



A Publication of
Grove Enterprises, Inc.

Monitoring Times™

SHOCK WAVES

Advances in
Earthquake Monitoring



- **Going...Going...Gone**
Shortwave Broadcasting in Haiti
- **Targeting the President**
A Methodical Approach to Scanning
- **Citizen's Band**
Radio for the People



NEW OPTOSCAN 456

Computer Interface for the PRO-2005/6 Scanner



Why spend \$1300* to get a scanner with a computer interface? For only \$299 make the outstanding PRO-2005/6 from Radio Shack the top performer under computer control.

A new standard for scanning is here now!

Features:

- High Speed 25 Channels per Second Scanning!
- CTCSS & DCS Controlled Scanning and Logging
- DTMF Decode & Log with Channel and Time
- PC Software for Computer Log, Scan & Search
- RS-232C CI-V Interface with Multi-Radio Capability
- No Drill or Solder Installation Video

It's a well known fact that the microprocessor made it possible to develop the programmable scanner in 1974. Virtually all programmable scanners could have had (many feel should have had) a computer interface. It's as if the scanner manufacturers had a secret meeting on some deserted island and agreed to put computer interfaces on only a few of the most expensive radios. Why are they trying to limit the number of computer controlled scanners? What don't they want you to listen to or to find?

Well they didn't invite Optoelectronics to the big secret meeting. We don't agree to keep computer scanning expensive! The OptoScan 456 makes computer controlled scanning available at half the price with unbeatable performance and features.

The OptoScan 456 includes every thing you need to easily convert the superb Realistic PRO 2005/6 scanners into computer controlled streamers. Hardware, cables and software for the PC is included for the introductory price of \$299. Step by step video instructions show installation details without drilling, cutting or soldering. Simple hand tools are all you need. Features such as CTCSS, DCS, and DTMF decode give the OS456 superior performance.

Why Computer Controlled Scanning?

The computer makes the scanner *really* perform, simply and effortlessly. Even when you are not around the computer can continue to search out those frequencies you want to listen to and record them into virtually unlimited numbers of memory channels. The OptoScan 456 becomes a relentless monitor of the VHF/UHF frequency spectrum searching out illusive signals. The OptoScan software makes using the PRO-2005/6 easier and much less confusing than using the front panel controls. Complex store, search, and scan features are more easily accessible through software menus.

Why Decode CTCSS Tones and DCS Codes?

Virtually all non-trunked VHF/UHF two way radio uses squelch tones or codes for privacy and efficiency. These sub audible tones and codes are identifying signatures that can aid in following transmissions across channels. The OS456 decodes tones, codes and touch-tone characters to provide the Radio Monitoring Enthusiast with a powerful new tool in sorting out who is talking, accessing a repeater and in general what is going on. Like the computer interface, tone decode should have been built into the radio but wasn't. Optoelectronics has produced the OptoScan 456 to make the PRO-2006 family radios perform to a new standard that no one else can match for any price!

Complete Installation Kit, Model OS465, includes the assembled and tested controller board, mounting hardware, cables, OptoScan 456 software for the PC and the installation video

Introductory Price
\$299

Complete OptoScan 456 modified PRO-2006 with software and cables is available from the Electronic Equipment Bank and other radio and scanner dealers. Call for price and availability. 1-800-368-3270, 703-938-3350 • 323 Mill Street NE, Vienna VA 22180

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Monitoring Times

After the Shock

10

by Ken Navarre, Jr.

Two years ago, MT explored current theories of earthquake prediction, including possible precursors in the form of radio waves. To accumulate data on earthquakes, the US Geological Survey has seismic sensors located around the country, sending their telemetry reports over the air to the USGS for analysis.

Though we may not be any closer to earthquake prediction, rescuers and other workers can now gain valuable seconds to vacate damaged structures by the fact that radio waves can travel faster than the impending aftershock. New early warning devices are just one more way that radio comes to the aid of communities devastated by disaster.



CB: Radio for the People

16

by Jock Elliott



What is the best thing about Citizen's Band Radio? Anyone can buy one and talk on it. What is the worst thing about Citizen's Band Radio? Anyone can buy one and talk on it.

The service everyone loves to put down has actually been a godsend to those who have found it to be good company while housebound, or who have used it when stranded on the highway. Jock Elliott says a lot remains that could be done with CB that hasn't even been tried yet.

Shortwave Broadcasting in Haiti

20

by Dr. Adrian Peterson

French-speaking Haiti's first shortwave broadcast station came on the air in 1950 under the call 4VEH. That callsign is still in use, though there are no shortwave broadcasters left. In fact, the short supply of fuel and electricity makes any broadcasting at all difficult and sporadic. Is there hope for Haiti? Perhaps a look back will bring encouragement for the future.

COVER: *The U.S. Geological Survey's Menlo Park headquarters eavesdrops on earthquakes. Photo by Ken Navarre. Inset: Warehouse building collapsed by the 1994 Northridge earthquake. Photo by Brian Webb.*

Monitoring the Prez 24

by Mark Raymond

A group of monitors was prepared for marathon monitoring when the President, Vice-President, and delegations from seven nations converged on Motown for the G7 Job Summit. Here is the strategy they used. The results of their monitoring reflect some changes in federal agency communications, but as you'll see, it's still exciting listening.



No Satellite or Cable Needed 28

by Henry Ruh

Summertime is the season for weird atmospheric phenomena — the kind that hobbyists love to log and compare. But you may not know that the same "skip" that brings long distance FM also affects television signals. When local reception is lousy, don't despair — DX!

A Real Old-Timer Remembers 30

by Kent Graybill

Kent wasn't really an old-timer — his early memories of radio were during WW II — but you will find his story memorable nonetheless. We dedicate this posthumous article to all those who have overcome disabilities to find real delight in listening to the radio.

And Much More ... !

Others of you who travel down memory lane may have fond memories of kit building. Well, one company has a modern approach — Magne reviews the MFJ-8100 regenerative radio, available as a kit or assembled.

Scanner equipment reviewed this month is the Realistic® PRO-23 handheld scanner. If you plan to take that handheld on the road, beef up its performance with a collapsible, homebuilt, VHF/UHF beam antenna. Full instructions can be found in "Antenna Topics."

Or, while you're on vacation, why not try something novel — relax! "Beginner's Corner" recommends you sit back and enjoy the local reception to be had as you travel. Whatever you do, your radio will help you enjoy it more!

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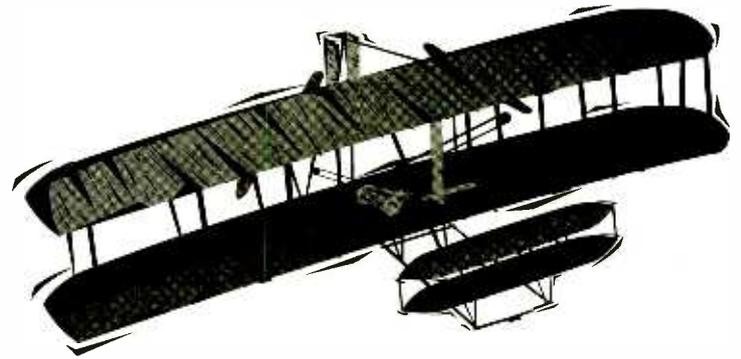
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"THE WORLD IS FLAT"



"THAT THING WILL NEVER FLY"



"THAT ANTENNA IS TOO SMALL TO WORK"

There's one in every crowd—one that pushes the limits and proves the skeptics wrong. The world sailed into a new era of discovery with Columbus. The Wright brothers propelled us into the age of air travel. AEA advances into the ranks of these distinguished pioneers with the IsoLoop 10-30 HF antenna—a 35" loop antenna with low-angle performance that is better than many full-size HF antennas.

One IsoLoop 10-30 HF pioneer offers this: "Big-gun DXers will tell you nothing *that* small can work. They will continue to tell you this after you work a couple hundred countries with it. Ignore them. In 24 months, I have worked 213 countries and confirmed 198."

The reason you get such a big performance in a small package is the efficiency of the IsoLoop 10-30 HF; it's 72% on 20m, rising to 96% on 10m. The main loop serves as an inductor, tuned with a 10,000 volt variable capacitor. Frequency range is 10 MHz to 30 MHz with continuous coverage. The unique

compact design is also ideal if you're facing space limitations—mount it in your attic, on a balcony, or go mobile.

With the optional IT-1 Automatic Antenna Tuner (below), tuning your IsoLoop 10-30 HF becomes an adventure in speed—2 or 3 seconds is typically all the time it takes before you're tuned and ready to go. (Antenna comes standard with a manual tuner.)

Discover the world of big antenna performance in a small antenna. Call our literature request line at (800) 432-8873 and request the "Inside Story" on the IsoLoop 10-30 HF or call us direct at (206) 774-5554. For best pricing,

see your favorite amateur radio equipment dealer.



LETTERS

Radio for the People

Citizens Band—that's a topic guaranteed to raise emotions in a hurry. Established with the best of intentions, the service eventually drove away many of the very people who would have benefitted from it most. But as Jock Elliott illustrates in this month's feature article, don't count it a wasteland yet. A recent clipping from the *Tampa Tribune* forwarded to us by an *MT* reader provides another example that CB can be every bit as effective as amateur radio when it comes to connecting someone who is housebound to his or her community.

The article introduces Paul Faught, who contracted muscular dystrophy when he was 5 years old, and cannot get out of bed by himself. Now 20 years old, he's known as the "Causeway Kid," and has made friends with many truckers in both Tampa and Eatonton, Georgia, where he now lives. Many of his CB friends stop to visit, and "if I miss a day off the radio, they get worried." As the report said, "He brings life to his room over citizens band radio, talking with an army of friends."

Bob Grove's "Closing Comments" last month may have raised the hackles of those involved in CB as well as those who participate in computer bulletin boards. Both mediums are a reflection of society, and they raise the same old question: will their participants rise to the responsibilities of a public forum, or will they sink to the lowest common denominator? Each of us must decide whether we'll be a part of the problem or of the solution ... or if we'll stand on the sidelines and judge.

An Insightful Company

Terry Whiteside of Billings, MT, appreciated the May article on sight impaired monitoring, and passed on some very valuable information. Terry is fortunate to be the son of Bob Crane, whose company caters to sight impaired SWLers, and who is himself sight impaired.

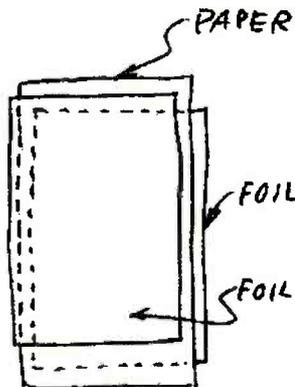
Should you order a receiver from C. Crane and Company, "Bob Crane has transcribed each operating manual to audio cassette together with personal tours of each receiver. The cassette is available when one orders any radio. They will also add bigger stick on buttons to make tuning easier."

We wholeheartedly echo Terry's sentiments when he says, "C. Crane & Company should pride themselves in catering to the sight impaired. This is a great personal service and has really helped sight impaired people learn to enjoy their new radios quickly and easily."

C. Crane and Company can be reached at (707) 725-9000; for a catalog or toll free ordering call 1-800-522-8863.

Semon Hatchikian of Upper Darby, PA, had this suggestion for making listening easier. On shortwave radios which have enough banks for each hour of the day, or at least for selected hours, organize the memory banks by hour. "You would punch in the hour of the day and that whole memory bank would be frequencies in use during that hour."

By the way, Semon also mentions he used to be pretty good at aligning older receivers. If anyone needs help with the process, they can write to him at P.O. Box 2275, Upper Darby, PA 19087. He also enjoyed Doug DeMaw's article on making your own components. He says, "I think figure 1 (a home-made paper and foil capacitor) should look like this. I remember that the foils should extend out from the edges of the paper so that when it is rolled each plate (foil) will extend out at one end so the metal can make contact."



A Spicy Variety

An ever present issue in the backs of our minds today is how to keep the balance between freedom of speech and abuse of that freedom; between individual rights and the government's mandate to keep the peace; between the rights of one group when it imposes on the rights of another.

Bill Krantz of North Wales, PA, says he, like one letter writer in April, was surprised to see pictures of Rush Limbaugh in *Passport to World Band Radio*. "What's worse, a sidebar describes the dramatic increase in the right-wing point of view on the shortwave bands. Now I'm having second thoughts about becoming a shortwave listener. I am concerned about our increasingly narrow and far-right political discourse in

Helping Hands



W.M. often recommends *MT* to those who ask his advice, because he works in the radio and TV room of his place of residence. He says "I find your publication fascinating and would like a subscription." The problem is, his residence is a state prison facility, and he cannot afford the subscription himself. Is there an *MT* reader out there who would sponsor WM and buy his subscription for a year? Any sponsorships may remain anonymous if you wish.

A more difficult request comes from D.D., a ham, who says, "I have a need of an AR1500 or Realistic PRO-43, but I don't have any money to buy one. I am under a doctor's care, am unemployed on fixed income; all my money goes for rent. I would appreciate it very much if someone could donate one of the above-mentioned scanners."

Anyone wishing to correspond with or to help either of these gentlemen may do so directly or anonymously by writing in care of the *Monitoring Times* editor.

the United States. Would our country not be better off with some more reasonable and productive points of view than Mr. Limbaugh's constant, simple-minded hate-mongering?"

Hang in there, Bill; remember, one of the reasons we listen to radio is to keep in touch with what people are thinking and saying. If we don't like what they're saying, we always have the right to write the station, especially if the program has purchased the air time from the station. Personally, I'd rather they have the right to speak their piece than to curtail that right by the same kind of legislation that is currently making it illegal to listen.

Continued on page 114

Last chance to buy

Cellular Modifiable Scanners

COMMUNICATIONS ELECTRONICS INC.
Emergency Operations Center

New FCC Rules Mean Last Buying Opportunity for Radio Scanners

Recently, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz. cellular telephone service. The Electronics Communications Privacy Act prohibits the intentional interception of cellular telephone transmissions. Supplies of scanners that are capable of being modified to receive full 800 MHz. coverage such as the Bearcat 200XLT and 2500XLT are in *very* short supply. If you need technical assistance or recommendations to locate a special scanner or solve a communications problem, call the Communications Electronics Inc. technical support hotline for \$2.00 per minute at 1-900-555-SCAN.

Radio Scanners

Bearcat® 2500XLT-J

List price \$649.95/CE price \$339.95/SPECIAL
400 Channels • 20 Banks • Turbo Scan
Rotary tuner feature • Auto Store • Auto Sort
Size: 2-3/4" Wide x 1-1/2" Deep x 7-1/2" High
Frequency Coverage: 25.0000 - 549.9950, 760.0000 - 823.9950, 849.0125 - 868.9950, 894.0125 - 1,300.0000 MHz.

Signal intelligence experts, public safety agencies and people with inquiring minds that want to know, have asked us for a world class *handheld* scanner that can intercept just about any radio transmission. The new Bearcat 2500XLT has what you want. You can program frequencies such as police, fire, emergency, race cars, marine, military aircraft, weather, and other broadcasts into 20 banks of 20 channels each. The new rotary tuner feature enables rapid and easy selection of channels and frequencies. With the AUTO STORE feature, you can automatically program any channel. You can also scan all 400 channels at 100 channels-per-second speed because the Bearcat 2500XLT has TURBO SCAN built-in. To make this scanner even better, the BC2500XLT has AUTO SORT - an automatic frequency sorting feature for faster scanning within each bank. Order your scanner from CEI.

A modification sheet with instructions to restore full 800 MHz. coverage for the Bearcat 2500XLT or Bearcat 200XLT may be ordered for \$8.00. To order any Bearcat radio product call 1-800-USA-SCAN.

Great Deals on Bearcat Scanners

- Bearcat 8500XLT-J base/mobile \$369.95
- Bearcat 890XLT-J base/mobile ..\$244.95
- Bearcat 2500XLT-J handheld \$339.95
- Sportcat 150-J handheld\$199.95
- Bearcat 760XLT-J base/mobile ..\$199.95
- Bearcat 700A-J info mobile\$149.95
- Bearcat 560XLA-J base/mobile\$84.95
- Bearcat 220XLT-J handheld\$229.95
- Bearcat 200XLT-J handheld . \$199.95
- Bearcat 148XLT-J base/WX alert . \$88.95
- Bearcat 120XLT-J handheld\$159.95
- Bearcat BCT2-J info mobile\$139.95

NEW! RELM® WHS150-J

List price \$481.67/CE price \$339.95/SPECIAL
16 Channel • 5 Watt VHF scanning transceiver
Size: 2.45" Wide x 1.38" Deep x 6.4" High
Frequency range: 148.000 to 174.000 MHz. continuous coverage.
Will also work 144.000-148.000 MHz. with reduced performance.

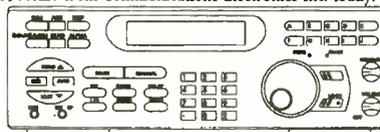
The RELM WHS150 is our most popular programmable five watt, 16 channel handheld transceiver with built-in CTCSS, which may be programmed for any 39 standard EIA tones. The full function, DTMF compatible keypad also allows for DTMF Encode/Decode and programmable ANI. Weighing only 15.5 oz., it features dealer programmable synthesized frequencies either simplex or half duplex in both 5.0 and 6.25 KHz. increments. Other features include scan list, priority channel, selectable scan delay, selectable 5 watt/1 watt power levels, liquid crystal display, time-out timer and much more. When you order the WHS150 from Communications Electronics Inc., you'll get a complete package deal including antenna, battery, belt clip and user operating instructions. Other accessories are available. A leather carrying case with swivel belt loop part #LCWHS is \$49.95; rapid charge battery charger, part #BCWHS is \$69.95; speaker/microphone, part #SMWHS is \$54.95; extra ni-cad battery pack, part #BP007 is \$59.95. The radio technician maintaining your radio system must order programming instructions part #PI150 for \$18.00 to activate this radio.

Bearcat® 8500XLT-J

List price \$689.95/CE price \$369.95/SPECIAL
500 Channels • 20 banks • Alphanumeric display
Turbo Scan • VFO Control • Priority channels
Auto Store • Auto Recording • Reception counter
Frequency step resolution 5, 12.5, 25 & 50 KHz.
Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High
Frequency Coverage:

25,000 - 28,995 MHz. (AM), 29,000 - 54,000 MHz. (NFM), 54,000 - 71,995 MHz. (WFM), 72,000 - 75,995 MHz. (NFM), 76,000 - 107,995 MHz. (WFM), 108,000 - 136,995 MHz. (AM), 137,000 - 173,995 MHz. (NFM), 174,000 - 215,995 MHz. (WFM), 216,000 - 224,995 MHz. (NFM), 225,000 - 399,995 MHz. (AM), 400,000 - 511,995 MHz. (NFM), 512,000 - 549,995 MHz. (WFM), 760,000 - 823,9875 MHz. (NFM), 849.0125 - 868.9875 MHz. (NFM), 894.0125 - 1,300,000 MHz. (NFM).

The new Bearcat 8500XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology featuring a triple conversion RF system, enables Uniden's best scanner to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. Other features include VFO Control - (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. Counter Display - Lets you count and record each channel while scanning. Auto Store - Automatically stores all active frequencies within the specified bank(s). Auto Recording - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional CTCSS Tone Board (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. 20 banks - Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; BC005 CTCSS Tone Board \$54.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from Communications Electronics Inc. today.



CB/GMRS Radios

The Uniden GMR100 is a handheld GMRS UHF 2-way radio transceiver that has these eight frequencies installed: 462.550, 462.725, 462.5875, 462.6125, 462.6375, 462.675, 462.6625 and 462.6875 MHz. This one watt radio comes with flexible rubber antenna, rechargeable ni-cad battery, AC adapter/charger, belt clip, F.C.C. license application and more.
Cobra 2000GTL-J SSB Deluxe CB Base \$389.95
Uniden GMR100-J GMRS Handheld\$159.95
Uniden WASHINGTON-J SSB CB Base . \$189.95
Uniden GRANTXL-J SSB CB Mobile\$139.95
Uniden PRO538W-J CB & Weather\$59.95

Shortwave

- ICOM AH7000-J super wideband disc type antenna\$99.95
- Grundig Satellit 700-J portable with 512 memory & AC adapt. ..\$389.95
- Grundig Yacht Boy 400-J digital portable shortwave\$199.95
- Grundig Yacht Boy 230-J portable shortwave\$139.95
- Sangean ATS202-J ultra compact 20 memory shortwave\$79.95
- Sangean ATS606-J ultra compact 45 memory shortwave\$149.95
- Sangean ATS606P-J shortwave with antenna & AC adapter\$169.95
- Sangean ATS800-J portable 20 memory shortwave\$69.95
- Sangean ATS803A-J portable with SSB reception & AC adapter. \$159.95
- Sangean ATS808-J portable 45 memory shortwave\$159.95
- Sangean ATS818-J portable without cassette recorder\$189.95
- Sangean ATS818CS-J with cassette recorder\$209.95
- Sangean ANT60-J portable shortwave antenna\$99.95

Weather Stations

Public safety agencies responding to hazardous materials incidents must have accurate, up-to-date weather information. The Davis Weather Monitor II is our top-of-the-line weather station which combines essential weather monitoring functions into one incredible package. Glance at the display, and see wind direction and wind speed on the compass rose. Check the barometric trend arrow to see if the pressure is rising or falling. Our package deal includes the new high resolution 1/100 inch rain collector part #7852-J, and the external temperature/humidity sensor, part #7859-J. The package deal is order #DAV1-J for \$524.95 plus \$15.00 shipping. If you have a personal computer, when you order the optional Weatherlink computer software for \$149.95, you'll have a powerful computerized weather station at an incredible price. For the IBM PC or equivalent order part #7862-J. For Apple Mac Plus or higher including Quadra or PowerBook, order part #7866-J.

Other neat stuff

- Uniden EXP9200-J 900 MHz. 2 line cordless phone\$289.95
- Uniden EXP9100-J 900 MHz. 1 line cordless phone\$269.95
- Cobra CP910-J 900 MHz. spread spectrum cordless phone\$249.95
- ICOM GP22-J handheld global positioning system\$699.95
- WR200-J weather radio with storm alert\$39.95
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- POL8-J Police Call for AZ, CO, ID, MT, NH, NV, UT, WY\$5.95
- Ranger RC12950-J 25 watt 10 meter ham radio\$244.95
- ANTK-J VHF scanner/VHF transmitting antenna PL259 connector\$29.95
- ANTMMBNC-J magnet mount scanner antenna w/ BNC connector\$29.95
- ANTMMBOTJ magnet mount scan antenna w/Motorola plug\$29.95
- ANTMMPJ magnet mount scan antenna with PL259 connector\$29.95
- ANTSGBNCJ glass mount scanner antenna with BNC connector\$29.95
- ANTSGMOTJ glass mount scanner antenna with Motorola jack\$29.95

Buy with confidence

It's easy to order from CEI. Mail orders to: Communications Electronics Inc., Emergency Operations Center, P.O. Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add \$15.00 per radio for U.P.S. ground shipping and handling in the continental U.S.A. unless otherwise stated. Add \$8.00 shipping for all accessories and publications. Add \$8.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, P.O. Box, or APO/FPO delivery, shipping charges are two times continental U.S. rates. Michigan residents add state sales tax. No COD's. No returns or exchanges after 15 days. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Call 1-800-USA-SCAN to order toll-free. Call 313-996-8888 if outside the U.S.A. FAX anytime, dial 313-663-8888. For technical assistance to solve your communications problem, call the Communications Electronics technical support hotline for \$2.00 per minute at 1-900-555-SCAN. Order your new electronic equipment from Communications Electronics Inc. today.

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Aussie Tradition Falls to Ad Revenues

The Australian Broadcasting Corporation is breaking a 62 year tradition by allowing, for the first time, advertising in its newscasts. The ABC's satellite television link to Asia, Australia Television International, will now insert a one-minute block of ads near the end of the newscast. The ads, however, will be cut out when the news service is rebroadcast for Australian audiences.

Russian Radio: Pulling the Plug

Listeners to All-Russian State TV and Radio's longwave station on 261 kHz were startled recently when the station suddenly disappeared from the air. This, the country's most powerful transmitter, left without warning.

The reason behind the dead air was simple: Radio Rossii did not pay its electric bill. What's worse is that the power company says that virtually all radio stations in the country are in severe arrears and face imminent disconnection. All this leaves Radio Rossi reporter Vladimir Mishev despondent. "So it appears for the umpteenth time that the Russian people face the prospect of reviving the old tradition of conversation. After all, after the radios are shut off, the TV transmitters could be next." Heaven forbid!

11 Meters



Bill Pasternak reports in *The Amateur Radio Communicator* that there is a growing movement among hams to "take back 11 meters" from CB operators and turn it over to novice and no-code ham operators. The hams are specifically eyeing 27.500 to 28.000 MHz.

Tom Saluti, N1KIO, of Durham, New Hampshire, appears to have spearheaded the move. Saluti calls the 11 meter band "a wasteland that even the government can't use." Hams hope to begin circulating a petition to be submitted to the FCC's Private Radio Bureau as a rule making request.

The call to arms has its roots in a number of places: the traditional animosity of hams towards "freebanders," a desire to "turn the tables" and recover some frequency space to make up for that taken away by the FCC, and the hope by hams to have access to the high frequency bands. Stay tuned. The fireworks are just beginning.

FCC Office Out Of Control?

Phil Riise and his employees at the Seaview Boatyard in Ballard, Washington, were spending a sunny April day like they often do, working and using their handheld radios to communicate around the 3.5 acre site. Suddenly, an FCC inspector appeared, demanding to see a license for the walkie talkies. Riise didn't have one, claims he didn't know he needed one, promptly filed an application and wrote out a check for \$150 — and thought it was over. A few months later, Riise received a bill from the FCC for an \$8,000 fine.

Riise is not alone. Washington state is home to what the *Seattle Times* calls "the hardest working, heaviest-fining inspectors in the entire FCC." In fact, the Washington office was responsible for issuing 232 fines in 1992. That's more than the total for all other 49 states combined.

Are local elected officials happy with this zealous effort to pay down the national debt? No. "What we've got is our own little FCC office going nuts fining people," says Heidi Vander, an aide to Sen. Slade Gorton. So frustrated has Gorton's staff become that they've considered closing the office by simply eliminating its financing from the federal budget.

The FCC see things differently, of course. Says Jack Bazhaw, engineer-in-charge of the Washington office of the FCC, "We get complaints... We chase [the perpetrators]... You'd think the first time they were told not to do it they'd quit. But they didn't think we had the right to tell them, so they did it again and again and again. Each time the fine goes up."

A Trial Balloon

Citizens in Virginia's Roanoke Valley are up in arms about a proposed cellular telephone tower that they say will destroy their panoramic view. Residents arrived at a recent county supervisor's meeting to make emotional appeals against issuing a construction permit for Cellular One. "If the issue was a public water line or utility, I would not speak out," said one resident. "But cellular phones is not something we all need."

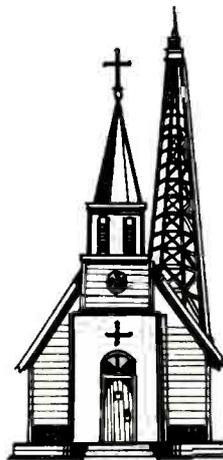
Tempers cooled when the cell phone company came up with a unique idea. The company said it would literally float a balloon, the same size and height as the proposed tower, at the site where the actual facility will be located. Residents will then have a chance to see how it would actually look.



County officials decided not to refuse the permit but to delay a decision until the trial balloon was floated.

Tower Symbiosis

It's a blessing in disguise, both to Bell Atlantic Mobile and to Sharon Baptist Church in Charlotte, NC. The phone company needed a tower to improve communications, but the traditional steel tower would have upset the neighborhood; and the church yearned for a bell tower it couldn't afford.



"They came to us and said they would be willing to build a tower with our architectural style," says Lee Smoak, a church trustee. The resulting tower uses exactly the same brick as in the church's last addition, and the closed cupola at the top hides the 110-foot tower's double mission.

The phone company, on the other hand, had to pay more than double what a tower would normally cost, but Bell Atlantic says this is not the first time it has explored innovative solutions. One spokesperson, Allen Bosworth, said, "We've done other types of unusual cellular sites - on smokestacks and things of that nature." However, this was the first time Bell Atlantic had used a bell tower.

"Bell Atlantic really went at this in a responsible way," says pleased architect and church member Moodye Clary.

Radio Buff Sentenced

A Roanoke radio buff who nearly caused a disaster last year when he took to the airwaves posing as an air-traffic controller was sentenced to 8 years in prison. Rodney Bocook, 27, the self-described Roanoke Phantom, told a federal judge that he was just "goofing off." Said Bocook, "I got the impression that I was getting on people's nerves... but I never tried to hurt anyone."

Bocook pleaded guilty last January to charges that he used an aviation radio to repeatedly broadcast false instructions to pilots. On one occasion, had Bocook's instructions been followed, a plane would have crashed into the mountains, according to a federal affidavit.

COMMUNICATIONS

Uncle Charlie's New Cars

The Federal Communications Commission is showing off its newest tool to fight radio piracy. It's a car equipped with two computers, a color printer, and a satellite receiver — among other things — in the trunk. Driven through cities and neighborhoods, it can detect unlicensed radio signals and signals that may cause interference.

Right now, the FCC has 10 such cars — one is a dusty blue Chevrolet Caprice. Each \$18,000 car is installed with \$75,000 worth of equipment. It is planned that each of the 35 field offices will eventually receive two of these cars, when, as FCC Chairman Reed Hundt says, Congress appropriates the money. According to an Associated Press story, the FCC usually finds about "two or three" pirated radio signals each month.

Total cost for the project is \$6,510,000.00, which, spread over a 10 year life of the vehicle and counting on two or three pirate apprehensions a month during that period, averages out to \$18,083.33 per apprehension. Of course, the FCC's massive fines should go a long way toward making up for any expenses incurred.

Leave the Monitoring To Us

Whatever Shirley Bendig was thinking when she got on the bus in Saskatoon, Canada, could not have been anything like what happened during her trip. As the bus was teeling down Highway 51, officials at the bus line received a phone call warning them that a paraplegic passenger was carrying a bomb. Police contacted the bus by radio and ordered it to stop. Passengers were told that there was a fire in the engine; all passengers must disembark. The passengers were herded into a nearby store; Mrs. Bendig, a paraplegic, was taken aside where her handbag was placed on the ground and searched.

There was, police determined, something dangerous inside the bag and so they destroyed it. Later police determined that the "something dangerous" had been a scanner. The bus company has promised to replace the radio.

Disgruntled BBC Workers Strike

On the morning of May 24th, editor Rachel Baughn tuned in to *Newsdesk* and heard, instead, classical music with very cryptic introductions, not at all in the style of BBC program-

ming. The National Union of Journalists and the Broadcasting, Entertainment, Cinematograph and Theatre Unions (half the BBC workforce) were on strike, and declared they would strike two days per week unless mediated talks were begun.

The strike was in response to the BBC's proposal to introduce performance-related instead of automatic pay increases, and to give managers more authority to require workers to cover unpopular shifts without special compensation. The BBC agreed to talk, and, so far, no further strikes have been called.

Disgruntled BBC Listeners Force Policy Change

One day the BBC said it would extend the customary gift voucher wedding present and week vacation to homosexual couples making a formal marriage commitment. Two days later, it rescinded the decision in response to the uproar, especially from Conservative politicians.

While it is reassessing its benefits package, one spokesperson said the monetary gift is suspended for all staff, regardless of orientation, but the vacation leave is still being offered to both heterosexual and homosexual couples who marry.

According to one member of Parliament, the policy was a serious abuse of public money, since the BBC's budget comes from license fees. Representatives of the gay and lesbian group point out they pay license fees and are also members of the public.

"Communications" is written by Larry Miller from information provided by the following fine people and publications: Henry Brown, East Falmouth, MA; Harold Eads, Fincastle, VA; Maryanne Kehoe, Atlanta, GA; Bob Ferguson, PA; Molly Graf, Seattle, WA; Bruce Hubbard, Seattle, WA; Mark Lefler, Athens, TN; Richard Miller, Yakima, WA; Don Putrik, Los Angeles, CA; William Quigley, Ottawa, IL; Jim Rindfleisch, Newport News, VA; Rick Robinson, St. Albans, WV; Daniel Scott, Humboldt, SK; George Zeller, Cleveland, OH; David Alpert, NY, NY; Jeff Multer, Charlotte, NC; *The Amateur Radio Communicator*, *National Scanning*, *BBC World Broadcast Information*.

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Monitoring Times

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- A **two hour international broadcasters forum** starts off the weekend Friday evening and is hosted by moderator Ian McFarland.
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- Saturday evening's banquet will feature **guest speaker international broadcaster Ian McFarland.**
- Get your scanner charged and ready for the **"Bug Hunt"**—a highlight at each convention!
- Visit **Delta Airline's Communication Center** and **Delta's Maintenance and Flight Operations Division.** Tours will be conducted on Friday.

SCHEDULE

Friday, October 21

9:00 am to 5:00 pm
Registration Open
12:00 to 5:00 pm
Exhibits and Listening Post
Open
7:00 to 9:15 pm
"International Broadcasters Forum"

Saturday, October 22

8:00am to 3:00 pm
Registration Open
9:00 am to 12:30 pm
Exhibits Open and
Morning Seminars
12:30 to 3:00 pm
Exhibits Open/Lunch Break

Saturday cont'd

3:00 pm
Exhibits Close
3:00 to 5:15 pm
Afternoon Seminars
7:00 to 9:00 pm
Banquet—Served at table
9:30 pm
Transmitter Bug Hunt

Sunday, October 23

9:00 am to 12:30 pm
Morning Seminars
Convention Closes at 1:00 pm



PRE-REGISTRATION FORM

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- Enclosed is my \$50 registration fee!
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AFTER THE SHOCK

Monitoring Earthquakes

Remains of Bullock's department store at the Northridge fashion center.

By Ken Navarre Jr.

In the United States, whenever people think of earthquakes, they naturally think of California. While we certainly have our share of earth shaking events out here, they are in no way limited to the West Coast, as evidenced by recent moderately strong temblors that shook areas of the Dakotas, Wyoming, and even the northeast. Earthquakes can occur almost anywhere. They are among the most costly of all natural disasters—in terms of both dollars and in human lives.

Whenever the ground shakes, so do people's nerves. Phones ring, emergency services are activated, and the radio comes alive with traffic. Communication lines become jammed as people report damage, call for help, or try to contact their family and friends. The effects are stimulating to some, devastating to others.

Most people dread earthquakes. However, for the scientist of the Office of Earthquakes, Volcanoes, and Engineering Division of the United States Geological Survey (USGS), an earthquake is a subject for study. It's an opportunity to examine data, search for correlations, and test theories, ultimately with the hope of learning how to predict when and where an earthquake will occur.

At the Western Region Headquarters for the USGS in Menlo Park, California, data is collected from more than 500 different recording locations. The state is criss-crossed with the largest seismic network (CALNET) in the United States. It the USGS. The CALNET system is made up of sites maintained by USGS, Lawrence Livermore National Labs., University of Nevada at Reno, University of California at Berkeley, and the California Dept. of Water Resources.

Data is collected from several different types of sensors that measure different motions or are especially responsive to specific frequencies of waves. Much of the data arrives at the Menlo Park center by VHF, UHF and microwave radio links. Data processing systems monitor the network and can produce real-time locations of earthquakes with magnitudes (M) between M 1.5 and M 3.5, within minutes.

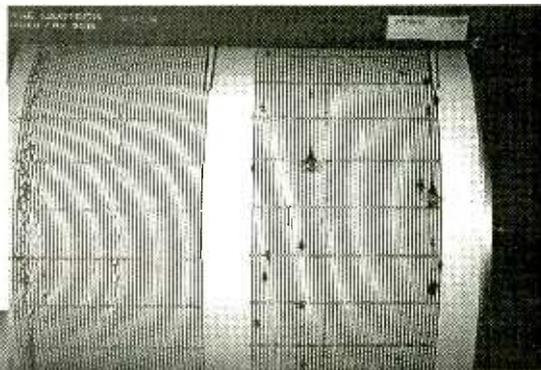
Whenever seismic waves are detected by instruments at four different recording locations, an "event" is declared and the data is routed to additional computers for further analysis.

When a seismic event occurs, some devices (called vertical gain accelerometers) use a spring loaded mass which is mounted in a sensor about the size of a small tomato juice can. The mass is free to move relative to the earth. A magnetic field is maintained around the mass. As the mass moves, changes in the magnetic field generate a signal. The signal, typically around 1 Hz., is amplified up to 90 dB and converted to frequencies in the voice range. It can then be transmitted by conventional means (radio or telephone) to a central processing center for analysis.

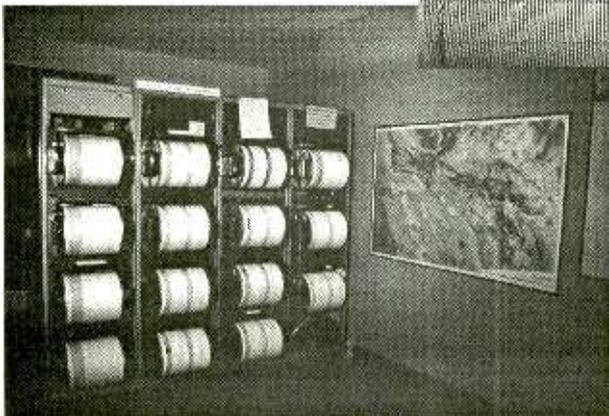
Seismic data transmissions can be identified by the listener by their continuous tone. Ground movement modulates the signal, which changes the tone. As the spring loaded mass moves in one direction the tone increases pitch, movement in the other direction decreases the pitch of the tone. The analog data produced can be displayed on the rotating drum seismographs that we see on the 11 o'clock news after an earthquake. During an "event," this analog data is digitized at a rate of 100 samples per second and saved in the data processing center for analysis.

VHF and UHF frequencies used to transmit the data are usually found in the US Government frequency allocations. Occasionally you may find telemetry on frequencies licensed to universities. Transmitter output power is typically less than 1 watt. Many sites provide reliable data with only 100 milliwatts of output power. The signal is transmitted by horizontally polarized beam antennas and may be relayed several times before it reaches a processing site. Emissions are narrow band FM.

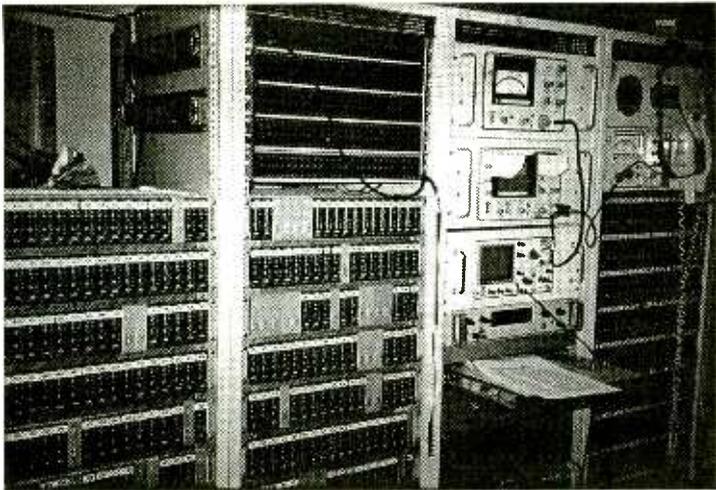
Routine monitoring of the voice channels of the USGS does not produce a "hot bed" of excitement. Voice traffic is normally between technicians testing equipment or making transmitter adjustments. Some traffic concerns the



Seismograph recording aftershocks of Northridge Mag. 6.6 earthquake.



Bank of 24 seismograph recorders display activity from CALNET Network in central and northern California.



Telemetry calibration equipment used daily in Menlo Park.

daily checks which are performed on all data channels to insure signal integrity. However, following a significant earthquake, traffic can be heard concerning epicenter location, evidence of surface ruptures, placement of sensors, microwave path alignment, and communication between scientist and engineers in the field.

Aftershock Early Warning System

William Bakun is a seismologist for the Office of Earthquakes, Volcanoes, and Engineering in Menlo Park. He was watching a television newscast that showed rescuers as they crawled through the rubble

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Where to search for telemetry signals

- 162.000 MHz - 174.000 MHz U.S. Govt.
- 216.000 MHz - 220.000 MHz U.S. Govt.
- 406.100 MHz - 420.000 MHz U.S. Govt.

California Telemetry Frequencies

San Francisco Bay Area - Northern California

163.0500	163.4400	163.6050	163.9100
164.8450	165.8100	166.4000	166.8250
167.8050	170.3100	171.0000	172.8600
217.6000	217.6900	218.2500	406.1900
407.3520	408.5120	409.6000	410.5500
412.2500	413.5100	414.6650	415.2000
415.2250			

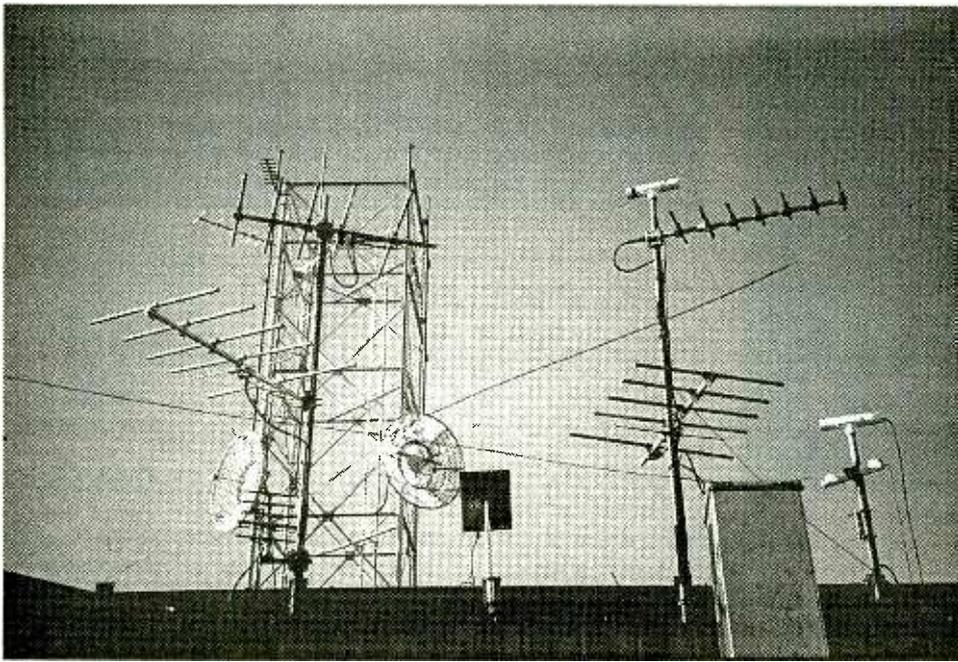
Southern California

162.5940	162.5970	162.8060	162.8090
163.3500	163.3970	163.6060	163.6090
163.7935	163.7970	163.9375	164.0060
164.0095	164.8440	164.8470	165.8065
165.8095	166.4190	166.4220	166.6565
166.6595	167.1940	167.1970	167.8065
167.9085	171.2190	171.2220	171.4065
173.1940	175.2550		

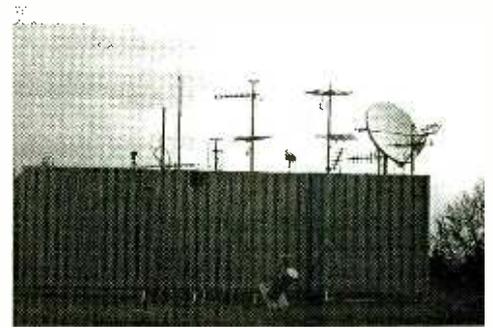
Nationwide Federal Frequencies Shared With USGS

164.1000	164.5250	164.6750	164.8000
165.4875	166.2750	166.3500	166.3750
166.8000	166.8750	166.9500	166.9750
167.0750	167.1250	167.9500	168.2750
168.5000	168.5500	169.5750	169.6250
169.8250	172.4250	172.6750	172.7250
407.4250	407.5250	407.5750	408.0750
408.5500	410.5750	411.6250	411.6750
412.1750	412.3750	412.7000	412.8250
412.8750	412.9500	412.9750	414.8250
417.4000	417.5750	417.6250	419.8750
419.9000	419.9250	419.9500	419.9750

Also check U.S. Govt. Dept. of the Interior frequencies for USGS activity.



Closeup of rooftop antennas from rear. Microwave telemetry tower in background.



Rooftop antennas for telemetry, satellite uplink / downlink, and WWVB time standards.

of the collapsed Interstate 80, in Oakland, California. The structure collapsed and trapped many motorists under tons of concrete and steel as a result of shaking caused by the October 17th., 1989, Loma Prieta earthquake. Aftershocks of the 6.9 quake were frequent. They were of great concern to the rescuers. Additional shaking of the damaged structure threatened additional collapse and a potential for loss of life. As a branch chief, he discussed the problem with other members of his staff and came up with an idea - deploy an Early Warning System for aftershocks.

The prototype system consisted of four elements: 1) ground motion detectors and telemetry transmitters placed around the epicenter of the earthquake, 2) a radio receiver and central processing unit in Menlo Park, 3) a mountain top radio repeater, and 4) alerting monitors. The key to the system is the difference in speed that radio waves travel as compared to seismic waves.

There are several different types of ground waves that are generated when portions of the earth's crust break during earthquakes. The speed of the waves depends upon the density and rigidity of the surrounding rocks. *P* waves are compressional or push-pull type waves. They are the first to arrive locally. In the San Francisco Bay Area, earthquakes that occur between 5 and 15 kilometers below the surface, typically produce *P* waves that travel about 6.2 miles per second. *S* waves are the second to arrive. They usually cause most of the damage due to the severe shaking that is produced by the high amplitude waveform. *S* waves generated by the Loma Prieta earthquake traveled about 2.5 miles per second. Compared to the 186,000 miles per second of radio waves, the

ground waves generated by earthquakes are real slow movers!

How It Works

The central processor evaluates the data supplied from the epicentral ground motion sensors and determines the magnitude of the aftershock. The system is designed to transmit an alert on all aftershocks with a magnitude greater than 3.7 on the Richter Scale. The alert consists of two, dual tone, multi-frequency signals that activate alarms at the remote receiving locations.

In the San Francisco Bay Area, the signal was transmitted by microwave to a repeater on top of Monument Peak, which overlooks the bay. In the 1989 quake, 12 aftershocks were detected with magnitudes greater than 3.7. The system triggered alarms successfully each time. It did not trigger any alerts on aftershocks with a magnitude of 3.6 or less. One false alarm was sent due to a minor design flaw which has now been corrected.

The farther away from the epicenter that you are, the more time you have between the time of the alert and the arrival of the first ground waves. The Loma Prieta earthquake epicenter was about 62 miles (100 km) from the severely damaged areas in San Francisco and Oakland. The Early Warning System for Aftershocks developed by the scientists at USGS in Menlo Park, provided between 20 - 27 seconds of warning for workers demolishing the damaged structures. 20 seconds may not seem like a lot unless you're the one under tons of concrete. Any warning that allows you to seek refuge is a blessing. I know. I was there.

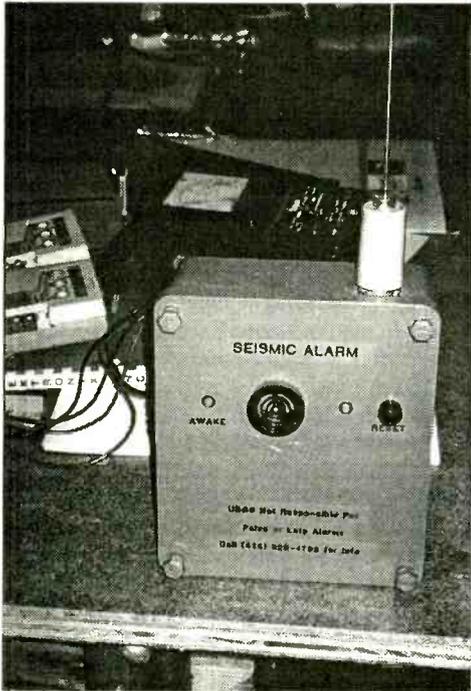
The system works. It is not earthquake prediction. It is a method of rapid notification of approaching seismic waves. When a seismic event occurs, the signals are analyzed immediately by the micro processor. If certain criteria are met, the alarm triggers. This all happens almost instantaneously—without human intervention. The current status of the system is that it is neatly packaged in the basement of the USGS in Menlo Park waiting to be sent wherever it is needed. Refinements have made it smaller and more compact than it was in 1989. It can be flown to a site and be quickly deployed to transmit the alert on any of the preexisting, nationwide, USGS frequencies. Remote receivers are provided by the USGS that respond to the alert tones.

Developments like these from the scientists and engineers of the USGS can help save lives following other major earthquakes which will certainly occur. Current technology cannot predict when or where earthquakes will happen. Perhaps someday predictions can be made, but that day is somewhere in our future. This system is available now. It can be used to notify emergency workers to evacuate hazardous locations and seek shelter. Receivers, placed at radio broadcast stations, can provide a tone alert and warn the general public instantly, without disrupting commercial broadcast.

Use of such a system for public notification will require a massive public education campaign to be effective and not create panic. Science and technology has provided us with a tool. It is up to the policy makers in our legislatures and emergency services to include systems like this in their disaster preplans. Japan, long known for its strong earthquakes, uses a similar system to detect aftershocks and automatically slow their high speed Bullet trains before the approach of strong ground waves.

Public Seismic Network BBS

The Public Seismic Network is a computer billboard dedicated to sharing information regarding seismology and earthquakes. Weekly earthquake reports from the USGS and California Institute of Technology are made available



Seismic Alert Receiver used in Oakland in 1989.

for downloading to your computer. Other information is provided by members of the network that allow you to plot distance from seismograph locations to epicenters of earthquakes. The network has four nodes that you may access 24 hours a day.

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Logo of USGS.

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William Bakun, USGS Seismology
Stan Silverman, USGS GEOS Program
John VanSchaack, USGS Telecommunication Div.

Selected Southern California frequencies from PSN BBS, Pasadena, Ca.
Field research by Ken Navarre Jr., 1993 - 1994.



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shows a H.A.R.P.S. station licensed to CALTRANS (California Dept. of Transportation). It was rapidly set up in a rest area 150 miles north of Los Angeles on Interstate 5. It broadcast on 530 kHz and informed motorists of delays and offered alternate routes into the earthquake damaged areas following the

Northridge Earthquake of Jan. 17, 1994. According to the manufacturer, Information Station Specialist in Zeeland, MI, 13 HARPS units have been built for the State of California at a cost of a bit over \$30,000 each. Each unit can be remotely controlled by a cellular telephone link. While unattended, the messages can be checked or changed as needed. Different messages can be programmed to start and stop as required. Power can be provided either by 110

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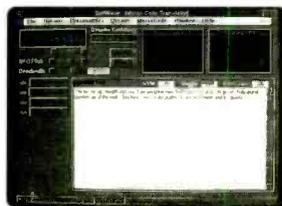
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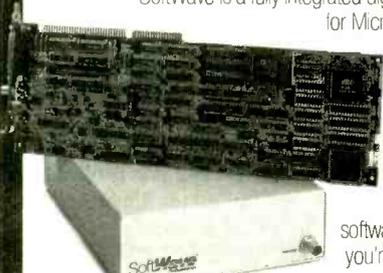
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Citizen's Band

RADIO FOR THE PEOPLE

by Jock Elliott

Question #1: *What's the best thing about Citizen's Band radio?*

Answer: *Anyone can buy one and talk on it.*

Question #2: *What's the worst thing about Citizen's Band radio?*

Answer: *Anyone can buy one and talk on it.*

Thereby hangs a tale: Citizen's Band is at once one of the most popular radio services in the U.S. and arguably the most reviled.

It's popular because there is no license required to operate on CB. You just walk into the store, buy your rig, and then you're a CBer. The cost is surprisingly low—a mobile CB can be put on the air for as little as \$50-60, and a full-blown single sideband base station can be erected for less than the cost of a 2-meter amateur radio handtalkie.

As a result, millions of CB radios are in use throughout the country, and it's anyone's guess what the worldwide CB population might be. But, just tune between 26.965 and 27.405 MHz when long distance propagation is occurring, and you'll hear a tumult of radio voices straining to be heard. This, of course, despite the fact that communicating with, or attempting to communicate with, any station more than 155.3 miles away is forbidden by the FCC regulations packed with every CB sold in the U.S.

It isn't hard to figure out why CB is reviled. If you think it isn't, reread Bob Grove's June editorial! Judging from the frequently appalling operating procedures heard on the 40 legal U.S. CB channels, one might readily conclude that CB is a kind of radio ghetto, to which the genetically deficient or criminally out-of-touch are consigned. A casual scan of the CB channels often reveals the saltiest profanity, manic noise-making or carrier chucking (the transmitting of a dead carrier in an attempt to block the communications of another CBer), power wars (my signal's louder than yours), and even threats of damage to property or persons.

Older hams, from whom the 11-meter band was taken to create the modern CB frequencies, often referred to CB as the "chicken band" (because CBers are allegedly "chicken" to take the ham licensing exams) or "criminal band" because of the outrageous behavior so often heard.

Yet, despite its deficits and warts, I love CB radio, with the kind of affection usually



Ed Barnat, Tri-County 44, fulfills CB's potential for mutual aid by standing the afternoon shift of RoadWatch. The boom microphone on the headset is for on-the-air traffic broadcasting. The audio output from eight scanners are brought into a mixer and into the headset.

reserved for an eccentric Uncle — he may be irascible and often annoying, but his antics and tall tales keep you coming back for more. *That's* how I feel about CB (and, yes, I am a licensed, CW-certified amateur radio operator, callsign KB2GOM).

Precisely because it includes as many people as it does, CB is alive and vibrant and well. It's wonderful and awful at the same time. I've heard CBers playing chess — really! — by radio at 3 a.m. I've talked with the driver bringing the Andretti racing team back from St. Jovite in Quebec. I've heard roundtable networks playing Trivial Pursuit. I've been one among hundreds of operators checking into a sideband network on a summer's evening. I've shared friendships over the years, and even helped to save a life using the CB.

Because CB is intended for both personal and business communications, its potential is almost unlimited. In Connecticut, the State

Police enlisted the aid of four truckers, via CB, to block the escape of a perpetrator "fleeing the scene." Families stay in touch during their busy days via CB, and delivery services use CB as their communications link. For long-haul truckers, CB continues to be the communications medium of choice. And REACT and CB emergency stations across the country help thousands each year with countless emergency and traveler assistance calls on Channel 9, which is reserved for that use. In the Albany-Schenectady-Troy area of New York, where I live, Tri-County Assistance and REACT stations took nearly 5,000 such calls last year alone.

The Rise and Fall ... ?

Originally started in the late 1940s and allocated to the 460-470 MHz UHF band (a frequency assignment that would have avoided many of the problems now caused by "skip" propagation), the fledgling radio service didn't really begin capture the public's imagination until the Class D 27 MHz Citizen's Band service was authorized in 1958. Then, slowly at first, then with greater numbers joining the ranks each year, CB began to come into its own.

To respond to this popularity, national CB magazines were started in the 1960s, and by the mid-1970s, CB was a national and international craze. So much so, in fact, that in 1977, the FCC expanded CB from its original Class D allocation of 23 channels to the 40 channels shown in Table 1.

In the 1980s, however, interest in CB subsided dramatically, and many thought (or perhaps hoped) it would soon disappear forever. Despite its uneven behavior, CB is far from going away. Norm Goldberg, National Marketing Communications Manager for Cobra, reports that Cobra's sales have been increasing each of the last four years. "There's a whole new generation of CBers — ones who didn't experience the boom of the '70s — who are discovering CB for themselves."

Goldberg reports that teenagers in the Chicago area have rediscovered what early CBers knew almost from the outset: CB can be a gigantic party line, and a great way to stay in touch. It's less expensive and less private than cellular phones, and the Windy City teens take advantage of those two qualities.

He says, "On weekends, Chicago teens sometimes go 'power shopping.' They split up, go to several nearby malls, and, at an appointed time, make contact via CB to share

are." Teens also use the party line aspect of CB to keep track of their friends. "Does anyone know where Bill is?" If he's checked into the CB channel recently, somebody probably does. One unanticipated fallout from the teens' discovery of CB is that their middle-aged parents are rediscovering the fun that CB was for them more than 20 years ago.

CB Rises Again!

Rick Borinstein, Vice President of Merchandise Marketing for Radio Shack, underscores the vitality of CB. He sees CB as an essential part of his company's core communications business: "CB continues to grow. It's very strong, always has been, probably always will be."

Cobra and Radio Shack are backing CB with their wallets as well. Both companies are investing money in bringing innovations to the CB marketplace (see the sidebar on Equipment).

With a resurgence of interest in CB, is there any hope that on-the-air behavior will get better any time soon? Well, yes and no.

One glimmer of hope is that throughout the country single-sideband CB networks continue to thrive. The operating habits of sidebanders mimic those of ham radio operators, and as a group they apparently tolerate far less nonsense than CBers who operate on AM only. Often at the heart of these networks are old-timers who've been through a sunspot cycle or two, yet new recruits sign on to sideband networks every day.

Sidebanders generally operate on channels 36-40 LSB, and they are allowed to run higher power (12 watts PEP SSB vs .4 watts AM), which gives them greater range. Sur-



LEFT: The headquarters of RoadWatch traffic and Tri-County Assistance, replete with antennas for just about every public service band – plus CB, of course.

RIGHT: A professional CBer's setup — A Cobra 2000 GTL, eight(!) scanners, two 2-meter ham rigs, phones, and a 486 PC with back-fax capability. All this is used to provide traffic reports in the Albany/Schenectady/Troy area of New York State.

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prisingly, in my part of the country, many of the sidebanders I've spoken with recently also hold code-free Technician amateur radio licenses.

The other 35 channels are mostly dominated by AM-only CBers, and while many do their level best to add a touch of class to their "home channels," wild outbursts, swearing, power games, and other misbehavior occur far more often than any of us would like to hear.

A Hands-Off Policy

I asked Dan Emrick, Chief of the Investigations Branch for the FCC, about enforcement in the Citizen's Band, hoping he would have some plans to deal with the bad actors on CB. He said flatly, "It's not a priority of ours. Our first concern is for the operation of public safety services — fire and police radio, and so forth. Our second priority to make sure that legitimate users are operating within their assigned frequencies, whether they are CBers, business band users, hams, or whathaveyou. Finally, we get concerned about interference, particularly as it relates to priorities one and two."

In short, the FCC is unlikely to do anything about some of the outrageous CB operators. But inasmuch as CBers run high power, cause interference to others outside of CB, or operate in the "freeband" outside of the legal 40 channels, they run the risk of attracting the attention of the FCC.

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Table 1
Citizens Band Radio

Channel	Frequency (MHz)
1	26.965
2	26.975
3	26.985
4	27.005
5	27.015
6	27.025
7	27.035
8	27.055
9	27.065
10	27.075
11	27.085
12	27.105
13	27.115
14	27.125
15	27.135
16	27.155
17	27.165
18	27.175
19	27.185
20	27.205
21	27.215
22	27.225
23	27.235
24	27.245
25	27.255
26	27.265
27	27.275
28	27.285
29	27.295
30	27.305
31	27.315
32	27.325
33	27.335
34	27.345
35	27.355
36	27.365
37	27.375
38	27.385
39	27.395
40	27.405

attention of the FCC.

And when they do, it can get very serious indeed, in part because of an interesting wrinkle in the CB rules. Suppose, for example, that a local CBER is running a high-power CB station with perhaps a linear amplifier or a non-type-accepted "export" radio, and that because of interference or out-of-band operation the FCC decides it wants to investigate what the CBER is up to. Even though a license is not required to operate a CB, the FCC's CB Rule 26 states that "if any authorized FCC representative requests to inspect your station, you must make your CB station and records available for inspection."

Failure to allow the FCC to inspect your station is, *in itself*, a violation of the rules, and the FCC may issue a "Notice of Apparent Liability." In other words, the CBER under investigation can't get out of it simply by refusing to let the FCC representative in the

door. Fines can run up to \$2,000. That's serious money in anybody's book. And staying out of trouble is incredibly easy: run legal power and stay in the band. And, yes, the FCC has some very sophisticated direction-finding equipment in their monitoring vehicles, so they can locate any operator they want to find.

Nevertheless, it is unlikely that the FCC will come knocking on the door of a CBER simply because of foul-mouthed, ill-tempered operation. Emrick, however, suggests a tactic that has proven effective in many parts of the country. "Simply ignore the bad behavior. No matter what catcalls, whistles, playing of music or whatever takes place, don't acknowledge it. If they don't have an audience, they'll change nightclubs."

My experience has shown that Emrick is right. The worst outbursts take place when two CB operators begin baiting each other on the air. Soon it can deteriorate into a full-scale RF donnybrook that can roll on for weeks, like the Hatfields and McCoys. The point of being outrageous on the air is to attract attention. If everyone ignores the behavior — if nobody pays attention — the outrageous operator has no incentive to continue.

But what about the future? Won't cellular phones and no-code ham radio licenses sound the death knell for CB? I don't think so. Cellular phones work well, and their popularity is growing by leaps and bounds, but they lack the on-the-air-community of CB. With a cellular phone, there's no chance to share your communications with a group of people, whether they are fellow commuters or folks around the neighborhood, or to randomly meet new people.

Ham radio offers all of that, but there is still that license requirement, even if it no longer includes Morse code. And, while many ham radio operators are warm, friendly, and generous of their time and expertise, some of their colleagues occasionally put off newcomers by being discriminatory — I recently heard one ham chastise another for "sounding like a CBER." Well, excuuuuuuse me!

Ultimately, I think there will always be people who enjoy the unlicensed, and sometimes unruly, partyline aspect of CB, and the sideband networks will continue to offer gabfests over greater distances. And as long as commuters and truckers use CBs, REACT and other Channel 9 networks will offer aid and assistance. But there's a lot more that could be done with CB that hasn't been tried yet — for example, why not set up CBs for shut-ins and less mobile elderly folks as a way of helping them stay in touch and not feel so isolated?

Why not equip rental cars with CBs and have the rental companies monitor specific channels to provide help? This could be a tremendous help in areas, like Miami, where attacks on tourists have been a problem. My greatest hope is that greater numbers of people will realize — and use — the potential of CB for helping another.

EQUIPMENT: What's HOT and What's NOT

BASE STATIONS

Hot: The Cobra 2000 GTL continues to be the Rolls Royce of type-accepted (legal) base stations. At \$350-370 (discounted), it's expensive, but it has everything that a serious sideband operator is looking for. (If you don't know which radios are type-accepted, contact your local FCC office for a list.)



Not hot: A number of non-type accepted stations are finding their way onto the CB airwaves. They include the Ranger (a 10-meter ham mobile rig, available in a 100-watt version), so-called export radios like Saturn's, and straight-out ham rigs like Yaesu's, Kenwood's, and Icom's. The problem with all of these transceivers is that they are not accepted by the FCC for use on the CB frequencies. Some of the operators who own them tend to overdrive the audio, causing splatter and interference across the band. Get caught with one of these on the air, and you could be looking at a large fine.

MOBILE RADIOS

Hot: Cobra's HH-70 solves the problem of "where do you install a CB in today's cars?" This radio requires no under-dash installation — the guts of the radio are in an enlarged microphone that has an LCD display, channel selector, speaker and signal strength meter. The power cord and antenna coax attach to a tiny metal box that can be tucked under the seat.

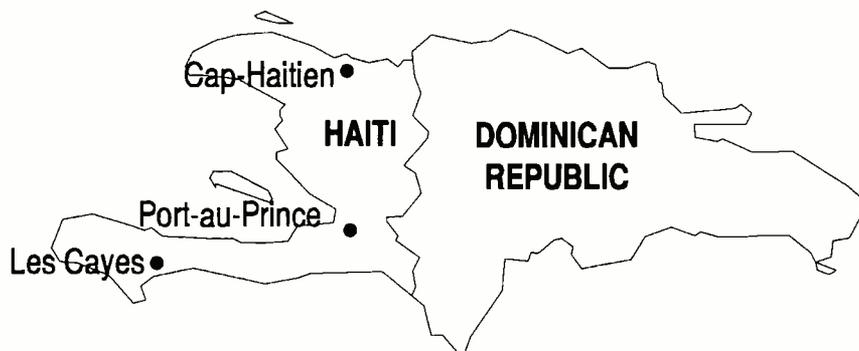


Very warm but not quite hot: Radio Shack's new TR-493 mobile radio with digital signal processing helps to take some of the high-pitched noise out of CB communications at the flip of a switch, but at a hefty price. Unfortunately, the more stubborn pulse-type noises are untouched. This is an interesting concept that holds great promise for future development.

REFERENCE MATERIALS

Hot: The book to have if you're serious about CB is Tom Kneitel's *Tom Cat's Big CB Handbook*. Kneitel, a long-time editor of CB magazines, is clear, informative, and witty. From CRB Research. \$13.95, plus \$4.00 shipping. 1-800-656-0056. VISA/MasterCard. Also interesting: *CB Radio Hacker's Guide*, \$18.95, plus \$4.00 shipping.

GOING ... GOING ... GONE!



Broadcasting History in Haiti

by Dr. Adrian Peterson, N9GWY

Since the time of Columbus, visitors to this unhappy island in the news have figured prominently in the course of its history. As the western world debates taking a more active intervention in its current affairs, we look at one of the disappearing avenues of free speech -- the voice of radio.

4VEH HAITI: The Station with the Wrong Callsign

Situated in a politically difficult climate is a small and exotic radio station which began its days as a shortwave station, though it is today heard only on mediumwave and FM. Interestingly, it identifies with the callsign with which it began its shortwave career, though it is registered for another mediumwave call which is in use on air today.

The Caribbean half-island of Haiti lies in the West Indies and is just fifty miles from

Cuba. Actually, the name of the island is Hispaniola; the Spanish speaking Dominican Republic occupies the eastern two-thirds of the island and French-speaking Haiti occupies the western third. The country is rugged (the very name comes from an Indian word meaning "high ground"), and it is the most densely populated country in the western hemisphere, with some six million people.

According to history, Christopher Columbus established in Haiti the first European colony in colonial times. (That makes three cities I know of that claim to be the first in the Americas!) The notorious religion spawned in Haiti is voodoo worship, an unhappy blend of Christianity with transported African beliefs

It was around Christmas of 1492 that one of the ships in the fleet of Christopher Columbus ran aground near Cap Haitian. From the ship's wreckage he constructed Fort Navidad, which was soon afterwards destroyed by the local Arawak Indians.

Near this same location on the northern coast of Haiti, at Cap Haitian, Haiti's best known shortwave station was established some 44 years ago. This station, 4VEH, with the slogan "The Evangelical Voice of Haiti," was founded in 1950 specifically as a shortwave station by Rev. G. T. Bustin. 4VEH made its first broadcast in June 1950 using a small unit radiating just 400 watts on the unusual channel of 9884 kHz.

The studios and transmitter for this

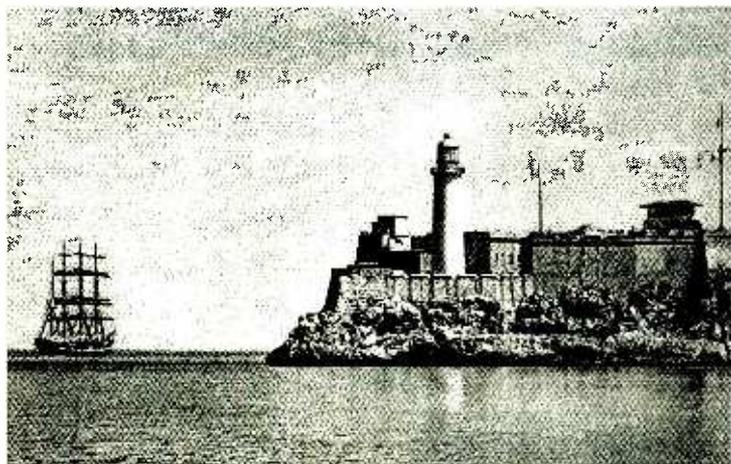
new station were first located in the back rooms of the church building in the "East and West Indies Bible Mission" at Vaudreuil in northern Haiti. At the time, there were several other shortwave stations located in Haiti, though they were all located in the capital city area, Port au Prince. On the other side of the island, in the neighboring Dominican Republic, are several other exotic shortwave stations which were featured in *Monitoring Times* in August 1993.

With the evidence of some success in this new venture, new studios were established and a new transmitter building was constructed for 4VEH. The new studio building was located on the site of a plantation which had seen the battle for Haiti's freedom two centuries before. The transmitter base was located seven miles away in the salt flats at Petite Anse across the bay from Cap Haitian. The 10 watt FM link between the studios in Vaudreuil and the transmitter at Petite Anse came into service in 1965.

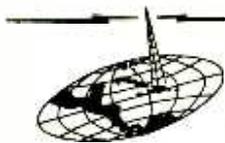
To celebrate their 5th anniversary and to honor the 25th anniversary of the International SW Club in London, 4VEH made a series of special DX broadcasts on May 21 and 22, 1955. Three different channels in the 31 meter band were used and attempts were made also to use two other shortwave transmitters for the occasion.

In 1958, just eight years after its inauguration, station 4VEH was taken over by the missionary organization, OMS International, headquartered near Indianapolis. This station, originally established to broadcast the Gospel to the Caribbean, continued under its new ownership with its regular programming in French, Spanish, and English to Haiti and neighboring islands.

Meanwhile, new transmitters were under installation at the transmitter base; the first 10 kW unit was commissioned in 1961, and the second in 1969. It was in 1973 that new studios and offices were opened for 4VEH in Cap Haitian in the Good News Bookstore, which is also operated by OMS International.



50 miles from this Spanish port in Cuba, Haiti was settled by French pirates.



RADIO 4VEH

CAP HAITIEN, HAITI, W.I.

840 Khz-AM 1035 Khz-AM 94.9 Mhz-FM
3340 Khz. 6120 Khz. 9770 Khz. 11835 Khz.

Chronology of Radio Station 4VEH

Year	Month	Event
1950	June	First broadcast from 400 watt 4VEH on 9884 kHz Studios & transmitter at church in Vaudreuil
1953		New studio building in Vaudreuil
1953		New transmitter base commissioned with 10 kW SW unit
1958		4VEH taken over by OMS International
1961		First of two new 10 kW transmitters installed
1965		FM program link from studios to transmitter inaugurated
1967	Jan	Broadcast commenced in two languages simultaneously
1969		Second new 10 kW transmitter inaugurated
1973		office & studios opened in Cap Haitian
1982		Usage of HF SW bands discontinued, 4930 only SW channel
1992		Final listing for 4VEH SW, now only MW
1993		New 10 kW MW transmitter procured

Over the years, this station has operated under several different subsidiary call signs. Here is the list:-

Call	kHz	kW	kHz	kW	kHz	kW
4VE	6120	1	3345	.25		
4VEC	1200	.25	1035	10	830	2.5
4VEF	1035	10	830	10	840	10
4VEH	9770	2.5	4930	1.5		
4VEJ	11835	.35	11835	2.5		
4VKB	1595	1	920	1		
4VSO	2450	.25	3345	.35		
4VWI	15280	15415	17840	21520	21540	all at .35 kW

When operating at its greatest potential, 4VEH was on the air with a bevy of transmitters radiating on allocated frequencies in the short-wave, mediumwave and FM bands. These were generally lower powered units, though for many years at least two 10 kW units were operated simultaneously. During its era as a SW broadcaster, reception reports were received from all areas in the United States, as well as from many other countries in Europe, the Americas and the Pacific. Two shortwave antennas were in use: a simple dipole, and a two element delta beamed towards Florida.

As a result of the recent international trade embargo against Haiti, fuel and thus electricity are in very short supply. Even though the local current is generated hydroelectrically, the station has difficulty remaining on the air. Currently, they are attempting to remain on air four hours daily on the MW channel of 840 kHz.

Recently, a new 10 kW mediumwave transmitter and power generator were purchased, though the final installation of these units will be delayed until conditions in the country return to some form of normalcy.

Currently, radio station 4VEH is on the air over one transmitter only, now designated as 4VEF with 10 kW on 840 kHz. Interestingly, radio station 4VEH no longer broadcasts from a transmitter under that original designation; 4VEH is now in reality, 4VEF. Thus, they are now the radio station with the wrong call sign.

The address for reception reports, if you can hear them on their MW channel, and if the mail still goes through, is BP 1, Cap Haitian, Haiti.

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West Indies

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Evangelique
d'Haiti



"Stand fast in the liberty where Christ has made you free" (The Bible)

In June 1950 Radio 4VEH began broadcasting the good news of salvation through Jesus Christ with 400 watts of power. Today, with a primary target audience of Haiti and the surrounding Caribbean area, 4VEH broadcasts in the French, Creole, Spanish and English languages with over 175 hours of weekly programming. By means of its short wave frequencies the station is heard in many parts of the world.

Radio 4VEH operates under the auspices of The Oriental Missionary Society, Box A, Greenwood, IN., 46142 U.S.A.

And the good news... "But as many as received Him, to them He gave the right to become children of God, even to those believe in His Name." (John 1:12)

The Gospel station 4VEH was probably the last shortwave station in Haiti. Another station that left the air in the same era was the rather well known Radio Citadelle, 4VWA, a Catholic station also located at Cap Haitien. Their final entry in the *World Radio TV Handbook* is for the year 1992, though it is probable that they were off the shortwave bands before that. They were on the air with 1 kW on 6156 kHz. Interestingly, the father of the station engineer, retired university professor Jenner Bastien, issued the QSLs for station 4VWA towards the end of its shortwave existence.

Station 4VEH was indeed an exotic shortwave station in an exotic tropical location. It was much sought after by distant international radio monitors who wanted a picturesque QSL card from this fascinating island nation in the blue Caribbean. During its more than forty year era as a shortwave broadcaster, this little station chalked up several notable firsts:

- It was the first shortwave station with the new 4V callsign
- It was the first and only Protestant shortwave station in Haiti
- It was the first shortwave station outside the capital city
- It was the last station to leave the shortwave bands in Haiti
- It was the longest continual broadcaster on the shortwave bands
- It was the most widely heard of all shortwave stations in Haiti

Do you have a QSL card from this notable and exotic Caribbean island station? My QSLs from 4VEH, heard while resident at a university in Michigan, were designated as follows:

Call	kHz	kW	Date
4VEJ	11835	2.5	20- 6-73
4VEH	9770	2.5	1- 4-73
4VEH	4930	1.5	15-10-87

SHORTWAVE BROADCASTING IN HAITI

Actually, the story of radio broadcasting in Haiti goes back a long way. Back in the era of World War I, the United States Navy established a spark gap long wave transmitter in the capital city of Port au Prince. The station had a range of 250 miles and operated under the American callsign NSC on its main transmitting frequency of 600 meters, or 500 kHz. Then, in 1927, the government established the first program broadcasting station in Port au Prince as HHK with 1 kW on 830 kHz.

The first shortwave broadcasting station in Haiti was actually a communication station which was used during its idle time to transmit programming. Located in Port au Prince, it radiated in the mid-1930's as HH2S on 5915 kHz and HH3W on 9595 kHz. These twin stations were joined soon afterwards by HHCN, HHCM and HHBM, all of which were less than 1 kW in power output.

Interestingly, a large 150 kW shortwave station, known as Radio Haiti, was projected for construction in Port au Prince in 1947, but nothing ever came of this project.

During the year 1950, when the international callsign sequence was modified to accommodate many new radio stations in many new countries, all of the callsigns in Haiti were amended from the HH series to the 4V series. Thus, for example, HHBM became 4VBM and HHCM became 4VCM.

A total of some fifty radio stations were on the air for varying periods of time during the almost sixty years of shortwave broadcasting in Haiti. The largest cluster of shortwave stations on the air was during

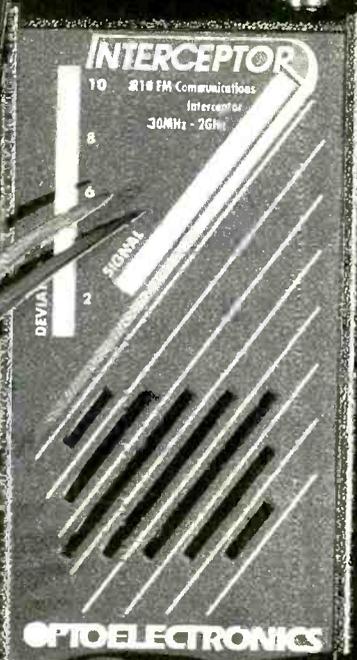
**Table 1:
Haiti on Shortwave**

Old Call	New Call	kHz	kW	Location	Slogan	Years
HHCA		4665	.2	Port au Prince	Haitienne	1948-1949
HHYM		6000	1	Port au Prince	Philips Radio	1948-1949
	4VB	6091	7.5	Port au Prince	Commerce	1954-1975
	4VC	9485	7.5	Port au Prince	Commerce	1954-1975
	4VE	6100	.3	Cap Haitien	Evangelique	1956-1984
	4VG	6050	.1	Port au Prince	Union	1966-1975
	4VH	6080	1	Port au Prince	Haiti	1958-1975
	4VM	6005	.5	Port au Prince	4VM	1952-1975
	4VO	6090	.25	Cayes	Lumiere	1961-1973
	4VU	3322	.25	Cayes	Lumiere	1959-1973
	4VAE	5090	.25	Jeremie	Grande Anse	1969-1978
	4VAF	5090	.2	Jeremie	Grande Anse	1963-1968
HHBM	4VBM	9660	1	Port au Prince	MBC	1937-1957
	4VBS	5750		Cayes	Sud	1958-1958
	4VCB	5750	.3	Cayes	Sud	1959-1966
HHCM	4VCM	6165	.1	Port au Prince	Magloire	1937-1968
HHCN	4VCN	5660	.2	Port au Prince	Fides	1937-1957
	4VCP	6310	.1	Cap Haitien	Nord	1952-1968
	4VDP	5060	.4	Les Gonaives	Independance	1955-1957
	4VEA	6075	.15	Cap Haitien	Nord	1969-1970
	4VEB	6005		Port au Prince	Caribes	1961-1984
	4VEC	6000	.4	Cap Haitien	Evangelique	1960-1961
	4VEH	9884	.4	Cap Haitien	Evangelique	1951-1992
	4VEJ	11835	.5	Cap Haitien	Evangelique	1963-1984
	4VEL	4520	.15	Ft Liberte	Nordeste	1970-1975
	4VES	6175		St Marc	St Marc	1958-1961
	4VEW	5155	.15	Ft Liberte	Nordeste	1970-1975
	4VGA	5030	.2	Cap Haitien	Capoise Mort	1963-1969
	4VGC	6135	1	Port au Prince	Liberte	1958-1958
	4VGM	6165	1	Port au Prince	Magloire	1951-1953
	4VGS	6340	.4	Les Gonaives	Independance	1954-1978
	4VHW	6175	.5	Etage Crystal	Haiti	1953-1974
	4VMD	6030	1	Cap Haitien	Nord	1971-1984
	4VOD	5040	.15	Port de Paix	Valparaiso	1970-1975
	4VPB	9000	.15	Petionville	Petionville	1954-1957
	4VPJ	6175	.5	Cap Haitien	Capoise	1968-1975
	4VPL	8984	.1	Petionville	PBS	1952-1957
	4VPM	5040	.225	Port de Paix	Nord Ouest	1955-1962
	4VRM	5068	.4	Gonaives	Gonaives	1958-1962
HH3W	4VRW	10130	.5	Port au Prince	4RW	1935-1973
	4VSC	6178	.2	St Marc	St Marc	1962-1975
	4VSO	2450	.25	Cap Haitien	Evangelique	1953-1978
	4VSW	10016	.1	Port au Prince	Radio Haiti	1953-1953
	4VUU	9635	.25	Les Cayes	Lumiere	1963-1964
	4VWA	6300	.1	Cap Haitien	Citadelle	1952-1992
	4VWB	6155	.25	Cap Haitien	Citadelle	1969-1970
	4VWI	15385	.3	Cap Haitien	Evangelique	1956-1973
	4VYM	6010	.5	Port au Prince	Haitienne	1955-1967
	4V2H	6205	.7	Port au Prince	4V2H	1953-1953
HH2S	4V2S	5918	.3	Port au Prince	Port au Prince	1935-1958
		6195	.54	Cap Haitien	Vie Marie	1959-1967

the mid-1970's with ten stations located in four different cities. After that, there was a sudden and dramatic decline, until all were gone by 1993.

Compiled from entries in the *World Radio TV Handbook*, Table 1 is the full list of shortwave stations in Haiti. These are arranged alphabetically according to the 4V call sign series. M

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Monitoring the President in Motown

By: Mark Raymond, John Morrison, and Les Butler.

Photos by Garry Watts

One cold Sunday in March 1994, Detroit was visited by President Bill Clinton and Vice President Al Gore in connection with the G7 Job Summit meetings — along with delegations from seven other nations, all their VIPs and respective entourages! In addition, hundreds of media correspondents descended upon the Motor City to cover the important event.

From the perspective of the professional monitor, this all added up to one thing: potential scanning excitement!

Several monitors in the Detroit area began preparing for the action several weeks in advance. Old logs were dusted off and rechecked, published frequency lists were cross-referenced, and personal frequency lists were shared.

However, a new twist was added that has rarely been used in connection with a monitoring event on this level. Monitors identified as living in locations best suited to hear specific services were assigned those frequencies in advance and they focused on them exclusively throughout the visit. Utilizing computers and modems, alpha-numeric pagers, the telephone, and, of course, scanners, all monitors in the loop were kept in virtually constant awareness of the President's location — from the moment Air Force One entered Detroit airspace until the moment it departed.

We offer the following recap of the results — provided for the furtherance of your hobby, for increased monitoring success should the President visit your town, and simply for your enjoyment.

The Approach

Although every previously logged ARTCC channel (Air Route Traffic Control Centers, both civilian and military) within range of Detroit were diligently, constantly and thoroughly scanned, the first indication of Air Force One approaching was a lock-up on Secret Service Channel Foxtrot (415.700 MHz FM) at 3:17 pm on Sunday, March 13. This is widely known as Air Force One's phone patch circuit and is a national common frequency. The phone conversations heard can't be repeated, but they were audible to more



than one monitor, and at widely separated distances.

At 3:34 pm, Air Force One called in to Selfridge Air National Guard Base (SANG) on the base's approach frequency of 128.700 AM. SANG answered back on 318.200 AM. Various navigational comms were subsequently heard, including wind direction, wind speed, and barometric pressure readings for the pilot's benefit. Upon Air Force One's confirmation of "turning final" and "gear down," the SANG controller advised the pilot to change to the SANG tower frequency of 126.150 AM. Switching to that frequency, monitors plainly heard that Air Force One was "clear to land."

Something unusual happened next which monitors may wish to file away in their memory banks. A Secret Service agent aboard a Detroit Police Chopper (referred to as "Air-One") advised the SANG tower and the Air Force One pilot that he would be acting as the ground controller! As soon as Air Force One finished the roll-out and the pilot confirmed "full stop," the agent began negotiating the huge 747-400's taxi towards the waiting crowd and motorcade staging area. Incidentally, Michigan State Police Mt. Clemens Post 24 was heard on 42.86 MHz doing a great job coordinating crowd control alongside the SANG Security Police on 173.535 MHz FM.

Once Air Force One came to a halt, the agent became the official motorcade coordinator. He thanked the tower and ground personnel and advised that he would be switching to the Michigan Emergency Police System (MEPPS) channel (155.865 MHz) for further coordination. He was henceforth referred to as "Eagle Pilot." Eagle Pilot's role was to point out trouble spots along the motorcade route. Monitors were clearly able to follow the motorcade procession from the SANG base all the way to the President's first stop at the

Omni Hotel, just by listening to Eagle Pilot.

Other frequencies which were very busy during the motorcade were the Macomb County Sheriff's F4 frequency of 460.150 MHz (motorcade lead vehicle), and the Michigan State Police Post 29 Detroit Freeway Patrol's frequency of 42.02 MHz FM (coordinating freeway ramp and intersection closure and reopening along the route under the watchful eye of Eagle Pilot).

Frequencies for local police departments along the motorcade route contained occasional communications related to the motorcade. For instance, the Macomb County Sheriff was dispatched on 460.400 MHz FM to "get the people out of the grass strip median at I-94 and Metropolitan Parkway per the motorcade pilot." St. Clair Shores Police Department was dispatched on 460.300 MHz FM to "clear the people off the Martin Road overpass per the motorcade pilot." Harper Woods patrol officers advised their dispatchers on 155.955 MHz FM that there were many gawkers at the freeway, and Detroit precinct 5 and 9 patrol officers advised their dispatchers on 453.700 MHz FM that they "didn't have enough manpower to clear all of the people off the I-94 pedestrian overpasses!"

Drama in the Background

Here enters an interesting side note: While the President was busy shaking hands back at SANG, the Detroit Police in the precincts through which he was about to travel had a tense moment with a brief vehicle chase on 7 Mile Road between Hoover and Gratiot. Dispatchers wisely advised the pursuing officer to "break it off." Luckily, however, the suspect bailed out at that moment and was subsequently apprehended. Whew!

The final motorcade communication was heard on 453.550 MHz FM, which is the

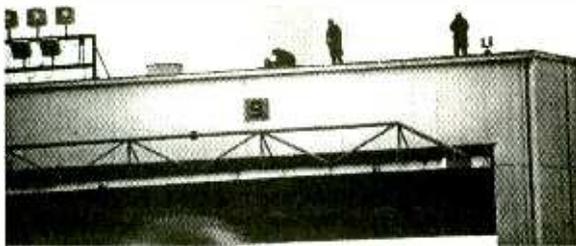
Detroit Police Department's Special Events frequency F5, as the Eagle convoy rolled to a stop in front of the Omni Hotel. This frequency was identified as the "G7 Command Post" and was used throughout the entire event for this purpose. The dispatcher advised "we have a safe arrival at 1650 hours."

About one minute after this safe arrival, 50 protestors climbed over the large concrete Renaissance Center berms across Jefferson Avenue, entered the complex and stormed the Westin Hotel entrance. A concerned G7 dispatcher requested all marked units to respond to the Westin immediately! Monitors could actually hear the chanting of the crowd in the background as the first officers arrived at the scene and advised the G7 command post of the situation. One protestor was arrested. Had the President been across the street at the Westin, he would have been truly welcomed — "Detroit style"!

Even while quickly diffusing the situation at the "Ren Cen," officers enabled the President's itinerary to continue as planned, with a first stop at Focus:Hope, a technical training center run by a charitable organization. He made the tour, met with workers, and gave his speech. The media took it all down and aired it on the evening news. But while the eyes of Detroit area scanner monitors may have been focused on images of the Prez on their turned-down TV's, their ears were hearing the sounds of SANG controllers guiding Air Force Two on a precision approach to the base.

Never a Dull Moment

The same channels that were active for the President again were bustling with activity as Vice President Al Gore exited Air Force Two and stepped toward the waiting "Sundance



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pectedly changed. Two unfortunate females flipped their vehicle and were pinned inside at I-75 near Woodward Avenue, directly in the path of the soon-to-be approaching motorcade!

The diversion was not an easy feat for officers who had to get off the freeway at an inconvenient point and race to re-enter at another new point to make it all appear as if nothing happened. I'll bet the VP never knew all the strategy that went into his little "extra" tour around the city. Nonetheless, Sundance arrived safely at the Omni Hotel just like the "Eagle" did hours earlier. (And through the use of the Detroit Fire Department's "Jaws of Life," the ladies were okay, too.)

The following Monday morning, the President decided to take his customary jog. Although the news media indicated that they



had no knowledge of where the President was running, early morning monitors were quite aware that Belle Isle was the planned area. Later in the afternoon, the Eagle Motorcade was again heard as it proceeded to Detroit Diesel for a tour.

On the return from Detroit Diesel, the Eagle Motorcade continued straight on to a safe 1500 hour arrival at SANG. The Eagle Pilot had to break off early, advising the G7 Command Post that he was experiencing a

weather related problem and needed to get the chopper back to base. Following some brief pre-flight checks, Air Force One was "wheels up" at 1523 hours. Secret Service Channel Foxtrot activated at 1530 hours, again at 1531 hours and finally at 1534 hours with what sounded like a system test. That was the last Detroit heard from Air Force One.

Believe it or not, another brief police chase did occur while the motorcade was still within the Detroit city limits on its way to SANG. This one was monitored on Detroit Police frequency 453.625 MHz, which is assigned to the Wayne State University detachment. Again, a quick-thinking dispatcher recommended that the chase be called off, which officers did at Chicago and Hamilton Streets.

Throughout all of this, the G7 Job Summit continued on at Cobo Hall. In addition to coordination on the G7 Command Post frequency, many organizational comms could be monitored on the Detroit Police Department's 800 MHz trunked system. Here is the 20 channel plan for the system, which we recommend be programmed in the reverse order shown. The data channel, which is changed daily, can be locked out.

855.4125, 855.3875, 855.3625, 855.3375, 854.4125, 854.3875, 854.3625, 854.3375, 853.4125, 853.3875, 853.3625, 853.3375, 852.4125, 852.3875, 852.3625, 852.3375, 851.4125, 851.3875, 851.3625, 851.3375



Lessons Learned

First: If you are determined to monitor Air Force One's in-flight navigational comms, learn what ARTCC sectors the aircraft will likely pass through on the way to landing near your town. We've ruled out the military channels, as they were quiet, so focus on the civilian channels. We don't recommend trying to scan a bunch of sectors at once, as picking out the comms from a specific aircraft is like searching for the needle-in-the ... well, you get the idea.

Second: Don't rely on scanning the Secret Service channels for timely information unless you are able to get the comms in the clear (unlikely). We submit that our stories

above indicate that the local police agencies

offer the most informative listening.

Most monitors are now quite aware that many of the Secret Service communications are coded using the Digital Encryption System (DES). Monitors in Detroit encountered the same frustrating problem once the President was in town and the motorcade was rolling. Channel Charlie (165.MHz FM), also known as the Nationwide Primary/Command Post coordination channel, was literally a constant roar punctuated by the tell-tale weak "beep" at the tail of the DES transmission.

Yet, many Secret Service comms were heard for several weeks prior to the event "in the clear" on 164.MHz FM, probably because most of the transmissions were rather routine and not sensitive. 164.MHz FM is not listed in known Secret Service channel plans, but was positively confirmed for the Detroit area. John Morrison, who lives in downtown Detroit, was in a position to copy the following (frequencies rounded for ease of entry):

165.790	"Baker" - DES w/ brief clear traffic
165.375	"Charlie" - DES and clear traffic (used heavily)
415.700	"Foxtrot" -in the clear (used for phone patch traffic from Air Force One)
166.215	"Hotel" -DES w/ brief clear traffic
168.790	"Lima" -DES w/ brief clear traffic
165.215	"Mike" -DES w/ brief clear traffic
166.700	"November"-DES w/ brief clear traffic
164.890	"Oscar" -DES w/ brief clear traffic
166.400	"Romeo" -DES w/ brief clear traffic
165.515	"Sierra" -DES w/ brief clear traffic
164.650	"Tango" -DES w/ brief clear traffic
164.100	"Victor" -in the clear (we suspect this might have been the Royal Canadian Mounted Police in Windsor, Ontario, Canada across the river)
167.025	"Whiskey" -paging only
162.690	"Yankee"-DES only
171.290	"Zulu" -short bursts of data "hash" following Air Force One's arrival at SANG (possibly telemetry data readout concerning fuel usage and other flight related data)

Although we don't recommend the Secret Service channels, if you are determined this channel plan may help you.

Third: Use as many scanners as your resources will allow, but certainly try for at least two. So much material is missed if you are forced to listen to one channel at a time.

Fourth: Be bold. Don't be afraid to look around for other channels. Our experience with the SANG tower / Eagle Pilot



scenario would indicate that Secret Service can key up just about anywhere they please!

Also, we discovered that there is room for investigation using the Air Force Orderwire frequencies published in an earlier *Monitoring Times* edition (Jan. 1990, Fed File). It is possible that Air Force One or Two uses these for additional inflight phone communications. On the evening of March 13, as Air Force Two was inbound for SANG, 382.350 MHz AM activated with what appeared to be an unmodulated carrier. This is listed as Orderwire F1 for aircraft. Upon turning up the volume, the carrier appeared to be modulated with unusual tones, and finally a voice.

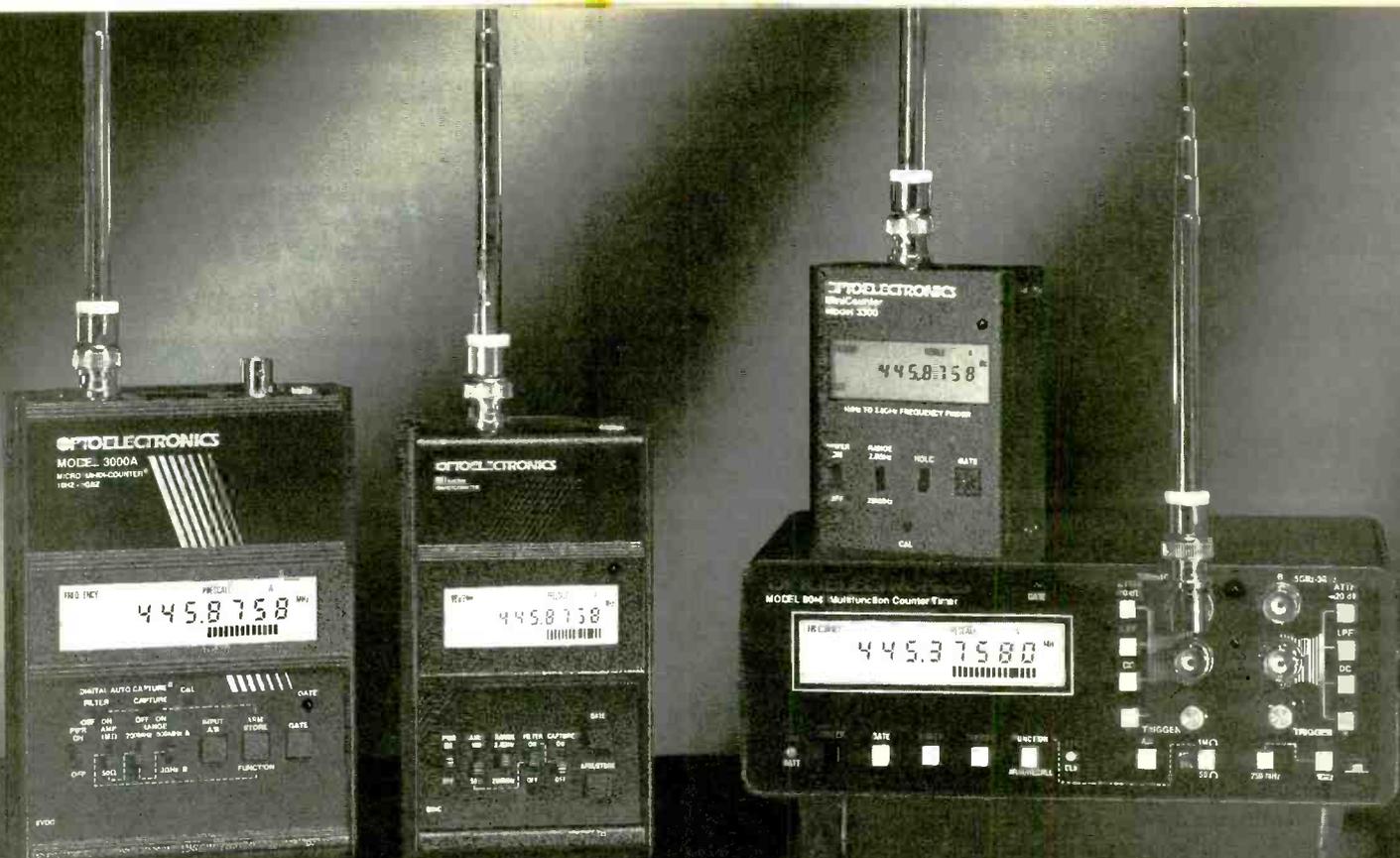
It was not AM, but appeared to be another mode, perhaps sideband, perhaps something more exotic. Les Butler made an attempt at getting a fix on his Icom R-7000, but the signal faded as Air Force Two sank closer to the ground. [The Jan. '90 article says *Orderwire* is "a full-duplex FDM multichannel wideband FM communication system," with phone patches taking place on sideband modes. - ed.]

The hope and intent of this article is to help all monitors achieve success in scanning all of the action their areas have to offer. We thank *Monitoring Times* and the 500+ dedicated law enforcement professionals on hand at G7 for the privilege and ability to share it with you.

Enjoy!

MT





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TV DXing

By Henry Ruh

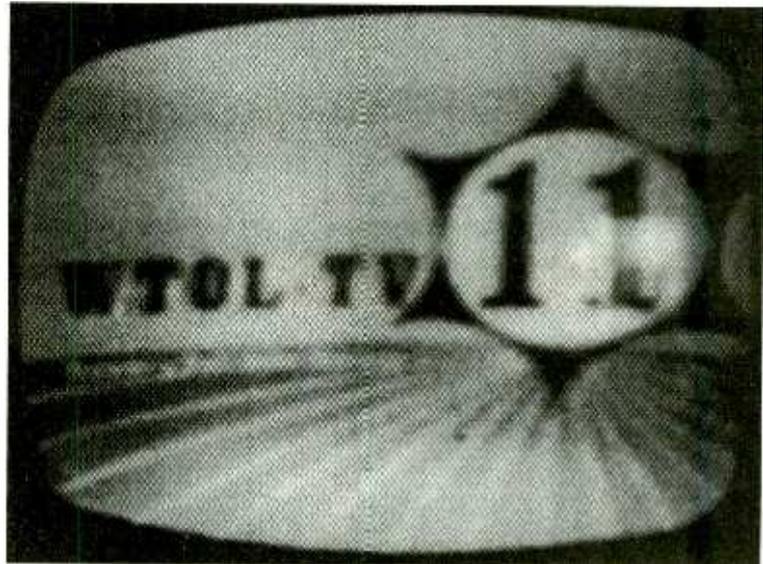
It's a little after 6 pm in Bloomington, Indiana, and Henry Ruh sits down before his TV set, switches it on and is about to watch the local TV station, WTWO channel two from Terra Haute, IN. Instead of the news and familiar anchors droning on about local sports, Henry sees WGBH TV channel two in Boston, Massachusetts, which is airing a Boston Pops concert! Magic? Cable TV? Satellite? No, none of these.

Mother Nature is even better.

Henry is not alone in watching channel two from Boston rather than the local station. The whole midwest is watching stations from great distances. It happens often—sometimes to the pleasure of the viewer, and at other times to your displeasure when the distant signals interfere and you miss the Bears/Colts game. No, ET has not returned but Mother Nature has.

Because of Sun spots, weather conditions, cold fronts, solar flares, aurora, and even meteors, several times during the year signals which usually travel only a hundred miles are sent bounding over long distances, up to thousands of miles. Radio engineers call it propagation. What it means to you is the excitement of watching long distance TV or listening to FM radio signals from great distances. There are even individuals and clubs which attempt to receive these signals as a hobby. They are called TV and FM DXers—"DX" being shorthand in electronics for "distance."

The phenomenon which causes this effect usually occurs during summer, or around Thanksgiving, and also in March, although it can happen at any time. Sometimes called skip or ducting, the atmosphere which usually allows the TV and radio waves to escape into space changes its nature and instead bends or



reflects the signals back down to the surface hundreds and even thousands of miles away. Joe Eisenberg also addresses this phenomenon in this month's "American Bandscan" column.

The eleven year sunspot cycle produces this effect during the years when there are the most sun spots. (We are currently on the down side of the cycle.) The atmosphere becomes electrically charged by particles trapped in the magnetic field of the earth, high above the surface. When the electric field has collected enough particles it becomes a signal mirror and the signals bounce back down. People living in the northern and southern latitudes who occasionally see the Aurora can also receive distant signals reflected from the same event.

Local weather can also provide opportunities to watch distant stations. When the air is layered, with cold air next to the ground and warm air above—a condition known as an inversion, the boundary where these two air masses meet can serve as a reflector. Because of the low altitude involved, the TV and FM signals are "ducted" between the boundary and the ground. This allows the distant signal to be received along the entire path, rather than skipping over the area between transmitter and receiver.

Residents of areas with smog, such as Los Angeles, can often see San Diego stations from this effect. It happens every spring and fall over any large body of water as well, allowing Virginia residents to watch Boston, Texas to watch Florida, and Chicago to watch Buffalo. In still air conditions, it can spread for several hundred miles beyond the imme-

diated lake effect area. Amateur radio operators use this effect to communicate over 2500 miles with low power radios from Hawaii to California, and Hawaii to Japan or New Zealand. They also try to send TV pictures over the same paths they now use for voice communications.

You don't need a ham radio license to enjoy receiving these signals. Many people put up large antennas for the express purpose of gathering signals from distant stations. TV and FM DXers regularly stay up late at night to watch for distant test patterns, and buy special TV sets and VHF-UHF radios which tune the TV and FM bands in search for distant signals. Ham operators use inexpensive, low power, two way television transmit-



ters and regular TV sets equipped with a converter for ham TV frequencies.

When a distant signal is received, it is usually recorded or photographed. The viewer sends the photo or tape to the station and receives a letter of confirmation. Most hams



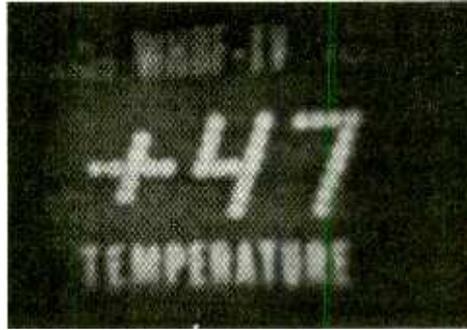


and some broadcast stations have special post cards printed, called QSL cards, which also confirm your reception. Many are colorful and informative, and are a prize to display on your wall.

Reference books, such as *Broadcasting and Cable Yearbook* found in your public library, list every station in the country and beyond, and are a source for addresses. Club newsletters also pass around news on enhanced viewing (known as band openings), listening tips, and information on equipment, station addresses and changes.

Hobbyists can also earn certificates of achievement from various publications. *Amateur Television Quarterly*, a magazine which is primarily but not exclusively for ham radio operators, offers membership in the TV Quest Society for people interested in DXing. There are also certificates for various distance goals and goals for number of stations received. The awards are available to anyone and subscribers receive their membership as part of the subscription.

The best time to eavesdrop on the ham TV operators is during the evening hours. Ham TV signals are transmitted in the 420-450 Megahertz band, which is located between VHF channel 13 (216 Megahertz) and UHF TV channel 14 (470 Megahertz). A Cable ready TV or VCR can receive these signals because cable TV also uses these frequencies. Cable channel 60 is 439.25 MHz,



and is the most used frequency for ham TV.

Hams also use the frequencies which correspond to cable TV channels 57 and 58. Connecting an outdoor UHF TV antenna to the CABLE TV input connector and tuning to the cable channels may snag a ham TV signal or two. It is not easy since hams use very directional antennas and usually less than 100 watts to transmit the signal, versus the up to 5 million watts used by commercial TV stations.

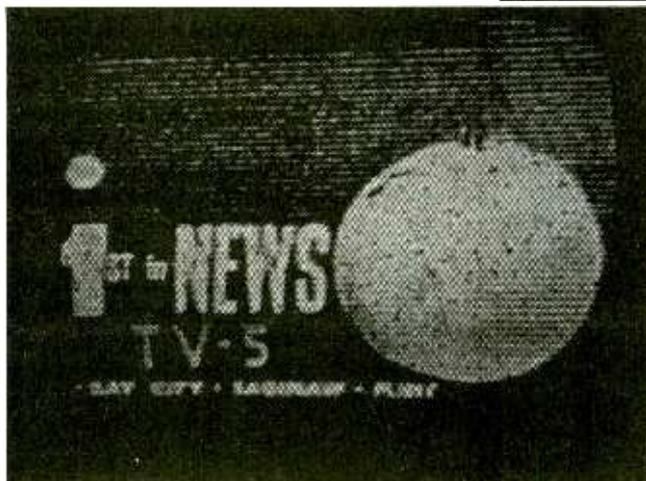
Still, the next time your TV set or FM radio starts receiving strange signals from "outer space" don't blame your neighbors ... it just may be Mother Nature doing her job. Make the most of it!

MT

For more on the hobby of television and FM Dxing, check out these resources:

Amateur Television Quarterly, 1545 Lee St., Des Plaines, IL 60018
FM Atlas by Bruce Elving, available from Grove Enterprises
M Street Journal, available from Grove Enterprises
 QCD Publications, 529 Cedar Street, Tipton, IA 52772-1739
 Worldwide TV-FM DX Association, P.O. Box 514, Buffalo, NY 14205-0514

The author has been chasing long distance TV signals since 1955 with reception in Chicago from 37 states and all Canadian provinces west of Quebec! He is currently Director of Engineering for WSNS TV Chicago, a ham radio/TV operator and publisher of ATVQ Magazine.



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A Real Old-Timer Remembers

by Kent Graybill

Last summer I was reading an article in *MT* by somebody who mentioned being an old-timer because the first receiver he had was a DX-400.

"Ha!" I snorted out loud. "Some 'old timer' he is. Why I can remember back in 1945 when my first SW rig was an old table model Emerson. Heck, that makes me a real old timer! I bet I'm almost as old as Glenn Hauser!"

I leaned back and thought about that first radio. You see, I have cerebral palsy, and my right foot was the only part of my body I could control well enough to tune a radio. The Emerson was only fairly good for me. The dial was large and easy to read, but the knobs were very hard for me to tune with my toes.

It showed two SW bands on the bottom of the dial, but for six months, I heard nothing there. I thought "short wave" was just a myth. Finally, Dad took it to a repair shop.

"The man said the SW antenna coil was missing," Dad reported. "Try it now."

Man, those bands really came alive! That evening I picked up Big Ben from London, a

kookaburra bird from Australia, a preacher from Ecuador, and some weird music I'd never heard before. When it ended, a weak voice said "This is Radio Ceylon, and here is the Number One song of the week." I listened breathlessly for what I was sure would be another hauntingly beautiful song of the mystic Far East.

But no. Somebody whanged on a gui-tar and a bunch of people started singing, "Good Night, Irene"! That really broke me up. I hated that song intensely. Now it came in from Ceylon!

But I turned the dial a little more and heard the Armed Forces Radio Service signing on with a program called *Command Performance*, with all the stars of stage, screen, and radio that they could squeeze into a one-hour show. World War II was still on, and nothing was too good for our boys overseas. I enjoyed it, too, and stayed up well past my bedtime. I was hooked! It took only one night to change me from a normal human being into a confirmed SWL.

That li'l old Emerson brought in all kinds of other interesting stuff, like CKRX, a commercial station in Winnipeg, Manitoba. It had a

SW transmitter they used to broadcast to their listeners in the Arctic. Every Saturday afternoon they read Sunday comics. The comics were the same as the ones in our paper, and for a few weeks I almost convinced my younger sister that I was psychic because I knew what was going to happen to Orphan Annie a day ahead of time. The day she caught me listening to Winnipeg was the day I got a pillow in the face!

Later on, my radio brought in a truly history-making broadcast. On an August afternoon in 1945, I heard the familiar strains of "Yankee Doodle." An unusually somber voice said: "This is the Voice of America. The following program is in Japanese."

I had heard Japanese broadcasts from the VOA before, but this was different. The announcer spoke more slowly and carefully than usual. And when they repeated the same program all that day and into the next, I suspected something was up. I knew we had dropped two A-bombs on Japan a few days earlier and I thought we might be threatening to drop some more.

The next day, Japan surrendered. Evidently what I'd heard were the surrender terms being read to the Japanese government. By golly, I'd heard it all on my little Emerson. It wasn't so bad, after all!

But as soon as I could, I ditched the Emerson and acquired the first of a succession of eight shortwave receivers, made by Hallicrafters, National, Hammarlund, and Icom. Each was an improvement over the one before, of course, but the one I had the most fun with was the pre-war Hallicrafters model S-20R.

The high band on that thing went from 30 to 45 MHz, which included our local police, and what I believe must have been TV Channel 1. I didn't know anything about TV, but for over a week in the winter of 1946 I could hear fairly clearly a half-hour science-fiction program from Boston somewhere around 43 MHz. I had to keep tuning the dial to keep the audio understandable. The S-20R wasn't very stable that high up.

This receiver had a BFO, of course, and I discovered that I could listen to scrambled overseas telephone calls! The scrambling they used was some kind of speech inversion, because all I did was tune the BFO across the signal until the speech became clear. It sounded



Using his trusty right foot, Kent tunes in the world on the old National receiver.

like SSB on AM, and I guess it was.

The phone stations were all AM in those days so the heterodynes were fierce, which is probably why I'm wearing a hearing aid today. The NC-173 I got next had crystal filter that did a great job of taking out heterodynes — much better than any slot filter I've ever tried.

There's one thing I used to hear that isn't heard anymore, at least not in the same form. A voice would say: "Here comes Cherish; 21 minutes." Then would follow 21 minutes of *gleep, glop, warble-warble glup, bleep*. It would go on like that for a while and then change.

This puzzled me until the next day's paper carried a picture of Mr. Winston Churchill. The caption started out, "A.P. Radiophoto ..." Today hams do the same thing, only they call it "slow-scan TV."

My right leg went bad on me in the early '70's, so I didn't do much SWLing until the early '90's, when I acquired an Icom R-71 that I could work with a mouthstick. Things sure had changed! The AFRTS no longer used shortwave, nor could I find any overseas telephone calls. My guess was that they were using satellites. (MT later confirmed this.)

The worst blow to me was that kilocycles and megacycles had become kHz and MHz. To an Old Timer like me, that really Hurtz!

Still, being an Old Timer was fun, but that old Emerson used to drift at least 10 kHz per minute 'til it got warmed up, and I was lucky if I could set it to within 500 kHz. My new Icom doesn't drift at all, and I can set it to within 100 Hz. Nope, I wouldn't go back to the Good Old Days for anything!

Editor's Note: Kent Graybill died before his story was published. We thank his wife Betty for allowing us to honor his memory in this way. Kent's memories of growing up with radio are so universal to so many of us that his disabilities are forgotten until we see the picture Betty provided. We hope that Kent's story will be an inspiration to us all to watch for that special person, young or old, who only needs an introduction to radio to have his or her life forever changed. **MT**

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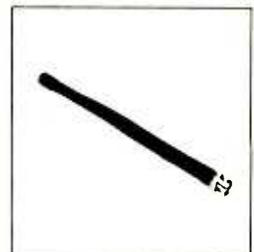
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North Korea Crisis Deepens

The dispute is over nuclear weapons on the Korean peninsula. A confrontation has been brewing for months. Just as this month's column is being prepared, the North Korean nuclear situation has flared up in the North American news media once again.

This on again/off again potential crisis just does not want to die off as a news story. Since the situation will not go away, the Utility World column will continue to provide information on utility frequencies broadcasting from that region of the world as information becomes available. Hopefully the parties involved will be able to find a peaceful resolution to the political stalemate and it will never come to anything more. Until then, however, communications activity involving the Pacific region increases each time the confrontation heats up.

Todd Dokey, *Satellite Times* GPS columnist, has been monitoring the Korean Central News Agency (KCNA) from Pyongyang on short-wave radio. By reading the RTTY (Radioteletype) intercepts broadcast from North Korea, you will get the North Korean side of the story not being heard in this country. Monitoring KCNA transmissions will bring you some good, old-fashioned, communist propaganda, the likes of which hasn't been seen since the fall of the Soviet Union.

Below is the most current schedule for KCNA as transmitted by the Pyongyang.

Korean Central News Agency (KCNA) - Pyongyang, North Korea

AREA	LANGUAGE	TRANSMISSION TIME (UTC)	FREQUENCY NUMBER	FREQUENCIES (kHz)	
Asia	English	0400-0600	HMF 32/46	14568/10580	
		1000-1100	HMF 32/46	14568/10580	
		1500-1730	HMF 46/85	10580/8020	
	French	1145-1430	HMF 45/86	10524/8152	
		Photo	2330-0000	HMF 36/52	13580/11476
			0030-0100	HMF 36/52	13580/11476
Europe	English	0400-0530	HMF 26/35	15633/13780	
			1000-1200	HMF 26/35	15633/13780
			1500-1730	HMF 55/35	11430/13780
	Russian	0600-0830	HMF 26/35	15633/13780	
			1230-1430	HMF 55/35	11430/13780
			2130-0000	HMF 84/55	9395/11430
Americas	English	0400-0730	HMF 36/52	13580/11476	
			2130-2300	HMF 36/52	13580/11476
Africa	English	0800-1030	HMF 36/49	13580/11536	
			1800-2100	HMF 52/85	11476/8020
			French	1145-1430	HMF 36/49
		1800-2100	HMF 49/84'	11536/9395	

KCNA Frequency/Station List

FREQUENCIES (kHz)	FREQUENCY NUMBER	FREQUENCIES (kHz)	FREQUENCY NUMBER
8020.0	HMF 85	11476.0	HMF 52
8152.0	HMF 86	11536.0	HMF 49
9395.0	HMF 84	13580.0	HMF 36
10524.0	HMF 45	13780.0	HMF 35
10580.0	HMF 46	14568.0	HMF 32
11430.0	HMF 55	15633.0	HMF 26

You can send any additions or corrections to this KCNA published schedule or any other press station schedules you receive to the address in the masthead. This is the kind of current information we sincerely appreciate.

BOSNIAN WAR UPDATE

Another hot spot worth keeping an eye on is the former Yugoslavia. Bob Thomas in Bridgeport, CT, sent in a very nice update to help monitors listen in on this volatile area of the world. Many thanks, Bob, for the majority of the list that follows.

Shortwave Broadcast Transmissions (AM mode)

Radiotelevizija Beograd, Serbia - 7200 kHz between 0600-2305 UTC
First program of Radio Zagreb can be heard on the following frequencies: 5085.0, 6145.0, 6511.0, 9830.0, 13830.0 These broadcasts are at irregular hours so try at different times.

Radio Amateur (Lower Side Band)

Hams working in the midst of this war have been heard on the following frequencies: 3422.0, 3472.0, 3818.0, 3858.0, 3862.0, 6915.0, 6966.0, 6974.0, *6978.0 kHz

Radio amateurs have been heard discussing deaths, damage, extent of fighting, etc. They have also provided communications in and around the various cities in the area. Information from amateurs have also kept friends and relatives abroad up-to-date on what is happening in country. Due to the severe nature of the fighting and disruption to general life in Bosnia, ham communication is often spotty or disrupted. Special news transmissions have been heard at various times on 6886.0 and 7430.0 in USB.

The International Red Cross network on 6996.0 (LSB) has been heard working various cities in Bosnia and Serbia.

Other Utilities

United Nations peace keeping troops from Canada have been heard using the Canadian MACS (Military Aeronautical Communications System) for routine and operational communications. Check the following frequencies in USB: 3092.0, 4704.0, 5690.0, 6705.0, 9006.0, 12233.0, 13252.0, 15031.0, 18012.0. Some of the activity on these frequencies also originates from the Lahr Air Base in Germany.

Peace keepers from the French National forces have been heard on 10168.2 and 11003.0 using the ARQ-M2 mode for digital transmissions. Peacekeepers have also been heard on 5310.0 6721.5 7800.0 and 7905.0.

From time to time, the US Air Force Global HF System has been active with Bosnia related traffic, especially UN flights. Look for activity on the following frequencies: 4725.0, 6738.0, 6750.0, 8967.0, 8993.0, 11176.0, 13201.0, 15015.0, 17975.0, all using the USB mode of communications. UN food convoy information has been passed on 4090.0 using SITOR-A mode for digital communication.

Marine radio frequencies can sometimes provide valuable information, especially information concerning the United Nations naval blockade of Serbia. Check the following stations, frequencies and modes for marine communications:

YUW - Bar Radio, Serbia (USB) 4405.0, 6501.0, 8797.0, 13095.0, 17353.0
9AR - Radio Rijeka, Croatia (USB) 4378.0, 4411.0, 6504.0, 6513.0, 8746.0,

8806.0, 13146.0, 13161.0, 17272.0, 17320.0, 22705.0, 22711.0,
22810.0: (CW) 4346.0, 8445.0, 8700.0, 12780.5, 16942.8

9AS - Split Radio, Croatia (USB) 4357.0, 6510.0, 8782.0, 13155.0, 17293.0

Finally, RTTY fans can hear one of the better sources of news from the Serbian viewpoint via the Tanjug press agency in Belgrade. The following is the latest information available on their 50 baud, 425 Hz shifted, English news bulletins:

Call	Frequency	Schedule	Call	Frequency	Schedule
40C2	5240.0	1700-0400	YZ07	12213.0	0400-1700
YZD	7658.0	0000-2400	YZJ5	13340.0	0400-1700
YZD7	7806.0	1700-0400	YZJ4	16343.0	1300-1400
YZD9	7996.0	1700-0400	YZJ	20204.0	1300-1400
YZJ2	11604.0	0400-1700			

The Serbian Ministry of Foreign Affairs in Belgrade has also been reported carrying Tanjug news bulletins occasionally using its callsign DFZG. Recently reported frequencies include:

5317.0, 9057.0, 11139.0, 13399.0, 14912.0, 16302.0, 16368.0, 17432.0, 18055.0, 18972.0, 21859.1 (all using 75 baud RTTY)

HOS Details Revealed

Several months ago, regular contributor Neal Perdue received some intercepts on 8294.0 kHz with stations identifying as "HOS ----". Neal and I both wondered what he was hearing on this marine simplex channel. Gordon Levine and Bob Lewallyn have come to the rescue to provide information on a very special group of vessels that operate in the Gulf of Mexico.

"HOS" is an acronym for "Hornbeck Offshore Operators, Inc." Hornbeck is a large oil patch work boat operator based out of Galveston, Texas. The company is engaged in the worldwide offshore marine services business, primarily serving the oil and gas industry. It does this through the operation and management of a diversified fleet of work boats.

The Hornbeck fleet of 53 ships consists of supply, tug-supply, crew, and specialty vessels operating in the Gulf of Mexico. The company also has a major ownership interest in an additional 23 North Sea safety standby vessels owned by Ravensworth Investments Limited, which is headquartered in Douglas, Isle of Man.

There are HOS boats operating out of virtually all of the major Gulf of Mexico oil patch ports, including Houma, LA; Morgan City, LA; and Venice, LA.

Hornbeck maintains its headquarters out of Galveston, Texas, and an additional office in Morgan City, LA. Table 1 is a list of HOS boats currently operating with offshore rigs out in the Gulf of Mexico.

Reception reports should be sent to headquarters in Galveston at the following address:

Hornbeck Offshore Operators, Inc
7707 Port Industrial Blvd
Galveston, TX 77554



TABLE 1

HOS Advocate	HOS Cavalcade	HOS High Gun
HOS Affirmed	HOS Centurion	HOS Iron Liege
HOS Agile	HOS Chaleur	HOS John Henry
HOS Alydar	HOS Chief	HOS Liberty
HOS Alysheba	HOS Citation	HOS Messenger
HOS Assault	HOS Conception	HOS Nashua
HOS Avatar	HOS Count Fleet	HOS Needles
HOS Barrow	HOS Count Turf	HOS Normandy
HOS Belle	HOS Dapper Dan	HOS Omaha
HOS Bold Forbes	HOS Determined	HOS Risen Star
HOS Bold Ruler	HOS Dover	HOS Samson
HOS Bold Venture	HOS Fortune	HOS Seattle Slew
HOS Bravo	HOS Gallant Knight	HOS Secretariat
HOS Canonero	HOS Gallant Man	HOS Shut Out
HOS Cape Charles	HOS Goliath	HOS Success
HOS Career Boy	HOS Gun Bow	HOS Swaps
HOS Carry Back		

The callsign for the Hornbeck base station in Galveston is WHD 769. Look for base to ship activity on the following ship to shore simplex frequencies:

2096.5, 2182.0, 4125.0, 4146.0, 6224.0, 6227.0, 6230.0, 8294.0, 8297.0, 12356.0, 16534.0,

and for those in the Houston area on VHF marine —

156.500 and 156.800 MHz.

According to a recent press release from the company, Hornbeck has acquired Trico Marine Services, Inc. Trico owns and operates 16 supply vessels, 22 crew vessels, five lift boats and one utility boat, and manages four other vessels along the Gulf coast. In the future look for even more HOS activity as these new boats hoist the HOS flag of operations.

Japanese Ute Club

Recently I received a very nice letter from Manabu Doi in Okayama City, Japan. Manabu's letter talked about the current state of utility station listening in Japan. In fact, Manabu is the chief of secretariat of the AUDX or Association of Utility DX'ers. To the best of my knowledge, this is the first ute-only hobby club in existence. The club bulletin, called *Beyond*, is published monthly in Japanese and looks excellent. It appears to have complete and diverse coverage of all types of utility stations.

If you are interested in the AUDX club you can contact them at the following address:

AUDX/Association of Utility DX'ers
c/o Manabu Doi
Kensetsushou Kounan-Ryou
501 Higasifurumatsu, Okayama-City
Okayama 700, Japan

Be sure to tell Manabu you heard about AUDX in the Utility World column. I hope that some of the AUDX members will make it into this column in the near future.

Now it's time to see what this month's monitors have been hearing in the Monitoring Times - Utility World logging section. **MT**

Utility World

Utility Loggings

Abbreviations used in this column

AFB	Air Force Base	FFT	Fast Frigate (Training)
AM	Amplitude Modulation	ID	Identification
AMC	Air Mobility Command (USAF)	IFF	Identification Friend or Foe
ATC	Air Traffic Control	LDOC	Long Distance Operational Control
Autovon	Automatic Voice Network	Meteo	Meteorological
AWS	Air Weather Service	MFA	Ministry of Foreign Affairs
CAMSLANT	Command Area Master Station, Atlantic	NAS	Naval Air Station
CAMSPAC	Command Area Master Station, Pacific	NATO	North Atlantic Treaty Organization
Centcom	Central Command	NORAO	North American
Comms	Communications	QSL	Verification of transmission
COMSTA	Communications Station	RAF	Royal Air Force (United Kingdom)
CW	Continuous Wave (Morse Code)	ROU-FEC	Romanian diplomatic FEC teleprinter system
DE	From	RTTY	Radioteletype
DFed	Direction Find (or Found)	SAM	Special Air Mission
DOD	Department of Defense	SELSCAN	Selected Scan
EAM	Emergency Action Message	Unid	Unidentified
ETA	Estimated Time of Arrival	USAF	United States Air Force
FAF	French Air Force	USB	Upper Side Band
Fax	Facsimile	USS	United States Ship
FEC	Forward Error Correction	VOLMET	Aviation Weather Broadcast
FEC-A	One-way traffic FEC teleprinter system	XINHUA	New China News Agency

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

- 2182.0 Following stations noted on this channel: DAN-Norddeich Radio, Germany; OST-Oostende Radio, Belgium; FFU-Brest Radio, France; Coruna Radio, Spain; GCC-Cullercoats Radio, England; Cardigan Radio, England; GKZ-Humber Radio, England; FFC-Arcachon Radio, France; SDJ-Stockholm Radio, Sweden; and LFO-Orlandet Radio, Norway with various announcements from 2003-2133. (Ary Boender-HR Spykenisse, The Netherlands)
- 2763.0 Plymouth Rescue working Rescue 173 in USB at 2206. (Boender-Neth)
- 3112.0 Architect working Edinburgh Rescue in USB at 2140. (Boender-Neth)
- 3365.0 King 1 working DOD Cape in USB at 1040. Notified them they were starting engines. (Henry Brown-MA via Internet)
- 3810.0 HD210A-Time Station in Guayaquil, Ecuador, with time signals and ID in AM at 1008. (Jacques d'Avignon-Kingston, ON Canada)
- 4029.0 Spanish female 5-digit number station in AM at 0500 (Friday) and 0600 (Monday). (Tom Mazanec-Maple Heights, OH)
- 4044.5 US Navy Link 11 transmission noted at 0319. (Jeff Haverlah-Houston, TX)
- 4051.0 G8S-Unid station working JWT-Norwegian Navy Stavanger in USB at 2115. (Boender-Neth)
- 4058.0 US Navy Link 11 transmission noted here at 0519. (Haverlah-TX)
- 4125.0 WBV-Port Richmond, NY, working the tug Esther Moran and the tug Alice Moran in USB at 1122. (Brown-MA) WBV is a Moran Towing and Transport Limited Coastal Station-Larry. Coast Guard Cutter Eagle calling COMSTA Portsmouth in USB at 1116. They didn't use the CAMSLANT identification. (Brown-MA)
- 4134.0 Navy London with 75 baud RTTY encrypted messages separated by RY test tape at 2140. (Boender-Neth)
- 4238.0 Navy London with 75 baud RTTY encrypted messages separated by RY test tape at 2030. (Boender-Neth)
- 4246.0 Navy London with 75 baud RTTY encrypted messages separated by RY test tape at 2038. (Boender-Neth)
- 4274.0 GBK4-Portishead Radio, England, with CW DE marker at 2046. (Boender-Neth)
- 4298.0 US Coast Guard Kodiak, AK USA, with fax chart transmission at 1020. (d'Avignon-ON)
- 4357.0 Weather forecast for North Atlantic heard in USB at 1007. Possibly from WAH-St. Thomas Radio, Virgin Islands in the Caribbean. (d'Avignon-ON) Looks like a good possibility to me, Jacques-Larry.
- 4448.0 Air Force One working Andrews with phone patch traffic in USB at 0145. (Jeffery Jones-Tracy, CA)
- 4498.0 GFL26-Bracknell Meteo with 50 baud RTTY weather at 2055. (Boender-Neth)
- 4513.0 Bravo Whiskey working Charlie Whiskey and Bravo Romeo plus single letter calls in USB at 0425. (Haverlah-TX) Probably USN-Larry.
- 4722.0 RAF Drayton VOLMET weather broadcast in USB at 2229. (Glenham Duffy-Durban, South Africa) US Navy Link 11 transmission noted here at 0507. (Haverlah-TX)
- 4723.0 IDR-Navy Rome, Italy, working T2P in USB for radio checks at 2120. (Boender-Neth)
- 4754.0 AJE-USAF AWS Croughton, England, with coded weather using 75 baud RTTY at 2130. (Boender-Neth)
- 4856.0 FDY-FAF Orleans with 75 baud RTTY RY test tape at 1350. (Boender-Neth)
- 5155.0 Coast Guard Mobile Group working Q0L in USB at 0436. (Haverlah-TX)
- 5171.5 US Navy Link 11 transmission noted here at 0442. (Haverlah-TX)
- 5270.0 PCD1-Israeli Mossad number station in AM at 1729. (Boender-Neth)
- 5271.0 BMAX-MFA Geneva, Switzerland, with messages to HBD92/HBD54 using SITOR-B at 1627. (Boender-Neth)
- 5630.0 SYB2-Israeli Mossad number station in AM at 2032. (Duffey-RSA)
- 5658.0 Bombay ATC working Air India 150 in USB at 1945. (Duffey-RSA)
- 5732.0 Octane 92 working Jockey 16 in USB at 0256. (Haverlah-TX)
- 5784.5 US Navy Link 11 transmission noted here at 0511. (Haverlah-TX)
- 6236.0 Ike working Victorious regarding getting the three phasetransformer for the rack in USB at 0013. (Fowler-MA)
- 6435.0 Navy London with 100 baud RTTY coded messages at 1400. (Boender-Neth)
- 6556.0 Springbok 283 working Jakarta ATC and Cathay Pacific working Madras ATC in USB at 1839. (Duffey-RSA)
- 6681.0 IPRNET-Many packet pirates from France, Italy, Belgium and England around 1413. (Boender-Neth) Ary, what does IPRNET stand for-Larry.
- 6683.0 Air Force One working Andrews enroute to Andrews from Dobbins at 0130 in USB. Operator said they were having crypto problems. AF1 also checking to block time for Executive Foxrot One. (Carl Pinsonat-Plaquemine, LA) Thanks for the log, Carl, and save a few of those mudbugs for me and Gayle-Larry. Andrews working SAM 971 on F-731 with signal checks in USB at 0003. (Jones-CA)
- 6730.0 Andrews working SAM 204 on F-267 with signal checks in USB at 0230. (Jones-CA)
- 6738.0 Ascot 5126 working Ascension in USB at 0338. (Haverlah-TX)
- 6739.5 US Navy Link 11 transmission noted here at 1455. (Haverlah-TX)
- 6750.0 Croughton noted here with periodic EAM broadcast at 0414. (Haverlah-TX)
- 6750.5 US Navy Link 11 transmission noted here at 2320. (Haverlah-TX)
- 6757.0 Air Force Perth working 7702 Bravo in USB at 1214. (Haverlah-TX)
- 6761.0 Cobra 20 calling Mainsail in USB at 1302, no response. (Haverlah-TX)
- 6817.0 Andrews in voice comms with SAM's 200, 204, 206, 682, 683, 971 and 974 on F-667 in USB at 0054. (Jones-CA) Air Force One working Andrews in USB. (Woodward-CA)
- 6830.0 SAM 971 working Andrews with phone patch traffic on F-867 in USB at 0054. (Jones-CA)
- 6840.0 Spanish female 4-digit number station in AM at 0230 (Nightly). (Mazanec-OH)
- 6881.0 HEP-Interpol Zurich, Switzerland, with V CW marker at 1356. (Boender-Neth)
- 6910.0 US Navy Link 11 transmission noted at 0344. (Haverlah-TX)
- 6920.0 RGC70-Kiev Meteo, Russia, with 50 baud weather at 1627. (Boender-Neth)
- 7527.0 Multiple SELSCAN pulses noted here at 2020. (Haverlah-TX)
- 7650.0 BZR67-Xinhua Beijing, China, with 75 baud RTTY RY test tape

	at 1915. (Boender-Neth)		USB with phone patch to Brunswick NAS. Aircraft enroute to Roosevelt Roads, Puerto Rico. (Brown-MA)
7831.0	Advisable and Celebrity working Nightwatch 01 on W-105 in USB at 1553. (Haverlah-TX)	11180.0	LL58 requesting autovon phone patch to MacDill. LL43 called Mainsail - no answer. Andrews called Range 51 - no answer, worked LL58. All in USB at 1645. (Williams-AL) Old habits must be hard to break; it's now DSN (Defense Switching Network), not autovon-Larry.
7888.0	Spanish female 5-digit number station in AM at 0300 (Friday). (Mazanec-OH)	11193.0	RNFV-Moscow, Russia, working unid aircraft with a phone patch in USB at 0942. (Boender-Neth)
8026.0	Andrews in comms with SAM 971 on F-290 checking this frequency for possible secondary in USB at 0242. (Jones-CA) Same at 0322. (Haverlah-TX)	11214.0	Andrews working SAM 970 with phone patch to Donna in USB at 2135. (Fowler-MA)
8032.0	Andrews working Navy 676 with signal checks in USB at 0125. (Jones-CA)	11220.0	SAM 26000 working Andrews with phone patch request on F-311 in USB at 0028. (Jones-CA) Andrews working SAM-049 & SAM 29000 in USB at 2156. Offutt Global working Reach 9411 in USB at various times. (Fowler-MA)
8289.0	Penelope working Raven in USB at 0333. Possible ship-to-ship comms. (Williams-AL)	11225.0	Icehouse entered net after Nightwatch accepted authentication in USB at 0022. At 0050, Icehouse used scrambled (green) comms with unid station. (Williams-AL) Looks like someone was off frequency-Larry.
8294.0	CAMPSPAC San Francisco, CA, at 0300 working the sailing vessel Cinnamon in USB for information on location, course and speed. Reply barely audible, but CAMPSPAC confirmed that the vessel had slowed to 4 knots due to sea conditions. (Jim Hugunin-Chicago, IL) CAMPSPAC San Francisco is a US Coast Guard communications station. An address for reception reports try: US Coast Guard Communications Area; Master Station Pacific San Francisco; Commanding Officer; 17000 Sir Francis Drake Boulevard; PO Box 560; Point Reyes, CA 94956-0560-Larry.	11226.0	Tiger calling Jackpot, advising Python, Longterm and Retention were also on the net in USB at 1900. Advised primary as X-905 (11226) and secondary was X-210 (11229). (Hixson-FL) SAM 971 working Andrews on F-287 with phone patch request in USB at 0225. (Jones-CA)
8308.5	US Navy Link 11 transmission noted at 0437. (Haverlah-TX)	11229.0	Python calling Retention on X-210. Python was ordered by Andrews to stop using the frequency immediately. Andrews then ran a phone patch for Executive Foxtrot One in USB at 1840. (Hixson-FL)
8411.0	Heard broadcast using SITOR with Brown Fox test tape then "Skyking, Skyking, do not answer" then "Skyking message ends." Also mentioned additional broadcast on 12570.0 at 15 past the hour. Station identified itself as PC8066. Have any ideas who they are? (Bob Evans-Don Mills, ON) No idea, Bob; readers?-Larry.	11271.0	Gonzo 05 Alpha calling Trenton Military with exercise message to MOC Halifax in USB at 1955 in USB, gave 9006 as secondary frequency. (Hixson-FL)
8475.0	UIB/UIB2-Unid station sending a V CW marker at 1031. (Jack Dix-Yonkers, NY)	11300.0	Echo 10111 with request to Cairo ATC for flight level 390. Is Echo 10111 an AMC aircraft? (Duffey-RSA) Don't know for sure, I don't think it is, but...-Larry.
8610.0	UCE5-Unid station sending DE CW marker at 1057. (Dix-NY)	11407.0	Andrews working SAM 971 for a radio check on F-419 secondary frequency in USB at 0145. (Jones-CA)
8675.0	UDB5-Unid station sending V CW marker at 1103. (Dix-NY)	11460.0	Andrews working various VIP flights on Mystic Star F-295 in USB. (Haverlah-TX)
8687.5	UGC-Unid station with DE CW marker at 2136. (Dix-NY)	12925.5	UGC-Unid station sending a DE CW marker at 1426. (Dix-NY)
8764.0	Female voice requesting station move to 9291.0 in USB. Established voice contact on 9291.0 then 75 baud RTTY sending unclassified naval messages from 0100 to 0143. Sign-off noted as follows: "01RPZ NMN de NELP int QSL 003/EEEE QSL 0001 K/JDD." (Bob Madorin-Lenexa, KS) NELP is the Naval Reserve training ship USS Joseph Hewes (FFT-1078). Sounds to me like some Reserve Radioman training with NMN. Nice catch, Bob, on your Universal M400-Larry.	13065.0	50W-Lagos Radio, Nigeria, with V CW marker at 2042. (Dix-NY)
8785.0	VCS-Canadian Coast Guard Halifax, NS Canada, with weather broadcast in USB at 0213. (Bill Funk-Glendale, AZ) Welcome aboard, Bill, please check in often-Larry.	13204.0	SAM 204 in voice comms with Andrews on F-089 in USB at 1804. (Jones-CA)
8822.0	Rockwell International flight 58011 working Tully requesting frequency change to 6550.0 in USB at 0458. (Duffey-RSA)	13211.0	Andrews working Air Force 2 with signal checks on F-461. Andrews operator stated he was using remote site out of Salinas, CA for this designator/frequency in USB at 2313. (Jones-CA)
8967.5	US Navy Link 11 transmission noted here at 0215. (Haverlah-TX)	13452.0	Spanish female 4-digit number station in AM at 1315 that was DF'ed to Remington, VA. (John Fulford-FL)
8970.0	Spanish female 5-digit number station in AM at 0415. (Haverlah-TX)	13565.0	Andrews in comms with SAM 201 on F-567 in USB at 0255. (Jones-CA)
8972.0	Bluestar net working T2L, S4JG and 2YB. India called Bluestar with lat-long report, had British accent and said he was squawking military IFF. In USB at 1525. (Williams-AL)	13878.0	SAM 204 in comms with Andrews on F-600 in USB at 0302. (Jones-CA)
8975.0	K65F working ZRD with traffic and position in USB at 0502. (Duffey-RSA) Interesting, Glenham, is ZRD a point-to-point or military station?-Larry Rescue 401 working ZRH-South African Navy Capetown, RSA, confirming VHF contact with ZSRAB and their ETA in USB at 0536. (Duffey-RSA)	14606.0	Reach 191 (over northern Canada) calling any MARS station for phone patch traffic in USB at 2006. No reply. (Hixson-FL)
9014.0	Gemini 87 working Raymond 7 (Cannon AFB, NM) at 1931 in USB. (Haverlah-TX)	14955.0	Nightwatch working Seatrain on Sierra-313 in USB at 2338. (Jones-CA) Nightwatch working Mincemeat 01/09 and Seatrain in USB on Sierra 313 at 2218. (Fowler-MA) A big UW thank you to Larry and Jeff for identifying this new USAF designator S-313-Larry.
9017.0	Andrews working SAM 204 on F-094 with signal checks in USB at 0254. (Jones-CA)	15011.0	Andrews working Air Force One, SAM 28000 and SAM 049 with signal checks on F-732 in USB at 1640. (Jones-CA)
9023.0	Andrews working SAM 971 on F-467 with signal checks in USB at 0034. (Jones-CA)	15041.0	Tiger Ace with roll call/check-in of stations with call signs of Europe, Alabaster, Centcom, NORAD, Strac, Special Ops and Uncle Sam in USB at 1826. Ended with 'this completes the conference'. Hixson-FL) Reminds me of a Flash Override Conference type call-Larry.
9057.0	DFZG-MFA Belgrade, Serbia, with 75 baud RTTY news at 1408. (Boender-Neth)	16270.0	English female (German accent) 5-digit number station in AM at 1350. (Boender-Neth) Wonder how 9VF207 in Singapore likes this-Larry?
9320.0	Nightwatch 01 setting up data circuit with McClellan in USB at 0210. (Jones-CA)	16362.0	DFZG-MFA Belgrade, Serbia, with 50 baud RTTY English news bulletins at 1439. (Dix-NY)
9362.5	DFJ36-DPA Bonames, Germany, with German news bulletins at 2235 using FEC-A at 86 baud. (Dix-NY)	16986.0	CTP-NATO Lisbon, Portugal, with V CW marker at 1829. (Boender-Neth)
10423.0	YMA20-Ankara Meteo, Turkey, with 50 baud RTTY weather at 1432. (Boender-Neth)	17410.0	EZL-Israeli Mossad number station in English at 1430 using AM. (Dix-NY)
10493.0	MFA Bucharest, Romania, with encrypted messages using 164 baud ROU-FEC at 2134. (Boender-Neth)	18023.0	Andrews working various VIP flights on Mystic Star F-778 in USB. (Haverlah-TX)
10780.0	King 1 working Cape Radio looking for frequencies for DOD Cape in USB at 1039. (Brown-MA)	20953.0	Andrews working SAM 049 and SAM 28000 with signal checks in USB at 2111. Operator said using the remote site out of McClellan. (Jones-CA)
11176.0	Mudbug Control (Barksdale AFB, LA) via phone patch through Ascension working Duke 87 in USB at 0024. Said wingman had fumes in the cockpit. Lima-Echo-11-Sierra calling MacDill in		

The Scanning Report

Bob Kay

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

Scanning the Races

During the 1991 Indianapolis 500 car race, it was suggested that Mario Andretti intentionally stalled his car to force a yellow caution flag. Several spectators and news photographers, who were monitoring scanner radios, said they heard Andretti ask his crew if they needed a yellow caution flag.

Yellow flags and/or yellow lights are displayed when an accident occurs or when a hazard exists on the track. Although Mario Andretti had no hope of winning the race, his son Michael was running in second place. A yellow light condition would have allowed Michael to catch the lead car. When the race resumed, Michael could renew his quest for first place.

A few minutes later, Mario Andretti's car slowed considerably and was eventually towed from the track. The incident did produce a yellow flag, but Michael Andretti lost the race to Rick Mears.

According to the United States Auto Club director, Roger McCluskey, the USAC did not hear the conversation and planned no action against the elder Andretti. "Mario Andretti's stalled car had no bearing on the outcome of the 500 miles race and the USAC considers the matter closed," McCloskey said.

During the "Winston Cup" practice at Watkins Glen, New York, Steve Hmiel, a race crew manager, used his two way radio to comment about an attractive young lady. To Hmiel's surprise, countless fans with scanner radios were listening to his remarks.

Auto race fans of all ages are discovering that scanner radios are an addictive addition to the spectator sport, once you've listened in behind the scenes. The race crew frequencies provide plenty of uncensored and often profane conversations that include race preparations, race day strategies and non-related discussions.

Scanning the races has become so popular that several fan clubs have been created. The Frequency Fan Club (1-800-Race Fan) has more than 4000 members and is growing. The club is based in Mulberry, Florida, and publishes a monthly magazine that provides updated race team frequencies, speed boat frequencies, off road race frequencies and much more. The subscription rate is \$30.00 dollars per year. For more

information, call the toll free number and tell 'em that MT sent you.

The preferred scanner radios for race car scanning include models that cover the 400 megahertz and 800 megahertz ranges. The majority of race crews utilize the 400 megahertz band, but there are a growing number of crews that have switched to the quiet, noise free realm of 800 megahertz. The popular race frequencies can be seen in Table #1.

A few of the race teams don't look kindly on the fact that anyone can listen in. The "Wood Brothers" race team issues a disclaimer before they begin their radio transmissions--alerting listeners to be prepared for "foul language." Other race teams are experimenting with scramblers and radio security devices.

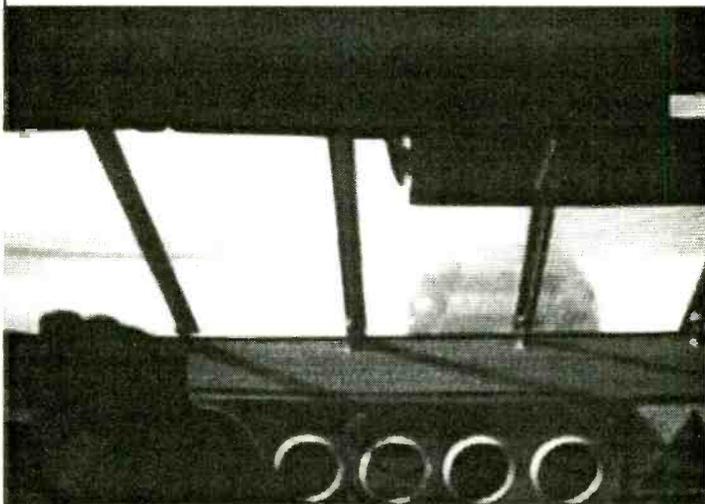
The ability to listen in has driven some drivers to paranoia. A. J. Foyt has been reported to use a different frequency every day. Michael Waltrip's race team is more concerned with the opposing team's ability to listen in. "If we think there is someone on another team listening in, we call his name on the radio. If he looks up, we know we got him," Waltrip said. Waltrip's team also uses codes to identify problems. "If we have something important to convey," Waltrip explained, "we may preface the information with a code word. The competition doesn't know if we're faking the situation, or if it's actually happening."

Scanner buffs don't really care if code words are used to convey information. Scanning allows the hobbyist to feel as though he or she is part of the action. Scanning allows the listener to become totally involved...to become one with the driver. If you want to experience the dangers and thrills of racing from the driver's seat, take your scanner radio to the races!

There may be as many as 30 radio's used per race team. NASCAR itself utilizes more than 85 radios at national events. Frequencies may be changed prior to race time. More racing frequencies can be found in the Sports & Entertainment Frequencies pocket-sized book from Grove Enterprises, Inc. for \$ 9.95.

Table 1

Freq MHz	Driver	Freq MHz	Driver
855.5125	Bill Elliott	465.6875	Jimmy Means
853.5000	Bill Elliott	855.5625	Jimmy Spencer
853.4875	Bill Elliott	461.2125	Joe Nemechek
854.2625	Bobby Hamilton	857.8375	John Andretti
467.1625	Bobby Hillin	466.7875	Ken Schrader
468.9375	Bobby Labonte	852.0375	Kyle Petty
460.587	Bret Bodine	457.525	Lake Speed
466.275	Buddy Baker	467.00	Loy Allen Jr.
467.725	Chuck Brown	460.95	Mark Martin
468.3375	Dale Earnhardt	468.5625	Mark Martin
469.0125	Dale Earnhardt	463.925	Mark Martin
464.0125	Dale Earnhardt	857.837	Mario Andretti
466.0125	Dale Jarret	466.30	Michael Waltrip
469.3125	Darrell Waltrip	855.0375	Morgan Shepard
467.5625	Dave Marcus	468.325	Neil Bonnett
468.725	Derrick Cope	463.975	P.J. Jones
466.450	Ernie Irvan	865.665	Richard Petty
855.575	Geoff Bodine	467.075	Rick Carelli
462.15	Geoff Bodine	461.1625	Rick Mast
463.70	Geoff Bodine	461.5875	Rusty Wallace
466.475	Geoff Bodine	464.30	Sterling Martin
468.775	Harry Gant	463.40	Steve Grissom
467.575	Hut Stricklin	468.45	Ted Musgrave
465.8875	Jeff Burton	468.2125	Terry Labonte
467.0625	Jeff Gordon	859.8375	Terry Labonte
463.50	Jeremy Mayfield	468.975	Todd Bodine
461.6625	Jimmy Hensley	852.1875	Wally Dallenback Jr.
462.7125	Jimmy Horton	463.775	Ward Burton



Take your scanner radio to the races and put yourself in the driver's seat

TREASURE HUNT

Mobile scanning is a very popular aspect of our listening hobby. But as most of you already know, it's nearly impossible to scan from a vehicle that doesn't have an outside antenna.

Installing a mobile antenna on your vehicle can be a nail biting experience. Drilling a hole through the body of a \$20,000 dollar vehicle certainly doesn't help to increase its value.

If you choose a magnetic mount, that solves the hole drilling problem, but now you've got an antenna that can be stolen. And don't forget about the coax cable that must be routed through a window.

The solution to your mobile antenna problems is Grove's "No Tenna." The unique No-tenna is connected to a single screw, inside your vehicle. You'll get, strong, clear and continuous frequency coverage between 1 and 1000 megahertz. Best of all, you can win the No-Tenna by finding the following clues.

1. The Grove "Ant-20" is the catalog number for the "No-Tenna." True or False?
2. In the May issue of *MT*, on page 79, how many 100 watt light bulbs are required to test a 1000 watt transmitter?
3. 300 South Highway 64 West, Brasstown, NC 28902, is the new address for Grove Enterprises. True or False?
4. I ordered the Grove CVR-4. What did I get?
5. In which 1994 issue did *MT* mention the "Mark of the Beast"?

The No-tenna mounts in seconds, using your entire car body as an efficient, all band antenna. A spring clip is also provided for temporarily connecting the No-Tenna to hotel/apartment window frames, curtain rods, bed springs or other metal objects. Full instructions and universal connectors for RCA, BNC and 1/8" mini-plug are included. Retail price is \$19.95 plus \$4.00 UPS ground shipping. For more info, call (704) 837-7081.

FREQUENCY EXCHANGE

The Blue Angels air show schedule has been provided by Roger West. If you go, don't forget to bring along your scanner radio.

July

- 2-3 Traverse City, MI
- 9-10 Eau Claire, WI
- 16 Pensacola Beach, FL
- 23-24 Minot, ND
- 30-31 Springfield, IL

August

- 6-7 Seattle, WA
- 13-14 Abbotsford, BC
- 19-21 Naval Air Station, Miramar, CA
- 27-28 Chicago, IL

September

- 3-5 Cleveland, OH
- 10-11 Naval Air Station, Memphis, TN
- 17-18 Burlington, VT
- 24-25 Naval Air Station, Jacksonville, FL

October

- 1-2 McGuire AFB, Trenton, NJ
- 8-9 San Francisco, CA
- 15-16 Salinas, CA
- 22-23 Fort Worth, TX
- 29-30 Naval Air Station, New Orleans, LA

November

- 5-6 Miami, FL
- 11-12 NAS, Pensacola, FL



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a new dimension in communications from Datametrics



Now Radio Shack PRO 2006 owners for the first time have access to the exciting world of

Computer Aided Scanning with the highly acclaimed Datametrics Communications Manager system. Computer Aided Scanning is as significant as the digital scanner was five years ago and is changing the way people think about radio communications.

The Datametrics Communications Manager provides computer control over the Radio Shack PRO2006 receiver. Comprehensive manual includes step by step instructions, screen displays, and reference information.

Powerful menu-driven software includes full monitoring display, digital spectrum analyzer and system editor. Extends receiver capabilities including autolog recording facilities, 1000 channel capacity per file, and much more.

Uses innovative Machine State Virtualizer technology (patent pending) hardware interface by Datametrics. Simple 4 step installation - no soldering or modification to normal receiver operations.

Datametrics, Inc

- Computer Aided Scanning system \$349
- PRO2006 receiver w/interface installed and CAS system \$749
- Manual and demo disk \$15
- Requires Radio Shack PRO 2006 receiver and IBM PC with 360K memory (640K for full channel capacity) and parallel (printer) port.

Send check or money order to Datametrics, Inc., 2575 South Hayshore Dr, Suite 8A, Coconut Grove, FL 33133. 30 day return privileges apply.

Frequencies

- 141.56 143.60
- 142.00 251.600
- 142.025 275.350
- 143.00

Since we're already visiting with Roger West, let's stop in at the **University of Minnesota Hospital**. When Roger was in the hospital for by-pass surgery, he taped Grove's "Hidden Antenna" to the window and monitored the following medevac frequencies:

123.05, 123.075, 155.280, 155.34 MHz.

Ojai, California, is home to Roy Hooper and here are his favorite frequencies.

- 151.805 Ojai Valley Inn 155.535 Ojai sheriff
- 153.95 Ventura County fire 155.625 Ventura County fire
- 154.01 Ventura County fire 170.55 Los Padres National Forest
- 154.235 Ventura County fire 171.55 Los Padres National Forest
- 154.92 Ojai sheriff 453.425 SCAT buses
- 155.145 Ojai Work Release farm 856.987 Caltran's portable radio
- 155.31 Ventura County police 860.737 Caltran dispatch

Our next invitation is from an anonymous reader who lives in **Bluefield, West Virginia**.

- 39.32 Bluefield VA PD *
- 39.54 Pocahontas VA PD
- 39.92 Princeton PD, Mercer Co. Sheriff
- 39.98 Mercer Co. Sheriff
- 42.10 WV State Police
- 42.26 WV State Police
- 155.10 Bluefield WV PD *
- 155.13 Beckley City PD
- 155.43 WV Turnpike Commission
- 159.00 VA State Police
- 159.03 Beckley City PD (detectives)

159.15 McDowell Co. Sheriff

*Don't let the listings for Bluefield confuse you. Bluefield is a town that is divided by the West Virginia/Virginia state line!

It's just a short hop from there to our next cross-country adventure in **Wilmington, North Carolina**. The invitation arrived anonymously, so we won't be serving refreshments.

31.34	Forestry	154.175	Ogden fire
45.44	Pender fire	157.56	Black River Hunt Club
47.50	Ogden rescue	453.40	Wilmington police
151.175	Forestry	453.50	Sheriff
154.13	Wilmington fire		

Taking a swing to the north, Joe Smith lives in **Brome County, New York** and his invitation includes free snacks and drinks. As you enjoy the munchies, don't forget to monitor the following:

33.80	Susquehanna Fire
33.86	Bradford County Fire
33.90	Broome County Fire
45.48	Broome County Fire
47.40	New York State Transportation
151.025	Broome County highway (Base)
151.10	Johnson City Public Works
154.95	NY State Police
155.16	Broome County Ambulance
155.595	Cortland County Sheriff
155.655	NY State Police
160.56	Conrail Special Agents
160.80	Conrail yard
161.14	Conrail track repair

Before we depart from Joe's company, fill your pockets with goodies. We have another anonymous invitation that doesn't include refreshments.

Welcome to **Bermuda!**

118.100	Bermuda Tower
119.100	Arrival & Departure
121.700	Civil Ramp Control
124.500	Ground
126.200	Clearance Delivery
128.500	Bermuda Center
129.750	US Air, air/ground
130.700	Continental & Northwest, air/ground
131.200	Air Canada, air/ground
131.400	American, air/ground
131.600	Aircraft Services Bermuda, air/ground
131.850	Delta, air/ground
131.900	British Airways, air/ground
133.000	Approach
134.100	Approach
270.600	Approach
289.400	Approach
291.000	Tower
305.400	Bermuda Center
336.400	Ground
363.800	Approach
395.900	Clearance Delivery

Bermuda's air traffic is apparently handled by a U.S. Naval Base. If you have more information on this subject, please share it with our readers. Send your frequencies and comments to the Frequency Exchange, P. O. Box 98 Brasstown, N.C. 28533.

COMPUTER CORNER

I have a computer disk that contains several pages of race frequencies. If you're looking to start a racing data base, here's the perfect opportunity. The race frequencies are contained in the popular "Radiolog"

shareware program. As most of you know, Radiolog is a user friendly program that can store and sort thousands of frequencies. If you already have a copy of Radiolog, the files can simply be copied into your existing data bank. If you don't have the program, it's already included on the disk.

To take advantage of this free offer, send a formatted disk (density and size is your choice) with return postage and disk mailer, to Bob Kay, P.O. Box 173, Prospect Park, PA 19076. If you don't want to provide the formatted disk, mailer and postage, here's the second option: Send \$5.00 dollars to the Prospect Park address, and I'll send the disk size that you specify. Please allow five weeks for delivery.

BEYOND POLICE CALL

Looking for additional race frequencies? Are you having difficulty locating non-public safety frequencies? If so, the new book, *Beyond Police Call*, belongs in your listening post.

Published by Hollins Radio Data, the book contains frequencies for hotels, resorts, casinos, malls, security companies, buses, taxi cabs, towing services, utility companies, schools, TV production crews and thousands of additional, non-public safety frequencies.

Beyond Police Call is the perfect companion to the familiar *Police Call*. If you don't have this new, 432 page book, your scanning shack isn't complete. Visit your local Radio Shack retailer or call Grove Enterprises and get a copy today!

DOG FENCE HARMONICS

The May issue of the Great Lakes Monitor newsletter published an interesting article about electronic dog fences. The author started to experience shortwave radio reception problems after his neighbor installed an invisible, electronic dog fence. This device is buried in the ground, and the dog wears an electronic collar. When the dog nears the "buried fence," the collar emits a tone that increases as the dog gets nearer.

The transmitter had an unfiltered output frequency of 100 kHz. The transmitted signal was full of harmonics and spurs that interfered with the author's attempt to monitor medium-wave and tropical band DX.

The author contacted the FCC, and as a result of his complaint, the FCC asked the dog fence installer if the device was FCC certified. When the owner contacted the supplier, the supplier sent a new fence that was FCC certified. At last report, the new fence was operating without any interference to the AM broadcast band.

CORRECTION

In April's "Scanning Report," I explained the technology of CTCSS (Continuous Tone Coded Squelch System) tones. In that column, I wrote that CTCSS is a series of tones. As most of you know, CTCSS utilizes only one single tone, and should not be confused with the sequential tones used for dispatching fire companies, for example. I also implied that CTCSS could be utilized as a private line, with multiple users. Again, as many readers pointed out, CTCSS cannot guarantee user privacy--it is simply a means by which users hear only the traffic intended for them, but that does not mean others cannot listen.

If you need further help on scanning CTCSS tones, or on any matter related to scanning, don't hesitate to drop me a short note. **M**
Please include an SASE for personal replies. The address is, The **T**
Scanning Report, P.O. Box 98, Brasstown, NC 28902.

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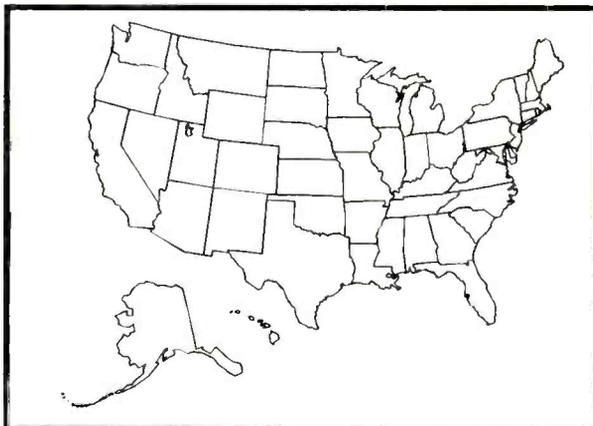
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The Beginner's Corner

"Uncle Skip" Arey, WB2GHA

GENIE T. AREYI

Local Notions

Every July, my long suffering family and I take up with millions of others and migrate to places far beyond our own home. Going into a new location is always exciting. It can also be very frustrating. How do you get to know the lay of the land and the local buzz?

Fortunately for my family, I am a RADIO MONITORING HOBBYIST (capital letters intentional). I have information gathering skills and abilities far beyond those of common folk. I can systematically spin the dials on several receivers and come up with everything my family needs to know to fully enjoy their R&R. And guess what? I can even have tons of fun doing it. You can join in the fun too, Compadre. All it takes is a little planning and maybe tossing a few extra items into your ditty bag prior to your trip.

STEALTH MONITORING

I have always made it a solid policy to limit my radio hobby activities while on any family outing. After all, the purpose of getting away with the brood is to enjoy some quality time together. Still, the urge to hear new and different things on the radio is one of my greatest joys.

There is a way your monitoring can creep into that quality time without really causing a commotion. To do this, you need look no further than the dashboard of your family car. That's right Bunkey, the good old AM/FM radio. Wedged between those high powered regional and metropolitan radio stations, you will find dozens of local outlets that are sure to give you hours of fun monitoring. These local outlets also offer important information to help your family fully enjoy their vacation. Local traffic and weather are sure to be important, but there is other information that can be gathered to good use. Pay attention to the needed supplies.

Listening to the local stations helps you get in touch with the "flavor" of an area, too. For instance, you are sure to hear a great deal of agricultural information when traveling through a farming area. Marine weather and fishing reports figure heavily into the mix of broadcasters along the coastlines. Get the idea? Listening to local



Only plan to bring the most basic equipment on your vacation..



broadcasters is the radio hobbyist's equivalent of "When in Rome, do as the Romans do."

Local broadcast station monitoring need not be any more complicated than twiddling the dials while riding down the road—sort of fishing for frequencies. (And you don't even have to handle worms to do it!) If you want to be a bit more organized in your search or even do a little preplanning before your trip, there are several great resources out there.

For information on AM broadcast stations around the country, nothing beats the National Radio Club's *AM Logbook*, \$19.95, available from many of the radio oriented booksellers in *MT* or direct from Ken Chatterton, PO Box 164, Mannsville, NY 13661-0164. This book is set up in "loose-leaf" format and includes just about everything you need and want to know about any radio station you are likely to encounter along the highways and byways of North America. It is cross referenced by city, state, and call letters to help you figure out what your traveling tuning is going to be like.

FM listeners are just as blessed with a super station guide. The *FM Atlas*, by Bruce F. Elving, \$14.95, is available from the same sources in *MT* or direct from FM Atlas Publishing Box 336 Esko, MN 55733-0336. This book shows you the location of North America's FM outlets arranged in an easy to follow map format. Stations are cross referenced by city and frequency to further aid in understanding.

Old Uncle Skip seldom travels far from home without these two publications in his possession. If I know I am going to be, say, driving down to Atlanta for the Monitoring Times Convention, I take these books beforehand and make note of the stations along the route that might give me some insight into the local point of view. Nothing makes a trip go faster or seem like more fun. Besides, logging local radio stations is a game the kids can play. Just like looking for license plates from different states. Who knows, you may hook Junior into the listening hobby during your vacation trip.

An activity popular with both AM and FM monitors is BANDSCANNING. This is simply listing all the stations you can hear from a particular location. It's an easy, low pressure monitoring activity that should fit in just fine with your vacation plans. Bring along a tablet and scan the AM and FM bands from end to end. Make note of the stations call signs, locations and programming formats. Most bandscanners make at least two sweeps across the band, one during daylight and one after dark. If you're a night owl you might do an additional sweep after midnight. The reason for these multiple scans is that the stations you hear will vary both because of sign on/sign off times as well as day and night propagation. You can accumulate these bandscans over time just like some folks collect pictures of their vacations. It's a great way to remember your vacation in a unique radio

monitoring manner.

By the way, while you're tuning around on your car radio, if you discover anything interesting, be sure to share it with your friends by sending it in to Joe Eisenberg's "American Bandscan" column right here in *MT*.

VACATION SCANNING

The recent crop of excellent handheld scanners has made monitoring VHF and above while traveling as simple as sticking a rig in your back pocket as you walk out the door. Low intensity scanning can almost always be done in the background during many other vacation activities. Getting a quick study of the frequencies in any particular area is a simple as running into the nearest Radio Shack and purchasing the appropriate regional volume of Gene Hughes' *Police Call Radio Guide* at the going price of \$9.99. This will allow you to program in the frequencies that will generate both interesting and useful listening while on vacation.

My family and I spend a lot of time at the beach. I have taken up the habit of programming in the area life guard and beach safety frequencies. If any foul weather or other problems are headed "up the beach," my trusty scanner alerts my family and once again I am a radio monitoring hero. Make sure you take some time to become familiar with state and local laws concerning scanner use. Also, many theme parks frown on scanner use within their grounds. A little thought ahead of time will save you from any hassles while you're supposed to be relaxing. When in doubt, leave the scanner out.

Another habit that will help your scanning while on a trip is reading the local newspapers. Most areas have either weekly or daily local newspapers. Sometimes this local information is found in a special section added to the region's metropolitan newspaper. You can probably get an idea of what is best by asking the folks behind the counter at a local convenience store or newsstand. Perusing the local sections will guide you in the direction of many additional scanning opportunities, such as all manner of public service and civic activities. For example, you might discover that the "locals" round about your vacation hangout are planning a walk-a-thon or a parade while you are in town.

In addition to local activities you might find scannable stuff in the form of how the residents "manage" us tourist types. I once read about an area setting up additional police services to manage "tourist" traffic. Also pay attention to the local ads for "radio dispatched" businesses.

Just like the folks who are broadcast bandscanning the bands, it pays the scanner monitor to keep a list of what is heard. These "hot" frequency lists will be useful to you if you are likely to return to an area for a future vacation. Frequency lists of resort areas are made for sharing with your fellow scanner hobbyists. Last summer I published a column that let folks know that I had a list of frequencies that I heard while vacationing at Disney World. The column generated over 400 SASEs requesting a copy of the list and sorely tested the ability of my meager photocopier. With this level of interest, you may want to share your resort frequency findings with other folks through "The Scanning Report" column here in *MT*.

WHATEVER HAPPENED TO ALL THOSE GOOD BUDDIES???

Believe it or not, there are still quite a few folks out there using CB radio (including feature writer Jock Elliott), especially during travels. You can buy in to what is left of the CB boom for around \$50. A CB radio in the car can be an important tool for getting directions or even help when the Hudson overheats. Some of my family's summer trips involve more than one car (My mother-in-law objects to being strapped to the bumper). CB radio is a cheap and easy way to keep the

caravan together. It lets you discuss where you are going to stop for lunch without shouting out the windows at each other while passing.

THE VACATIONING AMATEUR

If you are a licensed radio amateur with a No-Code Tech ticket or better, you probably already know the advantages of carrying along a two-meter transceiver when traveling. The system of repeaters across the country will get you in touch with hams just about anywhere you plan to go. In addition to the same utility as a CB rig, many repeaters provide access to phone patch services. This makes calling for help a little more direct. Most repeaters in resort areas have folks on them that go out of their way to make visitors welcome in their area. On more than one trip, ragchewing on the local repeater while on vacation has developed into some lasting friendships. I also maintain that hams know the best places to eat.

Local level amateur radio communication is just one more way to get a feel for the area you are visiting. If you're not a ham yet (and why not?!) it's perfectly okay to listen in via your VHF scanner. Not only will you get a taste of the local flavor, you may get excited enough to start studying to get in on all the fun for next year's vacation.

HAVE FUN

Don't forget to relax and enjoy your vacation. There will be plenty of time for "serious" DXing when you get back home. It's okay to just kick back. Besides, if you try to get a suntan while wearing *MT* headphones you're going to get really strange looking tan lines. *MT* Surf's up!!!

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*asterisk before/after time signifies station sign-on/sign-off;

// means parallel; + means continuing but not monitored;

= 2 x indicates 2nd harmonic of following frequency.

ECLIPSE RECEPTION Both Enid and Toronto were along the annular eclipse path May 10, and CFRX, 6070 was quite readable from 1646 tune-in past 1715 tho normally inaudible daytimes. But much other unusual reception was noted from outside the path: high-end MW similar to winter days with low solar angles, several Texans, mostly Spanish in the 1500s, XERF-1570, WOAI-1200 from 1615 checks; WHRI-9465 much stronger than usual as was WJCR-7490; 6116.1, probably XEUDS hetting 6115 from Far East Russia, whence also 6065 Moscow SSB as late as 1723; 6175, 7370 with typical Russian tune-up tones before 1700; 6087 music probably Taiwan; 6140 BBC Singapore; 6150 R. Japan//9535; 6080, R. Australia; 9625, CBC-Northern (gh, OK)

ARMENIA Araks, Yerevan in English: 2130-2145 on 11790, 11960; 2230-2245 on 11790, 11920, 11945; Suns 0830-0845 on 15170, 15400, 17700 (RJMR)

BOLIVIA R. Loyola reactivated after several years, drifting 5994.8 to 5995.3 until 0200* in Quechua; Spanish mornings (Tony Jones, Paraguay via Takayuki Inoue, *Relámpago DX* via RNM)

CHAD Ndjamená extended 6165, heard 2200-2300* UT Sat., instead of unheard 4904.5 this day; don't confuse with Zambia on 6165 at other times (Bob Padula, Melbourne, Victoria)

CHILE R. Triunfal Evangelica, 5825, active again 2300-0200 from outside Santiago, unlicensed so report via my address: Cas. 2868, 1000 Buenos Aires, Argentina with r.p.; I'll personally obtain QSL on my next visit from director Bishop Fernando González Segura (Gabriel Iván Barrera, RN Radio-Enlace and FT) R. Patagonia Chilena, 6080.1, after 1000 with R. Portales net news, heard only under unusual conditions, K-5 (Hans Johnson, MD, FT)

COSTA RICA RFPI new U.S. address: Box 20728, Portland, OR 97220, or call 503-252-3639 at 9-5 PT weekdays; inquire about joining Friends of RFPI, ordering T-shirts, etc., with SASE. Thanks to new Austrian staffer, Dieter Volger, German resumes, Tue. & Fri. 2300. Following outage in mid-May, 15030 came back with SSB at times, and may be upgraded with 10-kW transmitter days as 21465 propagation declines. Fax Portland 503-255-5216 (RFPI Mailbags & via Thurman)

CUBA RHC summer schedule in English: 2100-2200 on 17760; 2200-2300 on 9550; 0000-0200 on 13700-USB; 0000-? on 6010; 0200-0700 on 9820; 0400-0500 on 9550. Spanish changes include to Mexico 9505 ex-5965 mornings, 9655 evenings clashing with Austria 0130, 15230 ex-9550 eves to Southern Cone (RHCDXers *Unlimited & En Contacto*) Para los Diexistas, previously publicized on R. Rebelde UT Sats around 0500, has not yet started due to management attempts to fetter Manolo de la Rosa into doing a non-DX talk program instead (E. Perdomo C., Cuba, *Play-DX*) Orlando Valderrama, Vedado, doing *Comunicando DX* program on R. Taíno, 1180, UT Mondays at 0200. Your contributions welcome. Valderrama also doing DX segment on SW *En Contacto*.

CZECHIA RFE/RL will move from Munich to Prague if Congress approves; deadline extended (CTK via BBCM) R. Prague external service should be re-directed towards East, more important than the West (Vlastimil Jezek, Czech R. Dir.-Gen., *Radiozurnal* via BBCM)

ECUADOR HCJB abandoned 15155 for 11925 at 0030-0430 // 9745 (John Norfolk, OK) Mid-week DX update named *The Latest Catch*, additional time 0200 UT Thu. (gh) *Ham Radio Today*, Weds. 0800, 1030, 1930, 2100, Thurs. 0100, 0330, 0530 topics: July 6, QSL

cards, ionosondes, antenna harmonic operation, invention of radio. July 13, speech processing, obliquity factor, folded dipole, bay and stack antennas, the first ham radio. July 20, amps, transmission distance, ground reflection, Hertz. July 27, electronic counter-measures, propagation considerations, quads, watt, farad, ampere, volt, ohm. Aug. 3, phase noise, diurnal cycles, log periodics, Varian Klystron. Aug. 10, silent keys, hearing DX, zepp antennas, the very first ham?

FINLAND YLER. Finland on 15400 and 11900 at 1330 daily, 1230 and 1130 Mon.-Sat. *Compass North* is first daily program, then *Press Review* Tue.-Fri., ending with *Northern Lights*; in between, Tue., *Sports*; Wed., *Environment Report*; Thu., *Finnish History*; Fri., *Culture Close-up*. Also: Sat., *Starting Finnish*, *Capital Coffee Break*; Sun., *Focus*, *Nuntii Latini*; Mon., *Economic Review* (YLE)

FRANCE RFI English at 1200-1300 on 13620 or 13625, 13640, 15530, 21645, but heard only on marginal 13640 (Bob Thomas, CT) 13625 is French Guiana; also on 17575, 15325, 15195, 15155, 9805. At 1400-1500 on 17695, Gabon-17560, China-11910; 1600-1700 on 17850, 17795, 17620, 15530, Gabon-12015 & 11700, 6175 alternate 3965. RFO news review for Antarctica Mondays 0805-0835 on 11660. *Média France Intercontinents*, pass feed service in French, daily 0915-0945 on 25820, 21730, 21685, 21645, 17785, 17775 17650; daily exc. Sun. 1515-1545 on 25820, 21685, 17795, 17785, both to Africa (BBCM)

GABON Swiss Radio International dropping Moyabi relay at Junend (RNMN) By when their own French Guiana relay expected operational. SRI via Gabon was 2000-2200 on 6135, 2215-2400 on 12035 (*DX Listening Digest*)

GERMANY DW finally scheduled some programs formerly only beamed elsewhere onto the N. American service around 0130 and 0530, UT days: Tue. & Thu., *German Tribune*; Wed., *The Arts in Germany*; Fri., *Come to Germany* (DW tune in via Diane Mauer) DW's German program is not on strict 8- and 16-hour repeats; in May and June, *Auf kurzer Welle* is on 4th Monday at 1037, 1837, 0237 (gh)

GREECE Like WWCW, British ute forced VOG off 17535 at 1200-1350, moved to 17520 (via John Babbis, MD)

GUAM AWR-Asia has replaced some English hours with other languages, leaving only two daily English broadcasts, at 1600 on 7455, 2300 on 15610; Sat. & Sun. also 0200 and 1700 on 13720 (via Gigi Lytle, TX) Sometime this summer, a third transmitter will be added, and English will be: 1500 and 1600 on 9370, 2300 on 11980, all on KSDA-2 (*Radio News Bulletin*)

GUATEMALA AWR-Unión Radio has moved SW antenna and lowered it to a half wavelength to improve propagation into México, southern U.S.; ex-TIAWR-6 5-kW Elcor transmitter to be installed on hilltop at Canelitos, near Guat. City as TGMU-2, special QSL for first week, unknown when, maybe delayed by fighting (RNB)

HAWAII AWR officials have been scouting for transmitter site, perhaps near KWHR on the Big Island, but 20 times the power; 4 x 500 kW, and 4 curtains, some aimed at N. America and India (*World of Radio*) KWHR 0400-0800 on 17780 ex-17510; *W.O.R.* Sat. & Sun. 0600

HONDURAS HRJA, R. Copán Internacional, 15675, has added Bro. Stair, Sun.-Fri. 2100-2130, Mon.-Fri. 2300-2330, Sat. 2200-2230, Sun. 1900-1930; *Mailbag* shifted to 2215-2230 weekdays (via George Thurman) with DX news Fridays (Jeff White via Steve Cole, *Spectrum*) Much cheaper than WINB, which Stair said cost him \$2000 a month, but drew only \$200 income, for 3 hours a day (gh) R.

Internacional, 4930.6 heard with DX mailbag UT Sun 0215; fax 581070, phone 528181 (Santiago San Gil, Venezuela)

INDONESIA RRI Biak reactivated on 5497.8v, overmodulated to 1115*v, ex-5501v. RRI Tual, Maluku is new on SW, 5984.3 to 1409* (David Foster, OzDX via DSWCI SW News, DX Ontario) Both also heard here (David M. Clark, Ont., DXO)

IRAN VOIRI expanded English, 1530-1627 on 9575, 11790 from new site (Y. Kato, Radio Japan Media Roundup)

IRAQ RBI shifted English an hour earlier, 0900-1200 on 17740, 15180; some days, 17740 switches from Arabic late (Eugene, RVI Radio World via Cline, Mauer)

ITALY NEXUS-IBA's IRRS-Shortwave, despite longtime occupancy of 7125 at 0500-2000, has been hit by co-channel interference from R. Budapest at 1430-1500, Bulgaria 1500-2000, who refuse to move; please help persuade them to do so (Alfredo Cotroneo, NEXUS)

JORDAN Contrary to PWBR, R. Jordan does QSL, got mine in one day from Dir. of Engineering by fax (Box Padula, ADXN) fax +062 (6) 788115 (WRTH)

KAZAKHSTAN R. Almaty, English monitored on best-to-worst frequencies; 1700-1730 on 17605, 15360, 15270, 5260, 5035; 1830-1900 on 15155, 17765, 15360, 15470, 5260, 5035, 3955; plus more, unheard (Eugene, RVI Radio World via Mauer, Cline) [see TAJIKSTAN, May] R. Netherlands at 0030-0325 shifted 12025 from Dushanbé to Almaty due to modulation problems, but // 9860 still Dushanbé; since April 28 (Jonathan P. Marks, via Ben Krepp)

LAOS LNR has contracted to buy for \$1 million a new 50 kW SW transmitter from Telstra Co., Australia, to cover the entire country, on the air by May 1995 (BBCM) Luang Prabang regional, 7164v, is on-and-off due to power outages, but better in Vientiane where 49 and 41m both have muddy mod. No sign of Houa Phan, 4660, or Phongsali regionals, inactive or very short range (Tony Orr, Luang Prabang, NASWA)

MEXICO R. UNAM is about to put 50 kW on MW 860, convert the 10 kW to SW 9600; R. Educación has long-term plan to increase power on 6185 (DX-6185, which announces third airing is Sun. 1030)

MOLDAVIAN REPUBLIC OF PRIDNESTROVIE That's the official name on Verification Certificate from R. Dniester International, from Grigoriopol, 250 kW at 0335-0400 last Dec. on 7105, signed by Chief Editor A. Komar, at 25th October St. 45, Tiraspol, Pridnestrovie, Moldova, Transdnistria, CIS 278000 (Glenn Durant, KB0BHN, Firestone CO) Then it moved to 2130 on 9620 and ... (gh) At Aprilend, found on 15290 at 2030-2100, still announcing 9620, in English (Martin H. Gallas, IL) Still clear on 15290 in mid-May (gh)

MOZAMBIQUE R. Mozambique plans to install four new transmitters this year to extend coverage beyond present 30% of population (Noticias, via BBCM) Some may be MW, unclear about SW, but latter likely for wide coverage (gh)

NETHERLANDS RN reorganization entails: dropping French, Portuguese, Indonesian, Arabic, but dates not clear as staff being fired protest; Spanish may not last beyond one year; more emphasis on Europe, perhaps replacing with German; more satellite and local program placement; some expanded English hours may take up the slack. Of 450 jobs, including at the relay stations, 89 are being eliminated, 19 added for new activities, net loss 70 (RNMN, RN Press, Radio-Enlace) Newline specials, Aug. 6/8 on care of the aging. Research File, July 18/21 celebrates 25th anniversary of manned moon

landing, Mon. 52 past 07, 09, 11, 13, 15, 17, 19, Tue. 00, 02, 03, Thu. 08, 12, 14, 18, 23, Fri. 01. Documentary, Aug. 4 on the 50th anniversary of Anne Frank's diary, Wed, 52 past 07, 09, 11, 13, 15, 17, 19, Thu. 00, 02, 03, Fri. 08, 10, 12, 14, 23, Sat. 01 (RN via Will Martin, DXLD)

NEW ZEALAND Kiwi Radio, pirate, widely heard mid-April *0551-0700+ on 7445 USB with 350 watts, ID spelled out K-I-W-I, took phone calls to 64-68430084 (Guy Atkins, WA and Rob Keeney, KS, FT) QSLed on 2nd harmonic 14890 USB two days in a row, 0457-0558, 0544-0619; broadcasts Sats., Suns., holidays, AM 100-300 W, USB 250-1200 W (Gigi Lytle, TX)

NICARAGUA La Voz del Atlantico, Bluefields, tentative on 10125 at 2305-2317 on AM, then three contacts to 2328, to return next day at 1400; best on LSB. Was special sports broadcast, lots of ads, perhaps link with remote site (Santiago San Gil, Venezuela) R. Miskut director E. Mercado P. says off air since last November, due to transmitter and transformer problems. Had raised \$2000 for repairs but needed \$4825 more, asks for help from overseas listeners by registered mail to R. Miskut, Puerto Cabezas, R.A.A.N., Nicaragua. Since Aug. 1990 is no longer clandestine, important medium linking coastal communities. (Tetsuya Hirahara, Radio Nuevo Mundo)

PAKISTAN In the name of Allah, the Beneficent, the Merciful, only PBC change for J-94 and tent. S-94 to English schedule in May issue is 1700-1750 on 11570 ex-9855 (via Gigi Lytle, TX)

PALESTINE (non) V. of the Palestinian Islamic Revolution, 1900-1930 daily in Arabic on 7230, ex-9610 which was also used by Iran external service (BBCM)

PAPUA NEW GUINEA NBC switching from 4890 to 9675 at 2200 (Bob Padula, Australian DX News) Seems to have settled on this schedule: 4890 at *2000-2200* or 2215*, then 9675 until 0700* or 0710*, back to 4890 until 1400*; s/off mentions 9675 only (David Martin, OzDX, SW Echo, FT) on 9675 again at 1230 (MARE via DXPL)

PERU R. Jerusalem on 3194 at 1030, religious music and talk, 2 x 1597, may be new name of R. Luz de la Vida, Cajamarca (Santiago San Gil, Venezuela, W.O.R.) R. Luz y Sonido, Huánuco, new on 6472.6 at +1030-1030v, owned by diocese. R. Oriental, San Ignacio, 5179.0 until 0130v*. R. Tayabamba, 4647v ex-4713 around 0000-0030. R. Horizontes, Chachapoyas, 5019.8 ex-5009, now Colombian QRM (Henrik Klemetz, Colombia, Play-DX) R. Santa Rosa, Lima on 6045 has program *La Hora Huanuqueña* weekdays at 1000-1100 for people in Lima from Huánuco; don't mistake for a different station, nor weekend show *La Voz de la Libertad* for Cajamarcan. On 6238 is R. Estación Yurimaguas, ex-5046, sounds like it's about to break down like R. Oriente, 6190 already has (Klemetz, HCJB DX Partyline) R. Jerusalén, 3194.3, is at "flourishing and holistic cooperativa of Jerusalén" apparently near Cajamarca capital, announces 1600 and SW (Klemetz)

PHILIPPINES New station in English from *2200 on 9655 to 2245 fade, unID but resembles PBS (Bob Padula, ADXN)

RUSSIA R. Station Tsentr, Moscow, 0530-0600 on 12010, 1530-1600 on 9880 (Anatoly S. Klepov, ACK-DX) R. Vedo, Volgograd, 1400-1700 Mon.-Fri., 0400-0800 Sat./Sun. on 5915, 13710 (Andrey Klevtsov, Volgograd, *ibid.*, via Play-DX)



DX Listening Digest

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SEYCHELLES FEBA Radio, J-94 English until 3 Sep as in May column except 7205 ex-7170, and add Fri only 0457-0553 on 17750 (FEBA via *W.O.R.*)

SINGAPORE R. Singapore International fx:+65-255-2544, 253-8808, 256-1183; very interested in reports, QSL cards now in print, English 1100-1400 on 9530, 250 kW with quadrant (Peter Jenus, 4S7XW, via Andreas Volk, USENET via Ben Krupp)

SLOVAKIA Slovak Radio has not been receiving state subsidies as provided for by law, lacking 8 megacrowns per month, in a critical financial situation (Vladimir Stefko, SRO Director, via CTK, BBCM) Minister of Culture Lubo Roman has invited VOA to broadcast from Slovakia on an available frequency; would move technical centre from Munich, VOA seriously considering (TASR news agency via BBCM) AWR via Rimavská Sobota, Z-94 until 25 Sep, English; 0100 on 9465, 0400 on 11610, 9455, 0600 on 13715, 0830 on 7180, 1400 or 13595, 1700 on 13595, 15625, 1900 on 15625, 2000 on 6055, 2200 on 11610 (via Edwin Southwell, UKOGBANI)

SWITZERLAND SRI major changes as of June 6, with new 24-hour English service on satellite, first half of each hour daily news and current affairs, second half hour a variety of features. No intention to close shortwave service, but for now it only carries news portion. Weekend features on SW gone except to Europe at 1430, including *Grapevine*, and "we'll have to forget about that DX program," *Merry-Go-Round*; perhaps The Two Bobs will instead produce a new very different media program, only on satellite (Nicholas Lombard, SRI program director, on *Grapevine*) This immediately provoked great listener protest, notably by Jeff White, Michael Murray and Alfredo Cotroneo, who want the DX program to stay and SRI not to put most of its resources into a small, unknown satellite audience instead of its large, established SW audience. Letters of protest go to Mr. Ulrich Kundig, SRI Director, CH-3000 Berne 15, or fax +41-31-350-9569 (via Jeff White, George Thurman)

TAIWAN VOFC J-94 English programs until 24 Sept. at 0200 on 5950, 9680, 11740; 0700 on 5950; 2200 on 17750, 21720; next UT day 0300 on 5950, 9680, all WYFR relays: *News* first, *Let's Learn Chinese* last, and in between: Sun., *East Meets West*, *Mailbag Time*. Mon., *Jade Bells & Bamboo Pipes*. Tue., *Kaleidoscope*, *Taiwan Economic Journal*. Wed., *Main Roads & Byways*, *Music Box*. Thu., *Perspectives*, *Journey into Chinese Culture*. Fri., *Confrontation*, *New Record Time*. Sat., *Reflections*, *Jade's Kitchen* (via Gigi Lytle, RIB)

UAE Abu Dhabi in English at 2200-2400 continues announcing 9605, 9770, 11885, but only heard on 9770, barely on 11885, and unannounced 13605, gone from 9605 (Bob Thomas, CT) Dubai, English to us at 0330 heard on 11945, 13675, 15400 (Brian Alexander, *W.O.R.*)

UKOGBANI Although Skelton is only site mentioned for relays, some R. Japan and RCI broadcasts are actually via Woofferton as in BBC schedule and confirmed by groundwave signals whilst in the vicinity: R. Japan 1000-1030 German on 9600, 11710, 1030-1100 French on 9600, 1100-1200 Russian 15395; RCI 0500-0600 for peacekeepers on 15430, 17840 (Tony Rogers, *BDXCCommunication*)

UKRAINE RUI, English at 2100-2200 on 11780 and 11950 produce spurs on 11270, 11440, 11610, 12120 at 170 kHz separations; also on 12030, 11705, 9640, 7285, 7240, 1750 (Brian Alexander, PA)

USA FCC issued CP for new SW in McCaysville, GA, 50 kW CSSB with rotatable antenna, 38, 238 and 250; format plans unknown (George Thurman, *W.O.R.*)

Monitor your columnist's weekly half-hour *WORLD OF RADIO*: on WWC, Fri. 2115 on 15685, Sat. 0600 ex-0630 on 7435, Sun. 0315 on 7435, 0600 on 5810, 2300 on 15685, Tue. 1230 on 15685; on WHRI, Fri. 2300 on 7315, Sat. 0600 on 7315, 9495, Sun. 0130 on 7315, Mon. 0100 on 9495; on KWHR, Sat. & Sun. 0600 on 17780, Sat. 0900 on

9930; also on RFPI, Costa Rica (gh)

WHRI's *DX Radio Show*: UT Sun. 0300 on 7315, 17510; Mon. 0400 on 7315, 17780 (gh) *Sound Currents of the Spirit* added to WHRI, UT Mon 0000 on 7315; KWHR Sat and Sun, 1600 on 7425 (DXRS)

WWCR's 5810 service is reported on 1625 kHz, apparently pirate relay, not spur or mixing product; reports wanted and info on source. *Worldwide Country* weekdays 1700-2200 on 15610, 2200-2300 on 12160 has fine-tuned format to include hourly feature on traditional selection; also Sun 1700-2230, Maybe also Sat 1100-1700. (WWCR) WINB: see HONDURAS

Despite WEWN denials (see June column), it's obvious that one of their transmitters puts out a hiss blocking adjacent stations; sometimes it is on 7425, as they may rotate transmitters used on different services (George Thurman, Chicago IL)

"WVHA" via WCSN shifted 2300-0200 broadcast from 9850 to 9855 to avoid Sweden, but that's little consolation to those trying to hear Sweden. Plugged important announcement May 16-17, so I monitored: Prophecy Countdown failed to raise the \$5 million purchase price by that deadline, but Christian Science Monitor accepted \$1.2 million check and gave them another month to get the rest under "God's Plan A"; if not, "God's Plan B" would have them borrowing the rest, \$3.5 M, from "Gentile" financial institution, already agreed upon, to get WCSN one way or the other by Sept. 19. Plans to cover U.S.A.—oops, North America—20 hours per day weekdays, 24 hours weekends, add diesel generator, tank, security fence in totally self-contained compound. Log-periodic antenna with broad beam from México to Canada to be installed this summer as no work can be done in winter; next summer, more antennas, new transmitter, to cover South America. WCSN facility is "the best SW station in the world" (gh)

Monitor Radio International put off until Sept. ceasing separate SW production (Lawrence Kranich, *SW Echo* and Jim Moats) I'm glad Kim Shippey returned to host International edition (Moats)

VOA still does occasional world-wide call-in, *Talk to America*; one on AIDS aired Sunday May 15 at 1706 (gh)

VATICAN VR has a music service to Europe 2210-0040 on 5882, AM & FM (BBCM)

VENEZUELA When I started DXing in the early 1970s, there were Venezuelans almost every 10 kHz on tropical bands—7 on 120m, 21 on 90m, 33 on 60m, but perhaps due to economy and growth of AM & FM, only two are left: R. Táchira, 4830, and Ecos del Torbes, 4980 (John Fisher, *DX Ontario*) R. Frontera back on 4760, good for folk music, *Música Llanera* at 2330-2405* (Roy Baker, R. Portugal DX program) R. Dos Mil, Cumaná, may go on SW soon with Nautel transmitter (Jose Elias Diaz Gómez, Venezuela, via Santiago San Gil, HCJB *MOW-DX*) Radio Caracas Radio is testing 120 watts on 25705 USB for news: Mon.-Fri. 1900-1930, Sat. 1800-1830, Sun. 1500-1530, 1600-1630, 1700-1730, reports welcomed to Box 65657, Caracas 1066 (Manuel Rodríguez Lanza via Ben Krepp)

YEMEN NORTH Sana'a 1008v MW puts out 9th harmonic on 9069v (BBCM) 9069.3 heard at *0258 // 9780 (Hans Johnson, MD, HCJB *TLC*)

ZAIRE (non) Union Sacree plans SW clandestine on ship off coast against Mobutu; already has transmitters, maybe ship from Holland, in French and vernaculars (Jacques Mpanda, *RNMN*)



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Broadcast Loggings

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

0025 UTC on 6130

UNITED STATES: Voice of America. Report on Panama to sports update. International news on 9575 kHz at 0301. (William McGuire, Cheverly, MD; Frank Hillton, Charleston, SC)

0035 UTC on 4910

HONDURAS: LV de la Mosquitia. Spanish. Regional news and messages to listeners. Campo vocals to station ID. La Voz Evangelica audible on 4820 kHz at 0140 with religious programming. (Hillton, SC)

0045 UTC on 4915

GHANA: GBC. National news to African vocals. Choral tune at 0055, followed by closing IDs. National anthem to 0058*. (Hillton, SC)

0043 UTC on 12030

UKRAINE: Radio Ukraine International. *Letterbox* to Ukrainian folk tunes. (Harold Frodge, Midland, MI) *Close-Up* monitored on 11950 kHz at 2121. (Bob Fraser, Cohasset, MA)

0100 UTC on 9400 USB

COSTA RICA: Radio For Peace International. Feature on women's rights to station ID. (Dan Smith-N2PTF, Morrisville, NY)

0100 UTC on 11805

RUSSIA: Radio Moscow. Program features to ID. (Donald Kidder, Ashland, ME) News headlines to classical music on 15105 kHz at 1530. (Jim Moats, Ravenna, OH) Additional monitoring on 15105 kHz at 1840. (Smith, NY) Political news on 15290 kHz at 1900. (McGuire, MD; Fraser, MA)

0115 UTC on 4835

GUATEMALA: **Radio Tezulutlan**. Spanish. Religious vocal to station promo. **Radio Buenas Nuevas** with IDs and Spanish pops on 4800 kHz at 1110 and 0055. **Radio Maya** on 3324.8 kHz at 1150 (Tom Banks, Dallas, TX)

0115 UTC on 6055

PERU: **Radio Continental**. Spanish. News briefs to local ads and "Continental" promo. Peru's **Radio Satellite** noted on 6725 at 0230. Nice Andean flute tunes and regional announcements. (Banks, TX)

0130 UTC on 9570

PORTUGAL: Radio Portugal. ID and national news to *Musical Kaleidoscope* at 0146. Parallel frequency 9705 kHz weaker. (Smith, NY; Jim Moats, Ravenna, OH)

0210 UTC on 5810

UNITED STATES: WWCN. *Spectrum* program with excellent signal. (Smith, NY) ID to country & western music. (Frodge, MI)

0405 UTC on 9435

ISRAEL: Kol Israel. Report on peace agreement between Israel and PLO. Station identification to news update. (McGuire, MD)

0420 UTC on 15115

NEW ZEALAND: Radio New Zealand International. Sports match with India at tune-in. International and Pacific news audible on 11735 kHz at 1915. (Charlie Patterson, Mobile, AL; Smith, NY)

0500 UTC on 5055

FRENCH GUIANA: RFO Guyane. French. ID and *Press Review*. Commentary and correspondent's reports. Station promo to pop music program and weather forecast. (Giovanni Serra, Rome, Italy)

0520 UTC on 17860

AUSTRALIA: Radio Australia. Sports news on soccer, golf, rugby, football, basketball and motorcycling. Regional Australian news followed at 0540. (Jerry Witham, Keauau, HI) Report on a 24-hour strike by custom officers at 1110 on 9580 kHz. (Bob Fraser, Cohasset, MA; Patterson, AL)

0605 UTC on 4782

MALI: **RTV Mallenne**. Arabic. Koran recitations at tune-in. Station ID to local talk. Heard on parallel 4834 kHz. French programming noted on 4782 kHz at 2240. (Garland J. Thomas, Cleveland, OH) **China Radio International** relay heard on 11715 kHz at 0340. Chinese language lesson to sign-off. (Moats, OH; Fraser, MA)

0610 UTC on 4815

BURKINA FASO: RTV Burkina. French. Announcer's regional chat at tune-in. African pop vocals by upbeat male DJ. Station audible this frequency at 2230. (Tom Banks, Dallas, TX)

0845 UTC on 5015

Brazil: **Radio Brasil Tropical**. Portuguese. Strong "Radio Brasil" ID. Brazilian pops to ad jingles. (Hillton, SC) **Radio Nacional do Brasil** heard on 15265 kHz at 1820. Regional news, pop music breaks. (Serra, Italy)

1000 UTC on 6006

COSTA RICA: Radio Reloj. Spanish. DJ format with "Reloj" IDs and promos at 1000. Usual frequent time checks and national news update. Jingles and local ads heard past 1025. (Banks, TX)

1048 UTC on 4890

PAPUA NEW GUINEA: NBC. DJ with pop and country & western tunes.

Native "chanting" to time pips. NBC network news and station ID. Tentative on two additional PNG's; **Radio West Sepik** on 3335 kHz at 1139, **Radio West Highlands** on 3375 kHz at 1154. (Frodge, MI)

1053 UTC on 6025

BOLIVIA: Radio Illimani. Spanish. Andean music at tune-in. ID at the hour. Fair signal with intermittent co-channel interference. Bolivia's Radio Fides noted on 9625 kHz at 1110. (Banks, TX)

1100 UTC on 4775

PERU: Radio Tarma. Spanish. "Radio Tarma" identification in progress at tune-in. Time check and brief local announcement. Andean vocals to regional ads. (Sam Wright, Biloxi, MS)

1118 UTC on 5020

SOLOMON ISLANDS: SIBC. Announcer chat to ID and promo "Radio Happy Isles." Closing announcements to national anthem and 1130 sign-off. (Frodge, MI)

1140 UTC on 6185

MEXICO: Radio Educacion. Spanish. Radio drama to station promotionals. ID/frequency quote and local time check. (Hillton, SC)

1250 UTC on 9530

SINGAPORE: Radio Singapore International. Pop music program to 1259. Address for listeners' letters and station ID at 1300. *News in Brief* segment. Fair signal. (Tod Wilkinson, Santa Monica, CA)

1305 UTC on 11940

ROMANIA: Radio Romania International. *Frankly Speaking* with features on Romania. (Frodge, MI) *Listener's Letterbox* heard at 1925 on 11940. Parallel 9620 kHz with severe co-channel interference. (Smith, NY)

1312 UTC on 13635

SWITZERLAND: Swiss Radio International. *Grapevine* with letters and comments on upcoming Swiss National Day on August 1st. (Frodge, MI) Monitoring 2009-2020 on 13635 kHz, with *Swiss Shortwave Merry-Go Round*. (Moats, OH)

1350 UTC on 15400

FINLAND: YLE/Radio Finland. *Capital Coffee Break* show about public health care in Finland. (Kidder, ME)

1510 UTC on 17840

ANTIGUA: BBC Relay. International news headlines to World Service ID. (Serra, Italy) BBC Relay audible on 5975 kHz at 2215. *Seeing Stars* program on ancient observatories. BBC relay also audible on 6110 kHz at 2130. (Fraser, MA)

1620 UTC on 5990

RUSSIA: **U Radio**. (Tentative) Russian. Commentary followed by modern jazz music with sirens and whistles at 1627. **Radio Moscow** interval signal and news at 1630. Music of Kabelesky to dramatic readings with sound effects. Russia's **Radio Rossii** heard in Russian on 7355 kHz at 1710. News and IDs included. Unidentified Russian station noted on 5691 kHz at 1645. (Witham, HI)

1730 UTC on 7390

ARMENIA: Radio Yerevan. Armenian. Male announcer's talk and regional folk music. (Witham, HI) Arabic language on 4810 kHz at 1845. Frequency quote, and interval signal at 1900, to musical bridge and world newscast. (Serra, Italy)

1738 UTC on 21515

NETHERLANDS ANTILLES: Radio Netherlands Bonaire Relay. News with correspondent's reports. Audible on 21590, 6020 kHz. (Serra, Italy) Station heard on 17605 kHz at 1935 with *Happy Station* show on rock superstars of the 90's. (Fraser, MA)

1852 UTC on 15475

GABON: Africa Numero Uno. Variety of rap, thumb harp melody and African highlife tunes. Station audible on 9580 kHz at 1917. (Frodge, MI)

1910 UTC on 9700

BULGARIA: Radio Bulgaria. World news at tune-in. National features on travel and economy. (Brian Bagwell, St. Louis, MO)

2022 UTC on 12085

SYRIA: Radio Damascus. *Syrian Press Review* of current Syrian headlines. (Kidder, ME)

2205 UTC on 6050

NIGERIA: **Radio Nigeria**. Native drum rhythms to musical vocals. Co-channel interference on 6055 kHz. Station audible on 6025 kHz at 2302. Religious program to closing announcements at 2308. Nigerian pledge and anthem to 2310 sign-off. **Voice of Nigeria** heard on 7255 kHz, 2100 IDs and news. (Frodge, MI)

2300 UTC on 11770

LITHUANIA: Radio Vilnius. Five minutes of English national news. Lithuanian language service with features. (Fraser, MA)

2311 UTC on 9735

PARAGUAY: Radio Nacional del Paraguay. Spanish comments, Station identification and Latin vocals. (Smith, NY) Station monitored this frequency to 0035. (Frodge, MI) Good signal for national folk music on 9735 kHz at 0958. "National" ID to time check. (Hillton, SC)

2334 UTC on 11780

BRAZIL: **Radio Nacional da Amazonia**. Portuguese. Station ID and promotionals followed by Brazilian ballads at 2338. (Smith, NY) Brazil's **Radio Universo** heard on 6060 kHz at 0115. (Tom Banks, Dallas, TX)

Congratulations ! So ... you just logged your targeted Spanish language station! Remember the week of early morning DX sessions? Of course, it was worth it... even amidst the horrendous summer static levels!

Now it is time for the Spanish reception report. Do you dread the thought of gathering Spanish phrases? Time consuming, isn't it?

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AMSTERDAM & ST PAUL ISLAND

FJY4-Martin de Vivies Radio, 8690 kHz. Full data prepared card, with illegible signature. Received in 77 days for a French utility report and mint stamps. Station address: Station Radiomaritime FJY4, Martin de Vivies, St. Paul et Amsterdam, Terres Australes et Antarctiques Francaises, via Paris, France. (Steve George, Amherst, MA)

AUSTRIA

ORF/Radio Austria International, 17870/6015 kHz. Full data QSLs for two reports. Received in 28 days for a German report, and 15 days for an English report. Station address: A-1136 Vienna, Austria. (Michael J. McFerrin, Brights Cove, Ont., Canada)

BELGIUM

Radio Vlaanderen International, 5900 kHz. Full data "Easter Procession" card, unsigned. Received in 2.5 months for an English report. Station address: Belgische Radio en Televisie, P.O. Box 26, B-1000 Brussels, Belgium. (Marie Lamb, Brewerton, NY)

CANADA

VOK-Labrador CG Radio, 2598 kHz. Full data QSL verified by Operations Manager. Received in 69 days (20 days after using a new address) for an English utility report, mint stamps, and address label (both used). Station address: c/o Telecom Operations Manager, Canadian Coast Guard, P.O. Box 610, Station A, Goose Bay, Labrador AOP 1SO, Canada. (Mike Hardester, Jacksonville, NC)

Stephen George, Amherst, MA, received this QSL from an island in the Indian Ocean.

FJY4 QSL
Martin de Vivies Radio
New Amsterdam Island

Mr. Stephen George: Nous confirmons votre réception:

Date: 25.11.93 Heure: 1208/1235 UTC

Fréquence: 8690 MHz Mode: CW

(signature & empreinte)

LE GERANT POSTAL:
CHEF SERVICE

ECUADOR

HCJB, 3220/9745/17790 kHz. Full data station QSLs for each frequency, signed by Glen Volkhardt-Director of Broadcasting. Program schedules, calendar and souvenir key ring included. Received in 45/59 days for an English report. Station address: Casilla 17-01-00691 Quito, Ecuador. (McFerrin, CAN) Frequency 3220 verified in 80 days. QSL address: c/o World Radio Missionary Fellowship Inc., P.O. Box 39800, Colorado Springs, CO 80949-9800. (Hardester, NC)

GERMANY

Norddeich Radio, DAN-2727 kHz USB. Full data station QSL, signed by initials "D.L." Station window sticker included. Received in 44 days for an English utility report. Station address: c/o Norddeich Radio, Postfach 11 90, 2649 Norden, Germany. (Steve McDonald, Port Coquitlam, B.C., Canada)

NEPAL

Radio Nepal, 5005 kHz. Full data "Town of Pokhara," signed by R.S. Karki. Received in 37 days for a report in Nepalese sent by registered mail, plus mint stamps. Station address: P.O. Box 634, Kathmandu, Nepal. (George, MA)

POLAND

Witowo Radio-S P S, 2643.5 kHz. Full data QSL letter with illegible signature. Received in 122 days for an English utility report, 1 IRC, and address label (not used). Station address: (notation on letter indicated an address change) Panstwowa Agenja Radiokomunikacyjna, Zarzad Krajowy, ul.-0211 Warszawa, Poland. (Hardester, NC)

SHIP TRAFFIC

CHEMICAL PIONEER-KAFO, 156.65 MHz (Tanker). Full data prepared QSL card verified, plus photo of radio room, and ham card. Received in 176 days for an English utility report and mint stamps. Ship address: Marine Transport Lines Co., Meadowland Plaza, 150 Meadowland Parkway, P.O. Box 1550, Secaucus, NJ 07094. (Hank Holbrook, Dunkirk, MD)

POLYCARP-LAYD2, 156.65 MHz (Bulk Carrier). Full data prepared QSL card verified. Received in 36 days for an English utility report and one U.S. dollar. Ship address: Rasmussen, Einar-Kirkegaten 1, Postboks 37, N-4601 Kristiansand S., Norway. (Holbrook, MD)

GYPNUM BARON-ZCAN3, 2182 kHz (Bulk Carrier). Full data prepared QSL card verified. Received in 29 days for an English utility report and one U.S. dollar. Ship address: Gypsum Transport Ltd., Belevedere Bldg., Pitts Bay Rd., P.O. Box

723, Hamilton, Bermuda. (Holbrook, MD) SEA-LAND CHALLENGER-WZJC, 4071 kHz (Container). Full data prepared QSL card stamped with ship's seal. Card signed by Terry Piffier-Radio Officer. Received in 100 days for an English utility report, 1 IRC, mint stamps, and a SASE. Ship address: c/o Sealand Service Inc., P.O. Box 800, Iselin, NJ 08830. (Russ Hill, Oak Park, MI) Ship was former American Legion-U.S. Lines.

MAROL-SWHE, 8240 kHz (Bulk Carrier). Full data prepared QSL card stamped with ship's seal. Personal letter received from Christos Ioannou-Radio Officer. Received in 55 days for an English utility report, 1 IRC, one U.S. dollar, and a SASE. Ship address: c/o Lyras Bros. Ltd., 24-26 Baltic, London EC1 ORP, U.K. (Hill, MI)

SPAIN

Radio Exterior De Espana, 9540 kHz. Full data scenery QSL card of Barcelona Cathedral, signed by Pilar Salvador M.-Relaciones Externas. Program schedule included. Received in 10 days for an English report. Station address: Apartado 156.202, E-28080 Madrid, Spain. (Paul Jablonowski, Greenfield, WI)

UNITED ARAB EMIRATES

UAE Radio, 9605/9770 kHz. Full data QSL on station letterhead, signed by Aida Hamza-Director Foreign Language Services. UAE Certificate Of Appreciation included. Received in 58 days for an English report. Station address: Ministry of Information & Culture, Dept. of Broadcasting, P.O. Box 63, Abu Dhabi, United Arab Emirates. (LeRoy Long, Edmond, OK)

UNITED KINGDOM

Land's End Radio-GLD 3, 2696.7 kHz USB. Full data station QSL verified. Station schedule included. Received in 10 days for an English utility report. Station address: c/o Land's End Radio, Skewjack, St. Levan, Penzance, Cornwall TR6NB, U.K. (McDonald, CAN) (Hardester, NC)

Niton Radio-GNII, 3517 kHz USB. Partial data QSL verified by David Hawkins-Sta. Manager. Received in 10 days for an English utility report. Station address: c/o Niton Radio, Dean, Whitewell Rd., Ventnor, Isle of Wight PO38 2AB, U.K. (McDonald, CAN)

Humber Radio-GKZI, 3607.3 kHz USB. Full data station QSL signed by David Hopcroft. Station list which noted my report is their farthest received. Station address: c/o Humber Radio, Trusthorpe, Mablethorpe, Lincolnshire, Ln12 2PH, U.K. (McDonald, CAN)

UNITED STATES

WNZE 748, Roosevelt Island TIS-1620 kHz. Full data prepared QSL card verified by Mr. Barry Chafetz-Vice President of Operations. Received in 39 days for an English utility report, address label (used) and one mint stamp. Station address: Roosevelt Island Operating Corporation, 591 Main St., Roosevelt Island, New York, NY 10044. (Hardester, NC)

WADV-940 AM. Full data NRC card signed by Craig Baker-WADV Radio. Received in 9 days for an English AM report of DX Test. Station address: P.O. Box 940, Lebanon, PA 17042. (Hardester, NC)

How to Use the Shortwave Guide

1: Convert your time to UTC.

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

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

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

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings except for the "Newsline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

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

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

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

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station

name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

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

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

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

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Hot News and Hot Spots

Unrest in Colombia

According to the BBC monitoring service, Bogota television station Inravisión TV Cadena Uno reported on April 19 that Colombian military forces "seized a large part of the equipment of Radio Patria Libre," the clandestine station of the Army of National Liberation (ELN). The station was located in the upper part of San Lucas mountain range, covering depts. of Bolívar, Antioquia, Santander, César and Córdoba. The ELN was not part of an April peace settlement between the Colombian government and some rebel groups.

Following the raid, the BBC monitoring service reported that it no longer heard the clandestine on its normal (but variable) frequencies of 6260 and 6530 kHz. Henrik Klemetz reported in *Play-DX* that only the 1 kW shortwave transmitter was captured; the station's mobile studios were still heard on AM and FM. However, *MT* reader Bud Stacey of Satsuma, AL, and *MT*'s Outer Limits columnist George Zeller both heard R. Patria Libre in mid-May on 15050 kHz between 2115-2145 UTC. Klemetz reported on Radio Netherlands *Media Network* that RPL has been reactivated, though weaker and with a reduced schedule. It was heard on a Sunday at 2100-2140 on 6240, repeated Monday 1130 on 6260.

Another rebel faction, FARC, has a new clandestine, perhaps the one heard in January at 0030 to sign-off at 0100 on 6628; there was no ID, but the programming fits. The Colombian army net, La Voz de los Heroes on AM & FM, plans to add 15 kW SW shortly

in Yopal. Thanks to Henrik Klemetz for that news as well.

Santiago San Gil of Venezuela reported on *World of Radio* that La Voz del Yopal is now on 5040 instead of 5050, with RCN (ex-CARACOL) best at 1110 with net news, 1715 regional news as La Voz del Casanare, at 1800 they gave a full ID.

An unidentified Colombian was heard by Fernando Vilorio of Venezuela on 7000 LSB at 1030-1130, with long esoteric talks by woman, music, Satanic info, then contacts with various towns in Colombia. He asks if anyone knows what this might be?

DW African Relay

Deutsche Welle Dir.-Gen. Dieter Weirich thanked the Belgian ambassador for rescue of DW's Kigali relay staff, and gave a check for DM 20K to be put into a fund for families of Belgian soldiers that died in Rwanda (RVI *Radio World* via Steven Cline) The fate of DW's relay station is uncertain, but there are rumors DW will replace the time through VOA and BBC sites; meanwhile, some of its own sites took over African services, including English: 0400 on 7225-Wertachtal, also 0900 on 17800 and 15410; 1100 on 15410-Sines and 17800-Malta; 1500 on 11965-Shri Lanka, 17800-Wertachtal; 1900 on 9735-Nauen, 11740-Sines; 2100 on 9735 and 11765-Nauen, 15135-Jülich (RNMN)

Harold Sellers reported on HCJB's *The Latest Catch* that Colin Miller (ex-RSA) said DW is also working on a deal to be relayed via South Africa. Channel Africa's

future, by the way, is unknown under the new government. All parties seem to be in favor of the external service, but financing is a problem. RN's *Media Network* reported that Channel Africa would like to add Arabic, and the Organization for African Unity is also interested in using it to transmit programming.

Although it would not provide African coverage, Deutsche Welle is looking to satellites for the "long view." A news release from Beijing announced that Deutsche Welle will be Asiasat's first customer to lease a C-band transmitter on Asiasat 2, due for launch in early 1995. Global broadcasting from this satellite will cover Tokyo to Turkey, south to Jakarta and Australia, and covering Middle East and Eastern Europe, as well. (BBC Monitoring Service)

Somalia

The pro-Aydid Radio Mogadishu, the Voice of the Somali People (no longer "Great") has been heard daily at 0330-0500 and 1500-1900 in Somali on 6840v USB+carrier, according to the BBC monitoring service. R. Netherlands' *Media Network* reports that the Voice of America has cancelled its broadcasts in Somali.

New Address

A QSL received from the National Voice of Cambodia indicates a new address: Monivong Blvd., Road 106, Phnom-Penh (JSWC via Radio Netherlands MN).

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Next Reporting Deadline
July 22, 1994

Jim Frimmel, Program Manager
Texas

Dave Datko B.W. Battin
California New Mexico

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

<p>0000 UTC (8:00 PM EDT, 5:00 PM PDT) BBC CBC Northern Quebec Service China Radio Int+I Monitor Radio Int+I [T-F] Radio Australia Radio Havana Cuba Radio Moscow Radio New Zealand Int+I [M-A] Radio Prague Radio Thailand Radio Ukraine Int+I Radio Yugoslavia [M-A] Spanish National Radio Voice of America (am/as/ca) WWCR (5810) [S] 0003 Radio Pyongyang 0009 BBC* China Radio Int+I* 0010 Radio Havana Cuba* Voice of America (ca) [T-A]* 0030 HCJB Radio Havana Cuba [T-A] Radio Moscow Radio Nacional de Venezuela [T-S] Radio Netherlands Int+I Radio New Zealand Int+I [M-F] Radio Sweden [T-A] Voice of America (am) [T-S] (Special English) Voice of America (as) (Special English) 0050 RAI Italy 0057 Spanish National Radio [F] 0100 UTC (9:00 PM EDT, 6:00 PM PDT) All India Radio BBC CBC Northern Quebec Service [S-F] Deutsche Welle FEBC (Philippines) Monitor Radio Int+I [T-F] R Slovakia Int+I [T-S] Radio Australia Radio Budapest Int+I Radio Canada Int+I Radio Havana Cuba Radio Japan Radio Korea</p>	<p>Radio Moscow Radio New Zealand Int+I [M-A] Radio Norway Int+I [M] Radio Prague Radio Tashkent Radio Thailand Spanish National Radio Swiss Radio Int+I Voice of America (am/as/ca) Voice of Indonesia 0110 Radio Australia [M-F]* Radio Havana Cuba* Radio Japan [A]* 0130 BBC (as)* Radio Austria Int+I Radio Havana Cuba [T-A] Radio Moscow [T-A] Radio Netherlands Int+I Radio Portugal Int+I [T-A] Radio Sweden [T-A] Radio Tirana Voice of Greece [M-A] 0145 BBC (ca) [T-A]* 0155 Voice of Indonesia 0157 Spanish National Radio [F] 0200 UTC (10:00 PM EDT, 7:00 PM PDT) BBC ("Newsdesk") CBC Northern Quebec Service [M-A] Christian Science Sentinel [A] Deutsche Welle Monitor Radio Int+I [T-F] Radio Australia Radio Canada Int+I Radio Havana Cuba Radio Moscow Radio New Zealand Int+I [M-A] Radio Romania Int+I Radio Thailand Voice of America (am) [T-A] Voice of America (as) Voice of Myanmar (Burma) WWCR (5810) [T-A] 0203 Voice of Free China 0210 Radio Havana Cuba* 0215 Radio Cairo Radio Nepal</p>	<p>0230 Radio Budapest Int+I Radio Havana Cuba [T-A] Radio Moscow Radio Netherlands Int+I Radio Pakistan Radio Sweden [T-A] Radio Tirana 0245 Radio Yerevan 0300 UTC (11:00 PM EDT, 8:00 PM PDT) BBC CBC Northern Quebec Service China Radio Int+I Deutsche Welle HCJB KVOH [T-A] Monitor Radio Int+I [T-F] Radio Australia Radio Havana Cuba Radio Japan Radio Moscow Radio New Zealand Int+I [M-A] Radio Prague Radio Thailand Radio Ukraine Int+I Voice of America (af) [A-S] Voice of America (af) [M-F]* Voice of Turkey WHRI (7315) [T-A] WWCR (7435) [S] WWCR (5810) [T-A] 0303 Voice of Free China 0309 BBC* China Radio Int+I* 0310 Radio Havana Cuba* 0315 Radio Cairo 0320 Radio Philipinas [M-A] 0330 BBC (af)* Radio Bulgaria Radio Dubai Radio Havana Cuba [T-A] Radio Japan [A]* Radio Nacional de Venezuela [T-S] Radio Netherlands Int+I Radio Prague Radio Sweden [T-A] 0332 Radio Prague</p>	<p>0340 Voice of Greece [M-A] 0355 Radio Japan 0400 UTC (12:00 AM EDT, 9:00 PM PDT) BBC ("Newsdesk") BBC (af) CBC Northern Quebec Service Channel Africa China Radio Int+I Christian Science Sentinel [A] Deutsche Welle Monitor Radio Int+I [T-F] Radio Australia Radio Canada Int+I Radio Havana Cuba Radio Moscow Radio New Zealand Int+I [A] Radio New Zealand Int+I [M-F]* Radio Romania Int+I Radio Tanzania Radio Thailand Swiss Radio Int+I Voice of America (af/me) 0403 Radio Pyongyang 0409 BBC (af) [T-S]* China Radio Int+I* 0410 Radio Havana Cuba* 0411 Channel Africa [T] 0415 RAI Italy 0430 Channel Africa [A] Radio Finland Radio Havana Cuba [T-A] Radio Moscow Radio Yugoslavia Voice of America (af) [M-F]* 0431 Channel Africa [T/H/F] 0445 BBC (af) [T-F]* 0500 UTC (1:00 AM EDT, 10:00 PM PDT) BBC ("Newshour") CBC Northern Quebec Service Channel Africa Christian Science Sentinel [S] Deutsche Welle HCJB</p>	<p>Monitor Radio Int+I [T-F] Radio Australia Radio Cameroon Radio Canada Int+I [M-F] Radio Havana Cuba Radio Japan Radio Moscow Radio New Zealand Int+I [M-F] Radio Norway Int+I [M] Radio Thailand Spanish National Radio Swiss Radio Int+I (eu) Voice of America (af/me) 0510 Radio Australia [M-F]* Radio Havana Cuba* 0530 Channel Africa [S-F] Radio Austria Int+I Radio Dubai Radio Havana Cuba [T-A] Radio Moscow Radio Romania Int+I Radio Thailand Voice of Nigeria 0555 Radio Japan [A] 0600 UTC (2:00 AM EDT, 11:00 PM PDT) BBC BBC (af) [A-S]* BBC (af) [M-F] Channel Africa Deutsche Welle Monitor Radio Int+I [T-F] Radio Australia Radio Havana Cuba Radio Japan Radio Korea Radio Moscow Radio New Zealand Int+I Radio Prague Swiss Radio Int+I Swiss Radio Int+I (eu) Voice of America (af) [A-S] Voice of America (af) [M-F]* Voice of America (me) Voice of Kenya Voice of Malaysia WWCR (7435) [S-F] 0603 Radio Pyongyang 0609 BBC* 0610 Radio Havana Cuba*</p>
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0627 BBC (af) [M-F]*	0845 Radio Yerevan [S]	Christian Science Sentinel [A]	Swiss Radio Int+1 (eu)	Radio Australia
0630 Channel Africa []	0855 Voice of Indonesia [A-H]	Deutsche Welle	Voice of Turkey	Radio Bulgaria
Radio Austria Int+1 [T-S]	0900 UTC (5:00 AM EDT, 2:00 AM PDT)	Monitor Radio Int+1 [M-F]	Voice of Vietnam	Radio Cameroon
Radio Havana Cuba [T-A]	BBC	Papua New Guinea	WYFR (Satellite Network) [M-A]	Radio Canada Int+1 [S]
Radio Japan [A]*	China Radio Int+1	Radio Australia	1240 Voice of Greece	Radio France Int+1
Radio Moscow	Christian Science Sentinel [T/F]	Radio Ghana [A-S]	1254 Radio France Int+1	Radio Ghana
Radio Vlaanderen Int+1	Deutsche Welle	Radio Japan	1300 UTC (9:00 AM EDT, 6:00 AM PDT)	Radio Japan
Vatican Radio [M-A]	Monitor Radio Int+1 [M-F]	Radio Jordan	BBC ("Newshour")	Radio Jordan [A]
Voice of Nigeria [M-F]	Papua New Guinea [M]*	Radio Moscow	CBC Northern Quebec Service [S]	Radio Korea
0632 Radio Romania Int+1	Radio Australia	Radio Mozambique	China Radio Int+1	Radio Moscow
0645 Radio Finland	Radio Japan	Radio New Zealand Int+1	Christian Science Sentinel [A]	Voice of America (as)
Radio Romania Int+1	Radio Moscow	Radio Pakistan	WYFR (Satellite Network) [M-A]	WWCR (15685) [M-F]
Voice of Nigeria [M-F]*	Radio New Zealand Int+1 [M-F]	Radio Singapore Int'l	KNLS	China Radio Int+1*
0655 Voice of Med. (Malta) [M-F]	Radio Vlaanderen Int+1 [M-A]	Swiss Radio Int+1	Monitor Radio Int+1 [M-F]	1410 Radio Japan [M-F]*
0700 UTC (3:00 AM EDT, 12:00 AM PDT)	Swiss Radio Int+1	Voice of America (as/ca)	Papua New Guinea	1424 HCJB [M-F]
BBC	0909 China Radio Int+1*	1103 Radio Pyongyang	Radio Australia	1430 FEBC (Philippines)
Monitor Radio Int+1 [T-F]	0930 FEB (Philippines)	1110 Radio Australia*	Radio Canada Int+1 [S]	Radio Austria Int+1
Papua New Guinea	Radio Japan [A]*	Radio Austria Int+1	Radio Ghana	Radio Moscow
Radio Australia	Radio Moscow	Radio Finland [M-A]	Radio Korea	Radio Nacional de Venezuela [M-A]
Radio Ghana	Radio Netherlands Int+1	Radio Japan [A]*	Radio Moscow	Radio Netherlands Int+1
Radio Japan	Voice of Greece	Radio Moscow	Radio Nacional de Venezuela [M-A]	Radio Romania Int+1 [T-S]
Radio Moscow	0945 Voice of America (as/ca)	Radio National de Venezuela [M-A]	Radio Norway Int+1 [S]	Radio Tirana
Radio New Zealand Int+1 [M-F]*	0955 Radio Japan	Radio Netherland Int+1	Radio Romania Int+1 [M-A]	RTM Morocco [S]
Voice of Myanmar (Burma)	1000 UTC (6:00 AM EDT, 3:00 AM PDT)	Radio Singapore Int'l	Radio Singapore Int'l [M-F]	Voice of Myanmar (Burma)
0703 Radio Pyongyang	BBC	Radio Sweden [M-F]	Radio Tanzania [A-S]	WYFR (Satellite Network) [M-F]
Voice of Free China	China Radio Int+1	Voice of Asia	Radio Tashkent [S]	1431 Radio France Int+1 [T]*
0710 Radio Australia [W]*	Christian Science Sentinel [A]	WYFR (Satellite Network) [M-A]	Radio Vlaanderen Int+1 [M-A]	Radio Romania Int+1 [M]
0730 BBC (af) [A]*	FEB (Philippines) [M-F]*	1135 Radio Thailand	Swiss Radio Int+1	1440 FEBC (Philippines) [S-F]*
HCJB	HCJB	1145 Deutsche Welle [S-F]*	Voice of America (as)	1445 BBC (as) [M-F] (Special English)
Radio Austria Int+1 [T-S]	Monitor Radio Int+1 [M-F]	1155 Radio Japan	Voice of Israel [S-H]	Voice of Myanmar (Burma)
Radio Japan [A]*	Papua New Guinea	1200 UTC (8:00 AM EDT, 5:00 AM PDT)	Voice of Kenya	1450 All India Radio
Radio Moscow [M-A]	Radio Australia	BBC	WWCR (15685) [M-F]	1453 Radio France Int+1 [M-H/A]
Radio Netherlands Int+1	Radio Moscow	China Radio Int+1	WYFR (Satellite Network) [M-A]	1455 All India Radio
Radio Prague	Radio New Zealand Int+1 [S-F]	Christian Science Sentinel [A]	1301 Radio Romania Int+1 [S]	Radio Japan [A]
0740 Voice of Greece	Radio Tanzania	Monitor Radio Int+1 [M-F]	1303 Radio Pyongyang	Voice of Med. (Malta) [M-F]
0750 Radio New Zealand Int+1 [M-F]*	Swiss Radio Int+1 (eu)	Papua New Guinea [M-A]	Radio Pyonyang	
0755 Radio Japan	Vatican Radio [M-A]	Radio Australia	China Radio Int+1*	
Voice of Med. (Malta) [M-F]	Voice of America (as/ca)	Radio Bulgaria	1310 Radiobrçs [M-F]	
0800 UTC (4:00 AM EDT, 1:00 AM PDT)	Voice of Israel	Radio Canada Int+1 [M-F]	Radio Nepal	
BBC	Voice of Kenya	Radio France Int+1	1324 HCJB [M-F]	
Christian Science Sentinel [T/F]	WWCR (15685) [M-F]	Radio Moscow	1328 Radio Cairo	
KNLS	WYFR (Satellite Network) [M-A]	Radio New Zealand Int+1	1330 All India Radio	
Monitor Radio Int+1 [T-F]	1009 China Radio Int+1*	Radio Norway Int+1 [S]	FEBC (Philippines)	
Radio Australia	1010 Radio New Zealand Int+1 [M-F]*	Radio Singapore Int'l [S-F]	Radio Austria Int+1	
Radio Finland	1030 Radio Austria Int+1 [M-A]	Radio Tashkent	Radio Canada Int+1	
Radio Korea	Radio Dubai	Radio Thailand	Radio Dubai	
Radio Moscow	Radio Korea	Voice of America (as)	Radio Finland	
Radio New Zealand Int+1 [S-F]	Radio Moscow	WYFR (Satellite Network) [M-A]	Radio Moscow	
Voice of Indonesia [A-H]	Radio Netherlands Int+1	A]	Radio Netherlands Int+1	
Voice of Malaysia	Radio Prague	1203 HCJB [M-F]	Radio Sweden [M-F]	
0803 Radio Pyongyang	Voice of Nigeria	Radio Korea	Radio Tashkent [M-A]	
0810 Radio New Zealand Int+1 [M-F]*	1040 Voice of Greece	1209 BBC [W]*	Voice of America (as) (Special English)	
0830 R Slovakia Int+1	1045 Voice of Greece	China Radio Int+1*	Voice of Vietnam	
Radio Austria Int+1	Radio New Zealand Int+1 [M-F]*	1230 HCJB [M-F]	1335 Voice of Greece	
Radio Moscow	Voice of Nigeria [A-S]*	Radio Bangladesh [S-M]	1400 UTC (10:00 AM EDT, 7:00 AM PDT)	
Radio Netherlands Int+1	1100 UTC (7:00 AM EDT, 4:00 AM PDT)	Radio Cairo	All India Radio [M/W/F]	
	BBC ("Newsdesk")	Radio Canada Int+1	BBC	
	Channel Africa	Radio Finland [M-A]	BBC (as) [M-F]*	
		Radio Moscow [M-A]	CBC Northern Quebec Service [S]	
		Radio Netherlands Int+1	China Radio Int+1	
		Radio Singapore Int'l [S-F]	Christian Science Sentinel [A]	
		Radio Sweden [M-F]	Monitor Radio Int+1 [M-F]	
		Radio Vlaanderen Int+1 [S]		

1509
China Radio Int+I*
1510
Radio Japan [M-F]*
1525
BBC (af) [S]*
Radio Veritas [T-F]
1530
All India Radio
Deutsche Welle [M-F]*
FEBC (Philippines)
Radio Austria Int+I
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int+I
Radio Portugal Int+I [M-F]
Voice of Greece [M-A]
Voice of Nigeria [M-H]
1540
Radio Veritas [A-M]
1550
Voice of Med. (Malta) [F]
1555
Radio Japan [A]
Radio Veritas [A-M]
Voice of Med. (Malta) [M-H]
1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC
Channel Africa
China Radio Int+I
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int+I [M-F]
Radio Australia
Radio France Int+I
Radio Jordan
Radio Korea
Radio Moscow
Radio Pakistan
Radio Tanzania
Voice of America (af) [A-S]
Voice of America (as/me)
Voice of Kenya
Voice of Nigeria [M-F]
WRNO [M-F]
WYFR (Satellite Network) [M-A]
1605
Radio Yemen
1609
BBC*
China Radio Int+I*
1611
Radio France Int+I [T]*
1615
Radio Sweden [M-F]
1630
Radio Canada Int+I
Radio Dubai
Radio Moscow [S-F]
Voice of America (af) [M-F]
Voice of America (as/me)
(Special English)
1645
BBC (as)*
1652
Radio France Int+I [M-F]
1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
BBC (af)
Channel Africa
China Radio Int+I
Christian Science Sentinel [A]
HCJB [M-F]

Monitor Radio Int+I [M-F]
Polish Radio
Radio Australia
Radio Japan
Radio Moscow
Radio New Zealand Int+I [M-F]*
Radio Pakistan
Radio Prague
RTM Morocco [A]
Swiss Radio Int+I
Voice of America (af/as/me)
WWCR (15685) [M-F]
WWCR (15610) [S-F]
1703
Radio Pyongyang
1709
China Radio Int+I*
1710
Radio Australia*
1725
Radio New Zealand Int+I [F]*
1730
Radio Moscow
Radio Netherlands Int+I
Radio Romania Int+I
Radio Sweden [M-F]
Voice of America (af) [S]
1740
BBC (af)*
1745
All India Radio
1755
Radio Japan [A]
Radio New Zealand Int+I [M-H]*
1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC ("Newsdesk")
Christian Science Sentinel [A]
Monitor Radio Int+I [M-F]
Radio Australia
Radio Cameroon
Radio Moscow
Radio Mozambique
Radio New Zealand Int+I [M-F]*
Radio Norway Int+I [S]
Radio Omdurman
Radio Tanzania
Radio Vlaanderen Int+I
Voice of America (af/me)
Voice of Kenya
WHRI (9485) [M-F]
WWCR (15685) [M-F]
WWCR (15610) [S-F]
1805
Radio New Zealand Int+I [H-F]*
1830
R Slovakia Int+I
Radio Austria Int+I
Radio Kuwait
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int+I
Radio Yugoslavia
Voice of America (af) [A-S]
(Special English)
Voice of America (me) (Special English)
1835
Radio New Zealand Int+I [F]*
1840
Voice of Greece [M-A]

1845
Radio Yerevan
1855
Radio New Zealand Int+I [M-H]*
1857
BBC (af) [M-F]*
1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio [W]
BBC
China Radio Int+I
Christian Science Sentinel [A]
Deutsche Welle
HCJB
Monitor Radio Int+I [M-F]
Radio Australia
Radio Budapest Int+I
Radio Bulgaria
Radio Finland
Radio Japan
Radio Moscow
Radio New Zealand Int+I
Radio Portugal Int+I [M-F]
Radio Romania Int+I [T-S]
Spanish National Radio
Swiss Radio Int+I (eu)
Voice of America (af/as/me)
Voice of Israel
WHRI (9485) [M-F]
WWCR (15610)
1901
Radio Romania Int+I [M]
1909
China Radio Int+I*
1910
All India Radio [W]
Radio Australia [M-F]*
1911
Voice of Israel [W]*
1930
BBC (af) [S]*
Deutsche Welle [T-F]*
Polish Radio
Radio Japan [A]*
Radio Moscow [A-S]
Radio Netherlands Int+I
1933
Deutsche Welle [M]*
1935
RAI Italy
1955
Radio Japan
2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
China Radio Int+I
Deutsche Welle
KVOH [A-S]
Monitor Radio Int+I [M-F]
Radio Australia
Radio Moscow
Radio New Zealand Int+I [S-F]
Radio Norway Int+I [S]
Radio Prague
Swiss Radio Int+I
Voice of America (af/me)
Voice of Greece [M-A]
Voice of Indonesia
Voice of Nigeria [M-F]
Voice of Turkey
WHRI (9485) [M-F]
WWCR (15610) [S-F]
2003
Radio Pyongyang

2009
China Radio Int+I*
2010
Radio New Zealand Int+I [S-H]
2025
RAI Italy
2030
HCJB
Radio Canada Int+I
Radio Korea
Radio Moscow
Radio Riga Int+I [M-F]
Radio Sweden [M-F]
2045
All India Radio [A]
2055
Voice of Indonesia [M]
2100 UTC
(5:00 PM EDT, 5:00 PM PDT)
All India Radio
BBC ("Newshour")
China Radio Int+I
Deutsche Welle
KVOH [S]
Monitor Radio Int+I [M-F]
Radio Australia
Radio Budapest Int+I
Radio Bulgaria
Radio Cameroon
Radio Canada Int+I [A-S]
Radio Damascus [F]
Radio Havana Cuba [M-A]
Radio Japan
Radio Moscow
Radio New Zealand Int+I [A-H]
Radio Prague
Radio Romania Int+I
Radio Ukraine Int+I
Radio Vlaanderen Int+I [M-F]
Radio Yugoslavia
Spanish National Radio
Voice of America (af/as/me)
WWCR (15610) [S-F]
2109
China Radio Int+I*
2110
Radio Damascus [S-M]
Radio New Zealand Int+I [S-H]
2112
Radio Damascus [F]
2115
BBC (ca) [M-F]*
2120
Radio Cairo
2125
Radio Canada Int+I [M-F]
2130
Radio Austria Int+I
Radio Cairo
Radio Havana Cuba [M-A]
Radio Moscow [M-A]
Radio Nacional de Venezuela [M-A]
Radio Sweden [M-F]
Voice of Israel
2142
Voice of Israel [H]*
2145
Radio Damascus [W]
Radio Korea
Radio Yerevan

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC
China Radio Int+I
Christian Science Sentinel [A]
Monitor Radio Int+I [M-F]
Radio Australia
Radio Canada Int+I
Radio Havana Cuba [M-A]
Radio Korea
Radio Moscow
Radio New Zealand Int+I
Radio Tirana
Radio Yugoslavia
RAI Italy
Voice of America (as)
Voice of Turkey
WWCR (12160) [S-F]
2203
Voice of Free China
2209
China Radio Int+I*
2215
All India Radio [M/W/F]
Radio Cairo
2230
Radio Canada Int+I [A-S]
Radio Finland
Radio Havana Cuba*
Radio Moscow
Radio Sweden [M-F]
Voice of America (as) (Special English)
2240
Radio Cairo
Voice of Greece [S-F]
2245
Radio Bulgaria
Radio Yerevan
2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
BBC ("Newsdesk")
CBC Northern Quebec Service [A]
Christian Science Sentinel [A]
Monitor Radio Int+I [M-F]
Radio Australia
Radio Canada Int+I [A-S]
Radio Japan
Radio Moscow
Radio New Zealand Int+I [A]
Radio Norway Int+I [S]
Radio Singapore Int+I
Radio Vilnius [M-A]
Radio Vlaanderen Int+I
Voice of America (as)
WWCR (5810/12160) [A]
2303
Radio Pyongyang
2330
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int+I
Radio Sweden [M-F]
SLBC (Sri Lanka) [M]
2335
Voice of Greece [S-F]
2355
Radio Japan

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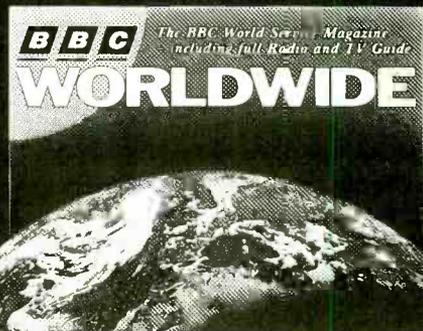
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BBC WORLD SERVICE

FREQUENCIES

0000-0100	Australia, Radio	13605pa	15320pa	15510as	17750as	0000-0100	Spain, Spanish Natl Radio	9540na			
0000-0100 vl	Australia, VLBA Alice Spg	4835do				0000-0100	Thailand, Radio	9655as	11905as		
0000-0100 vl	Australia, VL8K Katherine	5025do				0000-0100	Ukraine, R Ukraine Intl	7285na	9685na	9860na	11720na
0000-0100 vl	Australia, VL8T Tent Crk	4910do						12030na	15180na	15580na	
0000-0015	Cambodia, Natl Voice of	11938as				0000-0100	United Kingdom, BBC London	5975na	6175na	7180eu	7325na
0000-0100 vl	Canada, CBC N. Quebec	9625do						9580na	9590na	9915na	11750as
0000-0100	Canada, CFCX Montreal	6005do						11955as	12095sa	15260sa	15310as
0000-0100	Canada, CFRX Toronto	6070do						15360as			
0000-0100	Canada, CFVP Calgary	6030do				0000-0100	USA, KCBI Dallas TX	13740na			
0000-0100	Canada, CHNX Halifax	6130do				0000-0100	USA, KTVN Salt Lk City UT	15590am			
0000-0100	Canada, CKZN St John's	6160do				0000-0100	USA, KVOH Los Angeles CA	17775am			
0000-0100	Canada, CKZU Vancouver	6160do				0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	China, China Radio Intl	9780na	11715na			0000-0100	USA, Monitor Radio Intl	5850na	9430ca		
0000-0100 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	0000-0030	USA, R Bosnia H via WHRI	7315am			
0000-0100	Cuba, Radio Havana Cuba	6010na	13700na			0000-0100	USA, VOA Washington DC	5995am	6130am	7215au	7405am
0000-0027	Czech Rep, Radio Prague	7345na	9485na					9455am	9770au	11580am	11695am
0000-0045	India, All India Radio	9910as	11745as	11785as	15110as			11760as	15120am	15185as	15205am
		15145as						15290as	17735as	17765as	17820as
0000-0100 vl	Italy, IRRS Milano	7125eu				0000-0100	USA, WCSN Scotts Cor ME	9850am			
0000-0100 vl	Malaysia, RTM Kota Kinaba	5980do				0000-0100	USA, WEWN Birmingham AL	7425na	9410eu	9985sa	
0000-0100 vl	Malaysia, RTM Sarawak	4950do	7160do			0000-0100 vl	USA, WHRI Noblesville IN	7315am			
0000-0100	Netherlands, Radio	6020na	6165na	9840na	9860as	0000-0100	USA, WINB Red Lion PA	11950am			
		12025as				0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	New Zealand, R NZ Intl	15115pa				0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0050	North Korea, R Pyongyang	11335na	13760na			0000-0100	USA, WWCR Nashville TN	5810am	7435am	13845am	
0000-0100 mtwhfa	Palau, KHBV Voice of Hope	11980as				0000-0100	USA, WYFR Okeechobee FL	6085na			
0000-0100 vl	Papua New Guinea, NBC	9675do				0030-0100	Australia, Radio	11720pa	11880pa	13605as	15240pa
0000-0100	Philippines, FEBC Manila	15450as						15365pa	15510as	17795pa	17860pa
0000-0100	Russia, Radio Moscow Intl	5980na	7295na	9480na	9750na			17880as			
		9765na	11750na	11790na	11805na	0030-0100	Ecuador, HCJB Quito	9745am	11925am		
		12050na	15290na	15410na	15425na	0030-0100	Iran, VOIRI Tehran	7100na	9022na		
		17890as	21625as			0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0000-0030	Serbia, Radio Yugoslavia	9580eu	11870eu			0030-0100	Sweden, Radio	6065sa	9850sa		
						0050-0100	Italy, RAI Rome	6005na	9725na	11800na	

SELECTED PROGRAMS

Sundays

- 0000 WRNO: Jazz.
- 0000 WYFR (Satellite Network): Patterns in Music.
- 0007 Canada (N. Quebec): Sentiment 45.
- 0015 BBC: Good Books. Recommendation of a book to read.
- 0016 Radio Prague: The Arts.
- 0025 Radio Netherlands (na): EuroPress Review. Five-minutes of EuroPress news.
- 0030 BBC: Play of the Week: Death and the Maiden (10th). A remote cottage in Chile is the setting for Ariel Dorfman's award-winning play.
- 0030 BBC: The John Dunn Show. A melodic mix of songs old and new.
- 0035 China Radio Int'l: Music from China.
- 0037 Radio Netherlands: Newslines. Education for the Future (3rd). How The Radio Netherlands has been coping with recession in a shrinking job market.
- 0052 Radio Netherlands: Sounds Interesting. Listener feedback and the signs and sounds of Holland.

Mondays

- 0000 WHRI: Contemporary Christian Music.
- 0005 Canada (N. Quebec): Music Alive.
- 0006 Radio Prague: Live from Prague.
- 0012 Radio Yugoslavia: Culture of the Serbs.
- 0015 BBC: Music Feature. Pop the Question. See S 0445.
- 0018 Radio Ukraine Int'l: Music from Ukraine.
- 0025 Radio Netherlands (na): Music Break. Five-minutes of music at the end of an hour's program.
- 0026 China Radio Int'l: Music Album.
- 0030 BBC: In Praise of God. Weekly programme of worship and meditation.
- 0030 Radio Havana Cuba: Top Tunes.
- 0035 Radio Netherlands: Happy Station. See S 0137.

Tuesdays

- 0008 Radio Netherlands (na): From Sapphire to Laser. See M 1308.
- 0015 BBC: A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way.
- 0025 Radio Netherlands (na): Press Review. Summary of items

JULY PROGRAM SELECTIONS

Selected programs this month feature BBC World Service, Radio Netherlands, and Radio Singapore International. The main theme for other listed programs is music, culture, and the arts. Many thanks to Tom Sundstrom of New Jersey for providing the Radio Singapore Int'l program guide.

- in the Dutch media.
- 0037 Radio Netherlands: Newslines. Education for the Future (5th). See S 0037.
- 0039 Radio Moscow: Music.
- 0040 Spanish National Radio: Cultural Encounters.
- 0052 Radio Netherlands: Research File. The Moon Programme (19th). See M 1152.

Wednesdays

- 0000 KWHR (Hawaii): The Music and the Message.
- 0015 BBC: Concert Hall. See S 1515.
- 0025 Radio Netherlands (na): Press Review. See T 0025.
- 0030 Voice of America (ca): Now Music USA.
- 0034 Spanish National Radio: Stage and Screen.
- 0037 Radio Netherlands: Newslines. See S 0037.
- 0052 Radio Netherlands: Mirror Images. See T 1152.

Thursdays

- 0015 BBC: The Greenfield Collection. This classical music program replaces Ray on Record.
- 0025 Radio Netherlands (na): Press Review. See T 0025.
- 0030 Voice of America (ca): Now Music USA.
- 0037 Radio Netherlands: Newslines. See S 0037.
- 0039 Radio Moscow: Music.
- 0052 Radio Netherlands: Documentary. See W 1152.

Fridays

- 0000 KWHR (Hawaii): The Music and the Message.
- 0015 BBC: Music Review. News and views from the world of music.
- 0025 Radio Netherlands (na): Press Review. See T 0025.
- 0030 Voice of America (ca): Now Music USA.
- 0037 Radio Netherlands: Newslines. See S 0037.
- 0039 Radio Moscow: Music.
- 0052 Radio Netherlands: Media Network. See H 0152.

Saturdays

- 0000 KWHR (Hawaii): Great Christian Music.
- 0015 BBC: Music Feature. The Time Machine (2nd,9th,16th). Tracks from the best-selling albums of the past. Sex in Pop (23rd,30th). Exploring the history of sex in pop music in a four-part series.
- 0024 Radio Yugoslavia: Music.
- 0025 Radio Netherlands (na): Press Review. See T 0025.
- 0030 BBC: From the Weeklies. Review of the British weekly press.
- 0030 Voice of America (ca): Country Music USA.
- 0036 Spanish National Radio: Arts in Spain.
- 0037 Radio Netherlands: Newslines. See S 0037.
- 0039 Radio Moscow: Music.
- 0045 BBC: The Learning World. See M 0615.
- 0052 Radio Netherlands: Towards 2000. See F 1152.

FREQUENCIES

0100-0200	Australia, Radio	11720pa	11800pa	15240pa	15320pa	11810na	12050na	15425na	17690na
		15365pa	15510as	17630as	17750as	21625as			
		17795pa	17860pa	17880as	21595as	9465as			
0100-0200 vl	Australia, VL8A Alice Spg	4835do				5930na	7310na	9810na	
0100-0200 vl	Australia, VL8K Katherine	5025do				7550eu			
0100-0200 vl	Australia, VL8T Tent Crk	4910do				9540na			
0100-0200 vl	Canada, CBC, N. Quebec	9625do				6005as	9720as	15425as	
0100-0200	Canada, CFCX Montreal	6005do				5905am	6135am	9885am	
0100-0200	Canada, CFRX Toronto	6070do				9655as	11905as		
0100-0200	Canada, CFVP Calgary	6030do				5975na	6175na	6180na	7325na
0100-0200	Canada, CHNX Halifax	6130do				9590na	9915sa	11750sa	11955sa
0100-0200	Canada, CKZN St John's	6160do				15260sa	15280as	15310as	15360as
0100-0200	Canada, CKZU Vancouver	6160do				17790as	21715na		
0100-0200	Canada, RCI Montreal	6120na	9535na	9755na	11845na	13740na			
		11940na				7510na			
0100-0200	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	17775am			
0100-0200	Cuba, Radio Havana Cuba	6010na	13700na			17510as			
0100-0127	Czech Rep, Radio Prague	7345na	9485na			5850na	9430ca		
0100-0200	Ecuador, HCJB Quito	9745am	11925am			5995na	7205as	7405am	9445na
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9700na	9775am	11580am	11705as	15120am
		11740na	11865na			15205am	15250as	17740as	21550as
0100-0200 m	Guatemala, Radio Cultural	3300do				9850af			
0100-0130	Hungary, Radio Budapest	6025na	9835na	11910na	15220na	7425na	13710na		
0100-0200	Indonesia, Voice of	9675as	11752as			7315am			
0100-0130	Iran, VOIRI Tehran	7100na	9022na			11950am			
0100-0200 vl	Italy, IRRS Milano	7125eu				7490na	13595na		
0100-0110	Italy, RAI Rome	6005na	9725na	11800na		7355am			
0100-0200	Japan, NHK/Radio	5960na	9610as	11840as	11860as	5810am	5935am	7435am	13845am
		11910as	15195as	17810as	17845as	6065na	9505na	15440na	
0100-0130	Laos, National Radio of	7116as				9580na	9760na		
0100-0200	Netherlands, Radio	9860as	12025as			9655na	9870na	13730na	
0100-0125	Netherlands, Radio	6020na	6165na	9840na		9380na	9420na	11645na	
0100-0200	New Zealand, R NZ Intl	15115pa				9860as	12025as		
0100-0130 m	Norway, Radio Norway Intl	9560ca	11925na			9550na	9570na	9600na	9635na
0100-0200 vl	Papua New Guinea, NBC	9675do				9705na	11840na		
0100-0200	Philippines, FEBC Manila	15450as				9695au	11695as		
0100-0200	Russia, Radio Moscow Intl	5980na	7150na	7295na	9530na	7335as	9650as		
		9675me	9685me	9695me	9750me				
		9765me	11665me	11685na	11750na				
0100-0200	Slovakia, AWR Europe								
0100-0130	Slovakia, R Slovakia Intl								
0100-0200	South Korea, KBS/R Korea								
0100-0200	Spain, Spanish Natl Radio								
0100-0200	Sri Lanka, SLBC Colombo								
0100-0130	Switzerland, Swiss R Intl								
0100-0200	Thailand, Radio								
0100-0200	United Kingdom, BBC London								
0100-0200	USA, KCBI Dallas TX								
0100-0200	USA, KTVN Salt Lk City UT								
0100-0200	USA, KVOH Los Angeles CA								
0100-0200	USA, KWHR Naalehu HI								
0100-0200	USA, Monitor Radio Intl								
0100-0200	USA, VOA Washington DC								
0100-0200	USA, WCSN Scotts Cor ME								
0100-0200 vl	USA, WEWN Birmingham AL								
0100-0200 vl	USA, WHRI Noblesville IN								
0100-0200	USA, WINB Red Lion PA								
0100-0200	USA, WJCR Upton KY								
0100-0200	USA, WRNO New Orleans LA								
0100-0200	USA, WWCR Nashville TN								
0100-0200	USA, WYFR Okeechobee FL								
0130-0200	Albania, R Tirana Intl								
0130-0200	Austria, R Austria Intl								
0130-0150	Greece, Voice of								
0130-0200	Netherlands, Radio								
0130-0200 twfha	Portugal, Radio								
0130-0200	Sweden, Radio								
0140-0200	Vatican State, Vatican R								

SELECTED PROGRAMS

Sundays

- 0101 BBC: Play of the Week. No Bed for Bacon (3rd). A dramatization of Shakespeare himself. A Night Out (17th). An absorbing drama by Harold Pinter. Bliss (24th). After Harry's heart stops beating for seven minutes he wakes up in a nightmare world. Real Estate (31st). An adolescent runaway returns home twenty years later.
- 0107 Canada (N. Quebec): Sentiment 45.
- 0111 Radio Moscow: Music and Musicians.
- 0125 Radio Netherlands: Program Info. Summary of upcoming program schedules.
- 0137 Radio Netherlands: Happy Station. Pete Myers hosts this 65 year old program of family entertainment.
- 0137 Radio Tirana: Variety.
- 0145 WYFR (Satellite Network): Music.
- 0147 Radio Japan: Music Gallery.

Mondays

- 0100 KWHR (Hawaii): The Music and the Message.
- 0101 BBC: Feature. A Singular Experience (4th). Experiences of solitary confinement. Who are our Judges? (11th). Exploring the mystery and priest-like reverence. The Sea, The Sea (18th). The voyage of an iron brig. The Uncrested Light (25th). The life and works of a poet and priest.
- 0116 Radio Havana Cuba: Kaleidoscope.
- 0125 Radio Netherlands: Music Break. See S 0225.
- 0130 Radio Cultural Guatemala: Music in the Post Meridian.
- 0135 Radio Netherlands: East of Edam. See S 0235.
- 0136 Radio Havana Cuba: From Havana.
- 0137 Radio Netherlands: Newslines. Education for the Future (4th). See S 0037.
- 0140 Radio Tirana: Music on Request.
- 0145 BBC: Music As It Was. The popularity of early music played with original instruments.
- 0145 WHRI: Contemporary Christian Music.

Tuesdays

- 0100 WHRI: The Music and the Message.
- 0105 BBC: Outlook. See M 1405.
- 0125 Radio Netherlands: Program Info. See S 0125.

- 0130 BBC: Folk Routes. Ian Anderson extends the range of folk music to include country, cajun and blues.
- 0132 Radio Moscow: Folk Box.
- 0137 Radio Netherlands: Newslines. See S 0037.
- 0140 Spanish National Radio: Cultural Encounters.
- 0145 BBC: Health Matters. Keeps track of new developments in the world of medical science, as well as ways of keeping fit.
- 0152 Radio Netherlands: Accent on Asia. A magazine program focusing on Asia with interviews and music.
- 0155 Radio Japan: Tokyo Pop-In.

Wednesdays

- 0105 BBC: Outlook. See M 1405.
- 0117 Radio Korea: Seoul Calling.
- 0125 Radio Netherlands: Program Info. See S 0125.
- 0130 BBC: Feature. Sound business. Advice and pitfalls of starting a business.
- 0134 Spanish National Radio: Stage and Screen.
- 0137 Radio Netherlands: Newslines. See S 0037.
- 0145 BBC: Country Style. With David Allan.
- 0146 Radio Portugal Int'l: Musical Kaleidoscope.
- 0152 Radio Netherlands: Encore!. Reruns of the best programs from earlier seasons.

Thursdays

- 0105 BBC: Outlook. See M 1405.
- 0125 Radio Netherlands: Program Info. See S 0125.
- 0130 BBC: Waveguide. Hear World Service better.
- 0132 Radio Moscow: The Jazz Show.
- 0137 Radio Netherlands: Newslines. See S 0037.
- 0140 BBC: Book Choice. Short book reviews every week.

- 0145 BBC: The Farming World. Reports on new developments from around the world.
- 0152 Radio Netherlands: Media Network. Jonathan Marks surveys communications and media developments. Top-rated.
- 0152 Radio Netherlands: Research File. The Moon Programme (22st). See M 1152.
- 0155 Radio Japan: Tokyo Pop-In.

Fridays

- 0100 WHRI: The Music and the Message.
- 0105 BBC: Outlook. See M 1405.
- 0125 Radio Netherlands: Program Info. See S 0125.
- 0130 BBC: On the Move. A weekly program about travel and transport with Malcolm Billings.
- 0132 Radio Moscow: Music at Your Request.
- 0137 Radio Netherlands: Newslines. See S 0037.
- 0145 BBC: Global Concerns. Update on environmental issues.
- 0152 Radio Netherlands: Research File. See M 1152.
- 0155 Radio Japan: Tokyo Pop-In.

Saturdays

- 0100 KWHR (Hawaii): The Music and the Message.
- 0100 WHRI: The Music and the Message.
- 0105 BBC: Outlook. See M 1405.
- 0110 Radio Australia: Music of RA.
- 0115 Swiss Radio Int'l: Culture and the Arts.
- 0120 Radio Japan: The Travel and Book Beat.
- 0125 Radio Netherlands: EuroPress Review. Five-minutes of EuroPress news.
- 0130 BBC: World Brief. See M 0430.
- 0132 Radio Moscow: The Jazz Show.
- 0136 Spanish National Radio: Arts in Spain.
- 0137 Radio Netherlands: Newslines. Education for the Future (2nd). See S 0037.
- 0145 BBC: Jazz Now and Then. George Reid presents a mixture of jazz for all ages.
- 0152 Radio Netherlands: Documentary. See W 1152.
- 0152 Radio Tirana: Music.
- 0155 Radio Japan: Tokyo Pop-In.

FREQUENCIES

0200-0300 mtwhf	Argentina, RAE	11710am				0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as		
0200-0300	Australia, Radio	11880pa	15240pa	15320pa	15365pa	0200-0300	Taiwan, VO Free China	5950na	9680na	9765au	11740ca	
		15510as	17630as	17750as	17795pa			11860as	15345as			
		17860pa	17880as	21525as	21595as	0200-0300	Thailand, Radio	9655as	11905as			
0200-0300 vl	Australia, VLBA Alice Spg	4835do				0200-0300	United Kingdom, BBC London	5975na	6175na	6195me	7135me	
0200-0300 vl	Australia, VL8K Katherine	5025do						7155me	7325na	9410eu	9590na	
0200-0300 vl	Australia, VL8T Tent Crk	4910do						9630af	9915am	11705sa	11730af	
0200-0300	Canada, CFCX Montreal	6005do						11750sa	11955me	15260sa	17790as	
0200-0300 vl	Canada, CBC N. Quebec	9625do				0200-0230 vl	USA, KCBI Dallas TX	9815am	13740am			
0200-0300	Canada, CFRX Toronto	6070do				0200-0300	USA, KTBN Salt Lk City UT	7510am				
0200-0300	Canada, CFVP Calgary	6030do				0200-0230	USA, KVOH Los Angeles CA	17775am				
0200-0300	Canada, CHNX Halifax	6130do				0200-0300	USA, KWHR Naalehu HI	17510as				
0200-0300	Canada, CKZN St John's	6160do				0200-0300	USA, Monitor Radio Intl	5850na	9430ca			
0200-0300	Canada, CKZU Vancouver	6160do				0200-0230 twhta	USA, VOA Washington DC	5995am	6130am	7405am	9775am	
0200-0230	Canada, RCI Montreal	6120na	9535am	9755na	11845na			11580am	15120am	15205am		
		11940am				0200-0300	USA, VOA Washington DC	7115as	7205as	7651as	9740as	
0200-0300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am			11705as	15250as	17740as	21550as	
0200-0300	Cuba, Radio Havana Cuba	6010na	9820na			0200-0300	USA, WCSN Scotts Cor ME	7465am				
0200-0300	Ecuador, HCJB Quito	9745am	11925am			0200-0300	USA, WEWN Birmingham AL	7425na				
0200-0300	Egypt, Radio Cairo	9475na	11600na			0200-0300	USA, WHRI Noblesville IN	7315am				
0200-0250	Germany, Deutsche Welle	7285as	9580as	9615as	9690as	0200-0300	USA, WINB Red Lion PA	11950am				
		11945as	11965as	12045as	15185as	0200-0300	USA, WJCR Upton KY	7490na	13595na			
0200-0300 as	Guam, KSDA AWR Agat	13720as				0200-0300	USA, WRNO New Orleans LA	7355am				
0200-0300 vl	Italy, IRRS Milano	7125eu				0200-0300	USA, WWCR Nashville TN	5810am	5935am	7435am		
0200-0230 mtwha	Kenya, Kenya BC Corp	4935do				0200-0300	USA, WYFR Okeechobee FL	6065na	9505na			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do				0200-0245	USA, WYFR Okeechobee FL	15440na				
0200-0230	Myanmar, Radio	7185do				0215-0255	Nepal, Radio	3230do	5005do	7165do		
0200-0300	Netherlands, Radio	9860as	12025as			0230-0245	Albania, R Tirana Intl	9580na	9760na			
0200-0300	New Zealand, R NZ Intl	15115pa				0230-0300	Hungary, Radio Budapest	5970na	9835na	11910na		
0200-0300 vl	Papua New Guinea, NBC	9675do				0230-0300 s	Kenya, Kenya BC Corp	4935do				
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na	0230-0245	Pakistan, Radio	7290as	15190as	17525as	17705as	
		11940na						21730as				
0200-0300	Russia, Radio Moscow Intl	7205af	7295na	9530na	9620na	0230-0300	Sweden, Radio	6040na	9850na			
		9685af	9695af	9765af	11665na	0245-0300	United Kingdom, BBC London	6110sa	9515sa	9895sa	11965sa	
		11805na	12050as	15410na	15425na			15390sa				
		17570as	17655au	21625na		0250-0300	Vatican State, Vatican R	6095na	7305na			

SELECTED PROGRAMS

Sundays

- 0200 HCJB: Stories of Great Hymns.
- 0200 WYFR (Satellite Network): The Quiet Hours.
- 0225 Radio Netherlands: Music Break. Five-minutes of music at the end of an hour's program.
- 0230 BBC: Feature. The Greatest Music Festival in the World (3rd, 10th). The annual Henry Wood Promenade Concerts. Cyprus - A Life Apart (17th, 24th). The divided island. The Years of the Rainbow (31st). An exploration of the writer D H Lawrence and his work.
- 0230 HCJB: Musical Mailbag.
- 0235 Radio Netherlands: East of Edam. Lively mixture of off-beat interviews, music, and a touch of humor.

Mondays

- 0215 Voice of Free China: Jade Bells and Bamboo Pipes.
- 0225 Radio Netherlands: Music Break. See S 0225.
- 0230 BBC: Composer of the Month. Frederick Delius is featured during July.
- 0230 Radio Havana Cuba: Top Tunes.
- 0230 Radio Sweden: Sounds Nordic (biweekly).
- 0230 WRNO: Jazz 30.
- 0232 Radio Moscow: Timelines.
- 0235 Radio Netherlands: Happy Station. See S 0137.
- 0237 Radio Netherlands: Newslines. Education for the Future (4th). See S 0037.

Tuesdays

- 0225 Radio Netherlands: Music Break. See S 0225.
- 0230 BBC: Quiz. Brain of Britain. See M 1215.
- 0230 Radio Moscow: Audio Book Club.
- 0237 Radio Netherlands: Newslines. See S 0037.
- 0252 Radio Netherlands: Research File. The Moon Programme (19th). See M 1152.

Wednesdays

- 0225 Radio Netherlands: Music Break. See S 0225.
- 0230 BBC: Andy Kershaw's World of Music. Recordings of diverse music from around the world.
- 0237 Radio Netherlands: Newslines. See S 0037.
- 0252 Radio Netherlands: Mirror Images. See T 1152.

Thursdays

- 0225 Radio Netherlands: Music Break. See S 0225.
- 0230 BBC: Omnibus. See T 2330.
- 0232 Radio Moscow: Audio Book Club.
- 0237 Radio Netherlands: Newslines. See S 0037.
- 0252 Radio Netherlands: Documentary. See W 1152.

Fridays

- 0225 Radio Netherlands: Music Break. See S 0225.
- 0230 BBC: Feature. Into the Blue. See H 1130.
- 0237 Radio Netherlands: Newslines. See S 0037.
- 0252 Radio Netherlands: Media Network. See H 0152.

Saturdays

- 0225 Radio Netherlands: Music Break. See S 0225.
- 0230 BBC: People and Politics. Background to the British political scene.
- 0232 Radio Moscow: Audio Book Club.
- 0235 Deutsche Welle: The Jazz Corner.
- 0237 Radio Netherlands: Newslines. Education for the Future (2nd). See S 0037.
- 0252 Radio Netherlands: Bats, Balls & Baselines. Sports results, news, issues, features, personality profiles, and investigations.

Thank You...

Additional contributors to this month's Shortwave Guide:

John Babbis, Silver Spring, MD; Thomas Corrao; Gilbert Feldman, Milwaukee, WI; Bob Fraser, Cohasset, MA; Albert Friedman, Omaha, NE; Martin H. Gallas, Jacksonville, IL; Semon Hachikian, Upper Darby, PA; Clyde Harmon, Anniston, AL; Rev. Michael G. Mayer, Dover, DE; Jim Moats, Ravenna, OH; Kent Plourde, Bristol, CT; Joel M. Rubin, San Francisco, CA; Paul Seligman, Roseland, NJ; Tom Sundstrom (Singapore program sked); Alden Wires, East Point, GA; World DX Club; BBC Summary of World Broadcasts; Grove Enterprises BBS; Internet Shortwave Newsgroup via Larry Van Horn.

FREQUENCIES

0300-0400	Australia, Radio	11720pa 15320pa 17795pa 21595as	11880pa 15365pa 17860pa	13650pa 15510as 17880as	15240pa 17750as 21525as
0300-0400 vl	Australia, VL8A Alice Spg	4835do			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400	Bahrain, Radio	6010do			
0300-0400 vl	Canada, CBC N. Quebec	9625do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFPV Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9780na	11715na	
0300-0400	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0300-0400 vl	Costa Rica, Faro del Carib	5055do			
0300-0400	Cuba, Radio Havana Cuba	6010na	9820na		
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB Quito	9745am	11925am		
0300-0330	Egypt, Radio Cairo	9475na	11600na		
0300-0350	Germany, Deutsche Welle	6085na 11750na	6185na	9535na	9640na
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 vl	Italy, IRRS Milano	7125eu			
0300-0400	Japan, NHK/Radio	5960am 15325am	9610as 17810am	11875am 17845am	15210am
0300-0330	Japan, NHK/Radio	11885na	11895na	15230na	
0300-0400	Kenya, Kenya BC Corp	4935do			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0325	Netherlands, Radio	9860as	12025as		
0300-0400	New Zealand, R NZ Intl	15115pa			
0300-0350	North Korea, R Pyongyang	6522eu	9345eu		
0300-0400 vl	Papua New Guinea, NBC	9675do			
0300-0400	Russia, Radio Moscow Intl	7150na 9765na 13615na 15385as 15525na	7205na 9880as 15265as 15410na 15535as	7295na 11665as 15360as 15425na 17720as	9530na 11690as 15375as 15470as
0300-0400	S Africa, Channel Africa	3220af	5955af		

0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Taiwan, VO Free China	5950na 15345as 9655as	9680na 11905as		
0300-0400	Thailand, Radio	9445na			
0300-0350	Turkey, Voice of	4976do			
0300-0400 vl	Uganda, Radio	9620na	9685na	9860na	11720na
0300-0400	Ukraine, R Ukraine Intl	12030na	15180na	15580na	
0300-0330	United Kingdom, BBC London	11750sa	15260sa	15310as	15380as
0300-0400	United Kingdom, BBC London	3955af	5975na	6005af	6175na
		6180eu	6195eu	7230eu	7325na
		9410eu	9600af	9630af	9915am
		11730af	11760me	11985me	12095ca
		15310me	15420af	21715as	
0300-0400	USA, KCBI Dallas TX	9815am			
0300-0400	USA, KTNB Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785am			
0300-0400	USA, KWHR Naalehu HI	17780as			
0300-0400	USA, Monitor Radio Intl	5850na			
0300-0400	USA, VOA Washington DC	7105af	7265af	7280af	7340af
		7405af	9575af	9885af	11965af
0300-0400	USA, WCSN Scotts Cor ME	7465am			
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	7315am			
0300-0400	USA, WINB Red Lion PA	11950eu			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400 vl	USA, WWCR Nashville TN	5810am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0400	Greece, Voice of	9380na	9420na	11645na	
0315-0345	Vatican State, Vatican R	7360af	9695af		
0300-0400	Bulgaria, Radio	9700na	11720na		
0300-0357	Czech Rep, Radio Prague	5930eu	9440eu	11640af	
0300-0400	Netherlands, Radio	6165na	9590na		
0300-0400	Sweden, Radio	6040na	9850na		
0300-0400	Tanzania, Radio	5050af			
0300-0357	UAE, Radio Dubai	11945na 21485na	13675na	15400eu	17890eu
0340-0350	Greece, Voice of	9380na	9420na	11645na	
0345-0400	Tajikistan, Radio	7245as			

SELECTED PROGRAMS

Sundays

- 0300 KWHR (Hawaii): The Music and the Message.
- 0300 WYFR (Satellite Network): The Quiet Hours.
- 0308 Canada (N. Quebec): Sound of the Blues.
- 0315 BBC: Sports Roundup. The latest sports news.
- 0316 Radio Prague: The Arts.
- 0330 BBC: From Our Own Correspondent. BBC correspondents comment on the background to the news.
- 0330 Radio Australia: At Your Request.
- 0332 Radio Moscow (na): Timelines.
- 0332 Radio Moscow: Music.
- 0335 China Radio Int'l: Music from China.
- 0336 Radio Prague: The Arts.
- 0337 Radio Netherlands: Newline. Education for the Future (3rd). See S 0037.
- 0350 BBC: Write On. Air your views about World Service: write to PO Box 76, Bush House, Strand, London WC2B 4PH.
- 0352 Radio Netherlands (na): Sounds Interesting. See S 0053.

Mondays

- 0300 KWHR (Hawaii): The Music and the Message.
- 0305 Canada (N. Quebec): Jazz Beat.
- 0306 Radio Prague: Live from Prague.
- 0309 Voice of Turkey: World of Art.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 Voice of Free China: East Meets West.
- 0316 Radio Havana Cuba: Kaleidoscope.
- 0320 Radio Ukraine Int'l: Music from Ukraine.
- 0323 Voice of Turkey: Turkish Songs.
- 0326 China Radio Int'l: Music Album.
- 0330 BBC: Anything Goes. See S 1430.
- 0330 Voice of America (af): Music USA (Standards).
- 0332 Radio Moscow: Music.
- 0335 Radio Netherlands (na): Happy Station. See M 0035.
- 0336 Radio Havana Cuba: From Havana.
- 0336 Radio Prague: Live from Prague.
- 0341 Voice of Turkey: Turkish Music.

Tuesdays

- 0300 KWHR (Hawaii): The Music and the Message.
- 0315 BBC: Sports Roundup. See S 0315.

- 0315 Voice of Free China: Jade Bells and Bamboo Pipes.
- 0327 Voice of Turkey: Turkish Hit Songs.
- 0330 BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.
- 0330 WYFR (Satellite Network): The End of the Day.
- 0332 Radio Moscow: Music.
- 0337 Radio Netherlands: Newline. Education for the Future (5th). See S 0037.
- 0341 Voice of Turkey: Turkish Popular Music.
- 0352 Radio Netherlands: Research File. The Moon Programme (19th). See M 1152.

Wednesdays

- 0315 BBC: Sports Roundup. See S 0315.
- 0319 Voice of Turkey: Turkish Pop Songs.
- 0330 BBC: Pop Science. The program that answers listeners' questions about science and plays pop musical requests.
- 0330 Voice of America (af): Now Music USA.
- 0330 WYFR (Satellite Network): The End of the Day.
- 0332 Radio Moscow (na): Audio Book Club.
- 0332 Radio Moscow: Music.
- 0337 Radio Netherlands (na): Newline. See S 0037.
- 0338 Voice of Turkey: Turkish Music.
- 0353 Radio Netherlands (na): Mirror Images. See W 0052.

Thursdays

- 0305 Vatican Radio: Postcards from Rome.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: Assignment. A weekly examination of a topical issue.
- 0330 BBC: Feature. Banking on the Poor (28th). An in-depth study of the World Bank and the International Monetary Fund.
- 0332 Radio Moscow: Music.
- 0333 Voice of Free China: Music Box.
- 0337 Radio Netherlands (na): Newline. See S 0037.
- 0337 Voice of Turkey: Turkish Songs.
- 0352 Radio Netherlands (na): Documentary. See H 0052.

Fridays

- 0310 Voice of Turkey: Some Turkish Music.
- 0315 BBC: Sports Roundup. See S 0315.

- 0330 BBC: Focus on Faith. Comment and discussion on the major issues in the worlds of faith.
- 0337 Radio Netherlands (na): Newline. See S 0037.
- 0338 Voice of Turkey: Turkish Folk Songs.
- 0352 Radio Netherlands (na): Media Network. See F 0052.

Saturdays

- 0300 KWHR (Hawaii): The Music and the Message.
- 0311 Voice of Turkey: Turkish Artists.
- 0315 BBC: Sports Roundup. See S 0315.
- 0319 Voice of Turkey: Turkish Music.
- 0330 BBC: The Vintage Chart Show. Each week a classic Top 20 from the past with Paul Burnett.
- 0330 HCJB: Musica del Ecuador.
- 0330 Radio Australia: Music Deli.
- 0330 WYFR (Satellite Network): The End of the Day.
- 0332 Radio Moscow: Music.
- 0332 Voice of Free China: New Record Time.
- 0337 Radio Netherlands (na): Newline. See S 0037.
- 0353 Radio Netherlands (na): Towards 2000. See A 0052.

PROPAGATION FORECASTING
JACQUES d'AVIGNON
 965 LINCOLN DRIVE
 KINGSTON, ON
 K7M 4Z3 CANADA

Distributor for ASAPS,
 propagation software
 Compuserve: 70531,140

FREQUENCIES

0400-0500	Australia, Radio	11720pa	11800pa	13605pa	15240pa				
		15320pa	15365pa	15415pa	17630pa				
		17700pa	17750as	17795pa	17860pa				
		21525as	21595as						
0400-0500 vl	Australia, VL8A Alice Spg	4835do							
0400-0500 vl	Australia, VL8K Katherine	5025do							
0400-0500 vl	Australia, VL8T Tent Crk	4910do							
0400-0500	Bahrain, Radio	6010do							
0400-0500	Bulgaria, Radio	9700na	11720na						
0400-0500 vl	Canada, CBC N. Quebec	9625do							
0400-0500	Canada, CFCX Montreal	6005do							
0400-0500	Canada, CFRX Toronto	6070do							
0400-0500	Canada, CFVP Calgary	6030do							
0400-0500	Canada, CHNX Halifax	6130do							
0400-0500	Canada, CKZN St John's	6160do							
0400-0500	Canada, CKZU Vancouver	6160do							
0400-0430	Canada, RCI Montreal	9650me	11905me	11925me	15275me				
0400-0500	China, China Radio Intl	11680na	11840na						
0400-0500	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am				
0400-0500	Cuba, Radio Havana Cuba	6010na	9820na						
0400-0430	Ecuador, HCJB Quito	9745am	11925am						
0400-0450	Germany, Deutsche Welle	5980af	6015af	6185af	7150af				
		7225af	9565af	9765af					
0400-0500	Guatemala, Radio Cultural	3300do							
0400-0415	Israel, Kol Israel	9435na	11605na	17545as					
0400-0500 vl	Italy, IRRS Milano	7125eu							
0400-0500	Kenya, Kenya BC Corp	4935do							
0400-0500 mtwhf	Lebanon, Wings of Hope	9960me							
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do							
0400-0425	Netherlands, Radio	6165na	9590na						
0400-0500 vl	New Zealand, R NZ Intl	15115pa							
0400-0450	North Korea, R Pyongyang	6130as	15230as	17755as					
0400-0500 vl	Papua New Guinea, NBC	9675do							
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na				
		11940na							
0400-0500	Russia, Radio Moscow Intl	5940eu	7205eu	9465na	9530na				
		9580na	9685eu	9750na	9765na				
		9880eu	11765af	12010as	12050af				
		13615as	15180na	15375me	15385me				
		15425me	17655af	17720as	17880as				
0400-0500	S Africa, Channel Africa	17890as							
0400-0500	Slovakia, AWR Europe	3220af	5955af						
0400-0430	Sri Lanka, SLBC Colombo	9455as	11610as						
0400-0500	Swaziland, Swazi Radio	9720as	15425as						
0400-0430	Switzerland, Swiss R Intl	6155af							
0400-0430	Tanzania, Radio	6135na	9860na	9885na					
0400-0430	Thailand, Radio	5050af							
0400-0500 vl	Uganda, Radio	9655na	11905na						
0400-0430	United Kingdom, BBC London	4976do							
		6175na	6180na	7105na	7325na				
		9630af	9915am	11760me	11955me				
		12095eu	15310as	15575me	21725as				
0400-0500	United Kingdom, BBC London	3255af	3955eu	5975na	6005af				
		6180af	6195eu	9410af	9600af				
		11760af	11820af	21470af	21715as				
0400-0500	USA, KCBI Dallas TX	9815am							
0400-0500	USA, KTBN Salt Lk City UT	7510am							
0400-0500	USA, KVOH Los Angeles CA	9785am							
0400-0500	USA, KWHR Naalehu HI	17780as							
0400-0500	USA, Monitor Radio Intl	7465eu	9840af						
0400-0500	USA, VOA Washington DC	5995me	6040me	6873eu	7170eu				
		7265af	7280af	7405af	9575af				
0400-0500 vl	USA, WEWN Birmingham AL	7425na							
0400-0500 vl	USA, WHRI Noblesville IN	7315am							
0400-0500	USA, WINB Red Lion PA	11950eu							
0400-0500	USA, WJCR Upton KY	7490na	13595na						
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu							
0400-0500	USA, WRNO New Orleans LA	7395am							
0400-0500	USA, WWCR Nashville TN	5810am	5935am	7435am					
0400-0500	USA, WYFR Okeechobee FL	6065na	9505na						
0400-0458	USA, WYFR Okeechobee FL	9770eu							
0415-0440	Italy, RAI Rome	7275eu	9575eu						
0430-0450	Finland, YLE/Radio	6120af	9655af	11755me	15440af				
0430-0500	Nigeria, Radio	3326do	4770do	4990do					
0430-0500	Serbia, Radio Yugoslavia	9580na							
0430-0500	Swaziland, Trans World R	5055af	7200af	7215af					
0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na						

SELECTED PROGRAMS

Sundays

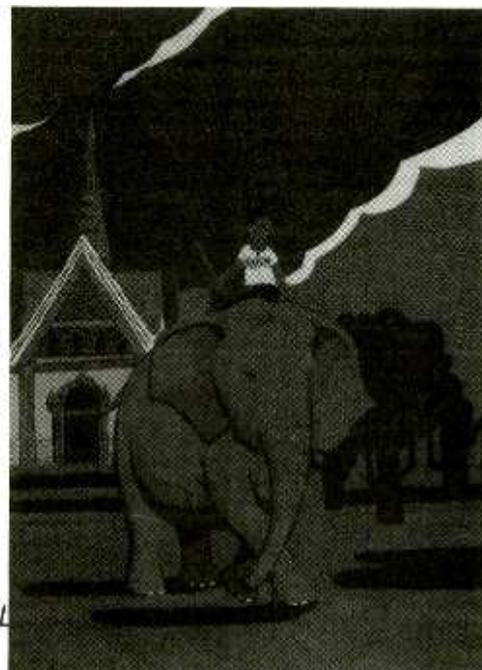
- 0400 Radio Bulgaria: Cultural Review.
- 0400 Radio Cultural Guatemala: Music.
- 0408 Canada (N. Quebec): Sound of the Blues.
- 0420 China Radio Int'l: Travel Talk.
- 0428 China Radio Int'l: Cooking Show.
- 0430 BBC: Seeing Stars (1). A discussion of astronomical observations and special events for the near future.
- 0430 BBC: Short Story. Blind Relations (10th). Saudi Arabia (17th). Rari Ma Goes Home (24th). Listeners send in their short stories.
- 0432 Radio Moscow: Kaleidoscope.
- 0435 China Radio Int'l: Music from China.
- 0435 Deutsche Welle: People and Places.
- 0443 Radio Yugoslavia: Pop Flash.
- 0445 BBC: Music Feature. Pop the Question (29th). A new series of programs that answer questions about pop music.

Mondays

- 0400 Radio Bulgaria: Folk Studio.
- 0400 WRNO: Shalom America.
- 0405 Canada (N. Quebec): Jazz Beat.
- 0408 Deutsche Welle: European Journal.
- 0415 Radio Bulgaria: Radio Bulgaria Calling.
- 0420 China Radio Int'l: China Scrapbook.
- 0426 China Radio Int'l: Music Album.
- 0430 BBC: Off the Shelf. Daily readings from the best of world literature.
- 0432 Radio Moscow: The Jazz Show.
- 0433 Deutsche Welle: Africa in the German Press.
- 0441 China Radio Int'l: Listeners' Letterbox.
- 0445 BBC: Feature. A Question of Science. Topical issues which pose dilemmas to scientists are discussed by experts and decision-makers.

Tuesdays

- 0430 BBC: Off the Shelf. See M 0430.
- 0432 Radio Moscow (na): Music.
- 0432 Radio Moscow: Music.
- 0445 BBC: On Screen. Film reviews and movie news from around the world.



A voice of Asia QSL
from Richard Lane

Wednesdays

- 0430 BBC: Off the Shelf. See M 0430.
- 0432 Radio Moscow (na): The Jazz Show.
- 0445 BBC: Country Style. See W 0145.

Thursdays

- 0400 HCJB: The Latest Catch.
- 0408 Deutsche Welle: Africa Report.
- 0415 HCJB: Chords of Love.
- 0423 Deutsche Welle: European Journal.
- 0430 BBC: Off the Shelf. See M 0430.
- 0433 China Radio Int'l: Profile.
- 0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

- 0405 Radio New Zealand Int'l: Calling Nule.
- 0411 Radio Moscow: Commonwealth Update.
- 0430 BBC: Off the Shelf. See M 0430.
- 0432 Radio Moscow (na): The Jazz Show.
- 0432 Radio Moscow: Music.
- 0445 BBC: Folk Routes. See T 0130.

Saturdays

- 0400 HCJB: On Line.
- 0400 Radio Bulgaria: Radio Bulgaria Spectrum.
- 0400 WRNO: Shalom America.
- 0400 WWCR: The Hour of the Time (live).
- 0410 Radio Australia: Book Reading.
- 0412 Deutsche Welle: Africa This Week.
- 0430 BBC: Jazz Now and Then. See A 0145.
- 0432 China Radio Int'l: Life in China.
- 0432 Radio Moscow (na): Folk Box.
- 0441 China Radio Int'l: China in Action.
- 0445 BBC: Worldbrief. Roundup of the week's news headlines, plus everything from sport and finance to best-sellers and weather.

FREQUENCIES

0500-0530	Australia, Radio	17750as			
0500-0600	Australia, Radio	11720pa	11800pa	13605pa	15240pa
		15320pa	15365pa	15415pa	17630pa
		17715pa	17795pa	17860pa	21525as
		21595as			
0500-0600 vl	Australia, VL8A Alice Spg	4835do			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Bahrain, Radio	6010do			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0530 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	15430af
		17840af			
0500-0600	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0500-0600	Cuba, Radio Havana Cuba	6010na	9820na		
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0600 as	Eqt Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	9515na	9670na	11705na
0500-0600	Guatemala, Radio Cultural	3300do			
0500-0600 vl	Italy, IRRS Milano	7125eu			
0500-0600	Japan, NHK/Radio	5975eu	7230eu	9610as	9725am
		11740as	11885as	15410as	17810as
0500-0600	Kenya, Kenya BC Corp	4935do			
0500-0600 mtwhf	Lebanon, Wings of Hope	9960me			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600	New Zealand, R NZ Intl	11900pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0550	North Korea, R Pyongyang	9640me	9977af		
0500-0530 m	Norway, Radio Norway Intl	9590na	11865na		
0500-0600 vl	Papua New Guinea, NBC	9675do			
0500-0600	Russia, Radio Moscow Intl	7165na	9530na	9750na	9760na
		9880as	12010na	12050na	15425na
		15465af	17570af	17590af	17610me
		17835af			
0500-0600	S Africa, Channel Africa	5995af	9695af		
0500-0553 f	Seychelles, FEBA Radio	17750me			
0500-0600	Spain, Spanish Natl Radio	9540na			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0600	Swaziland, Swazi Radio	6155af			
0500-0530	Swaziland, Trans World R	5055af	7200af	7215af	
0500-0515	Switzerland, Swiss R Intl	3985eu	6165eu		
0500-0600	Thailand, Radio	9655as	11905as		
0500-0600 vl	Uganda, Radio	4976do			
0500-0600	United Kingdom, BBC London	3955eu	5975ca	6005af	6180eu
		6195eu	7325af	9410af	9600af
		9640ca	11735eu	11760me	11820as
		12095af	15070me	15310as	15400af
		15420af	15575me	17830as	21470af
		21715as			
0500-0600	USA, KCBI Dallas TX	9815am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9785am			
0500-0600	USA, KWHR Naalehu HI	17780as			
0500-0600	USA, Monitor Radio Intl	9840af			
0500-0600	USA, VOA Washington DC	6035af	7210af	7405af	9665af
		12080af	15600af		
0500-0530	USA, VOA Washington DC	5995eu	6140eu	6873eu	7170eu
		9530eu	9700eu	11825me	15205me
0500-0600 vl	USA, WHRI Noblesville IN	7315am			
0500-0600 vl	USA, WINB Red Lion PA	11950am			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhf	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, WWCR Nashville TN	5810am	5935am	7435am	
0500-0600	USA, WYFR Okeechobee FL	5985na	11580eu		
0500-0545	USA, WYFR Okeechobee FL	9870af			
0500-0530	Vatican State, Vatican R	9695af	11625af	15090af	
0500-0520	Vatican State, Vatican R	3945eu	3975eu	6245eu	
0510-0520	Botswana, Radio	3356af	4830af	7255af	
0525-0600	Ghana, GBC Radio 2	3366do			
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Georgia, Radio	11910as			
0530-0600	Romania, R Romania Intl	11810af	15340af	15380af	17790af
0530-0600	Swaziland, Trans World R	7200af	11740af		
0530-0600	UAE, Radio Dubai	15435as	17830as	21700as	

SELECTED PROGRAMS

Sundays

- 0509 Channel Africa: Religions of the West.
- 0510 Radio Australia: Music of RA.
- 0516 WYFR: The Mailbag.
- 0519 Channel Africa: Our Wild Heritage.
- 0527 Spanish National Radio: Spain Speaking.
- 0530 Radio Australia: At Your Request.
- 0532 Channel Africa: Gospel Music.
- 0540 Spanish National Radio: Grass Roots.
- 0547 Channel Africa: Talking of Books.
- 0549 WYFR: Bible Quiz.

Mondays

- 0500 WHRI: The Music and the Message.
- 0509 HCJB: Saludos Amigos.
- 0511 Deutsche Welle: Living in Germany.
- 0511 Radio Moscow: Mailbag.
- 0511 Spanish National Radio: Grass Roots.
- 0515 Radio Canada Intl: Report to the Peacekeepers.
- 0530 Deutsche Welle: Larry's Random Selection.
- 0534 Spanish National Radio: Visitors Book.
- 0544 Spanish National Radio: Radio Club.

Tuesdays

- 0511 Radio Moscow (na): Commonwealth Update.
- 0515 Radio Canada Intl: Report to the Peacekeepers.
- 0515 Spanish National Radio: Panorama.
- 0532 Radio Moscow: Music.
- 0540 Spanish National Radio: Cultural Encounters.
- 0546 WYFR: The Radio Reading Circle.
- 0555 Radio Japan: Tokyo Pop-In.

Wednesdays

- 0511 Radio Moscow (na): Commonwealth Update.
- 0515 Spanish National Radio: Panorama.
- 0520 Spanish National Radio: Press Review.
- 0526 Spanish National Radio: Review of the Spanish Economy.

- 0532 Radio Moscow (na): Audio Book Club.
- 0534 Spanish National Radio: Stage and Screen.
- 0546 WYFR: The Radio Reading Circle.

Thursdays

- 0500 WHRI: The Music and the Message.
- 0515 Radio Japan: Current Views.
- 0515 Spanish National Radio: Panorama.
- 0525 Spanish National Radio: Press Review.
- 0532 Spanish National Radio: As Others See Us.
- 0540 Spanish National Radio: Science Desk (biweekly).

Fridays

- 0509 Deutsche Welle: European Journal.
- 0515 Spanish National Radio: Panorama.
- 0520 Radio Japan: The Travel & Book Beat.
- 0525 Spanish National Radio: Press Review.
- 0529 Spanish National Radio: People of Today.
- 0532 Radio Moscow (na): Audio Book Club.
- 0535 Radio Japan: Short Story.

- 0539 Radio Moscow: Music.
- 0545 Radio Japan: Book Review.
- 0546 WYFR: The Radio Reading Circle.
- 0547 Spanish National Radio: Spanish Course by Radio.

Saturdays

- 0500 KWHR (Hawaii): The Music and the Message.
- 0509 Deutsche Welle: European Journal.
- 0510 Channel Africa: Focus on Africa.
- 0510 Radio Australia: Jazz Notes.
- 0510 Radio Japan: This Week.
- 0515 Channel Africa: Good Vibrations.
- 0515 Spanish National Radio: Panorama.
- 0522 Spanish National Radio: Press Review.
- 0529 Spanish National Radio: Window on Spain.
- 0536 Spanish National Radio: Arts in Spain.
- 0546 WYFR: The Radio Reading Circle.
- 0547 Radio Japan: Music Gallery.
- 0554 Channel Africa: This Day in History.



The studios at
Radio Exterior
De Espana

FREQUENCIES

0600-0700	Australia, Radio	6020pa 13605pa 15365pa 17795pa	6080pa 15240pa 17630pa 17880as	11720pa 15320pa 17670as 21525as	11800pa 15360pa 17715pa 21595as
0600-0700 vl	Australia, VL8A Alice Spg	4835do			
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0700	Bahrain, Radio	6010do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFPV Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0600-0700	Cuba, Radio Havana Cuba	9820na			
0600-0627	Czech Rep, Radio Prague	7345eu	9505eu	11990eu	
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am	
0600-0700 as	Eq Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	11915af 17820af	13790af 17875af	15185af 21680af	15205af
0600-0630	Ghana, GBC Radio 1	4915do			
0600-0615	Ghana, GBC Radio 2	3366do			
0600-0700 vl	Italy, IRRS Milano	7125eu			
0600-0700	Japan, NHK/Radio	11860as	21610as		
0600-0625	Kenya, Kenya BC Corp	4935do			
0600-0700 vl	Kiribati, Radio	9825do			
0600-0630	Laos, National Radio of	7116as			
0600-0700 mtwhf	Lebanon, Wings of Hope	9960me			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765me			
0600-0700	New Zealand, R NZ Intl	11900pa			
0600-0700	Nigeria, Radio	3970do	4770do	4990do	
0600-0700	Nigeria, Voice of	7255af			
0600-0650	North Korea, R Pyongyang	15180as	15230as		
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0700	Russia, Radio Moscow Intl	9530eu 11985as 15190eu 15540as	9580af 12010na 15425na 15560me	9750eu 12050na 15470me 17805me	9765eu 15180na 15535as 21830as
0600-0700	S Africa, Channel Africa	15220af			
0600-0700	Slovakia, AWR Europe	13715as			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, KBS/R Korea	11945na	15155na		
0600-0700	Swaziland, Swazi Radio	6155af			
0600-0700	Swaziland, Trans World R	5055af	7200af	11740af	
0600-0630	Switzerland, Swiss R Intl	3985eu 15430af	6165eu	9885af	13635af
0600-0700	United Kingdom, BBC London	3955eu 7325af	6005af	6180af	6195af
		9410eu	9600af	9640na	
		11780eu	11820af	11940af	12095eu
		15360as	15420af	15575eu	17790as
		17830as	17885af	21470me	
0600-0700	USA, KCBI Dallas TX	9815am			
0600-0700	USA, KTBN Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	9785am			
0600-0700	USA, KWHR Naalehu HI	17780as			
0600-0700	USA, Monitor Radio Intl	9840eu	9870eu		
0600-0700	USA, VOA Washington DC	6035af 9665af 15600af	7120af 11950af	7405af 12080af	9530af 15080af
0600-0630	USA, VOA Washington DC	3980eu 6140eu 7325eu	5995eu 6873eu 11805me	6040eu 7120eu 11825me	6060eu 7170eu 15205me
0600-0700	USA, WEWN Birmingham, AL	7425na			
0600-0700 vl	USA, WHRI Noblesville IN	7315am	9495am		
0600-0700 vl	USA, WINB Red Lion PA	11950na			
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WWCR Nashville TN	5810am	5935am	7435am	
0600-0700	USA, WYFR Okeechobee FL	5985na	7355eu	11770eu	13695af
0625-0700	Kenya, Kenya BC Corp	4935do			
0630-0700	Australia, Radio	9580pa	9860pa	11910pa	
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Belgium, R Vlaanderen Int	6015eu	9925au		
0630-0645 mtwfta	Vatican State, Vatican R	3945eu 11740af	6245eu 15210af	7250eu	9645eu
0630-0700	Vatican State, Vatican R	9725af	11625af	15570af	
0632-0641	Romania, R Romania Intl	7225eu	9550eu	9665eu	11810eu
0640-0700	Monaco, Trans World Radio	7385eu			
0645-0700	Finland, YLE/Radio	6120eu	9560eu	11755eu	
0645-0700	Romania, R Romania Intl	11775pa 17805pa	15250pa	15335pa	17720pa

SELECTED PROGRAMS

Sundays

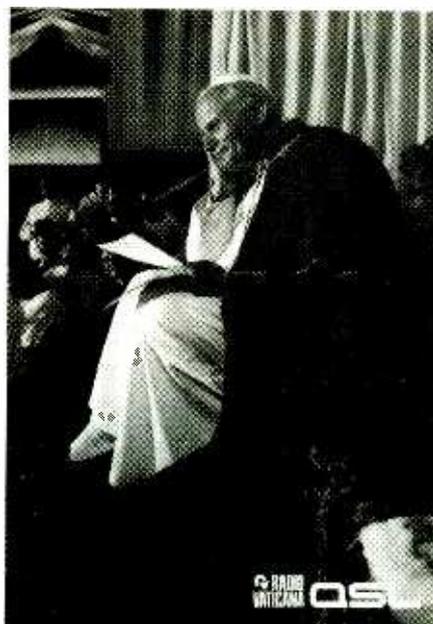
- 0600 HCJB: Musical Mailbag.
- 0600 WYFR: Hymn Storytime.
- 0610 Channel Africa: Checkpoint.
- 0615 BBC: Letter from America. Alistair Cooke shares his inimitable view of contemporary American life.
- 0616 Deutsche Welle: International Talking Point.
- 0630 BBC: Jazz for the Asking. Record requests with Malcolm Laylock.
- 0630 KWHR (Hawaii): The Music and the Message.
- 0630 WWCR: The Old Record Shop.
- 0636 Radio Vlaanderen Int'l: P.O. Box 26.
- 0639 Radio Vlaanderen Int'l: Music from Flanders.

Mondays

- 0600 KWHR (Hawaii): Christian Center Church.
- 0600 WYFR: The Open Forum.
- 0611 Radio Moscow: Science and Engineering in the CIS.
- 0615 BBC: The Learning World. News and views about worldwide education.
- 0630 BBC: Feature. See S 1401.
- 0632 Radio Moscow: Russian by Radio.
- 0639 WYFR: Creation Moments.

Tuesdays

- 0600 WYFR: The Open Forum.
- 0611 Radio Moscow (na): News and Views.
- 0611 Radio Moscow: Moscow Mailbag.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Music Feature. Notes from Brazil (5th). The music and the musicians of this country. Rock Salad (12th, 19th, 26th). Tommy Vance rocks on.
- 0632 Radio Moscow (na): Music at Your Request.
- 0639 WYFR: Creation Moments.



An earlier Vatican Radio QSL from Roy Labrie, Portsmouth, VA

0649 WYFR: The Basic Bible Study.

Wednesdays

- 0600 KVOH: University Network.
- 0600 WWCR: The Overcomer Broadcast.
- 0600 WYFR: The Open Forum.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Meridian Documentary. One of three topical programmes weekly about the world of the arts.

Thursdays

- 0600 Voice of Nigeria: West African Scene.
- 0611 Radio Moscow (na): Commonwealth Update.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Assignment. See H 0330.
- 0630 BBC: Feature. Banking on the Poor (28th). See A 0330.
- 0630 Radio New Zealand Int'l: Ears.

Fridays

- 0611 Radio Moscow (na): News and Views.
- 0611 Radio Moscow: Science and Engineering in the CIS.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Meridian Books. See W 0630.
- 0632 Radio Moscow (na): The Jazz Show.
- 0632 Radio Moscow: Music.

Saturdays

- 0611 Radio Moscow: Culture and the Arts in the CIS.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Meridian Reports. See W 0630.
- 0630 KWHR (Hawaii): The Music and the Message.
- 0630 Radio Austria Int'l: Report from Austria.

0700-0730	Australia, Radio	15320pa			
0700-0800	Australia, Radio	6020pa	6080pa	9580pa	9710pa
		9860pa	11720pa	11880pa	11910pa
		15240pa	15365pa	17695as	17790as
		21525as	21595as		
0700-0800 vl	Australia, VL8A Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio	6010do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0700-0800	Ecuador, HCJB Quito	6205eu	9600eu	9745au	11835eu
		21455eu			
0700-0800 as	Eqt Guinea, R East Africa	9585af			
0700-0730	Georgia, Radio	11910as			
0700-0715	Ghana, GBC Radio 1	4915do			
0700-0715	Ghana, GBC Radio 2	3366do			
0700-0800	Italy, AWR Europe	7230eu			
0700-0800 vl	Italy, IRRS Milano	7125eu			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11740af	15270af
		15380me	15410as	17810me	21610au
0700-0800	Kenya, Kenya BC Corp	4935do			
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800 mtwhf	Lebanon, Wings of Hope	9960me			
0700-0800	Liberia, Radio ELWA	4760do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800 mtwtfa	Monaco, Trans World Radio	7385eu			
0700-0730	Myanmar, Radio	9730do			
0700-0800	New Zealand, R NZ Intl	6100pa			
0700-0800	Nigeria, Radio	3326do	4770do	4990do	
0700-0800	Nigeria, Voice of	7255af			
0700-0800 vl	Papua New Guinea, NBC	9675do			
0700-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			
0700-0800	Russia, Radio Moscow Intl	7270na	7305eu	9530eu	9750eu
		9890eu	11765me	15190eu	15220me
		15480me	15550me	17710af	17755af
		17835af	21630af		
0700-0715 vl	Sierra Leone, SLBS	3316do			
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Swazi Radio	6155af			
0700-0800	Swaziland, Trans World R	7200af	11740af		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800	United Kingdom, BBC London	3955eu	6190af	6195eu	7150af
		7325eu	9410eu	9600af	9640na
		9660eu	9760eu	11760me	11780ca
		11940af	12095eu	15070eu	15310as
		15400af	15575me	17790af	17885af
		21470af			
0700-0800	USA, KCBI Dallas TX	9815na			
0700-0800	USA, KTBN Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785am			
0700-0800	USA, KWHR Naalehu HI	17510as			
0700-0800	USA, Monitor Radio Intl	9840eu			
0700-0800	USA, WEWN Birmingham AL	7425am	9350am	13615am	
0700-0800 vl	USA, WHRI Noblesville IN	7315am	9495am		
0700-0800 vl	USA, WINB Red Lion PA	11950na			
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5810am	5935am	7435am	
0700-0800	USA, WYFR Okeechobee FL	13695af			
0700-0745	USA, WYFR Okeechobee FL	7355eu	11770eu		
0730-0800	Australia, Radio	9580pa	1775as		
0730-0800	Austria, R Austria Intl	6155eu	13710eu	15410me	17870me
0730-0757	Czech Rep, Radio Prague	15605as	17535as	21705pa	
0730-0745 sh	Greece, Voice of	9425eu	11645eu	15650eu	
0730-0745 mtwhf	Iceland, Natl BC Service	9265am			
0730-0800	Netherlands, Radio	9630pa	9720pa		

0800-0900	Australia, Radio	6020pa	6080pa	7240pa	9580pa
		9710pa	9860pa	11720pa	11910pa
		15240pa	17695as	17750as	21525as
		21595as			
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, AWR	6150am	9725am		
0800-0900	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0800-0900	Ecuador, HCJB Quito	6205eu	9600eu	9745pa	11835eu
		11925pa	17490au	21455eu	
0800-0900 as	Eqt Guinea, R East Africa	9585af			
0800-0900	Finland, YLE/Radio	15445au	17800as		
0800-0805 s	Ghana, GBC Radio 1	4915do			
0800-0805 s	Ghana, GBC Radio 2	3366do			
0800-0900	Guam, KTRW Agana	9785as			
0800-0900	Indonesia, Voice of	9675as	11752as		
0800-0900 vl	Italy, IRRS Milano	7125eu			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0900 mtwhf	Lebanon, Wings of Hope	9960me			
0800-0830	Liberia, Radio ELWA	4760do			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0820 mtwtfa	Monaco, Trans World Radio	7385eu			
0800-0825	Netherlands, Radio	9630pa	9720pa		
0800-0900	New Zealand, R NZ Intl	6100pa			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0850	North Korea, R Pyongyang	11335na	13760na	15180as	15230as
0800-0845	Pakistan, Radio	17900eu	21520eu		
0800-0900 vl	Papua New Guinea, NBC	9675do			
0800-0900	Russia, Radio Moscow Intl	6065eu	7305af	7315af	9750af
		11690me	12010eu	12020eu	13615eu
		15105me	15125me	15290as	15420me
		15540me	17580eu	21585eu	
0800-0815 vl	Sierra Leone, SLBS	3316do			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, KBS/R Korea	7550eu	13670me		
0800-0830	South Korea, KBS/R Korea	15575af			
0800-0900	United Kingdom, BBC London	3955eu	6195eu	7150au	7325eu
		9410eu	9640na	9660eu	9760eu
		11760me	11940af	15070eu	15400eu
		15575me	17790as	17885af	21470af
		21660af			
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900 vl	USA, KNLS Anchor Point AK	9615as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	13615pa			
0800-0900 vl	USA, WEWN Birmingham AL	7425sa	9350na		
0800-0900 vl	USA, WHRI Noblesville IN	7315am	7355am		
0800-0900 vl	USA, WINB Red Lion PA	11950na			
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	5810am	5935am	7435am	
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	15450au	17870au		
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Netherlands, Radio	9595eu	9720pa	9895pa	
0830-0900	Slovakia, AWR Europe	7180as			
0835-0845 s	Monaco, Trans World Radio	7385eu			
0844-0855 s	Armenia, Radio Yerevan	15295eu	17815eu		
0855-0900	Guam, KTRW Agana	11805au			

DON'T PANIC...

... If you haven't received your **Monitoring Times** by the beginning of the month. Postal delays due occur, and we must wait until the 10th of the month before sending replacements for lost issues.

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**Guide to Shortwave Programs
1994 Edition**

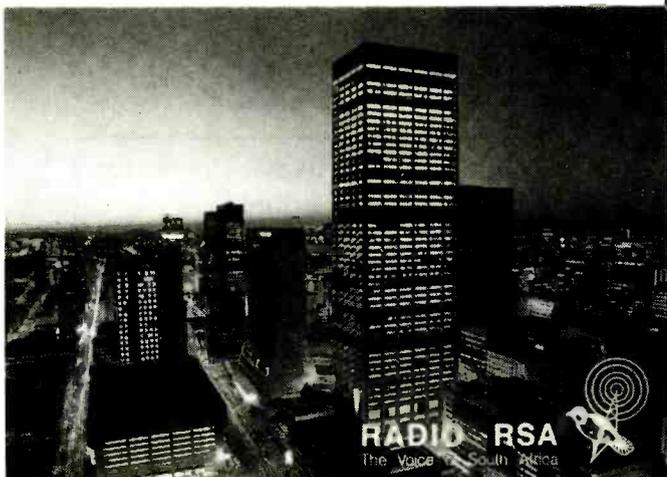
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0900-1000	Australia, Radio	6020pa 9710pa 21745as	6080pa 9860pa	9510as 13605as	9580pa 15170as
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Bahrain, Radio	6010do			
0900-0930 mtwta	Belgium, R Vlaanderen Int	6035eu	13690eu	17590af	
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa	17710pa	
0900-1000	Costa Rica, AWR	6150am	9725am		
0900-1000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-1000 as	Eqt Guinea, R East Africa	9585af			
0900-0950	Germany, Deutsche Welle	6160as 15410af 21600af	9565af 17715as 21680as	11715as 17780as	12055as 17800af
0900-0915 mtwtf	Ghana, GBC Radio 1	4915do			
0900-0915	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWX Agana	11805au			
0900-0915	Guam, KTWX Agana	9785as			
0900-1000 vl	Italy, IRRS Milano	7125eu			
0900-1000	Japan, NHK/Radio	9610as 15270au	9750as	11815as	15195as
0900-1000 mtwhf	Lebanon, Wings of Hope	9960me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0930	Netherlands, Radio	5955eu	9720pa	9895eu	
0900-1000	New Zealand, R NZ Intl	6100pa			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000 mtwrf	Palau, KHBN Voice of Hope	9830as			
0900-1000 vl	Papua New Guinea, NBC	4890do	9675do		
0900-1000	Russia, Radio Moscow Intl	9680eu 15210eu 15290as 15345eu 15380eu 15400eu 15495eu 15540eu 17595eu 17605eu	12070eu 13650eu 15190eu	15190eu 15380eu 15400af 15575me 17885af	15190eu 15380eu 17595eu 21540eu
0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17515au	
0900-1000	United Kingdom, BBC London	6190af 9660eu 11760me 15190sa 15310as 15400af 21470af	6195eu 9740eu 11940af 12095eu 15070eu 17705eu 21660af	7180as 9750eu 9760eu 12095eu 15070eu 17790af	9410eu 9760eu 15070eu 15575me 17885af
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	9840pa	13615pa	
0900-1000	USA, WEWN Birmingham AL	9350na	12160eu		
0900-1000 vl	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000 vl	USA, WINB Red Lion PA	11950na			
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwthf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5810am			
0910-0940 smha	Mongolia, R Ulaanbaatar	11850as	12015as		
0915-1000	Ghana, GBC Radio 2	6130do	7295do		
0920-0935 sh	Greece, Voice of	15650au	17525au		
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	5955eu 9895eu	9715pa 12065as	9720pa 15470as	9810eu
0930-1000	Philippines, FEBC Manila	11690as			
0940-0950	Greece, Voice of	15650au	17525au		

1000-1100	Australia, Radio	6020pa 15170as	6080pa 21745as	9580pa	9860pa
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Bahrain, Radio	6010do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa	17710pa	
1000-1100	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100 as	Eqt Guinea, R East Africa	9585af			
1000-1100	Ghana, GBC Radio 2	6130do	7295do		
1000-1100	India, All India Radio	15050as	15180as	17387au	17895as
1000-1030	Israel, Kol Israel	15640na	15650as	17575eu	
1000-1100	Italy, AWR Europe	7230eu			
1000-1100 vl	Italy, IRRS Milano	7125eu			
1000-1100 mtwhf	Lebanon, Wings of Hope	9960me			
1000-1100 vl	Malaysia, RTM Kota Kinaba	5980do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	Netherlands, Radio	12065as	15470as		
1000-1030	Netherlands, Radio	5995eu	9715pa	9720pa	9895eu
1000-1100	New Zealand, R NZ Intl	6100pa			
1000-1050	North Korea, R Pyongyang	15340as	17765as		
1000-1100 mtwhfa	Palau, KHBN Voice of Hope	9830as			
1000-1100 vl	Papua New Guinea, NBC	4890do	9675do		
1000-1100	Philippines, FEBC Manila	11690as			
1000-1100	Russia, Radio Moscow Intl	7205eu 12020eu 15210eu 15380eu 17710na	9750eu 12070eu 15290as 15435na 17760eu	11675na 13650eu 15320na 15465na 21515eu	12015eu 15175eu 15355na 15470na 21540eu
1000-1100	S Africa, Channel Africa	17810af			
1000-1030	Switzerland, Swiss R Intl	6165eu	9535eu		
1000-1100	United Kingdom, BBC London	6190af 9750eu 12095eu 15070eu 15400af 17790af	6195af 9760eu 15070eu 15575me 17885af	9410eu 11750me 15190sa 17640eu 21470af	9660eu 11940af 15310as 17705eu 21660af
1000-1100	USA, KCBI Dallas TX	9815am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	9930as			
1000-1100	USA, Monitor Radio Intl	7395sa	9840pa	13615pa	
1000-1100	USA, WEWN Birmingham AL	9350na	12160eu		
1000-1100	USA, WHRI Noblesville IN	7315am	7355am		
1000-1100	USA, WINB Red Lion PA	11950na			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1020-1030 mtwrf	Vatican State, Vatican R	6245eu 21730me	11740af	15210af	21515me
1030-1100	Austria, R Austria Intl	15450au	17870au		
1030-1057	Czech Rep, Radio Prague	7345eu	9505eu	11990eu	
1030-1100 vl	Malaysia, RTM Sarawak	4950do	7160do		
1030-1100	South Korea, KBS/R Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835au	15120as	17850as	
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605eu



Radio RSA, now called Channel Africa, sent this QSL to John Flake, Charlotte, NC.

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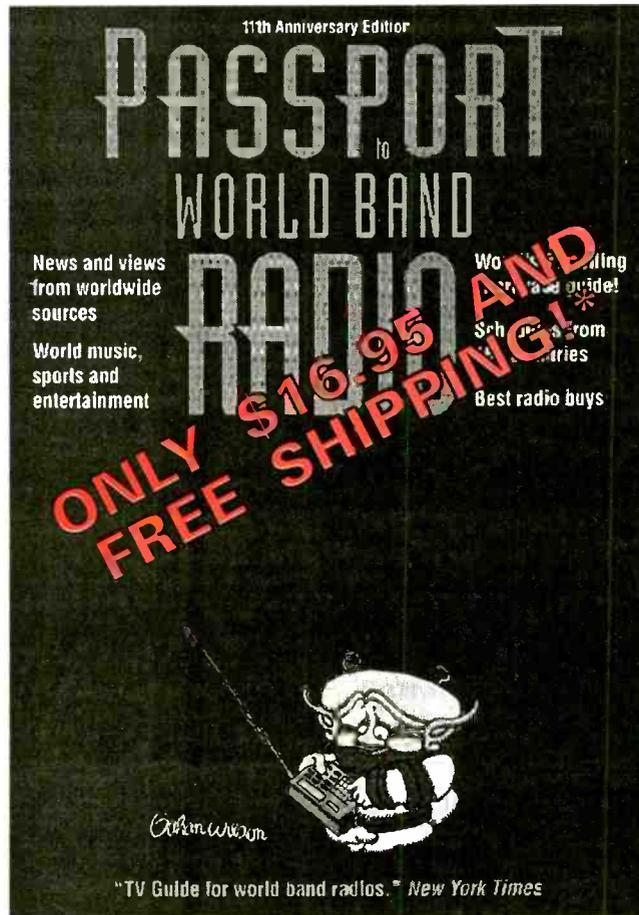
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FREQUENCIES

1200-1300	Australia, Radio	5995pa 7240pa 15170pa	6020pa 9580as 15565pa	6060pa 11800pa 17910as	6080pa 13605pa				
1200-1300 vl	Australia, VL8A Alice Spg	2310do							
1200-1300 vl	Australia, VL8K Katherine	2485do							
1200-1300 vl	Australia, VL8T Tent Crk	2325do							
1200-1300	Bahrain, Radio	6010do							
1200-1300	Brazil, Radiobras	15445na							
1200-1300	Bulgaria, Radio	17625au							
1200-1215	Cambodia, Natl Voice of	11938as							
1200-1300	Canada, CFCX Montreal	6005do							
1200-1300	Canada, CFRX Toronto	6070do							
1200-1300	Canada, CFVP Calgary	6030do							
1200-1300	Canada, CHNX Halifax	6130do							
1200-1300	Canada, CKZN St John's	6160do							
1200-1300	Canada, CKZU Vancouver	6160do							
1200-1300 mtwhf	Canada, RCI Montreal	9635na	9705na	11855na	17820na				
1200-1300	China, China Radio Intl	9655na 15440pa	9715as	11660as	11795pa				
1200-1300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am				
1200-1300	Ecuador, HCJB Quito	11925am 21455am	15115am	17490am	17890am				
1200-1300	France, Radio France Intl	9805eu 15195eu	13625af 15325af	13640af 17575na	15155eu				
1200-1230	Iran, VOIRI Tehran	9525me 11930as	11715me	11790as	11910as				
1200-1300 vl	Italy, IRRS Milano	7125eu							
1200-1300	Jordan, Radio	9560eu							
1200-1300 vl	Malaysia, RTM Kota Kinaba	5980do							
1200-1300	Malaysia, RTM Radio 4	7295do							
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as						
1200-1300	Netherlands, Radio	5955eu	9650eu						
1200-1206	New Zealand, R NZ Intl	6100pa							
1200-1230 s	Norway, Radio Norway Intl	17860as							
1200-1300 mtwhf	Palau, KHBN Voice of Hope	9830as							
1200-1230 a	Palau, KHBN Voice of Hope	9830as							
1200-1300 vl	Papua New Guinea, NBC	4890do	9675do						
1200-1300	Russia, Radio Moscow Intl	9835af 15105af 15335af 15485eu	11705as 15280af 15350af 15525af	11985eu 15290eu 15355na 15540eu	12055eu 15320eu 15440eu				
1200-1300	Singapore, R Singapore Int	9530as							
1200-1300	South Korea, KBS/R Korea	7180as							
1200-1230	Thailand, Radio	9655as	11905as						
1200-1300	United Kingdom, BBC London	5965af 9515na 9760eu	6190af 9660eu 11760me	6195am 9740na 11940af	9410eu 9750eu 12095eu				
1200-1300	USA, KCBT Dallas TX	9815am							
1200-1300	USA, KTVB Salt Lk City UT	7510am							
1200-1300 vl	USA, KWHR Naalehu HI	9930as							
1200-1300	USA, Monitor Radio Intl	7465ca	9425pa	9455na	13625as				
1200-1300	USA, VOA Washington DC	6110as 15160as	9560as 15425as	9760as 9850am	11715au				
1200-1300	USA, WEWN Birmingham AL	9350na	9985ca						
1200-1300 vl	USA, WHRI Noblesville IN	7315am	9850am						
1200-1300	USA, WJCR Upton KY	7490na	13595na						
1200-1300	USA, WWCN Nashville TN	5935am	15685am						
1200-1300	USA, WYFR Okeechobee FL	5950na	6015na	11830na	17750na				
1200-1230	Uzbekistan, R Tashkent	15295as	17815as						
1200-1300	Vietnam, Voice of	6115as	10059as	12025as	15010as				
1207-1300 occasnl	New Zealand, R NZ Intl	9700pa							
1215-1300	Egypt, Radio Cairo	17595as							
1220-1230 vl	Ghana, GBC Radio 1	4915do							
1230-1300	Bangladesh, Radio	11770as	13620as						
1230-1300 s	Belgium, R Vlaanderen Int	15545na	17775as						
1230-1300	Canada, RCI Montreal	9660as	15195as						
1230-1300 mtwhfa	Finland, YLE/Radio	11900na	15400ra						
1230-1300	Ghana, GBC Radio 2	6130do	7295do						
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as	15425as					
1230-1300	Sweden, Radio	15240na	17870na						
1230-1300	Switzerland, Swiss R Intl	6165eu	9535eu						
1230-1300	Turkey, Voice of	9675as							
1240-1250	Greece, Voice of	11645af							

SELECTED PROGRAMS

Sundays

- 1201 BBC: Plays of the Week. See S 0101.
- 1203 Radio Singapore Int I: E-Z Beat. Pop music program.
- 1211 Radio Moscow: Music and Musicians.
- 1212 Radio Korea: Echoes of Korean Music.
- 1225 Radio Netherlands: Program Info. See S 0125.
- 1225 Radio Singapore Int I: Kiasu Capers. The lighter side of life in Singapore.
- 1226 China Radio Int'l: Music Album.
- 1230 NBC Papua New Guinea: Classical Music Concert.
- 1230 Radio Sweden: Sounds Nordic (biweekly).
- 1235 Radio Netherlands: East of Edam. See S 0235.
- 1240 Radio Singapore Int I: Arts Arena. A program devoted to the visual and performing arts.
- 1240 Radio Vlaanderen Int'l: Music from Flanders.
- 1255 Radio Singapore Int I: Take Five. See S 1203.

Mondays

- 1203 Radio Singapore Int I: E-Z Beat. See S 1203.
- 1215 BBC: Quiz. Brain of Britain. This popular general knowledge contest continues.
- 1220 Radio Singapore Int I: Business and Market Report. See M 1120.
- 1225 Radio Netherlands: Press Review. See S 1525.
- 1237 Radio Netherlands: Newslines. Education for the Future (4th). See S 0037.
- 1240 Radio Singapore Int I: Bookmark. Spotlighting books, authors and the written word.
- 1252 Radio Netherlands: Let's Get to Business. Down-to-earth program of trade and business with Barry D'Dwyer.

Tuesdays

- 1203 Radio Singapore Int I: E-Z Beat. See S 1203.
- 1215 BBC: Multitrack: Hit List. See M 2330.
- 1215 Radio Singapore Int I: Frontiers. See S 1145.
- 1216 Radio Korea: Seoul Calling.
- 1220 Radio Singapore Int I: Business and Market Report. See M 1120.
- 1225 Radio Netherlands: Press Review. See S 1525.
- 1237 Radio Netherlands: Newslines. See S 0037.

- 1240 Radio Korea: Korean Cultural Variety.
- 1240 Radio Singapore Int I: Catching On. Trends in the Singaporean consumer, fashion, and lifestyle scenes.
- 1245 Radio Singapore Int I: Kiasu Capers. See S 1225.
- 1250 Radio Singapore Int I: Music. Selections by the program host.
- 1252 Radio Netherlands: Accent on Asia. See T 0152.

Wednesdays

- 1203 Radio Singapore Int I: E-Z Beat. See S 1203.
- 1215 BBC: New Ideas. See M 1615.
- 1220 Radio Singapore Int I: Business and Market Report. See M 1120.
- 1225 Radio Netherlands: Press Review. See S 1525.
- 1235 BBC: Feature. Personal Obsessions (6th). See T 1635. In a Word (13th, 20th, 26th). Musical terms explained.
- 1237 Radio Netherlands: Newslines. See S 0037.
- 1239 Radio Moscow: Music.
- 1240 Radio Singapore Int I: Frontiers. See S 1145.
- 1252 Radio Netherlands: Encore! See W 0152.

Thursdays

- 1203 Radio Singapore Int I: E-Z Beat. See S 1203.



Radio Exterior de Espana celebrated its 50th anniversary in 1992.

- 1215 BBC: Multitrack: X-Press. See W 2330.
 - 1220 Radio Singapore Int I: Business and Market Report. See M 1120.
 - 1225 Radio Netherlands: Press Review. See S 1525.
 - 1237 Radio Netherlands: Newslines. See S 0037.
 - 1239 Radio Moscow: Music.
 - 1240 Radio Singapore Int I: Singapore Snapshots. See S 1345.
 - 1248 Radio France Int'l: Arts in France.
 - 1250 Radio Singapore Int I: Music. See T 1250.
 - 1252 Radio Netherlands: Research File. The Moon Programme (21st). See M 1152.
- ### Fridays
- 1203 Radio Singapore Int I: E-Z Beat. See S 1203.
 - 1215 BBC: Feature. The Legacy of Colonialism (8th, 15th, 22nd, 28th). NEW. The different experiences of colonialism in four African countries.
 - 1215 BBC: Quiz. Brush Up Your Shakespeare (1st). Testing the panelists' knowledge of the works of the great bard.
 - 1220 Radio Singapore Int I: Business and Market Report. See M 1120.
 - 1225 Radio Netherlands: Press Review. See S 1525.
 - 1237 Radio Netherlands: Newslines. See S 0037.
 - 1240 Radio Singapore Int I: Potluck. See S 1105.
 - 1252 Radio Netherlands: Documentary. See W 1152.

Saturdays

- 1200 WHRI: Christian Music Countdown.
- 1203 Radio Singapore Int I: E-Z Beat. See S 1203.
- 1204 NBC Papua New Guinea: Top of the Pops.
- 1215 BBC: Multitrack: Alternative. See F 2330.
- 1225 Radio Netherlands: EuroPress Review. See A 0125.
- 1225 Radio Singapore Int I: Asean Notes. See S 1120.
- 1235 China Radio Int'l: Music from China.
- 1237 Radio Netherlands: Newslines. Education for the Future (2nd). See S 0037.
- 1240 Radio Singapore Int I: Arts Arena. See S 1240.
- 1252 Radio Netherlands: Bats, Balls & Baselines. See A 0252.

FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240pa	11800pa	1300-1400	Singapore, SBC Radio One	6155do		
1300-1400 vl	Australia, VL8A Alice Spg	2310do			1300-1330	South Korea, KBS/R Korea	9570as	13670as	
1300-1400 vl	Australia, VL8K Katherine	2485do			1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as	15425as
1300-1400 vl	Australia, VL8T Tent Crk	2325do			1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as 15505as
1300-1400	Bahrain, Radio	6010do			1300-1400	United Kingdom, BBC London	5965af	6190af	6195am 7180as
1300-1330 mtwtfa	Belgium, R Vlaanderen Int	15545na	17775as				9410eu	9515na	9580as 9660eu
1300-1320	Brazil, Radiobras	15445na					9740na	9760eu	11750as 11760me
1300-1400	Canada, CFCX Montreal	6005do					15070eu	15220na	15310as 15400af
1300-1400	Canada, CFRX Toronto	6070do					15420af	15575me	17640eu 17705eu
1300-1400	Canada, CFVP Calgary	6030do					17790af	17885af	21470af 21660af
1300-1400	Canada, CHNX Halifax	6130do			1300-1400	USA, KCBI Dallas TX	9815am		
1300-1400	Canada, CKZN St John's	6160do			1300-1400	USA, KJES Mesquite NM	11715na		
1300-1400	Canada, CKZU Vancouver	6160do			1300-1400 vl	USA, KNLS Anchor Point AK	7355as		
1300-1400 s	Canada, RCI Montreal	11955na	17820na		1300-1400	USA, KTVN Salt Lk City UT	7510am		
1300-1400	China, China Radio Intl	9715as	11660as	15440pa	1300-1400 vl	USA, KWHR Naalehu HI	9930as		
1300-1400 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	1300-1400	USA, Monitor Radio Intl	7465na	13625as	
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490am	1300-1400	USA, VOA Washington DC	6110as	9560as	9760as 11715au
		21455am					15160as	15425as	
1300-1330	Egypt, Radio Cairo	17595as			1300-1400	USA, WEWN Birmingham AL	9350na	15695na	
1300-1330	Ghana, GBC Radio 1	4915do			1300-1400 vl	USA, WHRI Noblesville IN	9465am	15105am	
1300-1325 smtwh	Israel, Kol Israel	15640na	15650as		1300-1400	USA, WJCR Upton KY	7490na	13595na	
1300-1400 vl	Italy, IRRS Milano	7125eu			1300-1400	USA, WWCR Nashville TN	5935am	15685am	
1300-1400 mtwhf	Lebanon, Wings of Hope	9960me			1300-1400	USA, WYFR Okeechobee FL	5950na	6015na	11830na 13695na
1300-1400 vl	Malaysia, RTM Kota Kinaba	5980do					17750na		
1300-1400	Malaysia, RTM Radio 4	7295do			1300-1330	Vietnam, Voice of	6115as	10059as	12025as 15010as
1300-1325	Netherlands, Radio	5955eu	9650eu		1330-1400	Austria, R Austria Intl	15450as		
1300-1400 ocasnal	New Zealand, R NZ Intl	9700pa			1330-1400	Canada, RCI Montreal	9535as	11795as	11935eu 15315eu
1300-1350	North Korea, R Pyongyang	13760na	15230na				15325eu	17820eu	17895af 21455eu
1300-1330 s	Norway, Radio Norway Intl	9590eu			1330-1400	Finland, YLE/Radio	11900na	15400na	
1300-1400 mtwhf	Palau, KHBN Voice of Hope	9830as			1330-1400 tw	Ghana, GBC Radio 1	4915do		
1300-1400 vl	Papua New Guinea, NBC	9675do			1330-1400	India, All India Radio	11760as	15120as	
1300-1400	Philippines, FEBC Manila	11995as			1330-1400	Laos, National Radio of	7116as		
1300-1355	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	1330-1400	Netherlands, Radio	9890as	13700as	15150as
		11815eu			1330-1400	Sweden, Radio	15240na	17870na	
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	1330-1400	UAE, Radio Dubai	13675eu	15320eu	15435as 21605as
1300-1400	Russia, Radio Moscow Intl	7305as	9755as	9825af	1330-1400	Uzbekistan, R Tashkent	15295as	17815as	
		11705eu	15105eu	15290me	1335-1345	Greece, Voice of	15630na	17520na	
		15355me	15360eu	15440eu	1345-1400 vl	Myanmar, Radio	7185do		
		15470me	17570eu	17590eu	1345-1400	Vatican State, Vatican R	12050as	15585as	17525au
		21740af	21785af						

SELECTED PROGRAMS

Sundays

- 1303 Radio Singapore Int I: You Asked for It. A request and dedication music program.
- 1325 Radio Singapore Int I: Kiasu Capers. See S 1225.
- 1326 China Radio Int'l: Music Album.
- 1332 Radio Moscow: Your Top Tune.
- 1335 Radio Netherlands: Happy Station. See S 0137.
- 1340 Radio Singapore Int I: Commentary. See S 1140.
- 1345 Radio Singapore Int I: Singapore Snapshots. Zooming in on festivals and interesting people and places in Singapore.
- 1346 Radio Moscow: Transcription Service Review.

Mondays

- 1303 Radio Singapore Int I: Singa-Pop. Homegrown Singaporean talents, hot favorites, and local songs.
- 1306 Voice of Israel: The Israel Sound.
- 1307 Radio Korea: Seoul Calling.
- 1308 Radio Netherlands: From Sapphire to Laser. NEW! Robert Green takes an issue and illustrates how composers have tackled the subject.
- 1323 Radio Romania Int'l: Cultural Survey.
- 1332 Radio Moscow: Audio Book Club.
- 1337 Radio Netherlands: Newsline. Education for the Future (4th). See S 0037.
- 1340 Radio Singapore Int I: Newsline. See M 1145.
- 1352 Radio Netherlands: Research File. The Moon Programme (18th). See M 1152.

Tuesdays

- 1303 Radio Singapore Int I: The Vintage Years. A nostalgic musical trip featuring hits from yesteryear.
- 1309 Radio Korea: Seoul Calling.
- 1315 Radio Singapore Int I: Frontiers. See S 1145.
- 1321 Voice of Israel: New from Israel.
- 1330 Radio Australia: Jazz Notes.
- 1332 Radio Moscow: Music.
- 1337 Radio Netherlands: Newsline. See S 0037.
- 1340 Radio Singapore Int I: Business World. See T 1145.
- 1350 Radio Singapore Int I: Catching On. See T 1240.
- 1352 Radio Netherlands: Accent on Asia. See T 0152.

Wednesdays

- 1303 Radio Singapore Int I: Hot Trax. Information about new music releases in Singapore.
- 1309 Radio Korea: Music Box.
- 1337 Radio Netherlands: Newsline. See S 0037.
- 1340 Radio Singapore Int I: Newsline. See M 1145.
- 1352 Radio Netherlands: Documentary. See W 1152.

Thursdays

- 1303 Radio Singapore Int I: Singa-Pop. See M 1303.
- 1311 Radio Moscow: Culture and the Arts.
- 1311 Voice of Israel: Studio Three.
- 1314 Radio Vlaanderen Int'l: The Arts.
- 1332 Radio Moscow: Audio Book Club.
- 1337 Radio Netherlands: Newsline. See S 0037.
- 1340 Radio Singapore Int I: Business World. See T 1145.
- 1350 Radio Singapore Int I: Music. See T 1250.
- 1352 Radio Netherlands: Media Network. See H 0152.

Fridays

- 1303 Radio Singapore Int I: Hot Trax. See W 1303.
- 1328 Radio Romania Int'l: The Skylark.
- 1330 Radio Australia: Music Del.
- 1336 Radio Tashkent: Music.
- 1337 Radio Netherlands: Newsline. See S 0037.
- 1340 Radio Singapore Int I: Newsline. See M 1145.
- 1352 Radio Netherlands: Towards 2000. See F 1152.

Saturdays

- 1303 Radio Singapore Int I: Chartbeat. A countdown of chart-toppers on Singapore's radio stations.
- 1329 Radio Romania Int'l: Pages of Romanian Literature.
- 1332 Radio Moscow: Audio Book Club.
- 1335 China Radio Int'l: Music from China.
- 1337 Radio Netherlands: Newsline. Education for the Future (2nd). See S 0037.
- 1340 FEBC (Philippines): The Poetry Programme.
- 1340 Radio Singapore Int I: Regional Press Review. See A 1140.
- 1352 Radio Netherlands: Sounds Interesting. See S 0052.



Radio Vlaanderen staff: Samira Bendadi, Ahmed Oubari, Abdelmalek El Houari

FREQUENCIES

1400-1500	Australia, Radio	5995pa	7240pa	9710pa	9770as	1400-1500	Philippines, FEBC Manila	11995as			
		11695pa	11800pa			1400-1500	Russia, Radio Moscow Intl	7280eu	9560as	9755eu	9825eu
1400-1500 vl	Australia, VL8A Alice Spg	2310do						9890eu	9895eu	11705na	15105eu
1400-1500 vl	Australia, VL8K Katherine	2485do						15210na	15290na	15320na	15355na
1400-1500 vl	Australia, VL8T Tent Crk	2325do						15455eu	17570eu	17590eu	17750eu
1400-1500	Bahrain, Radio	6010do						21630eu	21740eu		
1400-1500	Bulgaria, Radio	15460as	17705as			1400-1500	Singapore, SBC Radio One	6155do	9740as		
1400-1500	Canada, CFCX Montreal	6005do				1400-1500	Slovakia, AWR Europe	13595as			
1400-1500	Canada, CFRX Toronto	6070do				1400-1500	South Korea, KBS/R Korea	5975as			
1400-1500	Canada, CFPV Calgary	6030do				1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1400-1500	Canada, CHNX Halifax	6130do				1400-1500	United Kingdom, BBC London	6195as	7180as	9410eu	9515na
1400-1500	Canada, CKZN St John's	6160do						9660eu	9740eu	9750eu	11750as
1400-1500	Canada, CKZU Vancouver	6160do						12095eu	15070eu	15260af	15310me
1400-1500 s	Canada, RCI Montreal	11955na	17820na					15400af	15575me	17640af	17705eu
1400-1500	China, China Radio Intl	7405na	11815as	15165as				17790af	17840af	17880af	21660af
1400-1500 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am		1400-1500	USA, KCBI Dallas TX	15725am			
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am	1400-1500	USA, KJES Mesquite NM	11715na			
		21455am				1400-1500	USA, KTBN Salt Lk City UT	7510na			
1400-1500	France, Radio France Intl	11910as	17560me	17695eu		1400-1500	USA, KWHR Naalehu HI	9930as			
1400-1420	Ghana, GBC Radio 1	4915do				1400-1500	USA, Monitor Radio Intl	9355as	11900na		
1400-1500	Ghana, GBC Radio 2	6130do	7295do			1400-1500	USA, VOA Washington DC	6110as	7125as	9645as	9760as
1400-1500	India, All India Radio	11760as	15120as					11705au	15160as	15205au	15395au
1400-1500	Iraq, Radio Iraq Intl	15250as						15425as			
1400-1500 vl	Italy, IRRS Milano	7125eu				1400-1500 vl	USA, WEWN Birmingham AL	9350na			
1400-1500	Japan, NHK/Radio	9535na	9750as	11705as	11840as	1400-1500 vl	USA, WHRI Noblesville IN	9465am	15105am		
		11915am				1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500 mtwhf	Lebanon, Wings of Hope	9960me				1400-1500	USA, WWCR Nashville TN	13845am	15685am		
1400-1500 vl	Malaysia, RTM Kota Kinaba	5980do				1400-1500	USA, WYFR Okeechobee FL	6015na	11830na	17750na	
1400-1500	Malaysia, RTM Radio 4	7295do				1415-1500	Bhutan, Bhutan BS	5025as			
1400-1500 vl	Malaysia, RTM Sarawak	4950do				1415-1425	Nepal, Radio	3230do	5005do	7165do	
1400-1500	Malta, V of Mediterranean	11925eu				1430-1500	Austria, R Austria Intl	6155eu	9870af	13730af	15450as
1400-1500 mtwhf	Morocco, RTV Marocaine	17595af				1430-1500	Ecuador, HCJB Quito	11925am	17490am	17890am	21455am
1400-1500 vl	Myanmar, Radio	7185do				1430-1500	Myanmar, Radio	5990do			
1400-1500	Netherlands, Radio	9890as	13700as	15150as		1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1400-1500 ocasnal	New Zealand, R NZ Intl	9700pa				1445-1500 smha	Mongolia, R Ulaanbaatar	7260as	7780as		
1400-1430 mtwhf	Palau, KHBN Voice of Hope	9830as									

SELECTED PROGRAMS

Sundays

- 1401 BBC: Feature. Racism - The Natural Evil (10th). Trying to discover the underlying causes of the violence. The First Foot on the Moon (17th, 24th). The 25th anniversary of the Apollo 11 adventure is relived. The Sparks that Lit a Bonfire (31st). First of a three-part series on Northern Ireland's troubles.
- 1401 BBC: Sportsworld. Wimbledon Men's Final (3rd).
- 1413 Radio Korea: Echoes of Korean Music.
- 1425 Radio Netherlands: Program Info. See S 0125.
- 1426 China Radio Int'l: Music Album.
- 1430 BBC: Anything Goes. A variety of music and much more with Bob Holness.
- 1435 Radio Netherlands: East of Edam. See S 0235.

Mondays

- 1405 BBC: Outlook. An up-to-the-minute mix of conversation, controversy and color from around the world.
- 1416 Radio Korea: Seoul Calling.
- 1425 Radio Netherlands: Program Info. See S 0125.
- 1430 BBC: Off the Shelf. See M 0430.
- 1430 Radio Bulgaria: Folk Studio.
- 1432 Radio Moscow: Folk Box.
- 1437 Radio Netherlands: Newline. Education for the Future (4th). See S 0037.
- 1445 BBC: Music Feature. Pop the Question. See S 0445.
- 1452 Radio Netherlands: Let's Get to Business. See M 1252.
- 1455 Radio Japan: Tokyo Pop-In.

Tuesdays

- 1405 BBC: Outlook. See M 1405.
- 1416 Radio Korea: Seoul Calling.
- 1425 Radio Netherlands: Program Info. See S 0125.
- 1430 BBC: Off the Shelf. See M 0430.
- 1432 Radio Moscow: Music.
- 1437 Radio Netherlands: Newline. See S 0037.
- 1445 BBC: Music Feature. Music As It Was. See T 0145.
- 1452 Radio Netherlands: Mirror Images. See T 1152.
- 1455 Radio Japan: Tokyo Pop-In.

Wednesdays

- 1400 KWHR (Hawaii): Contemporary Christian Music.
- 1405 BBC: Outlook. See M 1405.
- 1416 Radio Korea: Seoul Calling.
- 1425 Radio Netherlands: Program Info. See S 0125.
- 1430 BBC: Off the Shelf. See M 0430.
- 1430 Radio Jordan: Pop Session.
- 1432 Radio Moscow: Music.
- 1437 Radio Netherlands: Newline. See S 0037.
- 1445 BBC: Good Books. See S 0015.
- 1452 Radio Netherlands: Encore! See W 0152.
- 1455 Radio Japan: Tokyo Pop-In.

Thursdays

- 1405 BBC: Outlook. See M 1405.
- 1425 Radio Netherlands: Music Break. See S 0225.
- 1430 BBC: Off the Shelf. See M 0430.
- 1432 Radio Moscow: Yours for the Asking.
- 1437 Radio Netherlands: Newline. See S 0037.
- 1441 Radio France Int'l: Arts in France.
- 1445 BBC: The Learning World. See M 0615.
- 1452 Radio Netherlands: Research File. The Moon Programme (21st). See M 1152.
- 1455 Radio Japan: Tokyo Pop-In.

Fridays

- 1405 BBC: Outlook. See M 1405.
- 1420 Radio Japan: The Travel and Book Beat.
- 1425 Radio Netherlands: Program Info. See S 0125.
- 1430 BBC: Off the Shelf. See M 0430.
- 1432 Radio Moscow: Music at Your Request.
- 1437 Radio Netherlands: Newline. See S 0037.
- 1445 BBC: Global Concerns. See F 0145.
- 1445 BBC: Sports. Sportsworld - Wimbledon (1st). Tennis action.
- 1452 Radio Netherlands: Documentary. See W 1152.
- 1455 Radio Japan: Tokyo Pop-In.

Saturdays

- 1401 BBC: Sportsworld. Wimbledon Ladies' Final (2nd).
- 1425 Radio Netherlands: Program Info. See S 0125.
- 1430 Radio Bulgaria: Folk Studio (biweekly).
- 1430 Radio Jordan: Music.
- 1432 Radio Moscow: Timeline.
- 1435 China Radio Int'l: Music from China.
- 1437 Radio Netherlands: Newline. Education for the Future (2nd). See S 0037.
- 1440 WYFR (Satellite Network): Music.
- 1447 Radio Japan: Music Gallery.
- 1452 Radio Netherlands: Bats, Balls & Baselines. See A 0252.

Volunteer.

American Heart
Association

FREQUENCIES

1500-1600	Australia, Radio	5995pa 7260as 11660as	6060pa 9510as 11680as	6080pa 9710pa 11695pa	7240pa 9770as 11800pa	1500-1530 1500-1600	Romania, R Romania Intl Russia, Radio Moscow Intl	11775as 7305eu 9895as 12030as 15290na 15540eu	15335as 9540eu 11675eu 15105eu 15320as 15550eu	17720as 9755af 11695eu 15180eu 15425eu	9825eu 11875eu 15210as 15470as
1500-1600 vl	Australia, VL8A Alice Spg	2310do				1500-1600	S Africa, Channel Africa	4945af	11770af		
1500-1600 vl	Australia, VL8K Katherine	2485do				1500-1543 mtwhfa	Seychelles, FEBA Radio	7170as	11870as		
1500-1600 vl	Australia, VL8T Tent Crk	2325do				1500-1600	Singapore, SBC Radio One	6155do			
1500-1600	Bahrain, Radio	6010do				1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1500-1600	Canada, CFCX Montreal	6005do				1500-1600	Switzerland, Swiss R Intl	11960as	13635as	15505as	
1500-1600	Canada, CFRX Toronto	6070do				1500-1600	United Kingdom, BBC London	6190af 9515na 9760eu 15070af 17640af 17880af	6195eu 9660na 11750as 15260na 17705eu 21470af	7180as 9740me 11940af 15310as 17760na 21490af	9410eu 9750eu 12095eu 15400af 17840na 21660af
1500-1600	Canada, CFVP Calgary	6030do				1500-1600	USA, KCBI Dallas TX	15725am			
1500-1600	Canada, CHNX Halifax	6130do				1500-1600	USA, KJES Mesquite NM	11715na			
1500-1600	Canada, CKZU St John's	6160do				1500-1600	USA, KTBN Salt Lk City UT	7510na			
1500-1600	Canada, CKZU Vancouver	6160do				1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600 s	Canada, RCI Montreal	11955na	17820na			1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	China, China Radio Intl	7405na	11815as	15165as		1500-1600	USA, VOA Washington DC	6110as 9760as 19379me	7125as 11705as	9645as 15205as	9700as 15395as
1500-1600 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	1500-1600	USA, WCSN Scotts Cor ME	15665eu			
1500-1527	Czech Rep, Radio Prague	5930as	7345eu	13580me		1500-1600	USA, WEWN Birmingham AL	9350na	17510eu		
1500-1600	Ecuador, HCJB Quito	11925am 21455am	15250am	17490am	17890am	1500-1600	USA, WHRI Noblesville IN	9465am	15105am		
1500-1600	Ethiopia, Voice of	7165do	9560do			1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1550	Germany, Deutsche Welle	7185af	9735af	11965af	21600af	1500-1600	USA, WRNO New Orleans LA	15420na			
1500-1600	Guam, KTWB Agana	12025as				1500-1600	USA, WWCR Nashville TN	13845am	15685am		
1500-1600	Iraq, Radio Iraq Intl	15250as				1500-1600	USA, WYFR Okeechobee FL	11705na	11830na	17750na	
1500-1600 vl	Italy, IRRS Milano	7125eu				1500-1600	Austria, R Austria Intl	11780as			
1500-1600	Japan, NHK/Radio	9535na	9750as	11955na	15355af	1530-1545	India, All India Radio	4760as	7412as	9910as	11740as
1500-1600	Jordan, Radio	9560eu				1530-1600 mtwhf	Portugal, Radio	21515me			
1500-1600 mtwhf	Lebanon, Wings of Hope	9960me				1545-1600	Vatican State, Vatican R	12050as	15585as		
1500-1600 vl	Malaysia, RTM Kota Kinaba	5980do									
1500-1600	Malaysia, RTM Radio 4	7295do									
1500-1600	Malaysia, RTM Sarawak	4950do	7160do								
1500-1600	Malta, V of Mediterranean	11925eu									
1500-1513 smha	Mongolia, R Ulaanbaatar	13780as									
1500-1525	Netherlands, Radio	9890as	13700as	15150as							
1500-1600 ocasnal	New Zealand, R NZ Intl	9700pa									
1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13185eu						
1500-1600	Philippines, FEBC Manila	11995as									

SELECTED PROGRAMS

Sundays

- 1510 Radio Australia: Music of RA.
- 1515 BBC: Concert Hall. Classical music concerts.
- 1525 Radio Netherlands: Press Review. Summary of items in the Dutch media.
- 1526 China Radio Int'l: Music Album.
- 1530 Radio Australia: Fine Music Australia.
- 1533 Deutsche Welle: Pop from Germany.
- 1535 Radio Netherlands: Happy Station. See S 0137.

Mondays

- 1508 Radio Netherlands: From Sapphire to Laser. See M 1308.
- 1511 Radio Moscow: Culture and the Arts.
- 1515 BBC: Features. See M 0101.
- 1525 Radio Netherlands: Press Review. See S 1525.
- 1537 Radio Netherlands: Newslines. Education for the Future (4th). See S 0037.
- 1552 Radio Netherlands: Research File. The Moon Programme (18th). See M 1152.
- 1555 Radio Japan: Tokyo Pop-In.

Tuesdays

- 1500 KWHR (Hawaii): Great Christian Music.
- 1515 BBC: A Jolly Good Show. See T 0015.
- 1525 Radio Netherlands: Press Review. See S 1525.
- 1530 Radio Australia: Arts Australia.
- 1532 Radio Moscow: Music.
- 1537 Radio Netherlands: Newslines. See S 0037.
- 1546 Radio Portugal Int'l: Musical Kaleidoscope.
- 1552 Radio Netherlands: Accent on Asia. See T 0152.

Wednesdays

- 1510 Channel Africa: Yours and Mine.
- 1515 BBC: From Our Own Correspondent. See S 0330.
- 1525 Radio Netherlands: Press Review. See S 1525.
- 1530 BBC: Feature. Laughing Matters. NEW. A six-part series

- about comedy around the world.
- 1530 WRNO: Jazz 30.
- 1537 Radio Netherlands: Newslines. See S 0037.
- 1539 Radio Moscow: Music.
- 1552 Radio Netherlands: Documentary. See W 1152.
- 1555 Radio Japan: Tokyo Pop-In.

Thursdays

- 1500 KWHR (Hawaii): Great Christian Music.
- 1515 BBC: The Greenfield Collection. See H 0015.
- 1525 Radio Netherlands: Press Review. See S 1525.
- 1537 Radio Netherlands: Newslines. See S 0037.
- 1552 Radio Netherlands: Media Network. See H 0152.
- 1555 Radio Japan: Tokyo Pop-In.

Fridays

- 1505 Radio Jordan: Music.
- 1515 BBC: Music Review. See F 0015.

- 1515 Radio Finland: Cultural Close-Up.
- 1525 Radio Netherlands: Press Review. See S 1525.
- 1532 Radio Moscow: The Jazz Show.
- 1537 Radio Netherlands: Newslines. See S 0037.
- 1552 Radio Netherlands: Towards 2000. See F 1152.
- 1555 Radio Japan: Tokyo Pop-In.

Saturdays

- 1500 KWHR (Hawaii): Great Christian Music.
- 1500 WHRI: Great Christian Music.
- 1506 Channel Africa: Yours for the Asking.
- 1515 BBC: Sportsworld. See A 1401.
- 1525 Radio Netherlands: EuroPress Review. See A 0125.
- 1532 Radio Moscow: Music.
- 1535 China Radio Int'l: Music from China.
- 1537 Radio Netherlands: Newslines. Education for the Future (2nd). See S 0037.
- 1552 Radio Netherlands: Sounds Interesting. See S 0052.

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1700-1800	Australia, Radio	6060pa	6080as	7240pa	7260as
		9510as	9580pa	9860pa	11660pa
		11695pa	11880pa		
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800	Bahrain, Radio	6010do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	7405af	9570af	11575af	
1700-1800	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1700-1727	Czech Rep, Radio Prague	5930eu	7345eu	11640eu	
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 vl	Eqt Guinea, Radio Africa	7200af			
1700-1800 as	Guam, KSDA AWR Agat	13720as			
1700-1800 vl	Italy, IRRS Milano	7125eu			
1700-1800	Japan, NHK/Radio	6150na	9535na	9580as	11930as
1700-1730	Jordan, Radio	9560eu			
1700-1730	Kazakhstan, Radio Almaty	5035eu	5260eu	15270as	15360as
		17605as			
1700-1713 mtwhfa	Lebanon, Voice of	6550eu			
1700-1800	Liberia, Radio ELWA	4760do			
1700-1800 a	Morocco, RTV Marocaine	17815af			
1700-1800 mtwtf	New Zealand, R NZ Intl	6100pa			
1700-1750	North Korea, R Pyongyang	9640af	9977af		
1700-1750	Pakistan, Radio	7485eu	9855eu		
1700-1800	Russia, Radio Moscow Intl	6970eu	9510eu	9880na	11705af
		11995af	12050af	13665eu	15105na
		15180na	15190na	15290na	15385na
		15500af	15520af	17760eu	17875as
		21740af			
1700-1800	S Africa, Channel Africa	4945af	11770af		
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1800	Slovakia, AWR Europe	13595as	15625as		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1700-1715	Swaziland, Trans World R	7120af			
1700-1730	Switzerland, Swiss R Intl	9885af	13635me	15635af	
1700-1730	United Kingdom, BBC London	6005af	17860af		
1700-1800	United Kingdom, BBC London	3955eu	6180eu	6190af	6195eu
		7160me	9410eu	9515eu	9630af
		9740me	11750as	11940af	12095af
		15070af	15260af	15400af	15420af
		17860af	17880af	21470af	21660af
1700-1800	USA, KCBI Dallas TX	15725am			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	7425as			
1700-1800	USA, Monitor Radio Intl	9355af			
1700-1800	USA, VOA Washington DC	6040eu	6110as	7125as	9645as
		9700eu	9760eu	11855as	11920af
		12040af	13710af	15205eu	15320af
		15395as	15410af	15445af	17790af
		19379me			
1700-1800	USA, WEWN Birmingham AL	13615na	15695eu		
1700-1800 vl	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WINB Red Lion PA	15715eu			
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WWCR Nashville TN	13845am	15610am	15685am	
1700-1800	USA, WYFR Okeechobee FL	21500eu			
1715-1730 mtwhf	Swaziland, Trans World R	7120af			
1730-1800	Netherlands, Radio	6020af	9605af	17655af	21590af
1730-1800	Romania, R Romania Intl	11830af	15340af	15365af	17805af
1730-1800	Sweden, Radio	6065eu	9655af	15390me	
1730-1800	Vatican State, Vatican R	9695af	11625af	15570af	
1745-1800	Bangladesh, Radio	7190eu	9700eu		
1745-1800	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		

1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1800-1900	Ecuador, HCJB Quito	21455am			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900 vl	Eqt Guinea, Radio Africa	7200af			
1800-1815	Ghana, GBC Radio 1	4915do			
1800-1815	Ghana, GBC Radio 2	3316do			
1800-1900 as	Guam, KSDA AWR Agat	13720as			
1800-1900	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1800-1900 vl	Italy, IRRS Milano	7125eu			
1800-1900	Kuwait, Radio	11990na			
1800-1900	Liberia, Radio ELWA	4760do			
1800-1900	Netherlands, Radio	6020af	9605af	17655af	21590af
1800-1900 mtwtf	New Zealand, R NZ Intl	6100pa			
1800-1900	North Korea, R Pyongyang	9640as	13750as	15435as	
1800-1830 s	Norway, Radio Norway Intl	5960eu	9590af	11745me	15220af
1800-1855	Poland, Polish R Warsaw	5995eu	7270eu	7285eu	
1800-1900	Russia, Radio Moscow Intl	6970eu	7105eu	7170na	7260na
		12015as	12050na	12065af	13665af
		15105eu	15190na	15290na	15375af
		15425na	15480na	15580na	17760eu
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900	Sudan, Radio Omdurman	9170af			
1800-1900	Swaziland, Trans World R	3200af	9500af		
1800-1900	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	9410eu
		9630af	9740me	11940af	11955as
		12095af	15205me	15205me	15400af
		15420af	17880af		
1800-1900	USA, KCBI Dallas TX	15725am			
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625as			
1800-1900	USA, Monitor Radio Intl	9355pa	13770eu	17510af	
1800-1900	USA, VOA Washington DC	6040eu	9700eu	9760eu	11920af
		12040af	13675af	13710af	15410af
		15580af	17800af	17895af	19379me
		15695eu	18930sa		
1800-1900 vl	USA, WEWN Birmingham AL	13615na	15695eu		
1800-1900	USA, WHRI Noblesville IN	13760am	15105am		
1800-1900	USA, WINB Red Lion PA	15715eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WWCR Nashville TN	13845am	15610am	15685am	
1800-1845	USA, WYFR Okeechobee FL	21500eu			
1800-1830	Vietnam, Voice of	9840eu	12020eu		
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880me	13730af
1830-1900	Kazakhstan, Radio Almaty	3955eu	5035eu	15155as	15270as
		15360as	17765as		
1830-1900	Serbia, Radio Yugoslavia	6100eu	9620eu		
1840-1850 mtwhfa	Greece, Voice of	15650af	17525af		
1845-1900 lrreg s	Mali, RDTV Maliene	4783do	4835do	5995do	
1850-1900	New Zealand, R NZ Intl	11735pa			



Voice of Free China QSL
from John Carson, OK

1900-2000	Australia, Radio	5960as 7240pa 11695pa	5995pa 7260as 11720pa	6060pa 9580pa 11880pa	6080as 11680pa
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-2000	Bahrain, Radio	6010do			
1900-1918	Brazil, Radiobras	15268eu			
1900-2000	Bulgaria, Radio	9700eu	11720eu		
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	9440af	11515af		
1900-2000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1900-2000	Ecuador, HCJB Quito	15270eu	17490eu	17790eu	21455eu
1900-2000 vl	Eq Guinea, Radio Africa	7200af			
1900-2000	Finland, YLE/Radio	9730eu	9770eu	11755eu	15440eu
1900-1950	Germany, Deutsche Welle	9670af	9735af	11740af	11785af
		11810af	13690af	13790af	
1900-1930	Hungary, Radio Budapest	3955eu	6110eu	7220eu	
1900-1945	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1900-1930	Israel, Kol Israel	9435eu	11603na	11675na	15640na
		17575af			
1900-2000 vl	Italy, IRRS Milano	7125eu			
1900-2000	Japan, NHK/Radio	6150as	7140au	9535as	9580au
		9610as			
1900-2000	Kuwait, Radio	11990eu			
1900-1930 as	Latvia, Radio	5935eu			
1900-2000	Liberia, Radio ELWA	4760do			
1900-2000 s	Morocco, RTV Marocaine	11920as			
1900-1925	Netherlands, Radio	6020af	9605af	17655af	21590af
1900-2000	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, Radio	3326do	4770do	4990do	
1900-2000	Nigeria, Voice of	7255af			
1900-2000 vl	Papua New Guinea, NBC	9675do			
1900-1930 mtwhf	Portugal, Radio	9780eu	9815eu	11975af	17680af
1900-2000	Romania, R Romania Intl	9690eu	9750eu	11810eu	11940eu
1900-2000	Russia, Radio Moscow Intl	6970eu	7105eu	7170na	7260eu
		9685eu	12050eu	13665eu	15105af
		15180eu	15290af	15425na </td <td>15525af</td>	15525af
		15580af	17560af	17605eu	17760eu
		17875af			
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu		
1900-2000	Slovakia, AWR Europe	15625as			
1900-2000	Spain, Spanish Natl Radio	11775af			
1900-2000	Swaziland, Trans World R	3200af	3240af		
1900-1930	Switzerland, Swiss R Intl	3985eu	6165eu		
1900-2000 vl	Uganda, Radio	4976do			
1900-2000	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	9410eu
		9630af	9740me	11955as	12095af
		15070af	15400af	17880af	
1900-2000	USA, KCBI Dallas TX	15725am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, KWHR Naalehu HI	13625as			
1900-2000	USA, Monitor Radio Intl	13770eu	15665eu	17510af	9700eu
1900-2000	USA, VOA Washington DC	3980eu	6040eu	9525as	9700eu
		9760eu	11870as	11920af	12040af
		13710af	15180au	15205af	15410af
		15580af	17800af		
1900-2000	USA, WEWN Birmingham AL	13615na	18930sa		
1900-2000 vl	USA, WHRI Noblesville IN	9485am	9590am	13760am	
1900-2000	USA, WINB Red Lion PA	15715eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000	USA, WWCR Nashville TN	13845am	15610am	15685am	
1900-2000	USA, WYFR Okeechobee FL	15355eu	21615af		
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1915-2000	Vatican State, Vatican R	3945eu	3975eu	5882eu	
1930-2000	Iran, VOIRI Tehran	9022me	9745me		
1930-2000	Netherlands, Radio	17605af	17655af		
1930-2000	Slovakia, R Slovakia Intl	5915eu	7345eu	9440eu	
1935-1955	Italy, RAI Rome	7275eu	11800eu		
1940-2000 mha	Mongolia, R Ulaanbaatar	11790eu	11850eu		

2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bahrain, Radio	6010do			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	9440af	9920eu	11500eu	11715af
		15110af			
2000-2100	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2000-2027	Czech Rep, Radio Prague	5930eu	7345eu	9485eu	
2000-2100	Ecuador, HCJB Quito	21455am			
2000-2100 vl	Eq Guinea, Radio Africa	7200af			
2000-2030 mt	Estonia, Estonian Radio	5925eu			
2000-2050	Germany, Deutsche Welle	7170eu	9615eu		
2000-2030	Ghana, GBC Radio 1	4915do			
2000-2030	Ghana, GBC Radio 2	3366do			
2000-2010 mtwhfa	Greece, Voice of	9375eu			
2000-2100	Indonesia, Voice of	9675as	11752as		
2000-2100 vl	Italy, IRRS Milano	7125eu			
2000-2010 mtwhf	Kenya, Kenya BC Corp	4935do			
2000-2100	Kuwait, Radio	11990eu			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2010 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
2000-2025	Netherlands, Radio	17605af	17655af		
2000-2100	New Zealand, R NZ Intl	11735pa			
2000-2100	Nigeria, Radio	3326do	4770do	4990do	
2000-2100	Nigeria, Voice of	7255af			
2000-2030 s	Norway, Radio Norway Intl	9590eu	15220af		
2000-2100 vl	Papua New Guinea, NBC	9675do			
2000-2100	Russia, Radio Moscow Intl	7250eu	7260eu	9190na	9450na
		9620na	9685na	9880na	9895na
		11630eu	11675eu	11715eu	11730na
		11760eu	11805na	11940eu	12050na
		15180eu	15290eu	15425eu	15580na
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu		
2000-2100	Slovakia, AWR Europe	6055as			
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do		
2000-2100	Sri Lanka, SLBC Colombo	9720eu	15120eu		
2000-2045	Swaziland, Trans World R	3200af	3240af		
2000-2030	Switzerland, Swiss R Intl	6135af	9885af	13635af	15505af
2000-2050	Turkey, Voice of	9900eu			
2000-2100 vl	Uganda, Radio	4976do			
2000-2030	United Kingdom, BBC London	6190af	6195eu	7160me	9630af
		9740me	17880af		
2000-2100	United Kingdom, BBC London	3255af	3955eu	4570af	5975am
		6005af	6180eu	6195af	7325eu
		9410eu	12095af	15070af	15260sa
		15400af	17800af		
2000-2100	USA, KCBI Dallas TX	15725am			
2000-2100	USA, KJES Mesquite NM	15385na			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100 as	USA, KVOH Los Angeles CA	1775am			
2000-2100	USA, KWHR Naalehu HI	15405as			
2000-2100	USA, Monitor Radio Intl	13770af	15665eu		
2000-2100	USA, VOA Washington DC	3980eu	6040eu	7415af	9700eu
		9760na	11820af	13710af	15160af
		15410af	15445af	15580af	17800af
		19379me	21485af		
2000-2100 vl	USA, WEWN Birmingham AL	13615na			
2000-2100	USA, WHRI Noblesville IN	9485am	13760am		
2000-2100	USA, WINB Red Lion PA	15715eu			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100	USA, WWCR Nashville TN	13845am	15610eu	15685am	
2000-2100	USA, WYFR Okeechobee FL	17612af	21525af	21615eu	
2000-2045	USA, WYFR Okeechobee FL	15355eu			
2000-2030	Vatican State, Vatican R	9645af	11625af	15570af	
2000-2010	Vatican State, Vatican R	3945eu	3975eu	5882eu	
2005-2100	Syria, Radio Damascus	12085eu	15095na		
2010-2100 sa	Kenya, Kenya BC Corp	4935do			
2015-2045 s	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Rome	7235me	9575me	11800me	
2030-2100	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670me
		15325me	17820me	17850af	17875af
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2030-2100	Poland, Polish R Warsaw	5955eu	6135eu	7285eu	
2030-2100	South Korea, KBS/R Korea	5975eu	9870as	11715af	
2030-2100	Sweden, Radio	6065af	9655me		
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	11880pa	15265pa	

2100-2200	Australia, Radio	9645as	11720pa	11855as	
2100-2130 vl	Australia, VLBA Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2106	Bahrain, Radio	6010do			
2100-2130	Belgium, R Vlaanderen Int	5910eu			
2100-2200	Bulgaria, Radio	9700eu	11645eu	11720na	
2100-2200 vl	Canada, CBC N. Quebec	9625do			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2130	Canada, RCI Montreal	5995eu	7235eu	13650me	13670me
		15325af	17820af	17850af	17875af
2100-2200	China, China Radio Intl	9920eu	1:500eu		
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2100-2200	Cuba, Radio Havana Cuba	17760eu			
2100-2127	Czech Rep, Radio Prague	5930eu	7345eu	9420eu	
2100-2130	Ecuador, HCJB Quito	21455am			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	9670as	9735af	9765as	11765af
		11785as	13690as	15135af	
2100-2130	Hungary, Radio Budapest	3955eu	6110eu	7220eu	
2100-2200	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		
2100-2200 vl	Italy, IRRS Milano	7125eu			
2100-2200	Japan, NHK/Radio	6035as	6185as	9610af	9625af
		9750me	11925eu		
2100-2115	Japan, NHK/Radio	9660as	11915as		
2100-2200	Liberia, Radio ELWA	4760do			
2100-2137	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, Radio	3326do	4770do	4990do	
2100-2200	Nigeria, Voice of	7255af			
2100-2200 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2100-2200 vl	Papua New Guinea, NBC	9675do			
2100-2125	Poland, Polish R Warsaw	5995eu	6135eu	7285eu	
2100-2200	Romania, R Romania Intl	7225eu	9690eu	9750eu	11940eu
2100-2200	Russia, Radio Moscow Intl	6970na	7150na	9470eu	9550eu
		9685eu	9750eu	9820eu	9880eu
		9895as	11730na	11760na	11770na
		11805na	11920na	12050na	15290na
		15425na	15580na	17605na	
2100-2115 vl	Sierra Leone, SLBS	3316do			
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2200	South Korea, KBS/R Korea	6480eu	15575eu		
2100-2200	Spain, Spanish Natl Radio	6125eu			
2100-2130	Sri Lanka, SLBC Colombo	9720eu	15120eu		
2100-2105	Syria, Radio Damascus	12085eu	15095na		
2100-2200	Ukraine, R Ukraine Intl	4825eu	6010eu	6020eu	6090eu
		7150eu	7285eu	9640eu	11780eu
		11950eu	12030eu		
2100-2200	United Kingdom, BBC London	3255af	3955eu	5975am	6005af
		6110na	6180eu	6195eu	7325eu
		9410eu	9590na	11955as	12095na
		15260sa	15400af	15575eu	
2100-2200	USA, KCBI Dallas TX	15725am			
2100-2200	USA, KTBN Salt Lk City UT	15590na			
2100-2200	USA, KWHR Naalehu HI	13720as			
2100-2200	USA, Monitor Radio Intl	13770eu	13840pa		
2100-2200	USA, VOA Washington DC	6040eu	6095eu	9760eu	11870as
		13710as	15185au	15205af	15410af
		15580af	17735as	17800af	19379me
2100-2200	USA, WEWN Birmingham AL	13615na	18930sa		
2100-2200 vl	USA, WHRI Noblesville IN	13760am	17830am		
2100-2200	USA, WINB Red Lion PA	15715eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200	USA, WWCR Nashville TN	13845am	15610am	15685am	
2100-2200	USA, WYFR Okeechobee FL	15566eu	17612af	21525af	
2100-2145	USA, WYFR Okeechobee FL	21615eu			
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom, BBC Carib	6110am	15390am	17715am	
2130-2143	Armenia, Radio Yerevan	11790eu	11960eu		
2130-2200	Australia, Radio	15240pa	15320pa	15365pa	17795pa
		17860pa			
2130-2200 vl	Australia, VLBA Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200	Austria, R Austria Intl	5945af	6155af	9880eu	13730af
2130-2200	Ecuador, HCJB Quito	11835eu	15270eu	17490eu	17790eu
		21455eu			
2130-2200	Israel, Kol Israel	7465eu	9435sa	11603na	11675na

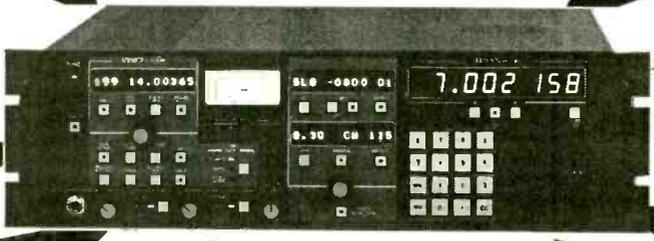
2130-2200	Lithuania, Radio Vilnius	17575sa			
2130-2200	Sweden, Radio	9675eu	9710eu		
2138-2200	New Zealand, R NZ Intl	6065eu			
		15115pa			
2200-2300	Australia, Radio	9645as	11720pa	11855as	15240pa
		15320pa	15365pa	17795pa	17860pa
2200-2300 vl	Australia, VLBA Alice Spg	4835do			
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	11705as	11845am	11875am	15305am
2200-2300	Canada, RCI Montreal	5960na	9755na	13670am	
2200-2300	China, China Radio Intl	7170eu			
2200-2230	China, China Radio Intl	3985eu			
2200-2300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2200-2300	Cuba, Radio Havana Cuba	6180na	9550eu		
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300 vl	Eq Guinea, Radio Africa	7200af			
2200-2230	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265eu		
2200-2300 vl	Italy, IRRS Milano	7125eu			
2200-2225	Italy, RAI Rome	5990as	9710as	11800as	
2200-2300 vl	Malaysia, RTM Kota Kinaba	5980do			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, R NZ Intl	15115pa			
2200-2300	Nigeria, Radio	3326do	4770do	4990do	
2200-2300	Nigeria, Voice of	7255af			
2200-2250	North Korea, R Pyongyang	9325eu	13185eu		
2200-2300 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2200-2300 vl	Papua New Guinea, NBC	9675do			
2200-2300	Russia, Radio Moscow Intl	7180eu	9550eu	9620na	9750na
		11710as	11805na	11960as	12050na
		12065as	15290na	15410na	15425na
		17605na	17690na		
2200-2215 vl	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, AWR Europe	11610as			
2200-2235 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2230	South Korea, KBS/R Korea	7275as	9640as		
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	17750eu	21720eu		
2200-2250	Turkey, Voice of	7185me	9445na	11710eu	
2200-2300	UAE, Radio Abu Dhabi	9605na	9770na	11885na	
2200-2300	United Kingdom, BBC London	3955eu	5975am	6195eu	7325eu
		9410eu	9590na	9915am	11750sa
		11955as	12095af	15260sa	15400af
		15575eu			
2200-2300	USA, KCBI Dallas TX	15725am			
2200-2230 s	USA, KGEI San Fran CA	15280sa			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, KWHR Naalehu HI	17645as			
2200-2300	USA, Monitor Radio Intl	13625as	13770na	15405as	17555sa
2200-2300	USA, VOA Washington DC	6035as	7215as	9770as	11760as
		15185au	15290as	15305as	17735au
		17820as			
2200-2300	USA, WEWN Birmingham AL	13615na			
2200-2300	USA, WHRI Noblesville IN	9485am	13760am		
2200-2300	USA, WINB Red Lion PA	15715eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 vl	USA, WWCR Nashville TN	12160am	13845am	15685am	
2200-2245	USA, WYFR Okeechobee FL	17612af	21525af		
2230-2243	Armenia, Radio Yerevan	11790eu	11920eu	11945eu	
2230-2300	Finland, YLE/Radio	11755na	13750as		
2230-2300	Sweden, Radio	6065eu			
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Bulgaria, Radio	9700na	11720na		
2245-2300	Ghana, GBC Radio 1	4915do			
2245-2300	Ghana, GBC Radio 2	3366do			
2245-2300	India, All India Radio	9910as	11745as	11785as	15110as
2245-2300 mtwtf	USA, Voice of the OAS	9670am	11835am	15160am	
2245-2300	Vatican State, Vatican R	9600as	11830au		
2300-0000	Australia, Radio	11720pa	11855as	15240pa	15320pa

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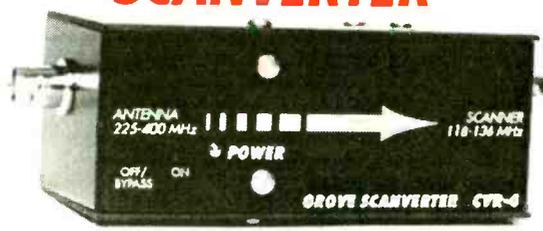
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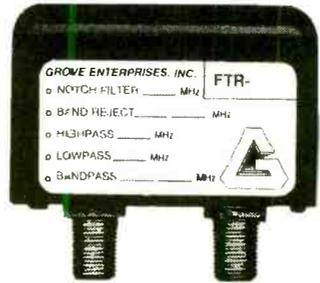
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2300-0000 vl	Australia, VLBA Alice Spg	15365pa	17795pa	17860pa	2300-0000	Russia, Radio Moscow Intl	9620na	9695na	9750na	11665as	
2300-0000 vl	Australia, VL8K Katherine	4835do					11750as	11805na	12050na	15290as	
2300-0000 vl	Australia, VL8T Tent Crk	5025do					15410as	15425na	17610as	17690na	
2300-2345	Bulgaria, Radio	4910do			2300-0000	Singapore, R Singapore Int	21480na				
2300-0000 vl	Canada, CBC N. Quebec	9700na	11720na		2300-0000	Thailand, Radio	9530as				
2300-0000	Canada, CFCX Montreal	9625do			2300-0000	UAE, Radio Abu Dhabi	9655as	11905as			
2300-0000	Canada, CFRX Toronto	6005do			2300-0000	United Kingdom, BBC London	9605na	9770na	11885na		
2300-0000	Canada, CFPV Calgary	6070do					7180eu	7325na	9410eu	9590na	
2300-0000	Canada, CHNX Halifax	6030do					9915am	11750sa	11955as	15260sa	
2300-0000	Canada, CKZN St John's	6130do			2300-0000	USA, KCBI Dallas TX	15280as	15370as	15400af		
2300-0000	Canada, CKZU Vancouver	6160do			2300-0000	USA, KTVN Salt Lk City UT	13740am				
2300-0000	Canada, RCI Montreal	5960na	9755na	13670na	2300-0000	USA, KWHR Naalehu HI	15590na				
2300-0000 as	Canada, RCI Montreal	11940am		15235am	2300-0000	USA, Monitor Radio Intl	17510as				
2300-0000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	2300-0000	USA, VOA Washington DC	13625as	13770na	15405as	17555sa
2300-0000	Ecuador, HCJB Quito	9745am	21455am				7215as	9770as	11760as	15185as	
2300-0000	Guam, KSDA AWR Agat	15610as					15290as	15305as	17735as	17820as	
2300-0000	India, All India Radio	9910as	11745as	11785as	15110as	2300-0000	USA, WEWN Birmingham AL	9985eu	11820sa	13615na	
		15145as				2300-0000 vl	USA, WHRI Noblesville IN	7315am			
2300-0000 vl	Italy, IRRS Milano	7125eu				2300-0000	USA, WINB Red Lion PA	15715eu			
2300-0000	Japan, NHK/Radio	5975eu	6125eu	6185as	9610as	2300-0000	USA, WJCR Upton KY	7490na	13595na		
		9625as				2300-0000	USA, WRNO New Orleans LA	7355am			
2300-2330 as	Lithuania, Radio Vilnius	9400eu	11770eu			2300-0000	USA, WWCR Nashville TN	5810am	13845am	15685am	
2300-0000 vl	Malaysia, RTM Kota Kinaba	5980do				2300-2315	Vatican State, Vatican R	9600as	11830au		
2300-0000 smtwha	Malaysia, RTM Radio 4	7295do				2330-0000	Belgium, R Vlaanderen Int	11740na	13655sa		
2300-0000	New Zealand, R NZ Intl	15115pa				2330-0000	Netherlands, Radio	6020na	6165na		
2300-2350	North Korea, R Pyongyang	11700na	13650na			2330-0000 m	Sri Lanka, SLBC Colombo	15425na			
2300-2330 s	Norway, Radio Norway Intl	9655sa	11860na			2330-0000	Sweden, Radio	11910as			
2300-0000 mtwhfa	Palau, KHBN Voice of Hope	11980as				2330-0000	USA, R Bosnia H via WHRI	7315am			
2300-0000 vl	Papua New Guinea, NBC	9675do				2330-0000	Vietnam, Voice of	9840as	12020as	15010as	
						2335-2345 smtwhf	Greece, Voice of	9425sa	11595sa	11645sa	

SELECTED PROGRAMS

Sundays

- 2322 Radio Vilnius: Letterbox.
- 2330 BBC: Feature. See S 1401.
- 2335 Radio Vlaanderen Int'l: P.O. Box 26.
- 2336 Radio Netherlands (na): East of Edam. Lively mixture of off-beat interviews, music, and a touch of humor.
- 2336 Radio Netherlands Int'l: East of Edam.
- 2339 Radio Vlaanderen Int'l: Music from Flanders.

Mondays

- 2300 WWCR: The Kurt Saxon Show (live).
- 2330 BBC: Multitrack: Hit List. The UK Top 20.
- 2337 Radio Netherlands: Newsline. Education for the Future (4th). See S 0037.
- 2352 Radio Netherlands (na): Let's Get to Business. Down-to-earth program of trade and business with Barry O'Dwyer.

Tuesdays

- 2300 WRNO: World in Review.
- 2300 WWCR: The Kurt Saxon Show (live).
- 2311 Radio Moscow: News and Views.
- 2330 BBC: Omnibus. American ambassadors to London are featured.
- 2330 BBC: Omnibus. Each week a half-hour programme on practically any topic under the sun.
- 2337 Radio Netherlands (na): Newsline. See S 0037.
- 2353 Radio Netherlands (na): Accent on Asia. A magazine program focusing on Asia with interviews and music.

Wednesdays

- 2300 Radio Bulgaria: Today.
- 2300 WWCR: The Kurt Saxon Show (live).
- 2315 Radio Bulgaria: Cultural Review.
- 2330 BBC: Multitrack: X-Press. New pop records, interviews, news and competitions.
- 2330 WHRI: The Music and the Message.
- 2335 Radio Bulgaria: Questionline.
- 2337 Radio Netherlands (na): Newsline. See S 0037.
- 2352 Radio Netherlands (na): Encore!. Reruns of the best programs from earlier seasons.

Thursdays

- 2300 WHRI: The Music and the Message.
- 2300 WWCR: The Kurt Saxon Show (live).
- 2330 BBC: Feature. Laughing Matters. See W 1530.

- 2332 Radio Moscow: The Jazz Show.
- 2337 Radio Netherlands (na): Newsline. See S 0037.
- 2343 Radio Vlaanderen Int'l: North-South.
- 2345 Radio Bulgaria: Timeout for Music.
- 2352 Radio Netherlands: Research File. The Moon Programme (21st). See M 1152.

Fridays

- 2300 WWCR: The Kurt Saxon Show (live).
- 2330 BBC: Multitrack: Alternative. Latest developments on the British music scene.
- 2332 Radio Moscow: Folk Box.
- 2337 Radio Netherlands (na): Newsline. See S 0037.
- 2339 Radio Vlaanderen Int'l: Belgium Today.

- 2349 Radio Vlaanderen Int'l: Tourism.
- 2353 Radio Netherlands (na): Documentary. See H 0052.

Saturdays

- 2300 Radio Bulgaria: Weekly Spotlight.
- 2307 Radio Canada Int'l: The Inside Track.
- 2330 BBC: Classical Music Feature. Best on Record. Classic tracks compared.
- 2330 Radio Australia: At Your Request.
- 2337 Radio Netherlands: Newsline. Education for the Future (2nd). See S 0037.
- 2348 Radio Vlaanderen Int'l: Tourism.
- 2353 Radio Netherlands (na): Bats, Balls & Baselines. Sports results, news, issues, features, personality profiles, and investigations.



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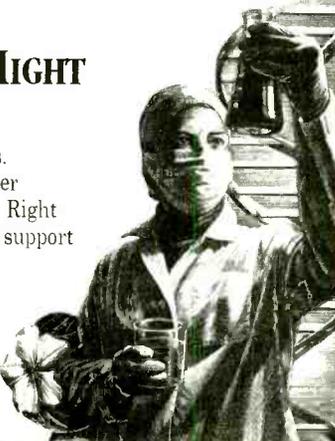
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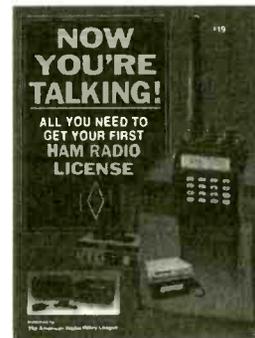
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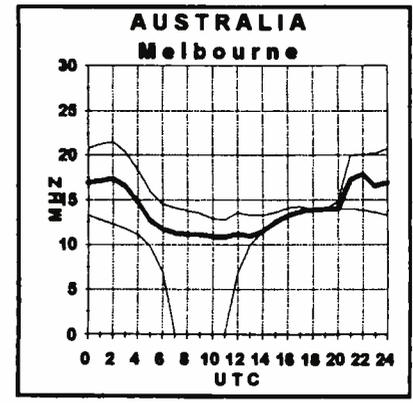
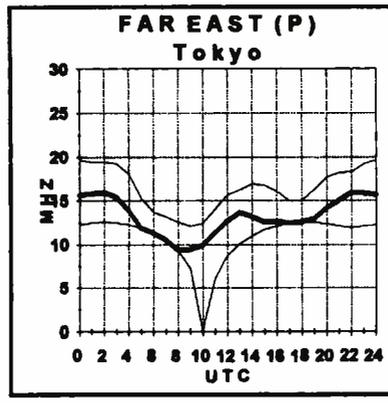
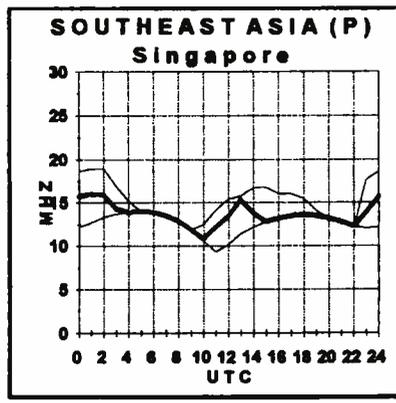
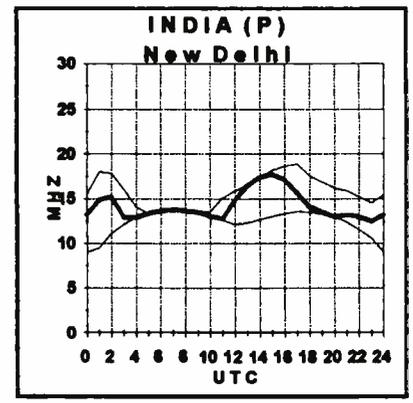
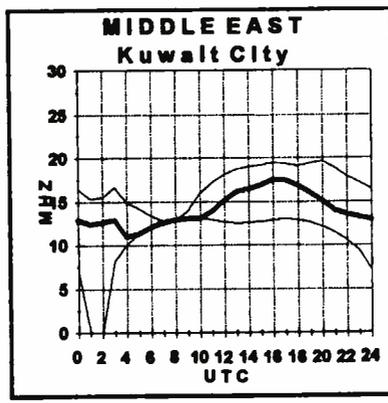
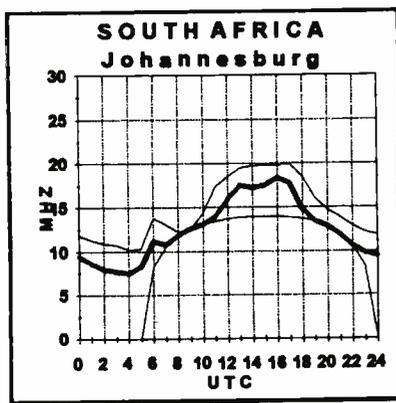
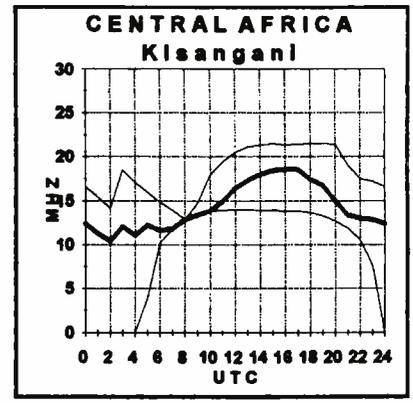
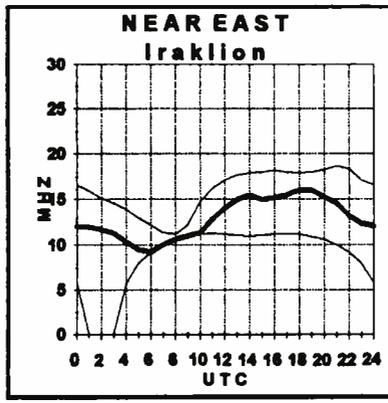
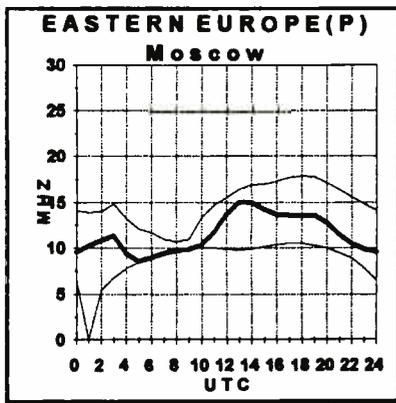
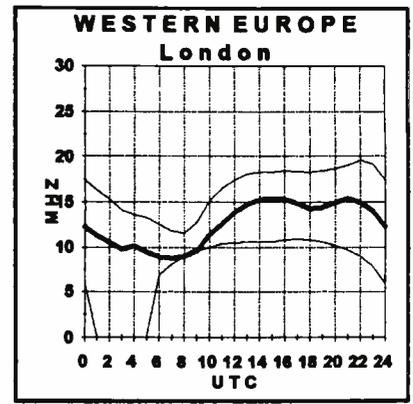
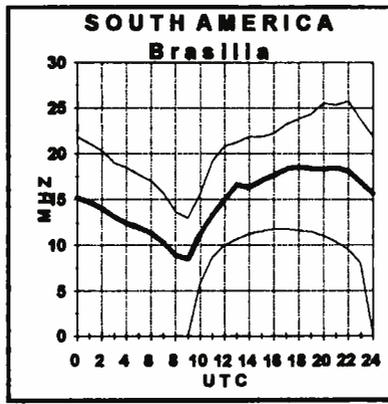
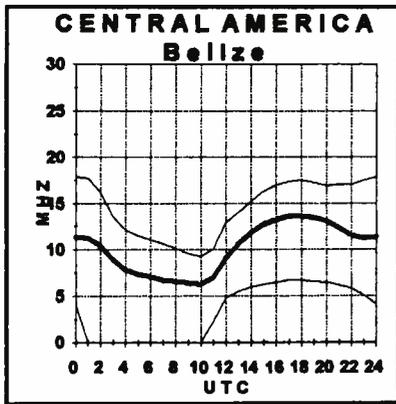
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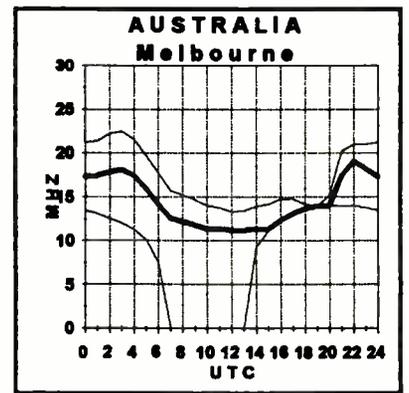
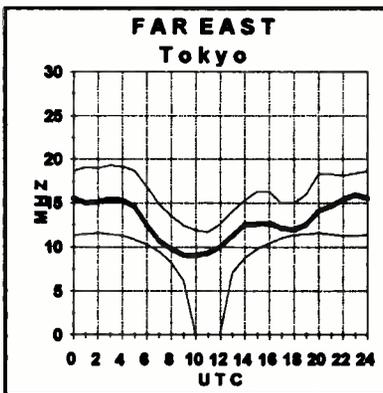
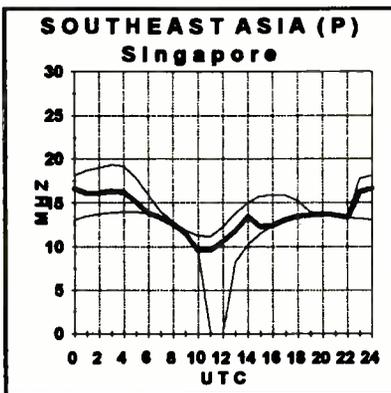
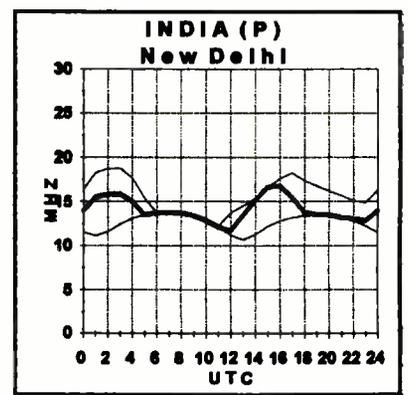
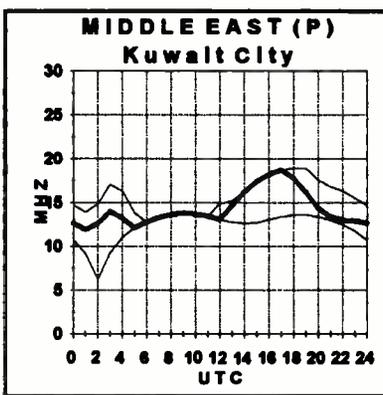
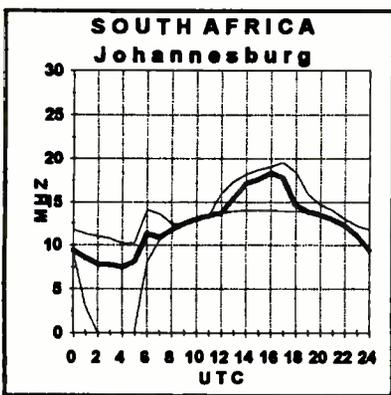
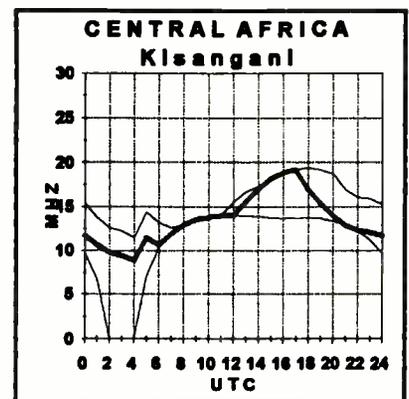
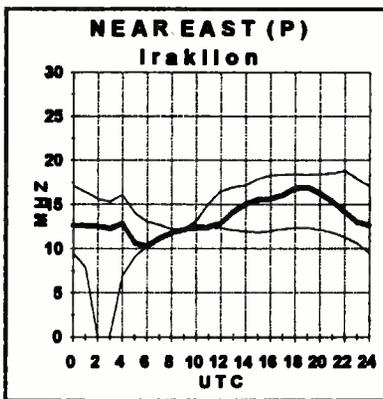
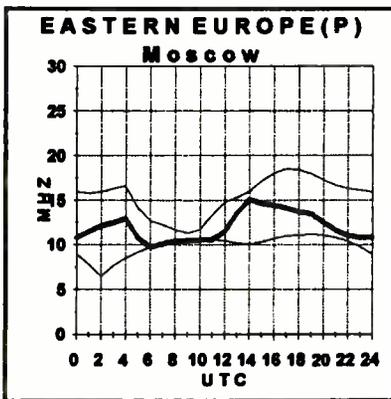
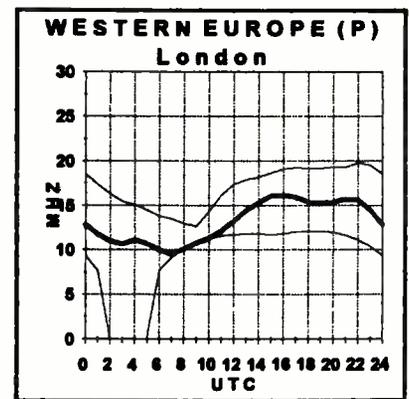
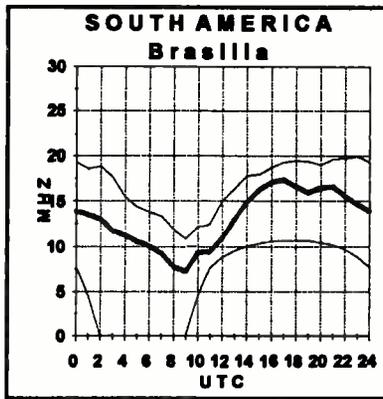
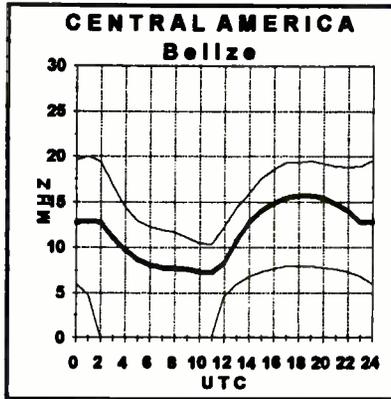
Propagation conditions: Eastern United States

How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.



Propagation Conditions: Western United States

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.



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Monitoring the French Military

Anyone who has ever tuned the digital shortwave bands has certainly encountered the French Military. Their Army, Navy and Air Force can be found on several frequencies. The French have always been in the forefront of utilizing new digital modes. When TDM (ARQ-M2/4) was first introduced a number of years ago, they abandoned RTTY in favor of this new protocol, and in recent years were quick to adopt ARQ-E, ARQ-E3 and FEC-A for their transmissions.

In addition to the French bases in Europe, others can be found in areas that are considered exotic locations, as far as the digital hobbyist is concerned. See Table 2 for a list of transmitter sites, all of which can easily be monitored from North America.

Despite their number and relative signal strength, decoding the French Military has remained the purview of only a few "hard core" digital monitors. The reasons for this are threefold: (1) It is not unusual for these stations to idle for hours on end, with no traffic being passed. When traffic is sent, it may only last a few seconds. (2) The message content is often very cryptic in

nature, and requires some knowledge to make sense of the traffic. (3) Text messages are generally, but not always, sent in French.

French Military callsigns usually begin with the letters "RF." Refer to Table 1 for an explanation of the NATO Routing Indicators which are used to form the prefixes for the callsigns. For example, RFLI is the callsign for the French Forces in Fort de France, Martinique. From Table 1 we can deduce the following:

- R - Strategic Routing Indicator
- F - Nationality : France
- L - Operational Area : Caribbean, South America
- I - Service: Navy

An additional one to three letters may be added to designate specific transmitter sites, such as RFLIA, RFLIB, etc. Call signs for French naval vessels are generally constructed from the four-letter code of their home port followed by a 3-letter vessel name abbreviation. Thus the minesweeper *L'Aigle* based in Toulon, France, is RFFLAGE,

By far the most common transmission you will encounter is the "CONTROLE DE VOIE" broadcast. Roughly speaking, this translates as

"LINE TEST," and is simply a loop-back test to ensure that the circuit is functioning properly. As a rule, a pair of circuit frequencies are always linked together. For example, one circuit from Fort de France to Cayenne can be found on 10798.3 kHz with the corresponding circuit from Cayenne to Fort de France on 10283.0 kHz. In other words, Fort de France would send a self-test message to Cayenne, which would then be rebroadcast back to Fort de France on Cayenne's half of the circuit.

When viewing a CONTROLE DE VOIE broadcast on either frequency, it would appear that the message originator on both circuits is the same. However, a unique three-letter code known as the "Circuit Identifier" provides the clue. Let's examine a typical "CDEV" message that was broadcast on 10798.3 kHz in ARQ-E3 96/400 mode.

MESSAGE

ZCZC IRT474
 OO RFLI
 DE RFLI 1320320
 ZNR UUUU
 CONTROLE DE VOIE
 NNNN

TRANSLATION

Z C Z C Start of Transmission
 I R T 4 7 4 Message # 474 sent on Circuit Id IRT
 (I = Fort de France
 (R = Cayenne
 (T = Circuit Designator Letter
 O O Priority Indicator: Operational
 Message
 R F L I NATO Routing Indicator: Destination
 Station Fort de France
 D E R F L I From: NATO Routing Indicator:
 Originating Station Fort de France
 1 3 2 0 3 2 0 Date Group and Time: 132nd day of
 year (May 12) 0320 UTC
 Z N R U U U U Security: Unclassified
 C O N T R O L E D E V O I E "Line-Test" Message
 N N N N End of Transmission

If you happened to catch this broadcast on 10283.0 kHz, the message would look identical, except the Circuit Identifier would be "RIT" followed by the message number. You cannot rely on the "DE - From" portion of the text. The French military makes extensive use of diversity reception (different receivers tuned to different frequencies at the same time) so that any circuit pair may actually consist of several frequencies being used simultaneously.

Longer traffic messages tend to occur around 0000 UTC, especially for the Caribbean stations. In addition to maritime weather and vessel messages, such mundane items as vehicle maintenance and commissary request lists may also be monitored. Seems the garrison stationed at Port Bouet has a liking for J & B Scotch Whiskey!

Table 3 contains a list of easily monitored frequencies.

Me voila a la fin. A la prochaine...

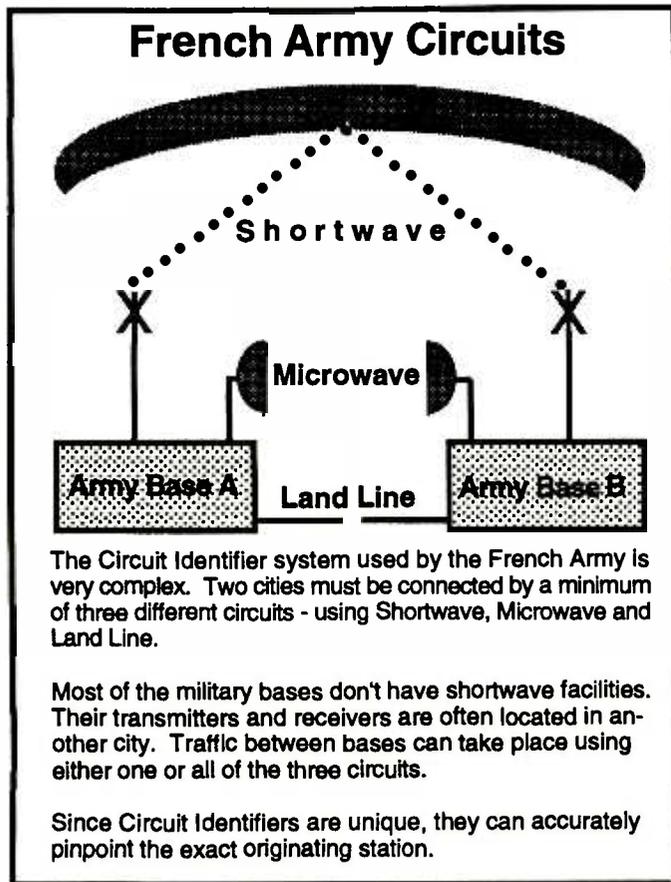


TABLE 1: NATO ROUTING INDICATORS

FIRST LETTER (Indicator Type)

- R Strategic Routing Indicator
- Q Reserve Strategic Routing Indicator
- U Tactical (Theater) Routing Indicator

THIRD LETTER (Operational Area)

- A East Asia
- C Central North America
- D United Kingdom and Iceland
- E Eastern North America
- F Continental Europe
- H Central South Pacific
- K Alaska, Aleutians

SECOND LETTER (Nationality)

- | | |
|------------------------|----------------|
| A Australia | M ASEAN |
| B British Commonwealth | N Netherlands |
| C Canada | P Portugal |
| D Denmark | Q Belgium |
| E Spain | S South Africa |
| F France | T Turkey |
| G Germany | U USA |
| H USA | Y Norway |
| I Italy | Z New Zealand |
| J Argentina | |
| K Greece | |
| L Luxembourg | |

FOURTH LETTER (Service)

- A - H Army
- I - O Navy
- P - V Air Force
- W - Z Joint Ministry of Defense, etc.

OPTIONAL C SUFFIXES

- OF Nail Benders (Technicians)
- OR Crypto
- CS Service Message Position
- CU Commercial Carrier Transfer Position
- CW Radio Transfer Position
- CX Routing Information Office

- L Caribbean, South America
- M South East Asia
- Q Middle East
- S Western Asia
- T Spain, Northwest Africa
- V South Africa
- W Western North America
- Y Australia

TABLE 2: NATO ROUTING INDICATORS

AREA	COUNTRY	CITY	ROUTING PREFIXES
Europe	France	numerous sites	RFFxxx
	Germany	several bases	RFGx
	Bosnia	Sarajevo	RFFVAY RFFXQA
Africa	Cameroon	Douala	RFTJD RFTLD RFTSD
	Chad	Ndjamena	RTFxxx
	Central Afr. Rep.	Bangui	RFFXx
	Djibouti	Jibouti	RFQx
	Gabon	Libreville	RFTJA
	Ivory Coast	Abidjan	RFTF
		Port Bouet	RFTx
	Morocco	Rabat	RFGW
	Senegal	Cap Vert	RFTJx
		Dakar	RFTJ
Middle East	Somalia	Mogadishu	RFFXS
	Lebanon	Beirut	RFFXL
	Saudi Arabia	Dhahran	RFFV
East Asia		Riyadh	RFFX
	Cambodia	Phnom Penh	RFVIMx
Indian Ocean	Comoros Is.	Dzaoudzi	RFVIT
	Reunion Is.	Le Port	RFVlx
South Pacific	New Caledonia	Noumea	RFHlxxx
	Tahiti	Papeete	RFHx
Caribbean	French Guiana	Cayenne	RFLxxx
	Guadeloupe	Point-a-Pitre	RFLIDxxx
	Martinique	Fort de France	RFLI

NOTE: the small letter "x" indicates additional variable characters

TABLE 3: SAMPLE FREQUENCIES TO TRY

FREQ:	MODE	CALL	STATION	CTY	SETTINGS	CID	CIRCUIT TO
5397.70	ARQ-M2	RFFP	MOD Paris	FRN	200/400	FDX	N'djamena
5879.70	ARQ-E3	RFLIO	Fort de France	MRT	192/400		
6771.70	ARQ-E3	RFLIA	Fort de France	MRT	192/400	BFL	Provence
6936.70	ARQ-E3	RFLI	Fort de France	MRT	192/400	LJ	Dakar
7606.70	ARQ-E3	RFHI	Noumea	NCL	100/400	HJ	Papeete
8509.00	ARQ-E	RFFX	MOD Paris	FRN	72/400	XXI	Bangui
9076.70	ARQ-E3	RFFA	MOD Paris	FRN	192/400	ITF	Libreville
9126.70	ARQ-E3	RFTJD	Libreville	GAB	192/400	FTI	Paris
10225.10	ARQ-E	RFTJF	Port Bouet	CTI	48/850	JFD	Libreville
10281.20	ARQ-E3	RFLIG	Cayenne	GUF	96/400	RTI	Fort de France
10467.70	ARQ-M2	RFPTC	N'djamena	TCD	200/250		
10638.70	ARQ-M2	RFQP	Jibouti	DJI	200/400	QRG	Paris
10798.30	ARQ-E3	RFLI	Fort de France	MRT	96/400	IRT	Cayenne
10873.70	ARQ-E3	RFVI	Le Port	REU	100/400	REI	Paris
11110.50	ARQ-E3	RFLI	Fort de France	MRT	192/400	BFL	Provence

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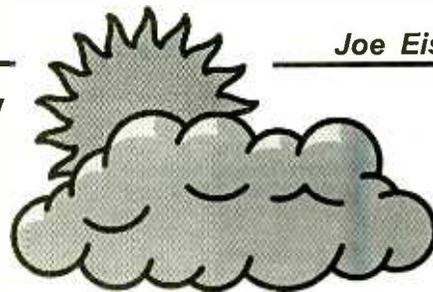
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TROPO BRINGS IN TV AND FM DX!



As the dog days of August approach, the tropo season for much of North America has its peak. "Tropo" is short for tropospheric bending, which can result in long-distance reception of radio and TV signals (DX). Tropo happens when there is a contrast between two air masses of different temperature and moisture levels. As the radio waves pass through these layers, they are bent, not reflected as many people think.

I look for the hot, humid days, with little breeze for relief, that brings the best summer tropo conditions. Also, long stationary fronts bring tropo along either side of the frontal boundary. When there is little wind to stir up the atmosphere, the air forms layers of different characteristics, and that bends waves in the VHF/UHF, and even in the microwave bands! Unlike E-skip, which has only a maximum usable frequency (an upper limit), tropo can have both a maximum and minimum frequency that can vary during the opening.

Tropo signals are a lot steadier than E-skip and do not fade very rapidly. Openings can be from 60-1000 miles or more. But, they are most often around 200-300 miles or so. Listen for strong and steady signals from stations you normally hear weakly or not at all on a normal basis at a range of over 100 miles. A tropo opening can last from a few minutes to several days! Look for tropo every morning, especially during the summer and fall months.

MORNING TROPO

Morning tropo can happen almost any summer day, and along the coasts, it can happen year 'round. As the sun rises, it heats up the air above you before it heats the air near the ground. This air forms a heat "cap" which is different from the cooler air near the surface. This "cap" bends the waves beyond the normal radio horizon when they hit the area where the two different air masses meet.

Along stationary fronts or near large high pressure areas, the atmosphere can have this same sort of boundary area that stretches for several hundred miles. It can cause very intense tropo openings that we call "ducts." A duct gets its name from the fact that it acts like a pipeline between two points. The signals can be so intense that even local stations on TV and FM can be obliterated by DX! A strong duct can last for hours and bring DX that is strong enough to be mistaken for a local station. Intense tropo can wreak havoc with cable TV systems that rely on antennas on tall towers to bring in the local broadcast TV stations.

During tropo, there may only be one or two stations on every channel, as opposed to E-skip, which can bring in several stations on every channel. This is because the tropo layers are mostly in the 30,000 foot altitude. If you have ever flown in a jet plane, the view out the window is the altitude of most tropo openings. Remember to watch for hot, humid, still days for the best in tropo DX! Indian Summer in the fall is also a very good time to watch for tropo.

A good weekend to watch for tropo on TV is Labor Day weekend. That is because the Jerry Lewis *Telethon* is on around the clock. Many local stations can be found late at night long after normal sign off. Another advantage is that telephone numbers which have various city names next to them run constantly on the screen, along with frequent local breaks. You can ID TV DX real fast on Labor Day!

Share your DX reports from the summer TV and FM DX season with us, and let's get ready for the fun in the fall on AM! Send your best listings of DX catches to *MT* for this column.

BITS AND PIECES

- Recent FCC rules changes now allow some AM stations to increase their daytime power levels to improve their coverage area. WNQM, 1300 AM in Nashville, TN, is the first AM station to take advantage of this new higher power. They have doubled their daytime power to 10 kW non-directional and 5 kW directional at night. Shortwave listeners will recognize this station because it is the local MW outlet of WWCR, a favorite of many shortwave listeners. WNQM runs some of the same types of programs, as well as programs aimed at their Tennessee audience. Thanks to George McClintock for the picture. It is hard to believe

that this facility was in ashes only a year ago!

- Karl Zuk sends in a copy of the TV DX logo maps. These maps show where all of the TV stations are located along with many of their logos, which makes it easy to ID them. They are available for an SASE with 52 cents postage on them. Write to Karl Zuk, 154 Old Post Road North, Croton-on-Hudson, NY 10520.

- Larry Rubin sent a copy of an article about a unique station in northern New Jersey. With a whopping power of 35 watts, WJUX on 103.1 serves Bergen County, NJ, with a mix of local news, traffic and music from the '30s, '40s and '50s. Its popularity has brought on a call for increased power, so the station can cover more of the county.

- Thanks to Don Putnik for sending in an interesting item about a low-power AM transmitter being used to advertise an upholstery shop in the Los Angeles area. These transmitters can only be heard a few feet away, but they allow potential customers to hear a message from the comfort of their own car as they pass by. In Iowa, these low power transmitters are used to relay the 162 MHz NOAA Weather Radio transmissions to cars in rest area parking lots along I-29. In Iowa, you just tune to 1560 AM as you pass by or stop in rest areas on your way to Sioux City.

- This year's Dayton Hamvention was a memorable one for all who attended. The rain dampened the flea market for two days, but the bargains came out on Sunday. For the AM DXer, Ramsey Electronics unveiled a new AM DX antenna kit. Look for a review of this exciting kit in a future column. Ramsey also carries a nice FM SCA decoder kit. SCA will also be addressed in a future column. It was nice to see the Grove/*MT* gang there and to see all of the new goodies! AMDXers with a "few"



George McClintock, WWCR General Manager, admires the new 10 kW WNQM mediumwave transmitter.

Something is Stirring in Uzi City

If you delve back into the annals of *Monitoring Times*, you will run across the columns of "Havana Moon" — a former intelligence officer and an old friend. The Moon is in retirement now, but interest and investigation into intelligence topics continues. Larry Van Horn continues to cover frequencies of the numbers stations intercepts in his Utility column; my contribution is in intelligence gathering and site locations.

Crockett and Tubbs (of *Miami Vice* fame) have long departed Miami — aka Uzi City — and Hurricane Andrew took out the National Communications Station, the home of KKN39, which was located in western Dade County, Florida. This past month, I took a trip down to the NCS site to see what, if anything, had been rebuilt.

The receive site was located at the Dade County Metrozoo. There were numerous federal agencies using this site, including an army/customs high frequency intercept site. Prior to Andrew, there were more HF antennas than one could ever imagine. There were log periodic HF beams (full size) mounted on towers. There were verticals, long wires, and rhombics. There were also two satellite satcomm dishes under their shrouds. It was a beautiful site, linked by a microwave link to the National Communications Center transmitter site located at 2400 S.W. 177th Avenue (Krome Avenue), Miami, Florida.

There were numerous transmitting antennas, including circular dipoles measuring over 100 feet in diameter. When Havana Moon and I went down there a few years ago, KKN39 was definitely — repeat, *definitely* — coming from that site on 4954 kHz.

Then the hurricane, the worst natural disaster in the history of our country, totally took out everything. Two years later the damage is still there, but the residents are rebuilding their homes ... and so is the National Communications Station.

The receive site, where Andrew came ashore, shows signs of life. There are two HF log periodic antennas there on new towers. No way did these survive Andrew — they are new. Most of the buildings are destroyed, or at least they *look* destroyed — something to wonder about. You cannot drive behind the site, as you could before Andrew, to see the vertical HF

farm. It is now fenced off with new fencing. There are two new Satcomm antennas, under new shrouds. There is a new guardhouse, with a new armed-to-the-teeth guard. And there is a new microwave link antenna out to the Krome Avenue transmitter site.

At the Krome Avenue site, all of the antennas there are new, and there are some big ones. The sign says National Communications System — Transmitter Site. It also has a new sign. It says "USAF - RTAO" with the above street address. There are also about a dozen new trailers moved inside the compound. No guards were seen, but new television cameras were visible. I had a feeling they knew I was there.

What does this have to do with the Federal File? It is a massive federal government location, once affiliated with the Department of State/CIA communications system. There are a couple of VHF antennas present, probably for the on-site guards. I am still looking for these frequencies.

With the closing of Remington/Vint Hill Farms on the horizon, maybe the KKN stations will be looking for a new landlord. You can hear KKN50 coming from the Virginia area on 6924.5 kHz, sending their marker tape. When the world heats up, so do the KKN stations.

Surveillance Techniques: Body Bugs

This month, as promised, we start our section on electronic surveillance. Lesson one will be on body transmitters. Let us start our examination with the units designed for the law enforcement/intelligence agencies.

There are very few manufacturers of such devices that fit the above category. They include audio intelligence devices (AID), Bell and Howell (the KEL units) and Motorola. For our class, we'll concentrate on the AID units, for the simple reason that I am most familiar with them. Nearly every police agency in Florida, including all of the federal agencies I have had contact with, use AID devices.

The backbone of their transmitter line is



Harry Baughn

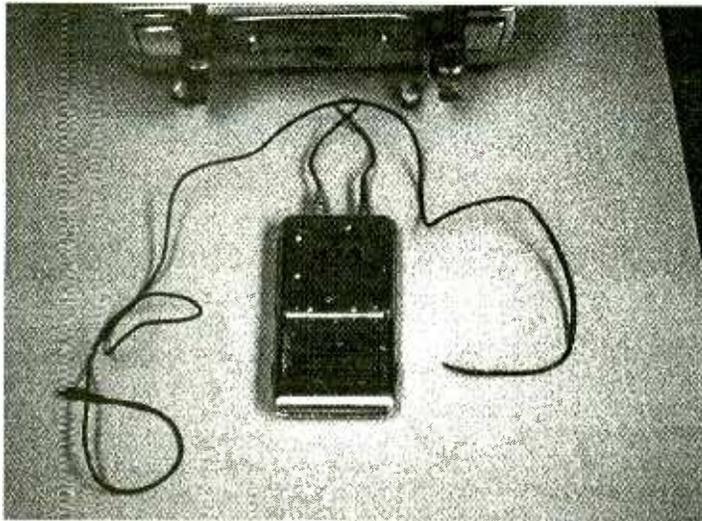
The NCS transmitting facility on Krome Avenue before Hurricane Andrew destroyed the antenna system.

the TX-903 unit. It is a one watt, crystal controlled device. It is almost the size of a pack of cigarettes, but only two thirds as thick. It is powered by two 9 volt batteries, which are in parallel and snap on the bottom of the unit. The external controls on the top of the unit consist of an on/off switch, a subminiature microphone connector, and a miniature BNC connector. The microphones that are provided with the units are essentially hearing aid microphones built into a larger case. The antenna is a piece of RG-174 coax with the end stripped so that you have a dipole.

The frequency range is normally 150 to 174 MHz, with 136 to 150 MHz a special order primarily for overseas use. There was a product line in the 216 to 220 MHz band, but my sources tell me that this was not a big seller — likewise for the units manufactured in the 406 to 420 MHz band.

The units are crystal controlled and the transmitter is tailored to produce the maximum audio for intelligence. The audio is, of course, narrow band. This is convenient, because some federal agencies such as the Bureau of Alcohol, Tobacco and Firearms (ATF) operate their transmitters on their primary two way radio

This bugging system was used by the US Post Office and was sold as part of surplus office equipment!
Photos by Todd Dokey.



channel of 165.2875 MHz. This way all of their mobile and portable units can monitor the covert transmissions. The audio is designed for the maximum punch-through effect.

Frequencies can be anywhere in the above range, although most police departments, especially the South Florida ones, use the 165 to 168 MHz range. An exception is the Drug Enforcement Administration (DEA), whose transmitters operate in the 170-172 MHz range. The specific frequencies (in MHz) are:

- 171.450 171.650 172.000 172.100
- 172.200 172.300

Some common frequencies used in AID equipment include 165.2125, 167.2010, 167.420, 168.010, and 150.010 MHz. In most of the new equipment sold by AID, the actual frequencies are not given on the equipment, but are color coded. The following correspond to the color codes:

- Yellow 168.011 MHz
- Green 168.062 MHz
- Blue 168.086 MHz
- Red 171.650 MHz
- Silver 171.950 MHz

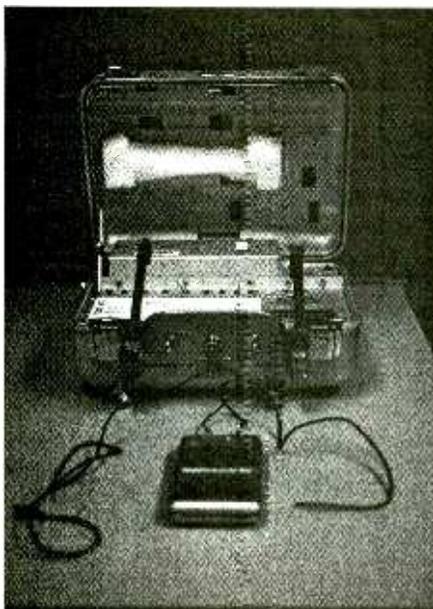


The FCC has allocated frequencies for wireless microphones, but they have limited output — not the one watt AID units have. These frequencies are 169.445, 169.505, 170.245, 170.305, 171.045, 171.105, 171.845, and 171.905 MHz. These frequencies must be offset 10 kHz from the adjacent telemetry frequency and are limited to 50 milliwatts output. You can usually hear these at your local fast food drive through window.

The best way to locate these units is to scan through the above ranges in an area known for illegal activity, such as prostitution or drug sales. If you are lucky, you may hear an actual undercover deal going down. Once you have this information, keep it to yourself. The police would be less than thrilled to know that you know their secret frequency, and the "bad guys" might decide to make you disappear because you know what happened.

There are repeaters used on these body bug channels. The Broward County Sheriff's Department (Ft. Lauderdale, FL) has one that has an input of 159.19 MHz and a 15 watt repeater output of 154.950 MHz.

Todd Dokey sent us pictures of a surveillance kit a friend of his bought from the Post Office as surplus office equipment! It



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was a wide band unit (50-75 kHz deviation) on 906.0 MHz. The kit, built by Thompson/CSF, came complete with a diversity receiving system and a tape recording system.

Agencies of the Month

National Transportation Safety Board
(seen at the scene of major airplane and train disasters):

- 165.7600 MHz simplex Channel 1
- 165.7625 MHz simplex Channel 2
- 165.1750 MHz simplex Channel 3

Securities and Exchange Commission
(regulate the nation's stock and securities exchanges):

- Field offices 164.180 MHz simplex
- Investigations 164.240 MHz simplex
- 164.260 MHz simplex

- New York Stock Exchange
- 171.950 MHz simplex
- 171.975 MHz simplex
- 172.275 MHz simplex

That's it for this month. Next month, room bugs and intelligence kits and more frequencies.

MT

Weather Facsimile broadcasts

The May column included a copy of the facsimile schedule from Norfolk, VA (NAM). These broadcasts can be quite interesting, and this month we will have a closer look at these informative broadcasts and what they offer.

The clarity of fax broadcasts can leave something to be desired and the quality of the samples in this column is not the best, but one

Even though such a map may not be the clearest to read, it is still possible to glean useful information. For example, the high and low pressure areas are marked and it is easy to see where the isobars (lines joining areas of equal barometric pressure) are located. Where the lines are closer together there will be more wind, and where the lines are further apart the air will be calm. In figure 1 it is likely that the

can make more accurate assessments than if they relied on the forecasts alone.

Figure 2 is the 200 millibar height 24 hour forecast valid for the same time as the analysis in Figure 1 (1200Z March 22, 1994). From this map one can see what the situation is expected to be at 1200Z on March 23. While there is the obvious of the forecast being for the height of 200mb, useful surface information can also be drawn from the map.

The high and low pressure areas have shifted, and our windy area appears to have moved off southwest of Greenland. A new region of high wind can be found at the lower right corner of the map with winds ranging between 35 and 45 knots. The wind is represented by an arrow (usually without a tip) pointing toward the direction from which the wind is blowing. Its feathers represent the wind speed. Each line in the feather represents ten knots and a half line is five knots.

For a mariner planning to cross from North America to Europe, these maps offer some favour for the period following the 22nd of March. For a crossing to North America, one might wish to allow the low over Europe to move east before departing.

Weather facsimile maps are of interest to more than just mariners. Anyone with a fascination with weather will find them useful. The maps which are broadcast are not as clear or as straightforward as the living colour maps which we get in *U.S.A. Today*, largely because they contain more information and are intended for those who will interpret them directly. Even if you have to read them with a basic book on meteorology in hand, you can derive some benefit from the maps.

In addition to weather maps, there are

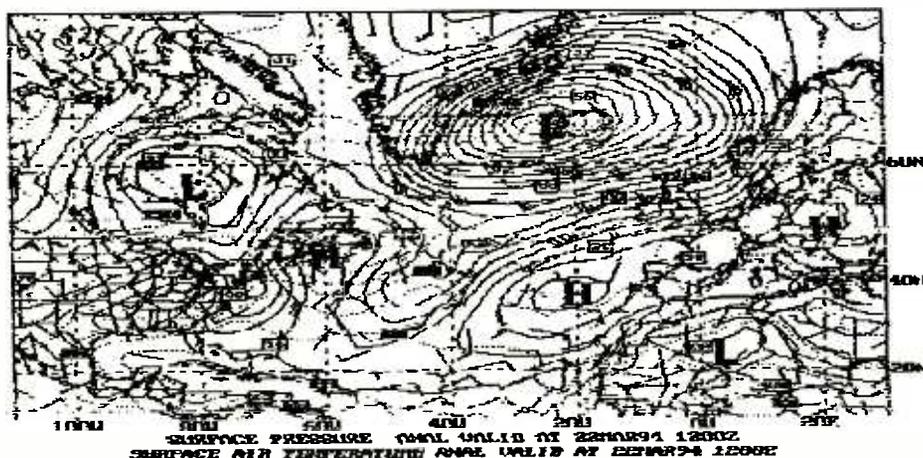


Figure 1

can at least get an idea of the squiggles, lines and lettering which show up on the maps.

Weather maps usually comprise a *prognosis* or an *analysis*. The prognosis is essentially a forecast while the analysis is what is happening at the time the map was made, or the data was being collected. For a specified time in the future, the prognosis projects what the air temperature and winds will be at a given height. The height is represented by barometric pressure in millibars.

Figure 1 is a typical example of a surface analysis. The map provides information on the air temperature and pressure at 1200 hours on March 22. While it can be difficult to read all of the numbers on the map, the isobars can be seen easily and the highs and lows identified.

There is representation of the land areas; however, as is often the case, these are not easy to see and tend to make the map more confusing. Latitude and longitude are shown on the map, with this one covering ten to eighty degrees north and thirty degrees east to one hundred ten degrees west. To make the land masses more prominent would make the map too hard to read and interpret, given the unreliable quality of radiofacsimile transmission.

strongest winds in the area covered by the map will be north of the low which is just right of the top centre of the map. The lightest winds will be found in the area at the bottom centre of the map coverage area.

The surface analysis and those provided at the 300, 500, 700 and 850 millibar levels allow a ship's officers—all of whom have had meteorological training of some kind—to better evaluate the current conditions. Armed with real-time observations along with the analysis, they

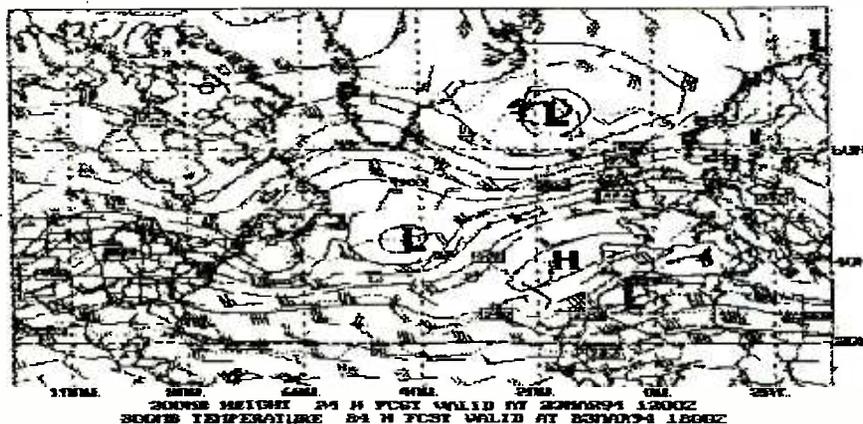


Figure 2

other types of maps sent by facsimile. Depending on where and what time of year it is, you will also find ice charts. The Canadian Coast Guard transmits them even during the summer time. Iqaluit CGRS (VFF) transmits on 3253 and 7710 kHz. They will send a requested chart at 0100; at 2100 is the ice analysis chart; and at 2335 is a local ice condition chart. Resolute CGRS (VFR) broadcasts on the same frequencies and sends an ice analysis chart at 1430 and 2335.

The Canadian Forces Station at Vancouver, B.C. (CKN) broadcasts a full facsimile schedule. Anyone on or near the West Coast might wish to give them a try on 2754, 4268, 6456 and 12753 kHz. Here is their broadcast schedule:

- 0245 Broadcast schedule
- 0300 Combined 850/500 kPa analysis
- 0310 0000 surface analysis
- 0320 Weather depiction prognosis VT1200 (Validity Time, 12hrs.)
- 1025 Test chart
- 1030 0600 surface analysis
- 1040 Wave height prognosis VT0000
- 1050 Wave height prognosis VT1200
- 1100 Weather depiction prognosis VT1800
- 1110 Weather depiction prognosis VT0600
- 1230 Test chart
- 1235 Surface prognosis VT0000
- 1245 Surface prognosis VT1200
- 1515 Test chart
- 1520 Combined 850/500 kPa analysis 1200
- 1530 1530 surface analysis
- 2115 Test chart
- 2120 Weather depiction prognosis VT1200
- 2130 Weather depiction prognosis VT1200
- 2140 Surface prognosis VT1200
- 2150 Surface prognosis VT0000
- 2200 1800 surface analysis
- 2210 Wave height prognosis VT1200
- 2220 Wave height prognosis VT0000
- 2230 Sea surface temperature analysis (Tues., Fri.)
Ocean analysis (Mon., Sat.)
- 2240 Standard chart symbols

On the Great Lakes, Rogers City Radio (WLC) still makes MF/HF facsimile broadcasts on 2195.5 and 5898.6 kHz as follows:

- 0330 Weather charts
- 0630 Weather charts
- 0930 Forecast

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These are just a few of the stations which broadcast weather facsimile maps and information for anyone to pick up with appropriate attachments between a receiver and computer, or with a dedicated terminal unit. The information is well worth the effort, especially some of the satellite pictures which are transmitted.

That's all for this time. I hope that everyone is enjoying the summer and that your reception won't be marred by too many of the thunderstorms that can be found on this summer's weather maps. Good listening until next time. **MT**

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BUILD YOUR OWN SATELLITE TV SYSTEM

Anyone who has recently visited a satellite TV showroom has probably returned with mixed emotions. First, there's the urgent desire which wells up from within to put these beautiful hi-tech marvels in your home. Second, is the sinking feeling that these products are reserved for folks with large disposable incomes or wallets stuffed with gold cards. There is an alternative: Build it yourself!

Before rolling up your sleeves and looking for your tools let's examine some of the issues involved. Building your own system yourself doesn't mean it will be free. It does mean that it's possible to substantially reduce the cost of actually receiving TV signals from space. If you're interested in only receiving cable-TV fare you'll be forced to cough up \$350 for the VideoCypher II/RS (VCII/RS) decoder module alone.

If you're interested in experimenting with satellite TV reception I'll show you how to put together the equipment necessary for less than the cost of the VCII module.

Buying A Receiver

The satellite receiver is the heart of the system. A brand new receiver (less VCII/RS module) will cost anywhere from \$350 to \$1,500 depending on the number of sequins and rhinestones added. A good, used receiver will cost between \$50 and \$150. There are a few place to look for them including hamfests, fleamarkets, etc.

I recommend buying from your local satellite dealer for several reasons. First, most dealers are interested in repeat business—they're happy to sell used gear to get you started because they're certain you'll be back for a new receiver before too long. Second, most hamfest or fleamarket dealers sell equipment "as is" which means if you get it home and it doesn't work, there's no recourse. On the other hand, many dealers service what they sell and should be able to repair any future problems you may encounter.

Here's what to look for:

- the receiver must be a 950-1450 MHz block receiver (that means that it will accept the signal from a standard LNB);
- it must have a working power supply (some receivers have the power supply built-in);
- it must have a working remote control (many receivers have no way of operating without a remote control);
- there should be a warranty (60 to 90 days is typical);
- look for name brands which have good reputations and for which it will be easier to

find parts later. Uniden, Houston Tracker, General Instrument are a few good examples of quality brands.

Just be aware that most dealers are very enthusiastic about their products and may discourage your plans to build it yourself. And why not? The mark-up on used equipment is minimal and the mark-up on the new gear is very nice. The best advice is to call around. Ask as many dealers as you can, what they have and how much they want. If you find something you like, make a counter offer. I've called several dealers whose used gear prices are quite inflated.

The Dish

The second component to your system is the dish or antenna. This is comprised of the parabolic reflector, the feedhorn and the LNB (Low Noise Block Downconverter). A good used LNB should cost \$25 to \$50 depending on the noise figure (a 25 degree LNB is considered low and 40 degrees is considered average; anything higher is less effective, especially on a smaller dish). A good, new LNB will cost between \$70 (40 degrees) and \$130 (20 degrees). If you're going to splurge anywhere in the process of building your system here is where your money will be most effective.

The LNB bolts directly onto the feedhorn which collects the microwaves for amplification. A C-band feedhorn will typically cost \$55 to \$65. A Low Noise Block Downconverter/Feedhorn (LNB/F) is the two devices combined. These are new products and not likely to be found used. New LNB/Fs typically cost \$130.

The actual dish consists of several mechanical parts. The reflector is secured to the pole in the ground by the mount. In normal installations a "polar" mount is used which, when driven by a small motor, allows the antenna to look at the various satellites situated throughout the Clarke Belt.

For purposes of keeping this as cheap as possible, we're throwing out the polar mount, the mounting pole and the motor. For the dish I'm using a solid spun-aluminum dish of four feet in diameter. Using the formula for finding the focal length (diameter squared, divided by the depth of the dish, times 16), I've cut three pieces of aluminum tubing from

the hardware store and (flattening out the ends and drilling holes in each end), bolted one end to three equally spaced places around the outside of the dish and secured the other ends to the factory drilled holes in the feedhorn.

Now we'll build a simple wooden frame made from two 2 x 6's. These are nailed together at one end and spread about two feet apart at the other end and notched to accept the lip of the dish. (You may want to nail a 1 foot piece of 1 x 6 to the bottom of the frame to keep the two pieces in place.) One 5 foot long 1 x 2 with many holes drilled in it is secured to the closed end of the 2 x 6's by a long bolt passing through all three pieces of wood.

By drilling a small hole through the dish, placing a nail through the dish and into the holes in the 1 x 2, it's possible to set the dish at the proper angle to view a satellite. By physically moving the dish around and raising

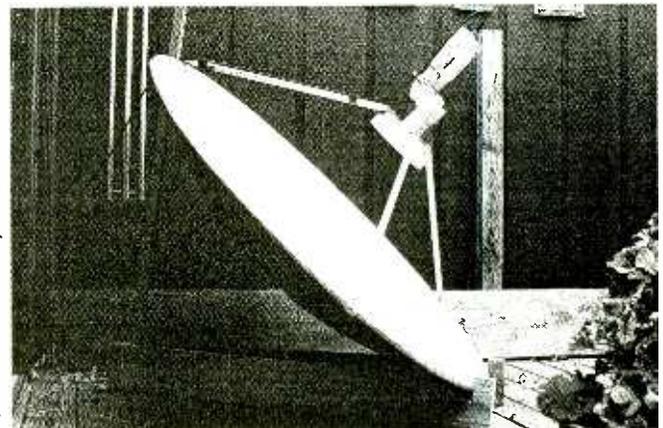


Photo # 1

or lowering the angle, it's easy to "tune" into any satellite you wish. (See photo #1)

Long's Electronics (800-633-4984) has a large quantity of spun aluminum dishes in various sizes including 4, 7.5, and 9 feet in diameter. These are parabolic reflectors only, and include no other hardware. However, as described above, it's not hard to fabricate a useful stand. The more qualified metal workers will be able to make an even better stand.

The point is that these reflectors make excellent dishes at C-band frequencies and spectacular dishes at Ku frequencies. Prices are very cheap, ranging from \$25 for the 4 footer to \$99 for the 9 footer. A crating and shipping charge will be added as these dishes must be shipped by truck. Typically the shipping charge will be \$40 and the crating charge will be about \$30. Total cost of the dish will be just under \$100.

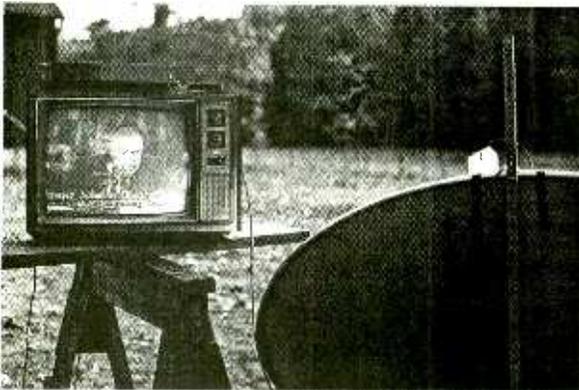


Photo # 2

New Catalogs Dept.

Two new catalogs have recently crossed the desk which are of interest to readers. First is the 64 page Skyvision catalog which features prices and information on a wide variety of satellite reception equipment. Included are many items which are hard to come by for consumers living out in the hinterlands without access to large electronics stores. There are other items which don't seem to be stocked anywhere, such as a new stand-alone actuator controller—a handy item for upgrading your build-it-yourself installation. For your free copy of the catalog call Skyvision at 800-543-3025 or write them at 1010 N. Frontier Drive, Fergus Falls, MN 56537.

The other catalog is from Mark Long, head of Mark Long Enterprises, Inc., one of the industry's most prolific writers. His 1994 World Satellite Catalog features 16 pages of books, videos, software, periodicals and charts all about satellite television. Many of his publications have become industry standards seen on the shelves of the nation's industry leaders. For your copy of the catalog write: MLE, Inc., P.O. Box 159, Winter Beach, FL 32971 or FAX: 407-589-9411.

TVRO Notes

- The World Radio Network (WRN) is an FM analog subcarrier on ASC-1 channel 23 6.20 MHz (home of SCOLA). The network features 24 hours a day of replays from the world's shortwave outlets. Hear perennial favorites BBC, Radio Moscow, RFI, and others, in addition to less frequently heard Voice of Israel, Radio Finland, and more. For WRN schedule information tune in every day at 1800 and 2000 UTC. There's no word as to what will happen to this service when SCOLA moves to Ku on Telstar 401 and goes digital.

- Telesat Canada hopes to have completely recovered the errant Anik E1 by the beginning of August. Using a series of tricky software moves the company has been working on this recovery for months.

- NASA has announced that there will be 10 Space Shuttle flights to the Russian Space Station MIR between 1995-97, representing the first of three phases of International Space Station cooperative activities. Launch of the first Shuttle SPACELAB-MIR mission, STS-71, is scheduled for May 1995. With any luck

One little note to add about using spun aluminum dishes: The surface of these dishes is very accurate and highly reflective. Not only does it do a great job on microwaves, it also makes a great unintentional solar cooker. To avoid burning up cables, melting the feedhorn throat cover and possibly doing other high heat related damage, paint the reflective surface with a flat metal spray paint.

All that remains is to attach a length of RG/6 coax cable from the feedhorn to the back of the receiver and the three small insulated wires from the polarizer (the small probe inside the throat of the feedhorn) to the back of the receiver marked for polarity ground, pulse and +5 volts. By the way, don't scrimp on the cable, it's cheap enough brand new. Polarizer cable is typically twelve cents per foot and RG/6 runs about twenty cents per foot. You should be able to buy 100 feet of both for under \$35. Don't forget to add the RG/6 cable end fittings.

The Recap

So, here's your system: A nice late model receiver with IR remote control, stereo audio tuning, a 70 MHz loop on the back for tuning in SCPC signals, all for \$150; a nice used 40 degree LNB for \$40; a good used feedhorn for \$25; cables for \$35; your dish for \$95. Total cost for your first satellite TV system is \$345—about the same price as a new decoder module from the dealer's showroom. By doing a little scrounging and haggling there's little doubt that this price could drop by at least \$100. Would you pay \$250 to monitor twenty C-band satellites? You probably paid more than that for your scanner or VCR!

So, how's the picture? Photo #2 shows the receiver on top of a 19" TV, the LNB is a very old 80 degree model and the picture is nearly perfect. For added fun buy a used Ku LNB and feedhorn for another \$50 and explore a whole new satellite band. Experiment, have fun, keep it cheap and above all don't let the big showroom prices get you down.



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some of those ten missions will include SAREX activities.

- Attention football fans: The NFL has signed a deal with TVN (Telstar 303) to offer a package of up to 12 Sunday football games for each week of the NFL season all games of which will be carried on T303. According to reports, all NBC and Fox games will be included in the package though subject to home game blackouts. Dish owners can expect to pay \$100-139 for "season tickets" depending on when purchased.

- TVRO related information can be heard on satellite via the Omega Radio Network on Galaxy 3, 17 at 5.80 MHz audio. The "ProShow" airs Sundays from 9:00 to 11:00 PM ET.

Tune Into NAVTEX

It's been nearly a year since the U.S. Coast Guard discontinued its CW watch on 500 kHz. Although the CW is gone, that's not to say that they've left the band entirely.

These days, the Coast Guard can be found on 518 kHz transmitting NAVTEX bulletins. NAVTEX is an internationally standardized method of sending marine information to boats equipped with low cost digital receiving equipment. NAVTEX capability is now required for large vessels as part of the Safety of Life at Sea (SOLAS) convention, as amended in 1988.

The bulletins are primarily intended for waters 0-200 miles from shore and contain information about OMEGA and LORAN status, search and rescue operations, weather forecasts, mine sweeping exercises, and other navigational data. These broadcasts can provide an interesting change of pace from the usual beacon game.

Getting Online

With the right equipment, you can read NAVTEX bulletins directly at your monitoring station. Let's review the basics for proper reception.

The first consideration for reading NAVTEX is your receiver. It's best if it has an "RTTY" mode to optimize the bandwidth for NAVTEX tones. This also helps eliminate adjacent signals that may interfere with clean reception. However, any receiver with a stable BFO should provide satisfactory NAVTEX reception.

In addition to your receiver, you will need a computer, an RTTY terminal unit (TU), and the appropriate software. Figure 1 shows the simple arrangement I use to monitor NAVTEX broadcasts. The setup consists of a Drake R8 receiver, a Macintosh computer, and a Kantronics Universal Terminal Unit. This particular TU has built-in software for decoding RTTY signals.

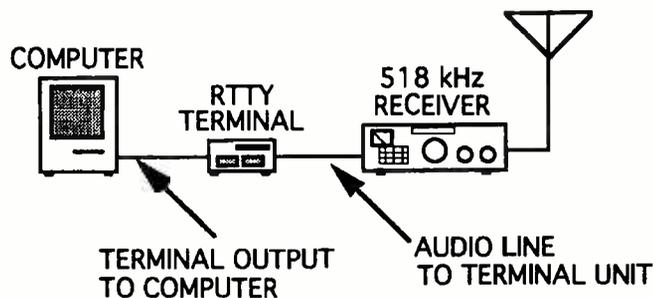


Figure 1. Typical Setup for NAVTEX Reception

NAVTEX is transmitted in SITOR Mode B (FEC Mode). This is similar to the AMTOR protocol used by amateurs, but it is meant for one-way broadcast as opposed to the "chirp-chirp" two-way exchanges commonly heard on the ham bands. Nevertheless, most ham-grade RTTY terminal units do have the capability to receive NAVTEX by selecting "AMTOR Mode B."

From my location in upstate New York, I was able to hear two NAVTEX broadcast sites; Boston, MA and Portsmouth, VA. Table 1 contains a complete list of the 12 U.S. Coast Guard NAVTEX stations and their operating schedules. There are also stations operating in many countries outside of the U.S.A. Happy teleprinting!

Table 1.
NAVTEX Stations
on 518 kHz

Location	Transmission Times (UTC)
Boston, MA	0445, 1045, 1645, 2245
Portsmouth, VA	0130, 0730, 1330, 1930
Miami, FL	0000, 0600, 1200, 1800
San Juan, PR	0415, 1015, 1615, 2215
New Orleans, LA	0300, 0900, 1500, 2200
Long Beach, CA	0445, 1045, 1645, 2245
San Francisco, CA	0400, 1000, 1600, 2200
Astoria, OR	0130, 0730, 1330, 1930
Kodiak, AK	0300, 0900, 1500, 2115
Adak, AK	0000, 0500, 1200, 1745
Honolulu, HI	0040, 0640, 1240, 1840
Guam	0100, 0700, 1300, 1900

OMEGA Trivia

One of the users of the lowest radio frequency spectrum is the Omega Navigation System, operating between 10 and 14 kHz. From eight sites worldwide, they cover the entire globe with navigation information for pilots and mariners.

What you may not realize is the immensity of the transmitting towers used for Omega. For instance, the tower at Tsu-Shima, Japan is 1500 feet tall and its guy wires are secured to

surrounding islands! In North Dakota, the tower is a still impressive 1200 feet tall.

Tall as they are, Omega antennas are not as efficient as you might expect. This excerpt from the Coast Guard Radionavigation Bulletin makes the point well: "At the Omega frequency of 10.2 kHz, a quarter

wavelength is about 7500m, or 4.68 miles long, and the Omega tower is only a small fraction of that. A similar reduction in length



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would cause a 1000 kHz AM broadcast antenna, nominally 246 feet (75m) high, to be reduced to a height of 13 feet (4m), or a full-sized 9-foot 27 MHz CB antenna to be reduced to 5-3/4 inches, or a 2 meter amateur (146 MHz) antenna to be reduced to a length of one inch! This short length causes the Omega antenna to have a very low efficiency, with the net effect that the transmitter must provide 150 kilowatts in order to radiate the required 10 kilowatts from the antenna."

Summertime Loggings

Summer can still bring opportunities for hearing new signals if you know when to listen. Many DXers report that the early-to-mid morning hours can be especially productive for beacon hunting. The warmer months also provide the opportunity for taking DXpeditions to low-noise locations!

To get you started, here are a sampling of beacon loggings sent in by MT readers. I'd like to thank Perry Crabill (VA), Don Tomkinson (CA), and Wayne Gregory (KY), for sharing their logs with Below 500 kHz. All contributors are identified by their initials *MT* and state in Table 2.

Table 2.
Beacon Loggings

FREQ.	ID	Location	By
205	COR	Saylor Farm, CA	DT. (CA)
226	FAF	Ft. Eustis, VA	P.C. (VA)
239	SAR	Sparta, IL	P.C. (VA)
266	YFH	Ft. Hope, ONT	P.C. (VA)
283	UZG	Zaragoza, CUBA	P.C. (VA)
290	AOP	Rock Springs, WY	D.T. (CA)
329	ISM	Kissimmee, FL	P.C. (VA)
338	PBT	Red Bluff, GA	D.T. (CA)
340	JES	Jessup, GA	P.C. (VA)
353	FOA	Flora, IL	W.G. (KY)
360	KIN	Kingston, Jamaica	W.G. (KY)
379	MDE	Cincinnati, OH	W.G. (KY)
381	Y E	Ft. Nelson, BC	D.T. (CA)
385	HYX	Saginaw, MI	W.G. (KY)
392	VEP	Vero Beach, FL	W.G. (KY)
400	QQ	Vancouver, BC	D.T. (CA)
408	SFB	Sanford, FL	W.G. (KY)

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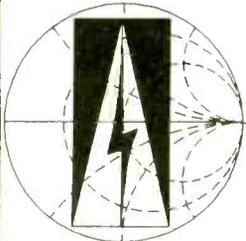
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Good Reading

While looking over the magazine rack at my favorite convenience store I came across the 1994 *Beginner's Guide to Amateur Radio*. Aha! sez I; at last some one is beginning to understand that ham radio is not just for a favored few, and is letting the public know what the hobby is all about. There is no way to get more folks interested in this fantastic hobby if beginner material is only published in magazines for the already-converted.

I plopped down the \$4.95 for the book, went home, locked the door to the shack and perused said tome. A look at the features and who wrote them pretty much told the story right away. Doug DeMaw, Lew McCoy, Gordon West, Paul Carr, and more well-known writers have filled the pages of this book with solid information that will help the new amateur get off to the right start. A directory section gives easy to read specifications for most of the popular ham gear, antennas and station accessories, as well as training aids and other publications.

I especially liked the section on "Awards Hunting and Contest Operating" by Doug Grant, K1DG, and John Doar, K1AR. These two chaps have done an excellent job of outlining the techniques required for success in these two entertaining aspects of our hobby.

Another section deals with buying ham gear. Called "Shopping to Avoid Obsolescence," the article leads the would-be purchaser of ham gear through various questions he or she should be asking in order to get the most for their money.

The only place this manual falls short on is the section "Getting Started in Satellites." The writer tried to squeeze too much information into a very small space without spending enough time explaining the basics.

I give the 1994 *Beginner's Guide to Amateur Radio* a 9.9+, though, and highly recommend it to anyone with an interest in amateur radio. The book is available on most newsstands and at your favorite radio store. It is published by *CQ Magazine*, 76 N. Broadway, Hicksville, Ny, 11801, phone (516) 681-2922.

More Radio Promotion

A new magazine called *RADIO* is available at your neighborhood Radio Shack store. *Radio* is published by Radio Shack, and of course promotes their products. However, there is a wealth of information for all radio buffs contained within this publication. The maga-

zine covers scanners, shortwave, CB, cellular, satellite and, of course, ham radio.

The first issue contains the following of interest to hams: "Getting your Ham Ticket is Easier Than Ever," a review of the RS HTX-404 transceiver, and a review of the 22-305 Frequency counter. An article by Bill Orr, W6SAI, on DX antennas for shortwave is also excellent and well worth reading for the ham as well as SWL.

Any publication that increases public awareness of the many options available in the radio hobby, and helps the beginner experience success with their new equipment is a boon to us all. I hope Radio Shack will publish *Radio* on a regular basis. At the moment it appears that their intent is to put out a new edition three or four times a year.

Tube Type Rig

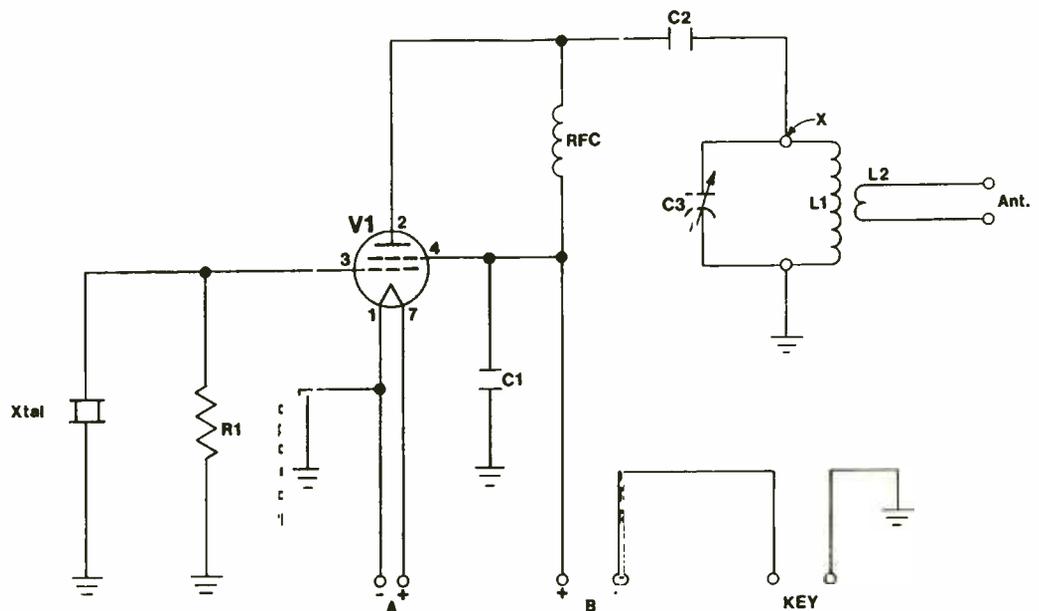
Over the past year or so I have received a fair amount of mail asking about QRP (low



The handsome chap in the photograph; surrounded by all the neat radio gear is none other than Jeff Seymour, KD4YVV

power) tube type rigs. The rig in figure 1 is one that I built nearly 40 years ago, and it still works great to this day. About a dozen have been duplicated by various hams and all were easy to get working.

I think I first saw this little Tx in an ARRL publication. It's very simple to build



V1 - 1S4 - 3S4 or similar 1.5V tube.

C1, C2 - 0.0047 ufd. mica.

C3 - 140 uufd. midget trimmer.

L1, L2 - depends on band and XTAL used,

(3.5 MHz.: L1-43t.,

L2 - 4t., No.30 enam. on 3/4-inch dia. form;

7 MHz.: L1-22t., L2 - 2t)

Position L2 for best output.

A Voltage - 1.5V

B Voltage - 45 - 90V

R1 - 47,000 ohms

RFC - 2.5mh.

Figure 1
QRP Tube Type Transmitter

Bob Rowland's

Ham DX Tips

July is considered one of our hotter months, but the weather is not the only thing that is hot in July. The amateur bands will be, too!

ANTARCTICA VP8GAV has been on 14015 CW or SSB on 14245 kHz daily starting at 0030 UTC. QSL to his QSL manager: GM0LV1, David Warburton, Law Vista, High St., Errol, Perthshire, PH2 7QQ, Scotland, U.K. **CANADA** John Reisenauer, NL7TB, an *MT* reader and friend of mine, wrote to tell us about his local contest group's upcoming operation from Herschel Island, Yukon Territory, in the Canadian Arctic, starting around July 22nd and ending around July 29th. The group consists of John Brian, VY1BE; N6IV/KL7 (Richard); KF6XC (Larry); Carl (VE8CF); and Bill VY1AU. They plan to operate on the following frequencies: 21,260 kHz, 14260 kHz and 14130 kHz. They also hope to operate on 40 and 80 meters as well. The callsign used will be Bill's VY1AU and QSL's should be sent to NL7TB: John Reisenauer, 1961 Norene St., Anchorage, AK 99508. Another *MT* reader and friend of mine, Roy Blakeburn, VE1AX, passes along the information that Industry Canada (formerly Dept. of Communications, Canada) has authorized the use of Special Prefixes to celebrate the "International Ploughing Match" to be held in Renfrew, Ontario, 18 to 25 September. Amateurs in Renfrew County who have callsigns starting with VA3 prefixes may substitute the prefix CH3 and amateurs whose prefixes start with VE3 may use the prefix CJ3 during that time period. The Renfrew County Amateur Radio Club station CJ3IPM will also be on the air as a Special Events station during the competition. **CONTESTS** The CQ World Wide WPX (Worked Prefixes) VHF contest will take place starting at 1800 UTC on July 9th and end 2100 UTC on 10 July. Those who have multi mode VHF transmitting or receiving equipment should listen to: 50.125 MHz and above; 144.165 to 144.250 MHz, 222.100 MHz to 222.120 MHz, 432.095 to 432.120 MHz for both SSB and CW signals from participating amateurs. The International Amateur Radio Union's annual World Wide HF contest takes place starting at 0000 UTC on July 15th and ending at 2400 UTC on 16 July. Amateurs the world over will be operating on all HF (SW) amateur bands except: 30, 17, and 12 meters. **DX NETS** Though the sun spot cycle is low and DX on most HF bands is poor, there is an increase of activity on 40 meters which is advent by these two popular DX nets: The "Pacific Rim DX Net" meets daily on 7083.5 kHz SSB at 1030 UTC. The net starts with check in's from the Pacific area and around 1100 UTC the net looks for Caribbean DX. At 1130 UTC a list of US amateurs is often taken on or near 7205 to 7220 kHz (the frequency depends upon the QRN and QRM, each day). Net controls are VK4EFZ and TI5RLI. KDOJL and NI5I are two of the net controls for the "40 meter DX Net" which has moved to 7205 kHz, starting at 0600 UTC daily. **KERGUELEN** FT5XJ has been frequenting 14188 kHz SSB at 1800 UTC daily and 21197 kHz SSB at 1040 UTC. On the later frequency the QSO's are mostly in French. QSL to: Pierre Cluzel F5NLL, Le Capitaine Plaigne, F-11420 Belpeche, France. **PITCAIRN ISLAND** Tom Christian, a direct descendent of the Fletcher Christian of Munity On The Bounty fame is on 21345 kHz every Friday at 1730 UTC. Tom meets with his QSL manager (WD6GUD, George Stevens, 11130 Dempsey Ave., Granada Hills, CA 91344) first then will work others. **SRI LANKA** 4S7/ON4IPA (QSL to: The International Police Association, Box 88, Brussel 23, B-1000 Brussel, BT, Belgium) has been on 14222 kHz SSB daily at 1800 UTC. This station will remain active till August, the operator has announced. **USA** Code Practice on the air is given by the "Brass Pounder's ARC" club station WB3IVO which transmits Code proficiency exams: Saturdays, Sundays, Mondays, and Thursdays on 7040 kHz at 2000 UTC and on 14060 kHz Tuesdays and Fridays at 2000 UTC. Code speeds range from 20 to 60 words per minute. **ZIMBABWE** Z21HS (Ralph Karhammar, Box 4110, Harare, Zimbabwe) will be returning to Australia in January of 1995, but until then you can usually find Ralph on 14020 to 14025 kHz CW starting at 1530 UTC.

and works great. It only uses 90 volts on the plate (so it is safe to work on). Power output is about 2 watts on 80 or 40 meters, and it can be scaled up to 30 or down to 160, too. I have run up to 120 volts on the plates without problem.

Tune up is easy. Use insulated wire

(about 20 to 22 gauge); make a two turn loop about an inch in diameter and solder it to a number 49 lamp. One side of loop goes to the side of the lamp, the other to the center. Hold the loop near L2 and tune C3 for maximum brightness.

It is possible to use a field strength meter,

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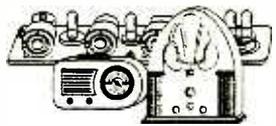
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too. Tune for maximum indication. An NE-2 or NE-51 neon lamp should also work. NE bulbs are neon filled, and simply holding the glass of the bulb near L2 should indicate output by emitting a very weak pink/blue glow.

On 80 meters I have worked over 40 states and six countries using this little peanut whistle. Parts count is very low and most components can be obtained at a ham fest (check around with some of the old timers, too).

Next Month

We will present the long-awaited feature on building your own ham station! We took a somewhat different approach to this task, but I am sure you will all be pleased with the results.

See ya then; 73 de Ike, N3IK

MT

7385 kHz Getting Popular

The primary North American shortwave pirate broadcasting frequency has been 7415 kHz during the 1990's. Unfortunately for the pirates, several powerful international broadcasters have barged into the pirate band during the last year or two. The **Voice of America** on 7405 from Greenville, NC, and on 7415 kHz from Botswana has caused pirate interference. Even worse, **WEWN** from Alabama hogs 7425 kHz with a very broadband signal that creates slop on adjacent channels. **WWCR** in Nashville adds to the mess with a big signal on 7435 kHz.

It was only a matter of time before the relatively low powered pirates began to move away from the interference generated by the big boys. Various pirates have experimented with alternative 41 meter frequencies such as 7445 and 7465 kHz. But, relatively few stations have been using these alternative channels.

7385 kHz has become a new contender for the title of "standard pirate frequency." **Radio for Peace International** in Costa Rica operates below this spot on 7375 kHz, but it does not generate much adjacent channel interference. In the other direction, 7385 is sufficiently far away from the licensed North American shortwave big signals, so it avoids most of the slop QRM interference.

The 41 meter pirate band is much more fluid than it used to be. Several stations still use the area around 7410-7415kHz at times of day when interference is diminished. Still, if you are programming pirate frequencies into the memory banks of your receiver, you definitely should add 7385 kHz to your collection.

Power Radio Busted

The FCC has added another scalp to the roster of busted pirate stations. Peter Sinadinos, a 15 year old resident of Broadview, Chicago, IL, in suburban Chicago, heard a knock on the door on March 31. The FCC alleges that he was the operator of **Power Radio**, an FM pirate on 87.9 MHz. The station had operated for 2½ years, maintaining a format of rock music and phone-in comedy game shows. Sinadinos claimed that he did not know that his broadcasts were illegal. The FCC issued a \$2,000 fine in the incident.

The incident received a great deal of publicity, including two articles in the *Chi-*



cago Tribune newspaper. One of the articles by *Tribune* reporter Ted Gregory ran prominently on the newspaper's April 15 front page. Several Illinois *MT* readers sent in copies of the articles, including Michael Blane of Rolling Meadows, Scott Gentry of Matteson, Jeff Helgoe of Deerfield, William Hassig of Mount Prospect, and William Quigley of Ottawa.

The Power Radio incident was somewhat of a pyrrhic victory for the FCC, given all of the positive media attention that it generated for the pirate radio scene. Among the subsequent coverage was a May "Media Watch" program on Wisconsin Public Radio hosted by Dave Bergman. Some *MT* readers phoned in to talk to the guest, *Outer Limits* columnist George Zeller.

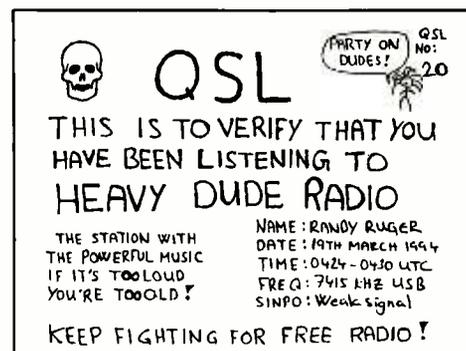
In other media developments, the April 22 San Jose *Mercury News* ran a large feature article about **San Francisco Liberation Radio**, **Radio Free Berkeley**, and **Black Liberation Radio**. Thanks go to *MT* reader Vince Migliore of Santa Clara for a copy. Vince is the publisher of **Geo-Monitor**, a journal "dedicated to earthquake prediction, amateur geophysical monitoring and earth mysteries." It sometimes covers research on very low frequency radio waves that may be associated with earthquakes. One year subscriptions cost \$22.00 from 65 Washington Street, #400, Santa Clara, CA 95050.

Pirate News

Don Zeigler of Princeton, WV, sends in a follow-up item on the *Fury* bust in South Carolina. During an April program on **WWCR**, Brother Stair discussed the FCC incident when prompted by callers to his program. Stair blamed Scott Becker for some aspects of the bust, stating that "he'd get drunk and do stupid things."

Secret Mountain Laboratory, a veteran North American pirate that features calm folk and new age music, says that it will be off the air until Fall 1994. The station is completely rebuilding its antenna system. The final improved product will permit simultaneous operation on two parallel frequencies.

Andrew Yoder, editor of the *Pirate Pages* newsletter, has announced that the publication is temporarily under suspension between May and August. Issue #121 is anticipated in early August. It will cover the three month period while the newsletter went on vacation. More information is available via the Blue Ridge Summit maildrop (see below).



Randy Ruger's Heavy Dude Radio verie

New FCC Gadgets

Gigi Lytle of Lubbock, TX, forwards an Associated Press article about the FCC's latest direction finding technology. The FCC has acquired ten radio direction finding automobiles. Each is equipped with \$75,000 worth of antennas, computers, color printers, and satellite receivers.

"This will give us a lot of advantages against the bad guys, no doubt about it," said FCC Chairman Reed Hundt. He hopes to eventually expand the FCC's direction finding fleet to 70 vehicles, pending congressional appropriations.

Correction

The May issue of *MT* incorrectly identified Rob Keeney of Overland Park, KS, as the President of the Association of Clandestine Radio Enthusiasts. Actually, Rob has the duties of publishing *The ACE* bulletin. As many of you know, Kirk Baxter has been ACE President for nearly a decade. In addition, Kirk operates the ANARC shortwave computer BBS, which is the largest BBS in North America that extensively covers pirate and clandestine radio. The BBS also serves many other ANARC shortwave hobby clubs. Access is free via (913) 345-1978. We apologize to Kirk and Rob for reversing their titles.

What We Are Hearing

North American pirate stations use anonymous mail forwarding services for their correspondence with listeners. When you write to these maildrops, you should enclose three

mint first class stamps to defray postage costs during the mail forwarding process. Foreign addresses require \$1.00 US for this purpose.

Several different addresses are used by stations reported this month, including PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; PO Box 493, Boys Town, NE 68010; PO Box 17534, Atlanta, GA 30616; PO Box 3893, Thousand Oaks, CA 91260; PO Box 293, Merlin, Ontario N0P 1W0; PO Box 1461, 614036 Perm, Russia; Kamnarsvagen 13D:220, 226 46 Lund, Sweden; and PO Box 220 342, D-42 373 Wuppertal, Germany.

Action Radio- 7415 at 2300. A. J. Michaels produces an entertaining blend of rock music, comedy, and knowledgeable commentary on events in pirate radio. Randy noted bootleg interference from two way Spanish language QSO conversations. Addr: Boys Town. (Randy Ruger, Brandon, FL; Harold Frodge, Midland, MI)

Christian Rock Radio- 7415 at 2345. This one is produced at the studios of **WGBR**. In addition to their pirate broadcasts, they are carried by four MW/FM licensed stations and some low power Part 15 operations. Addr: Wellsville. (Zeigler, Frodge)

Heavy Dude Radio- 7415 at 0430. The station is a Europirate rocker, but most North American logs have been via a NAPRS relay. They were clobbered by the sign on of Portugese programming from the **Voice of America** Botswana relay. Note the slight change to their address, in comparison to what we have printed in prior issues. Addr: Lund. (Hassig, Ruger, and direct from the station)

KDED, Voice of the Grateful Dead- 7465 at 0400. Randy sends in an excellent rare log of this one, along with a tape to prove it. As you might expect, Grateful Dead rock dominates the broadcasts. Randy says that this band was in Orlando when he logged the station, so it might use a travelling transmitter. Addr: Thousand Oaks. (Ruger)

Guerrilla Pirate Station- 7465 at 0300. This new one has not been widely heard yet. Their early shows have been dominated by taunts directed at the FCC. Addr: None. (Ruger)

Inmates from the Asylum- 7385 at 2130. Their name describes their wierd programming and sound effects, which also includes Pink Floyd rock. Addr: Unknown. (Gentry)

North American Pirate Relay Service- 7385 at 0015. Richard T. Pistek actively relays programming from many other pirates. In particular, NAPRS brings many Europirate stations to the Western Hemisphere with good signals. Addr: Wellsville. (David Chapchuk; Scranton, PA, Ruger)

Omega Radio- 7385 at 0030. Dick Tator's shows used to be dominated by Christian rock music and conservative political commentary, but he now adds secular rock and pirate radio analysis. Addrs: Wellsville and Blue Ricge Summit. (Gentry, Chapchuk, Ruger)

Radio Airplane- 7385 at 0045. Pilot Captain Eddy still beams his shows from a moving aircraft, weaving a mix of rock music and entertainment sketches. He uses quite a number of frequencies on 41 meters, including 7445 and 7465 kHz. Addr: Wellsville. (Lytle)

Radio Azteca- 7412 at 2315. Bram Stoker creates extremely funny parodies of DX-ing, broadcasters, and other hobby related subjects. These broadcasts are always a treat. Addr: Wellsville. (Frodge)

Radio DC- 7425 at 2345. This highly political left wing pirate still broadcasts in two modulation modes: upper sideband and Morse code. Typical shows attack Republicans such as Oliver North and Ronald Reagan. Addr: None, but verifies logs in *The ACE* bulletin. (Janet Whitney, Alexandria, VA)

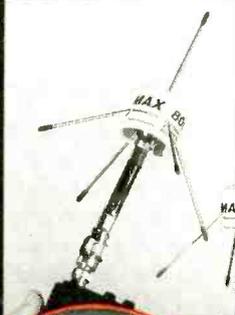
Radio Doomsday- 7465 at 2245. Nemesis has been less active lately. Harold calls the fake announcer a "sicko." Don't confuse this with the real thing. Addr: None. (Frodge)

Radio Titanic International- 7385 at 0230. Tim Cooper is the eran European pirate station, where the first shortwave transmission took place in 1975. It has been widely heard this year via relay transmitters in North America, featuring a fast paced music. Addr: (Hassig, Gentry)

RBCN- 7465 at 2300. Radio Bob does not transmit very often, but when he does, his southern redneck humor parodies are hilarious. He uses an alternative identification of "Radio Bob's Communications Network." Addr: Atlanta. (Ruger)



SERIOUS EAVESDROPPING

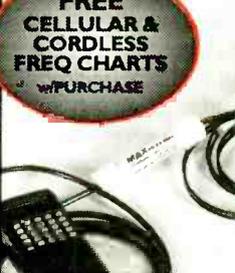


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Solid Rock Radio- 7465 at 2300. They usually program rock music, but Scott heard them with a relay of Mbanna Kantako's **Black Liberation Radio** in Springfield, IL. Addr: Wellsville. (Gentry)

The Unidentified Pirate- 8385 at 0115. This new one actually announces an identification as we list it here, but its operator says that it is not affiliated with **UNID**. So far its format has been Beethoven classical music. Addr: None. (Hassig)

Voice of the Americans- 7405 at 2345. Here's a new one that concentrates on political commentary, mainly complaints about the USA's current system. Addr: None. (Doehner, Frodge)

Voice of Laryngitis- 7385 at 0000. Genghis and Stanley Huxley have produced a special program in honor of the station's tenth anniversary. It contains bits from more than a dozen Laryngitis classics that have been heard over the years. Look for their barking seal interval signal. Addr: Wellsville. (Lytle)

WJLR- 7415 at 0000. During some of his shows this year, Dave Stone has announced that listeners were hearing his last broadcast. But, the classic rock format of "John Lennon Radio" is still heard on the pirate bands. Addr: Blue Ridge Summit. (Chapchuk, Ruger)

WKND- 7416 at 0045. Veteran pirate Radio Animal has been relatively inactive for months, but he has returned with his rock oldies and pirate radio advocacy broadcasts. Dogs are a prominent theme at this station. Addr: Blue Ridge Summit. (Williams)

WREC- 7417 at 0015. P. J. Sparx remains active with a well produced blend of rock music and comedy features. Addrs: Wellsville and Blue Ridge Summit. (Frodge and direct from the station)

WRV- 7465 at 0100. Pirate Pete at "The Radio Virus" aired a recent tribute to the rock group Nirvana, in memory of the Curt Cobaine suicide. Addr: Wellsville. (Ruger, Hassig, Gentry)

XEROX- 7385 at 0030. "Radio Duplicado" has a great station ID that parodies Mexican call signs and brings back memories of a shortwave bulletin logging hoax from more than a decade ago. The pirate mixes diverse ethnic music styles with subtle humor. Addr: Wellsville. (Hassig)

MT

what's new?

Hot New Uniden Num- bers



Uniden has announced its new summer scanner line up, and while not everything is "new" to readers of *Monitoring Times*' "What's New?" column, there certainly are some interesting offerings.

A Uniden scanner that's been widely publicized, but is only now available, is the Sportcat. It is unique in that it is the first scanner designed specifically for the burgeoning market of car race enthusiasts who pack a scanner along to the track to monitor drivers and pit crews. It's a 12 band, 800 MHz handheld with a suggested retail price of \$349.95. It has caused cries of "heresy!" from traditionalists who take exception to its canary yellow color.

Another new addition to the handheld scanner line, due out next month, is the BC 60XLT. It's a \$189.95 entry-level scanner with 10 band coverage, one-touch weather and AC adapter/charger. You'll find that arriving on dealer shelves in August. Also added is the BC 80XLT, a new 800 MHz, 12 band scanner whose primary claim to fame is its low cost-to-feature ratio. Although the official price has

Larry Miller

not yet been set, look for it in early fall at around \$299.95.

We've mentioned the BC 220XLT here before but only as "upcoming." It, too, is now available and has a suggested retail price of \$439.95. The '220 is, according to Uniden VP Al Silverberg, "a scanner for the professional user." It features turbo scan and turbo search and has received glowing reviews from those who have seen the prototype. It replaces the very popular '200XLT.

Uniden continues to battle its number one consumer problem—having to provide continual "how to" and frequency information to confused new scanner owners—by introducing yet another pre-programmed unit, the 11 band BC 120XLT handheld. To search for active frequencies, you initiate a pre-programmed service search, rather than setting user-programmed frequency limits. The '120 is now available for \$259.96.

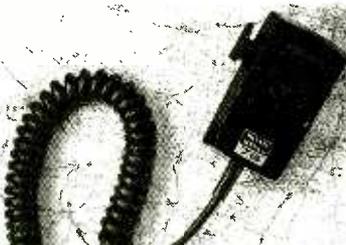
It's also interesting to note the introduction of the Beartracker BCT-7. Not due until October, it replaces the BCT-2, a radio that one Uniden representative called a "truck stop radio." The BCT series receives this designation because it is reportedly sold primarily to truckers who use them to evade speeding tickets. Sales reportedly skyrocketed after it became illegal for truck drivers to use radar detectors. It, too, is preprogrammed but adds full scanner 100 channel capability, as well as band search and one-touch weather. The BCT-7 will have a price tag of approximately \$329.95.

There are also two new base scanners. The BC 144XL is a 16 channel scanner that has that nice, new "contemporary" design and that has been simplified for easier use and programming. Again, watch it as Uniden seeks to make

scanners more accessible to the impatient, "I want it and I want it now" non-hobbyist consumer. The '144 is now available and is \$159.95.

Finally, there's the 178XLT, just arriving at your radio dealer this month. It's a 12 band, 100 channel scanner that sells for approximately \$219.95. It features—again—service scanning, turbo scan and turbo search, as well as data skip—the helpful feature that eliminates the annoying and increasingly common "noise" channels.

The Road King



There are some solid entries here, all worth your consideration. We'll be looking forward to having the opportunity for hands-on review.

Telex Communications has introduced a new CB microphone called Road King RK-76. Road King is, according to the manufacturer, the industry's only handheld amplified CB mic with compression. It is designed for users looking for higher average output power, better intelligibility, and greater transmission distances. A slider-control, located on the top-rear of the microphone, adjusts the compression ratio; a cartoid electret microphone helps reject unwanted ambient noise.

Also featured on the Road King RK-76 is a user-selectable, end-of-transmission "Roger" beep tone. When the push-to-talk button is released, the microphone automatically holds the radio in the transmit mode for an additional 1/8th of a second, generates a beep tone, and then drops the transmit mode. The

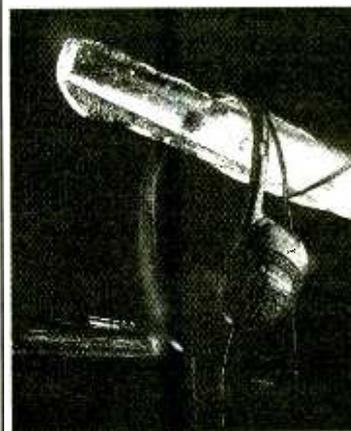
tone may be deactivated, if desired.

The RK-76 is available at your favorite radio dealer and has a suggested retail price of \$74.95, which includes dashboard mounting bracket and hardware.

Head Clamps

Headphones are an often under-discussed part of radio monitoring. Recently, however, we've seen sets specifically tailored for voice-mode listening. While they're actually made for the professional market—dispatchers and the like—their characteristics make them perfect for monitoring.

Audio-Technica has released a new series of stereo 'phones that, while not tailored to voice frequency ranges only, do feature the strong industrial design necessary to withstand the rigors of heavy monitoring. The new Omniphones also make listening easier on the head, even for those who wear glasses. The top and bottom of the foam earpieces are under tension, creating a soft convex "spring" that more closely conforms to the shape of your ears.



Says Audio-Technica Marketing Manager Peter Sabin, "Shoes fit your feet, mittens fit your hands, but flat-pad headphones don't really fit any part of your anatomy..."

You can check out a pair

of Omnipones at your local audio dealer. They're very affordable, ranging in price from \$19.95 to \$29.95.

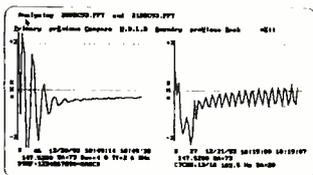
Another approach to comfortable listening is a set of cordless earphones that allows you to listen to any audio source with an output jack from up to 23 feet away.

Using infrared technology, the Zentek cordless Clearound headphones will let you putter in the workshop, watch TV with the family, or take your turn washing dishes while you listen to your favorite monitoring source. The earphones are easily adaptable to mono listening with an optional jack.



Powered by two AAA batteries, the CS530 is \$49.95, or, for \$10 more, you can get the CS720 which operates on two rechargeable AAA Ni-Cd batteries. Contact Zentek Corp., 3670-12 W. Oceanside, NY 11572; 516-678-1688 for more information.

Transmitter Fingerprinting



When keyed, every transmitter exhibits a unique frequency-versus-time characteristic before it stabilizes on frequency. As a result, it's possible to identify a particular

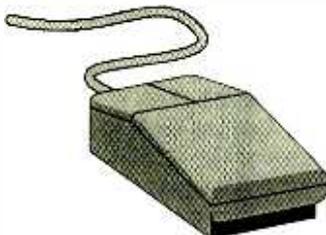
transmitter by means of capturing and displaying this frequency-versus-time history.

The TxID-1 is a printed circuit card that plugs into an expansion slot on an IBM/compatible computer and can "fingerprint" any keyed FM or AM transmitter. An additional feature allows the Tx-ID-1 to store "fingerprints" on audio tape, along with actual audio from the transmission.

The manufacturer of the TxID-1 warns that while each transmitter does indeed have its own unique, repeatable characteristics, transmitter "fingerprinting" is not an exact science. Visual comparison is necessary, but the Tx-ID-1 will no doubt make the process of fighting radio abuse and interference a lot easier.

TxID-1, with software, is available for \$699 plus \$8.00 UPS from Motron, 310 Garfield Street, Suite 4, Eugene, OR 97402.

Antlers for Windows



Anyone who has ever gone through the math for erecting an antenna will appreciate Joe Carr's latest contribution to the art. Author of the *Practical Antenna Handbook, 2nd Edition*, and *Joe Carr's Receiving Antenna Handbook*, Carr has extracted liberally from these two volumes in the preparation of Antlers for Windows software.

Antlers is designed to calculate element lengths, spacing, tuning networks, C and L values, matching sections, and dimensions for over two dozen antennas including dipoles, wire arrays, loops, verticals, Yagi arrays,

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and even curtains from 10 kHz through 2 GHz.

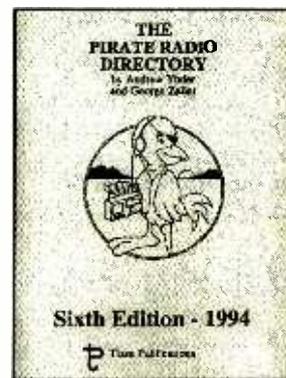
After about a minute of loading, Bob Grove discovered the program to be quite informative, including labeled illustrations to match the specification charts. Bob selected an HF Yagi, a dipole, and a UHF Yagi. After entering his desired specs, the entire set of measurements came up without delay.

Menu driven, Antlers is easy to use and accurate, providing rapid calculations for scaling the antenna design of your choice. Disk and documentation is \$30 from Joseph Carr, PO Box 1099, Falls Church, VA 22041.

Pirate Radio Directory

The new 6th edition of the *Pirate Radio Directory* is now available and it's a whopper. This edition combines the mega-talents of

Monitoring Times' own George Zeller with the insightful writing of Andrew Yoder, himself an accused pirate.



The book is essentially a collection of mini station profiles. Some of them provide a curious insight available only to someone very close to this aspect of the hobby. Others contain so little information as to make them nothing more than fillers. All are interesting in one way or another.

Still, if shortwave is, for the most part, known for its

very predictable, government-sponsored programming, the world of pirates is quite the opposite — it's where the desperately creative, alternative-*everything* people hang out. A very, very, open mind is a prerequisite for membership in this club.

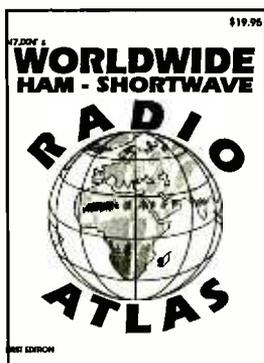
The *Pirate Radio Directory* is highly recommended. It's available for \$12.95 plus \$2 shipping from publisher Tiare Publications, P.O. Box 493, Lake Geneva, Wisconsin 53147, or from Grove Enterprises.

Ham-ROM

AmSoft has announced the world's first amateur CD-ROM subscription program called "The World of Ham Radio." According to the press release we received, subscribers will receive a new callsign CD every four months for one flat fee of \$99.00.

AmSoft will continue to sell its "World of Ham Radio" CD (see March '94 "Computers & Radio" for a review) for the single unit price of \$40. The single CD contains over 7,000 program files, including many of the latest software releases for amateur radio. Subjects include antennas, CAT, CW, Exams, satellites, weather tracking, and over 1,000 radio modifications and thousands of shortwave frequencies. For more information call Pete deVolpi at 1-717-938-8249.

Helping Ham



The *Worldwide Ham-Shortwave Radio Atlas* is an unusual book that takes the ham radio country list and provides a page of information about each of these countries. Under Bolivia, for example, you'll find a desktop publishing map, fascinating facts like, "Bolivia is the world's second largest producer of coca," as well as geographical information (the ethnic groups of Bolivia include the Aymara and the Quecha), beam headings, and ham information (there are 1,750 hams in Bolivia).

It's an interesting concept, one that some hams may find interesting or even helpful, even though virtually all of the information is available elsewhere.

You can get your copy of the book from artsci/FBenterprises, P.O. Box 1428, Burbank, CA 91507. The price is \$19.95 plus \$4.00 shipping.

Patches, We Depend On You



Mike Starr has written to say that he is producing a patch designed to honor amateur radio operators. The patch will be three inches 'round with a white background, red ink and a blue stitched border. As you can see from Mike's rough sketch, above, the patch speaks directly to amateur radio's life-saving role in emergency communications.

You can get your patch by sending \$2.30 (postpaid) to Mike Starr, 3420 Hadley Rd., Hadley, Michigan 48440. Tell

him that you read about it in *MT*.

See and Hear

Among people who monitor the 46 through 49 MHz band, are those who enjoy snooping into the private lives of their neighbors. All you need do is set the search limits on your scanner and you'll hear every cordless phone call in the neighborhood. My gosh, it's amazing what people will say on the phone despite the fact that it's widely known that cordless phones can be monitored!

Some monitors feel that actually it's the baby monitors that are the most revealing. Operating on the same frequencies, these devices act as whole-house bugs, broadcasting the most intimate details of people's lives over a wide area.

Now comes word that Gerber Electronics is marketing a baby monitor that also transmits *video*. The basic package, marketed by Toy Biz of New York, includes a TV camera with microphone attached to a wireless video/audio transmitter that operates on 900 MHz. Suggested retail price is \$299.99.

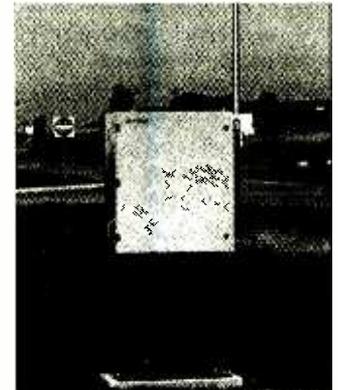
Can you stand it? Now it's conceivable you'll be able to hear and *see* your neighbors.

On the Air

Want to own your own AM radio station? Information Station Specialists in Zeeland, Michigan, has a self-contained 30 watt AM transmitter (factory set at 10 watts). It is a complete radio system, including all wiring, connectors, mounts, hardware, microphones and cables. In fact, the mobile unit looks very much like the one pictured in our lead article on earthquakes, right down to the bright orange color.

Illustrated installation,

operation, and maintenance instructions are provided. Operators receive free FCC licensing service for the first five years of operation.



Features include telephone control, which allows you remote control of transmitter power and message recording, status checks and actual off-air monitoring.

Information Station Specialists produce these radios for TIS (Traveler Information Service) use. A field intensity study is required by the FCC before use.

The Alert AM operates on either 120 volt AC or 24 volt DC and has a long-term battery backup.

For more information, contact Bill Baker at 616-772-2300 or write P.O. Box 51, Zeeland, Michigan 49464.

Military Monitoring

Followers of Steve Douglass' work will be happy to see his Comprehensive Guide to Military Monitoring now on the shelves. The book does touch on most aspects of military monitoring, but its strengths — and its weaknesses — reflect those of its author. For information on military "black" aviation projects, and military ("milspeak") terminology, the book is quite good—a substantial amount of information for \$19.95. Order from Universal Electronics, Inc., 4555 Groves Road, Suite 13, Columbus, OH 43232; 614-866-4605.

Utility Database

Are you interested in the frequencies and selective callsigns for the UN in Luanda? Or for the French Forces in Reunion? *MT* received an intriguing announcement of a world-wide utility database (in English) containing 20,000 frequencies from 9 to 30 MHz. Fields available for each entry are country, callsign, contents, group after which the transmission is encrypted, baud rate, shift, selcal, user, kind of system, and encryption (yes/no).

The mouse-controlled software allows you to choose the criteria on which to sort. Information is based upon both ITU allocations and reports from experienced monitors in locations around the world.

In addition to the database, a help system serves as a tutorial for utility monitoring. It explains both traditional and newer data systems, Q and Z codes, emissions designations, NATO and AIR routing indicators, and even help in recognizing Arabic transmissions.

Roland Prösch, Communications Engineer, says, "It makes no sense to buy a database ... to find out that it is old with the day of publishing." The database is changed almost daily, and purchasers can update every three months for a \$15 fee and return of the original disk.

The basic database system is \$48, including the installation handbook. Various printouts, including the help text in the database, are available for \$10-35. For more information, write Ingenieurbüro für Satellitentechnik, Mühlenweg 11, 24217 Stakendorf, Germany; FAX/tel. ++ 49 4344 6758.

REVIEWS

by Bob Grove

Trifield Environmental Monitor

There is growing concern over the impact of electromagnetic energy on the human body. Many instruments presently on the market measure only 60 Hz power line radiation, but evidence continues to point to higher source frequencies as well.

AlphaLab (1272)
Alameda Avenue, Salt Lake City, UT



84102-1703) has developed the TriField meter, named for its unique capability to monitor and display three energy sources: magnetic, electric, and radio/microwave.

Operating for 10-40 hours from a standard 9-volt battery (supplied), the TriField meter will measure up to 100 milligauss of magnetic field intensity in the 60-100,000 Hz range (0-3, 0-100 mG scales), up to 100 kilovolts per meter electric field intensity (0-3, 0-100 kV/m), and up to 1 milliwatt per square centimeter (as high as 3 GHz) radio/microwave power density.

The analog meter has undamped response, displaying immediate readings of home appliances, computers, microwave ovens, TV sets, electric blankets, fluorescent lights, power transformers, power lines, residential and industrial wiring, cellular and cordless telephones, VHF and UHF transceivers, and other sources of electromagnetic energy.

While the accuracy of the readings varies considerably, the meter is not intended for absolute laboratory measurements. It is designed to provide relative comparisons of environmental influences to indicate whether or not corrective measures should be considered. The response curves are weighted to favor those frequency ranges that latest research indicates are the most hazardous.

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Four pages of tutorial material provide excellent reference levels and techniques for measuring a variety of electromagnetic energy sources in the home and work environments.

The TriField meter sells for \$140 plus \$5 shipping from the manufacturer, but it is also available for \$119.95 plus \$6.50 shipping from Grove Enterprises, PO Box 98, Brasstown, NC 28902.

Whatever Became of the "E-Lamp"?

A couple of years ago we brought you news of the impending "E-Lamp," a revolutionary, new light bulb that worked on radio frequency energy. Apparently it's still impending.

A spokesman for ntersource technologies, developer of the device, says design is complete but they have been unable to find a manufacturing partner willing to invest the start-up funds required.

The E-Lamp's future is further clouded by a recent announcement by GE that they intend to produce a virtually identical "Genura" bulb. ntersource hopes to produce a trial run of E-Lamps later this year.

MT

REALISTIC® PRO-23 HANDHELD SCANNER

With the removal of several popular scanner models from the market due to the new anti-cellular-scanner law, attention is being turned to new products. Recently entering the scene is the Realistic® PRO-23, a 50-channel scanner with a low price tag and attractive features.

Operating from four AA cells (alkaline or rechargeable) or an optional AC adaptor/charger, the new release measures approximately 6"H x 2-1/2"W x 1-3/4"D and weighs about half a pound. A plastic belt clip and well-written operating manual are included.

Frequency coverage is 108-174 MHz, 406-512 MHz, and 806-956 MHz (less 824-849 and 869-894 MHz cellular frequencies, receivable — see sidebar article).

Take another look at those frequency ranges. See anything missing? That's right, the entire low band! We thought it was a misprint in the literature, but when we tried to enter frequencies between 29 and 54 MHz, we got the ERROR display. Low band is, indeed, missing.

So what's in this range? Ten- and six-meter hams, state highway patrols, military, paging, utility companies, state forestry, industrial communications, Red Cross, medical emergency operations, truck and bus lines, road crews, businesses and, of course, cordless telephones.

But let's take a look at what the scanner does have: 50 memory channels which may be stored in five 10-channel banks, plus another 5 "monitor" channels for storing search-discovered frequencies. These temporary frequencies may be transferred to permanent memory.

Any single channel may be selected for priority, sampled every two seconds for activity.

The memorized frequencies will be retained by a backup circuit for up to an hour for battery changes. Individual channels may be temporarily locked out from the scan sequence.

All seven NOAA National Weather Service channels are in permanent memory, scanned automatically by pressing the WX service search key.

The LCD is visibly backlit for 15 seconds by briefly pressing another key. Holding that same key down for two seconds enables a key lock feature, preventing accidental presses from activating the scanner. The backlight is independent of this operation, responding only to a brief press of the key.

A unique, new feature on recent models is the presence of angled, oversized keys for the SCAN and MANUAL functions. This ergonomic feature allows convenient thumb activation of the two most commonly-used functions while holding the scanner during monitoring.

Scan speed is 12 channels per second, rather sluggish when compared with competitive products which are now pushing the barriers at more than 100 channels per second. Search speed is a little more respectable at 19 steps per second.

Tuning step intervals are 12.5 kHz in the 108-137 MHz aircraft band as well as 406-512 MHz UHF and 806-956 MHz high UHF, and 5 kHz in 137-174 MHz high band.



Sensitivity averages 0.6 microvolts throughout the narrowband FM frequencies, and 1.3 microvolts in the aircraft band.

The conversion scheme is conventional double conversion at 10.8 MHz and 450 kHz. Channel one can be selected for a priority function and sampled every two seconds. A two-second scan delay is all-channel and non-defeatable.

Audio power is typically 250 milliwatts into the internal 1-7/16" speaker; a 1/8" (3.5 mm) earphone jack is provided. Sound quality is quite good.

The new PRO-23, available for \$199.99 from Radio Shack outlets, is recommended for metropolitan listeners where low band is in sparse use.

M

CELLULAR COVERAGE ON THE REALISTIC® PRO-51 and PRO-23

NOTE: It is unlawful to monitor cellular telephone conversations. These procedures are described to provide continuous frequency coverage only.

Manufactured by Uniden for Radio Shack, the new Realistic® PRO-51 and PRO-23 scanners have cellular frequencies blocked at the factory, but they are easily accessed by a short keyboard routine.

1. With the radio switched off, hold down the 2, 9, and LOCK-OUT keys; turn the radio on and release the keys.

2. Step to channel 23 on the PRO-51 or channel 15 on the PRO-23 to display 888.960 MHz, a factory test frequency.

3. Press either the up or down search arrow to scan the cellular band in proper 30 kHz steps. You may temporarily store up to 10 active cellular frequencies by pressing MONITOR.

To permanently store cellular frequencies for scanning and to have a starting point for searching:

1. Step to the MONITOR channel you wish to permanently store, then press PROGRAM, then the desired memory channel number (including those with factory-preprogrammed test frequencies).

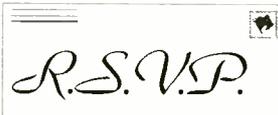
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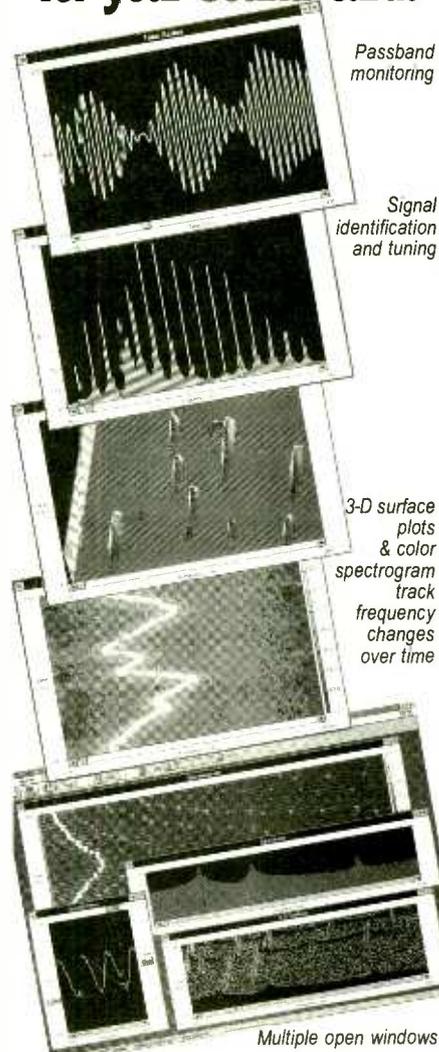
Grove Enterprises, Attn: New Publications
P.O. Box 98
Brasstown, NC 28902

2. Press in sequence PROGRAM, MONITOR, ENTER. Repeat steps 1 and 2 for each channel to be memorized.

We would like to thank our irrepressible scanner guru, Larry Wiland, for discovering these procedures.

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•MFJ-8100 Shortwave Radio, the Voice of Yesterworld •Better, Cheaper Keypad for Yaesu FRG-100

Scratch any group of graybeard shortwave listeners, and you're bound to find a few who handrolled their first rigs from a kit. A Knight "Star Roamer," perhaps, or an offering from Lafayette or Heath. They'll tell you how they lovingly assembled them, often with help from patient dads or uncles. And the thrill when those first stations crackled through the headphones.

Early Radios Used Regeneration

If you happen upon a group of *real* old-timers, you might even find one who remembers his earliest radio as a rig with regenerative circuitry. He'll also tell how they were superseded by "superhets," radios with superheterodyne circuitry that has been the norm for decades, now.

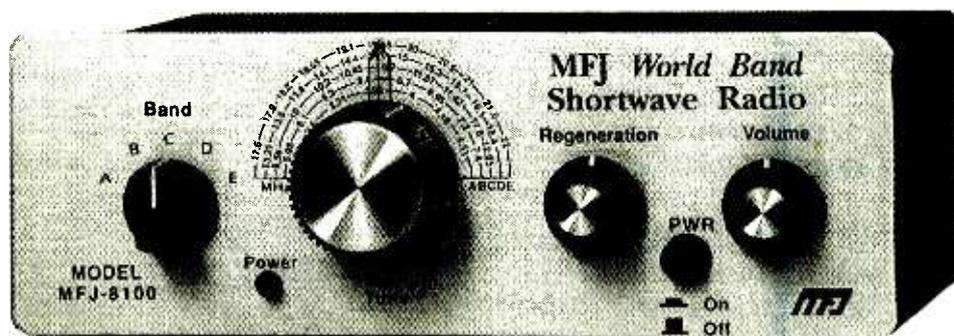
Shortwave Kits Once Popular

Not only are regenerative radios artifacts of history, so are radio kits. However, thanks to MFJ, you can now experience a kind of time warp on both fronts—through a kit with the redundant name of "MFJ Model 8100K World Band Shortwave Radio." Spend a few hours assembling this \$59.95 radio—perhaps they should have called it a "wireless," the original name for radio—and you'll have your very own regenerative receiver to play with.

If the idea of electronic assembly doesn't appeal to you, the radio can also be purchased assembled for \$79.95 as the Model 8100W.

In order to avoid the vagaries of individual assembly quality, at International Broadcasting Services we don't test kits unless they have been pre-built by the manufacturer. So we went for the "W" version. Thinking, though, of would-be builders, we pored over the Instruction and Kit Assembly booklet.

Our hats go off to MFJ. The instructions are well written, lively and useful. A separate Instruction Manual also makes for great reading, even if its claim that shortwave listening declined



in the Eighties is the exact opposite of what actually happened. Its recommended publications list is a bit odd, as well.

Only Essential Features Included

Eyeballing the spartan aluminum cabinet of the completed rig, it's hard to believe that this is a "real" radio. Its front panel sports a power switch, volume control, regeneration knob, tuning knob, power-on LED, and a five-position band selector.

The circuitry is all solid state; no tubes like our ancestors' radios had. It tunes roughly 3.5-4.31, 5.9-7.4, 9.45-12.05, 13.21-16.4 and 17.6-22.0 MHz. While this is far from ideal, it covers most of what world band has to offer. On the back panel are two headphone jacks, an antenna post, a grounding post and an RF gain control. That's it: no keypad, no presets, no signal strength meter, no antenna—not even a loudspeaker. Just a radio stripped to the bones.

Installing a battery calls for some construction, too. No less than eight screws have to be removed, the battery installed, and the screws reattached. You then plug in a set of walkaround headphones and hook up the 8100 to an antenna. *Voilà*—it works! After a few moments of fiddling, the BBC, VOA and several other big guns come booming in around 6 MHz.

Extra Knob Used

The only way to ferret out stations is by the traditional tuning knob. However, unlike with today's superheterodyne radios, you also have to manipulate a regeneration knob.

The tuning knob's vernier reduction is smooth and works surprisingly well. When you hear a station, you bring it up to proper listenability by turning the regeneration knob until the receiver starts to howl, then back it off a little. It's a little strange at first, but you quickly get used to it.

Even connected to our mighty Eavesdropper antenna, the radio doesn't overload one bit. Audio quality through good headphones is surprisingly pleasant, and the entire rig is stable enough to listen to hams and utilities in single sideband. Tuning SSB signals requires a delicate touch, though, since you have to sneak up on the sideband with the tuning knob (there is no SSB switch or BFO).

It's easy to lose a station if you get heavy-handed with the regeneration control. Yet, once you get the hang of working back and forth between the tuning knob and the regeneration control, it can be fun.

Fading Pattern Solves Mystery

In listening to the 8100, we came across something entirely unexpected: The regenerative circuitry is remarkably resistant to fading. While the audio on our Sony ICF-6800W would be PUMping aWAY like CRAzy, the 8100 would maintain virtually constant volume.

Until, that is, a really deep fade occurred. Then the 8100 would suddenly disappear into a black hole, the volume fading to virtually nothing. The signal would slowly build back up, staying almost constant until the next deep fade.

This experience appears to have solved a riddle that has mystified us for some time. Often we've heard pre-WWII shortwave listeners talk about how shortwave signals tend to fade out suddenly, then reappear. Yet, we'd never really experienced that ourselves until now. It's just a guess, but it looks like that phenomenon might well be an artifact of regenerative receiver design.

Significant Performance Limitations

Okay, if regenerative receivers are this good, why aren't they made any more?

The 8100 provides some clues. First, its dial gives you only the wildest guess at where you might be tuning within the radio spectrum. It's akin to having a road atlas that says only, "You're somewhere in Kansas."

Second, sensitivity to weak signals of an 8100 hooked to a long Eavesdropper antenna isn't even close to that of a modern portable operating off its built-in antenna. For example, within one 85 kHz segment our Sony ICF-6800W detected eight different stations. The 8100, beefy antenna and all, scraped up only three.

Third, selectivity, or adjacent-channel rejection, is abysmal. Stations fully 10 kHz, or two channels, apart sound as if they are impinging upon each other. This is one case in which the lower sensitivity of the 8100 pays off. Since fewer stations can be heard, they're less likely to interfere with each other!

Mediocre Performance, but Cheap and Fun

For about the same price, you can buy a cheap, relatively modern Chinese portable that outperforms the 8100. Yet, for all its inadequacies, we found ourselves liking this do-it-yourself radio from yesteryear. It would make a great project to share with a youngster willing to forego the Nintendo for a couple of days, and its simplicity is appealing. If radio had existed in Thoreau's day, a rig like this might well have graced his cabin at Walden Pond.

As a radio in straight competition with modern receivers, the MFJ Model 8100 World Band Shortwave Radio comes up short. This is clearly a radio for people who like radios, not those wanting pushbutton news from Paris. But as a time machine and construction challenge, MFJ's inexpensive "Voice from Yesterworld" is delightful, wholesome fun.

Improved Keypad for Yaesu FRG-100

Earlier, we reported on an excellent outboard French keypad for the Yaesu FRG-100. However, you had to send off to France to get it, and it cost around \$80, all told. Also, it was powered by batteries, which had to be replaced periodically.

Well, scrap all that. That keypad, manufactured by Brodier E.E.I., has been redesigned. It no longer needs any batteries, and is available in the United States from Universal Radio (800/431-3939) for only \$54.95 plus shipping. To operate it, simply take it out of the box and plug it in.

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

MT

PASSPORT® TO WORLD BAND RADIO'S Radio Database International White Paper® equipment reports contain virtually everything found during IBS' exhaustive tests of premium receivers and outdoor antennas. These are available in the U.S. from Grove Enterprises, Universal Radio, EEB and DX Radio Supply; in Canada from Sheldon Harvey (Radio Books), 79 rue Kipps Street, Greenfield Park PQ, J4V 3B1; in the United Kingdom from Lowe Electronics Limited, Chesterfield Road, Matlock, Derbyshire DE4 5LE, England; and in Japan from IBS Japan, 5-31-6 Tamanawa, Kamakura 247. For a complete list of available reports, please send a self-addressed stamped envelope to RDI White Papers, Box 300M, Penn's Park PA 18943 USA.

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WINDOWS RADIO SOFTWARE

While looking through one of my local radio equipment "candy stores" I picked up a 1994 AEA catalog. Ever vigilant for new digital radio accessories or programs, I paged through it, shutting out the world as I flipped the pages. "DSP, digital signal process, is becoming available to the consumers," I mused as I passed the page with AEA's DSP-2232, latest in the descendants of the PK-232 decoder.

On page 13 I hit it—Log Windows. The byline read "A fully integrated easy-to-use Windows program to simplify almost everything you do!" "How about simplifying writing the column?" I thought. A turn of the page and a product called PC-Pakratt for Windows jumped at me. *Have I been sleeping or has AEA been saving this stuff up for their catalog?* Well, at least the next page brought a program we had already looked at: AEA FAX. Uh oh! It's AEA FAX II! "I'd better call these guys," I thought.

Well, a call to the good people at AEA has borne fruit: here is a look at all three AEA programs. Let's start with Log Windows version 1.0—a logging, rig control, TNC interface and award tracking program.

As the name implies, Microsoft Windows 3.1 is required to run Log Windows. Also required is 4 MB of RAM and a VGA monitor. Installation looks straight forward, being done from the Windows' File Manager.

Overcoming Obstacles

The first thing you will notice about AEA's Log Windows when you try installing it is that it demands a ham call before it will let you install it! Not exactly user friendly to the SWL community. Since I was licensed in 1961, but let it lapse while spending time in Europe, I just used my old call. Voilá! We are by the gate keeper and the program installs itself in about four minutes.

If you are using HP's Dashboard, which we looked at in June, you will now see a Program group entitled Log Windows. Clicking on the box brings up a message telling you to create a logbook file. This only happens at start-up. Make sure your TNC (terminal node decoder such as AEA's PK-232MBX, which I use) is connected and turned on.

Unfortunately, I use my mouse and TNC on the same serial port with a switch to choose between them. Why not use the other serial port for one of these, I hear someone ask, since most PC's come standard with two serial ports—com1 and com2—these days?

Well, since this is a radio control and TNC program like SCORPIO and SCANCAT, I have all my radio interfaces on the other serial port. Since these other programs are not Windows based they use the keyboard for user input with no need for a mouse. Log Windows, and any other Windows based complex control program, such as Ham Windows, require the installation

mouse driver, second serial port configuration and about 100 ?*X's later. Moving the mouse to com3 or com4 seems to be well-nigh impossible.

Because all my other radio and TNC control programs (i.e., SCANCAT, SCORPIO) are set up for the radio and the TNC in com2 and com1 respectively, I didn't want to change these two. That's why I went after the mouse.

I'll JUST have to change the TNC to com3 or 4. Be right back...I HOPE!

Only a few minutes later and Log Windows is controlling the radio, displaying TNC data AND the mouse is working! Because you've been so patient, I'll skip lunch so we can get on with Log Windows.

Logging In

Log Windows screen layout is quite elegant with the top third of the screen looking like a QSL card with station information displayed: call, date/time (automatically read from the computer), mode, frequency, etc. There is also more information pertaining to Ham users such as logging the station to the appropriate reports required for an award such as WAS (worked all states). Log Windows will keep track of the states you have worked and give a running account of which are still required. Pretty nifty, I thought; it couldn't be too much trouble for AEA to modify some of these functions and screen to the SWlers. I would have this feeling throughout the try-out.

All manner of log book searches are possible and are at par with the best for speed and ease of use. The various Ham contest reports are very well done, but pretty useless to SWLs, except for those contests that welcome SWL participation.

The middle part of the screen is now scrolling decoded RTTY from my PK232. It's a nice feature to be able to see receiver, log and TNC information all on one screen.

Above the QSL type screen is the Command line. It is from here, using pull-down menus so familiar to Windows users, that log books are opened, the TNC (external decoder) is accessed, overall program settings are selected (again and again for the past four hours) and other such functions.

Many of these functions can also be called up from function keys. In fact, there is a set of



of an additional serial card enabling the use of serial ports com3 and com4.

Make sure when buying a second serial card that it can actually be configured for com3 or com4. The older cards would only support com1 and com2. Sure, you could fumble around with keyboard commands to overcome the lack of a mouse, but this defeats many of the benefits of a "point-and-click," Windows environment.

Ok. Give me a few minutes while I install a second serial card bought just for you guys.

TICK TOCK.....@#!x!!

Well it's now four hours, ten zillion combinations of little black slide switches, a googleplex of port combinations for Windows,

user definable keys at the bottom of the screen that can be set for TNC commands. Other programs have such an ability but are not as easily accessible or clearly labelled.

Radio Control

Directly under the QSL screen, before the TNC window, is a row of fourteen icons, which AEA calls the tool bar. One of these icons allows the user transfer frequency data received via the TNC to directly tune the radio. Hams often use a form of digital communications called Packet. Similar to a computer bulletin board, packet clusters are fed information about when rare Ham stations are on the air. Log Windows can read its own TNC decoding and then tune the radio to those frequencies. I have not tried it myself, but the idea sounds like another plus for the programmers' innovation.

In my opinion, one of the niftiest features is how Log Windows integrates the power of the CD ROM into the program. Clicking on the CALL box in the QSL portion of the screen, allows the user to enter a call of a station. Don't get too excited; Radio Netherlands doesn't work. Remember, this beauty is just for HAMS, right now (I hope you guys at AEA are listening).

Just randomly, let's say we heard a ham station on the air with a call WA4PYQ. The guy probably doesn't write a column so he has lots of free time to "rag-chew." Typing in WA4PYQ in the Call box of Log Windows and hitting return will look up the data on your CD ROM, and then fill out the name and address of the station automatically. Let's see in this case it's ... Robert from Brasstown, NC. Oh well, so much for that free time!

All kidding aside, should there ever be a CD ROM with the *WRTV Handbook* or *PWBR* on it, and AEA made an SWL version of Log Windows, this would be some impressive stuff. Right now, with the increased activity in Ham licensing, Amateur CDs experience much more turnover than would be the case for shortwave broadcasting.

In a similar manner to clicking on the callsign, the radio can be tuned to the frequency listed on the log entry. Right now, however, only Ham transceivers can be controlled by Log Windows. A call to AEA brought the suggestion that I should open my ICOM R71 and reset the address port to fit one of the ICOM transceivers. Thanks for the suggestion, guys, but I think we get the point that Log Windows Version 1.0, is really just for Hams; and that's a real shame.

CLOSING the WINDOW on LOGS

I'm jealous because Log Windows has so many nice features and is very well behaved in the terrifying (to me) Windows' environment. The manual organization could use a little work. Ninety-six pages of Log Windows and Windows items is too much, without a written index.

But right now Log Windows is not for the monitoring people. I believe that the modification of Log Windows to an SWL Log Windows would be a worthwhile business move for AEA, since over 80% of the program would remain the same. This program has many excellent features; all on a single screen—things that don't exist today in monitoring software. We hope AEA will think about it and remember their monitoring fans.

Two Fax or Not Two Fax

Well, that took much more time than I expected, so I think we can just get through a quick update on AEA FAX II. PC-Pakratt will have to wait 'til next month.

AEA Fax II uses the same interface hardware as the initial program reviewed in June '93. The main difference is the inclusion of other modes

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of decoding. FAX II can now decode Fax, Morse Code, Navtex and RTTY, all with that nice compact decoder. Hey, why did I spend over \$300 for my PK-232 with these guys?

Well, the answer is that FAX II fax capabilities are essentially the same as reported in that previous "Computers & Radios" review. The other modes of decoding work quite well. I listened to Ham RTTY on 14 MHz most of the night with over 75% copy. But as the propagation started to go bye-bye, the PK-232 could still decode perfectly; while FAX II had lots of trouble. In many ways FAX II now reminds me of SSC's PC SWL, also reviewed in a previous C&R.

In summary, if you don't have RTTY decoding capability and you are looking for a FAX program, FAX II will not only give you a good fax program but also a back-up basic RTTY and Morse decoder.

Log Windows and AEA FAX II are available from AEA, 2006 196th Street SW, Lynwood, WA 98036, (206) 774-5554. The list price for Log Windows is \$99.95. For AEA FAX II, the list price is \$149.95. Check with authorized AEA dealers for their pricing.

A Hardware Hacker's Work is Never Done

Two programs from AEA this month, and one to go. But that one will have to wait 'til I pick up my tools and computer which are scattered all over the room after that "easy" port installation.

By the way, I just tried Scancat with the TNC in com4. You guessed it! SCANCAT does not support a TNC in either com3 or 4. The best answer to this problem is a dedicated bus mouse, not a serial port mouse, as we tried this month.

OK. Now I have to pull out the new serial card. Buy a bus mouse and card. Install that in the computer. Change the port configurations of some programs..... Somebody get me an abacus! This computer is going out a Window, pun intended.

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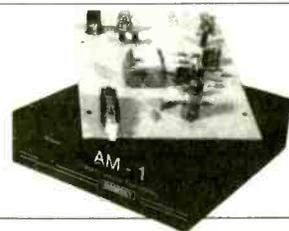
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Microphone Impedance and Amplification

A common dilemma exists when a CBER or amateur radio operator tries to use a modern microphone with an older piece of equipment that was designed for high-impedance microphones. Nearly all of today's mics are designed to interface with a 600-ohm (low impedance) speech amplifier.

Conversely, existing high-impedance mics, such as the ever-popular Astatic D-104, do not allow the production of quality audio when they are used with modern equipment that requires a low-impedance mic. The result from using a D-104 with a 600-ohm-input speech system is tinny sounding audio with no low frequency response. Fortunately, both of the foregoing problems have easy solutions if you are willing to tack together a few inexpensive components.

High Z to Low Z Conversion

A popular brute-force cure for impedance mismatches caused by using high-impedance (high-Z) mics with low-Z speech amplifiers is to simply insert a 100k- Ω , 1/4-watt resistor in series with the audio line from mic. This method prevents the 600- Ω input port of the equipment from loading the high-Z mic (usually about 50k- Ω impedance) and reducing its output level. The series resistor attenuates some of the mic's high-frequency response, but for communications this is often beneficial. It is important to recognize that this technique does not provide an impedance match: It is purely a quick means to an end. This approach, plus a more worthwhile alternative, is illustrated in Figure 1 at B and C.

A miniature matching transformer (T1) can be used between the high-Z mic and the 600- Ω input port. A Mouser Electronics' no. 42TL025 audio interstage transformer is suitable for this task, even though its 17k- Ω to 1k- Ω transformation does not allow a perfect match between the mic and the equipment. However, in a practical situation you will observe very little difference between this and a 50k- Ω to 600 Ω transformer's performance. The current price for this little transformer is \$1.52.

Figure 1C shows how to use an inexpensive JFET, such as the generic MPF102, as an impedance transformer. The only disadvantage associated with this method is that a dc operating voltage of 9 to 12 is required. This may often be taken from the mic jack of modern transmitting equipment. If it is not available,

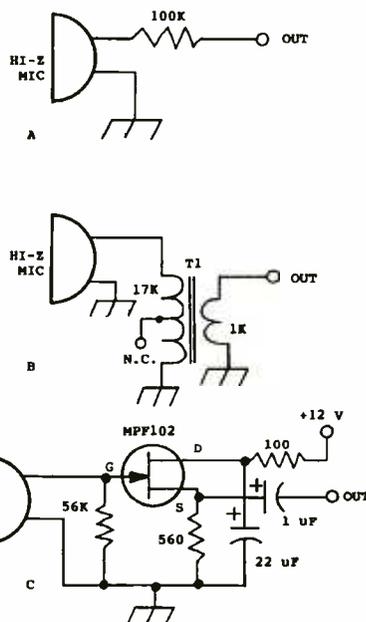


Figure 1 -- Examples of how to use a high impedance mic with equipment that has a low-impedance (600 Ω) audio input port. Circuits A, B and C are discussed in the text. N.C. = no connection.

you can borrow +12 volts from within the gear and route it to an unused pin on the mic jack. A 9-volt transistor radio battery may also be used to power the JFET.

A More Elegant Matcher

Figure 2 illustrates a circuit that is capable of amplifying the microphone output while providing an impedance match. This circuit is especially helpful if your high-Z mic has low output power. The component values listed are for matching 50k- Ω mics to modern low-Z input circuits. The voltage gain of this amplifier/matcher is 3, which is sufficiently low to avoid having too much audio input power supplied to most speech amplifiers.

C1 and R1 in Figure 2 are used as RF filters. This helps to keep stray RF currents from disrupting the performance of the amplifier/matcher. If you wish to attenuate some of the high-frequency response you may increase the value of C1 to any amount up to 1000 pF. In a like manner, enhancement of the low-frequency response can be realized by increasing the values of C2 and C3. You may use up to 10-uF of capacitance at those points in the circuit. The low-frequency response can be reduced by choosing smaller values of capacitance for C2 and C3.

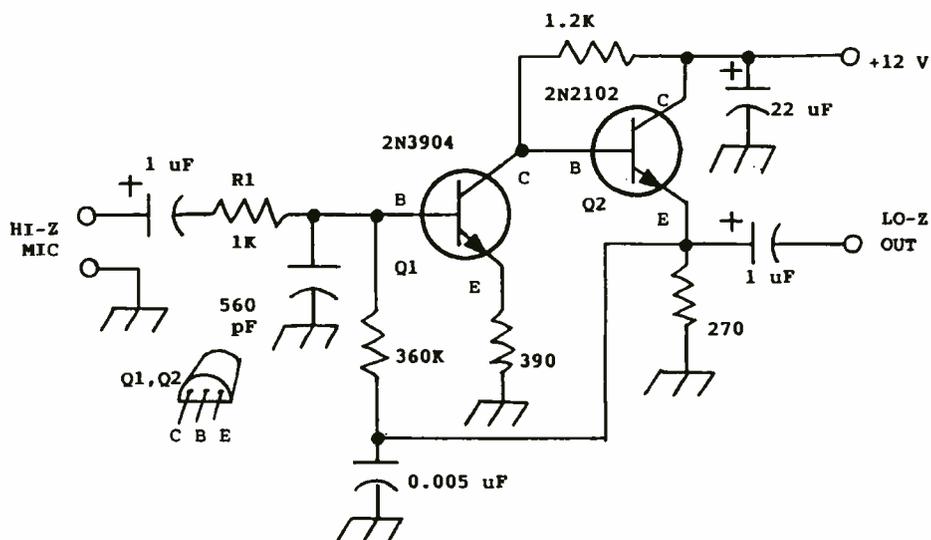


Figure 2 -- Two transistors are used to provide a voltage gain of 3 and to create an impedance match between a 50k- Ω mic and a low impedance audio amplifier in a transmitter or tape recorder. See text.

The Figure 2 circuit should be contained in a metal box to prevent RF energy from entering the amplifier. Shielded audio cable must be used between the mic and the box and between the box and the transmitter audio jack.

Converting Low to High Impedance

The flip side of the foregoing matching problem is encountered when we have a low-Z mic that we want to use with an older piece of equipment that was designed for a high-Z mic. A simple solution for this problem is to add the audio interstage transformer of Figure 1B. It is used in the reverse manner shown in that example. The low-Z (1k-Ω) winding connects to the mic and the 17k-Ω winding interfaces with the mic jack on the transmitter.

A JFET may also be used for matching a low-Z mic to a high-Z speech amplifier. This technique is seen at B of Figure 3. This circuit also requires a dc operating voltage of 9 to 12.

Construction Tips

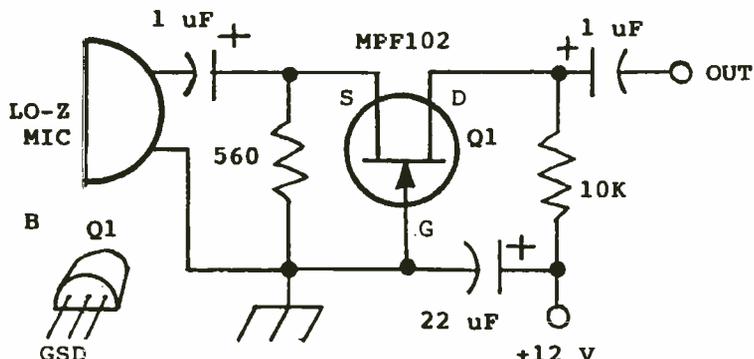
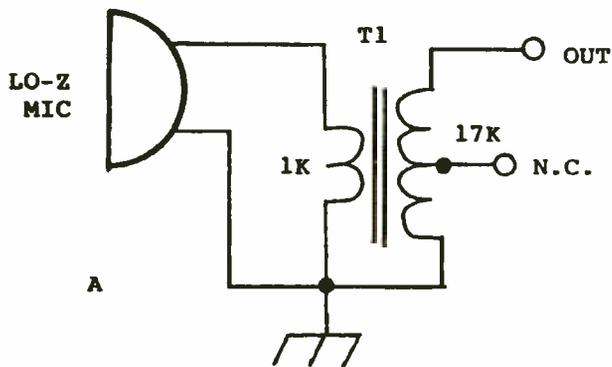
Any circuit that is external to the mic input jack of the equipment needs to be shielded in order to prevent 60-Hz ac-line pickup and to avoid having stray RF energy enter the outboard circuit. A small Minibox® will suffice. Be sure to connect the mic shield braid and ground wire to the box. Likewise with the ground line from the equipment.

The layout of the circuits that use transistors will provide the best performance if short, direct leads are used between the parts. This will minimize the potential for hum and RF interference to the circuit. You can assemble the circuits on perforated boards, on a small piece of Formica® or on multilug terminal strips.

Summary Remarks

I want to mention in closing that none of the circuits shown in this article provide a perfect match between the mics and the equipment. But, each method will improve the match between the mic and the transmitter over what would result from having no matching circuit whatsoever. Maximum power transfer (and best audio reproduction) will always be had when unlike impedances are perfectly matched. Although this degree of perfection is often necessary for high-performance or MIL-spec apparatus, it is seldom a criterion for hobby and amateur related applications.

1 -- All of the parts for the circuits in this article should be available from Mouser Electronics, 2401 Hwy. 287 N., Mansfield, TX 76063-4827. Phone (817) 483-4422 for catalog.



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Figure 3 -- A low-impedance mic (600 Ω) can be matched to a high-impedance speech amplifier by using T1 at A. A JFET is used for the same purpose at B. N.C. = no connection.

HOW TO PREPARE AND INSTALL MODIFICATION CIRCUITS

I like to do things the easy way when possible. I can't count the number of times in my early days of radio-hacking where I meticulously installed SuperWhizBang modifications with painstaking efforts to make things LOOK good and to withstand earthquakes and atom bombs. I don't do that anymore; it's a waste of time and energy and is actually counterproductive.

Well, let me qualify that.....when I do a hack for hire, I'll go to considerable time and trouble on its aesthetics and cosmetics. That's to be expected. When I develop and/or qualify equipment mods, it is important that I have easy access to them, both for adjustment/fine-tuning and for removal/reinstallation. When I do a job for someone else, it's not experimental; I do it up right the first time, based on my experiences in the lab.

Most of your efforts are going to be R&D, so it's better to make it easy on yourself by providing ease of access to your mods and hacks. Nothing is worse than to bury the results of a 12-hour effort deep into the gizzard of your receiver, only to find that it doesn't work as well as it could. Or, it does okay for weeks but then someone develops an improvement, so it has to come back out for more work.

I guarantee that you won't bother to polish your work if it's difficult to access and service!

Unless you know a certain mod is as good as it's ever going to be, make it easy on yourself and dispense with rigid professional techniques. After all, we're researchers and developers. This implies certain ways of doing things that would never be employed on the assembly line.

First and foremost, I do most of my initial prototypes on "perf-board" with point-to-point wiring. There is no sense in making a printed circuit board only to learn it needs several retrofits before it will work. Radio Shack #276-1394, -1395, or -1396 perf-board is acceptable. Design your circuit layout on paper and cut the perf-board to slightly larger than anticipated size, stuff the parts, do the wiring and soldering, and that's it. Later, when the design has proven itself, you can apply a layer of "hot glue" or silicone rubber to the solder side of the perf-board to make the thing more permanent.

I ordinarily do not advocate the installation of homebrewed circuit boards with standoffs, spacers, nuts and bolts. That's just too much trouble, for one thing, and for another, it's hard to install things that way and still leave plenty of room for other "TurboWhopper" innovations.

Besides, have you ever drilled a hole in your favorite radio, only to have the bit suddenly break through and run amok around the circuit board? No? Good! You don't want to, either. Even if you're extraordinarily careful, what about

minuscule drill shavings and metal dust? For experimenters, there is a better way.

Figure 1 will give you an idea of how small modification circuit boards can be easily installed in a radio. Most base receivers have a metal frame or chassis around the electronics. Even though the outer case slips over or bolts down to this frame, there is always a little space on the outside and top edges of the frame. Circuit boards installed like that shown in Fig 2 are held rigid to this frame by virtue of stiff, #18 copper wire soldered to the metal frame and to the modification circuit board.

The #18 wire should be tightly looped over the top edge of the frame before it is soldered to the inside surface of the chassis. If you look closely, this #18 wire also loops through holes in the circuit board and should be soldered on both sides of the board to make it stable and immovable. It should also be connected to the circuit board's ground traces. If there is any danger of the bottom side of your mod circuit board touching something on the chassis or main receiver board below it, then insulate the bottom of this board with some "hot glue" or even a sheet of acetate or plastic cut to size and held underneath with silicone rubber or hot glue.

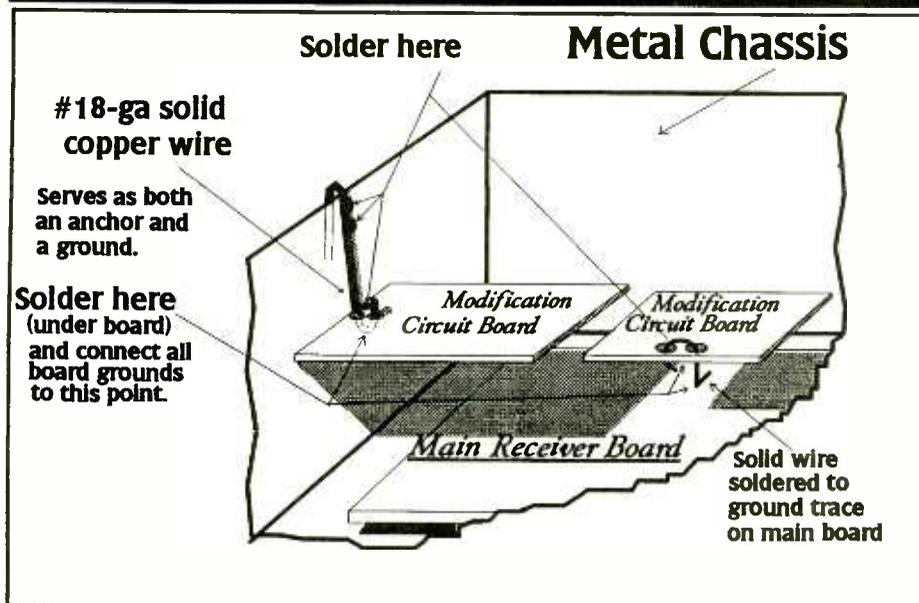
You can also fashion the #18 wire into a "leg" and solder it to a ground trace on the main receiver board, if a chassis wall is not available. This is also shown in Fig-1. A single 18-ga "mounting" and ground wire will suffice for most home-brew circuits of about 2-square inches or less. Larger boards might fare better with two or more of these mounting wires, depending. Extra won't hurt, but one is usually sufficient.

This method of installing modification circuit boards is permanent and yet easily undone if ever needed. It allows maximum utilization of the space inside the receiver and facilitates easy, clean routing of wires from the board to destination points within the receiver.

Paul Paris of Germantown, MD, expresses appreciation for our recent articles on power supplies and goes on to add, ".....related to, but beyond the scope of what's been written so far, I am planning to employ a small, deep-cycle lead acid battery to power my portable Sony receiver in lieu of the built-in AC supply. Rather than periodically connect the battery to my automotive charger, I would like to use a small solar panel to provide a constant charge and keep the battery always at or near full capacity. I have been warned this approach could be harmful to the battery. It would seem that some sort of regulation would be required. Can you help??

Sure can, Paul. Yours is an excellent question for a logical follow-up to our power supply

**FIGURE 1
SMALL CIRCUIT BOARD INSTALLATIONS**



series. The solar panel will prove to be the only difference between what you want to do and what we've already explored here, so let's take a closer look and weld the two together. Done right, the only "harm" from a solar panel will be to your wallet. Solar power is expensive.

Solar electric generation panels consist of a series of solar cells, of which the quantity, size and method of connection sets the overall specification. A typical solar cell generates roughly 0.4-volts under average sunlight at a current that's proportional to the area of the cell. A rule of thumb is that each square inch of solar cell is capable of producing about 250-ma (1/4-amp) under average sunlight.

You'll have to research the specs for the solar cells that are available to you, but your design goal will be to generate something on the order of about 18-volts at 2-amps. A lot depends on the power requirements of your Sony receiver. I'm going to assume here that it needs 12-volts at 250- 500-ma. A solar recharger should generate something like three to four times more power than the consumption of the device(s).

Why? Due to limited space, let me just suggest you think about how a full 5-gal water jug can last for several days of careful sipping, but when you fill it up, you won't want to take several days to do it! The idea is to make a supply of anything last a long time and still be able to "replenish" it in a short time. Therefore, the solar supply should be several times greater than the rate of consumption from the battery.

For the purpose of discussion, let's assume you'll need 1.5-amps to a maximum of 3-amps. You've already specified a lead acid battery, presumed to be 12-volts (actually 12.6 volts). A float or trickle charge of a lead-acid battery occurs at 13.8-volts, at which level the battery can be indefinitely charged. Fast charge rates are between 13.8 and 14.4 volts (max!).

Remember from past articles that a 3-port voltage regulator requires a minimum input of about 2.5-volts greater than the desired regulated output. Therefore, we'll require the solar panel to produce 14.4 volts plus at least an additional 2.5 volts for a minimum of 16.9-volts. But recall that solar cells achieve specification ONLY under specified sunlight which consists mostly of mid-day sun. You'd be wise to add a little to the peak voltage of the panel to allow for acceptable input to the regulator at off-peak hours, (hence my suggested minimum spec of 18-volts or even 20-volts). Now let's consider what's needed.

I've seen 3 or 4 inch cells rated at something like 0.5-volt @ 1/2-amp or maybe a little more. If this is so, then we're looking at upwards of 40-cells connected in series to generate 20-volts at 1/2-amps. If you want 3-amp capability, then 80-cells will be required, with two series strings of 40-cells each and each string connected in parallel to generate 20-volts at 3-amps. Not cheap!

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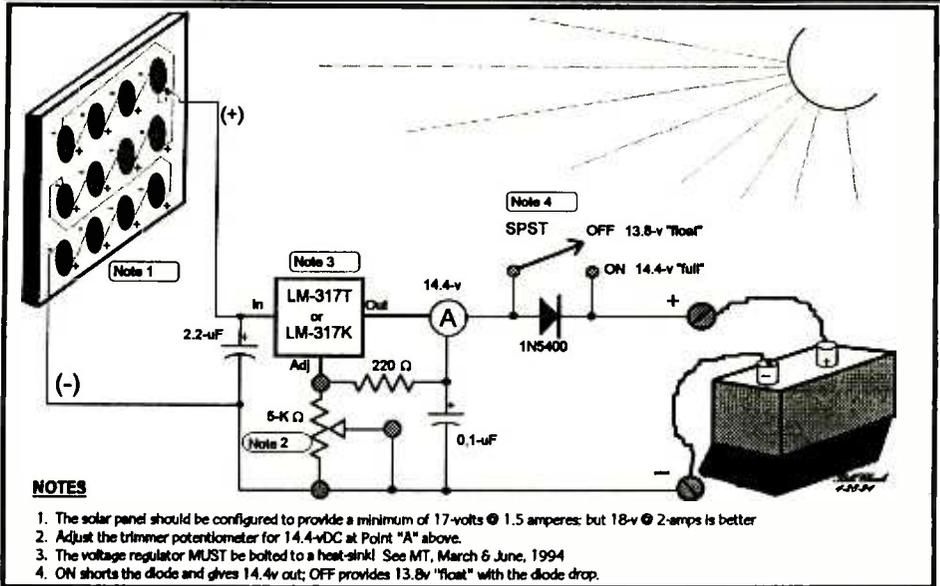
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Figure 2 SOLAR RECHARGER FOR LEAD-ACID & GEL-CELL BATTERIES



If your requirements are for 1 1/2-amps or less, the common LM-317T adjustable regulator will be fine. For up to 3-amps, the LM-317K is the better choice. In either case, the voltage regulator device MUST be properly mounted to an adequate heat-sink, and I don't mean a little piece of metal, either! It is easy to tell if your heatsink is not adequate: feel the metal around the regulator after it has been under rigorous operation for a while, and if it is more than "warm"—i.e., almost hot—then the heatsink is too small!

Build the regulator according to Figure 2 and with an input of greater than 17 volts, adjust the 5-

k trim pot for an output of exactly 14.40 volts at Point "A". The regulator circuit includes a switch-bypassed, 3-amp "barrel diode" to afford a choice of "float" or fast charge. This circuit does not offer current regulation or limiting by virtue of the fact that most any lead-acid or gel-cell battery can readily handle the maximum current (and more!) that can be produced by a small solar panel.

Refer to March and June's "Experimenter's Workshop" for anything else you need to know about regulated power supplies. More questions, anyone? 73 de BC.

MT

The VHF/UHF Beam Traveler's Beam

In 1990, in honor of the first annual Monitoring Times Convention, I designed a couple of portable antennas specifically for folks going to the convention; a tiny active antenna which covered from 100 kHz to 30 MHz and a small J-antenna for the two-meter and 450 MHz ham bands. Send a business-size stamped, self-addressed envelope to me in care of *Monitoring Times* if you'd like those plans. This month, in honor of the 5th annual Monitoring Times Convention I've designed a highly portable VHF/UHF beam and next month I'll have an HF antenna that is a natural for conventions, traveling or camping.

A Travelin' Antenna

The Traveler's Beam can be easily packed in your suitcase along with your clothes and quickly assembled for use wherever you wish: in your hotel room, parking lot or at some hilltop "DX heaven." Along with its convenient size this Yagi-Uda sports a gain of over 9 dB. When using a beam (or any other antenna) inside it may be necessary to have the antenna "looking" out a window that views the direction in which you wish to communicate. If you use it to transmit (low power only) remember not to get too close, especially in its forward direction.

Let's Make One:

1. Cut the elements from 8 gauge aluminum groundwire (Radio Shack #15-035) to the lengths which you obtain from the equations in fig. 1. Note that the active or driven element is made of two pieces and the reflector and director are one piece. This means that to shorten the reflector and director so that they may be easily packed, they are bent U-shaped and are straightened again when the antenna is to be assembled.

2. The boom is made of 1/2" plastic water pipe and its length will vary depending on the frequency you are using: boom length is twice the element-spacing distance plus one inch. Cut two pipes each 2" longer than one element-

spacing length and insert them completely into the T-joint. Then drill a 1/16" hole into each leg of the T-joint so that you can screw a #4 metal screw in the hole to lock the boom and mast pipes in place.

3. Use a 5" length hard-plastic tube for the center brace (fig. 1A) to which the pieces of the driven element attach. Drill a hole beside the T-joint in the 1/2" boom pipe to accept this tube. If the tube slips loosely in the boom use epoxy or super glue to fasten it. For this tube I used the body of a BIC "ROUND STIC"® ball-point pen; a 5/16" drill bit made the correct size hole to mount it on the boom.

4. From the side of the center-brace tube that is towards the T-junction measure one element-spacing length towards its far end. This is where the center of the director element will be, so drill a 1/8" hole through the boom there. Then measure one element spacing length from the same side of the center brace to the other end of the boom and drill a 1/8" hole for the reflector there. Trim the boom so that about 1/2" of boom extends past each of the holes just drilled.

5. Cut two 2" x 2 1/4" rectangles from thin plastic. I used material from the side of a plastic

6. Cut a piece of 50-ohm coax to the dimensions needed for the balun (fig. 1B). Space it about 3/4" from the 50-ohm coax you will use as a feedline and then tape it to the boom as shown in fig. 1A. Solder the balun connections (fig. 1B). No connections are made to the balun center conductor.

7. Make two leads as follows: strip some AC multistrand wire or something similar and make a 5" lead of bare wire. Twist the conductors in this lead so that its strands hold together well. Solder these leads to the balun output (fig. 1B). Then wrap the bare end of one lead tightly about the bottom end of one of the element halves. This winding must be tight, with its windings touching one another.

Now place the element up to the center-brace tube as shown in fig. 1A, slide the coiled plastic strip made in step 5 onto the top of the element and bring it down around the center brace with a screwing motion. You may have to practice this a few times to get the knack of it. When the coiled strip is in place it will hold the element up against the center brace and also hold the wire windings in place. If the rubber bands on the coiled plastic strip have the right tension then this arrangement works quite well and holds the elements in place very tightly.

8. insert the director element into the boom (fig. 1A). Loop a rubber band around the tip of the boom, wrap that band around the element just above the boom and also wrap it around the element just below the boom, then put the rubber band's open end around the boom end again. Do the same for the reflector element. This will hold the elements firmly in place.

9. A simple mast pole can be made of two 20" pieces joined with a coupler joint and locked together with screws as was done for the T-joint on the boom. The mast can be hand held, clamped or duct-taped to a table leg or bed post, or you can make a simple base as shown in fig. 1A. Although a base made of 1/2" pipe will hold the antenna, it may wobble if its mast is more than 25" high.

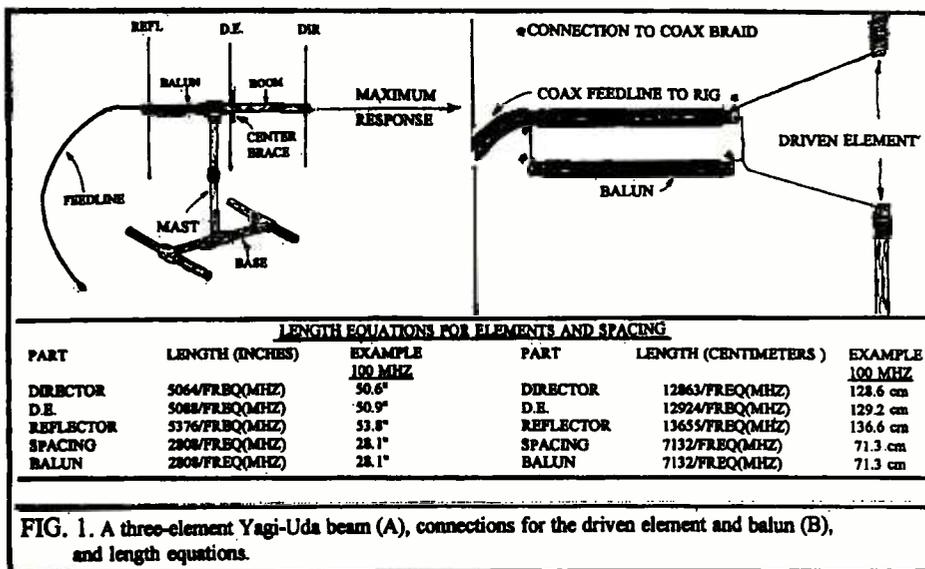


FIG. 1. A three-element Yagi-Uda beam (A), connections for the driven element and balun (B), and length equations.

milk bottle for this. Wrap each strip around a small rod (like a wood pencil) until it assumes a somewhat coiled shape along its 2" dimension. Then at each end of this coiled strip wrap a rubber band several times such that the plastic strip is now coiled into a tube that will fit just snugly over the center-brace tube.

with a coupler joint and locked together with screws as was done for the T-joint on the boom. The mast can be hand held, clamped or duct-taped to a table leg or bed post, or you can make a simple base as shown in fig. 1A. Although a base made of 1/2" pipe will hold the antenna, it may wobble if its mast is more than 25" high.

Use of adapters that will convert the 1/2" T-joint bottom leg to use 3/4" or 1" pipe will allow you to make a stronger base.

10. Connect the 50-ohm coax feedline and you're on the air!

When packing the Traveler's Beam put all the elements in a large bag, because aluminum can make smudge marks.

RADIO RIDDLES

LAST MONTH

Last month's Radio Riddle was "Yes you know what a 'balun' is, but what is an 'unun'?" No, it is not a garlic-like vegetable that makes you cry when you peel it!" Well, you will recall that a balun gets its name from the fact that it matches a balanced circuit to an unbalanced circuit. Similarly an unun gets its name from its function of matching an unbalanced circuit to another unbalanced circuit.

The 6:1 balun described in last month's column was a combination of a 4:1 balun and a 1.5:1 unun, giving an overall 4 X 1.5 (6:1) balun function.



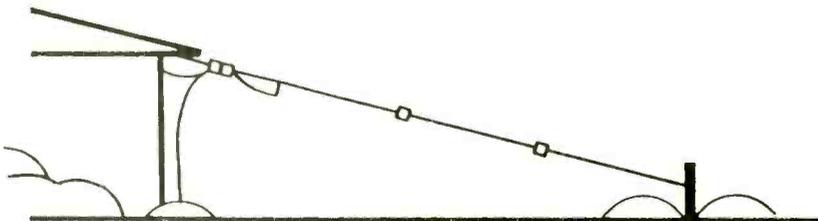
THIS MONTH

When an antenna and its feedline are matched, then only about half the power in a signal received by the antenna is transferred down the feedline toward the receiver. If the feedline and antenna are not matched then even less of the received power is transferred down the line toward the receiver. What happens to the portion of the signal which is not transferred down the line?

We'll have the amazing answer that riddle and much more in next month's issue of *Monitoring Times*. Till then, Peace, DX, and

MT

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Q. I notice a marked improvement in performance when I feed my Scanner Beam with heavy-duty, TV twin-lead rather than coax cable and a balun transformer. Is this to be expected? (Chester Pelfrey, Flintstone, GA)

A. Fresh, high-quality twin-lead has lower loss, especially at higher UHF, than coaxial cable. The problem with twin-lead is that, with time, the sun's rays take their toll; crazing (cracks) occur along the insulation, trapping salts and moisture which substantially increase loss.

Additionally, twin-lead is vulnerable to absorption by nearby metal surfaces, cannot be run through metal piping or water, and can pick up electrical noise fields. Coax, on the other hand, is virtually immune to these and, if high quality, has nearly the same low-loss characteristics as twin-lead.

Q. Is there any way to modify a scanner to provide narrower step intervals (1 kHz instead of 5 kHz) between frequencies? (Wes Parker, West Richland, WA)

A. No. The microprocessor is encoded to tell the frequency synthesizer how to step; no simple mod can rewrite this pattern, nor, necessarily could the synthesizer accommodate narrower steps even if the code were rewritten.

Questions or tips sent to "Ask Bob," c/o MT, are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT.

Q. How can I determine how much loss I will have (and, thus, how much gain I need for preamplification) as I add splitters to my antenna for several scanners? (Wes Parker, West Richland, WA)

A. At least 3 dB loss for the second scanner, then slightly less than that for each additional scanner (it is a logarithmic function). If you are adding only one or two scanners and you live in a strong signal area, you shouldn't need any preamplification to compensate for the modest loss in signal strength.

If you do need a preamplifier, put it between the antenna and first splitter; if you try amplifying after the splitter(s), you will be amplifying noise along with the signals.

Keep in mind that, even if you need an additional 10-15 dB gain because you are adding five or six scanners, the preamp's input will encounter whatever signal strength is coming down the antenna line; if it is strong, intermod and desensitization may occur. Always use a low-noise, high-dynamic-range preamplifier.

Q. What are the actual frequencies used for cordless and cellular telephones? (John Beger, Burlington, IA)

A. There are currently two cordless telephone ranges: CT-1 46.61-46.97 MHz (base) and 49.69-49.97 MHz (handset); and CT-2 902-928 MHz (no standard bandplan). An older 1.7 MHz range is no longer allowed for new products.

Cellular telephones are spaced every 30 kHz from 824-849 MHz (mobile) and 869-894 MHz (base).

KILOHERTZ OR KILOCYCLES PER SECOND?

In the May issue I said that, before 1960, when kilohertz became the official frequency unit in the U.S., the unit was used in Europe, specifically on German military radios. Reader Charles Nevel of Pocono Summit, Pennsylvania, disagrees, saying he heard "kilocycles" used by German broadcasting stations during World War II.

Ray Bentliff of Acton, Massachusetts, says that a contact in Great Britain remembers "kilocycles" being used on prewar radios, but that his German contacts distinctly remember "hertz" as the prewar frequency unit.

How about it, readers? Did the Germans say "kilocycles" on their external broadcasts, but use "kilohertz" internally? How about other European countries? What dial markings appeared on their domestic radios?

Q. I have a 300 foot dipole, coax fed, for 1.6 MHz reception. Do I need a balun transformer for reduced noise or better reception? I tried a TV balun, but its performance was poor at lower frequencies. (Tony Majka, Augusta, NJ)

A. TV baluns roll off in performance at the bottom of the shortwave range (approximately 3 MHz). But you don't need one for your application. While a horizontal dipole is a balanced antenna and coax is an unbalanced line, the only difference this makes is a slightly distorted pattern which you probably won't notice. You also won't experience more electrical interference.

Bob's Tip of the Month

MOBILE SHORTWAVE ANTENNA NOISE

Recently Allan Fredrickson of Rochester Hills, Michigan, installed the popular Philips DC777 auto radio with shortwave into his 1991 Chevrolet S10 pickup, but discovered that when the engine was running he was besieged with electrical noise.

The usual attempts at automotive noise reduction had little effect, so Allan took a close look at the factory-equipped antenna system and made a startling discovery.

The antenna lead is a two-piece cable; the connection under the hood had accumulated moisture and corroded. Cleaning didn't help, so Allan cut off the connectors and carefully soldered the two pieces together, using heat-shrink tubing across the union to make it water-tight. The noise was gone.

Alternatives could have included replacing the connectors, using coax sealant on the new union, or replacing the antenna and line with an aftermarket antenna.

Thanks, Allan, for sharing your findings with fellow MT readers.

Q. I suspect that a number of MT readers don't really understand some of the caveats and limitations regarding AC wall adaptors. Could you elaborate? W.C. Herman, Indianapolis, IN)

A. AC wall adaptors are full-wave power supplies, consisting of only a transformer, rectifier diodes, and a filter capacitor. Because they are unregulated, the unloaded (no accessory attached) voltage as measured with a voltmeter will always be higher than the rated voltage stamped on the case, often considerably higher (50% or more!).

Only when you are drawing the recommended current (i.e., 300 milliamperes on a 300 mA rated power supply) will the resistance of the transformer winding drop the output voltage to its stated value.

If you have an AC adaptor that has a miniplug-type connector, plug it into the accessory before inserting the adaptor into the AC outlet, otherwise the live tip and barrel of the miniplug will be short-circuited each time the plug is inserted into or removed from the jack.

Coaxial plugs (the hollow cylinder variety) are inherently safer to use than miniplugs because of their design which prevents the short circuit from occurring.

Q. Do gold plated audio connectors really provide any audio improvement over other types? (James Snow, Murray, KY)

A. None whatsoever; this is another hi-fi myth generated by Madison Avenue hype. Gold is a better conductor than tin/lead plating or nickel, but you cannot hear the difference. The amount of surface area which connects during the mating of RCA phono plugs, for example, would possibly make a difference of a few thousandths of an ohm, virtually unmeasurable, much less audibly detectable.

The only possible advantage to using gold over other connectors is that it is non-corrosive, so in an environment where corrosion is a problem, gold-plated connectors would be a better long-term choice.

Q. I hear ham radio conversations mixed in with my international broadcasters in the 7000-7400 kHz range day and night; is this just a local phenomenon? (Al Wires, East Point, GA)

A. In all of the International Telecommunications Union (ITU) Region 2 (North and South America), the hams share their 40 meter amateur band (7000-7300 kHz) with the 41 meter international broadcasters (7100-7300 kHz).

Because of nighttime propagation which favors European broadcasters, most hams abandon 40 meters at night, confining their communications to daylight hours when reception of the distant broadcasters is minimal.

Q. How can I eliminate the interference generated by my video monitor and heard on my short-wave receiver? (Chris Bursche, Sault St. Marie, Canada)

A. CRT monitors are infamous for radiating harmonics of their 15 or 18 kHz horizontal sweep oscillators. Much of the radio frequency interference (RFI) is radiated by the interconnect cable between the monitor and the host accessory (computer, decoder, etc.). Be sure to use well-shielded coaxial cable (RG-58/U or RG-59/U), never audio cable.

You might additionally place an RFI choke (Radio Shack 273-105 or similar) at the monitor end of the cable. Running a separate braided-cable ground between both chassis may help as well.

There may still be some residual radiation through the plastic cabinet of the monitor. Other than wrapping the monitor in grounded metal screening, there is little that can be done other than keeping the receiving antenna as far from the accessories as possible, and always using coax between the equipment and the antenna for additional shielding.

Q. If the Channel Master 5094A Monitenna and Grove ANT-7 ScanTenna are actually vertical dipoles, shouldn't their feedpoint impedance be 50 or 70 ohms rather than 300 ohms as they are presently fed? (Chester Pelfrey, Flintstone, GA)

A. That would be true only if the elements were half-wavelength, but they are longer than half wave and have a higher feedpoint impedance. Since the dipole also has a balanced feedpoint, the balun (balanced-to-unbalanced) transformer accommodates the coax cable.

MT

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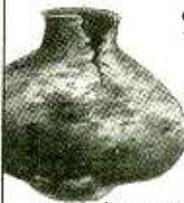
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Sounding the Alarm



One anonymous writer likens the struggle to protect radio waves to the dispute over gun laws. He says, "When Iraq invaded Kuwait the first things that they confiscated were private guns and personal radios."

"Our 'government' for whatever reasons is trying to gain control by eroding our constitutional freedoms, and using moral decay, crime, drugs, etc. as the vehicle to do it."

He encloses an unidentified editorial with some provocative quotes from Thomas Jefferson, such as this one: "If once the people become inattentive to public affairs, you and I and congress and assemblies, judges and governors shall all become wolves. It seems to be the law of our general nature, in spite of individual exceptions."

Harold Davis, in Canada, adds: "Scanner enthusiasts, SWL's and hams need to band together to put a stop to this encroachment of government power. I would suggest that they join gun owners in the fight, since the same politicians opposed to scanners seem to be opposed to gun ownership (I seriously doubt this is a coincidence)."

"I'll add that most Americans (and Canadians) are just misinformed enough to believe in the fiction of privacy. Privacy in communications does not, and has not, ever truly existed. It wouldn't exist no matter what law or statute was put into place, so therefore the best law is none at all."

Randy from Michigan sends this warning: "It seems to me the fine people in this wonderful country of ours are asleep. I mean, the President of the United States said on national TV that one reason he didn't mention some things in regards to White Water is that people probably would be watching the ball game. He was right. We as a people don't seem to notice what's going on in our country."

Reader Bob Reynolds of Wilkes-Barre, PA, overheard the head of the FBI testifying that cordless phones should be added to the

Electronics Communications Privacy Act. "I strongly believe that it's immoral and wrong to monitor someone's telephone conversation. I also believe that it's wrong for the Federal Government to establish a dangerous precedent by telling the American people what they can't listen to. WE MUST WAKE UP! What will it be next year? Public Safety communications? Satellite transmissions? Shortwave?"

"It's scary to think that in a democratic form of government, which is supposed to represent the people, the government has been able to get a foothold in telling us it's illegal to listen to certain chunks of the spectrum! For Pete's sake, the spectrum is considered publicly owned and is supposed to be used for the public good."

Even though we hobbyists are not all on the same political side of the fence, the shortsightedness (and the futility) of such legislation is one thing we all agree upon. Bob Reynolds and the other readers above call for a letter writing campaign "to make Congress see the dangers of the path we're on. I fear if this trend continues the only thing we'll be legally monitoring in the 21st century is the National Weather Service!"

Keeping the Public Safe



Rodney Souza responded to Bob Grove's March "Closing Comments" regarding the desirability of using public safety channels to disseminate emergency information: "I live in Hawaii, where we have to worry about hurricanes, topical storms, and tsunamis (tidal waves). TV and radio coverage of disasters is not that great, because they need to confirm the info. So most of Hawaii's residents own and depend on scanners for information. Police, fire, ambulance, county and state crews and electric companies, etc., keep us informed completely."

"But the police in Hawaii will be going scrambled in the 900 MHz band in a year. For now, the cops are told to phone in for critical cases or to give information like people's names and addresses. Why can't they use a scrambled channel for that type of delicate information and use the open channel for the ordinary calls, so we don't have to bug them when we hear a lot of sirens, or when disaster strikes?"

"I have family and friends that call me up whenever there's action with police or fire. Then they buy a scanner and come to me for the frequencies and how to program it. What's amusing is that they were all critics of scanners, saying we're just too nosy."

New Wave

Fascinating uses are being made of radio frequencies these days. Harry Baughn learned that the process of drying spools of thread after they have been dyed can be cut from days to mere hours by using radio waves in the Industrial, Scientific, and Medical service rather than air-blown heat. Many of us have experienced the benefits of Magnetic Resonance Imaging. We cook with microwaves, and delicate surgery is performed using radio energy. Bob Fraser of Cohasset, MA, reports on an experience he had last fall:

"I had a small skin cancer removed off my temple by a machine labeled 'Radio Frequency Surgery.' The gadget was about the size of a table radio with a wire leading to a hand-held 'knife' of sorts which somewhat resembled a 'water-pic.' There were a couple of other wires, one of which led to a plastic coated square about four by four inches, which the doctor said was an antenna and which was tucked under my shoulder. Apparently, this was to focus the radio waves in one direction."

"There are a couple of knobs on the transmitter, one of which I believe changed the waveform and one which changed the frequency. The doctor said that the machine separated the layers of skin. I did notice curls of smoke now and again. The whole business took about half an hour, a couple of stitches and that was that."

"A wireless speaker in each of the examination rooms relayed a Boston FM station, tuned in on the main radio in his office. When he was using the radio frequency surgery machine, I noticed that for the most part, the speaker fell silent as apparently the radio waves from the surgical machine blanked out the signal. At another time, I did hear quite a bit of static out of the speaker."

After all the stories about the dangers of radio frequencies, here's one where the "destructive" ability of radio waves is put to good use. As in nuclear science, it's just a matter of a slight difference in application. But what a difference!

Selected Shorts

"For the first time in all the years I have been subscribing, I failed to receive a copy of *MT*. I phoned your office and was sent a replacement copy straight away for which I am grateful. However, the original copy turned up recently; I think it must have been on a world tour of the postal system! I took the extra copy to my local radio club and it was read by almost everyone. Thanks again for a great service, and

a really excellent magazine. My thanks to everyone concerned with its production and delivery."

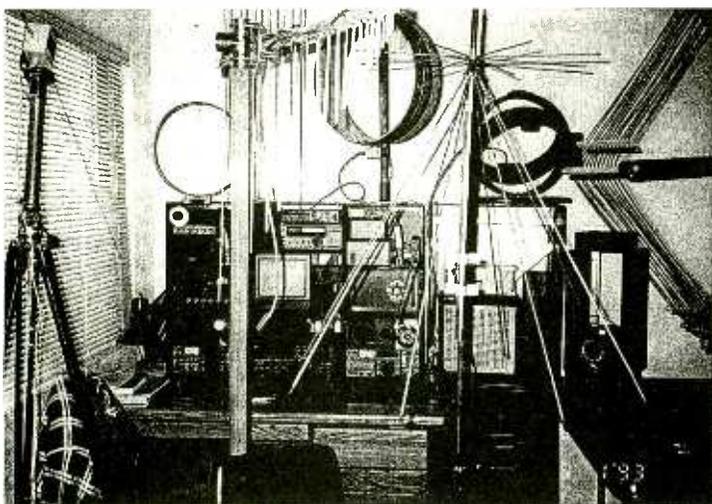
Alan Gale, Lancashire, England

"I want to tell you how nicely *MT* arrives in its plastic cover. Thank you to all of you. I enjoy SWDX and *MT* to help me. It arrives in good time for me to 'inwardly digest.'"

Mabel Guylee, Sarasota, FL

In reference to "Radio Riddles," April Antenna Talk: "The second part of the riddle in the April issue won't fly. Any object of appreciable size inside the tube will prevent it from being a waveguide. The discontinuity will enhance the production of out of phase waves reflecting off the side walls."

Arthur Long, Salem, IN



"How about an *MT* contest for 'The Most Disorganized Radio Room on Earth?' The enclosed photo is nothing compared to what my radio room is now. I've added three rather large 'indoor' antennas, two more cabinets of electronics, a large drill-press, an entire cabinet of tape-recording electronics, two coax patch-bays for the 'hundreds of unidentified cables,' and a few mountains of various other half finished projects ... The door to my room only opens 14-1/2 inches!"

Doug Chandler KB7YPZ, St. George, UT

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From the Editor

How about it? I propose a competition, but not necessarily for "Most Disorganized Radio Room" I have a very special first cover stamp donated by Radio Netherlands commemorating Radio Oranje, which will be awarded to the monitor who seems least likely to have thrown anything away since the days of World War II! Send a photo of your collection of radio equipment and/or memorabilia — disorganized or not — and a list of some of your treasures. The deadline to receive your material is August 31st. We'll announce the winner in the October issue of *MT*, and send you a very special addition to your collection!

I guess it's appropriate that in this July issue I've been waving the patriotic flag of citizen responsibility. Celebrate Independence Day: Write your state and national senators and representatives *today* and don't let them take away your monitoring times!

Rachel Baughn, Editor



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Listeners' Nets

This bi-monthly space is available for amateur radio nets primarily devoted to the radio monitoring hobby, whether shortwave, scanning, utilities, or other. Your listing should include the following information:

Name of Net and Sponsor
 Frequency
 Day and Time of Week
 Region covered
 Topics of Interest
 Net Manager
 Who may participate
 Modes of participation:
 Address for contributions/questions by mail
 BBS number for participation by computer
 Phone number for phone patch
 Club address and membership fee if required for participation

Capitol Hill Monitors
 146.91 MHz 1st & 3rd Mon 7:30pm ET; Scanning

Central Florida Listeners Group
 146.730 MHz, Sun 8pm ET, Central Florida; any radio communications outside amateur bands. Net Mgr: N4EF
 Telephone gateways announced; CFLGBBS conference on LASER BBS 407-647-0031
 Call Mark Kuziv, KC4ZVK, 407-933-7163 for info

Garland Amateur Radio Club Information Net
 146.66 MHz Mon (exc. 4th) 7:30pm CT, Greater Dallas; Amateur radio news, tech & equip
 24 hr newswire: (214) 272-4499
 (This listing 1-time only; This spot available for nets dedicated to listening hobby)

Listening Post, Baltimore Radio ATV Society
 147.03/224.96/448.975 (W3DID) Sun 8pm, Baltimore and metro area; Anything not amateur radio and not covered by ECPA (boo hiss!)
 Contact Mike Agner KA3JJZ, 6720-F Ritchie Highway #236, Glen Burnie, MD 21061
 BRATS packet mailbox 145.69, call N3EZD

Montreal DX Listeners Net
 146.910 MHz, Sun 8:15 pm ET, Montreal PQ area; MW, SW, & Scanner. Net Mgr: Sheldon Harvey VE2SHW
 Telephone gateways announced

Monitoring the Long Island Sounds Net
 146.805 Tues 8pm ET, Long Island, NY; Primarily scanning
 Net Mgr: WB2RVA, 2134 Decker Ave, North Merrick, NY 11566
 (Temporarily suspended; Check w/net mgr regarding current status)

New York DX Association
 146.880 Mon 9pm ET, NYC area; "DC to Light"
 Net Mgr: Charles Hargrove N2NOV, 723 Port Richmond Avenue, Staten Island, NY 10302-1736
 Voice mail 1/2 hr before net: 212-978-3375; Compuserve 73167,312

Northeast SW Listeners and Scanners Net, Rip Van Winkle Society
 147.21 MHz (WB2UEB) Wed 8pm, Albany, NY, area.
 Net Mgr: Ray Loeper N2RAD

Scanner and Shortwave Listeners Net; AOSC
 146.940 Mon 9:30pm ET, SW Ohio; Scanning, SW, AM-FM-TV DX
 Net Mgr: N8OAY.
 Open to licensed amateurs; no phone or mail gateways

Shortwave Listeners Net, Association of North American Radio Clubs
 7.240 MHz LSB, Sun 10am ET, Eastern US; Shortwave broadcasts and utilities
 Net Mgr: KW3F, 238 Cricklewood Circle, Lansdale, PA 19446
 Telephone gateways announced

Larkfield Net
 147.21 MHz, Fri 8pm ET, Long Island, NY; Shortwave and scanning

All Ohio Scanner Club: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. Ohio and surrounding states; VHF/UHF/HF utilities. Net Mon 9:30pm 146.940.
American Scannergram. \$18 U.S., \$21 Can/Mex, \$28 ww. \$3 sample. Annual summer meeting.

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia. SWBC, utilities, longwave, clandestine. SWL \$20 US, \$22 Can/Mex. \$1 sample (\$2 ww). Meets 1st Sats 10am address above.

Association of Clandestine Enthusiasts (A.C.E.): Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.* \$18 US, \$19 Can/Mex, \$25 ww.

Association of DX Reporters (ADXR): Reuben Dagold, 7008 Plymouth Rd., Baltimore, MD 21208. International; Utilities, ham band, QSLing, MW, LW, and SWBC. *DX Reporter*. \$19 US, \$29 Can/Mex, \$22ww. \$1 or 5 IRC's sample.

Association of Manitoba DX'ers (AMANDX): Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF. Meets monthly. \$2.

Bay Area Scanner Enthusiasts: Bruce Ames, P.A.O., 105 Serra Way #363, Milpitas, CA 95035, (408) 267-3244. Western U.S.; 25+ MHz. *Listening Post* (bi-monthly). Meets 2nd Mons. 7:30 Milpitas Police Admin Bldg. \$25 US, \$2 sample, or SASE for info.

Bayonne Emergency Radio Network (BERN): Ray Baron/Bob Frasca, P.O. Box 1203, Bayonne, NJ 07002-6203, 1-800-286-2876. Metro NJ, NY; Fire/disaster, pub safety.

Bearcat Radio Club: Norm Schrein, P.O. Box 291918, Kettering, OH 45429, 1-800-423-1331. National. Scanning only. *National Scanning Report* (bi-monthly). \$17.50 (sub only) or \$29.90 (membership), \$5 more Can., \$10 more elsewhere.

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810-1408, (508) 470-1971, 50 mile radius Boston; 3-30 MHz. Meets 3rd Fris 7:30pm, Bull Billerica Facility, 300 Concord Rd., Billerica.

British Columbia Shortwave Listening Club (BCDX): Box 500, 2245 Eton St., Vancouver, BC Canada V5L 1C9, (604) 255-8987 fax. Shortwave. *LOGJAM*. Meets 3rd Thurs. 7pm at 920 Davie St.

Canadian Int'l DX Club: Sheldon Harvey, 79 Kipps St., Greenfield Park, Quebec, Canada J4V 3B1, (514) 462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger*. \$26 Can, \$25 US, \$US28 or \$Can35 ww. \$2 sample. Meets 2nd Tues 7pm Montreal; several annual events.

Capitol Hill Monitors: Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531/5774 fax. DC, MD, No. VA, So. DE. Scanner bands. Frequency Forum BBS 703-207-9622 (8-N-1) Net 1st & 3rd Mons 7:30pm 146.91. *Capitol Hill Monitor*. \$8. Meets irregularly.

Central Florida Listeners Group: David Grubbs N4EF, 956 Woodrose Court, Altamonte Springs, FL 32714-1261; (407) 296-2055 Andy Fountain. Central Florida; All bands. Net on 146.73 MHz Sun 8 pm. Meets 2nd Sats 12 noon. Conf#10 on Laser BBS (407) 647-0031.

Central Indiana Shortwave Club: Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

Central VA Radio Enthusiasts: Richard Rowland, POB 34832, Richmond, VA 23234-0832. Metro Richmond and vicinity. VHF/UHF. SASE. No newsletter, no dues. Meets quarterly in Richmond.

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 300 mile radius of Chicago; DXing all bands. *DX Chicago*. \$17, \$1 sample. Meets irregularly.

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, 6219 N. Greenview, Chicago, IL 60660-1815. Chicago & midwest. Public safety & general coverage. SCUG/CARMA BBS (708) 852-1292. *CARMA Newsletter*. Meetings (Sats) and newsletter bi-monthly on alternate months.

Communications Research Group: Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning. *The Repeater*.

DecalcoMania: Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (908) 591-2522. Worldwide AM, FM and collecting radio related items. *DecalcoMania*. \$10 US, \$11 Can/Mex, \$16 Eur, \$17.50 Asia/Pac.

Drake SPR4 Int'l Club: Bill Swiger, Route 1, Box 142A, Bridgeport, WV 26330. Worldwide; Drake SPR4 owners.

Fire Net: Tom Kravitz, Box 1307, Culver City, CA 90232, 310-838-1436, internet mpaga@netcom.com. All of California; fire, EMS, tied in with nationwide notification net.

Global DX Club: David Williams, P.O. Box 1176, Pinson, AL 35128-1176. Worldwide; all bands. *Radio Waves* (bi-monthly). \$1 sample. Meets monthly.

Houston Area Scanners & Monitoring Club: Glen Dingley, 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW. Paging network. *HASMC Newsletter*. Meets Jan & June.

Hudson Valley Monitors Association (HVMA): Patrick Libretti, P.O. Box 706, Highland, NY 12528. Mid-Hudson valley and surrounding counties; VHF/UHF, public safety. *The Hudson Valley Monitor*.

International 11 Meter Alliance: Allen Newton, Rt. 1 Box 187-A, Whitney, TX 76692, (817) 694-4047. Public safety, traffic handling, all bands, esp. 11 meters.

Int'l Radio Club of America (IRCA): Ralph Sanserino, P.O. Box 70223, Riverside, CA 92513-0223. Worldwide; BCB/AM DX. *DX Monitor* (34 x) \$25 US, \$27 Can/Mex, \$28.50 ww. \$.29 or 2 IRCs sample.

Longwave Club of America: Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215) 945-0543. Worldwide; Longwave only. *The Lowdown*. \$18 US, \$19 Can/Mex, \$26 ww.

New Pager Net:

Scanner Users in the Toledo, Columbus, Cleveland, Akron/Canton/Youngstown, Erie, and Pittsburgh areas who are interested in being part of a scanner notification network, one is now forming in these areas. For more info send SASE to: R.E. Christian, P.O. Box 12753, Pittsburgh, PA 15241-0763. Internet: rcons1@pagenet@telarama.pgh.pa.us

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
July 17	Cambridge, MA	MIT Radio Society and Harvard Wireless Club Flea Market & Aug 21 9am-2pm, Albany and Main St., \$2 admission.
July 9	Oak Creek, MI	Swapfest '94/So. Milwaukee ARC (414)762-3235. Location: American Legion Post 434, \$4 admission, talk-in on 146.52
July 10	Pittsburgh, PA	North Hills ARC/Don Jackson N3LAZ, 915 Dale Ave, Bradford Woods, PA 15015 (412)935-3343. Location: Northland Public Library, 300 Cumberland Rd., Talk-in 147.69/09 Free admission
July 10	Baltimore, MD	Maryland Hamfest/BRATS, P.O. Box 5915, Baltimore, MD 21208. (410)467-4634. Location: Timonium Fairgrounds, 8am-?
Jul 16-17	Maplewood, MN	Electronics Fair '94/North Area Repeater Assoc, P.O. Box 26331, St. Paul, MN 55126 (612)653-9999. Location: Aldrich Arena, Friday 6pm-10pm, Saturday 6am-3:30pm, \$6 admission.
Jul 17	Chicago, IL	ACLR Hamfest/P.O.Box 34446, Chicago, IL 60634 (312)714-5411. Location: DeVry Institute of Tech, 3300 N. Campbell, doors open 8am, \$4 admission, talk-in on 147.225 107.2PL.
Jul 17	Washington, MO	Zero Beaters ARC Hamfest/PO Box 24, Dutzow, MO 63342 (314)764-2777. Location: Hillerman Park (Washington Fairgrounds).
Jul 23-24	Stratford, NY	Fulton Co. Mahlon Loomis Committee operates W2ZZJ 1300-2000Z on General portion of 40, 20, and 15 meters; Novice on 10 meters. QSL SASE to: W2ZZJ, 5738 ST HWY 29A, Stratford, NY 13470.
July 24	Queens, NY	HOSARC Hamfest/Arnie Schiffman, WB2YXB, (718) 343-0172. Location: Hall of Science, Flushing Meadow Park, 9am-3pm, \$5 admission, talk-in on 444.200 rptr 146.52 simplex.
July 24	Stickney, IL	Dupage ARC Hamfest '94/7511 Walnut Ave., Woodridge, IL 60517 (708) 985-9256. Location: Hawthorne Race Course, \$4 admission, talk-in on 145.250/442.55+/146.52s
July 29-31	Oshkosh, WI	Experimental Aircraft Association Fly-In/Fox Cities ARC will operate W9ZL. On grounds information on 146.520 simplex (no QSLs please). W9ZL Fly-In station will handle msgs through the Wisconsin Sideband Net (3985) daily. Proper QSL & SASE to: Wayne Pennings, WD9FLJ, 913 N. Mason, Appleton, WI 54914.
July 31	Racine, WI	Racine Megacycle Club Hamfest/WB9USI, P.O. Box 3, Racine, WI 53401 (414) 554-7565. Location: South Hills Country Club, \$3 advance admission with SASE.
Aug 6-7	Jacksonville, FL	Gtr Jacksonville Amateur Radio & Computer Show, P.O. Box 27033, Jacksonville, FL 32205, (904) 350-9193. Location: Osborn Convention Center Jct. I-10 & I-95. 9am-5pm Sat, 9am-3pm Sun. \$6 admission.
Aug 7	Westchester, NY	WECA Summerfest/ Westchester Emergency Communications Assoc., P.O.Box 831, N. Tarrytown, NY 10591-0831, Jeanne Raffaeli (914) 962-9666. Location: Westchester Co. Center, Jct. Rt119 & Bronx River Pkwy. Talk-in 147.06/66. 9am-2pm, \$5 admission.
Aug 7	Peotone, IL	Hamfesters RC Hamfest/ Box 42792, Chicago, IL 60642 (708) 535-AHAM. Location: Will County Fairgrounds, I-57 to Peotone, Exit 327 E. Talk-in 146.52 simplex. 8am, \$5 admission
Aug. 14	Frankfort, KY	Central KY ARRL Hamfest/Bill DeVore N4DIT, 112 Brigadoon Pkwy, Lexington, KY 40517 (606)257-3343. Western Hills High School, Exit 53 off I-64. Admission \$6. 6am-3pm
Aug 20	Longview, WA	Ham Radio, Computer & Electronic Swap Meet/Lower Columbia ARA, P.O. Box 906, Longview, WA 98632, (206) 425-6076. Talk-in 147.26+, 9am-3pm, \$3 admission.
Aug 20	Albuquerque, NM	Duke City Hamfest/P.O. Box 6552, Albuquerque, NM 87197-6552. Location: NM Army Natl Guard Armory, 1.5 mi south I-40 & Wyoming Blvd. 7am-5pm, admission free. Talk-in 147.10/147.15 MHz.
Aug 21	Montreal, PQ	CIDX Intl Radio Festival / Location: 1212 Panet St, 10am-5pm. Exhibits, seminars, videos on SW, scanners, amateur radio.
Aug 26-28	Hoquiam, WA	Intl Radio Club of America Convention / Nancy Hardy, 2301 Pacific Ave., Aberdeen, WA 9850-4527. Location: Westwood Inn, 1-800-562-0994.
Aug 27	Chaffee, NY	Chaffee Hamfest & Computer Show/ Pioneer Radio Ops Soc (PROS), Paul Sumski KA2ZMC, P.O. Box 334, Arcade, NY 14009 (716) 492-3198. Talk-in 145.390, 144.175. Location: Manion Park, off Rt 16, 30 mi. S. of Buffalo, 7am-3pm. \$4 admission.
Aug 27	Bridgewater, NJ	Hamfest/Somerset Co. ARS (SCARS), P.O. Box 742, Manville, NJ 08835, Donna/George N2RQH (908) 369-4533. Talk-in 448.175-. Location: Somerset Co 4H Center, Milltown Rd. 8am-1pm
Aug 28	Woodstock, IL	Hamfest & Computer Show/Tri-County Radio Group, P.O. Box 3107, Skokie, IL 60076-6107. Robert N9KXG, (708) 658-1678. Location: McHenry Co. Fairgrounds. Talk-in 146.52 simplex.
Aug 31- Sept. 3	Irvine, CA	RadioComm '94 / So Cal Area DXers (SCADS), Bill Fisher Sr, 6398 Pheasant Dr., Buena Park, CA 90620-1356. Location: Holiday Inn, Irvine (\$30 registration)

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Events Calendar
P.O. Box 98, Brasstown, NC 28902-0098

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STOCK EXCHANGE

Ads for **Stock Exchange** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*. **Ad copy must be typed for legibility.**

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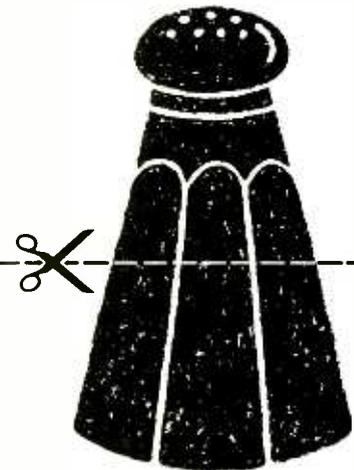
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Ojective Review or Self-Promotion

Recently, while perusing postings on a computer BBS, I saw a couple of comments criticizing my recent review of my own product in the pages of *Monitoring Times*. The criticism raised a reasonable question: How could I objectively—impartially—critique my own work? The implication was that the legitimacy of the review is governed by the independence of the reviewer.

I was the one who did the review, and it was of my own products. I know its merits and limitations because I specified its performance requirements. But was my objectivity clouded? Did I place promotional hype over integrity? Did I choose my product for review over a more worthy product, perhaps that of a competitor?

The dilemma is interesting: If I appraise someone else's product as "the best on the market," it would be acceptable, but if I were to make the same observation about a Grove product, even if it were true, look out! Incidentally, I didn't do that.



This led me to wonder what constitutes a valid review. I would think that it should be authoritative, comprehensive, easy to read, and accurate. Motivation, even if it is suspect, should not play a role; after all, we are questioning the validity of the review, not the reason for the review.

Some publishers use biased reviews as an inducement to curry favors of prospective advertisers; a favorable review of a dismal product may be philosophically and morally corrupt, but it does bring in advertising revenue.

In the *MT* case, the most common reason I review my own products is because of time. If I wait until someone equally (or perhaps more) qualified writes a review, the delay to our readers would sometimes be several months, just like other magazines. *MT* is known for its timeliness.

Still, products and books sent in to *MT* for review do sometimes have to wait until we have time to do the evaluation, or until there is space to publish it in *MT*. Should Grove products not suffer the same delay?

Which is more important to you, timeliness or detachment? Assuming that the facts are correct and accurately represent the true performance of the product, does a fair review not remain a fair review?

Bob Grove
Publisher



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