airwaves in 1948 with the primary purpose of bringing "Christ to the World by Radio." The emphasis remains on Asia. Today FEBC stations ring the globe.

Early on, FEBC acquired a station in San Francisco formerly owned by General Electric (hence the call letters KGEI) for transmission to Latin America and the Soviet Union. Later, largely through support from interested persons in England, FEBA in the Seychelles Islands came on the air to serve India, Pakistan and Bangladesh as well as Africa and later the Middle East. More recently FEBC established KFBS in Saipan to also reach Asia and has assisted in the operation of a station in Aruba where shortwave facilities are reportedly under consideration for the Americas.

The Stories we could tell...

Remarkable stories abound of the effectiveness of these and other Christian missionary radio stations. There was the providential meeting of an FEBC missionary and some Russian emigres at the Manila airport at a time when, due to lack of response, FEBC was considering dropping Russian language broadcasts. When the refugees learned the man was with FEBC, they spontaneously encouraged the station to continue the broadcasts and affirmed that thousands of people in the USSR listened regularly.

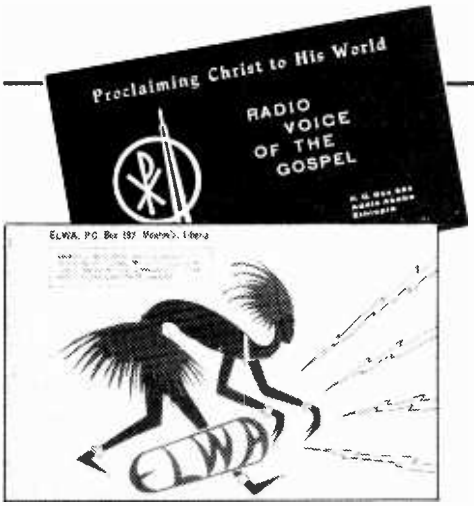
Several years back when an 80 year old Christian statesman from China visited the U.S. he told this writer that it was the broadcasts from FEBC which kept the Christian Church alive in China during the Cultural Revolution. And the Slavic Gospel Association, the organization responsible for providing most of the Christian programming to the Soviet Union, says that in 1983 80% of those baptized into Christianity in the Soviet Union became Christian through foreign broadcasts.

Theologically, FEBC is much akin to HCJB. Because of its initial task of reaching communist-dominated nations, however, it has taken a more strident anti-communist stance.

Students Start a Station

It was the idealism of youth that was responsible for the founding of ELWA in Monrovia, Liberia, in 1954. Several students at Wheaton College felt a call to reach the people of Africa by radio. Finding their youth and lack of contact a hindrance, they turned to the Sudan Interior Mission (now known as SIM International) for support. Eventually they merged their efforts with SIM.

The students and their families hacked a transmitting site out of the jungle near Monrovia from which Christian programming would eventually reach most of Northern Africa and the Middle East. (For a period of time ELWA also broadcast due west across the Atlantic to South America).



With the nationalization of Lutheran operated ETLF, by the Ethiopian government in 1977, ELWA took on an increasing responsibility for broadcasts to the Muslim population of northern Africa. Of all the missionary stations, ELWA (the call letters stand for "Eternal Love Winning Africa") is probably the most conservative in its theology and practice. Staff members sign a fairly strict code of behavior and belief. Several missionary staff members reportedly resigned in the early 1960s when ELWA began broadcasting contemporary (folk and rock) Christian music. (By contrast, HCJB supported contemporary Christian music both then and now.)

The programming on ELWA strongly reflects its African location. With the exception of a few syndicated programs, most of the broadcasts are produced specifically for the station using local African voices. Seldom will an American or European missionary be heard on the air regularly. The theory is that such programs will appeal more to the indigenous population.

Perhaps because it is the only major Christian station operated by a mission whose primary emphasis is not radio, ELWA's growth has not kept pace with the others. Now, though, through a cooperative effort with HCJB, TWR and FEBC, known as "The World by 2000", ELWA is working to expand the number of languages in which it broadcasts and to increase utilization of its existing transmitter capacity.

In the same year as ELWA took to the air several thousand miles to the north the Voice of Tangiers began directing Christian programming at Spain and the rest of Europe. Later moving its base to Monte Carlo, the effort became known as Trans World Radio (the initials also stand for "Telling the World of Redemption") and developed into a global network of stations.

Trans World Radio: A Major Success Story

Some of TWR's transmitting facilities are rented while others are owned outright by the mission. TWR has also pioneered international Christian broadcasting by powerful medium wave transmitters, such as those at Monte Carlo, Swaziland and Bonaire. Today TWR covers the earth from five locations: Europe from Monte Carlo; the Middle East and Northern Africa from Cyprus; the subcontinent from Sri Lanka (where shortwave was just recently added) Asia and the Pacific from KTWR on Guam; and the Americas from Bonaire.

When it first took the air, TWR's main interest was in broadcasting teaching programs and worship services. In the past decade, the stations have developed more original programming, such as the Bonaire's popular *Morning Sounds and Caribbean Nitecall* -- both a gentle mix of music, news and inspiration. One could characterize TWR as being evangelical with a bit more conservative programming philosophy than HCJB or FEBC.

These are the "big four"-- the best known of the international Gospel broadcasters. But there are others which must be noted, even though briefly.

Local and Regional Broadcasters

Many mission groups established local Christian stations as part of their outreach to a particular nation. Some of them added shortwave primarily to reach the more remote areas where the AM or FM signal would not go. Among those which can easily be heard in North America are:

--TIFC, *Lighthouse of the Caribbean/Faro del Caribe (5055 kHz). Operated by Latin American Mission from a small building and a dipole antenna in a suburb of San Jose, Costa Rica.*

--HRVC, *La Voz Evangelica, Tegucigalpa, Honduras (4820 kHz). This outlet is operated by the Conservative Baptist Home Mission Board.*

--TGNA, *Radio Cultura, Guatemala (3300 kz). Operated by Central American Mission.*

--4VEH, *Cap Hatian, Haiti (4930 kHz). Operated by OMS (formerly known as Oriental Missionary Society, before that as China Inland Mission). This station has a large listenership among Haitian refugees in the Bahamas and Miami. It's operation has been sporadic in recent years.*

In the same way that Radio Earth is a program service, not a separate station, there are two groups which at least began as a program service, although one now owns its own stations as well.

--IBRA *(International Broadcasting Association) is owned by 3,000 Swedish Pentecostal Churches. It places programming on Radio Trans Europe in Portugal and Radio Mediterranean in Malta as well as purchasing time from FEBC stations and other local groups.*

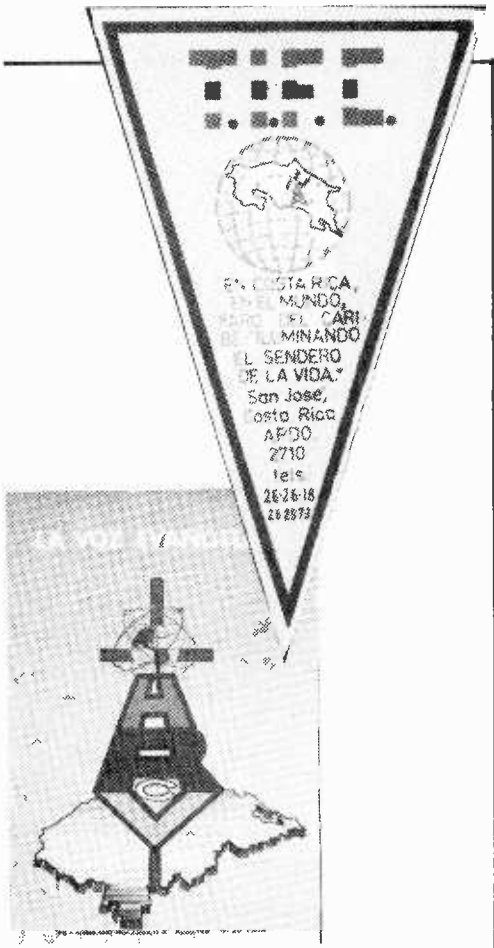
--Adventist World Radio *began with one hour of time in 1961, and now has developed stations of its own in Costa Rica, Guatemala and Guam. It continues to purchase time from broadcasters such as Radio Trans Europe and Sri Lanka. AWR is a ministry of the Seventh Day Adventists who observe Saturday rather than Sunday as their Sabbath and emphasize the imminent return of Jesus Christ. Their flagship program is the Voice of Prophecy, which can be heard on many U.S. stations.*

With the lifting of the freeze on the construction of new shortwave facilities many groups in the U.S. have placed stations on the air. These include:

--WINB: *Actually an older station on the air since the 1950s located in Red Lion, Pa. This fundamentalist outlet was associated early on with renegade Presbyterian minister Carl McIntyre. His vitrolic broadcasts condemning the U.S. government led the FCC to reconsider the wisdom of licensing privately owned shortwave stations. That freeze lasted until 1979. Today this station continues to broadcast very conservative programming and a good deal of beautiful music fill.*

--WYFR: *A true success story, Family Radio began international broadcasting by purchasing time on the old WNYW (Radio New York Worldwide) which at the time was owned by the Mormon Church. Later, Family Radio purchased the facility (which was located in Massachusetts) and moved it to a swampy cattle pasture north of Okeechobee, Florida. Continued expansion and an exchange of broadcast time with the Voice of Free China in Taiwan has made this ministry heard worldwide. Programming is very traditional with Bible readings, traditional music, and numerous teaching programs.*

--KNLS, *Anchor Point, Alaska has been on the air for several years but is rarely listened to regularly in North America because their target area is the Soviet Union and China. Programs are produced in a Sunday School wing of the Chestnut Blvd. Church of Christ in Cuyahoga Falls, Ohio, a suburb of Akron. KNLS, the New Life station, is operated by people related to the Churches of Christ, a loose knit federation of congregations with a Fundamentalist persuasion.*



--KVOH: *Related to the King of Hope station in Lebanon, this fairly new station in Van Nuys, California, is operated by George Otis with ties to the Full Gospel Businessmen's Fellowship a pentacostal layman's group. The station went on the air with a refurbished HCJB transmitter and a stated purpose of educating those who are already Christian. Future plans include a station located on board a ship off Southeast Asia and a facility in Palua, Philippines.*

--WHRI: *World Harvest Radio is situated in a cornfield near Indianapolis, but the studios are farther north in South Bend, Indiana. Pentecostal TV preacher Lester Sumrall operates this facility which offers a good deal of contemporary Christian music and some paid time programming as well as sermons by Dr. Sumrall. When asked how this station might compare to HCJB a spokesman once said "it is more conservative and more pentecostal." (HCJB is not a Pentacostal station).*

--KCBI, Dallas: *This station began with big promises but now seems to operate only on weekends. Its format vacillates between country music and soft contemporary Christian music. It is related to the Criswell Bible Institute and First Baptist Church in Dallas. The pastor, W. A. Criswell, is one of the key leaders of a group of theologically fundamentalist people who have worked to take over the more moderate Southern Baptist Convention in the past decade. KCBI has no official relationship to the Southern Baptist Convention.*

Change and the Unchangeable

David Craig,
Religious Broadcasting, BBC World Service

My secretary stared at me incredulously. "You mean you're leaving television to go to BBC and make religious radio programs? You can't be serious! You're mad! But I was and perhaps I am!

As a cadet in the Voluntary Service Overseas, straight from school, I remember my first evening in Africa, listening to the chimes of Big Ben against the unfamiliar chorus of crickets and mosquitos. So there was a certain inevitability in coming to Bush House.

Religion, like politics, is one of those areas where everyone has a view, feels strongly, and usually disagrees with most other people! This is reflected in our mailbag. Letters come from South Africa trying to defend apartheid on religious grounds; from the Gulf complaining that we allow Christians a voice, from tax-exiles in various havens demanding that the BBC reflect the religious life of Britain by transmitting only Anglican services.

We receive more than our fair share of annonymous letters which reveal attitudes of such entrenched prejudice that they make me tremble for any hope of future co-existence. And, of course, we receive letters of appreciation: some particular contribution to *Reflections* has hit just the right spot and could we send a script? We could and we do!

Sometimes the treatment of a particular story gives someone a fresh insight into a problem. Occasionally, a listener confesses to having come cloer to God.

But what is religious broadcasting all about? How different is it from any other sort of broadcasting? At one level, there is no difference. There is no justification for a bad program on the grounds that it is religious.

I want religious programs to be taken seriously. I want it to be seen as an integral part of all area of broadcasting. I don't want it to depend on a legacy of goodwill, an historical tolerance for making religious programs. I want religious programs to stand up and be counted as good *programs*: making points, effectively reflecting issues and making a contribution to people's understanding of themselves and God.

Nothing, including religious programs, can remain unchanged forever. nevitably they have to move forward. The formats of ten years ago might not be the best vehicle for today's material. Some subjects unmentioned then need discussion today. Venerial diseases would hardly have been talked about in a religious program of ten years ago. With the relentless progress of AIDS throughout the world, it now demands attention not only from an ethical viewpoint, but from a pastoral and informative one.

Religious programs must meet the needs of the audience. They are not a closed box that we open Sundays and briefly during the day for *Reflections.* Religion is such an essential part of life that commitment to one religious tradition or another has countless implications for the way we regard ourselves, our neighbors and our world.

More than ever before, religious broadcasting has to reflect religious life, with all its variety. The challenge of representation is the challenge of developing people's religious awareness of one another.

For the BBC World Service, the program *Religious Services,* with its regular visits to churches around the country, is an essential part of worship on the World Service. But there are other ways of using the airwaves. Shared experiences, intercessions, Bible study and letter writing are all ways of bringing people closer together, and closer to God. There are some of the areas we at the World Service will be exploring in coming months.

So what is religious broadcasting all about? Religious broadcasting is about the constant challenge of broadcasting itself: to strive to improve the standard of contributions while ensuring that what is said is accessible to a wide audience. And that is one of the great excitements of religious broadcasting!

What is religious broadcasting all about?

--WCSN: *Some might not immediately recognize the World Service of the Christian Science Monitor (nor its sister station KYOI in Saipan) as a religious station. But these outlets, as well as the highly respected Christian Science Monitor newspaper, are actually owned by a subsidiary of the First Church of Christ, Scientist, in Boston. This Christian sect was founded by Mary Baker Eddy with a particular emphasis on Christian healing and prayer. Mrs. Eddy founded the newspaper as an objective voice in the age of yellow journalism in the United States. As with the newspaper, the World Service on shortwave carefully separates religious commentary from news programs. Religious programs are primarily broadcast on the weekends.*

--WMLK: *This spunky sect deserves admiration. The Assemblies of Yahweh took an abandoned gas station and a used 50 kw AM transmitter and turned them into an international shortwave outlet located in Bethel, Pennsylvania. Programming from this unusual pentecostal sect consists primarily of the sermons of one Elder Jacob Meyer who uses Old Testament themes to tie his group into the Jewish heritage of Christianity. The programs are marked by Meyer's frequent references to God as Jehovah. The Assemblies do not celebrate Christmas. Meyer's programs are also placed on a number of AM outlets, including 50 kw Jesuit-owned WWL in New Orleans.*

Bright Future

What about the future of Christian broadcasting? In *International Radio Broadcasting: The Limits of the Limitless Medium*, Dr. Donald Browne says, "If there is a growth industry in the field of international broadcasting, clearly it is religious broadcasting."

Christian efforts to reach the world show no sign of diminishing. WHRI has installed a new 500,000 watt transmitter, the stations working on the "World by 2000" project are selecting up to 150 new languages in which to broadcast and FEBC is reportedly considering the establishment of a shortwave base in Aruba. HCJB has a permit for a station in Hawaii and announced in a December mailing that they are working with other groups to consider establishing outlets in Africa and the South Pacific. TWR recently added shortwave from Sri Lanka and a million watt AM transmitter at Monte Carlo.

HCJB's parent, the World Radio Missionary Fellowship, has established a transmitter construction facility in Elkhart, Indiana, to build new units for itself and partner groups. And Radio Rhema, a New Zealand Evangelical group, recently received a permit to construct an international station in Tonga in the South Pacific.

In addition, other groups are considering entering the fray. The World Bible Society near Nashville has employed an engineer to put two new stations on the air, one in the Pacific for China and one in Europe beamed to the USSR. Both outlets will feature nothing but Bible readings. Another commercial broadcaster in Nashville has a permit to develop a station which he says will offer time to "those who can't get on other stations." Whether that means we can expect 24 hours a day of faith healers and money raisers on World Wide Christian Radio from Nashville remains to be seen. A third group, New Covenant Ministries of Jacksonville, Florida, has plans for their own station.

All of this activity leaves only the question of the effectiveness of international Christian broadcasting. Part of the answer depends on one's initial attitude toward Christian Broadcasting efforts. Certainly it is a continuing topic of conversation by missionary broadcasters around midnight cups of coffee or tea.

One thing is certain--the response from listeners speaks for itself. The following quotes are taken from over 1,000 letters sent to HCJB's *Saludos Amigos* program since July, 1985.

AUCKLAND, NEW ZEALAND-*"For a long time I was searching like wandering around in a wilderness. Happy to say I have found myself through listening to the Voice of the Andes."*

TAMPIR, N.SEMBILAN, W.MALAYSIA - *"I'm a 21 year old Indian girl ... at one of the local universities here. Living in a country whose official religion is Islam can sometimes be pretty tough, but thanks to radio stations like HCJB our lives are blessed ...."*

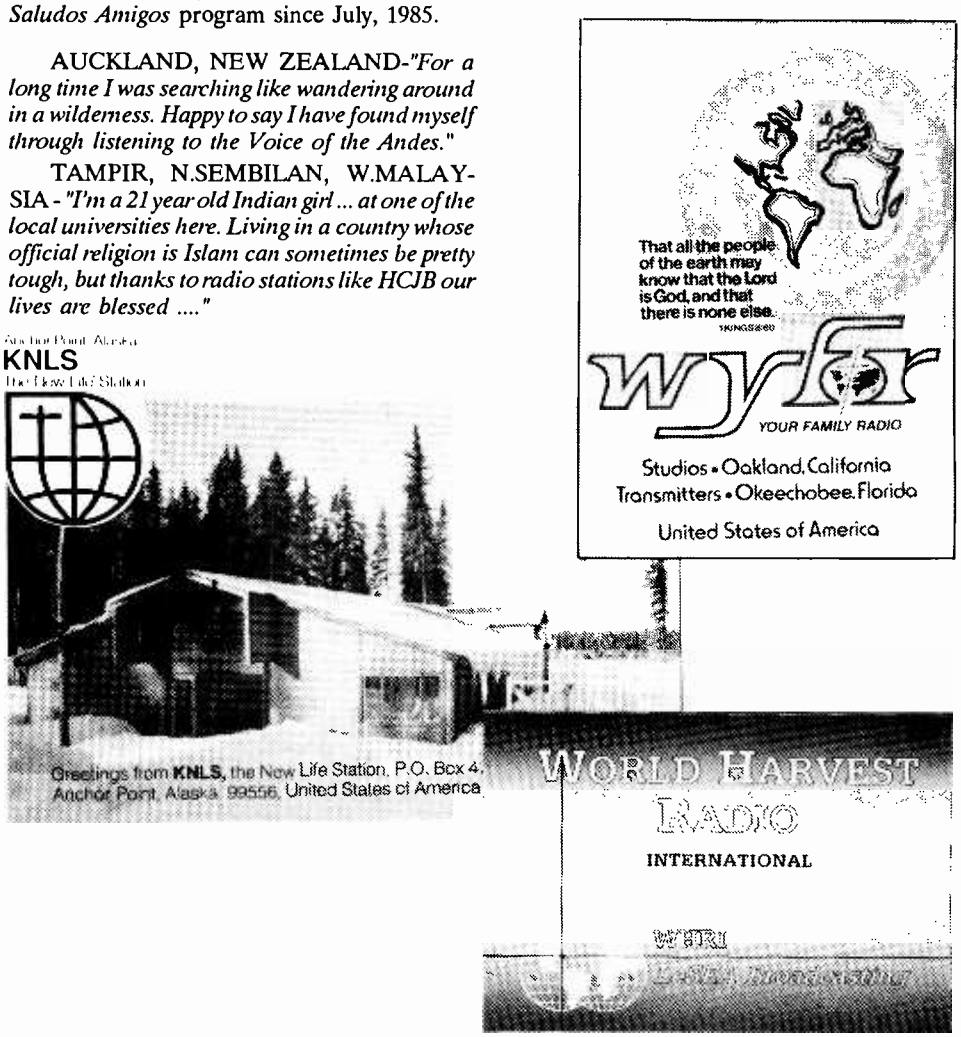
BRIESEN, EAST GERMANY-*"I heard the music by Sandi Patti. I am sorry we cannot buy here in East Germany records with gospel songs or music like this. So, I recorded the music with my cassette .... I wrote this that you know there in America and the rest of the world that in a communist country like we have (East Germany) live Christians too."*

OAXACA, MEXICO-*"We are missionaries. It is encouraging to get to hear Christian programming as we don't get much here."*

FLUSHING, NEW YORK USA-"Through your program and HCJB I have given up a 17 year drug and alcohol habit!"

Christian broadcasters know their efforts are heard and appreciated, and have meaning to millions around the world. ■

Kenneth MacHarg, an ordained minister, is one of the world's leading authorities on international Christian Broadcasting. He is host of the weekly "International Friendship Show," Saludos Amigos, on HCJB.



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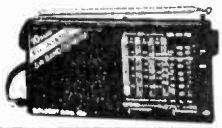

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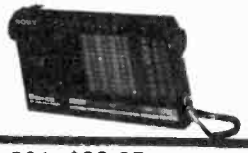

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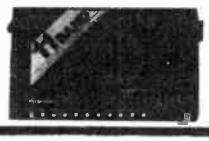

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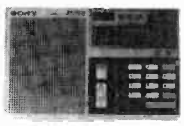

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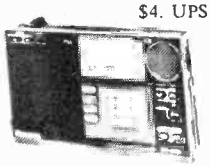

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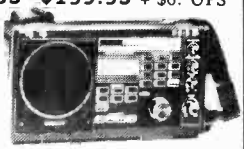

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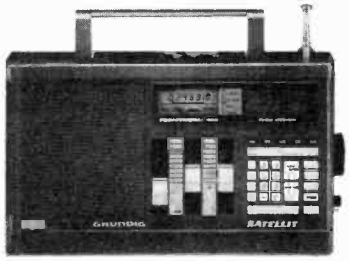

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150 kHz - 29.999 MHz. 12 Memories. Optional 118 - 174 MHz converter. AM, FM, SSB, CW. LCD readout. Scanning. 2 Clocks/Timer.

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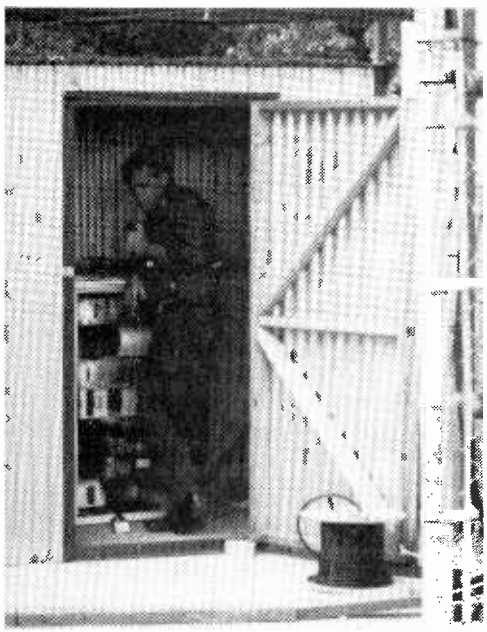
DX*ing the*

Brown Water Coast Guard

Most DXers, especially those who tune the utility bands, are aware of the many opportunities that exist to listen to U.S. Coast Guard communications along coastal areas and on the high seas. From exciting helicopter rescues to nabbing drug smugglers, the Coast Guard can be heard on the job, around the clock.

Yet how many DXers know that the Coast Guard also operates an extensive communications system on America's western rivers? From such unlikely spots as Omaha, Nebraska, Coal Mountain, West Virginia, and Hastings, Minnesota, the Coast Guard communicates with tow boaters, pleasure craft and nearly 20 Coast Guard Cutters (river buoy tenders) that ply the waters of the Mississippi, Arkansas, Ohio and other rivers.



A Coast Guard technician repairs the high level site at Signal Mountain, Tennessee.

Villainous Rivers

Although the Coast Guard did not officially begin operating on the rivers until the early 1900s, the service can trace its river heritage back considerably further.

In 1874, noted author Mark Twain wrote, "There is neither light nor buoy to be found anywhere in these thousands of miles of villainous river." That same year the U.S. Congress responded by assigning two steamers, the *Lily* to the Ohio River and the *Alice* to the Mississippi. Working for the old U.S. Lighthouse Service, they became the first vessels to perform aids to navigaton (AtoN) duties similar to those carried out by Coast Guard river buoy tenders today.

In 1881 the Louisville (Kentucky) Lifeboat Station was commissioned as part of the U.S. Lifesaving Service. The Lifesaving Service merged with the Revenue Cutter Service in 1915 to become today's Coast Guard. In 1919, the flood relief vessels *Kankakee* and *Yacona* became the first search and rescue cutters on the western rivers.

Despite this early activity, the Second Coast Guard District or "St. Louis District," as it was known at the time, wasn't formed until 1939. In that year the Lighthouse Service was moved from the Department of Commerce to the Coast Guard. Coast Guardsmen shared the responsibility for marking the rivers with the Army Corps of Engineers until 1969, when the Coast Guard assumed all responsibility for these duties.

Men with a Mission

The Coast Guard's principal mission in the Second District is the maintenance of the Aids to Navigation system. This includes setting and maintaining thousands of buoys that mark the river channels, lights along the banks and day marks that are usually located with the lights. The constantly changing and meandering channel conditions usually keep the cutters away from home port well over six months out of every year.

A secondary responsibility for cutters and other units in the District is the better-known Coast Guard mission of search and rescue (SAR). All of the cutters maintain a SAR standby crew that responds to reports of overdue boaters, man overboard calls, people who fall or jump from bridges that cross the rivers, and so forth. In these SAR cases, communication is an indispensable and critically important element.

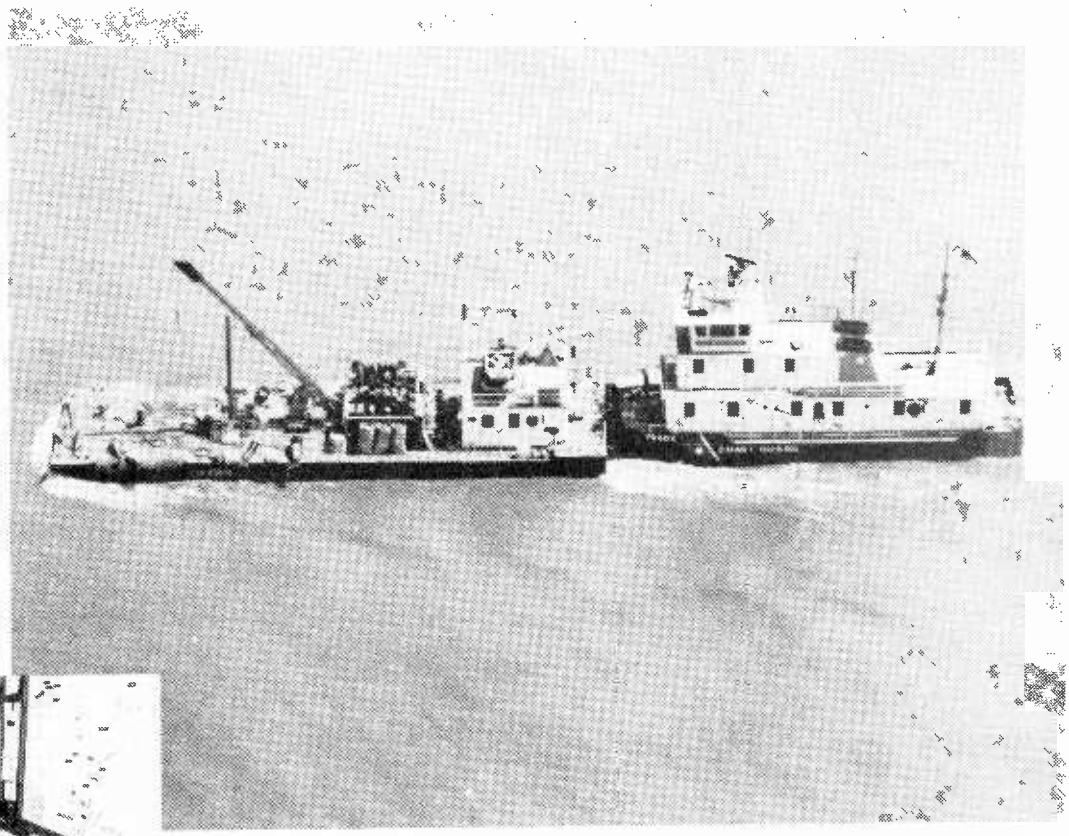
Communicators on the Rivers

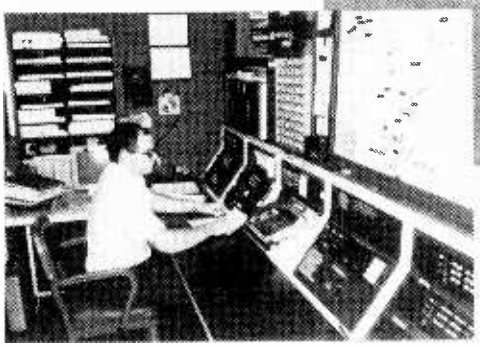
At one time, the Coast Guard operated a radio station in St. Louis (the equipment was actually located in East St. Louis, Illinois) for communication with cutters and shore units in the District. Radiomen also made marine information broadcasts (MIBS) and provided communications for the public.

Operating on 6230 or 4403 kHz during the day and 2694 kHz at night, it worked much like other radio stations located along coastal areas. With the growing popularity of the VHF-FM marine band, however, the Coast Guard jumped on the bandwagon and began building a system of remotely controlled VHF stations or "high level sites" to cover the rivers. When this system was completed around 1974, operation on the HF bands in the 2nd District ended.

Today, all Coast Guard river communications with cutters, commercial towboats pushing barges up and down the rivers, and pleasure boaters is conducted through these high-level VHF-FM radio sites. Operating and controlling these sites is the responsibility of four "Group" offices in the District. These Group offices and their areas of responsibility are:

by James T. Pogue





Radio on the River: The Group Lower Mississippi River (NML7) in Memphis, Tennessee, maintains communications with ships like the USCGC Kanawha (WLR-75407) seen above as it pushes its 99-foot work barge loaded with buoys and other equipment.

Coast Guard Group Upper Mississippi River, Keokuk, Iowa:
The Upper Mississippi River from Minneapolis, MN to Cairo, IL, 291 miles of the Illinois River, and all of the Missouri River.

Coast Guard Group Lower Mississippi River, Memphis, TN:
Lower Mississippi River from New Madrid, MO to Baton Rouge, LA, the Arkansas Waterway from the head of navigation to Catoosa (Tulsa), OK, the Atchafalaya River between Simmsport, LA and its juncture with the Lower Old River, the Red River including the Ouachita and Black Rivers, and Lake Texoma.

Coast Guard Group Ohio River, Owensboro, Kentucky:
The entire Ohio River, the Lower Mississippi River from Cairo, IL to New Madrid, MO, the Monongahela River and the Allegheny River.

Coast Guard Group Tennessee River, Buchanan, Tennessee:
All of the Tennessee River, (including the Tennessee-Tombigbee Waterway), and the Cumberland River.

Combined, these Group offices are responsible for directing the maintenance of the AtoN system on thousands of miles of navigable rivers through America's heartland. The map on page 14 shows the locations of the Group offices and the high-level radio sites controlled by them.

In most cases, the high-level sites themselves are nothing more than unmanned transceivers connected by leased telephone lines. Each of the sites can operate on six different marine band channels. These channels and their intended uses are:

Ch 6 - 156.3 MHz	Intership safety
Ch 12 - 156.6 MHz	Port operations
Ch 14 - 156.7 MHz	Port operations and river locks
Ch 16 - 156.8 MHz	Distress, safety and calling
Ch 21 - 157.05 MHz	Coast Guard working
Ch 22A -157.1 MHz	Coast Guard/Non-governmant liaison

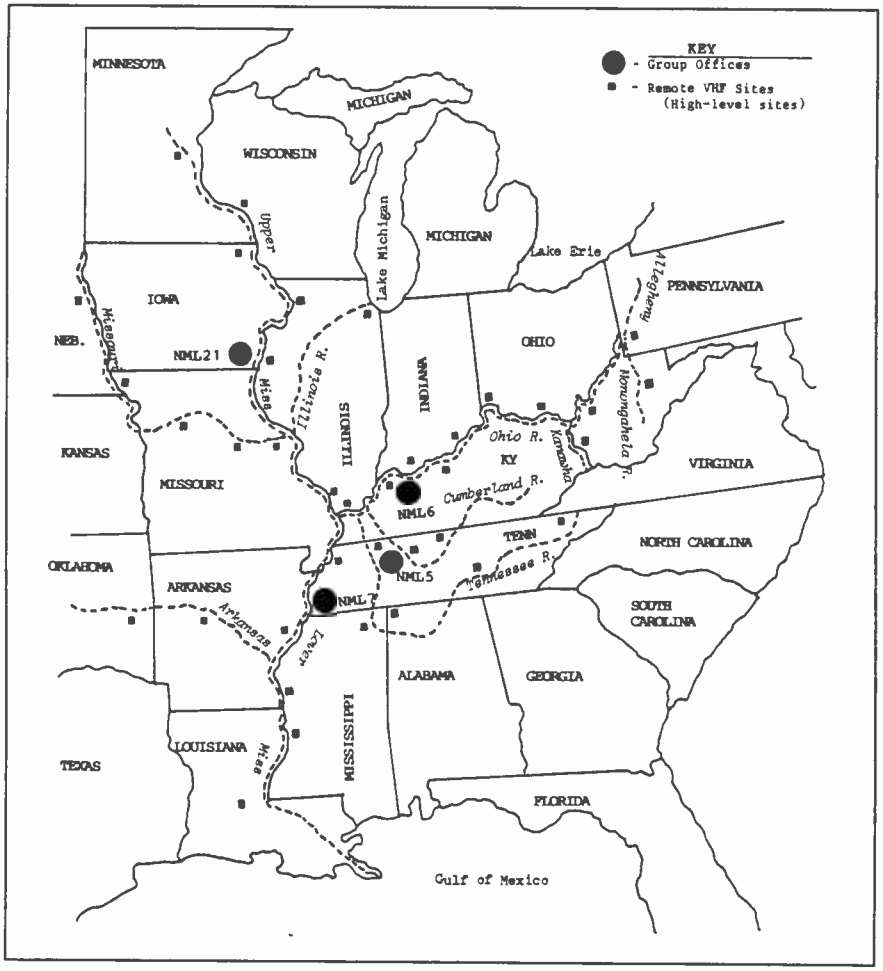
Power ranges on the transmitters are usually about 60 to 100 watts and antennas are vertically polarized stacked Yagi arrays. Efforts have been made to overlap antenna patterns to some extent in order to obtain the best coverage possible. Table I lists each of the Groups, their radio call signs and addresses where you can write to them if you wish to send a reception report.

Each Group is assigned a Radioman First Class as Radioman-in-Charge (RMIC), with another four junior Radiomen to stand radio watches around the clock. As is the case with most radio equipped Coast Guard units, all of the Groups maintain a continuous "guard" on channel 16. In addition, all of the Groups transmit regular Marine Information Broadcasts (MIBs) and river stages on channel 22A. Table I also lists times for these MIBs.

Under the immediate control of each Group are several river buoy tender Coast Guard Cutters. These cutters (designated WLRs) are strategically homeported along

"There is neither light nor buoy to be found anywhere in these thousands of miles of villainous river.

-- Mark Twain, 1874



the rivers and are responsible for setting buoys, ensuring that the lights and daymarks along the rivers are operating or showing properly, clearing brush and vegetation away from these shore aids, and responding to search and rescue (SAR) cases along the rivers.

The cutters range in length from 65 to 115 feet in length, and push a work barge carrying buoys and other AtoN supplies in front of them. Crews average around 22 men, and either a Chief Warrant Officer or Master Chief Petty Officer serves as the skipper. As a rule, Radiomen are not assigned to river tenders as most communications are restricted to voice mode only.

Table II is a list of all Cutters operating in the Second Coast Guard District, their radio call signs (if assigned) and mailing addresses.

There are several other shore units that are radio equipped in the Second District. These include Marine Safety Offices, Marine Safety Detachments, Coast Guard Base St. Louis and the Coast Guard Depot at Leavenworth, Kansas. Addresses for each of these units is shown in Table III.

One thing to bear in mind when listening for these stations: if you hear transmissions from one of the Groups, it may be from any one or more of the high-level VHF sites on the map. With the tenders and other shore stations, however, any transmissions you hear will be direct. The high-level sites are not repeaters---they only connect the controlling Group offices with the remotely controlled transceivers.

Table I
Second Coast Guard District

Group Upper Mississippi River/ NML21	**Broadcast Times (CST)**
Radioman-in-Charge Coast Guard Group Upper Mississippi River 221 Mississippi Drive Keokuk, IA 52632-4219	0115, 0915, 1130, 1715
Group Lower Mississippi River/NML7	
Radioman-in-Charge Coast Guard Group Lower Mississippi River P.O. Box 3058 Memphis, TN 38173-0058	0310, 1110, 1910
Group Ohio River/NML6	
Radioman-in-Charge Coast Guard Group Ohio River 201 Coast Guard Lane Owensboro, KY 42303-0277	0900, 1000, 1245, 2100
Group Tennessee River/NML5	
Radioman-in-Charge Coast Guard Group Tennessee River Route 1, Box 55 Buchanan, TN 38222-9801	0435, 1150, 1215, 1035

Getting a QSL

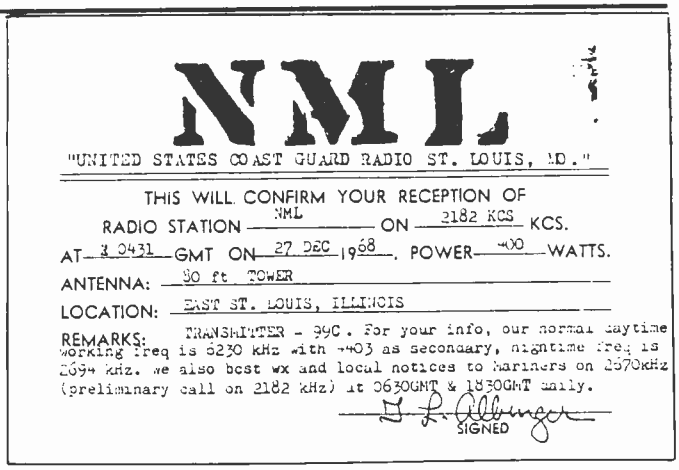
If you decide to write a reception report in hopes of getting a QSL from any of the stations or cutters you hear, your best bet is to send a Prepared Form Card (PFC). The person who receives your letter simply fills in the blanks and returns the PFC to you. You may receive more information or a nice letter as well, but your chances of getting the QSL you want are much better using a PFC. The pictured QSL card from NML is a good example of a PFC.

Address your letters to the Radioman-in-Charge at Groups, Officer-in-Charge for Cutters and the Depot at Leavenworth, and the Commanding Officer at all other units. If you have trouble QSLing a cutter, you might try sending your report to the RMIC of the Group that the cutter works for (see Table II).

At the author's listening post in Memphis, Coast Guard communications from throughout the Second Coast Guard District have been heard on the VHF band. Tune your scanner or receiver to 156.8 MHz and zero-in on the untapped DX of America's Brown Water Coast Guard.

■

A 1968 QSL card from now-off-the-air Coast Guard Radio St. Louis. All Coast Guard river communications are now on the VHF-FM bands.



NML

"UNITED STATES COAST GUARD RADIO ST. LOUIS, MO."

THIS WILL CONFIRM YOUR RECEPTION OF
RADIO STATION NML ON 2182 KCS KCS.
AT 2 0431 GMT ON 27 DEC 1968. POWER 400 WATTS.
ANTENNA: 90 ft TOWER
LOCATION: EAST ST. LOUIS, ILLINOIS
REMARKS: TRANSMITTER - 990. For your info, our normal daytime working freq is 6230 kHz with 4403 as secondary, nighttime freq is 2694 kHz. We also bcst wx and local notices to mariners on 2670kHz (preliminary call on 2182 kHz) at 0630GMT & 1830GMT daily.

SIGNED

Table II
Coast Guard River Buoy Tenders

Name and Address	Group**
USCGC CHENS (WLR 75409) P.O. Box 299, Hickman, KY 42050-0299	OHR
USCGC CHEYENNE (WLR 75405) CG Base, Ft. of Iron Street, St. Louis, MO 63111-2536	UMR
USCGC CIMARRON (WLR 65502) P.O. Box 55, Buchanan, TN 38222-9801	TNR
USCGC CHIPPEWA (WLR 75404) 201 Coast Guard Lane Owensboro, KY 42301-0277	OHR
USCGC DOGWOOD (WLR 259) P.O. Box 7627, Pine Bluff, AR 71611-7627	LMR
USCGC GASCONADE (WLR 75401) P.O. Box 12337, Omaha, NE 68112-0337	UMR
USCGC KANAWHA (WLR 75407) P.O. Box 3058, Memphis, TN 38173-0058	LMR
USCGC KICKAPOO (WLR 75406) P.O. Box 31, Vicksburg, MS 39180-0031	LMR
USCGC LANTANA (WLR 80310) P.O. Box 1343, Natchez, MS 39120-1343	LMR
USCGC MUSKINGUM (WLR 75402) P.O. Box 626, Sallisaw, OK 74955-0626	LMR
USCGC OBION (WLR 65503) CG Base, Fr. of Iron Street St. Louis, MO 63111-2536	UMR
USCGC OSAGE (WLR 65505) Foot of McKnown Lane Sewickley, PA 15143-2093	OHR
USCGC OUACHITA (WLR 65501) Foot of Old Harrison Pike E. Chattanooga, TN 37416-2825	TNR
USCGC PATOKA (WLR 75408) P.O. Box 468, Greenville, MS 38702-0468	LMR
USCGC SANGAMON (WLR 65506) Foot of Washington St. East Peoria, IL 61601-2039	UMR
USCGC SCIOTO (WLR 65504) 221 Mississippi Dr. Keokuk, IA 52632-4219	UMR
USCGC SUMAC (WLR 311) CG Base, Ft. of Iron Street St. Louis, MO 63111-2536	UMR
USCGC WYACONDA (WLR 75403) 60 East First St., Dubuque, IA 52001-7652	UMR

** LMR = Group Lower Mississippi River
OHR = Group Ohio River
TNR = Group Tennessee River
UMR = Group Upper Mississippi River

Only cutters Dogwood (NUNA) and Sumac (NTL2) are assigned radio call-signs.

Table III
Other Radio Equipped Coast Guard Units

U.S. Coast Guard Marine Safety Office
P.O. Box 2412
Huntington, WV 25725-2412

U.S. Coast Guard Marine Safety Office
600 Federal Pl., Rm. 360
Louisville, KY 40202-2230

U.S. Coast Guard Marine Safety Office
200 Jefferson, Suite 1301
Memphis, TN 38103-2300

U.S. Coast Guard Marine Safety Office
Rm A-935, U.S. Courthouse Annex
110 9th Ave., South
Nashville, TN 37203-3817

U.S. Coast Guard Marine Safety Office
P.O. Box 7509
Paducah, KY 42002-7509

U.S. Coast Guard Marine Safety Office
P.O. Box D-17
St. Louis, MO 63188-0017

U.S. Coast Guard Marine Safety Detachment
P.O. Box 882
Greenville, MS 38701-0882

U.S. Coast Guard Marine Safety Detachment
4335 River Road
Cincinnati, OH 45201-1094

U.S. Coast Guard Marine Safety Detachment
Rm. 332, Federal Bldg.
131 E. 4th St.
Davenport, IA 52801-1513

U.S. Coast Guard Marine Safety Detachment
Foot of Washington Street
East Peoria, IL 61611-2039

U.S. Coast Guard Depot
P.O. Box 350
Leavenworth, KS 66048-0350

U.S. Coast Guard Base
Foot of Iron Street
St. Louis, MO 63111-2536

U.S. Coast Guard Marine Safety Office
Suite 700/Kossman Bldg.
Forbes Ave. & Stanwix St.
Pittsburgh, PA 15222-1371

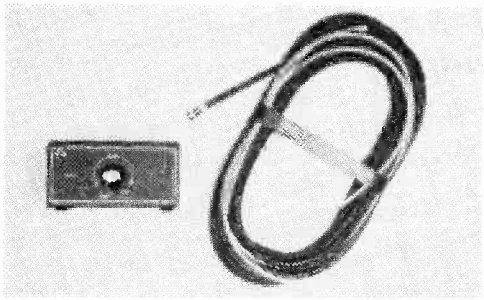
U.S. Coast Guard Marine Safety Detachment
Federal Office Building
P.O. Box 65428
St. Paul, MN 55165-0428

U.S. Coast Guard Marine Safety Detachment
275 Front St., Room 26
P.O. Box 129
Marietta, OH 45750-0129

U.S. Coast Guard Marine Safety Detachment
P.O. Box 3391
Evansville, IN 47732-3391

U.S. Coast Guard Marine Safety Detachment
402 Lee St., Room 306
Decatur, AL 35601-1855

Grove's Indoor SWL Antenna System

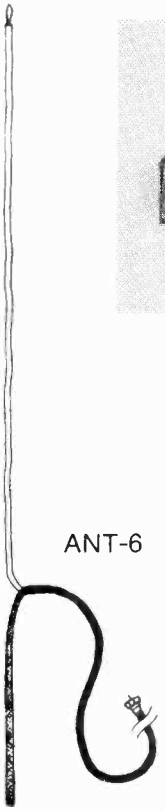


Get global shortwave reception from an antenna which hides behind a drape!

Connects to any receiver equipped with an external antenna jack

Left: Hidden Antenna, shown coiled, with optional Power Ant III and Minituner. Drawing depicts antenna in extended position, ready for use.

Our "Hidden Antenna System" is your key to exciting short wave reception without an outside antenna!



Here's the apartment dweller's dream—a high performance, amplified indoor antenna system for general coverage shortwave, medium wave and even scanner monitoring.

This 66-inch, thin profile, flexible wire antenna can be tucked in a corner, hung behind a drape—just about anywhere out of sight. And when connected to the powerful PRE-3 signal booster, you have instant total spectrum coverage from 100 kHz to over 1000 MHz!

Yes, global short wave reception will be at your fingertips, and you can operate two radios at one time!

Designed for use with the Grove Power Ant III

The Grove PRE-3 Power Ant has taken all the best from its successful predecessors and combined them into one powerful signal booster for scanners, short wave and medium wave receivers, even TV and FM stereos!

Equipped with a high gain, low noise, solid state amplifier stage, the PRE-3's front panel control allows custom selection of up to 30 dB of amplification!

100 kHz-1000 MHz

What you need to order:

ANT-6 Hidden Antenna	**$8.95** (free shipping)
PRE-3 Power Ant III	**$45** (plus $1.50 UPS, $3 U.S. Parcel Post, $4 Canada)
ACC-20 AC adaptor	**$9.95** (free shipping with PRE-3)
ACC-60 receiver cable	**$7.50** (you specify connector or receiver model; one for each receiver)

CALL TOLL-FREE (MC & Visa Only)
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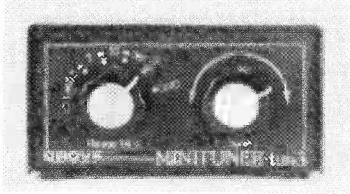
Add the Grove Minituner for Incredible Reception!

The addition of the Grove Minituner to the ANT 6/PRE-3 combo will allow signal peaking to perfection as well as eliminate intermodulation and image interference on your general coverage receiver.

100 kHz-30 MHz



Here's what you will need in addition to the combo above:

TUN-3 Minituner	**$49.00** (plus $1.50 UPS, $3 U.S. Parcel Post, $4 Canada)
ADP-1 UHF/F adaptor	**$5.00** (free shipping)
ADP-2 F/PL-259 adaptor	**$5.00** (free shipping)

Grove Enterprises

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MC and Visa Orders Only,
Call 1-800-438-8155

VIA MOYABI

by Charles Sorrell

Pity the fellow who pulls down transmitter watch at Africa No. 1 in Moyabi, Gabon. Back a few years ago, the job wasn't all that bad. All an engineer was responsible for was one program and two transmitters. You could kick back, put you feet up on the desk, and let your mind wander. Now *that* was a cake job.

Things have been a-changin' at the west African station in recent years. Transmitter duty isn't what is used to be. Today, the number of units on the air has doubled and all of them are giants of the 500 kilowatt variety. To make matters worse, there's now a whole *bunch* of different programs going out via Moyabi. Shortwave listeners are seeing those words -- "via Moyabi" -- in their reference materials and sources a lot more than they used to.

Africa No. 1 first came on the air back in 1982 and it did so with something of a splash. The station even held a contest. The grand prize was a sports car. In a part of the world where some folk get by on a handful of grubs dug out of the ground, that's not too shabby, if not altogether inappropriate.

Africa No. 1 is managed by a French company and for a time, was largely operated by French personnel. Local criticism soon sent most of the French packing, leading to an increasing role for Africans at the facility. Today, locals now occupy all of the on-the-air slots and many of the behind-the-scenes positions as well. Still, a few French linger on in technical capacities.

All four of those 500 kw behemoths that now punch out Africa No. 1's signals are located at what's called the "international communications center." Located in the east central part of the country, the station is much nearer to Gabon's "second city" of Franceville than to the capital of Libreville. The station itself reportedly contributes a large portion of Gabon's gross national product.

As anyone who has listened to it knows, Africa No. 1's programming rests heavily on music -- mostly African music. It's possible to tune in the station at almost any hour of the day or night and not be more than a handful of minutes away from a tune. A certain amount of European and international hits are also included, but mostly the sounds are native in origin. The dominant language is French.

There are two programs a week in English, each 25 minutes long, which are recorded in London. News headlines are at 0900 and 1500 UTC on 7280 and 15200 kHz. There is also an increasing amount of shorter English "bits," like station identifications, promotional announcements, a few short newscasts and some program and record introductions. Usage of these English "bits and pieces" seem to be slipped into the programming here and there, willy-nilly, with no apparent schedule.

No matter what the language, the station appears to remain fairly non-political in nature - with the exception of a program carried on behalf of the African National Congress (which is produced by the station, not the ANC). In addition, the station attempts to promote the African idea, to get Africans thinking continentally and to increase the idea of "continental integration."

Is there any other radio station on the Dark Continent which listeners in North America can hear so regularly and with such consistently good signal levels? The answer is not open for argument. Africa No. 1 is heard here day and night.

Those powerhouse signals haven't escaped the attention of other broadcasters, either. At present, Radio France International, Swiss Radio International and Radio Japan all have bought airtime in an effort to take advantage of those continent-covering transmitters. Adventist World Radio, too, has a program called *AWR Africa* on the station.

Chances are, Africa No. 1 will continue to add to its client list. Smart broadcast executives will want a part of what SRI, AWR, NHK and RFI already know -- there's no better station in Africa for covering Africa. And to our good fortune large chunks of North America. That poor transmitter engineer may one day have an even more difficult time keeping up with who has to be switched where at the top of the coming hour.

If you haven't already done so, take a few minutes to try for this African giant.

0400-0600 UTC on 4830 kHz
0600-0800 UTC on 4830, 11940 kHz
0800-1700 UTC on 7280, 15200 kHz
1700-2300 UTC on 4830, 15200 kHz

The station doesn't mind sending out QSL cards to interested listeners, either. Their address is P.O. Box 1, Libreville, Gabon.■

Broadcasts Via Moyabi

Radio France International

0300-0400 UTC on 4890, 7160 kHz
0400-0500 UTC on 9790 kHz
0500-0600 UTC on 6175, 11700 kHz
0600-0700 UTC on 7160, 11800 kHz
1200-1400 UTC on 9790 kHz
1400-1500 UTC on 9790 kHz
1600-1700 UTC on 9790, 11705* kHz
1700-2200 UTC on 7160 kHz

All broadcasts are aimed at Africa, with the exception of 9790 at 1800-2300 which is to both Europe and Africa. All Radio France International programs via Moyabi are in French, except 1600-1700 on 11705 which is the English language program, Paris Calling Africa.

Radio Japan

0200-0300 UTC on 11835 kHz
0500-0600 UTC on 9570 kHz
0600-0700 UTC on 9570, 17775 kHz
0700-0900 UTC on 9570, 17775, 216595* kHz
0900-1000 UTC on 17775 kHz
1000-1100 UTC on 17775 kHz
1500-1700 UTC on 21700* kHz
2200-0000 UTC on 11800* kHz

Swiss Radio International

2215-0100 UTC on 5965, 11925 kHz

Adventist World Radio

1700-1800 UTC on 9630 kHz (Monday to Friday)
1200-1300 UTC on 17880 kHz* (Sunday only)

* Transmission contains English-language programming.

ACARS:

New Technology for Aeronautical Communications

by Jean Baker

"SUPERAIRWAYS FLIGHT 51 CALLING SAN FRANCISCO ARINC ON 129.35!"

"THIS IS SAN FRANCISCO, GO AHEAD SUPERAIRWAYS 51."

"SUPERAIRWAYS 51 WAS OUT (OF THE GATE) AT ORD (CHICAGO O'HARE) AT 14:01 AND OFF (THE GROUND) AT 14:09. WE WERE ON (THE GROUND) AT ST. LOUIS AT 15:10 AND IN (THE GATE) AT 15:20. OUT ST. LOUIS AT 16:30, OFF AT 16:44. DELAY DUE TO WAIT FOR LATE CONNECTING PASSENGERS. FUEL ON BOARD IS 28.0. ESTIMATING LAS VEGAS AT 18:25. PLEASE RELAY TO COMPANY AT ORD."

"ROGER, SUPERAIRWAYS 51: OUT OF ORD AT 14:01, OFF AT 14:09. ON ST. LOUIS AT 15:10 AND IN AT 15:20. OUT ST. LOUIS AT 16:30 AND OFF AT 16:44. DELAY DUE TO WAIT FOR LATE CONNECTING PASSENGERS. FUEL ON BOARD IS 28.0. ETA LAS VEGAS AT 18:25. WILL RELAY TO COMPANY AT ORD. HAVE A GOOD FLIGHT."

"THAT'S AFFIRMATIVE. THANKS, ARINC. GOOD DAY."

The above radio transmission can chew up anywhere from 20 to 60 seconds of VHF radio time. More time will be involved if the pilot has to stand by while another flight is talking to San Francisco, or if he has to switch to another frequency, or if several other factors come into play.

These voice transmissions, or contacts, as they are called by ARINC, can total 1,000 per day -- 30,000 per month. However, impressive as those figures may sound, they've decreased tremendously from those of only a dozen or so years ago, before the advent of the data link system called ACARS.

ACARS -- an acronym for ARINC Communications Addressing and Reporting System - can handle the above intelligence compressed into only 1/3rd of a second in a data link message. Developed and implemented for the aviation industry by Aeronautical Radio, Inc. (ARINC) in the 1970s, it is no wonder that an increasing number of airlines (approximately 18 to date) have installed the ACARS System on their fleets of aircraft. Piedmont was the first carrier to utilize ACARS with others following suit shortly afterwards.

Fewer Voices on the Air

One of the most obvious effects of ACARS on the airline carriers' air/ground communications is the decreased need for voice communications -- and by association, the manpower involved in handling these transmissions.

One of the factors which make this system so effective is that only one frequency (131.550) has been used by the whole network to up-and-down link approximately 3 million messages per month. However, as of this writing, another frequency has been readied for usage because of increasing demands and requirements as more and more airlines are planning to equip their fleets with ACARS. Another factor to take into consideration is that ACARS is com-

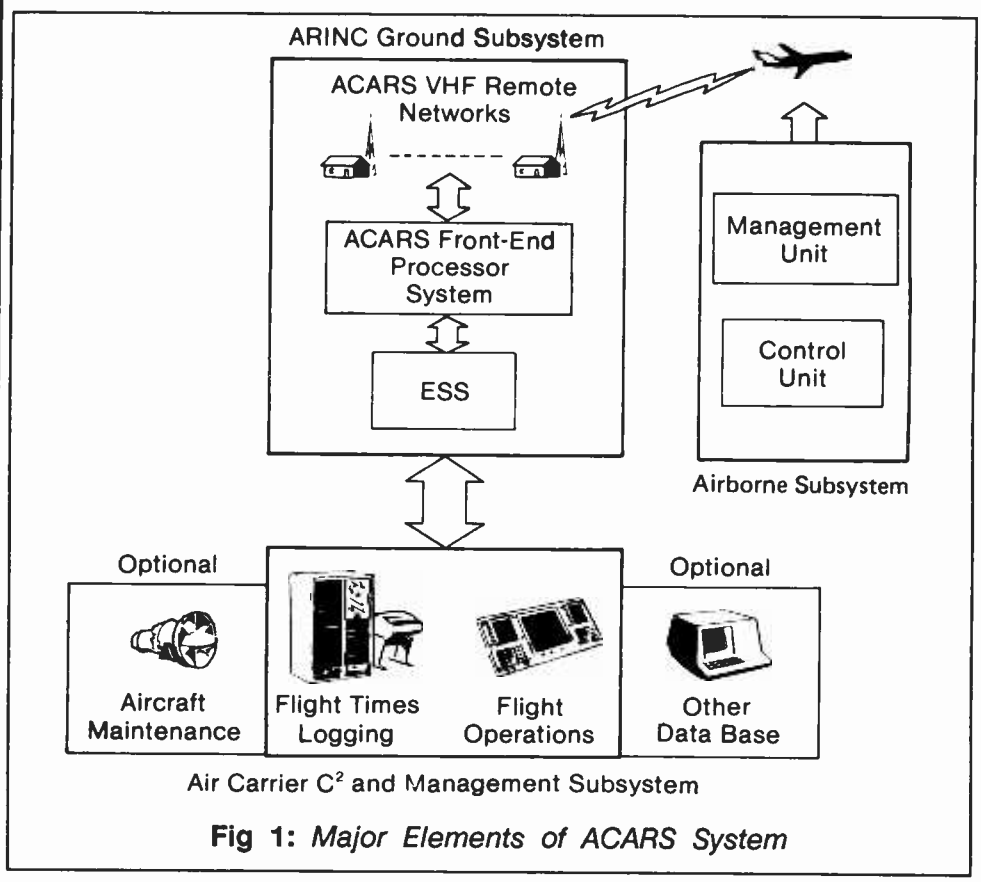

Fig 1: *Major Elements of ACARS System*

patible with radio equipment presently in use and that which is being designed for the next generation of aircraft to come. This results in more cost effectiveness for the whole industry.

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

OOOI!

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

Actually, ACARS was originally designed for the downlinkage of this data. However, it has proven itself useful for the exchange of other information which can either be automatically collected or alternatively, be entered manually by the crew.

Simply stated, ACARS is an air/ground communications network that enables aircraft to function as a mobile terminal associated with modern airlines command and control (C2) and management systems. The information which is collected is transmitted from the aircraft via a data link radio channel to ACARS ground radio stations.

It is then relayed via the ground stations to a central computer processor where the data is converted into airline interoperable messages, through the ARINC Electronic

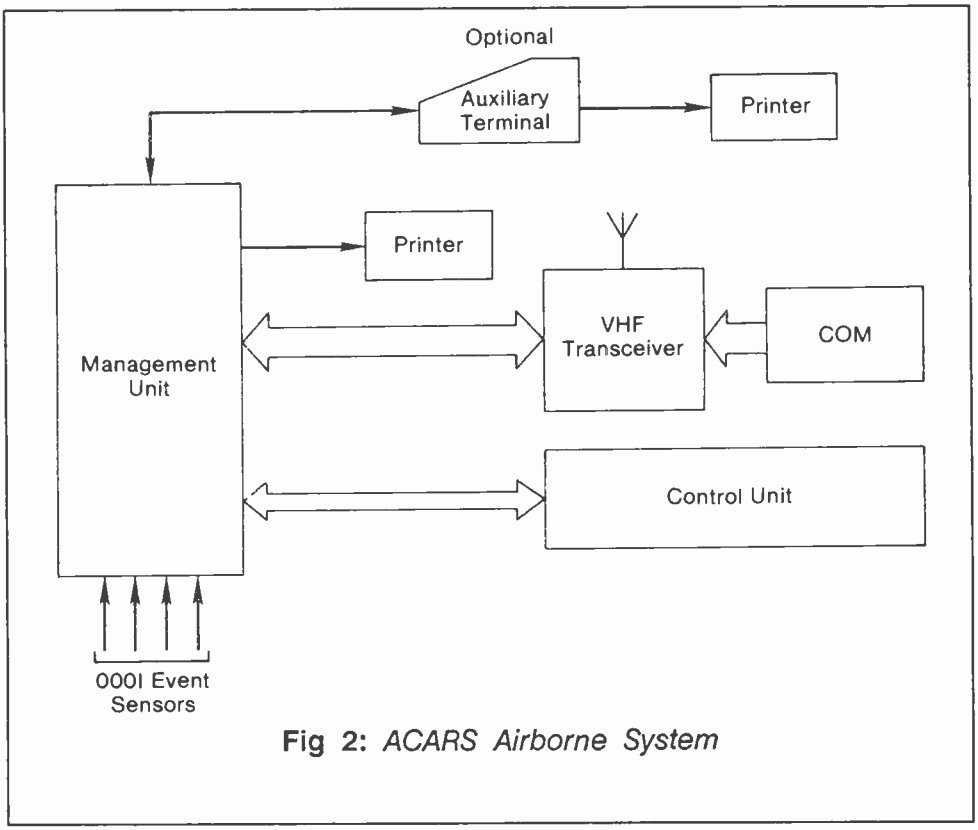

Fig 2: *ACARS Airborne System*

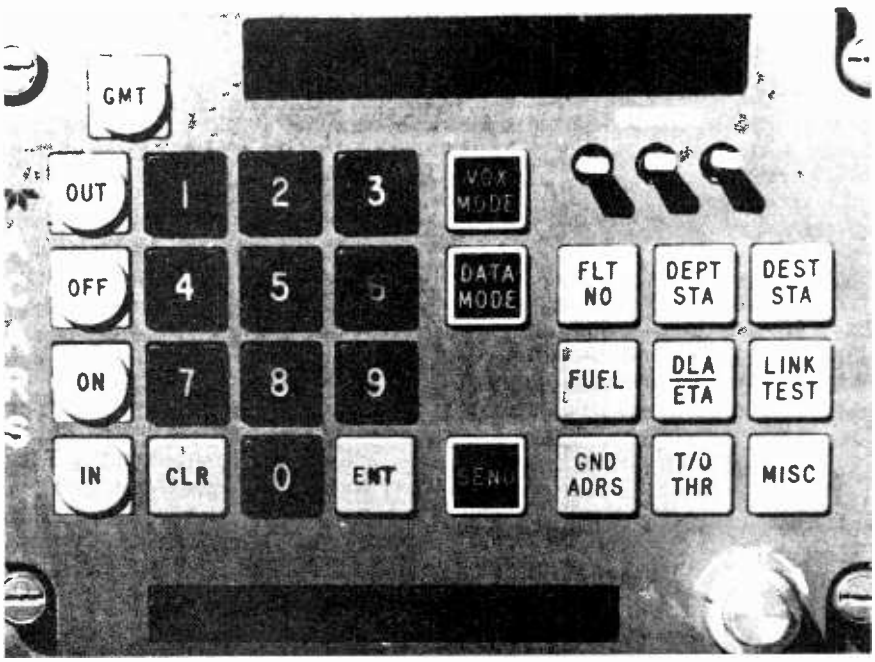

Fig 3: *ACARS Control Unit*

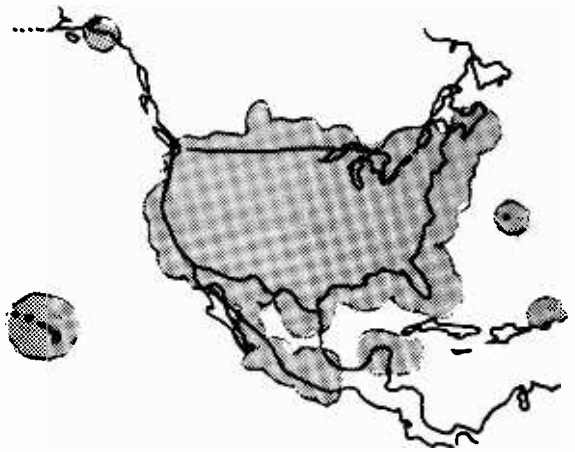

Fig 4: *ACARS Coverage Areas*

Switching System (also known as the ESS).

Figure 1 displays the three major elements of the ACARS Network: (1) The Airborne Subsystem, which consists of the Management and Control Units; (2) The ARINC Ground Subsystem - consisting of the ACARS VHF Remote Networks, the ACARS Front-End Processor System (AFEPS), and the ARINC Electronic Switching System; and (3) The Air Carrier C2 (Command and Control) and Management Subsystems which include the ground-based flight Operations, Maintenance Centers, Dispatch Offices, etc., of the carriers who use the ACARS System.

Figure 2 further defines the Airborne Subsystem as it shows the Management Unit and the Control Unit, among the other components of the system.

Figure 3 details the Control Unit. This provides the flight deck interface with ACARS. It facilitates the entry of text elements of departure/arrival and estimated time of arrival (ETA) reports and the addresses (actually telephone numbers) of parties on the ground with whom the crew may desire voice communication (i.e. when a phone patch is required).

Notice the display unit which can be used as a scratch pad in the data entry process and for the call-up presentation of radio frequency(s), stored OOOI times, flight numbers, and UTC. System status and ground to air voice signalling are also annunciated.

Not shown are the different types of display utilized for receiving messages which are uplinked from the ground. These include CRTs used by USAir and Piedmont, printers which only a few airlines are utilizing, Times Square-type displays which run in loop form, and eight-letter (character) displays which can only show eight letters or figures at a time and are rather hard to read.

Voice Comms at Arrival/Departure

As stated earlier in this feature, the immediate impact of ACARS on the airline industry's current air/ground communications status is the reduction of the need for voice communications for routine information transmission. Before ACARS, 70% of air/ground voice service concerned arrival and departure information (OOOI times).

Although reduction of these air/ground transmissions costs are important to airlines, there are numerous other applications in which ACARS comes into usage which include the transmission and reception of the following types of data:

- Winds Aloft Observations (on INS equipped aircraft)
- Dispatch and Weather Update Messages
- ETA Updates
- Takeoff Thrust
- Selective Calling (if SELCAL Unit is inoperative, a message can be uplinked alerting the crew, for example, that they are to come up on a certain frequency and they can respond accordingly)
- Crew Time Information
- Fuel Status and/or Requirements
- Flight Management Computer Update Messages
- Other miscellaneous Computer Base System Data

The future growth of the ACARS System applications is going to be limited only by the innovation -- or, conversely, lack of it -- by its users. All of these will be easier to achieve because ACARS is considered to be, and actually is, a general purpose data link. Consequently, it has the capacity to grow and change with user demands and incentives which lend themselves to this purpose.

Miscellaneous Facts about ACARS

Airports which are served by airlines equipped with ACARS have a VHF station connected to the ACARS Network. At present, there are over 170 ground stations connected via this network. ACARS now provides enroute coverage over the entire continental United States (CONUS), and has stations in San Juan, Hawaii, Canada, and Mexico.

SITA, a communications company with facilities similar to ARINC, has a version of ACARS called AIRCOM, with stations located in Europe, South Pacific areas, and SE Asia. Aircraft equipped with ACARS can utilize AIRCOM as the two systems are compatible.

Original plans to adapt ACARS for High Frequency radio usage have had to be scrapped for the time being as ACARS has not proven to be adaptable to utilization in the HF mode.

When an aircraft is using ACARS on the assigned frequency of 131.550, it sounds similar to RTTY; however, you cannot use an RTTY unit to decode it. Rumor has it that someone has built a decoding unit so he can "read" ACARS messages!

■

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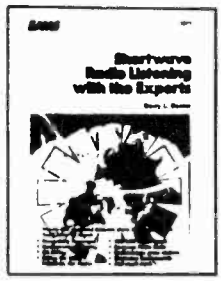

Each takes you through a different aspect of the hobby -- from getting started to choosing the right receiver to the fundementals of propagation and DXing, QSLing and more. By some of the biggest names in the business: Magne, Berg, Jensen, Helms, Dexter. A real doorstopper at 500+ large format pages. The encyclopaedia of shortwave. Imprime price: $21.95 plus $2.39 (3 lbs) UPS.

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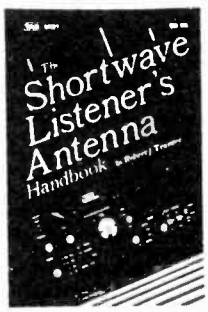

An invaluable guide for every shortwave listener who wants to maximum signal reception from his set up. You'll discover that even the most sophisticated receiver can only pick up hum-drum signals if the antenna isn't up to par. And a relatively inexpensive radio can bring in some pretty impressive stations when the right one is in place. *Shortwave Listener's Antenna Handbook is* Robert Traister's best-selling book on how to design, build and install shortwave antennas. Thorough and comprehensive yet easy to understand. $11.95 plus $1.95 (1 lb) UPS.

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The Day the Baby Stopped the Races

by Dan Mulford

Volunteer firemen are an interesting breed. As most of you know from listening to the radio, all of them seem to have a "never say die" attitude. It's the same all across our country. In this part of Indiana, volunteer firemen are a little more aggressive than most, though. For example, when it comes to fundraising, that same "never say die" attitude turns into "*do it or die.*" You see, in smaller departments like ours, outside funding provides a major part of the annual budget.

Fact is, here in Osgood, our "good ole boys" have tried every cockeyed idea in the book to bring in those dollars. We soon found that pick-up truck drag races are not only a great profit maker, but fun to put on. Being as ingenious as volunteers are -- and I being a ham radio and scanner nut since the age of eight -- I convinced them after the first race that we needed a communication system for the track. Between gates, pits, judges, scorers and "Christmas Tree" operators, we needed it bad! The idea proved to be invaluable.

One beautiful Sunday morning back in June of 1987, race preparations were under way. Seventy to eighty trucks were expected, ranging from the guys around town bringing in the farm truck to those super dragsters that arrive on the back of a flatbed. And with this weather, the trucks were starting to roll in hours before race time!

I could tell that all was not well when I arrived. A lot of our guys were standing around, waving their hands and yelling.

I could tell that all was not well when I arrived. A lot of our guys were standing around, waving their hands and yelling. Not a good sign. The problem, it turned out, was interference on those familiar headset radios we used to coordinate events.

Well, everyone already knew that much, but what was it? I listened for a minute and as a ham, recognized an FM carrier on our working frequency of 49.830 MHz. So bad was the interference that in places communications were limited to around 30 feet!

What was really curious was that once in a while there were knocking sounds. But you know how it is. They all had an idea what it was. So, for the next half hour, we walked around turning off PAs, CBs and walkie talkies, unwiring speakers, and shutting off pagers. And after everything had been turned on and of at least a half dozen times, it was still there.

Then it happened. A baby cried! That was it. It had to be a baby monitor, one of those cordless intercom devices that a mother places in the child's room so she can keep an ear on him while she goes about her housework.

By now, however, it was almost too late. The crowds were beginning to pour through the gate and these same never say die fellows were throwing up their hands in despair. This wasn't going to work!

I got into the antenna-mobile (CB, two scanners, ham radio -- you know!) and a couple of headset-equipped men got in the back seat. Meanwhile, the three wheelers were once again dispatched, all searching desperately for the baby on the FM.

Finally, in hot pursuit, we arrived at a place several blocks from the site of our dirt oval. The signal was *tremendous!* I unplugged the antenna on one scanner and homed in with that. Easily, we found the street.

But how are we going to go house to house, looking like a lot of space weirdos, antennas sticking out of our ears? A quick huddle and our volunteers decided that there was a new baby at one of these houses. I was elected to ask if they had a baby monitor. Fortunately, it was jackpot time. As soon as I knocked, we all heard a child yell, "Mom! There's someone at the door and he's got a *thing* on his head!"

As you can guess, it took several minutes to explain what was going on, but our friendly mother did agree to shut off her monitor while the race was going on.

This proves that you can never tell what may be heard on the 49 MHz band. And it's not limited to fire communications! ■

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

International DX Report

It's great to join the *Monitoring Times* team, so we can bring you a diverse world mix of listening tips to enhance your enjoyment of shortwave radio. We search many other publications and monitor as much as we can, but your input to the address above is needed to make sure *MT* readers can share your significant discoveries.

Bicentennial Australia

The Bicentennial leads Radio Australia to schedule several special series commemorating the occasion. Topics may change each month, in two different blocks: Friday 2330, Saturday 0230, Sunday 1030, Tuesday 1230, Wednesday 0730 UTC; and Saturday 0930, Monday 2030, Tuesday 1230, Wednesday 0130, Friday 0530. Also listen to two mini-features: *Bound for Botany Bay* daily at 1630, 2227, 0127, 0625, 1027; and *Looking Back*, Monday-Friday 1427, 1827, 0027, 0527, 0927. RA's show for shortwave enthusiasts, *Communicator,* can be heard UTC Sundays at 0230, 0730, 1230, 1730, 2030. (Via Bruce MacGibbon, *Review of International Broadcasting)*

KTWR, Guam, plans to stay on 11805 for English at 0800-1100 during March and April but move to 9820 for the final block between 1500 and 1645 (via Richard Lemke, North American Shortwave Association)

April 4 is the big day when Radio Canada International begins relays via Radio Japan. Unfortunately, *SWL Digest* is not among the programs they plan to carry at the outset. English will be at 1200-1230 on 15290 and 17810; and 2200-2230 on 17885.

Stay Young: Listen to China

Radio Beijing's colorful 1988 calendar portrays a collection of Chinese ornamental ceramics. And they've squeezed in some ads for enterprises in several cities. Our favorite is the Shanghai No. 2 Chinese Medicine Factory, providing Shanghai Chicken Essence, which "helps to keep alive the fervour of youth."

An attractive QSL from Radio Peking from the extensive collection of Paul Williams, Shaw AFB, SC

The new year brought another Mainland station broadcasting to Taiwan, Voice of Pujiang, from Shanghai, at 0955-1545 or later on 3280, 3990, 4950. Address is Box 3064. (Satoru Suga and Akira Yamanaka, Asian Broadcasting Institute via NASWA) The lowest frequency was heard immediately by Bob Hill in Massachusetts around 1130-1200.

What's the most popular station in Iran? Israel Radio's Persian service, claims Daniel Gavron in the *Jerusalem Post*, because its anal;ysis usually turns out to be correct. (via Rabbi Jeffrey B. Stiffman, *RIB*) Listen for yourself at 1530-1625 on 7355 and 11610 (beamed our way), and 9925, 9010, 7460 (beamed to Iran); and at 1800-1815 to us on 7355, Iran on 7460, 5885 (one hour earlier once Israel goes on DST).

Unlikely SW Department

Ayatollah Khomeini listens to the BBC along with almost any other foreign station's Persian programs he can pick up on the little radio he sometimes wears on a cord around his neck. So reports *The Observer* from Britain (via Mark Ward, World DX Club)

Israeli and Christian interests were hoping to gain control of Sierra Leone's dormant 250-kw transmitter on 5980, so the government stepped in and turned it over to the service of Islam. Initial schedule of 1600-2000 made reception in North America difficult.

National Unity Radio, Omdurman, Sudan, began as a black clandestine countering Radio SPLA. But now it provides the best overt reception of this country. Ernie Behr in Ontario and I have been hearing an Arabic outlet on 9435 from before 1430 until closing a few minutes after 1500, believed to be this, but IDs are hard to catch.

Still clandestine is Angola's UNITA station, Voice of the Resistance of the Black Cockerel (Galo Negro), at 0800-1000 and 1200-1400 on 11980 and 15167. Strength is very good but audio quality is poor. If Radio Nacional's 3376 outlet is too easy for you, try the fourth harmonic, 13504 (Richard Ginbey, Namibia, *Media Network)*

Now the Truth can be Told

Radio Botswana's barnyard sounds between 0340 and 0400 on 4820, 3356, were recorded in the studio, with former chief engineer Ian Kennedy, VE3ONK, doing the mooing (Robert Ross, DX Ontario)

Radio Tanzania' external service in English at 0330-0430 on 9684.1 suffers from machine-gun style jamming, starting about halfway into the hour, to block news and liberation programs for South Africa. That makes the source pretty obvious (Chris Bagge, Massachusetts, and Roland F. Archer, North Carolina, *RIB*) Tim Hendel comments that when he lived in Pretoria and Johannesburg a few years ago the jamming was audible but not too effective; perhaps local groundwave only, now increased (*World of Radio)*

WORLD RADIO NEWS

Glenn Hauser
Box 1684 - MT
Enid, OK 73702

Big Changes in Radio RSA Sked

Radio RSA is now making major changes in its English output, doubling the hour to North America so it runs from 0200 to 0400, bumping the East Africa service an hour later to 0400-0530, and replacing the hour at 1300 with one at 1800 (Michael Harla *WOR*).

We hope it's a misunderstanding, but Spanish Foreign Radio is reported to have issued a QSL commemorating the upcoming 500th anniversary of the European rediscovery of America, illustrated with a Ku Klux Klan march! (Elmer Boutin, Association of DX Reporters)

As of February 1, Radio Sweden dropped "International" from its name. Let's hope this starts a trend away from this cumbersome redundancy.

Program Highlights for March

Tentative topics on March *Media Networks*, Thursdays on Radio Netherlands: *3rd*, The Long Path Through Asia, report from Java; and Arthur Cushen's Pacific DX news. *10th*, Richard Ginbey's Africa DX news. *17th*, The Riviera Connection -- why so many English-language stations in the south of France? *24th*, Victor Goonetilleke, Asian DX news. *31st*, How modern technology is affecting the station on remote Norfolk Island. (via Carl Mann and Dick Rush, *RIB*).

BBC World Service Highlights: *Six Cities*, from March 20th, Sundays at 2330, Mondays 0630, 1001, 1515 -- Los Angeles, Lagos, Paris, Cairo, Bpombay, Jakarta. Wonderful music is in store on *Great Love Duets*, for six weeks from March 23, Wednesdays 1215, Thursdays 0630 and 2330; and on *The Seven Ages of Man*, from March 26, Saturdays 2115, Sundays 0430, Mondaysa 1545, Tuesdays 0945. *Two Cheers for March*, the monthly satirical review, can be heard Wednesday, March 30th, at 1530, UTC 31st at 0030, 1030.

BBC World Service visits Moscow on several series this month: *Science in Action,* Fridays 1615 and 2030, Sundays 0915, Mondays 0230; *Discovery,* Tuesdays 1001, Wednesdays 0330, Thursdays 1830; *Outlook,* Mondays-Fridays 1400, 1900, Tuesdays-Saturdays 0100; and *Meridian* (three editions a week), Saturdays 0630, 1130, 2030; Tuesdays 2030, Wednesdays 0630, 1130; Thursdays 2030, Fridays 0630, 1130.

Radio Vilnius has been running a brief *Lithuanian by Radio* series near the end of Sunday broadcasts in English at 2300 (from the end of March, 2200) (William Westenhaver, *The DX Spread)*

Rare Stuff

A shortwave broadcaster little-known to the DX world is Emisora CLX in Havana, on 6995 kHz with transmissions lasting about 10 minutes giving the schedule, address, and asking for reports, and weather data for "meteorological aficionados" -- daily at 1700 and 1945, Monday-Saturday 2300, and Sunday 2045 (perhaps one hour earlier for DST).

Cuban clandestine La Voz de Alpha 66 puts a potent signal out on 6669 (variable) for 30 minutes or more three nights a week, UTC Tuesdays, Thursdays and Saturdays at 0200 (an hour earlier for DST), also announcing a (legal) program via "wacky" WAQI, Radio Mambi, 710 kHz, Miami, UTC Mondays at 0400.

Guatemala's main gospel outlet TGN has been helping to set up other stations to evangelize specific Indian groups. The latest is Radio Kekchi, 5 kilowatts on 4845, which Don Moore found out about on a visit to Guatemala, but a presstime, no one has yet reported hearing *(DX Listening Digest)*

Guyana has resumed shortwave on 5950, opening around 0730, audible until blocked by WYFR before 1100 (William Westenhaver, Montreal, and Mike Harla, New Jersey, RCI *SWL Digest)*

HCJB has replaced the midweek edition of *DX Party Line* with *Ham Radio Today*, hosted by John Beck, Wednesdays at 0800, 1030, 1207, 2130, UTC Thursdays 0230, 0630. Another Ecuadorian, recently reactivated is La Voz de Saquisili, on 4900, from sign-on around 1148 (David Clark, Ontario, and Kirk Allen, Oklahoma, *Fine Tuning)*

The Peruvian on 3250.2 kHz provokes a difference of opinion. Pedro F. Arrunategui in Lima says it's Radio Poroy, while R. Cotroneo, and Italian DXer visiting Peru reports it as Radio Oyon in *Play DX.* North American DXers have made still more guesses.

Radio for Peace International, Costa Rica started testing 15493.5 kHz afternoons in mid-January, but evening reception on 7375 has been far superior, including a chance to hear our *World of Radio* program, UTC Wednesdays around 0300, Saturdays 0100.

World of Radio

Listening to *World of Radio* is an excellent way to keep up with developments between issues of *Monitoring Times.* It airs first on WRNO, New Orleans, Thursdays at 1615 on 15420, UTC Fridays 0130 on 7355, Saturdays 0400 on 6185, Sundays 0030 on 7355, 1800 on 15420 (one hour earlier by UTC from the first Sunday in April).

From the West to the World, KUSW's proposed schedule for March: from 1800 on 15225, 1900 on 17715, 2200 on 15580, 0000 on 11980, 0200 on 9850, 0500-0600 on 6155; Sundays only extended to 0700, then 6010; 0900 on 5980, 1200 on 9850, 1600-1900 on 15225. The Mormon Tabernacle Choir can be heard Sundays at 0700 and 1700. KUSW is offering a $20.00 "charter membership" to get you various promotional goodies.

Mel Russel, AFRTS spokesman, told Ian McFarland on RCI that shortwave is likely to continue at least through 1988.

Until the next, 73! ■

Broadcast Loggings

0000 UTC on 9420
Greece: Voice of Greece. Greek/English. English news after Greek popular and traditional music. Programming to 0148 with loud tone until 0159 interval signal. (James Kline, Santa Monica, CA)

0026 UTC on 6125
Spain: Radio Exterio de Espana. News and weather with ID on the half hour. (Bruce Gilson, Silver Springs, MD); 9630 kHz at 0025 (Tom Roach, San Jose, CA), (David Kammler, Ridgecrest, CA)

0030 UTC on 5960
Canada: Radio Canada Int'l-Sackville. Routine Business and The House features with 0056 schedule. (Bruce Gilson, Silver Springs, MD); 2100 UTC on 11945/15325 (Bill Scarbrough, Knoxville, TN)

0042 UTC on 7265
Germany-FRG: Sudwestfunk. German. Rock and pop hits of the US. Constant ham operators interference. (Cliff Goodlet, Chattanooga, TN)

0053 UTC on 6070
Bulgaria: Radio Sofia. Music program and interval signal at 0058. 0100 into presumed Bulgarian language. (Bruce Gilson, Silver Springs, MD)

0100 UTC on 11680
USA: KUSW, Salt Lake City. Rock music followed by country and western and numerous ads. First heard on 15580 at 0230 before moving to 11680. (Bill Scarbrough, Knoxville, TN)

0130 UTC on 6040
Germany-FRG: Deutsche Welle. Feature Germany Today on the arts at 0133. Heard also on parallel 6085/9545. (Bruce Gilson, Silver Springs, MD)

0140 UTC on 9815
USA: VOA-Delano. News and book review at 0150. Editorial and Focus program at 0210. (Bruce Gilson, Silver Springs, MD)

0150 UTC on 4830
Venezuela: Radio Tachira. Spanish. Usual numerous IDs and local ads for Coca-cola. (Cliff Goodlet, Chattanooga, TN), (Bill Scarbrough, Knoxvill, TN)

0200 UTC on 4830
Luxembourgh: Radio Luxembourg. Rock music with male DJ until 0230 tune out. (Pete Wahlquist, Reseda, CA), (James Kline, Santa Monica, CA); 1945 on 15350 (J.C. Brownlee, Laurens, SC)

0245 UTC on 7065
Albania: Radio Tirana. Feature The New Man of Socialist Albania and In Struggle and Social Liberation. 0257 end of programming. Logged while in Britian. (James Kline, Santa Monica, CA)

0300 UTC on 4920.4
Ecuador: Radio Quito. Spanish. Big band music - even the Chattanooga Choo Choo at 0307. (Cliff Goodlet, Chattanooga, TN)

0309 UTC on 6150
Vatican State: Vatican Radio. Interval signal and Vatican Viewpoint program, Part II featuring the international debt. (James Kline, Santa Monica, CA; 1940 on 9645 in Latin (Bill Scarbrough, Knoxville, TN)

0312 UTC on 4800
Lesotho: Radio Lesotho. Sesotho. Religious programming and women's choral group singing. Weak signal. (Michael Loran, Azusa, CA), (Cliff Goodlet, Chattanooga, TN), (Tom Roach, San Jose, CA)

0339 UTC on 4820
Botswana: Radio Botswana. English/Vernaculars. Usual 'barnyard' sounds for interval signal into ID and religious format. (Michael Loran, Azusa, CA), (Tom Roach, San Jose, CA)

0410 UTC on 6005
Ascension Island: BBC. Discussion on Gorbachev interview. Costa Rica report from Martha Honey. Parallels 5975/6175 also heard. (Tom Roach, San Jose, CA)

0430 UTC on 6075
Austria: Radio Austria International. Regular program of news and Report from Austria. 6075 is a new frequency from previous 6000. (Bill Scarbrough, Knoxville, TN)

0430 UTC on 5015
Clandestine: Radio Truth. Clear ID followed bird interval signal into weak script from male. (Bill Scarbrough, Knoxville, TN)

0436 UTC on 9720
Ecuador: HCJB. Interesting program on archeological finds in Quito. Native Ecuadorian music and religious programming. (Tom Roach, San Jose, CA)

0440 UTC on 4890
Gabon: Radio France International. Relay. Regular news programs with features. (Bill Scarbrough, Knoxville, TN)

0456 UTC on 5035
Central African Republic: RTV Centrafricaine. French. Newscast with constant interference. (Cliff Goodlet, Chattanooga, TN)

0501 UTC on 7255
Nigeria: Voice of Nigeria-Lagos. African music until 0507 and talk on current internaitonal events. (Tom Roach, San Jose, CA)

0502 UTC on 9535
Bonaire: Trans World Radio. Discussion on a 35 year Christian high school reunion. (David Kammler, Ridgecrest, CA)

0608 UTC on 4915
Ghana: Ghana Broadcasting Corporation-Accra. Local news, talk on economic growth. (David Kammler, Ridgecrest, CA)

0625 UTC on 4985
Brasil: Radio Central. Portuguese. Announcements and station ID at 0632 as "Radio Brasil Central." (David Kammler, Ridgecrest, CA)

0628 UTC on 3300
Guatemala: Radio Cultural. Oldies, instrumental music. Station ID at 0643. (David Kammler, Ridgecrest, CA); at 0400 UTC (Michael Loran, Azusa, CA)

0631 UTC on 6055
Czechoslovakia: Radio Prague. Multilingual. Interprogramme feature with rock and popular music in Czech, Slovak, English, French, and German. English news at 0745. Logged while in Britian. (James Kline, Santa Monica, CA), (Bruce Gilson, Silver Springs,)

0632 UTC on 6135
Tahiti: RFO Tahiti. French. Male announcer with programming of Tahitian music and news at 0700 UTC. Very poor reception. (Tom Roach, San Jose, CA)

0650 UTC on 7205
Chile: Radio Chile. Clear and distinct English IDs with Spanish music. (David Kammler, Ridgecrest, CA)

0659 UTC on 4845
Mauritania: ORT de Mauritanie. French. News report with very good signal and monitored to 0731. (Cliff Goodlet, Chattanooga, TN)

0713 UTC on 9545
Soloman Islands: Solomon Islands Broadcasting Corporation-Honiara. Station ID and "island" music. Local commercials. (David Kammler, Ridgecrest, CA)

0719 UTC on 5985
Taiwan: Voice of Free China. Discussion on managing your money. (David Kammler, Ridgecrest, CA)

0720 UTC on 4940
Marshall Islands: WSZO. Excellent program on 1950's music. (David ammler, Ridgecrest, CA)

0800 UTC on 7105
Monaco: Trans World Radio-Monte Carlo. Religious programming with IDs to 0900 tune out time. (Bill Scarbrough, Knoxville, TN), (James Kline, Santa Monica, CA)

0818 UTC on 7170
New Caledonia: RFO-New Caledonia. French. Music program from the 50/60s era from French DJ. (David Kammler, Ridgecrest, CA), (Tom Roach, San Jose, CA)

0830 UTC on 4920
Australia: ABC-Brisbane. Male announcer hosts Short and Sweet with Benny Goodman music. Weather and news report. Parallel heard on 9660. (James Kline, Santa Monica, CA)

0900 UTC on 7180
Hong Kong: BBC relay. World news, press review, features the The World Today and Sports Roundup. (James Kline, Santa Monica, CA)

0901 UTC on 3945
Japan: Nihon Shortwave Broadcast Corporation. Japanese. Music from Julie Andrews. English language lesson and ID as "Radio

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

Tanpa". Great signal! (James Kline, Santa Monica, CA), (J.C. Brownlee, Laurens, SC)

0954 UTC on 4825
Peru: La Voz de la Selva. Spanish. Peruvian folk music of flutes, drums, and whistling. Station ID at 0957. (Tom Roach, San Jose, CA)

1001 UTC on 4760
China: Yunnan People's Broadcasting Station-Ziyun. Chinese. Male announcer reading possible news items. Very weak signal. (Tom Roach, San Jose, CA)

1003 UTC on 6150
Alaska: KNLS. Sonya Ellis hosting All That Jazz to 1029 with ID. (James Kline, Santa Monica, CA)

1017 UTC on 4980
Venezuela: Ecos Del Torbes. Spanish. Rapidly speaking announcer with IDs and announcements. Spanish pop music. (Tom Roach, San Jose, CA); and 0340 UTC (Bill Scarbrough, Knoxville, TN)

1046 UTC on 3275
Venezuela: Radio Mara. Spanish. Latin music, local ads and station ID. (Cliff Goodlet, Chattanooga, TN)

1100 UTC on 6576
North Korea: Radio Pyongyang. Station ID and notional anthem with station schedule. Feature Scenic Spots in Korea. (James Kline, Santa Monica, CA)

1131 UTC on 4889.9
Papua New Guinea: NBC-Port Moresby. National news and statement from the PNG Prime Minister. Good signal but some RTTY interference. (Tom Roach, San Jose, CA)

1210 UTC on 6160
Canada: Radio CKZN-CBN-Newfoundland. Local news and music from male announcer with ID at 1215. (Bill Scarbrough, Knoxville, TN)

1245 UTC on 6000
USSR: Radio Moscow-Ul'yanovsk. Program of music including Strauss and jazz. (Bob Fraser, Cohasset, MA)

1250 UTC on 17720
Guyana: Radio France International. Relay. Report on wine production. Heard also on parallel frequencies 15365/21645. (Bob Fraser, Cohasset, MA); (J.C. Brownlee, Laurens, SC)

1300 UTC on 11900
USSR: Radio Moscow. International newscast. (Bob Fraser, Cohasset, MA); (Bruce Gilson, Silver Springs, MD)

1303 UTC on 9760
Philippines: VOA. Newscast and VOA ID. Programs Focus, Call to Action and East Asia frequency schedule. (James Kline, Santa Monica, CA; 2305 on 17740 (Tom Roach, San Jose, CA)

1329 UTC on 4990
China: Hunan People's Broadcasting Station-Changsha. Chinese. Male announcer presents Chinese folk music. 'Twinkle, Twinkle, Little Star' theme and English language lesson. (Tom Roach, San Jose, CA)

1400 UTC on 9580
Australia: Radio Australia-Shepparton. "International Report" followed by news, commentary, and pop music. (J. C. Brownlee, Laurens, SC); (James Kline, Santa Monica, CA)

1400 UTC on 9750
South Korea: Radio Korea. News and commentary about Japanese Red Army terrorist. Korean language lesson. (James Kline, Santa Monica, CA)

1407 UTC on 9610
Australia: ABC-Perth. Australian national news with stock reportand pop music. (James Kline, Santa Monica, CA)

1429 UTC on 4950
Malaysia: RTM-Sarawak. Announcement with phone number to call, news on Malaysian government, and Copyright Act information. (Tom Roach, San Jose, CA)

1430 UTC on 13770
Netherlands: Radio Netherlands. News about South Korean election and U.S.-USSR arms treaty. (Steven Cline, Indianapolis, IN); 0532 on 6165 (David ammler, Ridgecrest, CA)

1435 UTC on 4725
Burma: Burma Broadcasting Corporation Service-Rangoon. Burmese? Male and female announcers with chat, Asian music and possibly a public service announcement. (Tom Roach, San Jose, CA)

1452 UTC on 4485
USSR: Kamchatka Radio-Petropaviovask-Kam. Russian. Female operatic solo and classical music presented by male announcer. (Tom Roach, San Jose, CA)

1502 UTC on 6070
Canada: CFRX-CFRB-Toranto. Local news to 1505. Local commercials and weather followed by "Andy Berry Show." (J. C. Brownlee, Laurens, SC), (Bruce Gilson, Silver Springs, MD)

1517 UTC on 11940
Singapore: SBC-Radio I. Male host pop music program. "Radio One" ID. (James Kline, Santa Monica, CA); 1447 on 5051 (Tom Roach, San Jose, CA)

1521 UTC on 21590
South Africa: Radio RSA. Listeners' letters program and "Our Wild Heritage"feature. (Bruce Gilson, Silver Springs, MD) , (J. C. Brownlee, Laurens, SC), (James Kline, Santa Monica, CA)

1530 UTC on 17830
Switzerland: Swiss Radio Intenational. News and commentary to 1600 with French programming following. (J. C. Brownlee, Laurens, SC), (Bruce Gilson, Silver Springs, MD) 6135 at 0424 (Tom Roach, San Jose, CA)

1537 UTC on 15240
Yugoslavia: Radio Yugoslavia. "News From and About Yugoslavia," weather and mail bag program. Logged while in Britian. (James Kline, Santa Monica, CA)

1815 UTC on 9720
Saudi Arabia: Broadcasting Service of the Kindgom of Saudi Arabia. Orchestral music amid interference and poor audio level. (Stephen Price, Conemaugn, PA)

1820 UTC on 9779.3
Yemen Arab Republic: Radio San'a. Arabic. Music of Arabic and martial styles. Talk from male announcer. (J.C. Brownlee, Laurens, SC)

2128 UTC on 11625
Syria: Radio Damascus. Station ID and several Arabic music selections. (Tom Roach, San Jose, CA)

2206 UTC on 11830
Liberia: ELWA-Monrovia. Closing portion of newscast with ID and station address. (Bill Scarbrough, Knoxville, TN); 0714 on 4760 (David Kammler, Ridgecrest, CA)

2230 UTC on 9705
Mexico: Radio Mexico International. Spanish. Music styles of Mexican folklorica, rock, and instrumentals. Station ID included. (Bob Fraser, Cohasset, MA)

2243 UTC on 15140
Chili: Radio National-Santiago. Spanish. News and IDs to 2314 tune out. (Cliff Goodlet, Chattanooga, TN; 9550 at 0055 (Michael Loran, Azusa, CA)

2251 UTC on 2390
Mexico: Radio Huayacocotla. (tentative) Spanish. Spanish music with lady announcer. Very weak signal and interference from marine radio/telephone transmissions. Monitored to 0100 sign-off. Logged from Aurora, Illinois. (Michael Loran, Azusa, CA)

2300 UTC on 9445
Turkey: Voice of Turkey. Newscast from male announcer into classical Turkish music. (Bob Fraser, Cohasset, MA)

2300 UTC on 6200
USSR: Lithuania-Radio Vilnius. Interval signal and ID with world news commentary and music. (Bruce Gilson, Silver ISprings, MD)

2310 UTC on 9595
Italy: R.A.I. Italian. Light operatic music and speech from male. Heard also on parallel of 5990. (Bob Fraser, Cohasset, MA)

2310 UTC on 5025
Cuba: Radio Rebelde-Havana. Spanish. Blend of Latin and American pop. Heard parallel with 600 kHz medium wave. (J. C. Brownlee, Laurens, SC)

Scanning the Nation

New Radio for PA State Police

After what officials say was "ten years of dependable service," Pennsylvania State Police are now replacing their four channel MICOR mobile radios. Installation of the new 32-channel radios are already underway with the State Police communications specialists involved in a "massive training effort to orient troopers as quickly as possible." The result has been some incredible on-air "bloopers," including, according to Mark Swarbrick of Thorndale, Pennsylvania, one trooper who accidentally aired his grievances against the Force, on the air!

The new two-way radios are the result of some two years of planning by the Department. The new system contains four new communications channels, bringing the total to seven. n addition to the M/M channel, which holds the number one position in the frequency listing, several new tactical frequencies, seven new mobile unit monitor channels and the National Emergency Police Frequency have been added. In all, each radio will have 21 channels which will be identical in all of Pennsylvania. The remaining 11 channels have been allocated to local and municipal police organizations on a troop basis.

Other states have contributed their Statewide Emergency Frequencies to the new PSP radio. LEERN (Law Enforcement Emergency Radio Network) or Ohio and the SWEN (Statewide Emergency Network) of Delaware are included in Pennsylvania State Police vehicles operating near these state borders.

PA Truckers Hold World Record

That new system will probably get a good workout in the Keystone State: Pennsylvania has the world's worst record for truck accidents involving hazardous material. There were 6,718 such accidents between 1976 and 1984. According to Department of Transportation figures, 10 to 12% of all trucks on the road are carrying hazardous material.

Pennsylvania's Senator Bell hammered away at the truck safety issue and called for more hiring of state troopers and DOT inspectors to check the trucks.

According to Jim Burnett, chairman of the National Transportation Safety Board, avoidable accidents were caused by unqualified, untrained, fatigued drivers that were at times impaired by drugs. Burnett wants the federal government to qualify drivers of hazardous waste. "Drivers transporting hazardous materials should be the cream of the crop," said Burnett.

Until federal laws are passed, the Pennsylvania State Police will be increasing their spot checks of trucks using state highways. The state police can be monitored on the following frequencies: 154.67, 154.755, 155.505, 159.210.

The Skies Were Friendly Last Year. Honest!

Three major airline crashes -- including one that claimed 156 lives -- made 1987 one of the worst years for aviation accidents. Major airlines flying large jets had 31 accidents resulting in 231 deaths.

Airline officials suggested that the fatality figures are misleading. Their reasoning stems from the notion that single accidents involving large aircraft had caused the figures to soar. As a result, the Air Transport Association stated that 1987 was one of the better years for airline safety. Huh?

Scanner enthusiasts can get an ear or two on aircraft malfunctions by monitoring the "Repair and Replace" channels (R&Rs). These are used by commercial airline pilots to inform the ground crews of what needs to be repaired aboard the aircraft. Pilots refer to these transmissions as "Write-Ups."

Some of the monitored conversations included requests for compass repairs, inoperative strobe and landing lights, broken switches and fuel gauges that were indicating "empty" right after the plane was re-fueled. One pilot reported an emergency when all power was temporarily lost in the cockpit during a night approach to Philadelphia International.

R&Rs can be monitored on the following frequencies: 129.3, 129.7, 130.25, 130.525, 130.6, 130.65, 130,85, 131.150, 131.425 and 132,00. Additional frequencies can be found by searching through 128.9 to 132.0 MHz.

Pilots can also be heard talking to one another about various topics on frequencies between 122.0 and 123.0. These private chats are frowned upon by the FCC, but that doesn't seem to deter conversations that often sound like they belong on a CB channel!

Growing your own Scanner

A team of researchers at GTE laboratories in Waltham, Massachusetts, have succeeded in "growing" the basic component of a transistor. Scientists have learned how to let mother nature do the work of creating silicon structures that can be turned into electronic devices.

The growing of silicon structures is less expensive and is less likely to produce "faults" on the surface of silicon wafers. As a bonus, the technique produces transistors that can survive large electrical currents.

Will scanner radios of the future come in tablet form? If so, perhaps the instructions will read ... "Place tablet on table and add 3 drops of water!"

Lock Your Car! Christmas Never Ends at the Mall

Remember *MT*'s October 86 issue that covered Mall Security? Well, don't turn off your scanner just because the holidays are over! In 1987, vehicle theft costs were over 41 billion dollars nationwide. Of the vehicles stolen, over 47% were taken from mall parking lots.

Mall action will once again become hot as the Easter holiday nears. Here is a list of itinerant and mall frequencies that may help you locate mall security frequencies in your area: 151.625, 151.685, 154.6, 457.525, 457.6, 462.037,463.512, 464.5, 464.525, 464.975, 467.138, 468.512.

The Soviets Are Monitoring Ma Bell

Senator Pat Moynihan continues to strengthen his allegations that Russian agents are listening to America's telephone conversations. The senator points to strategically located buildings in the United Nations Mission, a compound in Glen Cove, Long Island, the Russian embassy in Washington, D.C., and a tower in the Bronx, New York. "All these buildings look like porcupines bristling with electronic equipment and radar dishes," said Senator Moynihan.

Bob Kay
104 Bonsal Avenue
Glenolden, PA 19036

"They can suck microwave telephone transmissions right out of the air!"

Perhaps the senator should subscribe to *Monitoring Times*. We've been voicing the same objections for the past three years!

If anyone would like to "reach out and touch" the Russian embassy, the number is (202) 328-3225. Don't forget to ask about the antennas on their roof.

Got a lead on the Russian embassy antennas? Send the material to *MT*. If there is enough content to support an article, we will edit the story and put your name in the byline. However, we won't be holding our breath in anticipation. The Soviets would rather listen than talk.

Meanwhile, the Russians were prohibited from participating in a multi-national ocean drilling endeavor involving the United States, France, West Germany, Canada, Japan and the United Kingdom. A government spokesman would only say that the technology aboard the U.S. drilling ship, "JOIDES Resolution" was too sensitive to allow Soviet crew members on board.

The *W5YI Report* says that the Personal Communications Section of the Electronic Industries Association has petitioned the FCC *not* to institute proposed changes to the 46/49 MHz cordless telephone channelization scheme. The EIA says that removal of center frequency standards, while fostering spectrum efficiency and development of narrowband products, would have the undesirable effect of increasing interference and possible malfunction of existing cordless telephones.

Taking Pictures for MT

Monitoring Times prefers that you send good quality black and white photographs or color slides. If you have problems taking snap shots for possible acceptance by *MT*, Eastman Kodak has a toll free number staffed by 45 experts that are willing to provide answers to any questions concerning photography. Kodak's toll free number is 1-800-242-2424. Hours are from 8AM to 9PM, Monday through Friday. That's a round-about way of asking for pictures of your shack!

-- Bob Kay

FREQUENCY LIST

Tri-State Area listings for West Virginia, Virginia, and Maryland. *Submitted by Bob Bailely, Charlestown, West Virginia.*

West Virginia

37.28	Charlestown Police
42.10	State Police
42.28	State Police
42.26	State Police
47.28	Department of Transportation
153.280	Rescue
460.2	Bee Mountain Repeater, State Police (out)
465.2	Bee Mountain Repeater, State Police (in)

Maryland

39.02	Sheriff, Fredrick County
39.24	State Police
39.40	State Police
47.30	Department of Transportation
47.50	Civil Defense
151.460	Washington and Fredrick County Forest Rangers
152.540	Fredrick County Telephone
168.425	Harper's Ferry Police
453.050	State Highway Commission

Virginia

State Police Statewide by Division

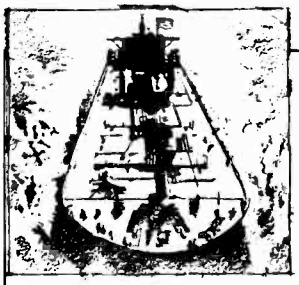
154.905	154.695	Tac 1	Statewide
154.935	154.665	Tac 2	Statewide
155.445			
158.985			
159.135			
159.165			

Western Pennsylvania listings

submitted by Ron White, Eagleville, PA

45.38	Gettysburg Police
155.235	Medivac Service-Pittsburgh
155.955	Harrisburg City Vehicles
453.1	Dispatch, Pittsburgh Police
453.250	"
453.675	Harrisburg Transit Buses
453.850	Phone Patch, Harrisburg

Utility World



Monitoring the Iranian Navy

How often during the last few months have you heard this item leading the evening news? "Iranian Navy gunboats attack another oil tanker in the Persian Gulf?" Listening to the Iranian Navy could be very exciting.

A friend recently returning from the Gulf says that the Iranian Navy is using frequencies in the 4 MHz marine band to communicate amongst their naval units and gulf shipping. One frequency to check in the late afternoon and evening hours in North America is 4143.6 kHz. This channel is one of several international coast/ship simplex frequencies the Iranians have been heard on, hailing ships to determine their nationality and destinations.

Other frequencies to watch for in the 4 MHz band include: 4125 and 4419.4 kHz.

Coastal/ship simplex and international calling channels offer the utility listener the chance to monitor a large number of ship and coastal stations. In the United States the FCC has allocated these frequencies for use by limited coastal stations. The limited coastal stations are somewhat analogous to the long distance operational control (LDOC) stations found in the HF aircraft bands. These company channels are used by fish canneries, pilot organizations, oceanographic institutes, oil drilling rigs, steamship companies and towing companies to name a few - for communication with their own vessels.

These frequencies are used on a shared basis, worldwide. They sound like a giant party-line or CB channel in busier periods. These stations all use upper sideband. Table 1 lists all the international calling channels and Table 2 lists all the coast/ship simplex frequencies.

Table 1
International Calling Channels

Shore/Ship Freq.	Channel Number
4419.4/4125.0	421
6521.9/6215.5	606
8780.9/8257.0	821
13162.8/12392.0	1221
17294.9/16527.0	1621
22658.0/22062.0	2221
2182 and 500 kHz	

Table 2
Coast/ship simplex channels

4125.0*	4136.3	4139.4	4139.5	4143.6*	4419.4*	6210.4
6213.5	6218.6*	6221.6*	6518.8*	6521.9*	8281.2	8284.4
8291.1*	8294.2*	12421.0	12424.5	12428.0	12429.2*	
12432.3*	12435.4*	16565.0	16568.5	16572.0	16587.1*	
16590.2*	16593.3*	22094.5	22098.0	22101.5	22105.0*	
22108.5	22124.0*	22127.1*	22130.2*	22133.3	22136.4*	

Asterisk indicates most active channels

El Representante de la Fuerza Aérea de los Estados Unidos de América

4 October 1984

TO: Larry Van Horn, USN

FROM: Major Wright, USAF

Dear Larry,

This letter is forwarded to you for verification that your reception of our radio station ZPM 261 on 9/25/84 was accurate.

We in fact logged a phone patch at 2044Z to AHF4 at Howard AFB, PN.

I enjoyed hearing from you. Good luck in your future contacts by shortwave.

Sincerely,

KERMIT M. WRIGHT
MAJ, USAF
AF Representative

Verification from US MAG station ZPM281 in Asuncion, Paraguay

Navy News

Californian David Kammler advises those that want to keep up with US Navy aircraft in the Atlantic to monitor 8972 kHz. This navy channel is a 'safety of flight' frequency for aircraft equipped with HF. The area of coverage extends from Iceland to the Caribbean. Letter/number tactical callsigns are used.

Another easily identified set of Navy channels are the HF HICOM channels. Navy HICOM channels are used by fleet commanders and deployed units. HICOM is an acronym for Navy High Command Worldwide Voice Network. The Navy's HICOM master control station is under the command of the chief of naval operations. These channels can be recognized by units using letter/number callsigns and periodic broadcast of skyking messages on the frequency. Naval aircraft can also use HICOM channels and their callsigns will consist of the aircraft bureau number.

Two of the more common HICOM channels normally monitored are 6697 and 11267 kHz.

Latin American Utes

One of the areas of the world that is difficult for the utility listener to hear and verify is Latin America. Language is a definite barrier and the region suffers from a lack of utility stations. There is one exception to this rule. You may be surprised to learn that this exception is broadcast in English and belongs to the US Military Advisory Group (MAG).

These stations are very good verifiers by military standards and can be heard quite easily during daylight hours. Virtually every Latin country is represented by these MAG stations. The U.S. Air Force operates this upper sideband network to link military attaches located in American embassies.

Frequencies to check are: 3503, 7430, 10935, 13937, 13950, and 20885 kHz. The latter two frequencies are the best daytime channels. Most of the communications you will hear consist of phone patches with the net control station AHF4 at Howard AFB in Panama. You will also hear supply requests, military flight information, and other administrative messages

Larry Van Horn
160 Lester Drive
Orange Park, FL 32073

passed on these frequencies.

Reception reports should not give detailed information, but should consist of frequency, date, and time each station transmitted. You should also indicate other stations communicating in each time slot.

Stations identify with the last letter of the callsign and numerals. For instance, AHF4 identifies as 'Fox 4'. Table 3 lists currently known stations in the net and also addresses for those stations when known.

Table 3
U.S. Military Advisory Group Stations

LQU21	Buenos Aires, Argentina U.S. Military Group Argentina/US Embassy/Army Section/Buenos Aires, Argentina
VPL1D5	Belize City, Belize US Military Liaison Office, Belize City/Department of State Pouch Room/Washington D.C. 20520
CPP67	La Paz, Bolivia US Military Advisory Group/Radio Station CPP67/ c/o US Embassy. La Paz/APO Miami, FL 34032
AHF4	Howard AFB, Panama 1978 ISG/DONJN / Howard AFB, Panama / APO Miami, FL 34001
CEF5U1	Santiago, Chile Matao Natividad / USDAO-Santiago / APO Miami, FL 34033
5KO225	Bogota, Colombia USAF Liaison Officer / c/o American Embassy / APO Miami, FL 34038
ACB	Rio de Janeiro, IBrazil Embassy of the United States of America / Military Liaison Office-Rio Section / US Consulate - Rio de Janeiro / APO Miami FL 34030
TI2USA	San Jose, Costa Rica Radio Station TI2USA / US Office of Defense Cooperation / APO Miami, FL 34020
HIP491	Santo Domingo, Dominican Republic US MAG Attache / c/o US Embassy / APO Miami,FL 34041
HCUS1	Quito,Ecuador Department of the Army / USMLO Quito / APO Miami FL 34039
YSIHUKE	San Salvador, El Savador Department of the Army / USMILGP El Salvador / APO Miami, FL 34023
TDMG3	Guatemala City, Guatemala USMAG Attache / c/o US Embassy / APO Miami, FL 34024
ACH54	Port-au-Prince, Haiti USASS/SA, Port-au-Prince / Department of State / Washington D.C. 20520
HR1MM	Tegucigalpa, Honduras Mison Militar de Los Estados Unidos / Embajada Americans / Tegucigalpa
YN1AFM	Managua, Nicaragua USMAG Attache / c/o US Embassy / APO Miami, FL 34021
ZPM261	Asuncion, Paraguay Radio Operations Braaaaaanch / US Office of Defense Cooperation / APO Miami, FL 34036
OAE21	Lima, Peru USMAG /USDAO / US Embassy Lima / APO Miami, FL 34031
CXC20	Montevideo, Uruguay USMAG Attache / c/o US Embassy / APO Miami, FL 34035
YWA6	Caracas, Venezuela USMAG Attache / c/o US Embassy / APO Miami, FL 34037

There are several unknown callsigns and anyone having information on these are invited to send in your updates to the address listed in the column masthead. Those stations include: AHF1A, AHF1B, AHF5, TGHM1.

Japanese Verifications

Rod Pearson in Florida showed up recently with a beautiful utility verification from Nagasakir radio in Japan. The station's verification signer Taisuke Kawakami used pastels to color in a picture that appears on the letter. Taisuke also included a schedule for the station's four callsigns as follows:

JOS	500/483 kHz	24 hours	UTC	1/2.7 KW
JOS	4328.0	0200 - 1500		3
JOR	6457.5	0000 - 0800		5
JOS	6491.5	0000 - 1900		3
JOS	8437.0	24 hours		3
JOU	8463.0	0000 - 0800		10
JOR	8523.4	2300 - 1500		10
JOU	12673.5	0000 - 1300		15
JOR	13008.0	2300 - 1900		15
JDB	13063.0	0000 - 1400		15
JOS	13069.5	24 hours		3
JDB	16877.5	0000 - 1200		15
JOU	16883.0	0000 - 1100		15
JOS	16933.2	2300 - 1000		3
JOR	17093.6	0000 - 1300		15
JOS	22396.0	0000 - 1100		3
JOR	22409.0	2300 - 1100		15
JOU	22440.0	0000 - 1100		15

Nagasakir radio provides telegram service for ships and transmissions are in Morse code. Reception reports can be addressed to: Coastal Station Nagasakir Radio, 14-1 Hinode-cho Isahaya-city, Nagasaki-pref. 854, Japan.

African Aero Channel

Charles McVey says that 11300 kHz is one of the more active African aero channels on the east coast. Utility listeners can hear a wide variety of stations and aircraft by monitoring the channel.

Some of the more common stations heard include: Addis Ababa, Ethiopia; Aden, PDR Yemen; Benghazi, Libya; Bombay, India; Bujum Bura, Burundi; Cairo, Egypt; Dar Es Salaam, Tanzania; Djibouti; Hargeisa, Somalia; Jeddah,Saudi Arabia; Khartoum, Sudan; Mogadishu, Somalia; Nairobi, Kenya; Male, Seychelles; Riyan, PDR Yeman; Sana, A.R. Yemen; and Tripoli, Libya.

Charles reports that monitors on the east coast could have up to two shots a day for the above listed stations on 11300 kHz. He says that late afternoon and early evening the frequency is quite active until the stations move down to 5658 kHz due to propagation. He also mentions that some mornings after local sunrise you might be able to hear stations listed above via long path propagation.

Not a bad way to pick up 15 African countries by monitoring one frequency.

Verifying and Return Postage

Most utility listeners readily admit that monitoring utility stations is the ultimate challenge. Just hearing a station that is transmitting for a limited audience (non-broadcast) is challenge enough. There are no published schedules or *Passport to World Band Radio* books to guide you. It's basically catch as catch can.

Then if you want to verify the station you must find an

address and write a report that will not violate any communications acts regarding communication privacy and added to all that, is an absolutely horrible international postal situation overseas and those verification cards and letters take on a new meaning when you finally get one.

Monitoring Times' and my own Gayle Van Horn offers the following postal tips for those of you who collect overseas verifications from utility stations. Gayle says, "You might want to use a self-addressed stamped envelope." This will save the person at the other end some time in preparing a reply and might help encourage the staff to verify. No utility station is under any obligation to reply to reception reports.

Where do you get the foreign mint stamp to use on the SASE?

Gayle says there are two dealers in foreign stamps that cater to the radio listeners via mail order. Both offer excellent service and will send you free a price list for an SASE. George Robertson has been operating the DX Stamp Service for a number of years. He can be reached at 7661 Rodger Parkway, Ontario, NY 14519. Bill Plum operates Airmail Postage and provides 24 hour service. The mint stamps that Bill sends will represent the airmail rate to North America. His address is 12 Glenn Road; Flemington, NJ 08822. Minimum order from Bill is $3.00; George has no minimum order.

"I have heard from a number of people overseas that the international reply coupon (IRC) system is breaking down and many overseas post offices will not accept IRCs," said Gayle. "The clerks do not understand them (IRC) or the particular government has decided, officially or unofficially, not to accept them."

You're Invited

Yes, we would like to invite you to participate in *Monitoring Times'* Utility World. The spectrum this column covers is from 2-30 MHz. Anything goes except for amateur radio and international broadcast stations. Your frequency list, callsigns, questions and background notes on utility stations is always welcome. Please, if you do desire a personal reply, enclose an SASE and allow for some delay as your editor does get very busy from time to time.

Loggings are also welcome. You must send with your logging, time and date (UTC), frequency (kHz), callsigns noted, transmission mode, and some background of what you heard. This is especially important if you are listing the logging as unknown. Now on with this month's loggings from the utility world.

-- Lary Van Horn

Utility Loggings

All times UTC, frequencies in kilohertz

2450.0 WOO-Ocean Gate Radio, NJ Coastal radiotelephone station working the ship Michelle, Phone Patch traffic through high seas operator at 0345. Mode was upper sideband. (Andrew Bradshaw, Illinois)

2598.0 VCS-Halifax, NS Canadian Coast Guard Station in upper sideband at 2341 with a notice to shipping broadcast. Announced broadcast on 2182 kHz first. (Rod Pearson, Florida) (Common Canadian Coast Guard Channel-ed.)

2670.0 NMK-Cape May, NJ US Coast Guard Station at 2311 in upper sideband. Station transmitted on 2182.0 to notify mariners of the weather and notice to mariners broadcast on this frequency. Operator said next broadcast from NMK would be at 15il. (Rod Pearson, Florida) (Common US Coast Guard broadcast channel; you can work quite a few stations in a short period of time - ed.)

2800.0 4XZ-Haifa, Israel, Israeli Navy Station with Morse code 'V' marker at 0450.

2830.0 Numerous ships communicationg in upper sideband on this intership simplex channel for the Gulf of Mexico around 0200. (Rod Pearson, Florida)

2887.0 Several aircraft noted working San Juan Aeroradio around 0356 in upper sideband. (Charles McVey, Virginia) (This channel is a Caribbean air traffic control channel -ed.)

2899.0 New York Aeroradio in upper sideband working numerous transatlantic aircraft. Frequent position reports and selcall checks around 0400. (Charles McVey, Virginia) (This Channel is stretches from the west coast of Europe and the British Isles to New York. Usually a very busy corridor during the late afternoon and early evening hours-ed.)

2962.0 New York Aeroradio at 0410 in upper sideband working different aircraft. (Charles McVey, Virginia) (This frequency covers basically from Ireland to Iceland and down to Newfoundland. It would appear that this channel is used for overflow from 2899.0 and for aircraft destined for Gander, a major trans-atlantic refueling stop-ed.)

2971.0 New York Aeroradio at 0420 working different aircraft in upper sideband (Charles McVey, Virginia) (This aero channel covers aircraft coming over polar routes and encompasses the northern Canadian land mass eastward to Greenland and northern areas of Europe-ed.)

3016.0 Continental 30 working Gander aero, NF at 0406 pilot giving position report in upper sideband. (Charles McVey, Virginia) Lufthansa 463 working New York aero at 0407 requesting a selcall check. (Charles McVey, Virginia)

3060.0 A couple of men talking in Spanish, unknown location. All transmissions in upper sideband around 0445. (Bill Crawford, Texas) (This has been a Spanish numbers station frequency in the past, might be worth a check by someone fluent in Spaniah-ed.)

3130.0 Navy Facsfac Jacksonville Night Primary Channel, several Navy tactical callsigns monitored around 0100, ships part of Caribbean exercise. All communications in upper sideband.

3287.0 CKN-Vancouver, BC Canadian Forces station in Morse Code with 'CQ' marker at 0425.

3366.0 Noted several phone patches between ships of the Norwegian Caribbean cruise lines in upper sideband over a one hour period around 0513. Calls appeared to come from ships crew members. The radio operators communicated in Norwegian to set up phone patches. This could possibly be a company voice channel. No shore stations noted.

3367.4 Federal Emergency Management station WGY-912 in Mt. Weather, VA at 0542 using encrypted Morse code to send messages.

4003.0 Fourth call area Army Mars Net at 1315 in lower sideband. (Rod Pearson, Florida)

4025.0 Sixth call area Army Mars Net at 1325 in upper sideband. (Rod Pearson, Florida)

4037.0 Navy Tactical net, stations K3G/020 working each other in the clear on upper sideband at 1326. Both stations then went to scrambled voice after establishing communications. (Rod Pearson, Florida)

4038.5 Navy Mars training net in upper sideband. NNN0YUL and NNN0OEE discussing message address procedures at 1327. (Rod Pearson, Florida)

4274.0 KFS-San Francisco Radio, CA Coastal station at 1338 in Morse code with 'CQ' marker.

4294.0 WNU31-Slidell Radio, LA Coastal with a Morse code 'DE' marker at 1340.

4352.0 WLO-Mobile Radio, AL Coastal Stations transmitting in Morse code with callsign only given at 1348.

4354.0 KLC-Galveston Radio, TX at 1350 with a Morse code with a 'CQ' marker.

4356.5 WCC-Chatham Raadio, MA Coastal with a Morse code marker 'DE' at 1352.

4585.0 North Carolina Civil Air Patrol units (Red Dog) in new session at 1355. (Rod Pearson, Florida)

4956.5 Department of State station KKN-39 in Morse code with a 'QRA' marker at 1402.

6351.5 WMH-Baltimore Radio, MD Marine Coastal station at 1431 with a 'V' Morse code marker.

6491.5 VCS-Halifax, NS Canadian Coast Guard station with a 'V/CQ' Morse code marker at 1437.

6604.0 North America Volmet channel, New York and Gander radio at 1442 in upper sideband with current weather conditions and forecast for selected cities. (Charles McVey, Virginia)

7335.0 CHU-Ottawa, Canada time and frequency station of Canada here at 1449 with time ticks, English and French language time announcements. (Rod Pearson, Florida)

Utility Loggings

7525.0 Victor 28 working an unknown station discussing ordering an engine. Believe the other station was at Jupiter Inlet, FL. Transmissions in upper sideband at 1610. (Rod Pearson, Florida) (This is a NASA channel, probably a couple of NASA units around Cape-ed.)

8051.5 WOO-Ocean Gate radio, NJ monitored here with their new high seas teleprinter data information service. Heard around 1456 mostly with FEC modes. WOO is requesting reports on this new service from monitors and will verify with a verification card. Send them to: AT&T Bell Labs, Room 1G623, Crawford's Corner Rd., Holmdel, NJ 07333

8080.0 NAM-Norfolk, Va. Naval radio in the facsimile mode with a complete schedule of daily transmissions at 0000.

8090.5 NAM-Norfolk, Va. Naval radio station with a 'V/CQ' Morse code marker at 1458.

8124.0 Monitored a Morse code transmission at 1533, noted the following: left parenthesis Lad QRA de R4U then into cipher letter blocks. Transmission lasted about 10 minutes then off the air. WHO??

8437.0 7TF-?? A lot of talk about this one recently. Monitored on 7TA6's frequency at 2312 with a 'CQ' Morse code marker. I believe this one is still the EL DJAZA' Radio, Algeria Coastal station with a call letter change. Appears about the right time and with the same apparent signal strength I have heard 7TA6 with before. No trace of 7TA6 either 7TA6 either. 7TA6 also used a 'CQ' marker.

8449.3 8PO-Bridgetown Radio, Barbadoes in at 2318 with a Morse cade ~DE' marker.

8453.0 HWN-Paris, French naval radio station with the typical French Naval 'V' Morse code marker at 2319.

8462.0 SVT-Alhens radio, Greece on a new frequency at 2329 with a Morse code 'DE' Marker.

8470.0 ZRH-Capetown, South Africa Naval radio at 2335 with a 'DE' Morse code marker. This is a new frequency.

8471.7 ZRQ2-Capetown, South Africa Naval Radio with a 'V' marker in Morse code at 2337 on another new frequency

8473.5 A7D-Doha Radio, Qatar on their new frequency. Appears as though these moves were made to cut down interference. Noted at 2341 in Morse code with a 'DE' marker.

8483.0 DAN-Norddeich Radio, West Germany at 2345 with a Morse code 'CQ' marker.

8484.5 HZG-Damman Radio, Saudi Arabia Coastal with a 'DE' Morse code marker at 2347.

8497.0 HLJ-Seoul Radio, South Korea in weekly at 2355 with a morse code ~CQ' marker. Nice long path surprises on this frequency at this time.

8498.0 SAG Goeteborg Radio, Sweden in with a lot of flutter in Morse code with a 'CQ' marker at 2357.

8514.0 GKC-Portishead Radio, England in the clear, very strong at 0002 with a Morse code 'DE' marker.

8562.0 PCH40-Scheveningen Radio, Holland at 0021 with a 'DE' Morse code marker. Station signal very weak.

8565.0 D3E51-Luanda Radio, Angola with a Morse code 'CQ' marker at 0022.

8566.0 ZSJ4-Silvermine, South Africa running slightly better than another unidentified Morse code station on frequency. Noted at 0024 with a 'CQ' marker.

8611.5 TAH-Istanbul Radio, Turkey in weakly at 0041 with a 'CQ' Morse code marker.

8700.0 YUR3-Rijeka Radio, Yugoslavia at 0108 with a Morse code 'V' marker.

8737.5 Radio Nicosia, Cyprus transmitting an upper sideband signal around 0250. Noted an English/Greek voice marker giving the station ID. Strong signal, New station. (Andrew Bradshaw, Illinois) (Nice catch Andrew-ed.)

8894.0 Zimbabwe 121 (aircraft) calling Algiers aeroradio for a position report at 2147 in upper sideband. (Charles McVey, Virginia) (This is an aero channel for North Central Africa designated AF2-ed.)

9090.0 IDR4-Rome, Italian Naval Radio station with a Morse code 'V' marker at 0120.

9124.0 Oscar 2 Hotel (O2H) working Lima 6 Tango (L6T) at 2019 in upper sideband passing information on a text message. (Andrew Bradshaw, Illinois) (Navy channel-ed.)

10004.0 RID-Irkutsk, Soviet Union time and frequency station noted at 0132 with time pips and Morse code ID.

10880.0 5LA10-USIA (VOA) Monrovia, Liberia broadcasting 'African File' English teletype news. Noted 425 Hz shift/100 WPM/reverse sense at 0135.

11243.0 SAC ALFA, part of the Giant Talk network. Tactical callsigns and skyking (Go-no go codes for bombers) transmitted at 2200 in upper sideband. (Andrew Bradshaw, Illinois)

11267.0 Navy Hicom channel, letter/number tactical callsigns noted at 0700 and K6F transmitted an op immediate message. All communications in upper sideband. (Andrew Bradshaw, Illinois)

11300.0 CSA99 (aircraft) working Aden, D.R. Yemen aero at 1330 in upper sideband. (Charles McVey, Illinois) (This is an excellent channel to work a lot of African aero stations on, Charles. It is also very good in the late afternoon and early evening-ed.)

11306.0 Eastern Airlines 902/796 working Lima, Peru aero in upper sideband at 1330. Aircraft giving position reports to Lima. (Charles McVey, Virginia) (Nice channel to work some English speaking Spanish stations. English is a universal language on aero channels for most of the world-ed.)

10780.0 MAC 60135 (AF aircraft) working Cape Radio (Cape Canaveral) in upper sideband at 1624. 60135 ran a phone patch through to Cape Weather requesting weather for Palmarola, Honduras. (Rod Pearson,Florida)
(This is the eastern test range primary daytime channel-ed.)

12022.5 KKN50-Washington D.C. Department of State Radio (Transmitter site at Warenington, VA at 1652 in Morse code with a 'Qra' marker.

12699.0 HPP-Panama Radio Coastal station with a Morse code 'V/CQ' marker at 1706.

12700.0 NMR-San Juan, Puerto Rico. US Coast Guard Radio staation transmitting in Morse code 'V' marker at 1707.

12702.0 Y5M-Rugen radio, East Germany at 1712 with a 'V' marker in Morse code.

12726.0 CFH-Halifax, Nova Scotia transmitting in Morse code with a 'V' marker at 1716. CFH is a Canadian Forces radio station.

12730.5 NMC-San Francisco CA Coast Guard Radio station transmitting a facsimile test chart at 1718.

12824.0 GYU-Gibraltar, Royal Navy Radio station transmitting a Morse code 'DE' marker at 1724.

12830.1 XFM-Manzanillo Radio, Mixico Coastal station at 1727 with a 'CQ' Morse code marker.

12853.5 HKC-Buenaventura Radio, Colombia with an excessive chirpy Morse code signal at 1730. Hard to miss their chirpy 'CQ' marker.
PCH52-Scheveningen Radio, Holland noted under HKC, very weak with a Morse code 'DE' marker.

13950.0 Unidentified station whistling on the US Military Advisory Group channel at 1701. This was during the weekend when government employees are normally off. Just a case of while the cat is away the mouse is playing (or whistling). (Larry Miller, Pennsylvania)

14441.5 NNN0XEN working another unidentified Navy Mars station at 2110 using upper sideband. (Rod Pearson, Florida)

14470.0 NNN0WHT working NNN0CMG to set up a phone patch at 2026 in upper sideband. NNN0CMG is the USS Flatley (FFG-21). (Rod Pearson, Florida)

14526.0 Greenville, NC VOA feeder station at 2114. Mode was independent sideband, just switch the mode from upper to lower and you had a different VOA program.

14564.0 CTA-Nicosia, Cyprus in at 1445 with a voice marker giving IDs in Greek. Mode was upper sideband. (Andrew Bradshaw, Illinois)

14760.0 Navy Mars stations NNN0NRI/NNN0ADF/NNN0VRO asking for check-ins from region 3. Teletype traffic net in upper sideband at 1515. Net control NNN0ADF mention 12127.5 as an alternate channel.

14818.0 Y7A60-MFA Berlin, East Germany with a Morse code 'V' marker at 1500 then into message traffic.

15034.95 CHR-Trenton, Ontario Military Weather Volmet heard in upper sideband at2130 giving current condidtions and landing forecast for Trenton, Ottawa, Toronto Intl., Quebec City, Bagotville, and North Bay.

15920.0 CFH-Halifax, NS Canadian Forces iRadio station with Morse code message traffic at 2136.

16180.0 NAM-Norfolk, Va Naval Radio broadcasting a Morse code 'V' marker at 2139.

16914.0 CBV-Valparaiso Radio, Chile on a new 16 MHZ Marine frequency with a Morse code 'CQ' marker at 2148.

16918.0 PPJ-Juncao Radio, Brazil with a Morse code 'V' marker at 2151.

16956.0 TIM-Limon Radio, Costa Rica transmitting on a new frequency at 2154 with a Morse code 'CQ' marker.

16961.5 FUF-Fort de France, Martinique French Naval Radio with the usual 'V' marker at 2156 in Morse code.

17003.7 HKB-Barranquilla Radio, Colombia has shifted their frequency down 300 kHz. Heard at 2159 with a Morse code 'CQ' marker.

17044.8 HKC-Buenaventura Radio, Colombia has also shifted their chirpy Morse code signal 300 kHz down. Noted at 2202 with a 'CQ' marker.

17149.6 TIM-Limon Radio, Costa Rica has moved up 600 kHz as monitor at 2210 with a Morse code 'CQ' marker.

17413.5 KKN39-Department of State Radio noted here with a Morse code 'QRA' marker at 2217.

17547.5 HDN-Quito, Ecuador Naval Radio with a teletype transmission at 2230. Noted 850 HZ shift/100 WPM speed/normal sense.

18093.0 LRO84-Buenos Aires, Argentina transmitting a facsimile signal at 2240. The station was transmitting a weather chart for South America.

18137.5 Dixon, CA VOA feeder at 2227 in independent sideband. Noted two foreign language broadcasts on each sideband.

22352.5 PPR-Rio de Janeiro, Brazil with a Morse code 'V' marker at 2246. Was quite strong but the only signal on the 22 MHZ Marine band.

22588.0 WLO-Mobile Radio, AL Coastal station heard at 2330 with a Morse code 'DE' marker.

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Antenna Basics

Basic wire antenna design is a topic radio enthusiasts should know. Although there are now many commercially available antennas for all radio enthusiasts, wire antennas are relatively easy to build (the hard part is erecting them, and even if you buy a commercially made antenna, you will have to erect it!), and provide an opportunity for experimentation that is enjoyable in and of itself. Even if you do decide to buy a commercially made product, a basic understanding of the various designs will guide you in an intelligent purchase.

In this column, we will cover the basic antenna designs, and each design's characteristics. The emphasis here will be primarily on antennas useful at SW, MW and LW frequencies, but the theory applies to all antennas. One caveat though, a detailed analysis of design and construction is beyond the scope of this column, and can be found in Clem Small's "Antenna Topics" column in *MT*.

Do You Really Need an Antenna?

First you need to decide whether an external antenna is appropriate for you, or if the internal loop, whip or other built in antenna is sufficient. Depending on your receiver, interest and location you may not need one.

If you are primarily interested in listening to "powerhouse" or local stations, you probably do not need an external antenna. Many modern portable radios are so sensitive that installing an external antenna will hurt reception rather than help unless you install an antennuator as described in this issue (Technical Topics by Terry Staudt).

Outdoor Antenna Designs

If you are like most listeners you will want to seek out more difficult signals or more reliably receive the "easy" stations. An outdoor antenna is the first step to improving the situation. This is true for at least two reasons. First of all, an outdoor antenna is away from all the locally generated noise inside your house. Electrical appliances from vacuum cleaner to your computer all generate radio noise, and the farther away from that noise your antenna is, the better.

Second, an external antenna is less likely to be shielded from the signal you are trying to hear. Many modern buildings are made with metal superstructures, and act as a dandy shield for radio energy. Putting an antenna inside a modern apartment complex structure is a little like hiding the proverbial candle under a basket.

If you decide that an outdoor antenna is desirable for you based on the above criteria, the next decision you must make is what type of antenna you should erect. The rest of this article will look at the various types of outdoor antennas, and a future column will look at indoor and attic designs for those of you who have space or other limitations on outdoor "skyhooks."

Dipoles

The dipole is the standard by which all other antennas are judged, so, let's look at it first. The basic form of dipole is called the "half wave" dipole (see figure 1). The dipole consists of two conductors each one quarter wavelength long at the desired frequency. It is connected to the receiver through a two conductor cable called a feed line.

A dipole, if erected high enough and far enough away from obstructions (at least one wavelength) will show greatest sensitivity to signals arriving off its sides, and a lack of sensitivity to signals off the ends. In most practical situations though this directivity cannot be predicted with any degree of certainty and one dipole will show a marked improvement in signals arriving from a particular direction while another will be generally omni-directional. In any case, though, such an outside antenna will be a marked improvement over a built in whip or loop.

You can calculate the length of a half wave dipole by using the formula 468 divided by the frequency in MHz. This will give you the length of the full dipole in feet. For example a dipole cut for 9 MHz. will be 468 divided by 9 or 52 feet. To find the length of each leg of the dipole divide this length by 2 to arrive at 26 feet on each side of the feedpoint.

The dipole is basically a single band antenna, but it can be made to function on many bands by two methods. The first is to cut dipoles for as many bands as you wish and connect them together at the center feedpoint and insulate the ends from each other. This scheme is called paralleled dipoles and works very well.

The second scheme uses a single wire with

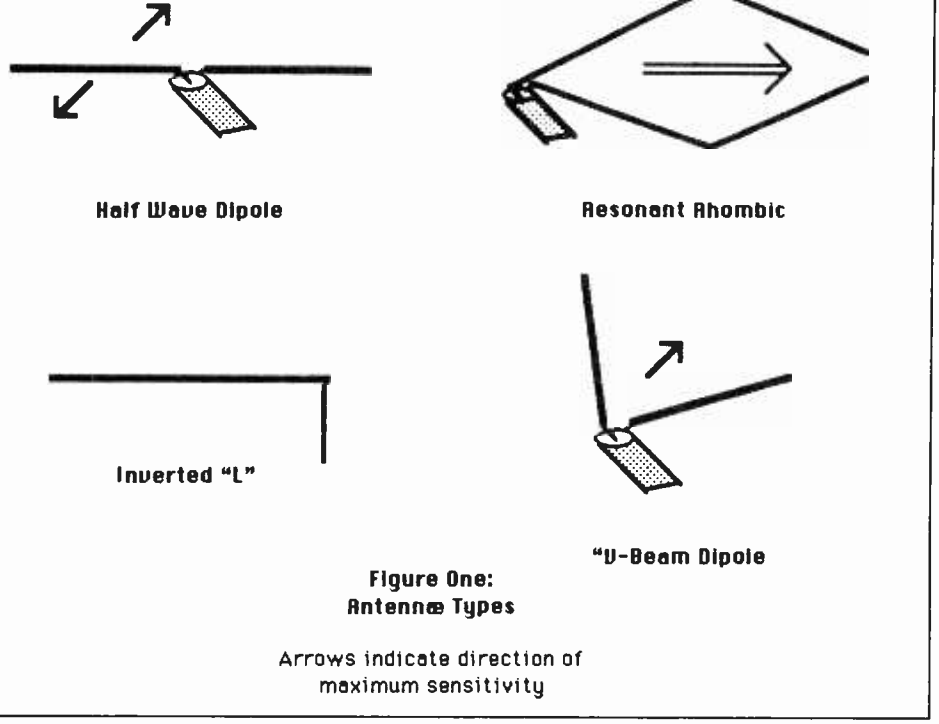

Figure One: Antennæ Types

Arrows indicate direction of maximum sensitivity

electrical traps located at strategic points along the length of the wire. These traps isolate each section of the antenna essentially turning the antenna into an effective multiband antenna. More information on both schemes can be found in the ARRL *Antenna Handbook,* available from Imprime, Box 241-R, Radnor Station, Radnor, PA 19087.

Dipoles can also be drooped, which is to say their legs can be lowered toward the ground. The most important advantage to letting the ends of a dipole droop is that now only one high support is required instead of three. Try to keep the angle of the droop between 120 and 90 degrees; going beyond 90 degrees will cause deterioration of performance (generally). This drooping dipole is often called an inverted V, but this is incorrect as the inverted V is an entirely different antenna.

Marconi Antenna

The Marconi antenna is one half of a dipole -- often called a quarter wave antenna. The missing half is replaced by the earth or a counter poise wire. It is not as effective generally as the half wave dipole, but it is easier to erect than a full size antenna in many cases and on the average will work well. The Marconi can take the form of a horizontal, sloping or vertical radiator, in each case though a ground connection must be provided.

The formula to calculate the length of a Marconi antenna is 234 divided by the frequency in MHz. As you might suspect it is possible to use the same formula to calculate each leg of a half wave dipole.

Long Wire Antenna

Usually long wire antennas exhibit gain and directivity over a half wave or quarter wave antenna. An antenna becomes a long wire when its length is one or more wavelengths at the desired frequency. The long wire can be fed at the end, the center or off center as the design dictates.

Two outstanding long wire antennas much favored by radio enthusiasts with enough room are the VEE Beam and the Rhombic antenna. The VEE beam is made up of two long wires (of same length) and looks like a V when viewed from the bottom. This antenna is bi-directional and depending upon its length and the included angle of the V, exhibits very high gain over a half wave dipole.

The second famous long wire antenna is the Rhombic; basically two VEE beams placed end to end to form a rhomboid shape. The Rhombic is also bi-directional and exhibits extremely high gain. Both the VEE and the Rhombic can be made uni-directional but such a discussion is beyond the scope of this article. As you can imagine both of these antennas are very large and require a great deal of real estate to erect.

Loop Antenna

There are several basic types of loop antennas. The first is the one we are all familiar with inside of our AM radio. Modern AM loop antennas are wound on a core of iron ferrite and work extremely well. They are quite directional and rotating the radio will improve reception from the desired station.

These small loop antennas very critical to tune, and if the user intends to cover a wide range of frequencies some method of tuning the loop must be included in the design; moving too far from the design frequency will cause the loop to become extremely inefficient unless a method of varying the tuning is included.

A second popular loop antenna is the full wave loop. The full wave loop can take the form of a triangle, square, trapezoid or circle. Full wave loops are very tolerant and provide the user with several advantages. First of all loops are very quiet, so if you live in a location with a lot of electrical noise the loop is a good choice. Second the full wave loop provides about 2 decibels of gain over a dipole (at the design frequency) and is directive at right angles to the plane of the loop.

Third, if the loop is fed with 300 ohm TV line and coupled to the receiver through an antenna tuner it can be used on a wide range of frequencies. Usually loop antennas are hung in a vertical plane, but angles up to 45 degrees will not cause the performance to deteriorate.

Two excellent antenna reference manuals are the *ARRL Antenna Handbook* and *The Radio Handbook* by William Orr. Both books are available from most radio book dealers.

That concludes our overview of antenna types. We have just scratched the surface and what I have not said here could fill books (it has). As always if you have a specific question or suggestion for a topic feel free to drop me a line at the address above. If you want a reply be sure to include an SASE.

■

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Campaign Excitement:

There's more to it than TV

A major election year is upon us. At stake, the highest office in the most powerful nation on earth: the presidency of the United States of America. And while it's still far to early to predict a winner, we can promise lots of listening opportunities normally not available to most monitors.

The United States Secret Service (USSS), along with other federal, state and local public safety personnel, will provide unusual radio traffic during the remaining months of the year, especially when President Reagan or Vice President George Bush travel and campaign. The Secret Service will also provide security to the front runners of each party as well as those who may have received death threats or other serious forms of harassment during their campaigns.

More Chances to Tune in

What makes an election year so exciting for radio monitors is the fact that so many candidates are on the road. They'll typically will travel to virtually anywhere a voter may be found and this in turn bring radio signals *to you* that normally would be out of reach to the average monitor. USSS sends an advance team to each location where the candidates or dignitaries are to travel to verify security details and set-up radio communications. Advance teams for the president arrive at least a week in advance of the chief executive's arrival and usually several days before the vice-president.

Test communications begin as soon as the Secret Service advance team arrives. "Checks" of various forms can be monitored base-to-base, hand-held-to-base and so forth. Also the testing and verification of secure communication mode - D.E.S.

Table One
Tactical Callsigns

ANGEL	Air-Force One (Presidential Aircraft)
BAMBO	Presidential 'ferrying vehicle'
COW PUNCHER	Presidential Vehicle (even trains)
DOG POUND	Press Aircraft
EOD TEAM	Emergency Ordinance Disposal Team
FALCON	Presidential Tactical Air Cover Unit
HERCULES	Counter-Sniper Response Team
HUNTSMAN	Surveillance Helicopter
K9 TEAM	Working Dog Unit
MAJIC BASE	Helicopter Coordination Base
MAJIC X	Helicopter Unit
MARINE ONE	Presidential Helicopter w/President aboard
NIGHTHAWK	Helicopter
RAWHIDE	President Reagan
ROAD RUNNER	Communications Van
TIMBER WOLF	Vice-President Bush

Table Two
Frequency Assignments

ABLE	32.32	WHCA (White House Communications Agency) Vans
ALPHA	166.5125*	Security Details; V.I.P. Escorts
BAKER	165.7875*	Security Details; Helicopter Coordination; Field Offices
CHARLIE	165.375*	Primary Nationwide Repeater; Command Post; Field Offices
DELTA	169.925*	Security Details, Simulcast w/NOVEMBER at times
ECHO	407.850*	AF-1 Phone Patch Link (PPL)-Uplink from ground
FOX	415.700*	AF-1 PPL-Downlink from aircraft
GULF	166.400*	Input to CHARLIE
HOTEL	166.2125	V.I.P. Protection; Field Offices
INDIA	407.925	V.I.P. Special Protection
JULIET	170.000	Camp David Pagers
KILO	167.825	WHS (White House Staff)
LIMA	168.7875*	WHS-D.E.S.
MIKE	165.2125	PAPA Repeater; Field Offices
NOVEMBER	167.025*	WHCA; Wireless Microphones
OSCAR	164.8875*	WHCA; Motorcade; V.I.P. Protection, Some D.E.S.
PAPA	164.400	Input to MIKE, V.I.P. Protection; Counterfeit Operations
QUEBEC	166.700*	WHCA Staff Radios
ROMEO	166.400	Field Offices; Input to BAKER; Common Repeater Input
SIERRA	166.5125*	WHCA; Security Details; Alternate Command Post
TANGO	164.650*	Security Details; V.I.P. Protection,Alternate Command Post
UNIFORM	361.600	AF-1
VICTOR	164.100	V.I.P. Protection
WHISKEY	167.025*	WHCA Paging
X-RAY	166.4625	Treasury Common
YANKEE	162.6875*	AF-1 PPL Downlink
ZULU	171.2875*	AF-1 PPL Uplink
BLACK	415.675	White House Uniformed Division
BROWN	414.850	Foreign Missions Division, Repeater Output
ORANGE	414.950	White House Uniformed Division
RED	415.975	Foreign Missions Division
SILVER	415.650	Input to BROWN
VIOLET	415.875	Training
YELLOW	414.675	WHCA
46.75*		Helicopter Operations-Main (FM)
46.70, 46.80		Helicopter OPERATIONS-SECONDARY (FM)
407.825, 407.875		Low Power V.I.P. Protection (concealed radios)

Field Offices (Common Usages): 163.3625, 163.400, 164.750*, 164.800*, 165.0875*, 165.2375, 165.2875*, 165.675*, 165.6875, 165.8625*, 165.9125, 165.950, 166.4875, 168.200, 168.400 and 169.850*.

(Digital Encryption Standard, ala DVP-Motorola's trade name Digital Voice Protection) may be monitored.

The agents will state that they are switching to DS, or DES or digital then the next transmission may have beeps or tones preceding what sounds like static when a receiver squelch is opened. D.E.S. use appears to be quite prevalent when the president or dignitary arrives.

Agents in Action

The agents typically will ID with their last name as their call, or the name of the city if operating the base station. It is not uncommon to hear Agent Jones contacting Cleveland base. Tactical callsigns are also utilized quite frequently for various operations and those that have been personally confirmed by this editor are listed in Table One. The tactical callsigns are utilized for identities of individuals and for tactical type operations. 'Huntsman' is a tactical used by a helicopter based crew when flying over a presidential caravan providing security and traffic recommendations.

The tactical calls for individuals are carefully picked but with a wit about them that reflects something about the person being protected. President Reagan, given his California-Cowboy image, is called "Rawhide." And during his visit to the United States, the Pope was known as "Shepherd One." Members of the dignitaries family will also have tactical calls but theirs begin with the same first letter: Mrs. Reagan is Rainbow.

Many Frequencies in Use

The USSS utilizes a myriad of frequencies to perform their radio communications and many are assigned on a nationwide basis. Additionally, local offices may utilize their own discrete frequency in addition to the nationwide assignment list. Table two lists the nationwide frequency assignments for the USSS along with the common field office and operation frequencies. The frequencies followed by an asterisk have been confirmed.

Similarly, frequency usages are those that have been monitored - not just published in a directory. It should be noted that some frequencies have a strictly dedicated use like YANKEE-ZULU channels (AF-1, AF-2 Phone Patch Links) while others appear to have multiple uses like CHARLIE (Primary nationwide repeater, command post and field offices).

The USSS will also 'borrow' frequencies normally utilized by other federal agencies when in town on special details. For example, the Secret Service has been heard on 165.950, -- an IRS channel -- performing security perimeter sweeps during a presidential visit. The ATF primary channel of 165.2875 has also been utilized in similar capacities. On special occasions other federal agencies will lend assistance as was the case during President Reagan's 'Heartland Special' train trip in western Ohio in 1984.

The USSS also has the capabilities to communicate with state and local public safety personnel on LEERN (Law Enforcement Emergency Radio Network) or Intercity/Intersystem channels. These state and local channels should not be overlooked while monitoring during a presidential or vice-presidential visit.

When the V.I.P. aircraft 'wheels down' (meaning the V.I.P. aircraft has landed), the command post will announce the wheels down and notify all stations to maintain radio clear unless an emergency occurs.

Often the radio traffic is most interesting to monitor just prior to a visit within one or two days as this is when dry runs of motorcades and special events are held. Two scanners are almost essential to monitor most events as one scanner needs to guard the command post frequency while the other scanner scans other known frequencies or is used in the search mode to discover new frequencies.

The advent of a major election only occurs once every four years and the monitoring opportunities peak during this time for the USSS. Good Luck with your monitoring efforts and let us know of your success. Several readers contributed material utilized in this column who I wish to acknowledge and say thank you: John Carr, Eugene Krolak and those who wished to remain anonymous.

■

DOMESTIC BROADCASTING - *AM, FM, and TV DXING*

Paul Swearingen

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Don't touch that dial! At this time last year, trans-Atlantic (TA) AM reception continued hot through most of April, with some rare DX not heard in the winter sneaking through. Late-season TA DX tends to favor the area from Spain and the Mediterranean on South. Caribbean stations tend to peak during this period. My only reception in Kansas of a signal from Africa (on 1403; now Kipe, Guinea-1404) occurred in March.

Tropospheric enhancement for TV and FM DX'ers can become more common now once weather patterns start to create this phenomenon. You can usually attribute reception of over 200 miles to perhaps 400 miles to tropo.

Tuning in Your Appliances

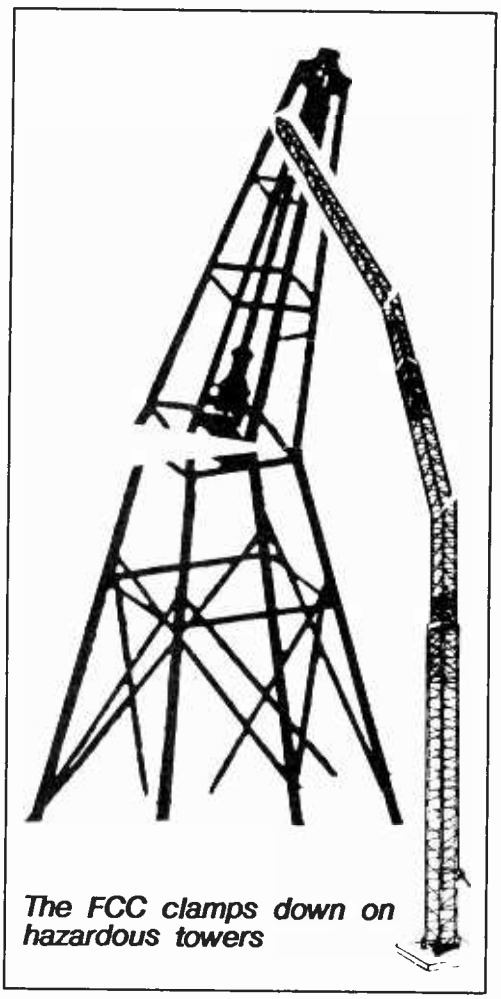
You can tune in almost every appliance in your house -- and sometimes those of your neighbors as well. Being DXERS, however, the idea is not amusing. It's called QRM or man made noise and it can make hearing those weak stations impossible. And sure, we're interested in identifying these signals, but it's not because we want to send out for a QSL card -- it's because we want to find them and eliminate them.

Here's a few of those unwanted byproducts of modern civilization and what they'll sound like on your radio: microwave ovens - a ragged, slightly pulsating hash; light dimmers - a steady 120 Hz buzz, sometimes peaking at various spots across the AM band; television - a buzzing, slightly raucous sound found every 15.75 kHz on the AM band; bug zappers - the zap caused by the arc is just like lightning static; wireless intercoms - a loud buzz every 200 kHz; baby monitors and cordless telephones - spurious voice signals; fluorescent lights - a buzz similar to a light dimmer, but continuous across the band; blenders and mixers - a whirring buzz; microprocessors in such items as timers, VCR's, furnace thermostats, telephone answering machines, security systems, even the receiver itself - various high frequency whizzing sounds.

Those are from CIDX's *Messenger.* We can all add a few of our own: electric shavers and vacuum cleaners, defective transformers in outside electric transmission lines and defective street lights. Even poor solder joints or intermnittent connections in two large pieces of metal which can cause two or more signals from powerful locals to mix and re-radiate from the connecting point. The result: a mixed signal at one frequency in your receiver. A frying sound can indicate a poor connection in a light (which should flicker), and if you can't immediately locate the source, you should notify your local electrical company immediately. It could be a potentially dangerous short hidden in your walls.

FM, of course, is immune to most QRM, although a defective automobile ignition system can cause a temporary problem as the offending car drives past your location. And don't let any pundit convince you that you can't hear static generated by lightning on an FM receiver. Tain't so, although the strikes generally have to be within a mile or so before they override the FM signal to produce QRM.

TV video, an AM signal, is prone to the same problems as the AM band, and the appearance of the QRM varies. Much is in the form of "sparklies" dancing across the screen and therefore hard to identify and track down. Of course, a "herringbone" pattern, caused by a secondary TV signal, is your cue to expect E-skip signals from a distant station, perhaps 1,500 or more miles away.



The FCC clamps down on hazardous towers

Take Action!

QRM can be more than annoying to you as a DX'er. It can also be a cue for you to take action. Some interference can be reduced or eliminated by replacement of defective or worn parts, or by the use of filters available from various electrical supply stores. For example, an AC line interference filter from Radio Shack (15-1111) can be used to subdue the noise generated by a touch on-off lamp.

Perhaps the ultimate warning through QRM occurs on your television set. Some years back, one researcher announced that you could use your television set to warn when a tornado was approaching. His method was simple: turn your TV set to Channel 2 and then turn the brightness down until the picture just goes dark. Then, when a tornado is bearing down on your QTH, the screen will light up. He didn't explain how the tornado caused the screen to light up, but it is a fact that the inside of a funnel is often full of continuous lightning bolts, almost in the manner of a Van de Graaff generator, which would certainly cause the TV screen to flicker. Unknown is how close the twister would have to be to cause enough useful QRM to give you a warning. We recommend, despite the obvious thrill of testing out new ideas, to rely on the National Weather Service.

Warning: Falling Tower!

The US Federal Communications Commission is warning radio stations that it is going to crack down on broadcast towers that do not meet the Commission's painting and lighting requirements. Saying that such towers were a "potential hazard to air navigation," it was announced that thirteen percent of the 289 towers recently sampled did not meet lighting requirements. Further, said the FCC, fewer than half of those stations notified the Federal Aviation Administration (FAA) as required by the FCC.

Capitol Magnetics to Close

Broadcasters who purchase Audiopak broadcast tape cartridges, used to record and play back multiple-replay items like commercials, station IDs and even music in

some cases, will have to look elsewhere for the product. Capitol Industries, manufacturer of the line, has announced that it will shut down its magnetic tape division. At least two other firms, one of them the competing Fidelipac, has confirmed interest in buying the rights and certain manufacturing assets and keeping the Audiopak line in production.

In other action, the FCC returned, with no action, a letter from Kahn Communications President Leonard Kahn, which claimed that competing Motorola was conspiring to keep multisystem stereo AM radios out of the marketplace. In a letter to the Commission, Kahn accused Motorola of illegally "frustrating the growth of AM stereo."

In order to substantiate his claim, Kahn produced an exchange of letters between Sony and Motorola. In one, Motorola informed Sony that it held the patent to independent sideband AM stereo decoders, which Sony was planning to use in multisystem radios. Motorola reportedly told Sony that it was "unwilling to license" those patents and told the Japanese radio giant to "cease selling AM stereo receivers in the United States that use these patents."

Motorola's response to the decision was a short statement denying Kahn's charges and saying that "further comments are unnecessary." That according to *Radio World.*

New Stations Signing On

Lets take a look at new stations granted construction permits by the FCC. For television (thanks to WTFDA's Bill Fahber) in the near future you can expect 46-Green Valley, AZ; 68-Novata, CA; 59-Jacksonville, FL; 35-Miami, FL; 64-Macon, GA; 63-Monroe, GA; 44-Salina, KS; 57-Madisonville, KY; 17-Missoula, MT; 11-Reno, NV; 63-Newton, NJ; 43-Syracuse, NY; 9-Guymon, OK; 68-Humacao, PR; 36-Sioux Falls, SD; 54-Jellico, TN; 52-Blanco, TX; 60-San Antonio, TX; 60 Tyler, TX; and 2-Jackson, WY. Locally, 38-Lawrence, KS will broadcast the Home Shopping Network's #2 program.

A few higher-powered FM's (thanks to WTFDA's Dr. Bruce Elving) include 93.9-Paris, TX (50 kw); and 89.7-Manitouwadge, ON (46.4 kw).

More AMs Coming On

AM'ers keep on coming on, in spite of alleged reduced revenues. Thanks to NRC's Jerry Starr, here are FCC grants: 670-Syracuse, NY (2.5 kw day); 830-Lithia Springs, GA (50 kw day/1kw night); 880 Fairview, NC (1.1/); 890-Pendleton, SC (25/5); 1090-Oakhurst, CA (.5/); 1120-Florence, SC (1/); 1120-Rocky Mount, NC (2/); 1160-East Point, Ga (10/.4); 1180-Quakertown, Pa (.3/); 1400-Roxbury, NH (1/1); 1430-Grand Junction, BO (5/); and 1520Cypress, TX (.5/). Note that most of these are for daytimers on the once-clear channels. ■

Let me remind you to play it safe with your antennas, especially longwires: remember to unhook them from your receiver after you finish each DX session, even though the weather forecast may call for no thunderstorm; the trouble it takes to hook and unhook it is nothing compared to the expense of replacing a fried receiver after an unexpected high-voltage visitor.

James R. Hay

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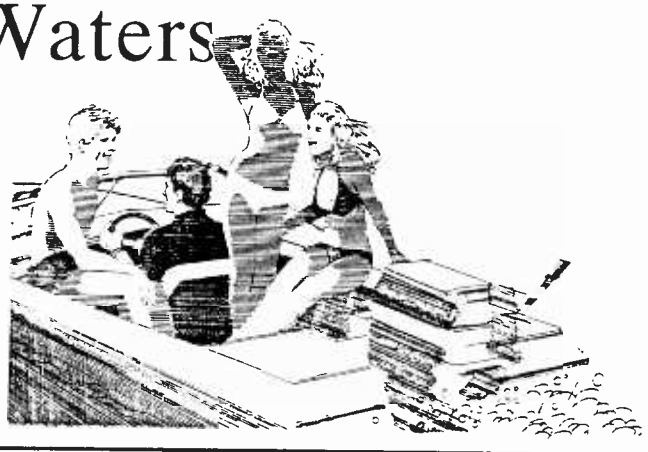
VHF and the Open Waters



North Americans love the water. And a growing number of them love to be *on* the water -- in speedboats, yacths, even rowboats and kayaks. Most of them are radio equipped. Along with this love affair with pleasure boats is an increase in local shipping activity.

In order to simplify all of the resulting traffic on the airwaves, the International Telecommunications Union assigned channel numbers and purpose to each frequency or pair of frequencies in use in order to increase efficiency on what are often very crowded radio channels.

Originally, there were only 28 channels allocated on the VHF Maritime Mobile Band. However, as the band became more popular and the channels became progressively more overcrowded, another 28 channels were added, numbered 60 to 88 and these were interspaced between the existing channels.

This interspacing became possible when the FM bandwidth standard was changed from 25 kHz which then allowed the addition of the new channels without fear of interference. Note that a guard band was left around Channel 16 to minimize the chances of any interference.

Table One is the general band plan as followed in the United States, with the appropriate uses. In the table, public correspondence refers to the public telephone and messaging service provided by the marine operators and wireless telegraphy companies.

Channel 6 (156.300 MHz) is set aside for intership communications relating to safety, and ship to ship or ship to shore coordination of search and rescue. Channel 13 (156.650 MHz) is used at facilities operated by the United States Army Corps of Engineers, and is also required to be carried on commercial vessels for bridge to bridge communications between vessels.

With the public demanding better access to weather information, the National Weather Service began operating stations which broadcast continuous weather information and which use the following channels: WX1 162.550; WX2 162.400; WX3 162.475

In Canada the same general band plan is followed, however, there are exceptions which are indicated in Table Two.

Ship movement refers to the various vessel traffic control systems which are in effect in various areas of Canada, and Channel 70 (156.525 MHz) has recently been changed from pleasure craft to prepare for the coming of digital selective calling equipment to the world of maritime radio. Pilotage refers to communications between pilot boats, the vessels to which they are taking pilots, and the pilot station.

When the letter 'A' is used in conjunction with a channel number, it refers to the lower frequency of a duplex channel being used for simplex operation. The letter 'B' refers to the higher frequency of a duplex frequency being used for broadcasts to vessels.

In addition to the three weather channels being used by Weatheradio Canada, the Canadian Coast Guard operates a continuous marine broadcast which provides weather information,

Table One

Ch	Frequency (MHz) Ship	Shore	Allocation
5	156.250	156.250	Port Operations
6	156.350	156.350	Safety
7	156.350	156.350	Commercial
8	156.400	156.400	Commercial
9	156.450	156.450	Commercial & non-commercial
10	156.500	156.500	Commercial
11	156.550	156.550	Commercial
12	156.600	156.600	Port Operations
13	156.650	156.650	Navigational
14	156.700	156.700	Port Operations
15		156.750	EPIRB's
16	156.800	156.800	Distress, safety and calling
17	156.850	156.850	State control
18	156.900	156.900	Commercial
19	156.950	156.950	Commercial
20	157.000	161.600	Port Operations
21	157.050	157.050	US Coast Guard Only
22	157.100	157.100	US Coast Guard Liaison
23	157.150	157.150	US Coast Guard Only
24	157.200	161.800	Public Correspondence
25	157.250	161.850	Public Correspondence
26	157.300	161.900	Public Correspondence
27	157.350	161.950	Public Correspondence
28	157.400	162.000	Public Correspondence
65	156.275	156.275	Port Operations
66	156.325	156.325	Port Operations
67	156.375	156.375	Commercial
68	156.425	156.425	Non-commercial
69	156.475		Non-commercial
70	156.525	156.525	Digital data
71	156.575	156.575	Non-commercial
72	156.625	156.625	Non-commercial
73	156.675	156.675	Port Operations
74	156.725	156.725	Port Operations
75	156.775	156.775	Not used - Guard Band for Ch 16
76	156.825	156.825	Not used - Guard Band for Ch 16
77	156.875	156.875	Port Operations
78	156.925	156.925	Non-commercial
79	156.975	156.975	Commercial
80	157.025	157.025	Commercial
81	157.075	157.075	US Coast Guard only
82	161.725		US States Government only
83	157.175	157.175	US Coast Guard Auxilliary
84	157.225	161.825	Public correspondence
85	157.275	161.875	Public correspondence
86	157.325	161.925	Public correspondence
87	157.375	161.975	Public correspondence
88	157.425	157.425	Commercial

water and tide levels, and notices to shipping 24 hours a day. This practice has permitted the elimination of scheduled broadcasts on VHF and thus increased the efficiency of the operation of Canadian Coast Guard Radio stations, which also handle telephone traffic.

In both the United States and Canada, channels 1 to 4 and 60 to 64 have not been assigned, except on a case by case basis to stations in the fishing industry.

Occasionally one may hear references to International versus United States channels. This refers to the fact that not all channels are assigned in the manner that the ITU laid down in their radio regulations. Internationally several other duplex channels are used, where in North America they are used as simplex frequencies, and we do not use certain channels as was mentioned above.

Try plugging some of these frequencies into your scanner and enjoy what you can hear.

New Maritime Distress System

One of the most romantic and enduring images of ocean-going vessels is the picture of a headset-clad radioman. Listening intently, he scribbles down notes, relaying the last words of some bottom-bound ship to anxious rescuers on shore. That image may, like the ghosts of those long-gone sailors, be fading away.

Currently, ships do keep continuous watch on the international distress frequencies. In case of emergency, they're obligated to render assistance. As the result of a five week conference specially implementing a new maritime distress system, satellites will automatically notify search and rescue teams on shore.

The conference, yielding to the Maritime Unions in the interest of preserving jobs, says it still wants a full-time radio man on board its seagoing vessels.

Also on the agenda was a rearrangement of the HF bands used by the Maritime Service. The result, hope the organizers, will be more narrow-band and digital channels and less for the more traditional maritime uses such as Morse code. *From the W5YI Report*

Table Two

Ch	Frequency (MHz) Ship	Shore	Allocation
	156.250	156.250	Not assigned
6	156.350		Safety
9	156.450	156.450	Commercial and Non-commercial, Except ship movement on St. Lawrence River.
10	156.500	156.500	Commercial except ship movement on St. Lawrence River
11	156.550	156.550	Ship movement
12	156.600	156.600	Ship movement
13	156.650	156.650	Ship movement
14	156.700	156.700	Ship movement
15	156.750	156.750	Government operations
17	156.850	156.850	Pilotage
19	156.950	156.950	Canadian Coast Guard
21A	157.050	157.050	Canadian Coast Guard
21B		161.650	Continuous Marine Broadcast
22	157.100	157.100	Canadian Coast Guard Liason
23	157.150	161.750	Public Correspondence
25B		161.850	Continuous Marine Broadcast
66	156.325	156.325	Port Operations
67	156.375	156.375	Commercial and Non-commercial
68	156.425	156.425	Pleasure Craft
69	156.475	156.475	Non-commercial
70	156.525	156.525	Digital Distress and Calling
71	156.575	156.575	Marinas and yacht clubs
72	156.625	156.625	Commercial and non-commercial
73	156.675	156.675	Commercial and non-commercial
74	156.725	156.725	Ship movement
77	156.875	156.875	Pilotage
78	156.925	156.925	Commercial
81	157.075	157.075	Federal Government - Pollution Control
82	157.125	157.125	Canadian Coast Guard
83A	157.175	157.175	Canadian Coast Guard
83B		161.775	Continuous Marine Broadcast
88	157.425	162.025	Public correspondence

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QRP (low power) operation

One of the more interesting hobbies within amateur radio is QRP or low power operating. QRP operating is defined by the American Radio Relay League (ARRL) as "10 watts input or 5 watts output" and the thrill is sometimes best described as "similar to the excitement of your first QSO (contact)...Like riding a leaf instead of a supersonic jet."

QRP operating was born out of necessity during the years of the Great Depression. Then, of course, hams didn't have a lot of money and rigs were necessarily low-power.

Many years later in 1961, the QRP Amateur Radio Club International was formed. The club, like the ARRL, recognizes a five watt maximum power limit for its members during club activities such as contests and QSO parties. They offer several awards; QRP WAS (Worked All States), QRP WAC (Worked All Continents) and QRP DXCC as well as an award for working specified numbers of club members. A superb newsletter accompanies membership.

During the early days of the club, true low power gear was difficult to come by. Many members used rigs like the Heath DX-20 or 35 and ran them in the standby position to keep power levels low (2 to 3 watts). Others built their own gear from scratch; some circuits were gems and attracted much interest, especially the early solid state rigs (transistors were seldom used for RF in the 60's). The newsletter was formed to exchange ideas between club members.

In addition, each call area and country had a representative who would publish a local newsletter to keep his call area informed of new trends and operating practices. It was a good idea and the club grew rapidly to over a thousand members.

Many early club members were a bit cautious about low power, fearing it would never amount to much. Boy! Were they surprised! Rigs of less than one watt were working world wide DX. True they could not compare with the big guns, but they proved it could be done. One ham in Florida, trying for the WAS and WAC awards, used mobile CW on 20 meters, an eight foot whip antenna and 100 milliwatts of power!

Thanks in large part to the QRP ARCI, low power has become extremely popular world wide. Today the QRP enthusiast can purchase many different commercial rigs, notably Ten-Tec and Heath. Many imported rigs can be run at very low power levels.

How effective is QRP? Extremely! Given a good antenna, the peanut whistle artist can do anything the big guys can do -- just not as fast (and cheaper). Several years ago I had an interesting experience that proved just *how* effective low power can be.

For many years I was very active with the East Pa. CW traffic net and took a regular turn as Net Control Station. One evening my big rig (75 watts) died and the only thing I had was a Heath HW-8 that put out 3 or 4 watts. In desperation I threw the HW-8 on and called the net to order (hoping and sweating). The entire roster reported in and never knew I was running low power! Over the next year and a half this rig was in nearly daily use handling traffic. Never once did a station report difficulty copying.

QRP, however, is not for everyone. I don't advocate it for Novices. Master the basics of operating, first.

QRP operators are generally patient, tolerant folks, who just enjoy the challenge. And are a heck of a lot of fun to talk with. There's little conflict between them and the high power crowd. After all, seldom will a low power station interfere with a QRO (high power) QSO. In addition, hams are, for the most part, ladies and gentlemen, respecting the low power operator and willing to give them room to work in.

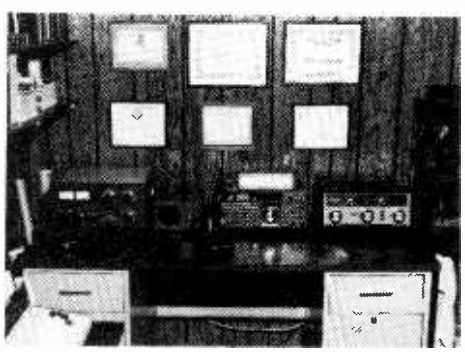
Over the years low power operation has centered around the following frequencies - CW 1810, 3560, 7030, 7040, 10106, 14060, 21060, 28060 and 50060 kHz. Check 3710, 7110 and 28110 on the Novice bands. QRP SSB hangs out on 3985, 7285, 14285, 21385, 28885 and 50885 kHz. Give a listen and work a peanut whistle. Maybe even join the fun!

I would like to make QRP operating a regular feature of "On the Ham Bands", and invite your reports, circuits, comments regarding low power.

Tube Rigs

Back in December, we offered plans for two simple tube rigs. I was overwhelmed by the response. Apparently, a lot of you are interested in these older circuits. Each plan set included a sheet of parts substitutions, a simple power supply circuit for one rig and several ideas concerning RFI.

Even at that, many of you wrote requesting information as to where you could pur-



See your ham station in print!

Above is amateur station W3CPR, Tom Islieb, Lehighton, PA. Send a photo of your station to N3IK at the above address to see your shack in MT.

QRP Clubs

There are several active QRP organizations in existence today. All publish interesting and informative newsletters. They are:

QRP ARCI
Fred Bonavita, W5QJM, P.O. Box 12072, Capitol Station, Austin, TX 78711

"The G-QRP Club"
Rev. George Dobbs, G3RJV, 17 Aspen Drive, Chemsley Wood, Birmingham, B37 7QX, United Kingdom

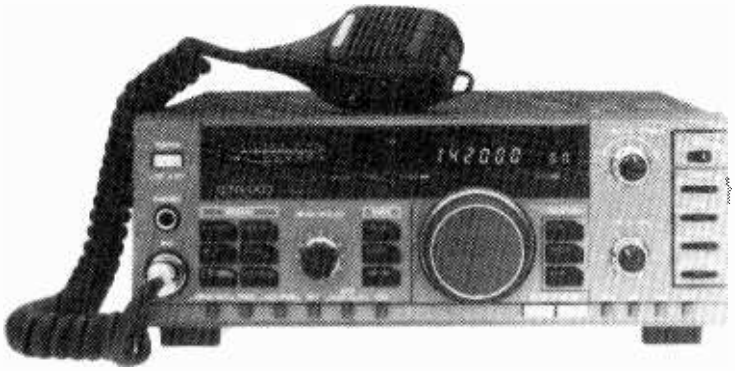
"The Michigan QRP Club"
Thomas Root, WB8UUJ, 538 Leland Street, Flushing, MI 48433

Write them for full details on membership or receiving their newsletters.

CQ and 73 magazines both have regular QRP columns that contain information on awards, operating activities and "how to" articles. QST and Ham Radio often have articles for the QRPer too.

Must reading for the low power operator is W1FB's QRP Notebook, available from the ARRL 225 Main St., Newington, CT 06111. The cost is five dollars plus shipping. It's loaded with circuits and information about low power rigs and operating. Buy it, you'll like it!

The new Kenwood TS-680S



chase parts. Chester Beck of Downy, CA, suggests Fair Radio Sales, 1016 E. Eureka, Box 1105, Lima, Ohio 45802 (for tubes, capacitors and parts) and C-W Crystals, 570 Buffalo St., Marshfield, Mo 65706 (for crystals). Thanks, Chester. If you would like to see more of these tube circuits drop me a note.

Kenwood Announces New HF Transceiver

Kenwood has announced the new TS-680S, an all band, all mode, a 100 watt transceiver with a slight difference. This difference is an extra band. This rig includes not only the HF bands but the 6-meter band as well. (On six meters, the TS-680S runs ten watts output.)

The TS-680S also contains a new feature, a programmable band marker, which can be used to mark band edges to prevent out-of-band operation. Other "bells and whistles" include dual VFO's, 31 memory channels, programmable scanning, IF shift, dual noise blankers, RIT and FM squelch.

FCC Authorizes Additional Club "200" Call Signs

ARRL Headquarters received a letter from the FCC regarding the use of special "200" call signs used in celebration of the Bicentennial of the US constitution by preregistered clubs.

Previously, the FCC had only authorized the special call signs by preregistered clubs located in state capitals. The FCC letter said, however, that the original order "contemplated club stations at state capitals, but early experience has shown the desirability of a broader base of participation." The letter then goes on to say that the 199 club stations pre-registered with the ARRL who are not in state capitals are now approved to use the special 200 call.

ARRL will individually notify clubs of this action by mail. FCC will also permit some additional registrations, provided they are made in a reasonable and prudent manner.

Amateurs are reminded that only club stations registered with the ARRL may participate, as it is an absolute necessity that each FCC Field Office be provided with an up-to-date database printout of all participating stations.

Any additional questions should be addressed to the ARRL Club Services Department.

From the ARRL

Three new instructor guides are now available from the ARRL. The Novice Instructor Guide has been revised to include Novice Enhancement Info, and the old Tech/General guide has been split in two. Prices are $5.00 each for Novice Instructor Guide, Technician Instructor Guide, General Instructor Guide, and Advanced/Extra Instructor guide. Order from Publication Sales Department, ARRL 225 Main Street, Newington, CT. 06111.

Spring Time

Spring arrives in March (hopefully). And along with spring comes some interesting and useful propagation conditions for the amateur. This time of year marks the transition from winter to spring in the northern hemisphere and summer to fall in the southern hemisphere.

What this means for the amateur is a period of relative relief from QRN (thunderstorms) on the north south path hence making contacts with southern hemisphere easier on 160 and 80 meters. Best time to look for contacts on these bands is the period just before and after sunset and again before and after sunrise. Normally DX stations will be found on the low end of 80 (3500-3530). On 160 most activity will be from 1800 to 1835.

Spring is also a good time for the VHF operator to check the low end of the band for auroral openings. When you hear CW signals that sound like a buzz saw and are wide as a barn door, that's aurora. Point your beam north and work a lot of stations. CW is the mode to use for aurora. The most popular VHF band affected by aurora is 144 MHz although all the bands from 50 thru 450 can utilize the phenomenon.

Wanted

Your input. I would appreciate receiving reports of what you are doing, send me your pet circuits, what are you working on what bands, and what you want to see in "On The Ham Bands." How about a diagram of your super antenna?

Questions, comments, whatever. If you require an answer please include an S.A.S.E. ■

Dr. John Santosuosso

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The Sixties - Live on Shortwave

It was billed, hopefully, as the dawning of the Age of Aquarius. Long-haired youth knowingly flashed the "peace sign" to one another. Love beads dangled around outrageous nehru jackets and tinted "granny" glasses shielded dilated pupils. It was a time of Woodstock, weed and free love. It was the "sixties."

For those old enough to remember, or venturesome enough to want to return, Radio for Peace International can be your ticket back in time. Its low-power transmitter, located in Costa Rica, can be heard on 7375 kHz during the local evenings. Some programming is in Spanish, but much of it is in English.

Listening to Radio for Peace is a great way to recapture the glory and insanity of the turbulent sixties.

What you'll hear is enough to give even the most ancient of hippies a real "head rush" of memories. One night the station featured a recorded interview with Daniel Ellsberg on the horror of nuclear war. If you need your memory jogged a bit, it was Ellsberg who released the controversial Pentagon Papers during the Vietnam war. These controversial and classified documents convinced both Ellsberg and many Americans that despite government claims to the contrary, the Vietnam war was not being brought to a satisfactory conclusion. Another broadcast stressed the "evils of corporate America."

RFPI is a good way to capture some of the glory and insanity of that turbulent period in American history. So, as they used to say in the sixties, "Tune in [the station], turn on [the radio] and drop out [of the eighties] with Radio for Peace International. I mean, can you dig it?

We Shall Overcome

Eyes still glazed over with nostalgia? Do you remember the old civil rights hymn "We Shall Overcome," made famous by the followers of the Rev. Martin Luther King? Recently it was heard in English on the shortwaves. No, it was not from Radio for Peace International. Instead, it was heard on the 6220 kHz domestic service of Radio Iran! Apparently, the song has taken on a new meaning for the followers of the Ayatollah: overcoming the Iraqis.

One of the more unusual licensed broadcasters being logged these days is the Burmese Army Station from Taunggyi in the Shan State. It was recently heard on 6570 kHz at 1145 UTC with a program of Burmese music. This one is difficult but by no means impossible.

On the other side of the Burmese broadcasting coin is the recently reactivated communist clandestine, Voice of the People of Burma. Look for it around sign on at 1200 on 5110 kHz. According to *Clandestine Confidential,* it is an easier catch than the Burmese Army Station. Like the Army Station it is a byproduct of the numerous civil wars that have engulfed Northern and Central Burma for decades.

Vacation Radio

California's James Kline has managed to log an interesting shortwave pirate. While in London, he was able to hear Radio 101 International. In the past, Radio 101 International has broadcast on FM from Germany, Belgium, and the Netherlands. Its shortwave transmitter, however, is in Ireland. It pays to take a receiver on vacation. You never know what you might hear!

Late breaking news just in from Dave Crawford is that a Florida pirate identifying as Jam Radio has been heard on 1620 kHz on several evenings. Dave reports one night it relayed a Florida FM pirate!

Meanwhile, Further South in Havana...

Pennsylvania's John Demmitt came across something very interesting on that very interesting AM frequency of 1040 kHz. One night not long ago, John was monitoring the Radio Moscow relay out of Cuba. It was about 2345 UTC (6:45 PM EST). Nothing out of the ordinary was noted until fifteen minutes later when a jammer, sounding very much like a buzz saw, blotted out the station. The buzz saw stayed on the air until after Radio Moscow signed off at 0000 UTC (7:00 PM EST).

John offers three possible explanations for wht he heard. First, Cuba may have been testing one of its own jammers. Second, Cuba may have put a second transmitter on the air to see if it could be used to jam a nearby transmitter, in this case its own. Third, the United States may have been testing a jammer for possible future use against Havana. John also notes there was no spill over on to 1030 or 1050 kHz, indicating that the jammer was a professional, well-constructed piece of equipment.

Number, Please?

California's David Kammler sends along some numbers loggings. One of the most interesting was monitored on 6227.1 in USB. The station came on the air at 0700 UTC, immediately after HCJB signed off. The format was typical: female with Spanish numbers in a "XXX XX" format for seven minutes. There was also a 5-digit identifier repeated for two minutes.

David also reports English numbers on 11449.1 at 1725 UTC and German numbers on 10177 at 0015.

My thanks, too, to Marion Kincaid and Dave White for their information on the subject of numbers. Your contributions will prove useful in the future.

A final note. That venerable old clandestine (active since 1974), Voice of the Turkish Communist Party, has left the air since the the group can now function legally in Turkey. However, its sister station, Bizim Radio (Our Radio), remains active on 7355 at 0800, 1100, 1200, 1500, 1600, and 1800 UTC. Both broadcast from the same transmitters in East Germany and both were intended primarily for Turks who were "guest workers" in other European countries. From time to time both of the Turkish clandestines have been heard in North America.

I will keep my pager on, and you can call me when it's time for that tecate.

■

You don't need a weatherman to know which way the wind is blowing.

-- Bob Dylan

Larry Van Horn

160 Lester Drive
Orange Park, FL 32073

"We have a problem here."

How those words bring back such bad memories. It's been a little more than two years since the Challenger accident. What is happening to the U.S. space program?

The answer is, not much.

Since 1983 the U.S. and western spacefaring nations (except Japan) have suffered setback after setback. Meanwhile, the Russians continue their dominance in space.

In the case of the United States, the unprecedented string of failures has involved every major rocket launching system. Only the Scout remains untouched. The cost to taxpayers: several billion dollars. The result: a crippling of a critical national asset.

US Problems Started in '83

These failures started within the space shuttle program in 1983. A chronological list of upper stage, propulsion failures and ground mishaps follows:

~ April, 1983 -- An Air Force/Boeing inertial upper stage boosting a NASA TDRSS satellite from the space shuttle Challenger fails, leaving the unit in an unusable orbit. A design problem, in which an oil-filled seal deflated in flight, crippled the steering mechanism. Boeing subsequently redesigned the failed engine gimbaling mechanism.

~ February, 1984 -- Two McDonell Douglas payload assist modules (PAM) failed during STS-41B (another Challenger mission). This resulted in the inability of the Indonesian Palapa B2 and the Western Union Westar 6 satellites to achieve geo orbit. The cause was a burn-through of defective carbon-carbon material in the nozzle of both PAMS. Both satellites were later recovered during the Discovery mission 51A in November, 1984. Cost to insurers: $180 million.

~ June, 1984 -- A NASA/General Dynamics Atlas-Centaur, carrying an Intelsat 5 failed, resulting in a $102 million insurance claim. The leading theory of the cause of the failure is that a separation charge punched a hole in the Centaur oxygen tank.

~ August, 1985 -- A Martin Marietta Titan 34D failed with a KH-11 or Big Bird photo recon aboard. The launch accident was caused by the premature shutdown of one of the Titan core vehicle's aerojet liquid engines.

~ January, 1986 -- Shuttle mission 51-L disintegrated 73 seconds after liftoff, killing its crew of seven. The cause of the accident was the failure of a solid rocket booster joint, attributed to a combination of factors including a faulty seal design and cold temperatures during the launch.

~ April, 1986 -- Another Titan 34D failure, this time 6 seconds after launch. Destroyed was a Big Bird recon satellite. Cause: a solid rocket booster problem.

~ May, 1986 -- A Delta launch vehicle, carrying a GEOS-G geostationary weather satellite, was destroyed by range safety command 90 seconds after lift-off following a premature shutdown of the first stage main engine. The rocket and payload were valued at nearly $100 million.

~ March, 1987 -- A tumbling Atlas Centaur vehicle, carrying the U.S. Navy's Fleetsatcom 6 communication satellite, was destroyed by a range safety officer approximately 51 seconds after launch from the Cape. An investigation board determined that an electrical transient, caused by a single-triggered lightning flash, was the most probable cause of the vehicle loss.

~ July, 1987 -- A vehicle handling mishap at Launch Complex 36B, Cape Canaveral, ruptured a Centaur liquid hydrogen tank as the Atlas Centaur was being prepared for the U.S. Navy's Fleetsatcom F8 mission. A failing work platform did the damage.

Table One

Flight	Launcher Type	Date	Payload Lost
2	Ariane 1	5/23/80	Firewheel & phase 3 IIIA amateur satellite
5	Ariane 1	9/09/82	Marecs B/ESA Sirio-2
15	Ariane 3	9/12/85	ECS-3/Spacenet F3
18	Ariane 2	5/30/86	Intelsat 5 F14

Europe has Problems, Too

Europe has had its share of problems with the Ariane rocket program. There have been four launch failures out of 19 Ariane rocket launches. These failures have involved all three versions of the rocket. Table One is a list of all the Ariane failures.

The Russians, too, have suffered launch/payload failures. They, however, have been able to overcome adversity and bounce right back into the launching business. Their designs are simple and as a result, they have complete understanding of the hardware they're using.

The Soviet's only known problem was in 1986 when an SL-6 booster designed to put Cosmos 1783 into orbit failed. Cosmos 1783 was believed to be a missile early warning satellite. Nine days later they used the SL-6 to place a Molniya 3 class satellite into orbit.

While the Soviets had a couple of disappointments in 1987, they have continued to forge ahead in all aspects of their ambitious space program.

1988 should also be another record launch year for the Soviets. I expect the Soviets to launch at least one more Energia mission prior to the launch of their first heavy lift shuttle mission. ESA will be back flying and the Chinese and Japanese space programs will continue to fly at a slow but steady pace. Will the U.S.?

Former NASA Administrator James Biggs summed it up very well, "Space is an important place to be, but we can't afford to be second rate."

Project NASA

The US space program may not see any major advances during 1988. Nonetheless, *Monitoring Times is* attempting to catalog HF/VHF/UHF frequency information for all the major NASA/Air Force sites to help readers listen in on the action when we *do* get back into space. *MT* readers are invited to contribute information and in return will be provided with all the accumulated information as it becomes available. Also information on Ham Radio Operations that carry NASA Select shuttle audio is wanted.

Your monitor notes are most appreciated and monitors information is needed in the following areas: Kennedy Space Center/Patrick AFB; Goddard Space Flight Center; Johnson Space Center; Marshall Space Flight Center; National Space Technology Lab, St. Louis; Hugh Dryden Flight Research Center/Edwards AFB; Hollman AFB; White Sands/Northrup Strip; and Vandenberg AFB. Send your contributions to PROJECT NASA, c/o Larry Van Horn, 160 Lester Drive, Orange Park, Florida, 32073.

Monitor the Soviets

The Soviet Meteor Weather Satellite program continues on track and easily monitored on a scanner. These satellites can easily be decoded by the amateur equipped to print NOAA weather satellite information. The following is a summary of Meteor frequency activity monitored in 1987 and early 1988:

137.3
Believe this is a backup/maintenance channel. MT's own Greg Mendell monitored APT from what was believed to be Meteor 2-3 in the summer of 1987. Dormant Meteors are probably checked out on this channel. The Soviets also probably use this channel for initial satellite check out. No other activity noted.

137.4
Cosmos 1766/Meteor 2-14/Meteor 3-1/Meteor 2-16 All have transmitted here sometime in 1987. At the end of the year Meteor 2-15/Cosmos 1766 was left on this channel. Mid-summer 1987, Charles Pocius in Palatine, IL, noted a wideband digital signal on the channel of unknown origin; the signal was not coming from a Meteor weather satellite.

137.850
Meteor 2-14 moved to this channel in February, 1987. Meteor 2-15 has transmitted on this channel all during 1987. ■

Vatican Radio

00120 Vatican City

Vatican Radio's programs are polished and professional, but more often than not, of nominal interest to anyone but the extraordinarily devout and the curious.

Veronica Scarisbrick

Unlike many other international broadcasters, Vatican Radio does not take opinion polls or make market surveys of its audience. It relies exclusively on "those few individuals" who, according to Sean-Patrick Lovett, director of the station's English Department, "care enough about our programs to pick up pen and paper to write." The result is hardly a scientific sampling of listeners. Says Lovett, "Have you ever tried to cook a really special dinner without knowing who, or even how many, your guests will be? That's what it's like making programs for Vatican Radio."

From Lovett and crew, meals for North American guests are infrequent and brief. There are only two officially scheduled, 25 minute transmissions. One, for the east coast, is at 0050 UTC (7:50 PM EST) on 6150, 7315, 9605 and 11780 kHz. The other, labeled "experimental" and seldom heard in this country, is at 0310 UTC (7:10 PM PST) -- reportedly on 6150 kHz. West Coast listeners need not miss out on hearing Vatican Radio because of this phenomenon, however. Another transmission, also in English but beamed to Europe, is heard in North America at 0600 UTC (10:00 PM PST/1:00 AM EST) on the frequency of 6185 kHz.

Not surprisingly, Vatican Radio's programs reflect the Catholic nature of the station. All are polished and professionaly produced, but more often than not, of nominal interest to anyone but the extraordinarily devout and the curious.

The sole exception to this is the station's *Letter-Box* program. Hosted since January of 1985 by Veronica Scarisbrick, it's an informal, chatty sort of show. Originated as a forum from which to reply to listener's letters, it has developed over the past three years into what the staff calls "a window on the English programs as a whole."

"Not only does *Letter-Box* let you know about upcoming programme projects," says Ms. Scarisbrick, "it also introduces you to the people who make our programmes." You will also, Vatican Radio promises, get a "rare glimpse behind the scenes at how programmes are produced and the kinds of problems we confront while making them."

One of *Letter-Box*'s special features is a brief appearance by resident technical expert, Jesuit Father Lars Rooth. The "Technical Slot," as Rooth's segment is known, provides listeners with tips on how to improve reception and makes note of upcoming frequency changes for Vatican Radio. "Plus," says the Swedish-born priest, "we're at the ready to answer questions on anything from QSL's to rotating antennas." *Letter-Box* is heard on the last Monday of every month.

Aside from *Letter-Box*, a regular listener to Vatican Radio will be able to pick out some interesting if not esoteric features. For example, one recent program contained comments on the visit of Mother Teresa to the Soviet Union.

Perhaps the most valuable aspect of Vatican Radio's broadcasts, however, are related to the activities of current Pontiff, the politically involved, often controversial, globe-hopping John Paul II, all of which are covered in great detail. That, undoubtedly, is Vatican Radio's saving grace.

-- Bill Kendall, Jr.

Programs of Interest from Vatican Radio

UTC	Broadcast	Schedule	Frequencies	Targets
0050	English Programs	Daily	6150, 9605, 11780	North America
0310	English Programs	Daily	6150	North America
0600	English Programs	Daily	6185, 9645	Europe
0630	Mass in Latin	Daily	6248, 9645	Europe
0730	Four Voices	Weekdays	6248, 9645	Europe
1100	Pope's Angelus	Holy Days	6248, 9645	Europe
			15190, 17865	Pacific
			17840, 21485	Africa
1140	Four Voices	Weekdays	6248, 9645	Europe
1445	News Bulletin	Daily	6248, 7250, 9645	Europe
1530	Concert	Mon-Sat	6248, 7250	Europe
1610	Four Voices	Weekdays	6248, 7250, 9645, 11740	Europe
1940	Rosary and News	Daily	6248, 9645	Europe
			9625, 11700	Africa
2050	English Programs	Daily	6190, 7250, 9645	Europe
2300	Music	Daily	6185	Europe

English programs in the North American and European services are presented on the following schedule:

Mondays: *A Many Splendored Thing* (Host: Jill Bevilacqua)
Tuesdays: *Talking Point* (Host: Sean-Patrick Lovett)
Wednesdays: *Vatican Week* (Lana Hale)
Thursdays: *Vatican Viewpoint* (Host: Philippa Hitchen and David Gibson)
Fridays: *The Church Today* (Host: Donald MacIntyre)
Saturdays: *With Heart and Mind* (Host: Helen Kieran, O.P.)
Sundays: *The Pope, The Church, The World* (Host: Staff)

frequency SECTION

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

Dave Kammler, CA

On March 6th, many stations will adjust their frequencies for the spring. In addition, over the next 30 days or so, a number of nations will begin changing from Standard Time to Daylight Savings Time. While every effort is made to predict the effect of these changes on the shortwave bands, 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 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		Radio Berlin Int'l, E. Germany	6080 9730
0000-0045		WYFR, Oakland, California	5950 7440 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	6125 9625
0000-0100		CBN, St. John's, Newfoundland	6160
0000-0100		CBU, Vancouver, British Colombia	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 Colombia	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 Colombia	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-S	KUSW, Salt Lake City, Utah	11680
0000-0100		KVOH, Rancho Simi, California	9495
0000-0100		Radio Australia, Melbourne	15140 15160 15240 15320
			15395 17750 17795
0000-0100		Radio Canada Int'l, Montreal	5960 9755
0000-0100		Radio Havana Cuba	6090 6140
0000-0100		Radio Luxembourg	6090
0000-0100		Radio Moscow, USSR	5915 5940 6000 6045
			7115 7130 7150 7215
			7310 11770 12050 15455
0000-0100		Radio New Zealand, Wellington	15150 17705
0000-0100		Radio for Peace, Costa Rica	7375
0000-0100		Radio Sofia, Bulgaria	9700 11720
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		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	9852.5
0000-0100		WHRI, Noblesville, Indiana	7400 11770
0000-0100		WRNO New Orleans, Louisiana	7355
0030-0045		BBC, London, England*	6195 7235 9570 11820

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.

- 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.
- BBC 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 first the ones for your location (they are divided into east coast, midwest and west coast of North America). Then look for the one most closely describing the geographic location of the station you want to hear.

Once you've located the right charts, look along the bottom line for the time that you are listening. The top line of the graph indicates the MUF (maximum useable frequency) and the lower line the LUF (Lowest useable frequency).

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

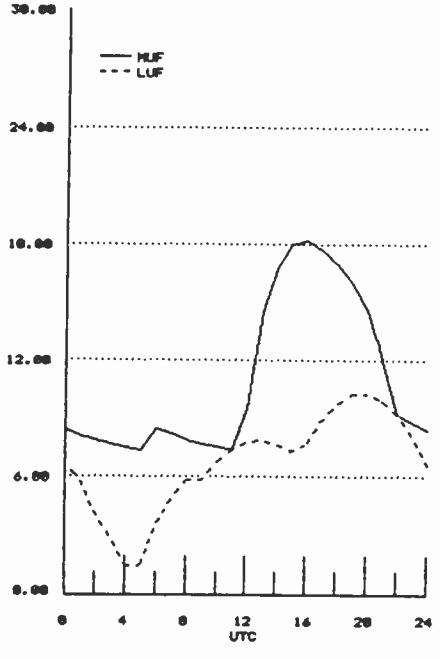
			15435			
0030-0055		BRT, Brussels, Belgium	5910	9925		
0030-0100		BBC, London, England	5965	5975	6005	6120
			6175	7135	7325	9515
			9580	9915	9590	11955
0030-0100		HCJB, Quito, Ecuador	9720	11775	11910	15155
0030-0100		Radio Kiev, Ukraine, USSR	6200	7165	7400	11790
			11860	13645	15180	
0030-0100		SLBC, Colombo, Sri Lanka	6005	9720		
0030-0100		WINB, Red Lion, Pennsylvania	15145			
0035-0040		All India Radio, New Delhi	3925	4860		
0045-0100		Radio Berlin Int'l, E. Germany	6080	9730		
0045-0100	A	Radio New Zealand, Wellington	15150	17705		
0045-0100		WYFR, Oakland, California	5950	9680		
0050-0100		Vatican Radio, Vatican City	6150	7315	9605	11780

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

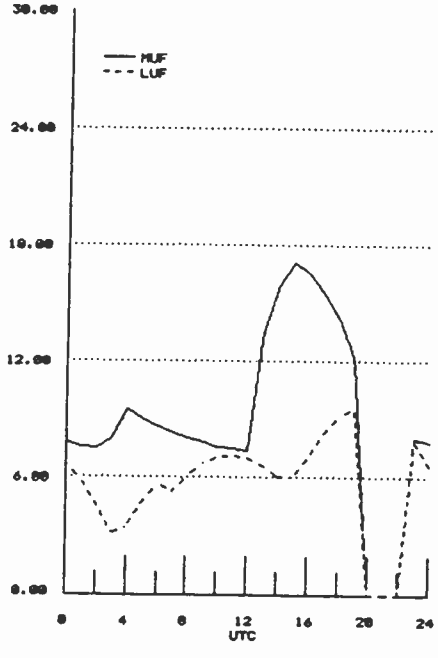
0100-0103	S	Port Moresby, Papua New Guinea	3295	4890	5960	5985
			6020	6040	6080	6140
			9520			
0100-0110		Vatican Radio, Vatican City	6150	7315	9605	11780
0100-0115		All India Radio, New Delhi	6055	7215	9535	9910
			11715	11745	15110	
0100-0120		RAI, Rome, Italy	9575	11800		
0100-0125		Kol Israel, Jerusalem	7462	9435	9845	
0100-0130		HCJB, Quito, Ecuador	9720	11775	11910	15155
0100-0130		Radio Berlin Int'l, E. Germany	6080	9730		
0100-0130		Radio Canada Int'l, Montreal	9535	11845	11940	
0100-0130	T-A	Radio Canada Int'l, Montreal	5960	9755		
0100-0130		Radio Japan, Tokyo	15280	17810	17835	17845
0100-0130		Laotian National Radio	7113v			
0100-0145		WYFR, Oakland, California	5950	7440	9555	9680
0100-0150		Deutsche Welle, West Germany	6040	6085	6145	9545
			9565	11785		
0100-0200		(US) Armed Forces Radio and TV	6030	15345		
0100-0200		BBC, London, England	5975	6005	6120	6175
			7325	9515	9590	9915
			9975			
0100-0200		CBC Northern Quebec Service	6195	9625		
0100-0200		CBN, St. John's, Newfoundland	6160			
0100-0200		CBU, Vancouver, British Colombia	6160			
0100-0200		CFCF, Montreal, Quebec	6005			
0100-0200		CFCN, Calgary, Alberta	6030			
0100-0200		CHNS, Halifax, Nova Scotia	6130			
0100-0200		CKWX, Vancouver, British Colombia	6080			
0100-0200		CFRB, Toronto, Ontario	6070			
0100-0200		(US) Far East Network, Tokyo	3910			
0100-0200		FEBC, Manila, Philippines	15445			
0100-0200	T-S	KUSW, Salt Lake City, Utah	11680			
0100-0200	T-A	KVOH, Rancho Simi, California	9495			
0100-0200		Radio Australia, Melbourne	15160	15180	15240	15320
			15395	17715	17795	
			17750			
0100-0200		Radio Baghdad, Iraq	6110			
0100-0200		Radio Havana Cuba	6140			
0100-0200		Radio Luxembourg	6090			
0100-0200		Radio Moscow, USSR	5915	5940	6000	6045
			7115	7150	7215	7310
			12050	15455		
0100-0200		Radio Moscow World Service	15130	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		Voice of America, Washington	5995	6130	7205	9455
			9650	9740	9775	9815
			11580	11740	15205	17735
			21540			

West Coast

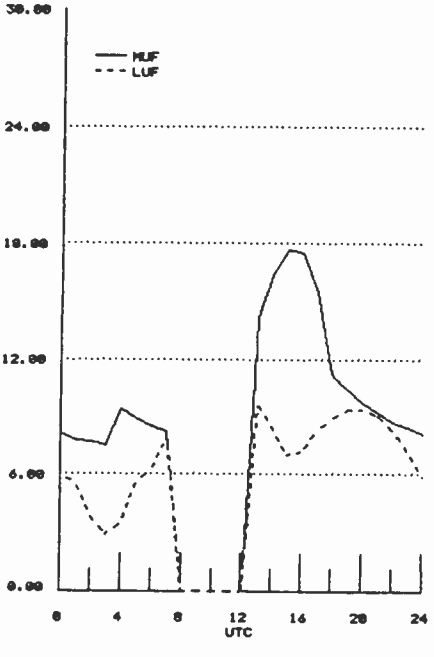
West Europe



East Europe



Middle East



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

VISA

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.

Greatly expanded and revised in an all new, fourth edition, the Shortwave Directory is crammed with up-to-date, accurate frequency listings from 1600 to 30000 kHz, including U.S. and foreign Air Force, Navy, Coast Guard, Army, Energy and State Departments, FBI, scientific installations, spies and smugglers, pirates and clandestines, aircraft and ships, space support, RTTY, FAX, INTERPOL and more.

Most stations are cross-referenced by agency and frequency for rapid identification. Also includes an exhaustive glossary of terms, acronyms, and abbreviations commonly encountered on shortwave. A great buy at just $17.95 plus $1.95 (1 lb) UPS. Ships in March.

Basic Electronics Course by Norman Crowhurst

Master the fundamentals of today's electronics! *Basic Electronics Course,* in an all-new 2nd edition, helps you to really understand electronics. Not a Ph.D-only type of book, this one takes you gently and easily from the fundamentals, one chapter at a time, to today's state-of-the-art equipmment. Take the *Basic Electronics Course* today and in no time at all, you'll be talking resistors and capacitors like a pro. 430 pp. $14.95 plus $2.62 (4 lbs) UPS shipping.

1988 World Radio TV Handbook

The all new, completely revised 42nd annual edition of this revered international broadcasting annual is due out in January. An indespensible reference long known for its comprehensive coverage of world broadcasting, the '88 *WRTVH* boasts almost 600 pages of information. Arranged by country, you'll find station broadcast schedules, languages, target areas, transitter power and addresses along with station personnel and even phone numbers. It's like having a mini-profile of every broadcast station in the world! *And the World Radio TV Handbook* is the perfect compliment to your 1988 *Passport to World Band Radio.* The 1988 *WRTVH* is available for $19.95 plus $2.39 (3 lbs) UPS shippping.

The "Top Secret" Registry of U.S. Government Radio Frequencies

It's the standard reference source for federal frequencies in an all new, 6th edition. Over 12,000 listings for more than eighty federal agencies operating from 25 to 470 MHz. FBI, Drug Enforcement Agency (DEA), CIA, NSA, Customs, Secret Service, Border Patrol, Immigration, ATF, Treasury, Federal Prisons, FCC, FAA, U.S. Army, Coast Guard, Marines, Navy and Air Force. There's even coverage of the UHF aero (225-400 MHz) and important 2 to 25 MHz frequencies. All this and an introductory article on how to monitor this exciting portion of the radio spectrum. Twice as much information as in the previous edition! Just $17.95 plus $1.95 (1 lb) UPS shipping.

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If you've spent much time behind the dials of your shortwave radio, chances are you've heard them: mechanical, monotone voices reading endless streams of seemingly meaningless numbers. A shortwave mystery story of the first degree, these broadcasts are actually thought to be international intelligence organizations communicating with spies in the US and other countries! Havana Moon, noted "numbers station" sleuth, tells what he knows in this unusual, 74 page report. $13.95 plus $1.95 (1 lb) UPS.

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frequency SECTION

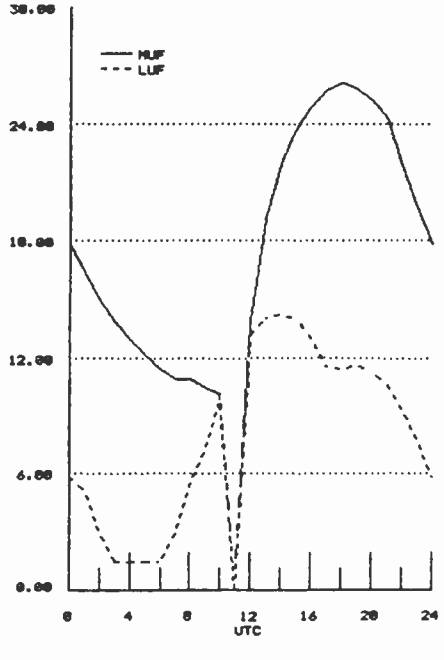
0100-0200		Voice of Indonesia, Jakarta	9680	11790		
0100-0200		WCSN, Boston, Massachusetts	9852.5			
0100-0200		WINB, Red Lion, Pennsylvania	15145			
0100-0200		WHRI, Noblesville, Indiana	7400			
0100-0200		WRNO, New Orleans, Louisiana	7355			
0130-0200		HCJB, Quito, Ecuador	9720	11775	11910	15155
0130-0140	T-S	Voice of Greece, Athens	7430	9395	9420	
0130-0155		Radio Austria Int'l, Vienna	9550			
0130-0200	S,M	Radio Canada Int'l, Montreal	5960	9755		
0130-0200		Radio Veritas Asia, Philippines	15305	15330		
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]

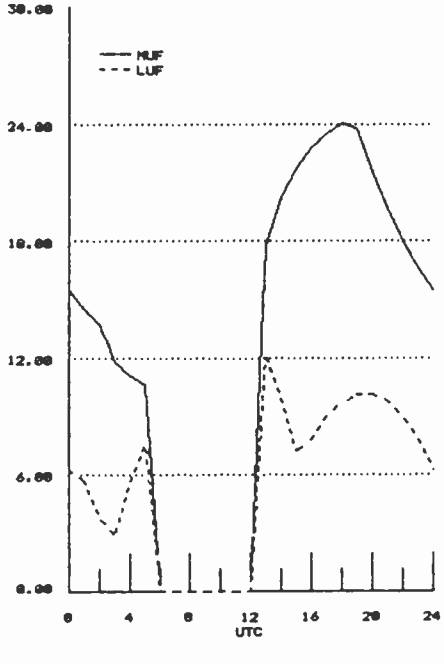
0200-0210		Radio France Int'l, Paris	3965	5950	6055	9790
0200-0210		Vatican Radio, Vatican City	6145	7125		
0200-0225		Kol Israel, Jerusalem	7462	9435	9845	
0200-0225	T-A	Radio Budapest, Hungary	6025	6110	9520	9585
			9835	11910		
0200-0230		BBC, London, England	5975	6005	6120	6175
			7325	9515	9590	
			9915			
0200-0230		Burma Bcasting Service, Rangoon	7185			
0200-0230	M	Radio Austria Int'l, Vienna	9550			
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			
0200-0250		Deutsche Welle, West Germany	5995	6035	7285	9615
			9690			
0200-0250		Radio Baghad, Iraq	6110			
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	T-S	KUSW, Salt Lake City, Utah	11680			
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	T-A	Radio Canada Int'l, Montreal	5960	9755		
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 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	6010	9580	9615	
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		Voice of America, Washington	5995	6130	7205	9650
			9740	9775	9815	11580
			15205			
0200-0300		Voice of Asia, Taiwan	7285			

West Coast

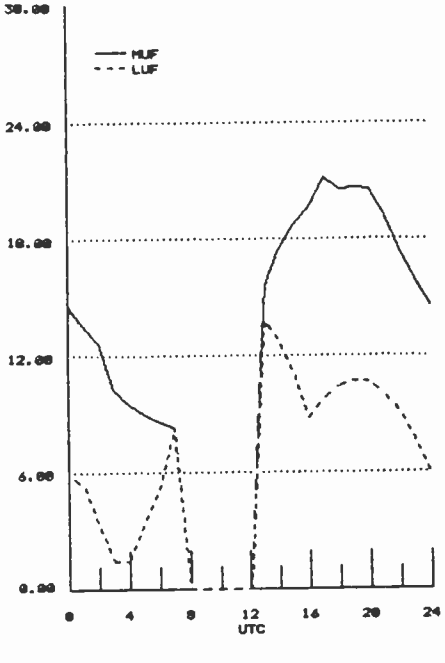
West Africa



East Africa



Central Africa



frequency SECTION

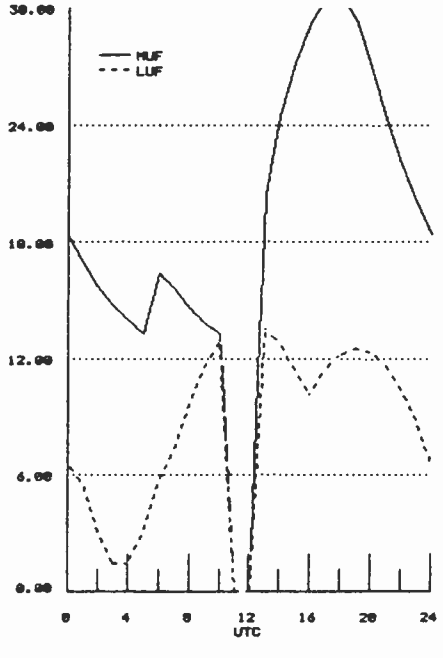
0200-0300	Voice of Free China, Taiwan	5950	5985	7445	9555
		9755	11740	11745	11860
		15345			
0200-0300	Voice of Kenya, Nairobi	6045			
0200-0300	WCSN, Boston, Massachusetts	9852.5			
0200-0300	WHRI, Noblesville, Indiana	7400			
0200-0300	WRNO, New Orleans, Louisiana	7355			
0200-0300	WYFR, Oakland, California	5950	7440	9680	
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
		7125	7325	9515	9660
		9845	9915	11955	
0230-0300	Radio Berlin Int'l, E. Germany	6080	9730		
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	
0245-0300	Radio Berlin Int'l, E. Germany	6125	6165		

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

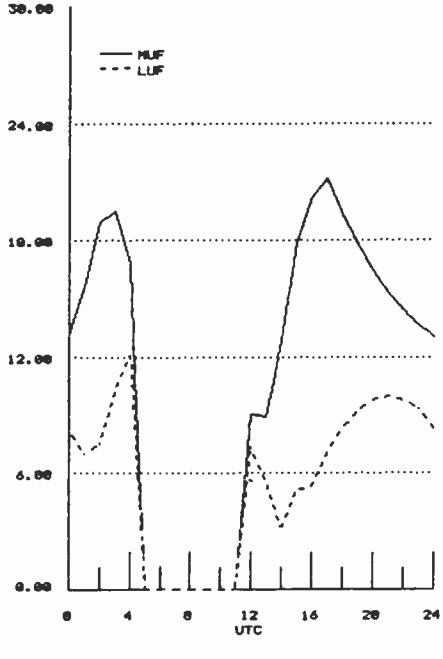
0300-0307	Radio Pakistan, Islamabad	5090	5930	7095	
0300-0310	CBC Northern Quebec Service	6195	9625		
0300-0315	BBC, London, England	3955	5975	6005	6050
		6105	6120	6155	6175
		6195	7125	7160	7185
		7210	7325	9410	9515
		9600	9660	9915	11740
		11955	15380		
0300-0325	Radio Budapest, Hungary	6025	6110	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	Radio Kiev, Ukraine, USSR	6200	7165	7400	11790
		13645	15180		
0300-0330 S,M	WINB, Red Lion, Pennsylvania	15145			
0300-0345	Radio Berlin Int'l, E. Germany	6080	9560		
0300-0345 A	Radio New Zealand, Wellington	15150	17705		
0300-0350	Deutsche Welle, West Germany	6010	6045	9545	9605
		9700			
0300-0355	Radio Beijing, PR China	9645	9770	11715	11980
		15455			
0300-0355	Radio Polonia, Warsaw, Poland	6095	6135	7145	7270
		9525	11815	15120	
0300-0400	(US) Armed Forces Radio and TV	6030	11730		
0300-0400	CBN, St. John's, Newfoundland	6160			
0300-0400	CBU, Vancouver, British Colombia	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 Colombia	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-S	KUSW, Salt Lake City, Utah	9755			
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
0300-0400	Radio for Peace, Costa Rica	7375			
0300-0400	Radio Havana Cuba	6115	6140		

West Coast

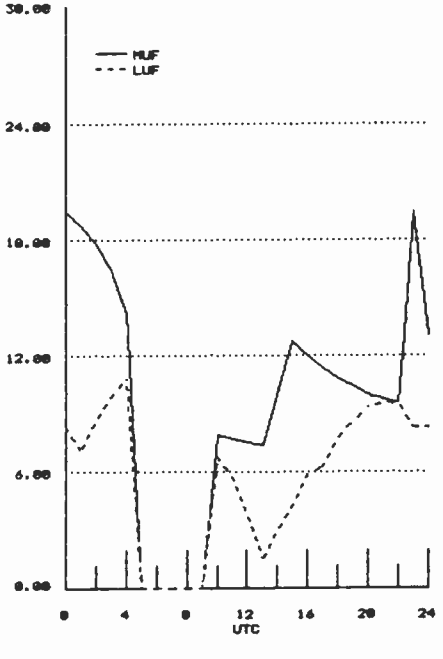
South Africa



Indian Ocean



Central & South Asia



frequency SECTION

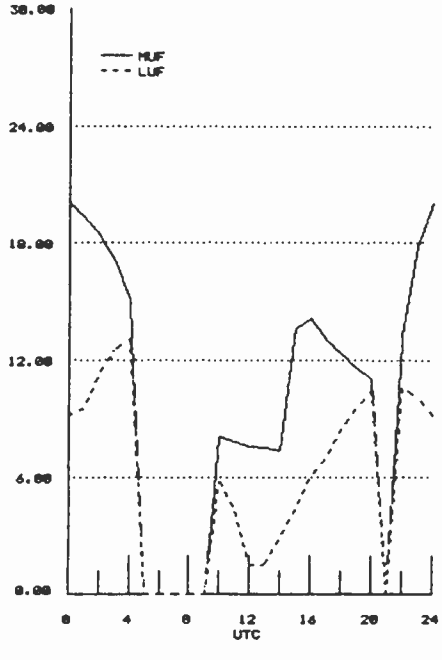
0300-0400		Radio Japan, Tokyo	5960	117810	17845	
0300-0400		Radio Moscow, USSR	5915	5940	6000	6045
			6045	6070	7115	7150
			7260	7310	9580	12050
0300-0400		Radio Prague, Czechoslovakia	5930	6055	7345	9540
			9630	9740	11990	
0300-0400		Radio RSA, South Africa	6010	9580	9615	11730
0300-0400		Radio Thailand, 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		Trans World Radio, Bonaire	9535			
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	9852.5			
0300-0400		WHRI, Noblesville, Indiana	7400			
0300-0400		WRNO, New Orleans, Louisiana	7355			
0300-0400		WYFR, Oakland, California	5950	7440	9680	
0310-0330		Red Cross Beasting, Switzerland	6135	9725	9885	12035
			[3-1, 3-4, & 3-29 only]			
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	6175	6195
			6120	7185	9410	9570
			9600	11955		
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	11940	15435	17890	
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	
0350-0400		Radio Yerevan, Armenia, USSR	11790	13645	15180	
0350-0400		RAI, Rome, Italy	9710	11905	15330	

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

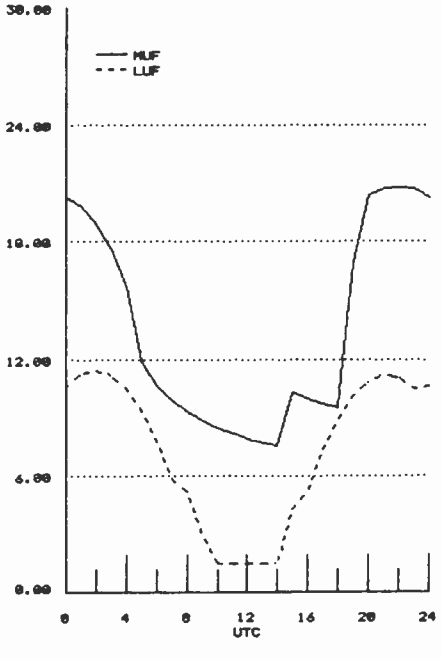
0400-0405		Radio Uganda, Kampala	4976	5026		
0400-0410		Radio Thailand, Bangkok	9655	11905		
0400-0410		RAI, Rome, Italy	9710	11905	15330	
0400-0415	W,A	Radio Budapest, Hungary	6025	6110	9520	9585
			9835	11910		
0400-0420	T-S	Radio Zambia, Lusaka	3345	6165		
0400-0425		Radio Netherland, Hilversum	7210	9850		
0400-0430		BBC, London, England	5975	6005	6120	6155
			6175	7105	7185	9600
0400-0430		La Voz Evangelica, Honduras	4820			
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		
0400-0450		Voice of Turkey, Ankara	9445	17760		
0400-0455		Radio Beijing, PR China	9645	11980		
0400-0455		RAE, Buenos Aires, Argentina	9690	11710		

West Coast

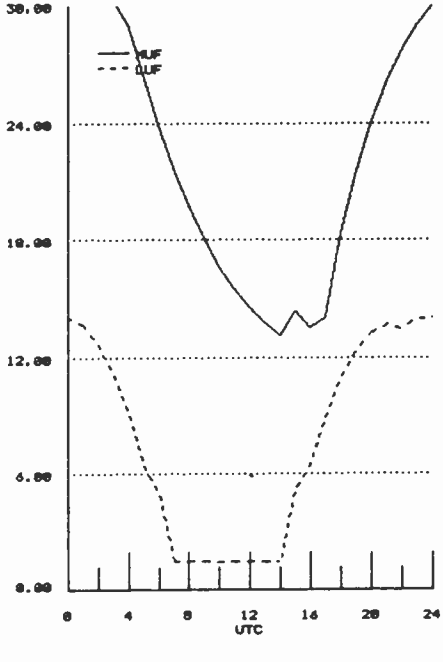
South East Asia



Far East



Pacific



frequency SECTION

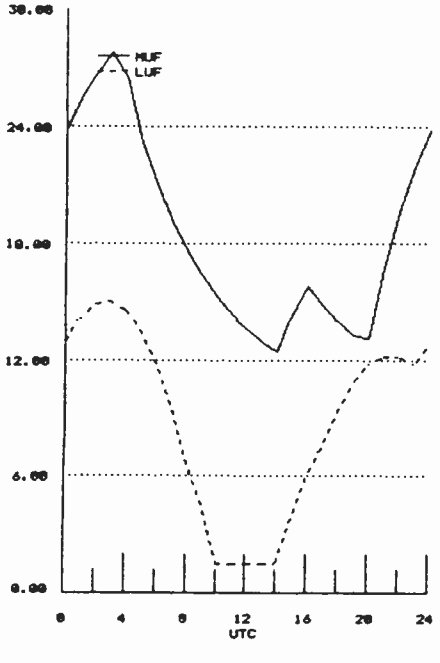
0400-0500		(US) Armed Forces Radio and TV	6030	11730		
0400-0500		CBC Northern Quebec Service	6195	9625		
0400-0500		CBN, St. John's, Newfoundland	6160			
0400-0500		CBU, Vancouver, British Colombia	6160			
0400-0500		CFCF, Montreal, Quebec	6005			
0400-0500		CFCN, Calgary, Alberta	6030			
0400-0500		CHNS, Halifax, Nova Scotia	6130			
0400-0500		CKWX, Vancouver, British Colombia	6080			
0400-0500		CFRB, Toronto, Ontario	6070			
0400-0500		HCJB, Quito, Ecuador	6230	9720	11775	
0400-0500		(US) Far East Network, Tokyo	3910			
0400-0500		FEBC, Manila, Philippines	11850			
0400-0500	T-S	KUSW, Salt Lake City, Utah	9755			
0400-0500		Radio Australia, Melbourne	11910	11945	15160	15240
			15320	17715	17795	
0400-0500		Radio Moscow, USSR	5940	6000	6140	6150
			6160	7150	7165	7310
			7345	9490	12050	
0400-0500		Radio New Zealand, Wellington	11780	15150		
0400-0500		Radio RSA, South Africa	5980	7270	9580	
0400-0500		Radio Sofia, Bulgaria	7115	9560	9595	11735
0400-0500		SBC Radio One, Singapore	5010	5052	11940	
0400-0500		Spanish Foreign Radio, Madrid	6125			
0400-0500		United Nations Radio (?)	4820			
0400-0500		Voice of America, Washington	5995	6035	7280	9525
			9575	11835		
0400-0500		Voice of Kenya, Nairobi	6045			
0400-0500		WHRI, Noblesville, Indiana	7400			
0400-0500	M-A	WMLK, Bethel, Pennsylvania	9455			
0400-0500		WRNO, New Orleans, Louisiana	6185			
0400-0500		WYFR, Oakland, California	5950	7355	9680	
0425-0440		RAI, Rome, Italy	5980	7275		
0430-0455		Radio Austria Int'l, Vienna	6000	6015	6075	15410
0430-0500		Deutsche Welle, West Germany	6065	7150	7225	9565
			9765			
0430-0500		Radio Berlin Int'l, E. Germany	6080	9560		
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	11700	
0445-0500		Radio Berlin Int'l, E. Germany	5965	9620	11920	
0450-0500		Radio Havana Cuba	5965	6035	6140	

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

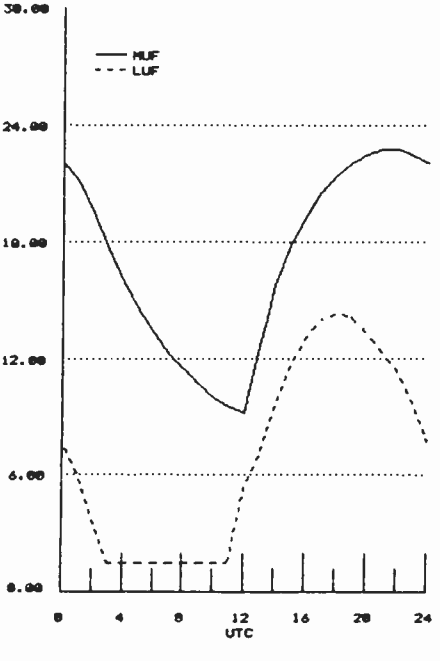
0500-0510		CBC Northern Quebec Service	6195			
0500-0510		Radio Lesotho, Maseru	4800			
0500-0510	M-A	Radio Zambia, Lusaka	3345	6165		
0500-0515		Deutsche Welle, West Germany	6065	7150	7225	9565
			9765			
0500-0515		Kol Israel, Jerusalem	7355	7462	9385	9435
			9460	11655	11700	17615
0500-0515		Radio Berlin Int'l, E. Germany	6080	9560		
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		Radio Berlin Int'l, E. Germany	5965	9620	11920	
0500-0530	M	Radio Norway Int'l, Oslo	6015	11735	11865	
0500-0530		Radio RSA, South Africa	5980	7270	9580	
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	5975	6005	6155	6180
			6195	7105	7185	9510
			9600			
0500-0600		CBC Northern Quebec Service	6160			
0500-0600		CBU, Vancouver, British Colombia	6160			
0500-0600		CFCF, Montreal, Quebec	6005			
0500-0600		CFCN, Calgary, Alberta	6030			

West Coast

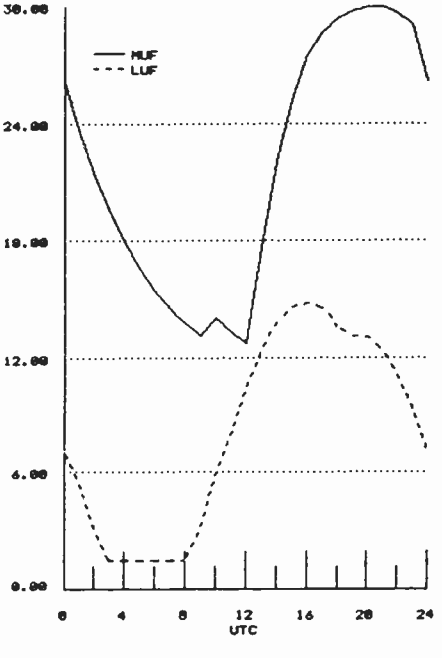
Australia & Malaysia



Central America/Carribean



South America



frequency SECTION

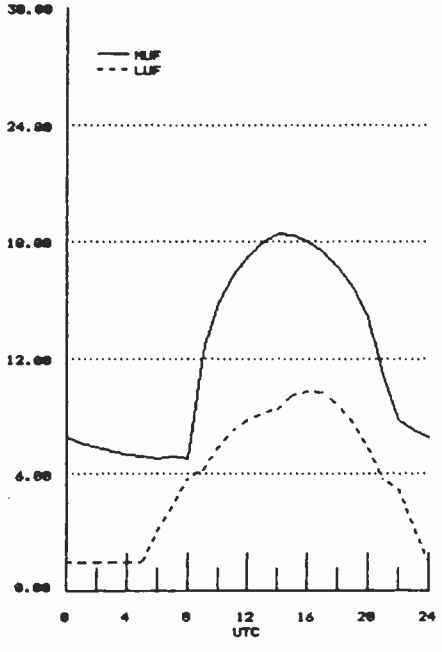
0500-0600		CHNS, Halifax, Nova Scotia	6130			
0500-0600		CKWX, Vancouver, British Colombia	6080			
0500-0600		CFRB, Toronto, Ontario	6070			
0500-0600		(US) Far East Network, Tokyo	3910			
0500-0600		FEBC, Manila, Philippines	11850			
0500-0600		HCJB, Quito, Ecuador	6230	9720	11775	
0500-0600	T-S	KUSW, Salt Lake City, Utah	9755			
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			
0500-0600		Radio Moscow, USSR	5915	5940	6095	6105
			6150	6190	7105	7165
			7240	7310	7345	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	Swaziland Commercial Radio	6155	9705		
0500-0600		Voice of America, Washington	3990	5995	6035	6125
			7280	9530		
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	6065		
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	
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]

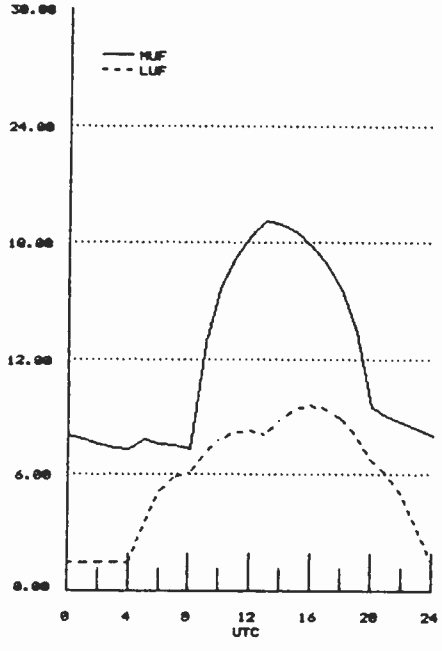
0600-0615		Radio Ghana, Accra	3366	4915		
0600-0615	M-A	Radio Zambia, Lusaka	6165	7235		
0600-0620		Vatican Radio, Vatican City	6185	9645		
0600-0625		Radio Netherlands, Hilversum	6165	9715		
0600-0630		Laotian National Radio	7113			
0600-0630		Radio Australia, Melbourne	11910	11945	15160	15240
			15315	15395	17715	17750
			17795			
0600-0630		Trans World Radio, Swaziland	5055	6070	7210	
0600-0630		Voice of Kenya, Nairobi	6045			
0600-0645		HCJB, Quito, Ecuador	6230	9720	11775	
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	9600	9640	
0600-0700		CBC Northern Quebec Service	6195			
0600-0700		CBU, Vancouver, British Colombia	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 Colombia	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	S	KUSW, Salt Lake City, Utah	6135			

East Coast

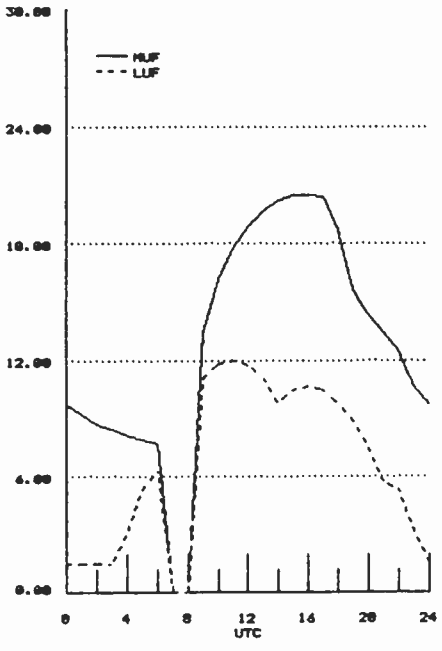
West Europe



East Europe



Middle East



frequency SECTION

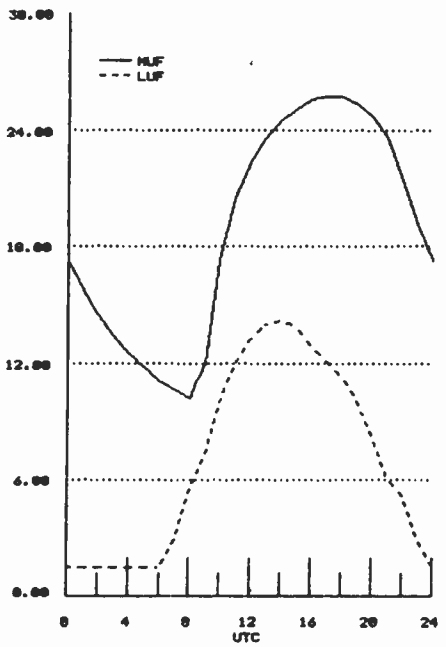
0600-0700		Radio Havana Cuba	6035	6190	9525	
0600-0700		Radio Korea, Seoul, South Korea	6060	7275	9570	
0600-0700		Radio Kuwait	15345			
0600-0700		Radio Moscow, USSR	5915	5925	5940	6105
			6150	6190	7165	7290
			7310			
0600-0700		Radio New Zealand, Wellington	11780	15150		
0600-0700	A,S	Radio Thailand, Bangkok	9655	11905		
0600-0700	S	Radio Zambia, Lusaka	11880			
0600-0700		SBC Radio One, Singapore	5010	5052	11940	
0600-0700		Voice of America, Washington	6035	6060	6080	6125
			7200	7280		
0600-0700		Voice of Asia, Taiwan	7285			
0600-0700		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	
0600-0700		Voice of Nigaria, Lagos	15185			
0600-0700		WCSN, Boston, Massachusetts	7365			
0600-0700		WHRI, Noblesville, Indiana	6100	7400		
0600-0700	M-A	WMLK, Bethel, Pennsyvlania	9455			
0600-0700		WYFR, Oakland, California	5950	6065	7355	
			9852.5			
0615-0630	M-F	Radio Canada Int'l, Montreal	6050	6140	7155	9740
			9760	11840	15235	
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	9720	11775	
0645-0700		Radio Berlin Int'l, E. Germany	15240	17880	21465	21540
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]

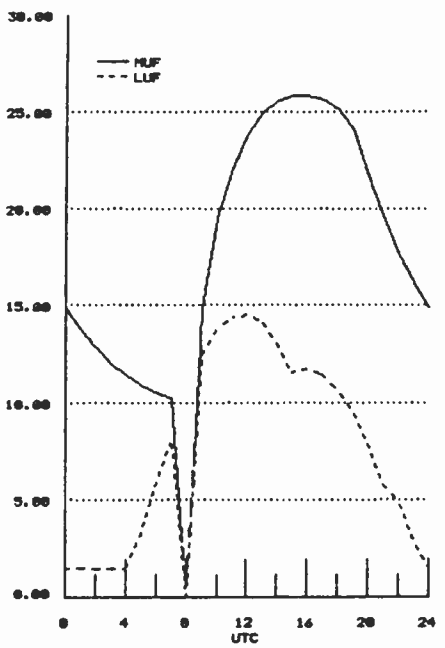
0700-0703		Port Moresby, Papua New Guinea	3925	4890	5960	5985
			6020	6040	6080	6140
			9520			
700-0710		Radio Bucharest, Romania	11940	15250	15335	17790
			17805	21665		
0700-0710		Radio Sierra Leone, Freetown	5980			
0700-0715		Radio Ghana (HS), Freetown	3366	4915		
0700-0730		BBC, London, England	5975	7150	7180	9640
0700-0730		Burma Bcasting Service, Rangoon	9730			
0700-0730		Radio Berlin Int'l, E. Germany	15240	17880	21465	21540
0700-0730		Radio New Zealand, Wellington	11780	15150		
0700-0730	S	Radio Zambia, Lusaka	11880			
0700-0745		Radio Berlin Int'l, E. Germany	5965	11810		
0700-0745		WYFR, Oakland, California	6065	7355	9852.5	
0700-0750		Radio Pyongyang, North Korea	13750	15340		
0700-0800		CBU, Vancouver, British Colombia	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	9745	9860
			11835	11925		
0700-0800		King of Hope, South Lebanon	6215			

East Coast

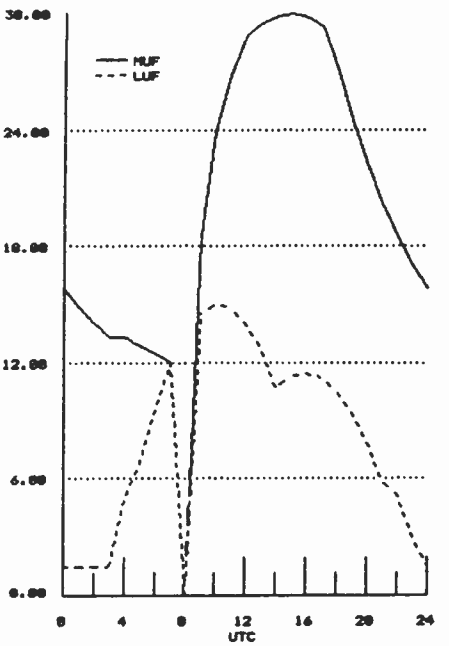
West Africa



Central Africa



East Africa



frequency SECTION

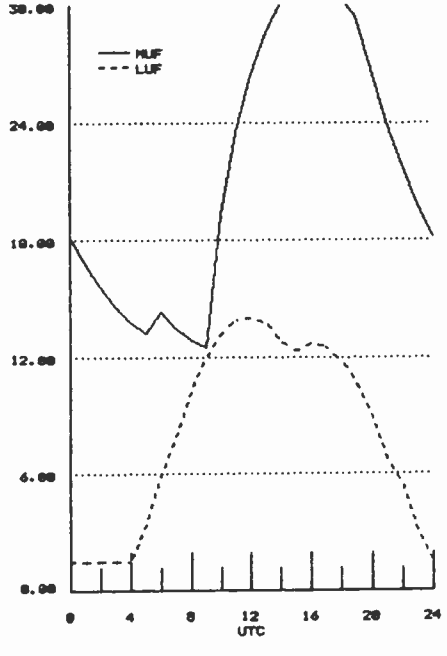
0700-0800	S	KUSW, Salt Lake City, Utah	6135				
0700-0800		Radio Australia, Melbourne	5995	9655	9845	15160	
			15395	17715	17750		
0700-0800		Radio Ghana, Accra	6130				
0700-0800		Radio Havana Cuba	9505				
0700-0800		Radio Japan, Tokyo	5990	15195	15235	17810	
			21695				
0700-0800		Radio Kuwait	15345				
0700-0800		Radio Moscow, USSR	5905	6020	6095	6150	
			6160	6190	7290	7345	
0700-0800	A,S	Radio Thailand, Bangkok	9655	11905			
0700-0800		Trans World Radio, Swaziland	6070	9725			
0700-0800		Voice of Free China, Taiwan	5985				
0700-0800	A,S	Voice of Kenya, Nairobi	7270				
0700-0800		Voice of Malaysia, Kuala Lumpur	6175	9750	15295		
0700-0800		Voice of Nigeria, Lagos	15120	15185			
0700-0800		WCSN, Boston, Massachusetts	7365				
0700-0800		WHRI, Noblesville, Indiana	6100	7400			
0700-0800		WYFR, Oakland, California	11580				
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]			
0730-0735		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		
0740-0757		Red Cross Broadcasting Service	9560	9885	17830	21695	
			(3-3, 3-28, & 3-31 only)				
0745-0800		Radio Prague, Czechoslovakia	6055	7345	9505		

0800 UTC 3:00 AM EST/12:00 AM PST]

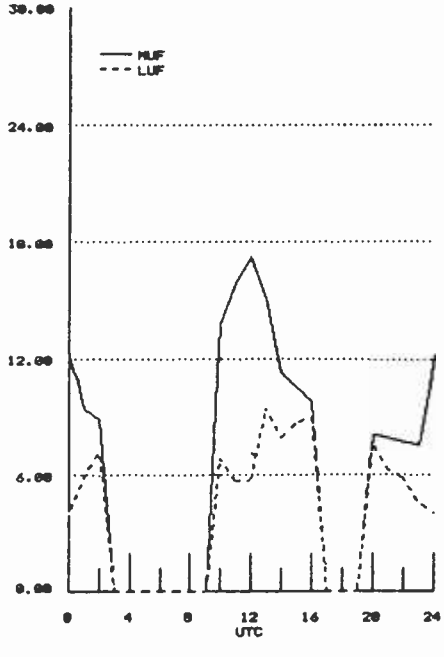
0800-0805	M-F	Port Moresby, Papua New Guinea	3925	4890	5960	5985	
			6020	6040	6080	6140	
			9520				
0800-0805		Soloman Islands Broadcasting Corp	9545				
0800-0815	M-A	Radio Zambia, Lusaka	6165	7235			
0800-0825	M-F	BRT, Brussels, Belgium	9860	21810			
0800-0825		Radio Netherland, Hilversum	9630	9715			
0800-0825		Voice of Malaysia, Kuala Lumpur	6175	9750	15295		
0800-0830		HCJB, Quito, Ecuador	6130	9860	11835		
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	7150	7180	9600	9640	
0800-0900		CBN, St. John's, Newfoundland	6160				
0800-0900		CBU, Vancouver, British Colombia	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 Colombia	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				

East Coast

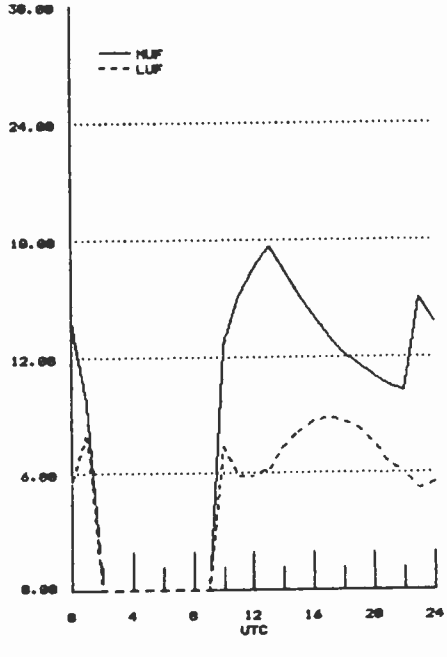
South Africa



Central & South Asia



Southeast Asia



frequency SECTION

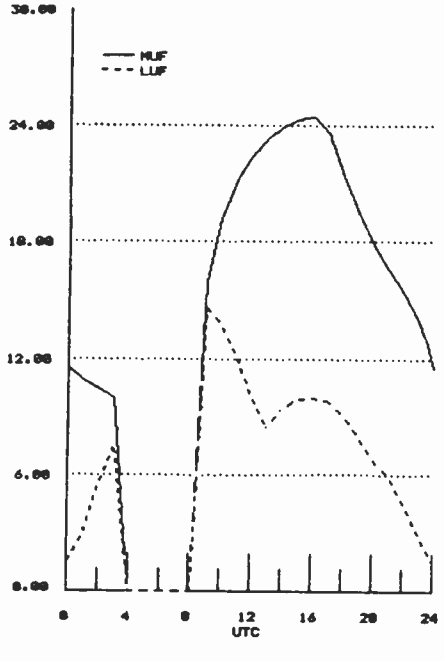
0800-0900		KTWR, Guam	11805			
0800-0900	S	KUSW, Salt Lake City, Utah	6135			
0800-0900		Radio Australia, Melbourne	9710	11720	15395	17715
			17750			
0800-0900		Radio Korea, Seoul, South Korea	7550			
0800-0900		SBC Radio One, Singapore	5010	5052	11940	
0800-0900		Trans World Radio, Monte Carlo	7105			
0800-0900		Voice of Indonesia, Jakarta	11790	15105		
0800-0900	A,S	Voice of Kenya, Nairobi	7270			
0800-0900		Voice of Nigaria, Lagos	7255	15185		
0800-0900		WCSN, Boston, Massachusetts	7355			
0800-0900		WYFR, Oakland, California	11580			
0805-0900		KTWR, Agana, Guam	11805			
0815-0830	S	Radio Austria Int'l, Vienna	6155	11915	15410	15415
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]			
0815-0900	A,S	Radio Berlin Int'l, E. Germany	6040	7185	9730	21465
			21540			
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 Bcasting Service, Thimpu	6035			
0830-0900		FEBC, Manila, Philippines	11850	15350		
0830-0900		Radio Beijing, China	9700	11755	15440	
0830-0900		Radio Netherland, Hilversum	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 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]

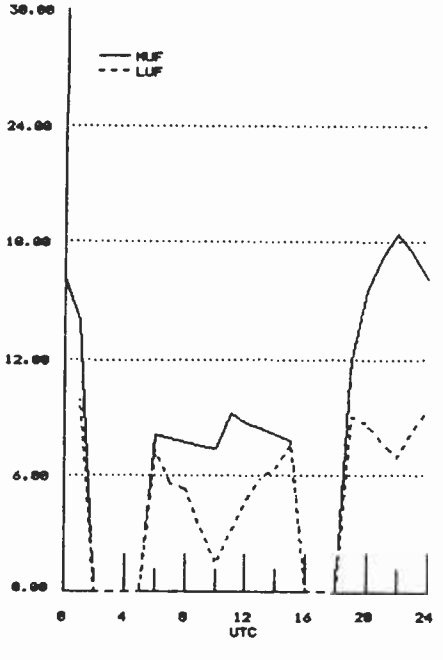
0900-0905		Africa No. 1, Gabon	7200	15200		
0900-0910		All India Radio, New Delhi	5960	5990	6010	6020
			6050	6065	6100	6140
			7110	7140	7150	7160
			7250	7280	7295	9610
			11850	15235	15250	17705
0900-0910		Port Mresby, Papua New Guinea	3295	4890	5960	5985
			6020	6040	6080	6140
			9520			
0900-0910		Voice of Lebanon, Beirut	6548			
0900-0930		FEBC, Manila, Philippines	11850	15350		
0900-0930		KTWR, Agana, Guam	11805			
0900-0930		Radio Beijing, China	9700	11755	15440	
0900-0930		Radio Netherland, Hilversum	21485			
0900-0930	A,S	Radio Prague, Czechoslavkia	11685	17840	21705	
0900-0950		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	9720	9740	
0900-1000		CFCF, Montreal, Quebec	6005			
0900-1000		CFCN, Calgary, Alberta	6030			
0900-1000		CHNS, Halifax, Nova Scotia	6130			
0900-1000		CKWX, Vancouver, British Colombia	6080			
0900-1000		CFRB, Toronto, Ontario	6070			
0900-1000		(US) Far East Network, Tokyo	3910			
0900-1000		HCJB, Quito, Ecuador	6130			

East Coast

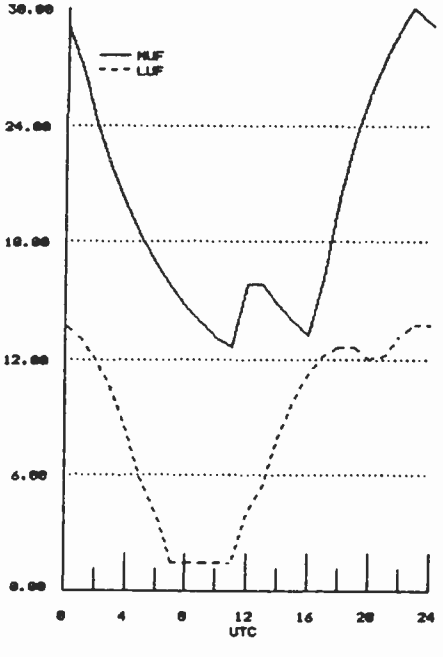
Indian Ocean



Far East



Pacific



frequency SECTION

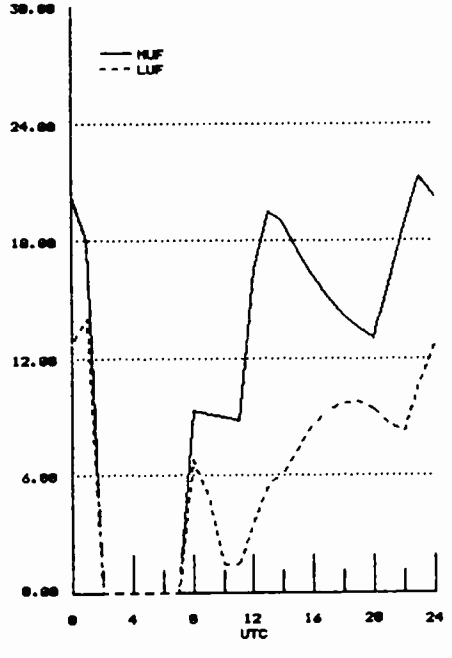
0900-1000		King of Hope, South Lebanon	6215			
0900-1000		KNLS, Anchor Point, Alaska	6150			
0900-1000		KTWR, Guam	11805			
0900-1000	S	KUSW, Salt Lake City, Utah	6135			
0900-1000		Radio Afghanistan, Kabul	4450	6085	15435	17720
0900-1000		Radio Australia, Melbourne	5995	6080	9580	9655
			9710	9760	11720	15415
0900-1000		Radio Japan, Tokyo	11840	15235	17810	
0900-1000		Radio Moscow, USSR	5905	6020	6095	7345
0900-1000	S	Radio Prague, Czechoslovakia	6055	7345	9505	[ML]
0900-1000		Radio Tanzania, Dar es Salaam	7165			
0900-1000		SBC Radio One, Singapore	5010	5052	11940	
0900-1000		Trans World Radio, Monte Carlo	7105			
0900-1000		Voice of Kenya, Nairobi	7270			
0900-1000		Voice of Nigeria, Lagos	7255	15120	15185	
0900-1000		WHRI, Noblesville, Indiana	7355			
0915-0950	M-A	Radio Ulan Bator, Mongolia	9615	12015		
0930-0935		All India Radio, New Delhi	5960	5990	6010	6020
			6050	6065	6100	6140
			7110	7140	7160	7250
			7280	7295	9610	11850
			15235	15250	17705	
0930-0940	M-F	Radio Canada Int'l, Montreal	5960	9755		
0930-0945		BBC, London, England*	9725	11955		
0930-0955		Radio Finland, Helsinki	6120	15245	17860	
0930-1000		CBN, St. John's, Newfoundland	6160			
0930-1000		KTWR, Agana, Guam	11805			
0930-1000		Radio Beijing, China	9700	11755	15440	
0930-1000		Radio Sweden Int'l, Stockholm	9630	15390		
0945-1000		BBC, London, England*	5995	7180	9725	11955
0945-1000		Radio Berlin Int'l, E. Germany	21540			
0945-1000	M-A	Radio Prague, Czechoslovakia	6055	7345	9505	

1000 UTC [5:00 AM EST/2:00 AM PST]

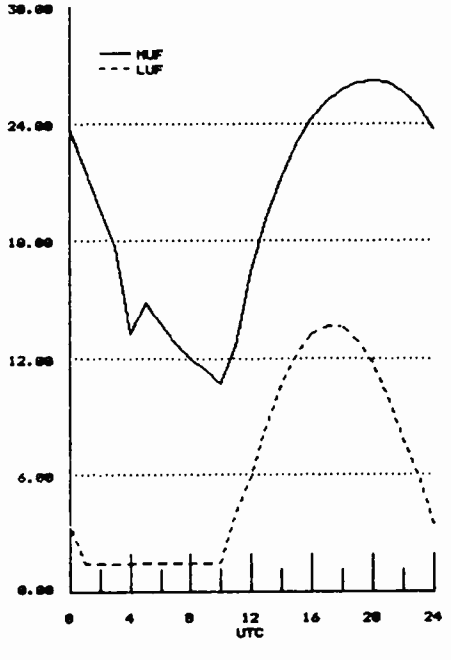
1000-1025	M-F	BRT, Brussels, Belgium	17595	21810		
1000-1030		Deutsche Welle, West Germany	7225	9735	17765	21600
1000-1030		HCJB, Quito, Ecuador	6130	9745	11925	
1000-1030		Radio Afghanistan, Kabul	4450	6085	15435	17720
1000-1030		Radio Beijing, China	9700	11755	15440	
1000-1030		Radio Berlin Int'l, E. Germany	21540			
1000-1030	S	Radio Norway Int'l, Oslo	9590	15180	15235	17780
			21730			
1000-1030		Radio Tanzania, Dar es Salaam	7165			
1000-1030		Swiss Radio Int'l, Berne	9560	9885	17830	21695
1000-1030		Voice of Ethiopia, Addis Ababa	9560			
1000-1030		Voice of Vietnam, Hanoi	9840	12020		
1000-1055	A	Trans World Radio, Monte Carlo	7105			
1000-1100		ABC, Alice Springs, Australia	2310	[ML]		
1000-1100		ABC, Katherine, Australia	2485			
1000-1100		ABC, Tennant Creek, Australia	2325	[ML]		
1000-1100		All India Radio, New Delhi	11860	11920	15130	15335
			17387	117875		
1000-1100		BBC, London, England	6190	6195	9515	11775
1000-1100		CBN, St. John's, Newfoundland	6160			
1000-1100		CFCF, Montreal, Quebec	6005			
1000-1100		CFCN, Calgary, Alberta	6030			
1000-1100		CHNS, Halifax, Nova Scotia	6130			
1000-1100		CKWX, Vancouver, British Colombia	6080			
1000-1100		CFRB, Toronto, Ontario	6070			
1000-1100		(US) Far East Network, Tokyo	3910			
1000-1100		KNLS, Anchor Point, Alaska	6150			
1000-1100		KTWR, Agana, Guam	11805			
1000-1100		KUSW, Salt Lake City, Utah	6135			
1100-1200		Radio Australia, Melbourne	9580	9655	9770	15415
1000-1100		Radio New Zealand, Wellington	9540	11780		
1000-1100	S	Radio Prague, Czechoslovakia	6055	7345	9505	[ML]
1000-1100		SBC Radio One, Singapore	5010	5052	11940	
1000-1100		Voice of Kenya, Nairobi	7270			

East Coast

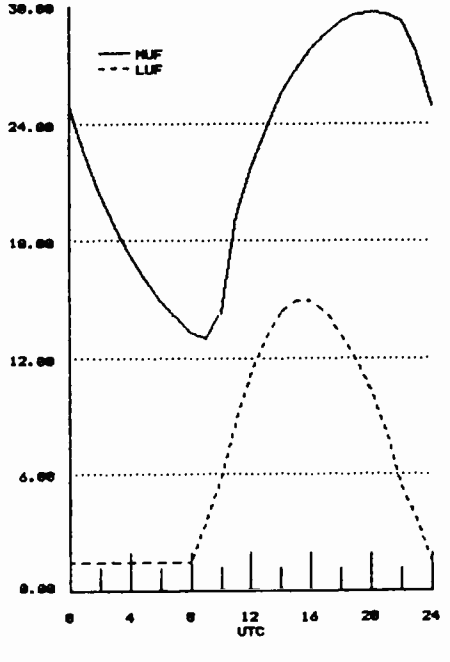
Australia & Malaysia



Central America/Carribean



South America



frequency SECTION

1000-1100		Voice of Nigeria, Lagos	7255	15120		
1005-1010		Radio Pakistan, Islamabad	15606	17660		
1030-1040		Voice of Asia, Taiwan	5980			
1030-1055		Radio Budapest, Hungary	9835	11910	17710	17780
			21525			
1030-1100		HCJB, Quito, Ecuador	6130	11925		
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	M-A	Voice of Greece, Athens	11645	15630		
1040-1057		Red Cross Broadcasting Service	9885	11935	15570	17830
			(3-3, 3-28 & 3-31 only)			
1045-1055	M-A	Radio Bucharest, Romania	9690	11940	15405	
1045-1100	M-A	Radio Prague, Czechoslovakia	6055	7345	9505	
1055-1100	S	Trans World Radio, Monte Carlo	7105			

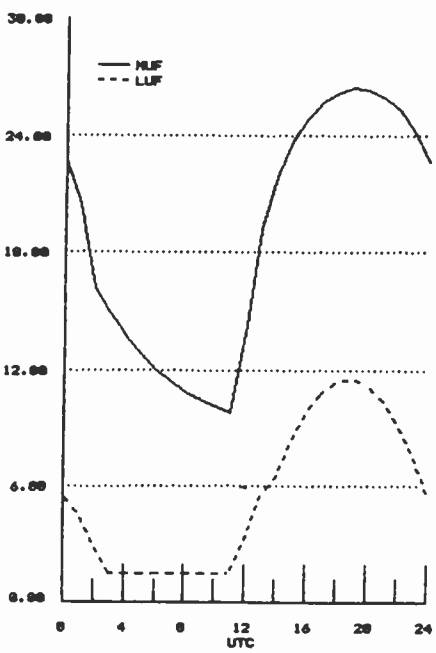
1100 UTC [6:00 AM EST/3:00 AM PST]

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		Kol Israel, Jerusalem	9385	11700	15485	15640
			15650	17635	17685	21625
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		Red Cross Broadcasting Service	7210	(3-27-88 only)		
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		(US) Armed Forces Radio and TV	6030	6125	15430	
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 Colombia	6080			
1100-1200		CFRB, Toronto, Ontario	6070			
1100-1200		(US) Far East Network, Tokyo	3910			
1100-1200	S	KUSW, Salt Lake City, Utah	9850			
1100-1200		Radio Australia, Melbourne	5995	6060	9580	9645
			9710	9770	11705	11800
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	9580	15225		
1100-1200	A,S	Radio Tanzania, Dar es Salaam	7165			
1100-1200	S	Radio Zambia, Lusaka	11880	[IRR]		
1100-1200		Voice of America, Washington	5975	6160	9590	
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			
1100-1200		WYFR, Oakland, California	5950			
1110-1120	M-F	Radio Botswana, Gaborone	4820	5955	7255	
1115-1125		Radio France Int'l, Paris	6175	9790	9805	11670
			11700	11845	15155	15195
			15300	15315	15435	17620
			17850	21620		

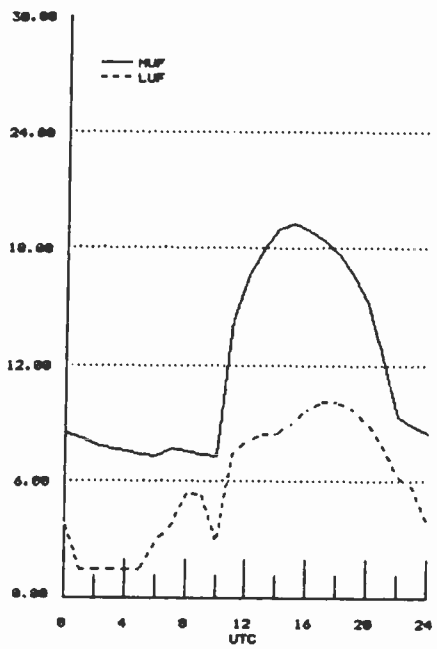
East Coast

Midwest

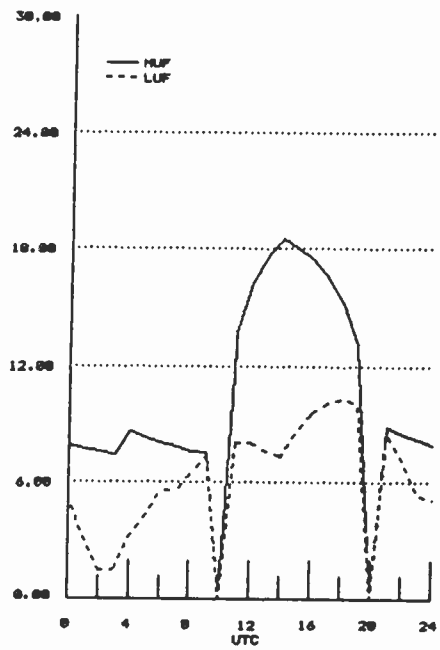
West Coast



West Europe



East Europe



frequency SECTION

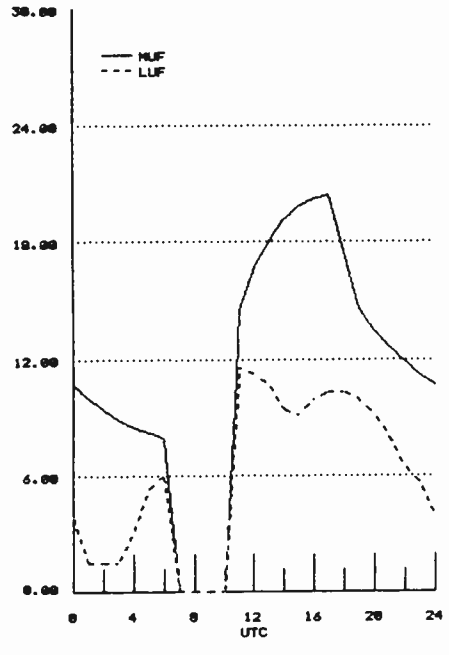
1115-1130		Radio Korea, Seoul, South Korea	7275	11740		
1115-1130		Vatican Radio, Vatican City	11840	21485		
1115-1145		Radio Nepal, Kathmandu	5005			
1115-1200		Trans World Radio, Bonaire	11815			
1115-1200		Voice of Islamic Republic Iran	11790			
1130-1200		Deutsche Welle, West Germany	15410	17765	17800	21600
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	
1150-1200	M-F	Radio Budapest, Hungary	9585	9835	11910	15160
			15220			

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

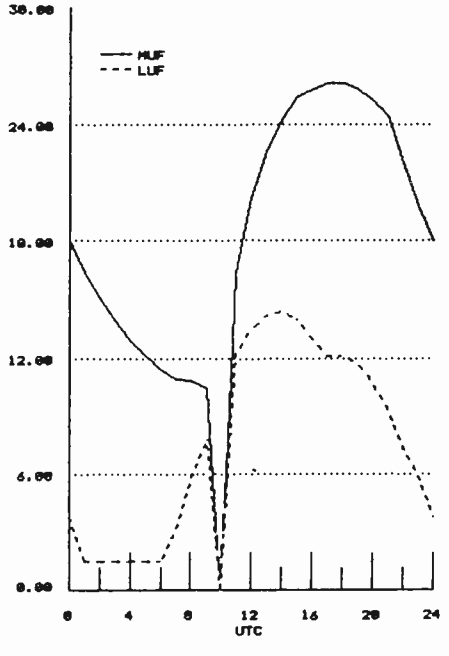
1200-1205	M-A	Port Moresby, Papua New Guinea	3295	4890	5960	6020
			6040	6080	6140	9520
1200-1215		BBC, London, England*	3915	6065	7275	
1200-1215		Radio New Zealand, Wellington	6100	9540		
1200-1215		Vatican Radio, Vatican City	15190	17865		
1200-1215		Voice of Kampuchea, Phnom-Penh	9693	11938		
1200-1220		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		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 Colombia	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	S	KUSW, Salt Lake City, Utah	9850			
1200-1300		KYOI, Saipan	11900			
1200-1300		Radio Australia, Melbourne	5995	6060	6080	7205
			7215	9580	9645	9710
			9770	11705		
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			

Midwest

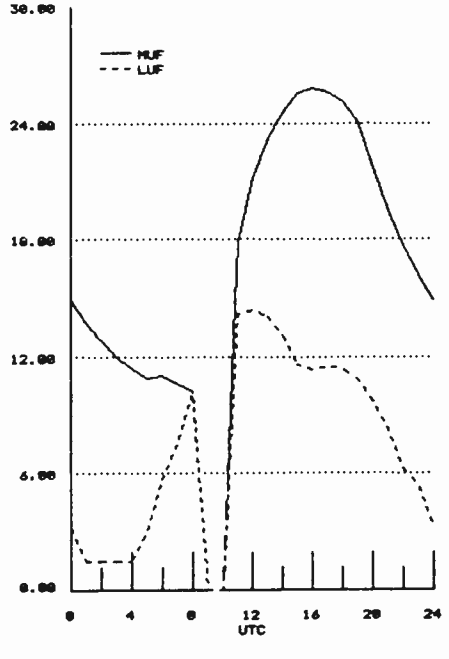
Middle East



West Africa



Central Africa



frequency SECTION

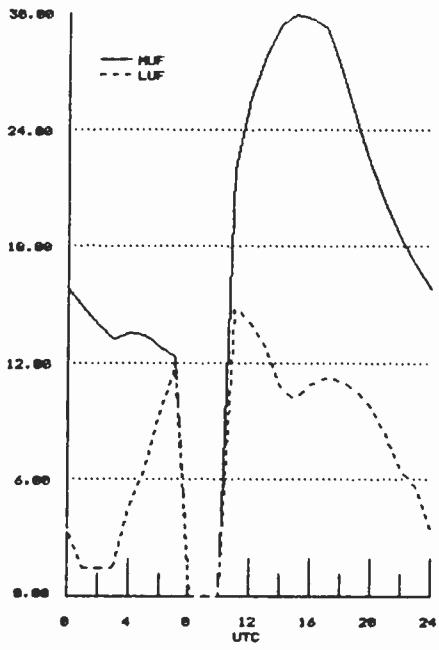
1200-1300	SBC Radio One, Singapore	5010 5052 11940
1200-1300	Trans World Radio, Bonaire	11815
1200-1300	Trans World Radio, Sri Lanka	11920
1200-1300	Voice of America, Washington	6110 9760 11715
1200-1300	Voice of Kenya, Nairobi	7270
1200-1300	Voice of Nigeria, Lagos	7255 15120
1200-1300	WCSN, Boston, Massachusetts	5980
1200-1300	WHRI, Noblesville, Indiana	5995 11715
1200-1300	WYFR, Oakland, California	5950 6175 6185
1215-1300	Radio Berlin Int'l, E. Germany	15445 17880 21465 21540
1215-1300	Radio Cairo, Egypt	17675
1230-1235	All India Radio, New Delhi	3905 4800 4920 7280 9565 9615 11620 11735 15120
1230-1245	Radio Korea, Seoul, South Korea	7275 11740
1230-1255	Radio Austria Int'l, Vienna	6155 9685 11915 15320
1230-1300	BBC, London, England*	6125 7255 6195 9635 9660 11780 12040 15270 15390 15435 17695
1230-1300	Radio Bangladesh, Dhaka	11750 15525
1230-1300	Radio Sweden, Stockholm	15190 15430
1245-1255	Radio France Int'l, Paris	9805 11670 11845 15155 15195 15300 15315 15365 21620 21645
1245-1300	Radio Berlin Int'l, E. Germany	9665 11705 11785 15170 15240

1300 UTC [8:00 AM EST/5:00 AM PST]

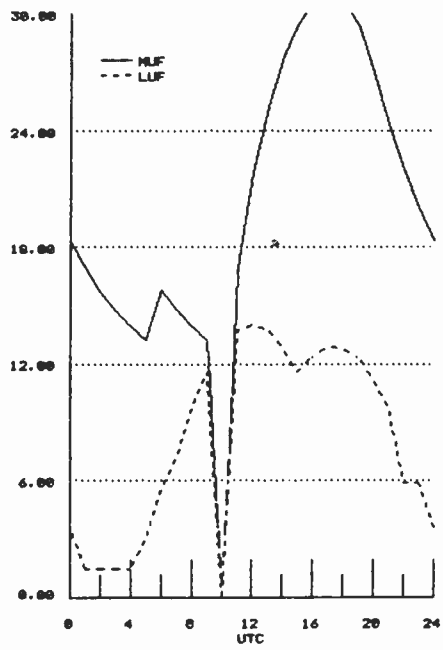
1300-1305	Port Moresby, Papua New Guinea	3295 4890 5960 5980 6020 6040 6080 6140 9520
1300-1325	Radio Bucharest, Romania	9690 11940 16405 17720
1300-1330	BBC, London, England	5965 9510 11775 12095 15070 18080
1300-1330	Radio Berlin Int'l, E. Germany	9665 11705 11785 15170 15240
1300-1330	Radio Cairo, Egypt	17675
1300-1330	Radio Finland, Helsinki	11945 15400
1300-1330	Radio Ghana, Accra	4915 7295
1300-1330 S	Radio Norway Int'l, Oslo	6035 9590 15195 15310 25730
1300-1330	Swiss Radio Int'l, Berne	6165 9535 12030
1300-1330	Trans World Radio, Sri Lanka	11920
1300-1330	Voice of Kenya, Nairobi	7270
1300-1332 A,S	Trans World Radio, Bonaire	11815
1300-1350	Radio Pyongyang, North Korea	9325 9345
1300-1355	Radio Beijing, China	7335 9530 11600 11755
1300-1400	ABC, Alice Springs, Australia	2310 [ML]
1300-1400	ABC, Katherine, Australia	2485
1300-1400	ABC, Tennant Creek, Australia	2325 [ML]
1300-1400	(US) Armed Forces Radio and TV	6030 6125 15330 15330 15430
1300-1400	CBN, St. John's, Newfoundland	6160
1300-1400	CBU, Vancouver, British Colombia	6160
1300-1400	CFCF, Montreal, Quebec	6005
1300-1400	CFCN, Calgary, Alberta	6030
1300-1400	CHNS, Halifax, Nova Scotia	6130
1300-1400	CKWX, Vancouver, British Colombia	6080
1300-1400	CFRB, Toronto, Ontario	6070
1300-1400 S	ELWA, Monrovia, Liberia	11830
1300-1400	(US) Far East Network, Tokyo	3910
1300-1400	FEBC, Manila, Philippines	11850
1300-1400	HCJB, Quito, Ecuador	11740 15115 17890
1300-1400 S	KUSW, Salt Lake City, Utah	9850
1300-1400	Radio Australia, Melbourne	5995 6060 6060 7205 9580
1300-1400 M-F	Radio Canada Int'l, Montreal	9625 11855 17820
1300-1400	Radio Jordan, Amman	9560
1300-1400	Radio Moscow, USSR	6050 7135 7185 9820 9830 11670 11840 11900 12040 13790 15225 15585

Midwest

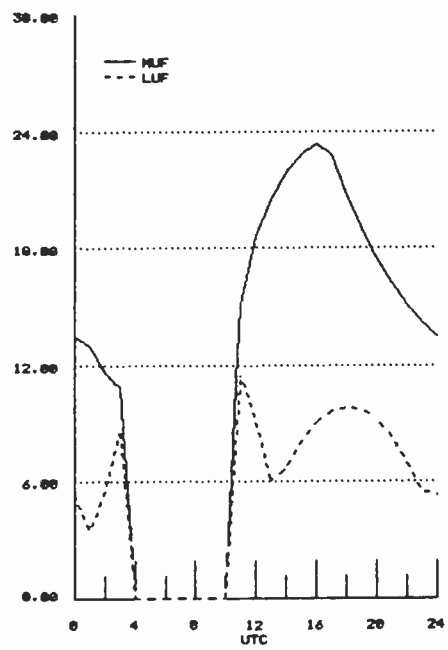
East Africa



South Africa



Indian Ocean



frequency SECTION

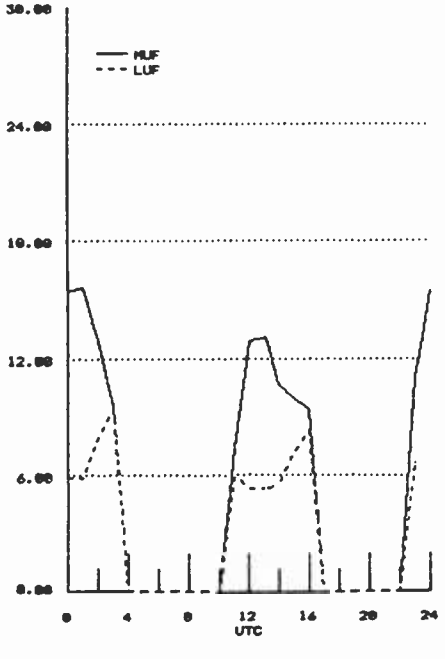
			15595	17655	17820		
1300-1400		Radio RSA, South Africa	9655	15125	17755	21590	
1300-1400		Radio SPLA (Sudanese clandestine)	4666	9550	11710		
1300-1400	A,S	Radio Tanzania, Dar es Salaam	7165				
1300-1400		SBC Radio One, Singapore	5010	5052	11940		
1300-1400		Voice of America, Washington	6110	7230	9455		
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	6175	15170	13695	
1302-1400		WYFR, Oakland, California	15055				
1305-1315		Radio France Int'l, Paris	6175	9790	9805	11670	
			11845	15155	15195	15300	
			15315	15365	17620	17720	
			17850	21645			
1310-1327		Red Cross Broadcasting Service	11695	11955	15135	15570	
			17830	21695			
			(3-3, 3-28 & 3-31 only)				
1315-1325		Voice of Lebanon, Beirut	6548				
1330-1355	M-A	BRT, Brussels, Belgium	15590	17600			
1330-1400		BBC, London, England	12095	15070			
1330-1400		All India Radio, New Delhi	9545	11810	15335		
1330-1400	M-A	Bhutan Beasting Service, Thimpu	6035				
1330-1400		Laotian National Radio	7113				
1330-1400		Radio Berlin Int'l, E. Germany	17880	21465	21540		
1330-1400		Radio Korea, Seoul, South Korea	7275				
1330-1400		Radio Tashkent, Uzbek, USSR	5945	7275	9540	9600	
			11785				
1330-1400		Swiss Radio Int'l, Berne	11695	11955	15135	15570	
			17830	21695			
1330-1400		UAE Radio, United Arab Emirates	15435	17865	21605		
1330-1400		Voice of Kenya, Nairobi	6100				
1330-1400		Voice of Turkey, Ankara	15255				
1330-1400		Voice of Vietnam, Hanoi	9840	12020			
1332-1400	A	Trans World Radio, Bonaire	11815				
1345-1400		Radio Korea, Seoul, South Korea	6135	7275	11740	15575	

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

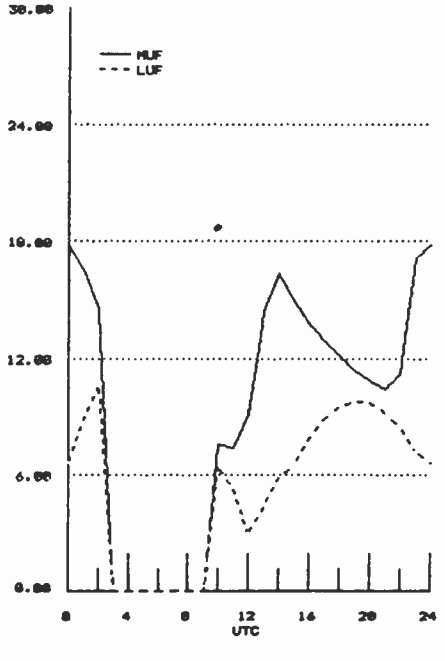
1400-1405	A	Trans World Radio, Bonaire	11815				
1400-1415		Radio Berlin Int'l, E. Germany	17880	21465	21540		
1400-1425		Radio Austria Int'l, Vienna	15320				
1400-1425		Radio Finland, Helsinki	11945	15400			
1400-1427		Voice of Nigeria, Lagos	15120				
1400-1430		ABC, Alice Springs, Australia	2310 [ML]				
1400-1430		ABC, Tennant Creek, Australia	2325 [ML]				
1400-1430	S	Radio Norway Int'l, Oslo	9530	15300	15305	15310	
1400-1430		Radio Peace and Progress, USSR	9550	9635	11835	15470	
			17560				
1400-1430		Radio Polonia, Warsaw, Poland	6095	7285			
1400-1430		Radio Sweden, Stockholm	11785	15345			
1400-1430		Radio Tirana, Albania	9500	11985			
1400-1430		Voice of Ethiopia, Addis Ababa	9550	11710			
1400-1430		Voice of Republic of Iran	15085				
1400-1450		Radio Pyongyang, North Korea	6576	11735			
1400-1455		Radio Beijing, China	11600	15165			
1400-1500		ABC, Katherine, Australia	2485				
1400-1500		ABC, Pertyh, Australia	9665				
1400-1500		Adventist World Radio, Italy	7275				
1400-1500		All India Radio, New Delhi	9545	11810	15335		
1400-1500		(US) Armed Forces Radio and TV	6125	15330	15430		
1400-1500		BBC, London, England	5995	6195	7160	9740	
			11705	12095	15070		
1400-1500		CBN, St. John's, Newfoundland	6160				
1400-1500	M-A	CBU, Vancouver, British Colombia	6160				
1400-1500		CFCF, Montreal, Quebec	6005				
1400-1500		CFCN, Calgary, Alberta	6030				
1400-1500		CHNS, Halifax, Nova Scotia	6130				
1400-1500		CKWX, Vancouver, British Colombia	6080				
1400-1500		CFRB, Toronto, Ontario	6070				
1400-1500	S	ELWA, Monrovia, Liberia	11830				
1400-1500		(US) Far East Network, Tokyo	3910				
1400-1500		FEBC, Manila, Philippines	9670	11850			

Midwest

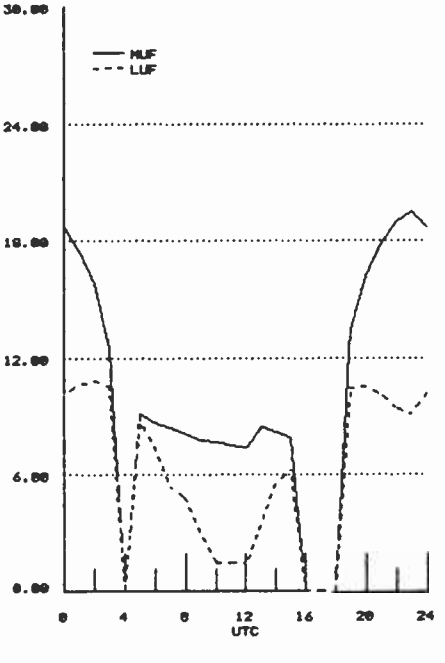
Central & South Asia



South East Asia



Far East



frequency SECTION

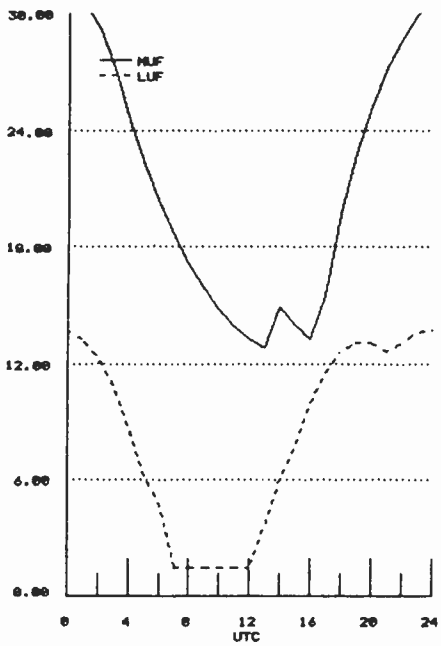
1400-1500		HCJB, Quito, Ecuador	11740	15115	17890		
1400-1500	S	KUSW, Salt Lake City, Utah	9850				
1400-1500		KYOI, Saipan	11900				
1400-1500		Radio Australia, Melbourne	5995	6035	6060	6080	
			7205	9580			
1400-1500	S	Radio Canada Int'l, Montreal	9625	11720	11955	15440	
			17820				
1400-1500		Radio 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				
1400-1500		Radio RSA, South Africa	21590				
1400-1500	A,S	Radio Tanzania, Dar es Salaam	7165				
1400-1500		SBC Radio One, Singapore	5010	5052	11940		
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		WYFR, Oakland, California	5950	6175	15170	13695	
			15055	15170	15375		
1415-1420		Radio Nepal, Kathmandu	3230	5005			
1425-1500	S	Radio Austria Int'l, Vienna	9665				
1425-1500	S	Radio Finland, Helsinki	11945	15400			
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	6280				
1430-1500		KTWR, Agana, Guam	9780				
1430-1500		Radio Australia, Melbourne	6060	7205			
1430-1500		Radio Netherland, Hilversum	5955	11735	13770	15560	
			17575				
1430-1500		Radio Prague, Czechoslovakia	9605	11685	13715	15110	
			15155	17705	21505		
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]

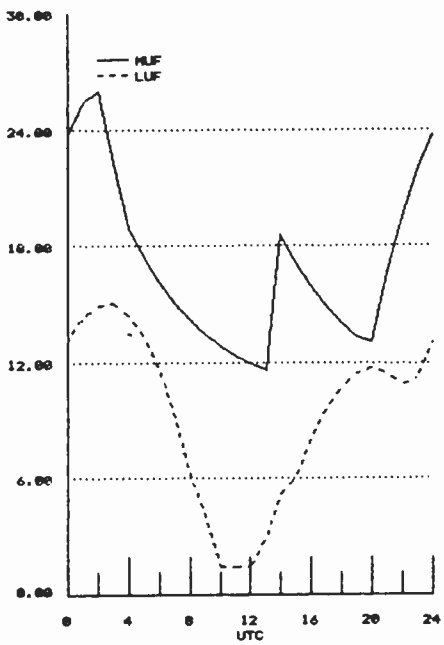
1500-1502		WYFR, Oakland, California	15055				
1500-1505		Africa No. 1, Gabon	7200	15200			
1500-1510		Vatican Radio, Vatican City	11960	15090	17870		
1500-1515		FEBA, Mahe, Seychelles	15325				
1500-1520		Radio Ulan Bator, Mongolia	9575	15305			
1500-1525		Radio Bucharest, Romania	9510	9690	11775	11940	
			15250	15335			
1500-1525		Radio Netherland, Hilversum	5955	11735	13770	15560	
			17575				
1500-1530	A,S	Radio Tanzania, Dar es Salaam	7165				
1500-1530		Radio Veritas Asia, Philippines	9770	15215			
1500-1545		WYFR, Oakland, California	5950	6175	13695	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	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	
			11750	12095	15070	15260	
			15400	15420			

Midwest

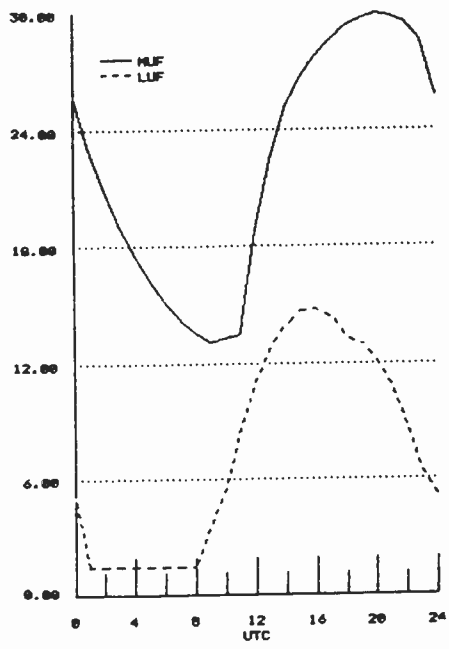
Pacific



Australia and Malaysia



South America



frequency SECTION

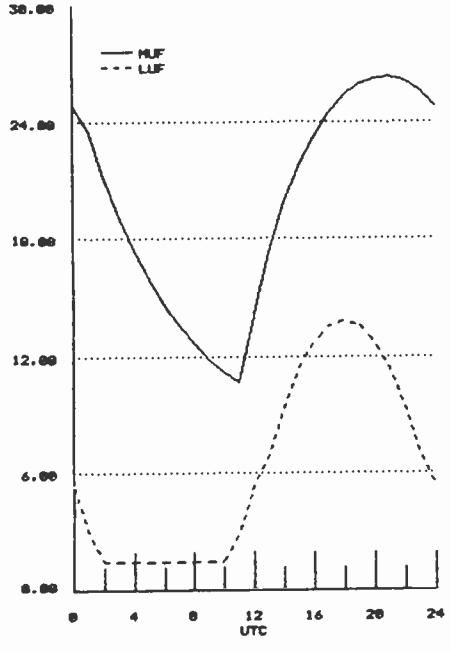
1500-1600		Burma Broadcasting Service	5985				
1500-1600		CBC Northern Quebec Service	9625	11720			
1500-1600		CBN, St. John's, Newfoundland	6160				
1500-1600		CBU, Vancouver, British Colombia	6160				
1500-1600		CFCF, Montreal, Quebec	6005				
1500-1600		CFCN, Calgary, Alberta	6030				
1500-1600		CHNS, Halifax, Nova Scotia	6130				
1500-1600		CKWX, Vancouver, British Colombia	6080				
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	S	Superpower KUSW, Utah	9850				
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	15125	17810	21590		
1500-1600		SBC Radio One, Singapore	5010	5052	11940		
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	S	WRNO, New Orleans, Louisiana	11965				
1500-1600		WYFR, Oakland, California	5950	6175	13695		
			15170				
			15375	17612			
1505-1530		Radio Finland, Helsinki	11850	15185			
1515-1600		FEBA, Mahe, Seychelles	11865	15325			
1515-1525	T,F	Radio Budapest, Hungary	6110	9585	9835	11910	
			15160				
1515-1600		Radio Berlin Int'l, E. Germany	15240	17880			
1530-1545		All India Radio, New Delhi	3905	3925	4860	6160	
			7160	7412	9545	9950	
1530-1555		Radio Austria Int'l, Vienna	6155	11780	11915		
1530-1555	M-A	Radio Budapest, Hungary	9585	9835	11910	15160	
			15220				
1530-1600		Radio Prague, Czechoslovakia	6055	7345	9605	11665	
			11685	11990	15110	13715	
			17705	21505			
1530-1600		Radio Sofia, Bulgaria	9740	11735			
1530-1600		Radio Tanzania, Dar es Salaam	9684				
1530-1600		Radio Tirana, Albania	9480	11835			
1530-1600		Radio Yugoslavia, Belgrade	7240	15240	15415		
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 Berlin Int'l, E. Germany	11785	15170	15255		
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				

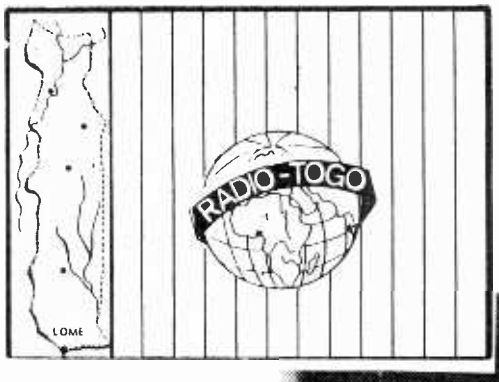
1600 UTC [11:00 AM EST/8:00 AM PST]

1600-1610		FEBA, Mahe, Seychelles	11865	15325	
1600-1610		Radio Lesotho, Maseru	4800		

Midwest

Central America/Carribean





Radio Danny of Providence, Rhode Island, and his dad are kinda proud of this card from Radio Togo.

frequency SECTION

1600-1610		SBC Radio One, Singapore	5010	5052	11940	
1600-1625		Radio Prague, Czechoslovakia	6055	7345	9605	11665
			11685	11990	15110	13715
			15110	17705	21505	
1600-1630		ELWA, Monrovia, Liberia	11830			
1600-1630		Radio Berlin Int'l, E. Germany	11785	15170	15255	
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 Sofia, Bulgaria	7245	9560	11735	15310
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			
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		KUSW, Salt Lake City, Utah	15225			
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		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	21515			
1600-1700		WHRI, Noblesville, Indiana	15105	21640		
1600-1700		WRNO, New Orleans, Louisiana	15420			
1600-1700		WYFR, Oakland, California	13695	15170	15440	21525
			15566	17612	17750	17845
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			

RADIOTELEVIZIONI SHQIPTAR

Paul Williams of Shaw AFB, South Carolina, has sent us an impressive list of QSL's. Paul says he has been fortunate to have a QSL return rate of 95% - and his receivers are 30 years old! Here are QSLs from Radio Norway, Voice of Free China, and Radio Tirana.

frequency SECTION

1610-1650		Deutsche Welle, West Germany	9745	11785	15105	17875
			15510			
1615-1700		Radio Berlin Int'l, E. Germany	6115	7295	9730	
1630-1645		Trans World Radio, Swaziland	5055	7285	9525	
1630-1655	M-A	BRT, Brussels, Belgium	17595	21810		
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	9745
			9760	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			
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		
1700-1725		Radio Budapest, Hungary	6110	9585	9835	11910
			15160			
1700-1725		Radio Netherland, Hilversum	6020	15570		
1700-1730		Radio Australia, Melbourne	5995	6060	6080	7205
			9580			
1700-1730		Radio Japan, Tokyo	5990	11815		
1700-1730	S	Radio Norway Int'l, Oslo	11850	15220	15310	
1700-1730		Red Cross Broadcasting Service	7210	(2-28 only)		
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	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	S	KCBI, Dallas, Texas	11735			
1700-1800	S	KUSW, Salt Lake City, Utah	15225			
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	7200
			7315	7345	9470	9490
			9565	9740	9760	11840
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		Voice of Africa, Egypt	15255			
1700-1800		Voice of America, Washington	6110	9575	11760	15190
			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	21515			
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	13695	15170	15440
			15566	17612	17845	21525
1715-1730		Radio Korea, Seoul, South Korea	9870	15575		
1715-1745		BBC, London, England*	3975	6185	7165	
1718-1727		Red Cross Broadcasting Service	7210	(3-3, 3-28 & 3-31)		
1718-1800		Radio Pakistan, Islamabad	6210	11570		
1725-1740		Radio Suriname Int'l, Paramibo	7835v			
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
			13715	15110		
1730-1800		RAE, Buenos Aires, Argentina	15345			
1734-1800		FEBA, Mahe, Seychelles	11760			
1745-1800		BBC, London, England	9515	9740	12095	15070
			15260	15400		
1745-1800		SLBC, Colmbo, Sri Lanka	11800			

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		Kol Israel, Jerusalem	9385	9460	9925	11585
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 Berlin Int'l, E. Germany	6115	7260	9730	
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		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 Abidjan, 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			
1800-1900	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 Colombia	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 Colombia	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		KUSW, Salt Lake City, Utah	15225			
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			

frequency SECTION

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				
1800-1900		WRNO, New Orleans, Louisiana	15420				
1800-1900		WYFR, Oakland, California	11380	11580	13695	15170	
			15566	17612	17845		
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			
1815-1900		Radio Berlin Int'l, E. Germany	9665	15145	15255		
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			
1830-1900		BBC, London, England	9740	11820	12095	15400	
1830-1900	A,S	Radio Canada Int'l, Montreal	15260	17820			
1830-1900		Radio Havana Cuba	9670				
1830-1900	MWF	Radio Mozambique, Maputo	3265	4855	9618		
1830-1900		Radio Netherland, Hilversum	6020	15175	17605	21685	
1830-1900		Radio Sofia, Bulgaria	7245	9560	11735	15310	
1830-1900		Radio Sweden, Stockholm	11845				
1830-1900		Radio Tirana, Albania	7120	9480			
1830-1900		Radio Yugoslavia, Belgrade	5980	6100	7240	11735	
1830-1900		Spanish Foreign Radio, Madrid	7275	9765	11840	15375	
1830-1900		Swiss Radio Int'l, Berne	9885	11955			
1830-1900		WINB, Red Lion, Pennsylvania	15185				
1840-1850	M-A	Voice of Greece, Athens	11645	12045	15630		
1840-1900		Radio Senegal, Dakar	4950				
1845-1855		Radio Nacional, Conaky, Guinea	4833	4900	7125		
1845-1900		All India Radio, New Delhi	7412	11620			
1845-1900		BBC, London, England*	6070				
1845-1900		Radio Ghana, Accra	6130				
1855-1900		Africa No. 1, Gabon	4830	15475			

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

1900-1915		Radio Bangladesh, Dhaka	6240	7505			
1900-1915		Radio Tanzania, Dar es Salaam	9684				
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		Radio Afghanistan, Kabul	4760	6020	9635		
1900-1930	M-F	Radio Canada Int'l, Montreal	15260	17820			
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		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 Colombia	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 Colombia	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	M-A	KUSW, Salt Lake City, Utah	17715				
1900-2000		Radio Algiers, Algeria	9509	9685	15215	17745	
1900-2000		Radio Australia, Melbourne	6035	6060	6080	7205	
			7215	9580			
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	9865	11840	
1900-2000		Radio New Zealand, Wellington	11780	15150			
1900-2000		Radio Prague, Czechosiovakia	5930	7345			
1900-2000		Radio Riyadh, Saudi Arabia	9705	9720			
1900-2000		Radio Zambia, Lusaka	9580				
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			
1910-1920		Radio Botswana, Gaborone	3356	4820			
1915-2000		Radio Berlin Int'l, E. Germany	6080	6115			
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		Radio Sofia, Bulgaria	6070	7155	9700		
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			
1945-2000		Radio Berlin Int'l, E. Germany	9665	11920	15255		

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		Kol Israel, Jerusalem	7355	7462	9435	9815	
			9845	9855	11655	11700	
2000-2030		Radio Australia, Melbourne	6035	7205	7215	9580	
			9620				
2000-2030		Radio Berlin Int'l, E. Germany	9665	11920	15255		
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		Radio Yugoslavia, Belgrade	5980	7240	9620		
2000-2030		Swaziland Commercial Radio	6155				
2000-2030		Voice of Nigeria, Lagos	7255				
2000-2030		Voice of Republic of Iran	9022	9770			

frequency SECTION

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
2000-2100	M-A	ABC, Alice Springs, Australia	2310	[ML]		
2000-2100		ABC, Katherine, Australia	2485			
2000-2100	M-A	ABC, Tennant Creek, Australia	2325	[ML]		
2000-2100		CBN, St. John's, Newfoundland	6160			
2000-2100		CBU, Vancouver, British Colombia	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 Colombia	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-A	KUSW, Salt Lake City, Utah	17715			
2000-2100	M-F	Radio Malabo, Equatorial Guinea	9553			
2000-2100		Radio New Zealand, Wellington	11780	15150		
2000-2100		Radio Riyadh, Saudi Arabia	9705	9720		
2000-2100		Radio Zambia, Lusaka	9580			
2000-2100		Voice of Nigeria, Lagos	11770			
2000-2100		WCSN, Boston, Massachusetts	9495			
2000-2100		WHRI, Noblesville, Indiana	13760	17830		
2000-2100		WRNO, New Orleans, Louisiana	15420			
2003-2100		WINB, Red Lion, Pennsylvania	15185			
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 Tirana, Albania	9480	11835		
2030-2100		Voice of Africa, Cairo, Egypt	15375			
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 Korea, Seoul, South Korea	5975			
2045-2100		Vatican Radio, Vatican City	9625	11700	11760	15120
2045-2100		WYFR, Oakland, California	11830	13695	15566	17612
			17845			
2050-2100		Vatican Radio, Vatican City	6190	7250	9645	

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	7205	9655
2100-2125		Radio Beijing, China	6955	7480	9440	9745
			11790			
2100-2125		Radio Bucharest, Romania	5990	6105	7145	7195
2100-2125		Radio Budapest, Hungary	6110	7220	9585	9835
			11910			
2100-2125		Radio Netherland, Hilversum	9540	9715	9895	11740
2100-2130		Radio Canada Int'l, Montreal	5995	7130	11945	15325
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		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		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 Colombia	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 Colombia	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			
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			

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

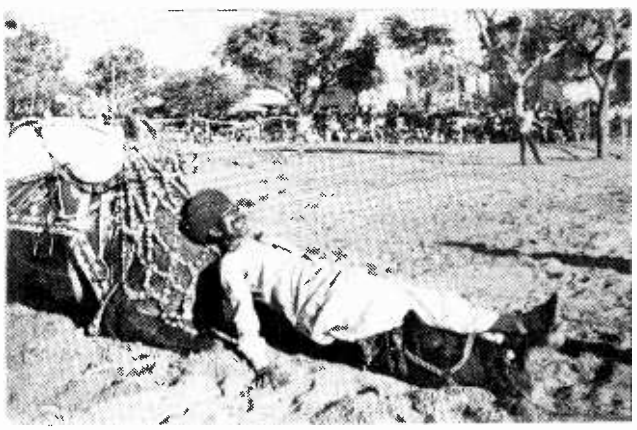
2200-2205	M-F	ELWA, Monrovia, Liberia	3993	11830		
2200-2210	M-H	Port Moresby, Papua New Guinea	3925	4890	5960	5985
			6020	6040	6080	6140
			9520			
2200-2210		Radio Damascus, Syria	9950	11625		
2200-2210		Radio Sierra Leone, Freetown	5980			
2200-2215	M-A	ABC, Alice Springs, Australia	2310	[ML]		
2200-2215	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			

frequency SECTION

2200-2230		All India Radio, New Delhi	9550	9910	11620	11715
2200-2230		BBC, London, England	5975	6005	6175	7325
			9915	15260		
2200-2230		CBC Northern Quebec Service	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, Argnetina	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 Colombia	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 Colombia	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 Jamahiriya, 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 UTC [6:00 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		
2300-0000		CBN, St. John's, Newfoundland	6160			
2300-0000		CBU, Vancouver, British Colombia	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 Colombia	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 Jamahiriya, 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			



Totally wiped out after reading every line of the frequency section?! We enjoyed this QSL from All India Radio via Paul Williams.

Like to send us your attractive or exotic QSL? We'll copy them and return promptly, to be used as space permits. Send to Rachel Baughn, QSL editor, P.O. Box 98, Brasstown, NC 28902.

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 **Voice of America:** *News* [1,4]
0009 **BBC:** *News About Britain*
0010 **Voice of America:** *Encounter* [1,4]
0015 **BBC:** *Radio Newsreel*
0030 **Voice of America:** *Studio One* [1,4]
0050 **Vatican Radio:** *With Heart and Mind*
0100 **BBC:** *News Summary*
0100 **Deutsche Welle:** *News*
0100 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
0100 **Voice of America:** *News* [1]
0110 **Voice of America:** *New Horizons* [1,3,4]
0110 **Voice of America:** *VOA Morning* [3]
0130 **Voice of America:** *Spotlight* [1,4]
0130 **Voice of Greece:** *News*
0200 **BBC:** *World News*
0200 **Radio Austria International:** *DX Program*
0200 **Voice of America:** *News* [1.3.4]
0209 **BBC:** *The Sunday Papers*
0210 **Voice of America:** *Critic's Choice* [1,4]
0210 **Voice of America:** *VOA Morning* [3]
0230 **BBC:** *Album Time*
0230 **NBC, Port Moresby, Papua New Guinea:** *National News*
0230 **Radio Netherlands:** *World News*
0230 **Voice of America:***Issues in the News*[4]
0235 **Radio Netherlands:** *Newsline*
0250 **Radio Netherlands:** *Shortwave Feedback* (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 **NBC, Port Moresby, Papua New Guinea:** *National News*
0340 **Voice of Greece:** *News*
0345 **Voice of Nicaragua:** *Nicaragua Today* (News)
0400 **BBC:** *Newsdesk*
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*
2335 **Voice of Greece:** *News*
0530 **Radio Netherlands:** *World News*
0535 **Radio Netherlands:** *Newsline* (See 0235)
0545 **BBC:** *Letter from America* (Alstaire Cook)
0550 **Radio Netherlands:** *Shortwave Feedback* (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*
0900 **NBC, Port Moresby, Papua New Guinea:** *National News*
0909 **BBC:** *The Sunday Papers*
0915 **BBC:** *Science in Action*
1000 **BBC:** *News Summary*
1015 **BBC:** *Classical Record Review*
1030 **BBC:** *Religious Service*
1100 **BBC:** *World News*
1100 **NBC, Port Moresby, Papua New Guinea:** *National News*
1109 **BBC:** *News About Britain*
1115 **BBC:** *From Our Own Correspondent*
1125 **Radio Botswana:** *News*
1200 **BBC:** *News Summary*
1235 **Voice of Greece:** *News*
1300 **BBC:** *World News*
1300 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
1309 **BBC:** *Twenty-Four Hours* (News summary)
1330 **BBC:** *Sports Roundup*
1345 **BBC:** *The Sandi Jones Request Show*
1400 **BBC:** *News Summary*
1500 **BBC:** *Radio Newsreel*
1540 **Voice of Greece:** *News*
1600 **BBC:** *World News*
1609 **BBC:** *Commentary*
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*
1840 **Voice of Greece:** *News*
1900 **BBC:** *News Summary*
1902 **BBC:** *Classical Record Review*
1910 **Radio Botswana:** *News*
2000 **BBC:** *World News*
2000 **NBC, Port Moresby, Papua New Guinea:** *News*
2009 **BBC:** *Twenty-Four Hours* (News summary)
2100 **BBC:** News Summary
2100 **NBC, Port Moresby, Papua New Guinea:** *National News*
2115 **BBC:** *The Pleasure's Yours* (Record Requests)
2200 **BBC:** *World News*
2200 **NBC, Port Moresby, Papua New Guinea:** *National News*
2225 **BBC:** *Book Choice*
2230 **BBC:** *Financial Review*
2240 **BBC:** *Reflections* (Religion)
2245 **BBC:** *Sports Roundup*
2300 **BBC:** *World News*
2309 **BBC:** Commentary
2315 **BBC:** *Letter from America* (Alstaire Cook)
2335 **Voice of Greece:** *News*

Monday

0000 **BBC:** *World News*
0009 **BBC:** *News about Britain*
0015 **BBC:** Radio Newsreel
0030 **BBC:** *Religious Service*
0050 **Vatican Radio:** *The Pope, The Church, The World*
0100 **BBC:** *News Summary*

Your Guide to Shortwave Listening in March

Happy Station, Radio Netherland's popular music and talk program, celebrates its 60th anniversaary this year. Eddie Startz, the show's original host, is shown here on the air in a 1930's broadcast.

Happy Station is heard Mondays at 0230 and 0530 UTC

0100 **Deutsche Welle:** *News*
0130 **Voice of Greece:** *News*
0200 **BBC:** *World News*
0209 **BBC:** *Commentary*
0219 **BBC:** *Peeble's Choice*
0230 **BBC:** *Science in Action*
0230 **NBC, Port Moresby, Papua New Guinea:** *National News*
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*
0330 **NBC, Port Moresby, Papua New Guinea:** *National News*
0340 **Voice of Greece:** *News*
0400 **BBC:** *Newsdesk*
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*
0700 **BBC:** *World News*
0700 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
0709 **BBC:** *Twenty-Four Hours* (News summary)
0800 **BBC:** *World News*
0800 **NBC, Port Moresby, Papua New Guinea:** *News*
0809 **BBC:** *Reflections*
0830 **BBC:** *Anything Goes*
0840 **Voice of Greece:** *News*
0900 **BBC:** *World News*
0900 **NBC, Port Moresby, Papua New Guinea:** *National News*
0909 **BBC:** *British Press Review*
0915 **BBC:** *Good Books*
0930 **BBC:** *Financial News*
0945 **BBC:** *Peeble's Choice*
1000 **BBC:** *News Summary*
1040 **Voice of Greece:** *News*
1100 **BBC:** *World News*
1100 **NBC, Port Moresby, Papua New Guinea:** *National News*
1109 **BBC:** *News About Britain*
1110 **Radio Botswana:** *News*
1120 *Radio Botswana: University of Botswana*
1115 **BBC:** *Health Matters*
1130 **BBC:** *Album Time*
1200 **BBC:** *Radio Newsreel*
1200 **NBC, Port Moresby, Papua New Guinea:** *National News*
1235 **Voice of Greece:** *News*
1245 **BBC:** *Sports Roundup*
1300 **BBC:** *World News*
1300 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
1309 **BBC:** *Twenty-Four Hours* (News summary)
1330 **BBC:** *Anything Goes*
1400 **BBC:** *News*
1405 **BBC:** *Outlook*
1500 **BBC:** *Radio Newsreel*
1540 **Voice of Greece:** *News*
1600 **BBC:** *World News*
1609 **BBC:** *Commentary*
1610 **Radio Botswana:** *News*
1630 **BBC:** *Chain Reaction*
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 **NBC, Port Moresby, Papua New Guinea:** *News*
2009 **BBC:** *Twenty-Four Hours* (News Summary)
2030 **BBC:** *Sports International*
2100 **BBC:** *News Summary*
2100 **NBC, Port Moresby, Papua New Guinea:** *National News*
2102 **BBC:** *Network UK*
2130 **BBC:** *The Vintage Chart Show*
2200 **BBC:** *World News*
2200 **NBC, Port Moresby, Papua New Guinea:** *National News*
2209 **BBC:** *The World Today*
2225 **BBC:** *Book Choice*
2230 **BBC:** *Financial News*
2240 **BBC:** *Reflections*
2245 **BBC:** *Sports Roundup*
2300 **BBC:** *World News*
2309 **BBC:** *Commentary*
2330 **BBC:** *Multitrack 1* (Top 20)
2335 **Voice of Greece:** *News*

Tuesday

0000 **BBC:** *World News*
0009 **BBC:** *News about Britain*
0015 **BBC:** *Radio Newsreel*
0050 **Vatican Radio:** *A Many Splendored Thing*
0100 **BBC:** *News Summary*
0100 **Deutsche Welle:** *News*
0102 **BBC:** *Outlook*
0130 **BBC:** *Short Story*
0130 **Voice of Greece:** *News*
0200 **BBC:** *World News*
0209 **BBC:** *Commentary*
0215 **BBC:** *Network UK*
0230 **BBC:** *Sports International*
0230 **NBC, Port Moresby, Papua New Guinea:** *National News*
0230 **Radio Netherlands:** *World News*
0235 **Radio Netherlands:** *Newsline*
0250 Radio Netherlands: *Feature* ("Portraits of the Past")
0300 **BBC:** *World News*
0300 **Deutsche Welle:** *News*

Your Guide to Shortwave Listening in March

0300 **Voice of Nicaragua:** *Nicaragua Today* (News)
0309 **BBC:** *News about Britain*
0315 **BBC:** *The World Today*
0330 **BBC:** *John Peel* (Progressive rock)
0330 **NBC, Port Moresby, Papua New Guinea:** *National News*
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:** *Feature (*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*
0700 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
0709 **BBC:** *Twenty-Four Hours* (News summary)
0745 **BBC:** *Network UK*
0800 **BBC:** *World News*
0800 **NBC, Port Moresby, Papua New Guinea:** *News*
0809 **BBC:** *Reflections*
0815 **BBC:** *Health Matters*
0830 **Radio Japan:** *Godzilla Eats the NHK*
0840 **Voice of Greece:** *News*
0900 **BBC:** *World News*
0900 **NBC, Port Moresby, Papua New Guinea:** *National 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*
1100 **NBC, Port Moresby, Papua New Guinea:** *National 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*
1200 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
1215 **BBC:** *Multitrack 1* (Top 20)
1235 **Voice of Greece:** *News*
1245 **BBC:** *Sports Roundup*
1300 **BBC:** *World News*
1300 **NBC, Port Moresby, Papua New Guinea:** *National 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 **NBC, Port Moresby, Papua New Guinea:** *News*
2009 **BBC:** *Twenty-Four Hours* (News summary)
2030 **BBC:** *Meridian*
2100 **BBC:** *News Summary*
2100 **NBC, Port Moresby, Papua New Guinea:** *National News*
2200 **BBC:** *World News*
2200 **NBC, Port Moresby, Papua New Guinea:** *National News*
2209 **BBC:** *The World Today*
2225 **BBC:** *A Letter from Scotland*
2230 **BBC:** *Financial News*
2240 **BBC:** *Reflections*
2245 **BBC:** *Sports Roundup*
2300 **BBC:** *World News*
2309 **BBC:** *Commentary*
2335 **Voice of Greece:** *News*

Wednesday

0000 **BBC:** *World News*
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*
0102 **BBC:** *Outlook*
0130 **BBC:** *Report on Religion*
0130 **Voice of Greece:** *News*
0145 **BBC:** *Country Style*
0200 **BBC:** *World News*
0209 **BBC:** *Commentary*
0230 **BBC:** *Citizens*
0230 **NBC, Port Moresby, Papua New Guinea:** *National News*
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*
0330 **NBC, Port Moresby, Papua New Guinea:** *National News*
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*
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*
0700 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
0709 **BBC:** *Twenty-Four Hours* (News summary)
0730 **BBC:** *Development '88*
0800 **BBC:** *World News*
0800 **NBC, Port Moresby, Papua New Guinea:** *News*
0809 **BBC:** *Reflections*
0815 **BBC:** *Classical Record Review*
0840 **Voice of Greece:** *News*
0900 **BBC:** *World News*

Your Guide to Shortwave Listening in March

0900 **NBC, Port Moresby, Papua New Guinea:** *National 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*
1100 **NBC, Port Moresby, Papua New Guinea:** *National News*
1109 **BBC:** *News about Britain*
1110 **Radio Botswana:** *News*
1125 **BBC:** *A Letter from Wales*
1130 **BBC:** *Meridian* (Arts)
1200 **BBC:** *Radio Newsreel*
1200 **NBC, Port Moresby, Papua New Guinea:** *National News*
1215 **BBC:** *Time for Verse*
1225 **BBC:** *The Farming World*
1235 **Voice of Greece:** *News*
1245 **BBC:** *Sports Roundup*
1300 **BBC:** *World News*
1300 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
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 **NBC, Port Moresby, Papua New Guinea:** *News*
2009 **BBC:** *Twenty-Four Hours* (News summary)
2030 **BBC:** *Assignment*
2100 **BBC:** *News Summary*
2100 **NBC, Port Moresby, Papua New Guinea:** *National News*
2102 **BBC:** *Network UK*
2115 **BBC:** *Rock Salad*
2145 **BBC:** *Recording of the Week*
2200 **BBC:** *World News*

Dateline East Asia

The BBC World Service has launched a new program specializing in the political and economic affairs of North-east and South-east Asia. Called "Dateline East Asia," it will take a broader look at developments in Australasia and the South Pacific. Featured will be interviews with political leaders and commentators from the region as well as analysis of the events as seen from London.

"Dateline East Asia" will not be easily heard by North American listeners; however, those with a specialized interest in the region should listen in on Fridays at 1115 and again at 1145 UTC. Frequencies for the 1115 UTC broadcast are 6195, 9740, 11750 and 15360 kHz. At 1145 UTC, try 7180 and 5995 kHz.

2200 **NBC, Port Moresby, Papua New Guinea:** *National News*
2209 **BBC:** *The World Today*
2225 **BBC:** *A Letter from Wales*
2230 **BBC:** *Financial News*
2240 **BBC:** *Reflections*
2245 **BBC:** *Sports Roundup*
2300 **BBC:** *World News*
2309 **BBC:** *Commentary*
2330 **BBC:** *Multitrack 2* (Pop music)
2335 **Voice of Greece:** *News*

Thursday

0000 **BBC:** *World News*
0009 **BBC:** *News about Britain*
0015 **BBC:** *Radio Newsreel*
0050 **Vatican Radio:** *Vatican Week*
0100 **BBC:** *News Summary*
0100 **Deutsche Welle:** *News*
0102 **BBC:** *Outlook*
0130 **BBC:** *Waveguide* (Listening tips)
0130 **Voice of Greece:** *News*
0140 **BBC:** *Book Choice*
0145 **BBC:** *The Story of English*
0200 **BBC:** *World News*
0209 **BBC:** *Commentary*
0215 **BBC:** *Network UK*
0230 **BBC:** *Assignment*
0230 **NBC, Port Moresby, Papua New Guinea:** *National News*
0230 **Radio Netherlands:** *World News*
0235 **Radio Netherlands:** *Newsline*
0250 **Radio Netherlands:** *Wednesday* Report (Developments affecting Holland)
0300 **BBC:** *News*
0300 **Deutsche Welle:** *News*
0300 **Voice of Nicaragua:** *Nicaragua Today* (News)
0309 **BBC:** *News about Britain*
0315 **BBC:** *The World Today*
0330 **NBC, Port Moresby, Papua New Guinea:** *National News*
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:** *Wednesday Report* (See 0250)
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*
0700 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
0709 **BBC:** *Twenty-Four Hours* (News summary)
0745 **BBC:** *Network UK*
0800 **BBC:** *World News*
0800 **NBC, Port Moresby, Papua New Guinea:** *News*
0809 **BBC:** *Reflections*

0815 BBC: *Country Style*
0830 BBC: *John Peel* (Progressive rock)
0840 Voice of Greece: *News*
0900 BBC: *World News*
0900 NBC, Port Moresby, Papua New Guinea: *National 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*
1040 Voice of Greece: *News*
1100 BBC: *World News*
1100 NBC, Port Moresby, Papua New Guinea: *National 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*
1200 NBC, Port Moresby, Papua New Guinea: *National News*
1215 BBC: *Multitrack 2* (Pop music)
1235 Voice of Greece: *News*
1245 BBC: *Sports Roundup*
1300 BBC: *World News*
1300 NBC, Port Moresby, Papua New Guinea: *News Summary*
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 NBC, Port Moresby, Papua New Guinea: *News*
2009 BBC: *Twenty-Four Hours* (News summary)
2030 BBC: *Meridian* (Arts)
2100 BBC: *News Summary*
2100 NBC, Port Moresby, Papua New Guinea: *National News*
2115 BBC: *A Jolly Good Show*
2200 BBC: *World News*
2209 BBC: *The World Today*
2225 BBC: *A Letter from England*
2230 BBC: *Financial News*
2240 BBC: *Reflections*
2245 BBC: *Sports Roundup*
2300 BBC: *World News*
2309 BBC: *Commentary*
2315 BBC: *Seven Seas*
2330 BBC: *A time for Verse*
2335 Voice of Greece: *News*
2340 BBC: *The Farming World*

Friday

0000 BBC: *World News*
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*
0102 BBC: *Outlook*
0130 BBC: *Stuart Colman's Record Hop*
0130 Voice of Greece: *News*
0145 BBC: *Talking From...*
0200 BBC: *World News*
0209 BBC: BBC: *Commentary*
0215 BBC: *Health Matters*
0230 BBC: *Citizens*
0230 NBC, Port Moresby, Papua New Guinea: *National News*
0230 Radio Netherlands: *World News*
0235 Radio Netherlands: *Newsline*
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*
0330 NBC, Port Moresby, Papua New Guinea: *National News*
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: *Newsline* (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*
0700 NBC, Port Moresby, Papua New Guinea: *News Summary*
0709 BBC: *Twenty-Four Hours* (News summary)
0730 BBC: *Write On...* (Mailbag)
0745 BBC: *Seven Seas*
0800 BBC: *World News*
0800 NBC, Port Moresby, Papua New Guinea: *News*
0809 BBC: *Reflections*
0830 BBC: *Music Now*
0840 Voice of Greece: *News*
0900 BBC: *World News*
0900 NBC, Port Moresby, Papua New Guinea: *National 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*
1100 NBC, Port Moresby, Papua New Guinea: *National News*
1110 Radio Botswana: *News*
1109 BBC: *News about Britain*
1115 BBC: *Talking From...*
1130 BBC: *Meridian* (Arts)
1200 BBC: *Radio Newsreel*
1200 NBC, Port Moresby, Papua New Guinea: *National News*
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*

Your Guide to Shortwave Listening in March

1800 **BBC:** *Newsdesk*
1830 **BBC:** *Multitrack 3* (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:** *Personal View*
2000 **BBC:** *World News*
2000 **NBC, Port Moresby, Papua New Guinea:** *News*
2009 **BBC:** *Twenty-Four Hours* (News summary)
2030 **BBC:** *Science in Action*
2100 **BBC:** *News Summary*
2100 **NBC, Port Moresby, Papua New Guinea:** *National News*
2102 **BBC:** *Network UK*
2115 **BBC:** *Business Matters*
2200 **BBC:** *World News*
2209 **BBC:** *The World Today*
2225 **BBC:** *A Letter from Northern Ireland*
2230 **BBC:** *Financial News*
2240 **BBC:** *Reflections* (Religion)
2245 **BBC:** *Sports Roundup*
2300 **BBC:** *World News*
2309 **BBC:** *Commentary*
2315 **BBC:** *From the Weeklies*
2330 **BBC:** *Multitrack 3* (Pop music)
2335 **Voice of Greece:** *News*

Saturday

0000 **BBC:** *World News*
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*
0102 **BBC:** *Outlook*
0130 **Voice of Greece:** *News*
0145 **BBC:** *Nature Notebook*
0200 **BBC:** *World News*
0209 **BBC:** *Commentary*
0215 **BBC:** *Network UK*
0230 **BBC:** *People and Politics*
0230 **NBC, Port Moresby, Papua New Guinea:** *National News*
0230 **Radio Netherlands:** *World News*
0235 **Radio Netherlands:** *Newsline*
0250 **Radio Netherlands:** *Friday Report* (Developments affecting Holland)
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:** *Friday Report* (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*
0900 **NBC, Port Moresby, Papua New Guinea:** *National News*
0909 **BBC:** *British Press Review*
0915 **BBC:** *The World Today*
0930 **BBC:** *Financial News*
0940 **BBC:** *Sports Roundup*

Radio Beijing celebrates International Women's Day

March 8th is International Women's Day. On that date, Radio Beijing's Travel Talk has a rendezvous with a woman tourist guide and Sports Beat will be talking with women athletes about their joys and worries and the challenges they face. Radio Beijing can be heard at 0000 UTC on 9770 and 11715 kHz.

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*
1100 **NBC, Port Moresby, Papua New Guinea:** *National News*
1109 **BBC:** *News about Britain*
1115 **BBC:** *Chain Reaction*
1125 **Radio Botswana:** *News*
1130 **BBC:** *Meridian* (Arts)
1200 **BBC:** *Radio Newsreel*
1200 **NBC, Port Moresby, Papua New Guinea:** *National News*
1215 **BBC:** *Multitrack 3* (Pop music)
1235 **Voice of Greece:** *News*
1245 **BBC:** *Sports Roundup*
1300 **BBC:** *World News*
1300 **NBC, Port Moresby, Papua New Guinea:** *News Summary*
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:** *Sportworld*
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*
2009 **BBC:** *Twenty-Four Hours* (News Summary)
2030 **BBC:** *Meridian* (Arts)
2100 **BBC:** *World News*
2130 **BBC:** *People and Politics*
2200 **BBC:** *World News*
2209 **BBC:** From Our Own Correspondent
2225 **BBC:** *Book Choice*
2230 **BBC:** *New Ideas* (New British Products)
2240 **BBC:** *Reflections*
2245 **BBC:** *Sports Roundup*
2300 **BBC:** *World News*
2309 **BBC:** *Commentary*
2315 **BBC:** *Nature Notebook*
2330 **BBC:** *Anything Goes*
2335 **Voice of Greece:** *News*

Legend: [1]Americas service, [2]East Asia service, [3]South Asia service, [4]Caribbean Service, [5]Africa service, [6]Europe and North Africa services, [7]Middle East service

ASK BOB

Bob Grove, WA4PYQ

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. Why does the Yaesu FRG9600 frequency coverage start at 60 MHz when low band in the U.S. actually begins at 30 MHz? (Jack Belck, Mt. Pleasant, MI)

A. The rig was designed for European and Oriental distribution and sold later in the western hemisphere. We were not the primary market.

Q. Why didn't scanners like the popular Bearcat BC-300 have continuous 30-512 MHz coverage like some of the new scanners? (Dan Birkner, Spokane, WA)

A. At the time the BC-300 was being developed, little interest had been expressed in receiving the 225-400 MHz band; not only that, but an entirely different approach called "up-conversion" is required for continuous coverage over that wide a spectrum. This requires totally new software and hardware during design and manufacture.

Q. Religious broadcaster KVOH just installed their 1000 foot tower within a few miles of my listening post and I hear them everywhere on my Kenwood R2000 as used with an Eavesdropper antenna, Grove TUN-3 MiniTuner and Grove PRE-3 preamplifier. What can I do? (Pete Wahlquist, Reseda, CA)

A. First and foremost, remove the preamplifier from the line; a preamp should never be used with a full-size outdoor shortwave antenna. If that doesn't solve the problem, try re-installing the antenna so that the wire axis points toward the broadcaster's tower; this should reject most of the signal.

Next, replace the twin-lead on the Eavesdropper with coaxial cable, any kind so long as it is well shielded. Be sure the receiver is well grounded. If you still hear the broadcaster, try using the attenuator on the R2000 to reduce signal strengths.

Construct a simple notch filter consisting of a coil and variable capacitor in series, tuned to the frequency of the offending transmitter, and place it across the antenna input of your receiver.

If none of the above works, replace the R2000 with an ICOM R71A, Kenwood R5000 or JRC NRD525.

Q. Within minutes after using my cordless telephone a few days ago, a police officer knocked at the door asking if I had a problem. Apparently, my phone had automatically dialed the 911 emergency number! What happened? (Patrick McBride, St. Louis, MO)

A. Not only do cordless phones dial up 911, but many other combinations as well! Fortunately, the situation will continue to improve now the cause has been determined.

It seems that when the telephone base unit senses low power coming from the handset, whether from distance or discharged batteries, the 5-6 kHz pilot tone which tells the base unit that the handset is still in use causes relay chatter--random pulses which are interpreted by the phone company's equipment system as an attempt to dial.

Some cordless telephone users have complained of staggering long-distance bills at the end of the month after their mischievous marvels dialed 1 to access the world's telephones, then had a field day!

The task force working on the problem will recommend that cordless telephone manufacturers incorporate some foolproof method of signalling the base to connect and disconnect in a positive fashion when the handset is out of range or its batteries are discharged. In the mean time, keep your handset fully charged and cradled in the base when not in use.

Q. My aquarium heater makes pronounced clicks that I can hear through my receiver. How can I eliminate it? (Dan Birkner, Spokane, WA)

A. The "make/break" switching contacts generate sparks which radiate considerable pulse-noise interference over most of the HF (shortwave) spectrum. To attenuate the sparking, you need to solder a 0.1 microfarad, 400 or 600 volt capacitor across the leads that go to the contacts, and as close to the contacts as possible.

Q. I am interested in learning what frequencies are used by civilian and military railroads throughout the western and northwestern United States. How can I find out this information? (Robert Brock, Phoenix, AZ)

A. I am unaware of military railroads, although large military installations will use common military frequencies, usually 30-50 MHz low band FM, for intercommunication among their land mobile vehicles of all types. Some high band (165-174 MHz) may also be heard.

Three recent books list railroad frequencies nationwide: *Pocket Guide to Railroad Radio Frequencies* by Bruce K. Heald (1905 Johnson Mill Rd., North Branch, MI 48461); *Compendium of American Railroad Radio Frequencies* by Gar Sturm and Mark Landgraf (3 Coralberry Circle, Albany, NY 12203); and *Canadian Railway Radio Guide* by Kenneth Gansel (P.O. Box 1108, Niagara-on-the-lake, Ont., Canada L0S 1J0.

Q. What is a good antenna to use strictly for 800 Mhz band coverage? (Russ Miller, Cedar Lake, IN)

A. One of the most successful home-brew projects, and certainly one of the least expensive, is to buy a UHF-TV "bow-tie" antenna with a screen reflector. Turn it so the elements are vertical rather than horizontal, and connect a standard TV-type VHF/UHF balun transformer to the wing nuts. Run low-loss RG-6/U coax down to the receiver. That's it. ■

SCAN 'n' SEARCH

(the catalogs) (the aisles)

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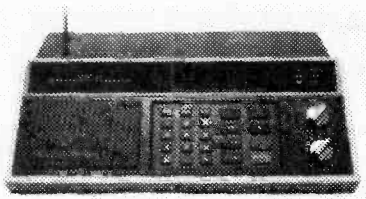

SCN 11

Yes, the BC800XLT features wide frequency coverage: 29-54, 118-136 (AM), 136-174, 406-512, and 806-912 MHz with 40 channels of memory in two banks.

Other features include rapid scan (15 channels per second), powerful 1.5 watt audio amplifier, two telescoping antennas (one for 800 MHz range), better than 1 microvolt sensitivity, 55 dB selectivity @ ± 25 kHz, instant weather reception, brilliant fluorescent display, AC/DC operation, direct channel access, individual channel delay, priority channel one, fully synthesized keyboard entry.

Dimensions: 10½"W x 3⅝"H x 8"D; *Weight: 7 lbs., 2 oz.*

List Price ~~$489~~

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Bearcat BC950XLT

New!

SCN 12

BC600XLT same as BC950XLT but without 800 MHz. Order SCN8, **$249.95**.

Measuring a tiny 2" high by 7" wide and deep, this upgraded version of the BC600XLT is ideal for compact mobile or base installations. Features include user-programmable search ranges, five priority channels, individual channel lockout and delay, direct channel access, external antenna jack (MOT female), and optional CTCSS tone-squelch decoder. Mobile mounting kit, DC cord, AC wall adaptor, plug-in whip, and operating manual are all included at no extra charge!

In addition to normal 29-54, 118-174 and 406-512 MHz coverage, the new 950 also has 806-952 MHz (less cellular band; we can restore full coverage for $10 at time of order). And with its pre-programmed service search capability, just push a button to find active police, fire, aircraft, maritime, emergency, and weather channels!

One hundred memory channels may be scanned sequentially or in five 20-channel banks.

Recommended Retail ~~$389.95~~

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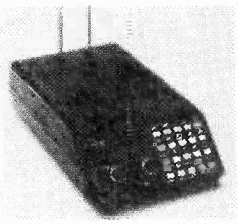

From Regency

SCN 2

The Regency TS-2 boasts the fastest scan and search rates in the industry—50 channels per second—more than three times faster that the next closest competitor. Six memory banks store up to 75 separate frequencies, selectable by groups or in a continuous sequence.

Frequency coverage is wide: 29-54 MHz FM (ten meter amateur, low band and six meter amateur), 118-174 MHz (Am aircraft and FM high band), 406-512 MHz FM (UHF federal government and land mobile), and 806-950 MHz (microwave mobile).

Other features include instant weather channel, priority, direct channel access, and scan delay. Accessories included are telescopic antennas, AC power supply, DC mobile cord, and mobile mounting bracket.

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Lawrence Magne

Editor-in-Chief
Passport to World Band Radio

World Band Radios: *Buy Now or Wait?*

A Look at World Band Radios in the 21st Century

That old clunker you've been using as a radio has long ago seen its best years. You've studied the market, read all the equipment reviews you can get your hands on. And you've decided. It's time to make an investment in a new receiver.

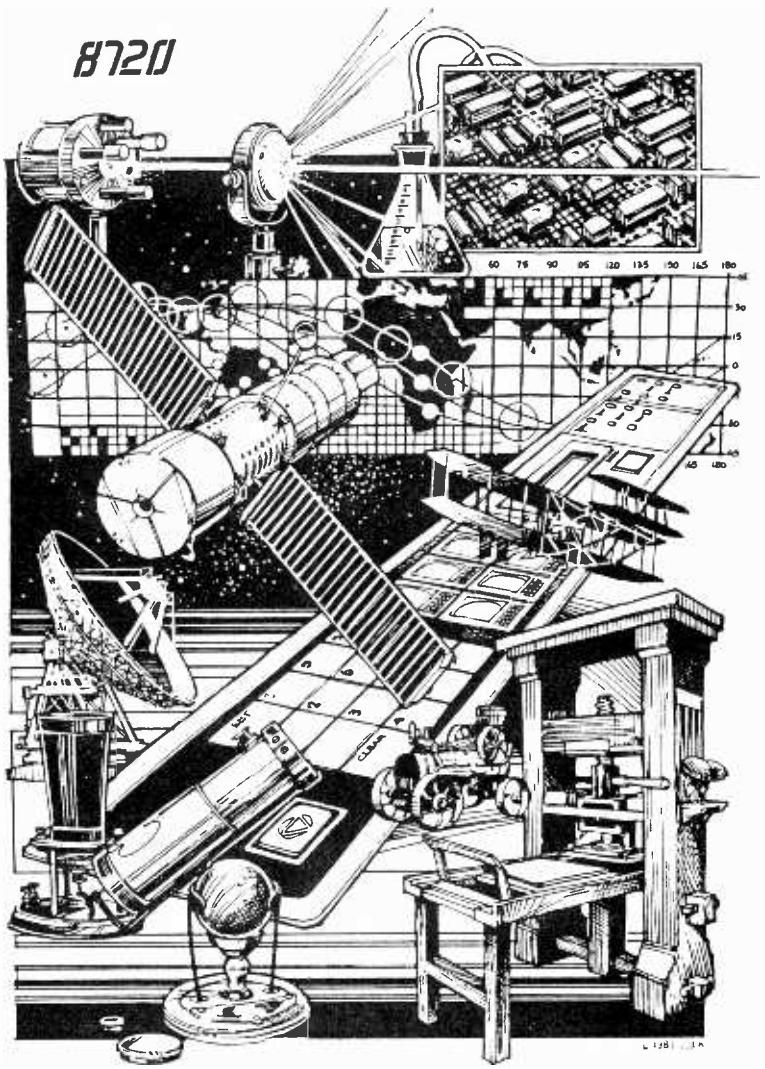
Still, a particularly nasty scenario lingers in the back of your mind. You go out, spend all of those hard-earned dollars on a new receiver and thirty days later, you find that yet another technological breakthrough has already made your purchase obsolete.

That's a question we've been hearing since back in 1977, when we first started doing equipment reviews for the shortwave industry. Given the pace of major advancements in receiver technology, it's not a bad question at all.

"Should you buy now, or is something better coming up?"

The answer is, "Something better is always coming up -- if you wait long enough."

Indeed, recent years have brought us some sweeping advances in world band receiver technology. The immediate future, however, appears to hold little in the way of revolutionary promise. A couple of nice variations on the Sony ICF-2010's technology are about all that's expected in the 1988 portable market, for example.



The scenario every consumer dreads--You spend your hard-earned dollars on a new receiver and thirty days later another technological breakthrough has already made your purchase obsolete!

Into the Future

That's OK, but the real news is that when we rubberneck into the next century, we find the necessary technology to change world band radio into a snazzy, high-tech medium. And here's the big secret: Little of this will rely on the broadcasters. Instead, these changes will result from advances in *receiving* technology.

To see where world band radio is going for the rest of this century, it's helpful, first, for us to glance back at how it's gotten to where it is today.

Spiffing it Up

Until the late Seventies, shortwave listening was in a trough of some thirty years' standing. Receiving technology was at a standstill. New was "in," old was "out." Old-fashioned shortwave was definitely "out."

People no longer gathered in amazement to hear crackly transmissions from strange, exotic places like Europe. These were modern times. People wanted sharp, new technologies, like FM and hi-fi.

By 1980, however, our love affair with technology had matured. At the same time, some of this advanced technology began to find its way into shortwave radios. Books such as *Passport to World Band Radio*, began making shortwave listening easier, more pleasant and decidedly less old-fashioned.

Should I buy a new receiver now or wait for something better? You should be safe until the turn of the century.

Digital Technology Revolutionizes Listening

When shortwave broadcasting was in its infancy sixty years back, it was the broadcasters who took much of the initiative to get the field off the ground. Today, it's the receiver manufacturers -- especially Panasonic and Sony -- that have been the primary initiators. In 1977, Panasonic in Japan -- plus ITT in Germany -- both came out with the first portables having *digital* frequency readout.

But the biggest change came when Sony introduced its digitally tuned, digitally synthesized ICF-2001 portable in 1980. With the '2001, for the first time, consumers could use a keypad to get right to the desired frequency. In addition, there were programmable channel memories that allowed the listener to bring up a favorite station at the push of a single button. To top it off, the '2001 was small, lightweight and affordable.

In short, the Sony ICF-2001 changed the whole ball game. Now, there's an entire range of variations available on the original '2001's design. In fact, in the 1988 *Passport to World Band Radio*, we've tested and evaluated no less than ninety different models of advanced-design world band portables and tabletop models!

What's happened in the Eighties is that the '2001 generation of world band radio has been refined and made immensely popular. But as the Nineties wind down, we should start moving towards 21st century technology. And that will, once again, change the whole ball game for world band radio.

Be Your Own "Producer"

21st-century world band radios will allow you to obtain all the information you want in a fraction of the time it takes today. Artificial intelligence will allow the receiver to analyze the myriad transmissions on the air, sort out desired types of content, then spit out exactly what you want to hear -- and only what you want to hear -- whenever you see fit. By instructing your radio what to receive and how to present it, you become, in effect, your own "producer."

Simultaneous Translation: Hear It All

Simultaneous translation off the air -- with voices that are lifelike and have the same intonation as the original announcer -- will probably become available early in the century. In fact, it's already here to some extent. Large mainframes and even personal computers using sophisticated software already perform at least some degree of simultaneous translation.

There still remains considerable ground to cover before you'll be able to tune in a Spanish language station and hear the Comandante Gomez inflame the crowd in perfect, colloquial English. For one thing, existing software has a tough time determining the context of what's being said. Does "a buck" mean a dollar, a male deer, a man, a type of frame, buckskin, or a type of knife? National variations of the same language further complicate things. For example, in the US it's obvious what is meant by "honk if you love shortwave." But in England, "honk" also means vomiting.

Still, advances in voice recognition are such that accurate simultaneous translation of world band broadcasts should be a reality sometime during the first quarter of the next century.

Synthesized Audio

Similar technology will also allow for receiver-generated voice synthesis to allow voices to be heard as clearly as on a compact disk on your audio system. Further down the road, kindred techniques will be used to generate synthetic replication of music, as well.

How? Using a combination of artificial intelligence, database techniques, efficient bulk storage and complex ultra-fast processing, your 21st-century world band radio will analyze ordinary analog radio signals to discern what is actually being aired. Having done this, it will command that these same sounds -- minus static, interference and other unwanted clutter -- be generated afresh from selected bits of sounds already stored digitally within your radio.

What's nice about this approach is that it doesn't require that the broadcasters change their transmitting techniques. Whether they transmit in the conventional AM mode, as now, or in single-sideband, they're airing an analog signal that will be converted to digital *within* the receiver.

That's important, because it means that the vast majority of listeners that won't be able to afford this new generation of receivers for many years will be able to continue to listen as they do now on their old-fashioned sets. And broadcasters will be spared the hassle and expense of converting over to another transmitting medium. Perhaps most important, by retaining analog rather than digital as the transmission norm, scarce shortwave spectrum space will be conserved.

After all, if you transmit digitally, it takes up more spectrum space than does a comparable analog transmission.

Video Now Technically Feasible

Finally, the technology already exists to add some video to shortwave broadcasts. Already, facsimile (still picture) transmissions are scheduled to be received on a forthcoming Sony receiver that has its own fax printer. Down the road, especially once single-sideband is established as the norm for world band broadcasts, enough spectrum space should be available to have companion FAX transmissions aired. These would provide pictures to accompany the broadcast -- much as pictures appear periodically in, say, *Newsweek* magazine.

So, what it looks like is that we'll be living with pretty much the same technology for the rest of this century. But as we go into the 21st century, it'll become a new ball game -- nigh-perfect audio fidelity, the elimination of language barriers, automatic information selection and even a dollop of video to spice up the works! ■

Larry Magne reviews equipment the first Saturday night each month over Radio Canada International's "SWL Digest" at 8:10 PM Eastern Time on 5960 and 9755 kHz. Larry's "What's New in Equipment" is also featured over "SWL Digest" various other Saturdays throughout the month. Passport's Don Jensen and Tony Jones can be heard the third Saturday night each month.

In the US, RDI White Papers are carried by various dealers, including Electronic Equipment Bank, Imprime and Universal Shortwave. A free catalogue of the latest editions of all available RDI White Papers may be obtained by sending a self-addressed stamped envelope to Publications Information, Radio Database International, Box 300, Penn's Park PA 18943 USA.

The Newest from Bearcat: The BC950XLT Scanner

SPECIFICATIONS

Band Coverage:	12 Bands	
Frequency Range:	10 Meter "Ham"	29.0-29.7 MHz
	Low Band	29.7-50.0 MHz
	6 Meter "Ham"	50.0-54.0 MHz
	Aircraft	118-136 MHz
	Military Land Mobile	136-144 MHz
	2 Meter "Ham"	144-148 MHz
	High Band	148-174 MHz
	Federal Government	406-420 MHz
	70cm "Ham"	420-450 MHz
	UHF Band	450-470 MHz
	"T" Band	470-512 MHz
	"800" Band	806-956 MHz
Channels:	100 Channels (5-20 channel banks)	
Scan Speed:	15 channels per second	
Display:	Illuminated Liquid Crystal	
Power Requirement:	13.8 VDC (vehicle battery or AC Adapter) 2 A-A size batteries (not included) for 6 month memory backup.	
Sensitivity:	29-54 & 136-174 MHz = 0.4 microvolts (nominal)	
	118-136 MHz = 0.8 microvolts (60%AM) (12 dB SINAD)	
	406-512 MHz = 0.5 microvolts	
	806-956 MHz = 1.0 microvolts	
Selectivity:	−55dB @ ± 25 KHz	
Audio Output (Nominal):	2.5 Watts at 10% T.H.D.	
Antenna:	telescopic antenna included	
Connectors:	antenna, external speaker, DC power, tape out	
Size:	6 5/16" W × 1 5/8" H × 7 3/8" D	
Weight:	1 lb. 3 oz.	

A casual glance at this miniature mobile/base scanner and you might mistake it for its twin: the BC600XLT (upgrade version of the BC580XLT), reviewed in the February, 1988 issue of *MT*. It is identical--with some important differences--to the new BC760XLT.

Like the BC600XLT, the BC950XLT is capable of accepting an optional preamplifier and tone squelch decoder; the BC580XLT and BC760XLT are not. Additionally, the BC950XLT can have the cellular frequency coverage restored; it is unalterably deleted from the BC760XLT.

Specifications and Features

Frequency coverage of the BC950XLT is 29-54 MHz FM, 118-136 MHz AM, 136-174 MHz FM, 406-512 MHz FM, and 806-956 MHz FM (with modification: see sidebar article). 100 memory channels (sequential or in up to five 20-channel banks) may be scanned at 15 channels per second.

A memory lock switch, mounted on the rear apron, may be selected to prevent accidental erasure or replacement of frequencies in memory. This function protects a set of frequencies installed in the scanner for long term use.

A two-second delay may be selected for any channel or for the search function, allowing the scanner to wait for a reply before resuming its scan or search function. Individual channels may be selectively locked out of the scan sequence; holding the lockout button for 2.5 seconds will clear all locked out channels.

A service search function permits automatic seeking of occupied frequencies chosen among police, fire, aircraft, weather, or ship to shore services, automatically stopping when they are discovered.

Any two frequency limits within a given

band may be searched for activity automatically and a hold button allows manual search stepping if desired.

Sensitivity figures show a nominal 0.4 microvolts at low and high band (FM), 0.5 microvolts at UHF (FM), 0.8 microvolts on the aircraft band (AM), and 1.0 microvolt on the 800 MHz range. IF selectivity is -55 dB at +/-25 kHz.

Channel one may be selected for a priority function; it is then sampled every two seconds for activity. If a transmission is detected, it will remain on channel one until the activity stops or the priority function is manually defeated by the operator.

The squelch control is a concentric knob behind the volume control; a large reference tab makes setting easy and it does not interact with the rotation of the volume control.

A brightly backlit liquid crystal display (LCD) announces frequency, channel number, memory bank(s) selected, lockout and delay status, scan or search mode selection, service being autosearched, priority status, and hold selection.

Audio output is a powerful 2.5 watts at low distortion (10% THD), unusual for a scanner and ideal for noisy mobile applications. An external speaker jack is provided on the rear apron as well as a tape output for recording.

A telescoping whip is provided and a Motorola jack permits use with an appropriate wide-frequency-coverage antenna. The 950 is powered by 13.8 volts DC, provided either by an AC wall adaptor (supplied) or from the automotive battery line (fused DC mobile cord also supplied).

Two AA size cells are required to provide memory backup for at least six months; without them, memorized frequencies will be lost if power is disconnected from the radio.

The 950 measures a very compact 6-5/16"W x 1-5/8"H x 7-3/8"D and weighs a scant 19 ounces. A mobile mounting bracket is included. An integral tilt bracket conveniently raises the face of the 950 for desktop use, permitting a better viewing angle and stronger sound from the bottom-mounted speaker.

The Cellular Fix

The BC950XLT is capable of continuous 806-956 MHz coverage, but the cellular mobile telephone portions of that range are disabled at the factory. The following procedure will restore cellular coverage, but should not be attempted by anyone unfamiliar with integrated circuits or precision soldering.

The procedure will require a Philips screwdriver, a fine-point soldering iron and rosin-core solder, and a fine-point cutting tool (cuticle scissors will do). But remember, if you botch the job, your warranty will be voided!

Grove Enterprises is offering this modification for $10 at the time of purchase from them.

Procedure

1. Be sure power is disconnected; remove four screws holding bottom cover.
2. Remove bottom cover carefully, protecting speaker wires.
3. Locate microprocessor chip (64 pin IC at front of board)
4. Note the indented dot which marks pin one; count along that row to pin 20 and cut it loose at the board (not at the IC body).
5. Carefully solder a bridge between pin 20 and pin 19.
6. Reconnect power to the radio, turn it on and program in 845 Mhz, confirming cellular band restoration.

If all is well, reassemble the radio. If not, check for accidental solder bridges to other pins or incomplete disconnection of pin 20.

Options

The BC950XLT is certainly feature packed, but two additional options are available: a preamplifier and a CTCSS decoder. Let's examine possible applications for these accessories.

If your signals are generally weak because of your location or antenna, you might benefit from the signal-boosting preamplifier. This is not recommended, however, if you are situated in a large city or near powerful transmitters. As with most scanners, intermod and image interference will be noticed under strong signal conditions.

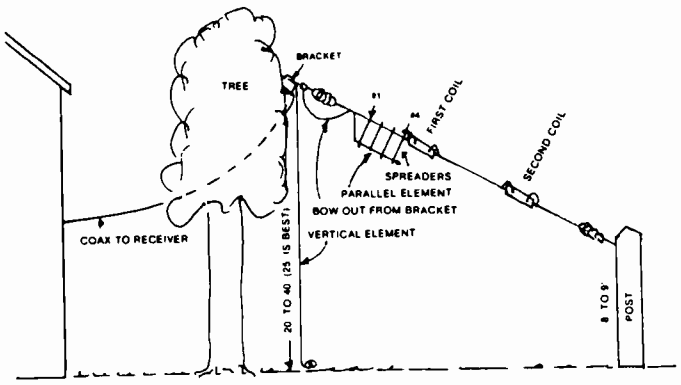
If you are at times interested only in monitoring specific transmissions which have sub-audible tone-encoded squelch (common among law enforcement agencies), the CTCSS option would be a wise choice. When switched on, however, the radio will only respond (break squelch) when a tone-encoded transmission is encountered; you can't mix encoded and non-encoded signals.

The CTCSS option has nothing to do with scrambling; consumer voice descramblers are no longer available because of the Electronic Communications Privacy Act.

In Closing....

We were pleased with the general performance and value of the new Uniden BC950XLT. It showed high sensitivity, thoughtful design, full features, and was extremely easy to program. An excellent choice for mobile applications considering its size and reasonable cost (under $300 from some dealers).

■



Eavesdropper SWL "Sloper" Antenna

Pre-assembled "sloper" antennas are a relatively new phenomenon on the shortwave listening scene. First on the scene was a model by Alpha Delta. It was their first shortwave listening antenna and it functioned well enough. Fortunately, however, like all innovations, however, each version of an idea that appears seems to top the one before it. Antenna Supermarket, the manufacturer of the top-rated Eavesdropper trap dipole, has just released a sloper antenna and it's no exception to the rule.

Like their trap dipole, the Eavesdropper Sloper is ruggedly constructed and fully assembled. It even comes with a package of coax sealant for making sure all connections are waterproof! And it's that kind of attention to details that makes Eavesdropper lines so exceptional. Eavesdropper antennas have earned a reputation for durability and -- we don't use the words lightly -- fine craftsmanship. The sloper continues that tradition.

It should be pointed out that slopers are an antenna orientation, not a type of antenna. It's actually a combination of several kinds of antennas: an off center-fed dipole with one element electrically loaded or shortened via a pair of coils. A parallel element is added underneath the shortened element. In short, it is a dipole with a 1/4 or a multiple of a 1/4 wave on the shortwave broadcast frequencies. A sloper is called a sloper simply because it's mounted diagonally, as opposed to horizontally.

The end result is that signals received from the low end are enhanced. And that's what makes the Eavesdropper sloper antenna such a breakthrough for serious DXers. It "specializes" in pulling in those those hard-to-hear Tropic Band stations (90 and 120 meters) at the same time providing full coverage of the 11, 13, 16, 19, 21, 25, 31, 41, 49, 60 and 75 meter bands as well as the AM broadcast band.

Further, the antenna is directional. You simply "point" the low end in the direction of the part of the world you want to hear. Other signals come in strong, but those in the direction that you've chosen are especially so.

The Eavesdropper Sloper is 67 feet, 6 inches long. It works best when the high end is erected about 25 feet above ground (as should most other antennas) and the low end about 8 or 9 feet above ground.

Compared to the Alpha Delta sloper ($69.95), the Eavesdropper sloper shows higher quality construction. Actual antenna wire is used in the Eavesdropper version, house wire in the Alpha Delta unit. In the Alpha Delta version, the entire antenna is supported by a wire fed through a bare hole in the mounting bracket, which can wear through and drop the antenna. The Eavesdropper sloper has a unique pivoting polycarbonate insulator for longer life. Coils, too, are permanently soldered in place, not bolted to the wire with hardware that can loosen or corrode.

Despite all of this, the Eavesdropper sloper is twenty dollars *less* than the Alpha Delta sloper, retailing at $49.95. The Eavesdropper Sloper is available from most *Monitoring Times* advertisers.

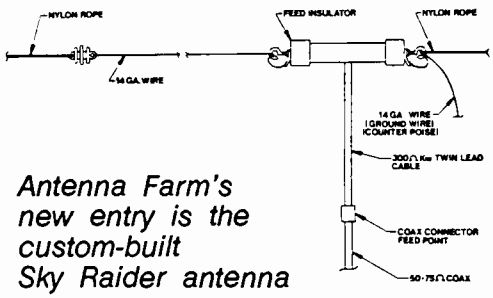
The Sky Raider Antenna

The Sky Raider is a new entry onto the shortwave listening scene. Custom-built by the Antenna Farm, it's based on the G5RV design -- developed by British ham Louis Varney (G5RV).

The Sky Raider is designed for the shortwave listener or ham living on a small lot. It's only 51 feet long and unlike other short multiband antennas on the market, it uses its entire length on all frequencies. There are no traps or other electrical devices to simulate antenna length.

What makes the Sky Raider especially appropriate during these days of increased sunspot numbers (and enhanced reception) is that is provides gain at frequencies *above* 12 MHz. As many listeners have probably noticed, more and more stations are moving into these frequency ranges in recent months. In addition, the *de facto* opening of the 13 MHz band has made these upper reaches more attractive to listeners.

The Sky Raider can be erected either horizontally or as a sloper and covers all frequencies from the AM broadcast band to 10 meters. It's fully assembled and ready to connect to your coax. The Sky Raider is for $39.95 from many *Monitoring Times* advertisers.



Antenna Farm's new entry is the custom-built Sky Raider antenna

Corrections

In the February issue we reviewed Robert Kelty's *Government Radio Systems - California* edition; we incorrectly listed the price as $12. Instead, the price is $25 postpaid, available from Mobile Radio Resources, 2661 Carol Drive, San Jose, CA 95125. Please note this correction if you plan to order.

Shortwave Directory Price Change

In our January issue we reviewed Bob Grove's new *Shortwave Directory*, indicating that its page count exceeded 200. It certainly does; in fact, it excedes 500! The incorporation of an exhaustive radioteletype section with some 14,000 listings resulted in doubling the size of the book.

The correct price of the 1988 (4th edition) of the *Shortwave Directory* is $17.95 plus $2 shipping.

1988 World Radio TV Handbook

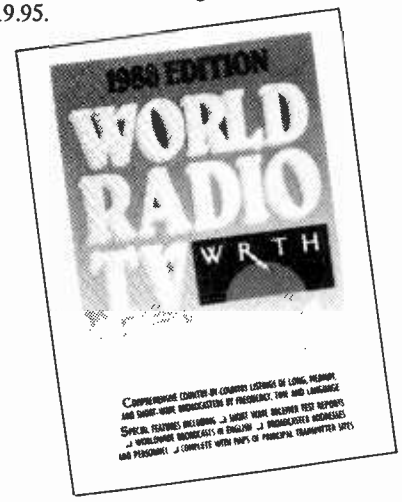
As predictable as a cold, snowy day in winter, the new *World Radio TV Handbook* is once again available. This is the 42nd edition -- 1988 -- of this revered, old, reference annual.

There are no major innovations in this year's book; even the cover remains the same except for a change in color. Most notable is the return to normal size illustrations from last year's postage-stamp size pix.

Inside, you'll find a number of very necessary legends (along with a "how to use this book" type article), lists of organizations involved in broadcasting and an article on sunspots. The bulk of the book, however, is taken up with the usual listing of shortwave stations by country. Under each station heading is a mini-profile including name, address, schedule and transmitter power.

But what makes the *Handbook* so valuable is the other information included: Stuff that is pure minutae, like telephone and telex numbers, personnel, and even station IDs, which are presented in a variety of languages. Also included is a similar list of TV stations.

While station schedules are a strong point of the *World Radio TV Handbook,* its real strength lies in professional minutae: station personnel, addresses and telephone numbers. For this reason, the 1988 *World Radio TV Handbook* remains a "must have" for any serious DXer. The *Handbook* is available from most *Monitoring Times* advertisers for $19.95.



The venerable World Radio TV Handbook - always a "must" for any serious DXer.

Panasonic's RF-B40 - A very handy pocket portable

Panasonic RF-B40

Looking for a perfect pocket portable? Panasonic's compact, multi-band RF-B40 offers sensitivity, stability, and a good value for the dollar in a package about the size of a small paperback book.

Coverage includes long wave from 146 to 288 kHz, AM from 522 to 1611 kHz, FM from 87.5 to 108 MHz and continuous shortwave coverage from 1611 all the way up to 29995 kHz. Tuning the RF-B40 is accomplished via and up/down tuning button which moves the dial in 5 kHz increments (on shortwave). Or you can use the touch tone phone-like keypad to punch in the exact frequency. You can also store 9 shortwave, 9 FM and 9 AM and longwave frequencies in the radio's memory -- easily recovered by a push of the button.

Although the 1988 *World Radio TV Handbook* says that the RF-B40 "does not offer any form of fine tuning control," information from Panasonic does indicate that the receiver has a 1 kHz-step fine tuning control for long wave, AM and shortwave. There is also an auto-scan feature, allowing the listener to move across a specific band in search of stations.

Frequency is displayed on a good LCD along with all functions selected.

The Panasonic RF-B40 does not have provision for SSB reception. With a single, wide bandwidth filter, separating stations 5 kHz apart is difficult, meaning that you won't be doing a lot of heavy-duty DXing with the RF-B40. What you will be doing, however, is using a very good, very handy travel portable. The Panasonic RF-B40 has a suggested retail price of $199.95.

Scanner Frequencies

Finding out what there is to hear on your scanner can be a frustrating experience. Sure, there are some great books and regional directories available to the scanner enthusiast. But what if you're looking for real local information for your area? Unless you have enough patience to sit on the search mode of your scanner or can find a knowledgeable local scanner dealer, you could be out of luck.

Bruce Heald offers individually-researched local scanner directories for anywhere in the United States. He claims to be able to provide a virtual phone book of local frequencies for you -- all local, country and state government are covered. along with businesses, non-profit organizations, police, sheriff, ambulance, rescue, taxis, hotels, motels resorts and more -- virtually anything that uses a scanner frequency from 30 to 1300 MHz.

Charges for the service vary. To obtain a quote, simply list the community (not county) for which you want general coverage and send a self addressed, stamped envelope to Bruce K. Heald, 6886 Jefferson St., North Branch, MI 48461.

A Trouble Shooter's Guide to Electronic Repair

by Bob Sickels

Hundreds of electronic projects are built by amateurs. Many of these fail to work and are eventually crapped by the builder in disgust, even though just a little intelligent trouble-shooting would get them operating. The following is a routine developed by the author over 42 years of field service experience:

1. Everything which follows is based on a single premise: *That an electronic device works is no miracle. It only requires that all operating parameters are satisfied.*

2. Don't be intimidated by complexity. The device may be analyzed piece by piece or by individual circuit legs.

3. The first step is to subject the device to a good visual examination.

a) Is there any obvious miswiring?

b) Did solder manage to get somewhere that it shouldn't?

c) Are there any broken traces on a circuit board? Places shorted across?

d) When the device is powered up, does any component smell hot? Feel hot?

e) Could there have been any ambiguity in the way you read the schematic diagram or the parts list? Have you misread a resistor color code? Mistaken a common diode for a zener? Are any electrolytic capacitors or diodes wired backwards?

f) Has any wiring been deleted? Have two unalike parts been switched? Have you made a dubious parts substitution?

g) Have pinouts on I.C.s been properly observed?

h) Could your wiring efforts have damaged a part? Cracked a diode? Pulled a lead wire out of a capacitor?

If the above fails to reveal the problem, proceed to step 4.

4. Now is the time to apply test equipment. Using a voltmeter with appropriate scale, begin by measuring all of the various voltage potentials required for operation at the *source*. If you don't have operating potential there, you won't have it anywhere. Most circuitry involved delivering these operating potentials to the individual active components. Proceed from the source out along the various supply lines to determine the presence or absence of operating voltages. Look for any suspicious voltage drop which may indicate an individual circuit that is drawing excessive current. Look for any breaks in the potential supply line if operating voltage is absent anywhere. Don't stop until all of the various active components show there recommended operating potentials at the appropriate terminals.

5. Assuming that all previous steps have not solved the problem, now is the time for signal tracing techniques. This approach is used in any circuitry designed to amplify or relay signals, either analog or digital. Here an audio signal tracer with probe, or an oscilloscope will be most helpful. If the signals are audible in nature, you should be able to hear them at the input and output terminals of active devices, or see them on the screen of an ordinary oscilloscope.

If the signals being processed are too high in frequency to be heard or to be detected on your oscilloscope, then other techniques must be employed. With such circuitry that is designed to amplify or process signals too high to be heard or registered on a frequency limited oscilloscope, modulated signal injection is commonly used. (An R.F. signal modulated by an audio note.) Presence or absence of signal may then be heard or read out by use of a *demodulator probe* which reveals the presence or absence of the audio content of the waveform.

In this series of tests, you will not only be looking for the presence or absence of signal, but also whether or not it is being amplified by components meant to be amplifiers. If any stage is found to be lacking in any of the above tests, look for a possible failure of any individual component in that stage.

6. If a device designed to be an amplifier has signal output which appears constant and does not vary with increase or decrease in input signal, *immediately suspect that the amplifier is oscillating!* This may be further revealed by supply line resistors or amplifier components that are overheating. If such turns out to be the case, run through the following tests:

a) Are input and output signal lines dressed too close together?

b) Has appropriate shielding been used?

c) Could any bypass condenser--including electrolytic capacitors in the power supply--be open? (A quick check here is to bridge in a capacitor known to be good.)

d) Are all grounds making firm electrical contact?

e) Have two stages been physically placed too close together? Have the supply lines to amplifier stages been adequately decoupled from signal?

f) Could chassis signal currents be circulating due to the lack of a *common chassis ground?*

Careful observation of the above trouble shooting techniques will resolve about 95% of all of the problems present in newly-built (or even older) equipment. The remaining 5% of malfunctions involved intermittent or noisy operation. Most problems involving excessive noise involve:

a) Defective amplifying active device

b) Noisy carbon resistors

c) Coupling capacitors (especially electrolytics) that are breaking down and leading dc voltage into the following stage

d) Corroded coil or interstage transformer windings.

Any operating device that delivers noise when gently tapped probably has a cold solder joint or a defective component as noted above. Here very careful and gentle prodding with an insulated probe many times will show up the defect.

If the device is intermittent in its operation but does not appear to show the above defects, try applying quick thermal changes to individual components. Individual component heating may be accomplished with the use of a lady's hair dryer to which a paper cone has been attached. Instant cooling of an individual component may be

accomplished by using spray cans of refrigerant, available from many electronic supply houses. In any of the tests employed in this series causes you to suspect an individual component, *replace it.* The clost of the component is usually much less than the timeinvolved, if you value your time at all.

If the device is still stubborn and has failed to yield to any of the above troubleshooting techniques, proceed to step 7.

7. Time out for mental digestion. If careful analysis over long periods of time fail to produce results, do not carry the tests to a point of mental fatigue. Sleep on it and return to the problem at a later time when you are more alert. I cannot count the times when I have solved a tough service problem the morning after. In several instances the solution was staring me in the face the next morning and I wondered how I could have been so stupid.

If the device is too expensive to scrap and you have still failed to get results, proceed to step 8.

8. Swallow your pride and seek outside help. Often consultation or discussion with another will turn up something you have overlooked. If all else fails, take it to a professional servicer skilled in such work, and when the problem is resolved, find out what was wrong so that any error might not be duplicated in the future.

(NOTE: This excellent step-by-step procedure first appeared in the December 1987 issue of The Radio Observer.)

One Antenna for Dual-Input Scanners

Many scanners now on the market with 800 MHz coverage utilize a separate antenna jack for that band, requiring two antennas to be used for full coverage. Two plug-in whips are generally packaged with those radios.

But what if you want to use one of those scanners with an outside antenna? Is there a simple way to use one all-band antenna connected to both antenna ports on the radio? Yes, and it is quite simple.

A trip to an electronics hobby store or to the TV department of a discount store should readily provide you with a "two-way splitter", a device intended to permit one outside TV antenna to be used with two television sets. Be sure it is marked for both VHF and UHF (often rated as 5-905 MHz).

The splitter uses TV-type F connectors; you will need to make up two jumper cables for the scanners as well as outfit the main antenna cable with F connectors. The other ends of the jumpers should be outfitted with appropriate connectors for your scanner antenna jacks, usually Motorola (car radio type) plugs.

If Motorola plugs are unavailable or awkward to install, use PL-259 "UHF" connectors in combination with UHF/ Motorola adaptors; they work well, are more rigid and less lossy, but more expensive. They add flexibility to the system, however, accommodating other types of adaptors for other uses.

Software for the Ham

Ike Kerschner has come across three interesting disks for the Apple II series of computers. Disk one contains programs on satellite locating and tracking, antennas, code practice, electronic design calculation, great circle bearing, filter, noise bridge, coil design and VSWR calculations.

Disk two has several electronic calculation programs, L network design, Ohm's law, QSL Card, Quad antenna design, transistor amplifier calculator.

The third disk has log books, contest logs, dupe checkers, loaded dipole design, and award record-keeping programs.

Each disk contains about 30 programs, far too numerous to list. Price is $5.00 each or $17.00 for all three from "Imprime," Box 241, Radnor Station, Radnor, PA 19087.

W. Clem Small, KR6A, CET
Rt. 1 Box 64A
Weybridge, VT 05753

Confusing Coax

It's a good bet that most of us use at least some coaxial cable as feedline at our stations or monitoring posts. So, this month, let's take a look at some ideas which can help us utilize that coax effectively.

Born to Lose

Any feedline has some amount of loss which will decrease the strength of the signal passing through it. Some attenuate the signal more than others.

When you're looking to eke out that last possible decibel of signal from your feedline, then open-wire feedline (sometimes called "ladder-line"), with its relatively low loss, is sometimes preferable. Losses in good quality TV twin-lead type line tend to be more than two or three times the open-line value, but still considerably less than that for coax.

Admittedly, the "hardline" type of coax has very low losses which are comparable to those of open-wire feedline. But hardline is very expensive and most of us can't afford to buy the stuff. So, for weak-signal reception, it is sometimes open-wire line or twin-lead that looks best to us.

On the other hand, if you will be dealing only with signals of at least moderate strength, the convenience of regular coaxial cable may turn the tables in its favor. And, for short runs of feedline (up to a wavelength or so long), good quality coax has little loss anyhow. Even longer spans may have insignificant losses, depending on the needs of your system.

To illustrate, we'll use an example. Most of us have an idea of what changing a signal by one S-unit in strength will do to its readability. One S-unit is *not* an insignificant amount of signal change. But for moderately strong signals, the loss of one S-unit is not a problem.

Consider that, at 20 MHz, it takes something like 300 feet of RG-58 to attenuate a signal 6-dB, or a single S-unit. If we go to the lower loss RG-8 foam dielectric coax, it takes over 800 feet of cable to drop the signal level by that one S-unit. Use 800 feet of open-wire feedline and you'll lose only only about 1 dB. It is very difficult to detect a change of 1 dB in signal level.

Actual cable-loss values may vary in value from those given in this discussion, depending on whose tables you use for computing cable loss. The general implications are always the same: open-wire line has much lower losses than coaxial cable. If the difference is important enough to you, you will pick the open-wire.

In Practical Terms

Back to reality, notice that the distances given above are probably longer than most of us need to run our feedlines. For the 50 to 100 feet that most of us would need, the difference between using open-wire and coax is probably not worth the trouble it takes in most installations. This is especially true for the HF band and below.

If we move up into the VHF and UHF bands, then the differences between the two types of lines are more important. For instance, at 10 MHz the difference in loss between a 100 noticeable in most work we do. At 100 mHz, however, the difference becomes a very noticeable 4.5 dB. So you can see why the experts always recommend that coax which is to be used at VHF and higher frequencies should be the best (lowest-loss cable) you can afford.

Some Other Factors

Another consideration in choosing between feedline types is the extra installation work which the open-wire and twin-lead require. They must be strung in the clear and high enough to be out of the way of pedestrian or vehicular traffic. Compare this with the fact that you can run coax along the ground, hang it from tree branches or across fences, lay it under water, or even bury it.

From a different perspective, we mustn't forget that open-wire feedlines are more susceptible to signal and noise pick-up by the feedline. When used as transmitting feedline, it is prone to problems of signal radiation from the feedline. A plus for open-wire line (or any low-loss line) when used for transmitting installations is that it maximizes transmitted power under high SWR conditions.

Points Worth Noting

Most equipment today has an unbalanced input or output, ideally suited to the use of coaxial cable, which is also unbalanced. Open-wire line, on the other hand, is a balanced feedline. And most modern equipment doesn't have a balanced input to output. But balanced devices and balanced feedlines can be changed to unbalanced

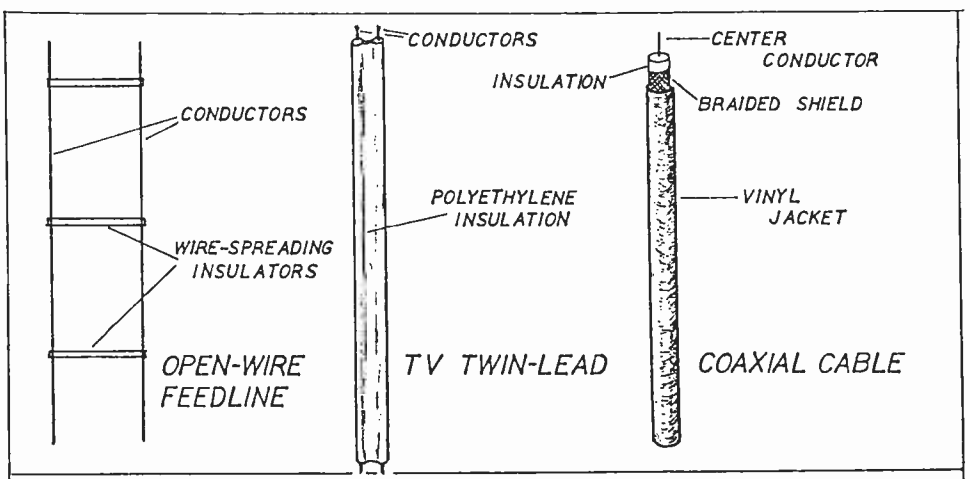
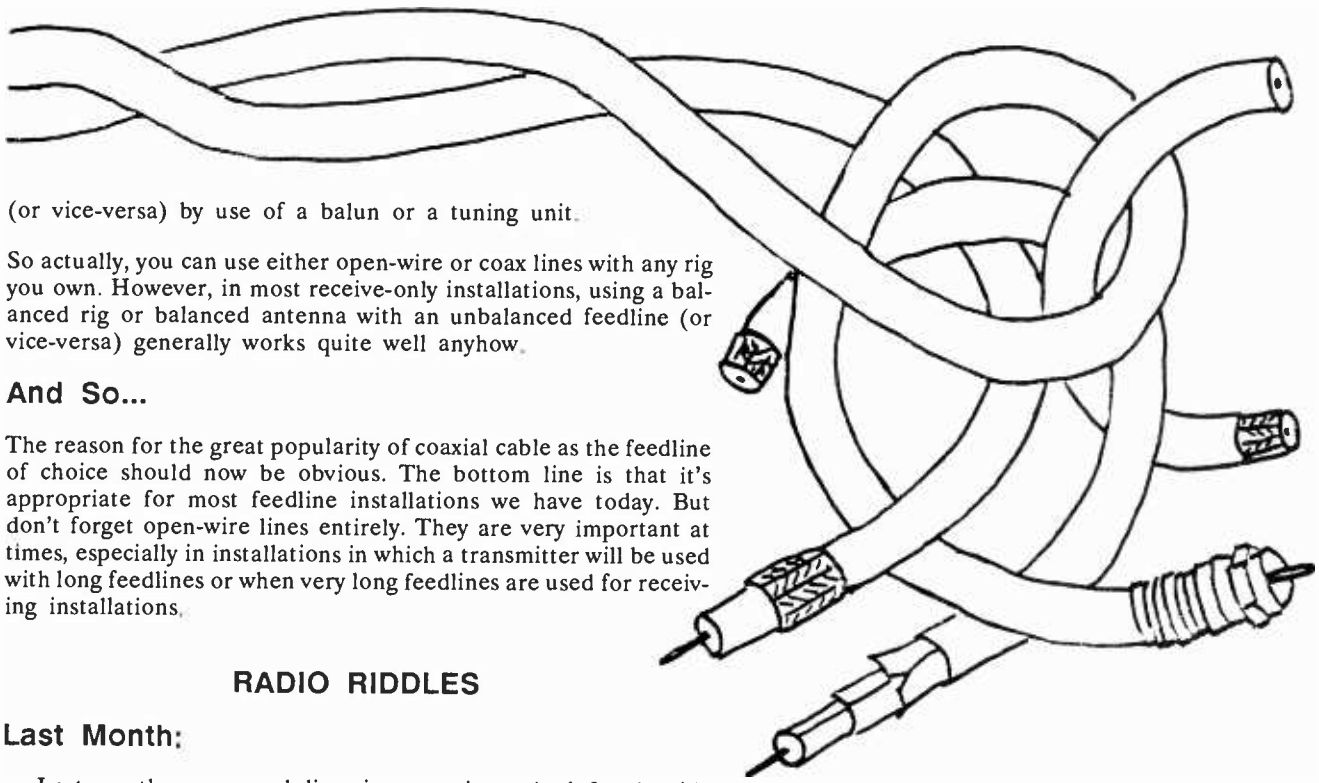


FIG.1. OPEN-WIRE FEEDERS GIVE LOW SIGNAL-LOSS BUT COAX OFFERS SEVERAL ADVANTAGES (SEE TEXT)



(or vice-versa) by use of a balun or a tuning unit.

So actually, you can use either open-wire or coax lines with any rig you own. However, in most receive-only installations, using a balanced rig or balanced antenna with an unbalanced feedline (or vice-versa) generally works quite well anyhow.

And So...

The reason for the great popularity of coaxial cable as the feedline of choice should now be obvious. The bottom line is that it's appropriate for most feedline installations we have today. But don't forget open-wire lines entirely. They are very important at times, especially in installations in which a transmitter will be used with long feedlines or when very long feedlines are used for receiving installations.

RADIO RIDDLES

Last Month:

Last month we covered diversity reception. And, for the riddle, I asked you: "Which kinds of antennas have a sort of "built-in" automatic diversity effect, and why?" Well there are at least two kinds of antennas which have this effect. One category which would have this effect is any very large antenna. Some antennas are so large that some of their individual elements are separated by several wavelengths. These antennas cover sufficient territory that a wandering signal may wander a fair distance and still be in the capture area of the antenna. Thus, they have an automatic, built-in space diversity effect.

The other category of antenna with automatic diversity effect consists of antennas with elements which are oriented at various polarities. For example, some antennas used to receive satellite transmissions use crossed dipole elements. Because the elements are at right angles to one another, the difference in signal polarization between the two dipoles which make up this antenna is 100 degrees. Which of the two dipoles responds most to an incoming signal depends on the polarity of the received signal. During reception, a satellite signal will often shift its polarity. When this occurs, the dipole which was less responsive before the shift will become more responsive, yielding a polarity diversity effect.

This Month:

There are many types of feed lines: coaxial feed-lines, four wire open-wire feedlines, two wire open-wire feedlines, and even single wire feedlines. But what kind of feed system uses no line at all? There is a system of feeding a signal from the top of a tower to ground level, using no coax, no open-wire line, no waveguide, no conductor at all! This avoids the losses associated with a feed line for bringing the signal down the tower. How is that accomplished?

Tune in next month and find out the answer to that one.

Terry Staudt, LPE, W0WUZ

716 N. Roosevelt
Loveland, CO 80537

Back off a Little

When I started out in this game, I wanted to have the *best* sensitivity available. Before long, however, I began to suspected a sinister plot on the part of the manufacturers to keep me from hearing things. What I'm trying to tell you is I wanted to listen to communications from Altair IV.

In retrospect, it was all rather silly, but judging from the number of 'after market' preamplifiers available, you guys are still jumping up and down for gadgets just to hear the BBC.

Like vitamin freaks, (if one is good, a whole bucketful must be better) a lot of you, while meaning the very best, paint yourselves into a corner with a bunch of wide-band or tuneable amplifiers ahead of a receiver that can hear the cry of a dying fly in Outer Mongolia. What this does is cause strange problems wherein *nothing* sounds good. This is called cross modulation, intermodulation, or just plain overload.

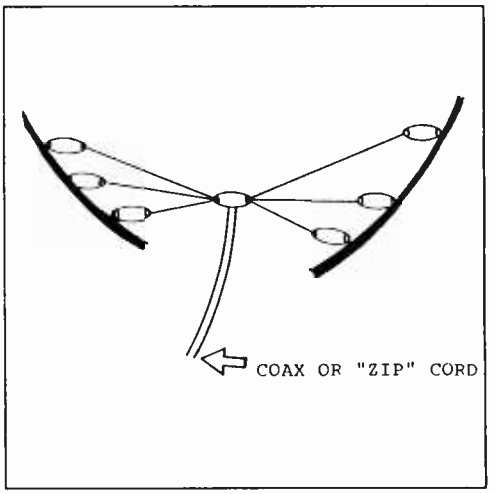
While I take the risk of being tried for heresy, I'm going to outline an inexpensive and easy to build an *attenuator* that might just shock the daylights out of you by the way it can enhance reception. The toggle switches are in 3 db increments and to use it you just start throwing them until the garbage disappears from the station you're listening to. This can be almost as effective as a crystal filter in some situations.

Wiring should be short, stiff and point to point for it to work correctly.

Why the R-71A?

To my acute embarrassment, many of the tricks I've outlined in the past few years, Schottky diodes, etc., just aren't germane to the ICOM R-71. It has a most exotic ICd circuit that doesn't lend itself to easy modifications. The good news is that it works very well "as is." I apologize to the many writers who've asked me "where does it go"? It usually doesn't. Also a 3N211 transistor in the 1st RF actually degrades it. They must be doing something right!

About the only thing that *really* works is the Fox Tango FT-44A filter which sells for $50.00 less than the very good ICOM FL-44A and has better specifications. Hats off to ICOM for a job well done! If only they could make the lithium battery replacement/re-programming situation user competent, they would really have it all together. I expect they'll solve this one before 1988 is out. They don't want the radio every five years any more than you want to be without it, I assure you.



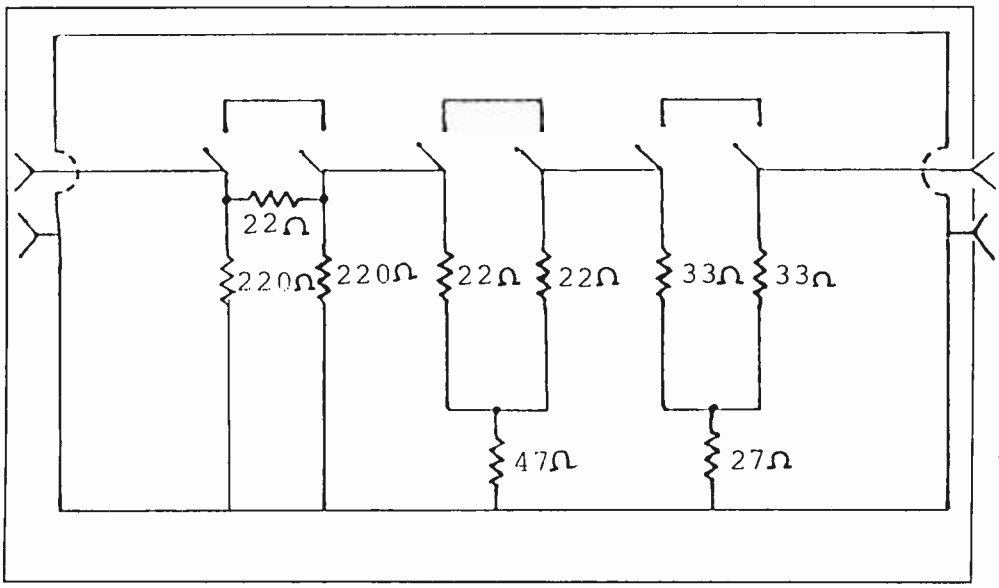
The Antenna

Here I go again. You can tie a rock to a wire and throw it over a tree limb. No doubt about it - it picks up signals. What Clem Small and I have been trying to tell you, lo these long years, is that it has to have an arithmetical relationship to the frequency of interest to "ring", like a tuning fork, for efficient transfer of the signal to your radio.

Otherwise, as I've experienced when talking to a ham in a far off place, people break in and ask "what frequency is he on"? When I say "this one," they tell me that they can't hear it on their Super Werewolf 10,000. Pity. It's all in the antenna - otherwise it doesn't matter what you have!!

The formula for a half wave dipole is 468/f MHz. This is cut in half and attached to the receiver with 52 Ohm coax or regular lamp (zip) cord or speaker wire, which has an impedance (radio resistance) of about 75 Ohms - the same as the center of the dipole.

An antenna works at twice or more multiples of the fundamental (5, 10, 15, 20 mhz) although the impedence changes except at the third 'harmonic', where it remains the same. This requires an antenna tuner, such as the Grove "Minituner III" for best results. Dipoles can also be 'piggy backed' so as to need only one feedline.



(Figure 2).

Talk Up/Talk Down

I get flak from people who tell me they can't understand what I propose. Conversely, I'm told "it's too simple, everybody knows that!"

That's precisely why one month I present heavy construction articles and the next I ease up a bit. It's impossible to please all of the people all of the time. Also, newcomers are always reading me for the first time and it's only fair to want them to look forward to the next time rather than frighten the daylights out of them.

Our readership ranges from "appliance operators" to engineers and there's room in the boat for everyone. Otherwise, our subscriber list wouldn't be growing at an astonishing 5% per month.

I'm aware that I've 'run off at the mouth' for a few paragraphs, but the reason is quite simple. This is a general reply to the most asked questions in the great letters you guys and gals send me. When the mail comes, it really makes my day to go through all the "love letters," as my wife refers to them. Knock on wood, I've never had what I could call a bad one. (There was one from an East Bloc country that try as I could, I couldn't get translated. I sent him my QSL card and wished him well.)

On the PRE-III

An 'in house' review is rightly suspect by any intelligent reader. I borrowed a PRE-III from Bob in September after I'd received some complaints from users. I felt the best thing was to try it, and I do have a commercial AM/FM station about a mile from my location. The results were rather tepid. IF the gain was run up all the way, it was really bad news - it amplifies like all get out! It also has no selectivity whatever. It was designed that way.

BUT, if the gain control is "ridden" *along with an antenna tuner*, it is quite satisfactory in pulling up a weak one. I would simply say that the gripes I received were from people living very close to one radio transmitting service or another in the main. If you're not in an RF saturated area and use it intelligently, it's worth the money. It's also good for fringe FM and TV through UHF. That's the story.

Enjoy. Don't forget a S.A.S.E. with your questions - a lot have recently.

■

Build a 3-Band Shortwave Converter for Your Car

Wouldn't it be nice if you could take your shortwave radio with you in your car? Imagine tooling down the highway on your way to work, listening to the latest world news on the BBC. Or maybe tuning in a spot of upbeat Latin music to get your day started on the right foot.

You could put an inexpensive portable on the dashboard and watch it slide from one side to the other every time you make a turn. The heat of the sun, magnified through the windshield, even in winter, might ruin that radio and chances are that if it survives that, someone might steal it. Too much of a headache? There is an easier way.

We're going to show you how to build a converter for your car radio that will allow you to tune in the 49 (5950 to 6200 kHz), 31 (9500 to 10000 kHz) and 19 (15100 to 15490 kHz) meter bands without all of those hassles. We chose these bands because the probability of finding one or more of them open during any time of the day or night is good. Also, the time signals from WWV on 10000 kHz are tuneable on the 31 meter band. So we have a talking clock in our car to tell us how late we are!

How it Works

There are two controls on the converter; the bandswitch S1, and the on/off switch S2. T1 matches the car antenna's impedance to the input impedance of Q1, a dual gate mosfet. Capacitors are placed in parallel with T1's secondary by S1A. These capacitors are chosen to resonate T1 to the band we wish to tune on the car radio.

Q1 is the mixer. Shortwave band frequencies are present on gate #1, while a fixed H.F. frequency from oscillator Q2 is present on gate #2. At the drain of the mixer are 4 signals: the 2 original ones on gates 1 and 2, their sum, and their difference. The difference frequency will fall in the tuning range of the AM car radio.

Q2 is a Pierce crystal oscillator. Two capacitors (designated Cfb) provide feedback to sustain oscillation. S1B selects a crystal to correspond to the band selected by S1A. The oscillator is a fundamental type, meaning it's output is the same frequency as the crystal.

S2 is a DPDT slide switch. One pole switches 12v DC to the converter during use, the other pole switches the converter out of the antenna line when not in use.

Choosing Crystals

The builder is given wide latitude in choosing crystals for this converter, with the hopeful result that he will be able to scrounge them up for free in the junkbox or for cheap at a swapmeet or hamfest. It makes no difference if the crystal frequency is above or below the shortwave frequency we want to receive, so long as the difference falls in the tuning range of the AM car radio.

If the crystal frequency is below the shortwave frequency, then the car radio will tune the shortwave band in the conventional manner (lowest frequency on the left, highest on the right of the slide rule scale). If the crystal frequency is above the shortwave frequency, then the car radio will tune "backwards" (highest frequency left, lowest on the right).

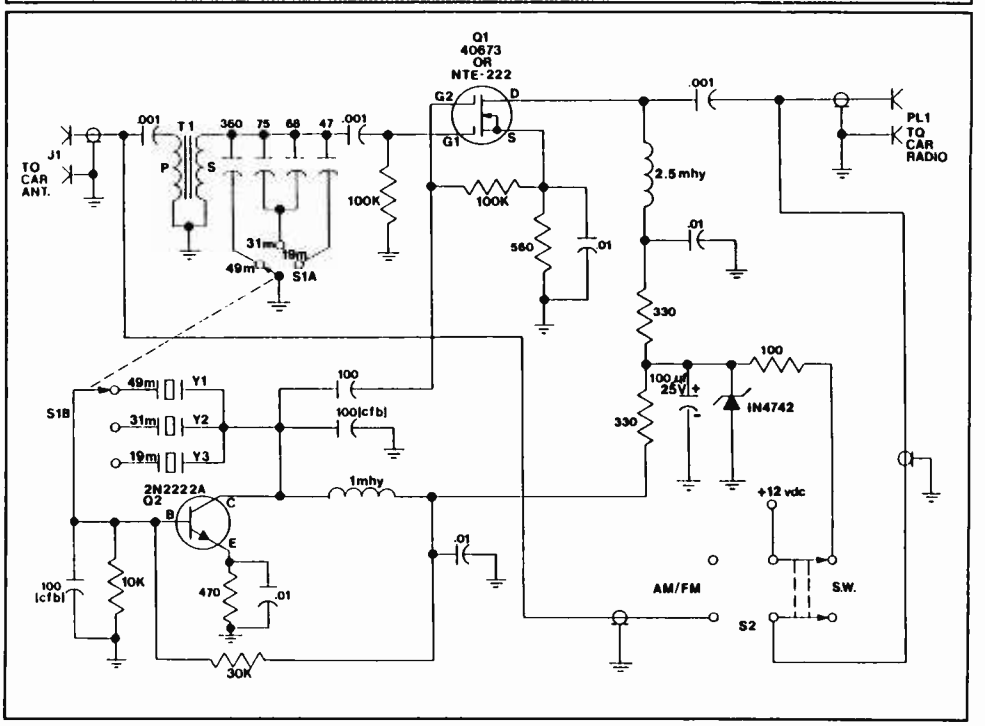
Listening enjoyment will not be affected if you choose a crystal which causes "backward" tuning. So start scrounging for crystals that will fall in the frequency ranges given in the chart below, and see how cheaply you can get by!

Construction Tips

The manner of construction is not too critical. Perfboard is recommended for the first time builder. An ambitious builder could make up a single or double sided PCB. T1 must be wound by hand; the secondary windings must use the gauge of wire specified and must be "closewound" in order for the transformer to resonate properly with the values of fixed capacitors specified in the schematic. A sketch of how the transformer should look is included with the semiconductor base diagrams.

Crystal Frequency Ranges

Xtal	Band	Band Frequency	Xtal Frequency Range
Y1	49M	5.95-6.2 MHz	4.6-5.41 MHz or 6.74-7.55 MHz
Y2	31M	9.5-10.0 MHz	8.4-8.96 MHz or 10.54-11.1 MHz
Y3	19M	15.1-15.49 MHz	13.895-14.56 MHz or 16.035-16.7



Keep all leads to S1 as short as possible. One way to do this is to mount S1 on the front panel of the box you are going to use, then mount your board directly behind S1 using screws, spacers, and nuts. (see diagram). J1 and PL1 are simply a 2 foot long car antenna coax extension cable available from Radio Shack, which is cut in half. Drill two holes in the back of the box and fit the holes with grommets, then put the two pieces of coax through the holes. The +12v power lead can also pass through one of the holes with the coax.

Be sure and use a metal box for the enclosure, as a plastic one will allow the strong local mediumwave stations to "bleed" past the mixer and you'll never hear any shortwave stations. The fixed capacitors on S1A could be replaced by small trimmer capacitors of a slightly higher value if desired. This will increase the costs but will allow you to more exactly resonate T1 to the center of each shortwave band.

Using the Converter

First of all be advised that this project will work best with a conventional slide-rule tuned (analog) car radio. Most digital radios are pre-programmed to tune in 10 khz increments, where as shortwave stations are in 5 khz increments or on "weird" frequencies like 99770 kHz. So a digital car radio which is programmed in 10 khz increments will only allow you to hear half of what is available.

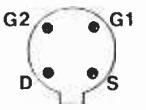
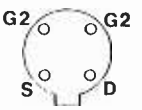
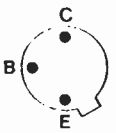
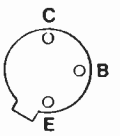
Next you need to know where on your dial you can expect to find the shortwave. To do this, subtract the frequency of each crystal you've found from the band limits of it's corresponding band. For example, say you found a crystal marked 8.65 MHz for the 31 meter band. 9.5 - 8.65 = .85, and 10.0 - 8.65 = 1.35. So you will tune the 31 meter band between 850 and 1350 on your car radio, with WWV falling on 1350.

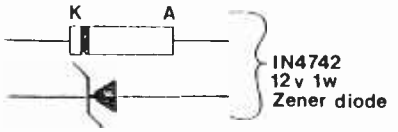
This circuit is sensitive enough to get all the major broadcasters loud and clear with your engine on. And if you are out camping in a quiet location with your engine off, you can actually do some real DXing on your car radio using only the car's antenna!

Good luck! Any questions from constructors regarding this project will be answered if a Self-addressed, stamped envelope is enclosed.

Eric Johnson KB6EPO
799 Ada Street
Chula Vista, CA 92011-2603

SEMICONDUCTORS

DEVICE	BOTTOM VIEW	TOP VIEW
40673 OR NTE-222 N-CHANNEL dual gate MOSFET		
2N2222 NPN Bipolar Transistor		

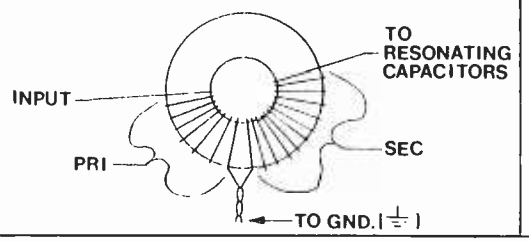


TOROIDAL TRANSFORMER T1

AMIDON T-68-2 core (red color, one size.)

PRI: 8 Turns, #21 enamel coated wire.

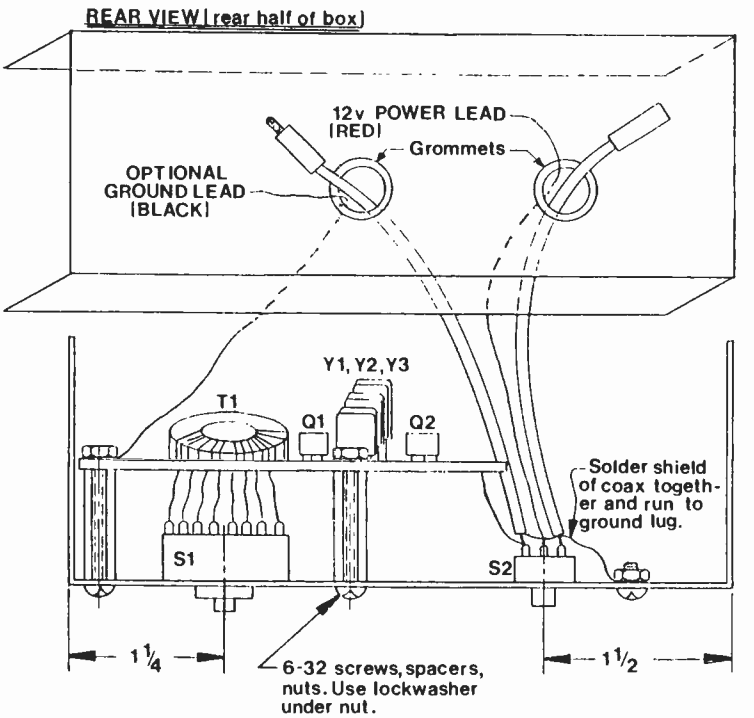
SEC: 12 Turns, #21 enamel coated wire.



GENERALIZED PHYSICAL LAYOUT

1.) Use metal box 5 1/4" W x 2 1/4" H x 2" D; larger if you feel confined working in so small a box. Box consists of two "U" shaped pieces held together by screws.

2.) Mount back half of box to frame of car with screws. If mounted to plastic, provide ground wire as shown, connect to car chassis.



* Hook power lead to "radio" side of fuse, or use an in-line fuse holder with a 1/4 A fuse inside.

From the Editor:

Let's Start a Campaign

Last year, two new commercial shortwave stations signed on the air from the United States: WCSN, the World Service of the *Christian Science Monitor* and KUSW Worldwide. Both cover different areas of interst, one news, the other music. Both are of superior quality.

Tired of the same old government-sponsored dreck on the shortwave bands? Interested in seeing more professional, mass-appeal stations like WCSN and KUSW on the air? You *can* make a difference. Vote "yes" with your dollars and your mouth.

If you make a purchase from a company that advertises on a shortwave station, simply make the effort to point out that you heard about their product on a shortwave station. Specify exactly which station. Tell them twice, just to make sure it registers along with your money in the cash drawer.

It's a simple proposition. If the people who advertise on shortwave see that their advertisements are having an effect on sales, they'll spend more money on shortwave advertisements. Some of that revenue goes into programming on the station. And if other organizations see that WCSN and KUSW are doing well, they'll jump on the bandwagon, too, and put stations on the air. And if more high quality station are on the air, more people will listen. Receiver manufacturers will sense growth and provide a better selection of receivers. It goes on and on, you see. It has a name: capitalism. And it works if you work it.

Cast your vote. Say you heard about it on shortwave.

Larry Miller

LETTERS continued from page two

Scanner Coverage: Yes and No

With few exceptions, shortwave signals can be heard all over the world. In the case of scanners, you are basically limited to the activity in and around the area you live. And yet that seems to absorb the lions share of *MT's* monthly contents. Readers in North Carolina could not care less about what can be received in Minneapolis.

Frederick M. Townroe
Major, USA (Retired)

Look back at issues of *Monitoring Times* from a couple of years ago. Then compare it to recent issues. Where have all the scanner articles gone? We need more coverage of local frequencies, things we can hear in our local areas. Enough about shortwave! Let's get back to our scanner roots.

Ken Smith
Washington, DC

I think *MT* currently has a very good balance of subject matter.

Gary Hahnke
Venice, FL

Your subscription rates are too low. Raise them to $18.00+ a year. You won't lose anyone.

Clark Nobil
Miami, FL

More to Europe than Meets the Ear

The "DXing Europe" article [January, 1988] was amazing. I've been listening for some years now and never even *knew* some of these stations existed. Issue in and issue out, you people never cease to amaze me. DXing Europe will never again be like "shooting fish in a barrel" for me!

Steve Miller
Arlington, TX

Our resident equipment expert, Larry Magne, also enjoyed the article but called to point out an error: The Bulgarian Home Service transmitter in Stolnick listed on 5057 is actually on 7670 kHz. We're not surprised that Magne would notice something like that. He also happens to be the publisher of the best-selling frequency guide, "Passport to World Band Radio."

Phone Phreaking

I'd like to see an article on phone phreaking. There used to be a group called TAP in New York in the 60s and 70s -- kind of fun anarchy -- that used the CIA's telephone credit cards to make long distance calls. Theft? Well, it's a few less dollars for the Contras. anyway!

[Withheld]
Capitola, CA

No More Scraped Knuckles

I like the new size of *Monitoring Times*. Now my mailman doesn't have to work so hard to squash it into my mailbox and I don't have to scrape my knuckles trying to pry it loose.

Ruth M. Hesch
White Plains, NY

An enthusiastic "well done" on the new format of *Monitoring Times*. Keep up the good work!

Robert Gayhart
Peoria, IL

Congratulations on the new format of *Monitoring Times*. It's much easier to file.

Stanley Mayo, WDX1B
Westbrook, ME

The new size of *Monitoring Times* is a gem. The content, as always, is of high quality.

(Mrs.) Leslie Edwards
Doylestown, PA

The new *Monitoring Times* doesn't cover the bottom of Prince's bird cage nearly as well as did the old version. Here's one "no" vote.

Ken Karweil
Wilmington, DE

All I can say about the new *MT* is... GREAT! Keep it up!

El Charlton
Baton Rouge, LA

Scanner Squabble

In the December issue of *Monitoring Times*, I read about the TS-2 scanner. So I bought one. Then I got the January issue and it told me all of the things wrong with the TS-2. I would be nice if you can put both the pros and cons in the same issue! Still think *MT* is great. Keep up the good work.

Greg Grace
Sun Valley, CA

How about it readers? After all the hoopla about the new Radio Shack scanners and what can be done to improve them, let's get some of you high-tech types taking on the workhorse of the scanning world, the Bearcat 100 XL? I've been told that the chips can be programmed to allow expanded frequency coverage. And how about more memory by bridging some wire somewhere? Even *I* have found that the 100 XL can go out of band by leaving the squelch open and stepping up through the band.

Steve Wills
New Albany, IN

I am seeking technical improvements and projects on improving general coverage receiver and scanner operations. To be more specific, projects such as adding tuneable IF passband, replacing cheap diode product detectors, extending HF receiver displays to 10 Hz resolution, active IF noise blankers...

Roy Galbrecht, Jr.
Birmingham, AL

Low Frequency Fantasy

Now I'm no fool. I know when I'm getting hosed. Everyone once in a while, you people propagate the fantasy that there really *are* stations on longwave. But for the life of me, I can't seem to hear them. And I've been trying on my Sony ICF-2010 for about two years now. Nothing. C'mon, guys. Stop pulling my leg. You are pulling my leg, aren't you?

Mark Kensill
Cedar Rapids, Iowa

Tune Me In

I would like to hear from other utility listeners who use the Info-tech M-6000 to copy CW, RTTY, ASCII, TDM, Packet Radio, fector, and Arqtor.

Kenneth MacLeod
14 Flanders Road, Westborough, MA 01581

MONITORING TIMES dealerships are available at a substantial discount. Call or write Judy Grove at P.O. Box 98, Brasstown, NC 28902 or call 704-837-9200.

STOCK EXCHANGE

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

NON-COMMERCIAL SUBSCRIBER RATES: $.10 per word; NON-SUBSCRIBER RATE: $.25 per word. All ads must be paid in advance to Monitoring Times. All merchandise must be personal and radio-related. Ads for Stock Exchange must be received 45 days prior to the publication date.

COMMERCIAL RATES: $30 per two inch ad must accompany ad, payable to Monitoring Times. Send 2-1/4" x 2-1/4" camera-ready copy or send text.

For Sale: BEARCAT 300 scanner - $150.00 mint condition in original box. C. Wolgel, 305 East 86th Street, New York, NY 10028. Call between 9:30-11:30 PM EST 212-534-5045.

HAL-Telereader RTTY/CW terminal CWR-6750 $350.00; YAESU FRG-9600 VHF/UHF communication receiver $400.00; YAESU FRG-8800 receiver, FRV-8800 converter $425.00. 716-693-5290.

For Sale - YAESU FRG-7000 w/Gilfer Filter Mod (4 & 2.4). Factory tuned 1-1/2 years ago. Exc. Cond. $300. C.Vernon Hyson, 9835 Lone Eagle Lane, Charlotte, NC 28215. Phone 704-568-7577 after 0000 GMT.

For Sale: ICOM R7000 with manual two months old $750. Call 612-489-4614. GROVE Power Ant III $20.

Sell/Swap: KANTRONICS The Interface, with Vic-20 hamsoft, box, cables, PS, manuals, $100. PRIDE in-line freq counter, 0-40 MHz, 12/24 hr clock, 250 watts, 6 digit large red display, 117VAC, manual, $105.

INDEX OF ADVERTISERS

HYGAIN Afterburner Plus, 6/10 meter amp, manual, 117VAC, $105. YAESU FRG-7700 receiver with FRV-7700F VHF converter, new 12 channel memory, and matching indoor active antenna w/preamp, manuals, $500. All gear mint, includes shipping. Will trade all for COBRA 2000 CB and HF amplifier capable of 200 watts out on 10 meter ham band. C.Dunn, P.O. Box 584, Dunkirk, NY 14048 (716-366-8595)

REGENCY HX1200 $150. JIL SX200 $110. Box excellent condition with accessories. John Johnson, 1905 East Lexington, Eau Claire, WI 54701-6673.

REGENCY RH-250-B, 25 Watt, (150-160 MHz) PROGRAMMABLE Two-Way synthesized 10 channel non-volatile memory, switch has been added to allow USER to program desired frequencies and CTCSS tones, priority, scan, carrier or tone squelch selector, lighted keyboard, message light, manual, bracket, new antenna, magnetic mount, copy of factory information not usually supplied to users, first $285, (803) 723-5061 evenings.

GMRS repeater available in Worcester Country, Mass., and northern RI for personal or group/club use. For info write: Box 515, Millbury, MA 01527.

For Sale: BEARCAT 20/20 ($150), BEARCAT 800 ($225), FRG-9600 ($225), UNIDEN CR-2021, and B&K Precision Dual Trace 20 MHz Oscilloscope ($200). Send phone no. and I will call if still available: David Wilson, 340 Charles St., Bridgeport, CT 06606.

For Sale: REALISTIC DX-302 communications receiver. A quality digital display tabletop shortwave radio in excellent condition. $200 price includes original box, owners manual and UPS delivery. Robert Crawford, 5105 Falmouth, Troy, MI 48098 [313] 879-8245.

Wanted: Owners manual (copy) for YAESU FRG7700. Bob Morehouse, 2437 Allen Street, Kelso, WA 98626.

For Sale: VOICEGATE new condition, audio/hum upgrade, power pack, complete factory instructions and speaker $90.00; KOSS K/6A closed ear design dynamic headphone, a perfect match for Voicegate Audio $20.00. UPS to your door with full insurance. Frederick White, 904/829-8175 after 0100 UTC. No collect calls.

COLLINS Military Surplus Cache: R-390 family of receivers and manuals. Paul Zecchino, 35 East Pond Road, Narragansett, RI 02882 Ph. 401-783-7106.

For Sale: Two 1987 RADIO DATABASE INTERNATIONAL books $8; EICO 377 audio generator $25. Jeff Brown, R1 Box 386, Alexandria, IN 46001.

Wanted: Information for interfacing a YAESU FRG-9600 receiver to a COMMODORE 64 computer. Also, any info on hints, tips or modifications for the YAESU FRG-9600. R. De Armond, 5631 Boot Way, Oceanside, CA 92056-1943.

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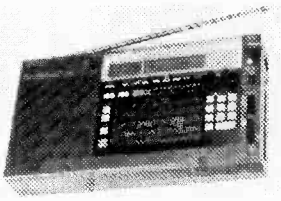

RCV 2

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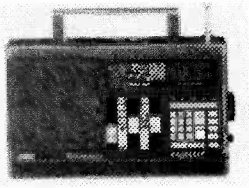

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RCV 4

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