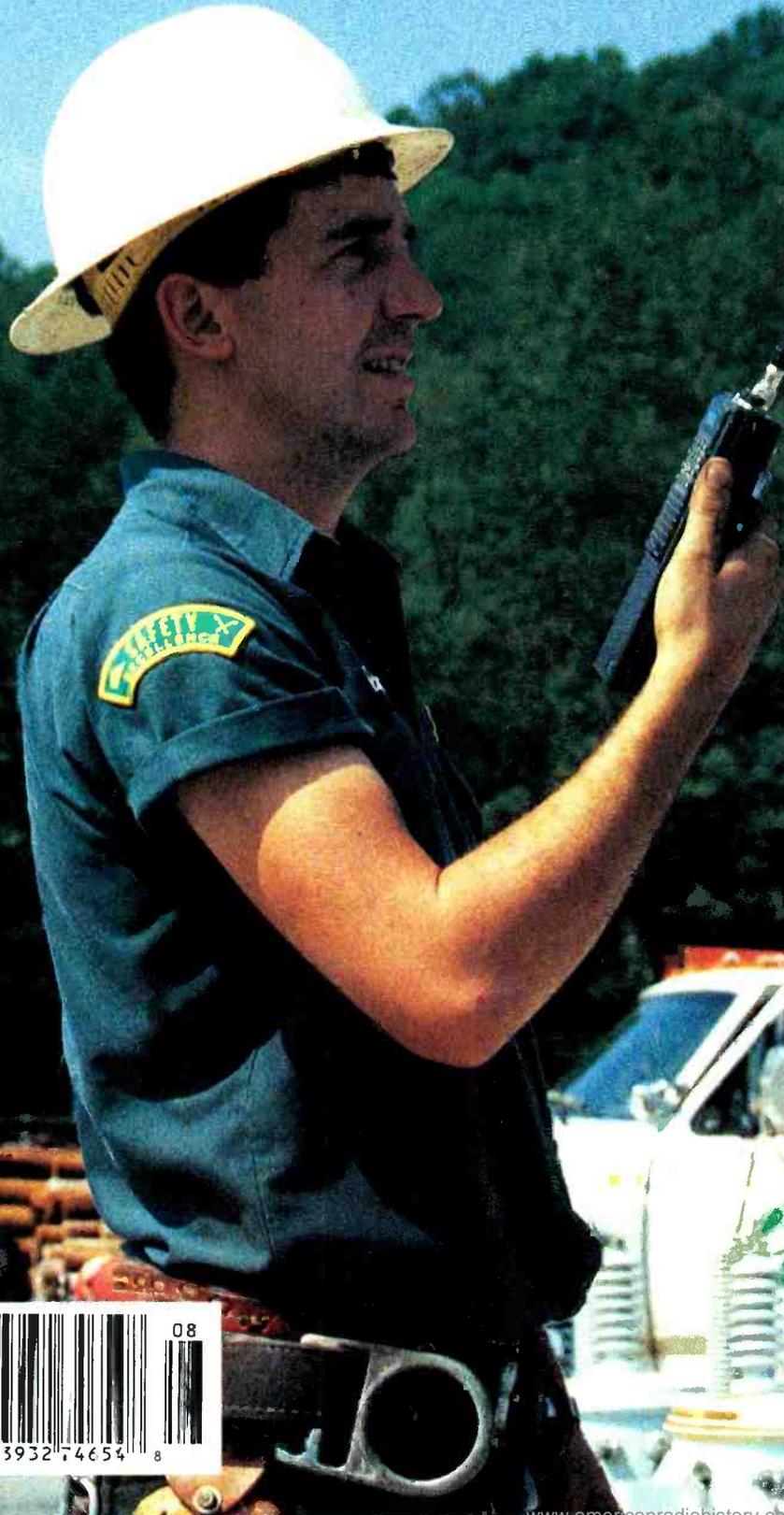


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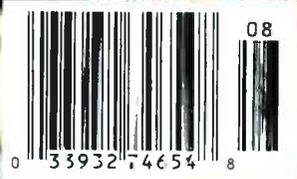
Monitoring Times™

- ◆ *Deutsche Welle:
Voice of a New Germany*
- ◆ *Air Show Scanning:
From Triumph to Tragedy*



Radio's True COLORS

*Uses—and Misuses—
of Business Band Radio*



YOU CAN'T HIDE



FROM THE INTERCEPTORS

The New and Improved Model R10 FM Communications Interceptor®

If RF security is a concern then the R10 Interceptor® may be the answer. FM signals just can't hide from the R10. It provides a shield of protection that no FM signal can penetrate without being detected.

The proprietary circuitry was developed exclusively by Optoelectronics. Thousands of customers including security professionals, radio technicians, and monitoring enthusiasts appreciate the near field capabilities of the R10.

For the first time since its introduction two years ago the R10 has been upgraded with a new high intensity bargraph LED display, a

low battery indicator and a delayed squelch. The new squelch circuit provides continuous reception of a signal during most multi-path drop outs. Now when used with our DC440 Decoder, Digital Coded Squelch codes can be checked as well as CTCSS Tones and DTMF Characters.

- Check deviation with 10KHZ (1KHZ step) or 100KHZ (10KHZ step) range.
- Check relative signal strength.
- Skip button lets R10 scan to next signal.
- Continuous 30MHz to 2GHz coverage in less than one second.
- Completely automatic with no tuning required.
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- Use built in speaker or earphone/headphones.

Model R20 Interceptor/Bug Detector AM Communications Interceptor®

The R20 is a compact RF signal strength detector with a 10 segment bargraph display. There is also an audio output from the detector that is processed for constant volume for use with ear phone.

The audio output is useful for room sweeps where in close proximity to a transmitter a quieting effect can be heard due to detector saturation.

Transmitters can be easily checked for output and AM modulation.

- The 10 segment LED bargraph responds to all RF signals with nominal 3dB increments
- Pocket sized with built in telescoping antenna.
- 9 Volt battery operation.
- Monitor Aircraft, CB, AM broadcast transmissions when close.
- Check Microwave oven leakage.
- Wide .5MHz - 3GHz+ frequency range.

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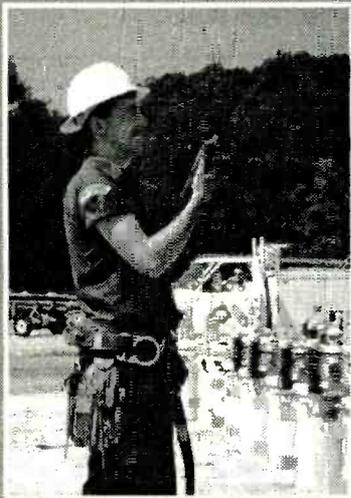
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R10 checks coded squelch codes with DC440 Decoder

R10 FM Communications Interceptor®	\$359.
R20 AM Communications Interceptor®	\$119.
DC440 Decoder	\$259.
CX12 RS-232C Interface Converter (Interface DC440 to PC)	\$ 89.



Cover Story

Radio Shows its True Colors

By Larry Elass

Business band radios, whose frequencies are coded by color to ensure compatibility, are easily available and widely used. Unfortunately, they are often *mis-used* as well by a public which perceives them to be glorified walkie-talkies. Licensed users, such as Blue Ridge EMC, Young Harris, GA, (pictured) find such radios invaluable. Photo by John Bailey. See Page 26.

Air Show: From Triumph to Tragedy..... 10

By Les Butler

June's airshow at Selfridge ANG turned from a pleasant day into a national news story — complete with the author's video.

Deutsche Welle: Voice of a New Germany..... 14

By Dean B. Mahin

Deutsche Welle's forty years of broadcasting have seen a lot of changes, but nothing like that experienced since Germany's reunification. DW's steadfast goal is to provide objective and independent coverage of their country to the rest of the world.



Monitoring the Military's Satellite Communications..... 18

By Jack Sullivan

Increasingly, military communications are taking to satellites. They are sometime audible with a basic scanner set-up, but these step-by-step instructions for a simple helical antenna will increase your chances for reliable reception.

European DX Council Annual Meeting..... 28

By Jacques d'Avignon

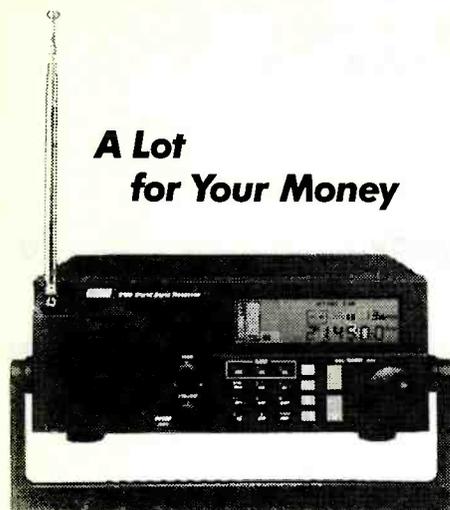
MT's Propagation columnist represented the magazine at the 1994 meeting of European clubs and hobbyists.

Video-Scanning..... 30

By Arthur Edwards

You're on vacation, so naturally you have your video camera with you, and your portable scanner as well. Why not combine them to make an even more memorable keepsake?

DEPARTMENTS



A Lot for Your Money

That's what you'll get with the Drake SW8 "portatop" shortwave receiver, says Magne. Bob Grove compares two digital signal processors in "Scanner Equipment." Check out the equipment pros and cons by our reviewers.

You'll find more projects, news, tips, and great advertisers from cover to cover in your August MT!

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MT

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Telephone: (704) 837-9200
Fax: (704) 837-2216 (24 hours)
BBS: (704) 837-9200 (M-F 6:30 pm-8 am; 24 hours on weekends)

Subscription Rates: \$21.95 in US and \$32.00 US funds elsewhere; Label indicates last issue of subscription

Postmaster:
 Send address changes to *Monitoring Times*, P.O. Box 98, Brasstown, NC 28902-0098.

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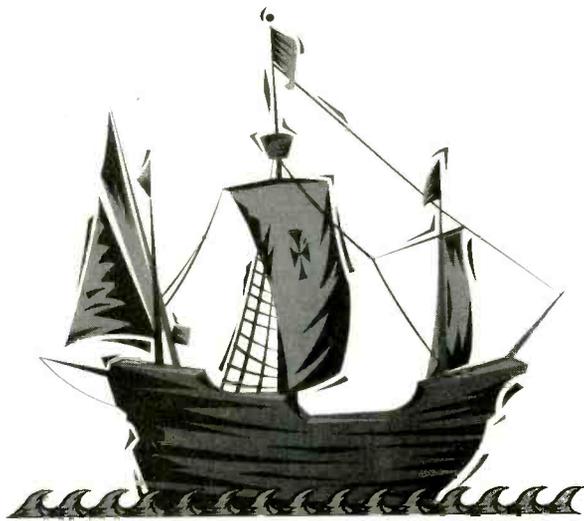
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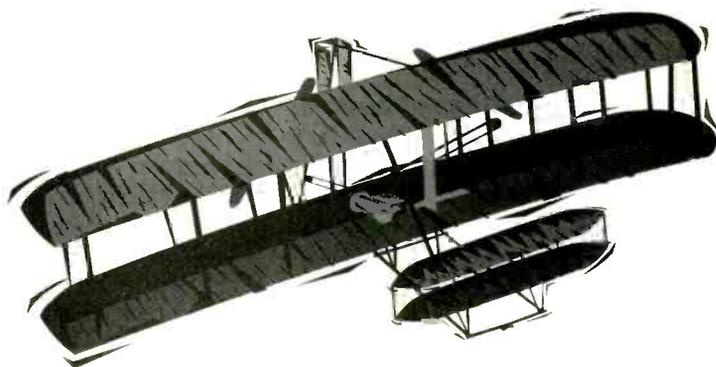
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"THE WORLD IS FLAT"



"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."

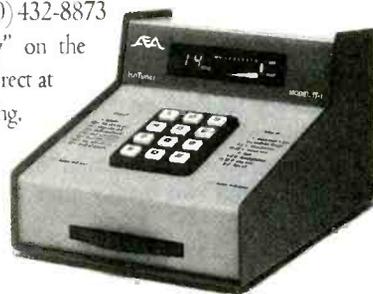
The reason you get such a big performance in a small package is the efficiency of the IsoLoop 10-30 HF; it's 72% on 20m, rising to 96% on 10m. The main loop serves as an inductor, tuned with a 10,000 volt variable capacitor. Frequency range is 10 MHz to 30 MHz with continuous coverage. The unique

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.

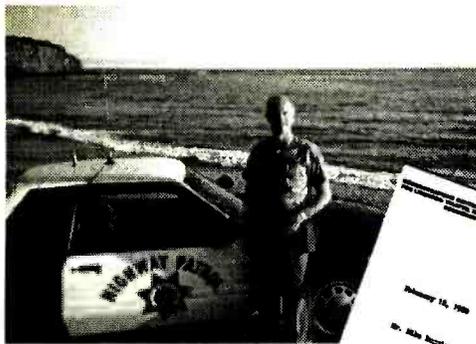


Connect with us

Old Friends for a New Day

This August finds me excited about a new look to Grove publications, including the newest—*Satellite Times*, which is due in your mailbox in two or three weeks. The person responsible for upgrading our image is art director John Bailey, who used to design *MT* covers and the Grove catalog several years ago. We are delighted he is back with us, and we think you'll like the changes he is making to improve the liveliness and readability of the magazine.

It's great to get back in touch with old



Fourteen years ago Mike Lussier asked for microfiche and ended up with the first Grove directory. Today he is on patrol in San Juan Capistrano.

friends like John who have gone on to improve their skills; it's also fun to reminisce about the "old days." Bob Grove recently received such a letter from Mike Lussier of Capistrano Beach, CA.

Mike says, "We're old acquaintances due to our being members of RCMA (Radio Communications Monitoring Assoc.). I am ID-001... I have a copy of a letter you sent me over 14 years ago that I thought you'd enjoy seeing. (For your info, I did buy the directory.)"

"When you wrote me in February 1980, I had been in the Ca. Highway Patrol Academy for fifteen days!"

Bob's reply: "Mike, it's good to hear from you again after all these years. The government frequency records we published in the *Federal Frequency Directory* (now out of print) were classified "Confidential" by President Reagan about two weeks after we received them!"

Could you see the reference Bob made in his letter to microfiche? Now there is a piece of technology I'd love to go back to — *NOT!*

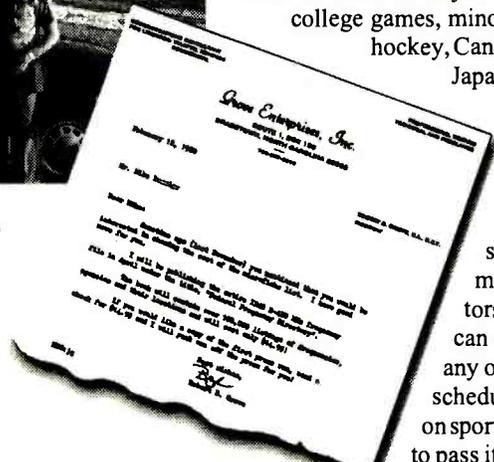
For the Love of Sports

"I've listened to a lot more radio the past couple years, especially since I found the G.E. Superadio," says Jack Little of Northwood, OH. "As a sports fan this has been a real find. It has allowed me to find out about baseball and hockey teams from AM stations outside our immediate area, especially for minor leagues who aren't widely publicized.

"Shortwave has also proved to be an adventure. Rugby from Australia is much better than what I played in college. BBC *Sportsworld*, hosted by Paddy Feeney, is an excellent program. It has brought a lot of information about soccer, where the score is often one nil. Then there's cricket, in which they have scores like 246!" (Which Jack learned is not always desirable.)

"I would like to see more information on where to tune in major league and major college games, minor league baseball, hockey, Canadian football, and Japanese baseball."

Jack, I'll pass your comments on to Jim Frimmel and Joe Eisenberg, the shortwave and mediumwave editors, and see what we can do! Meanwhile, if any of you readers have schedules or other input on sports, we'll do our best to pass it along to the readers as long as it remains current.



Scanner Intrigue

An anonymous reader in the Tacoma, WA, area is puzzled by some radio activity he heard over a period of three days on the county sheriff's frequencies.

"There were two units involved; one a base station and one mobile. Our county frequencies run dispatches as car-to-car east and car-to-car west, plus miscellaneous. This activity involved these three frequencies, but dispatch was involved in only a few transmissions.

"The area covered was limited to a radius of no more than 15 miles from the center of Tacoma. The base unit would direct the mobile unit to drive through various areas, effectively forming a grid as far apart as five miles. The mobile unit had a hand held for communications that he held out the window while driving. Something in the mobile unit was sending readings to base which gave readings on a counter; the word "scope" was used once.

The mobile could be "hot" (the desired reading) in one area and "cold" in another. It appeared to me like a transmitter working through repeaters on some unknown frequency.

"They were working long hours during this process, apparently finishing about 9 pm June 3rd."

In another communication from several county cars later the same night, our reporter overheard something which might (or might not) be related. "One said he didn't have all the lights lit when he stopped; he only had one lit that was pointing southwest; but when he started driving they all came on. Another car told him that these need adjusting as he had been told they were too sensitive, and to turn it off for a few minutes, but also turn down the volume. A different one told him to unplug it for a bit and then plug it back in. The car with the problem came back and asked him where? In the trunk or behind the unit? He was told to just unplug it from the back of the unit."

Since our writer thought he recognized the voice on the base station as that of a ham he used to know who was also a Motorola tech, it seems logical that the Tacoma police were either installing a new system, or doing a system analysis, perhaps to map "dead spots" — a common and dangerous problem in public safety repeater systems.

Matt Mercer, RCMA's new editor for the western states, gives the Tacoma police frequencies as: 460.050, primary dispatch; 460.150 and 460.300, car-to-car, 460.350, records. Matt says in the July edition of *Scanner Journal*, "The Communications Center used to be in the basement of the County-City Building, but has long since moved to a new undisclosed location."

If anyone has more insight into new developments in Tacoma, send them in and we'll pass them along in the "Scanning Report."

News from the North

We always enjoy hearing from John Musgrove of Campbell River, British Columbia. John, who started listening to shortwave radio during WW II in England says, "Present equipment consists of a Lowe HF150 and a PRO2006. I'm delighted with the HF150. I find I don't miss an S meter or RF gain. My only complaint is the lack of a dial light. However, I put two AAA cells in the keypad, with an LED on the front, a dropping-diode and a push switch (momentary), and am happy with the ability to read the dial with the LED a foot or more from the dial.

"The Lowe set is like *MT*—all the money goes into content, not cosmetics!"

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

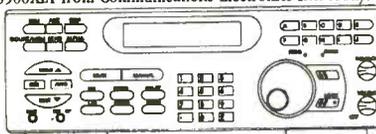
NEW! RELM® WHS150-J

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 #BPO07 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 discone 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 ATS1818-J portable without cassette recorder\$189.95
- Sangean ATS1818CS-J with cassette recorder\$209.95
- Sangean ANT60-J portable shortwave antenna\$9.95

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\$339.95
- RELM WHS150-J VHF handheld 5 watt, 16 ch. transceiver\$339.95
- RELM RH256NB-J VHF 25 watt synthesized transceiver\$289.95
- Ranger RC12950-J 25 watt 10 meter ham radio\$244.95
- Ranger RC12970-J 100 watt 10 meter ham radio\$369.95
- Uniden LR9000W1-J Super Wideband Laser/Radar Detector\$169.95
- HPCPC/J HamCall CD Rom for IBM PC by Buckmaster Publishing\$39.95
- PWB-J Passport to Worldband Radio by IBS\$10.95
- POL1-J Police Call for CT, ME, MA, NH, NY, RI, VT\$5.95
- POL2-J Police Call for DE, MD, NJ, PA\$5.95
- POL3-J Police Call for Michigan & Ohio\$5.95
- POL4-J Police Call for IL, IN, KY, WI\$5.95
- POL5-J Police Call for IA, KS, MN, MO, NE, ND, SD\$5.95
- POL6-J Police Call for DC, FL, GA, NC, PR, SC, VA, WV\$5.95
- POL7-J Police Call for AL, AR, LA, MS, OK, TN, TX\$5.95
- POL8-J Police Call for AZ, CO, ID, MT, NM, NV, UT, WY\$5.95
- POL9-J Police Call for California, Oregon & Washington\$5.95
- ANT1-J VHF scanner/VHF transmitting antenna PL259 connector\$29.95
- ANTMBNBJC/J magnet mount scanner antenna w/ BNC connector\$29.95
- ANTMMOTJ/J magnet mount scan antenna w/Motorola plug\$29.95
- ANTMPLJ/J magnet mount scan antenna with PL259 connector\$29.95
- ANTSGBNBJC/J glass mount scanner antenna with BNC connector\$29.95
- ANTSGMTJ/J glass mount scanner antenna with Motorola jack\$29.95

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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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For information call 313-996-8888 or FAX 313-663-8888

Garcon! Our Table Is On Fire!

It's been hard to escape the publicity: exposure to radio waves has been linked to health problems. This might come as no surprise to RF engineers who suffer "burns" when working on transmitters and antennas.

In Saudi Arabia, construction at a soccer stadium near one transmitting site was suspended because heavy equipment, steel girders and even hand tools became electrified by the radio waves. Other less credible reports say that birds actually drop dead, cooked from the inside out, while flying close to some high-powered antennas.

So it was somewhat curious when Chinese officials announced that they topped their recently completed "Oriental Pearl" TV tower in Shanghai with millions of watts of transmitting antennas — and a 1,000 seat restaurant. There are no indications on how the restaurant has been received; however, we assume that everything on the menu is served "well done."

The Oriental Pearl is the highest TV tower in Asia and is third highest in the world, standing at some 460 meters (1,509 feet). Reservations are required. Call 86 (1) 801 1149.

Infinite Power — But no Sense of Humor?



WHJY in Fall river, Massachusetts, had just returned to full power and wanted to tell everyone about it. Management rented a billboard on Interstate 195. On it they put the message:

"MORE POWER THAN GOD.
50,000 WATT WHJY-FM."

Within days, the station had received dozens of complaints and a formal protest from the Greater Providence Council of Churches. So the station decided to "lighten things up" a bit by having the billboard altered to look as though it had been torn apart by a lightning bolt. The protesters, apparently a humorless bunch, were not satisfied.

"We never intended for people to take us literally," said a weary Jim Corwin, general manager of WHJY. "At this point, any attempt at levity is falling on deaf ears."

Bad News About Angels

In 1988, fifty people were killed and 400 injured during an air-show crash in Ramstein,

West Germany. One year earlier, in Spokane, Washington, several fliers died when a KC-135 crashed while demonstrating in-flight refueling. The result of those disasters is an increasing unwillingness on the part of FAA officials to allow the Blue Angels acrobatic team to perform at certain airshows.

At Seattle's Seafair, the FAA nixed the Angel's participation this year because the planes made their approach over downtown and residential neighborhoods. Safety concerns were heightened when an FAA inspector observed a "near incident" during last year's performance.

According to Dick Meyer, an FAA spokesman in Seattle, an observer saw one F-18 in a near stall as it approached the Seafair crowd. Peyton Whitely, a reporter for the *Seattle Times*, says, "a near stall means that an airplane is losing too much speed to remain flying."

As that happened, the airplane began wavering. The pilot was able to recover by applying more throttle, regaining speed and shooting forward. Says the FAA's Meyer, "The crowd cheered and thought it was a great performance, but the FAA observer recognized it wasn't part of the act."

Seattle is not alone in losing the Blue Angels. Also cancelled this year were permits for the Angels to fly in Florida and Georgia.

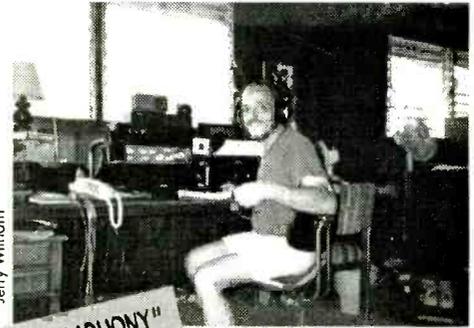
A Kinder, Gentler, FCC

As expected, KNAC, the unlicensed, 10-watt, pro-Hawaiian sovereignty station in Naalehu, has been closed by the FCC. Representatives of the FCC and the U.S. Marshal's Office broke down the station's door, confiscated the equipment and cut the antenna cable.

The raid occurred at 6:30 a.m.. Says the FCC, "No one was there. There was no confrontation."

What is unexpected is that the FCC, which had been in communications with the station's operator, opted not to levy a fine. A local paper quoted FCC spokesman Jack Shedletsky as saying, "...They're just people trying to make a living. They're not making tons of money. Our main objective was to stop the operation." The fine could have topped \$75,000.

Meanwhile, reader Jerry Witham reports that residents of the Puna section are mourning the loss of another pirate station. Classical Radio Puna, which broadcast for six hours a night on 89.9 MHz, was reportedly hosted by Jerry DeOreo. Witham said that DeOreo was a musicologist, musician and trained announcer



Jerry Witham

"MASTERS OF THE SYMPHONY"
FROM
CLASSICAL RADIO PUNA
STEREO 89.9 FM
WEEKEND EVENINGS, FRI. SAT. SUN
7 PM TO MIDNIGHT
MUSIC OF THE MASTERS, PERFORMED BY
THE WORLD'S FOREMOST CONCERT ARTISTS.

providing "expert commentary." Perhaps it was because of the quality of the programming or the excellent audio that the FCC allowed the owner to complete the show and make a closing

announcement. The operator served the FCC representative coffee as he waited. Very civilized; a "classic" bust?

Classical Radio Puna had 15 watts of power. Says Jerry Witham, "We miss it."

FCC Fines ACE

A Notice of Apparent Liability (NAL) was issued on June 30th by the Federal Communications Commission (FCC) against ACE Communications, an Indiana mail order scanner firm. A forfeiture in the amount of \$20,000 was levied against ACE for advertising and selling the Yupiteru MVT-7100 and Trident TR-2400 scanners, willfully misrepresenting them by affixing fraudulent labels suggesting they were FCC certified, which they were not.

It is unlawful for cellular-capable or cellular-restorable scanners or converters to be marketed in the United States, although domestic dealers are allowed to sell whatever units were in the country before the April 26 deadline. While some Canadian and European firms still place the ads in U.S. magazines (including *MT*), the law allows U.S. Customs to deny entry and place in a bonded warehouse such contraband devices. It is up to the off-shore vendors to arrange their return and whether or not to refund any prepayment made by the U.S. customer.

VOA is #1

The Voice of America says that its weekly shortwave and mediumwave audience is approximately 92 million adults. This, they say, is a conservative estimate.

Specifically, the VOA breaks its audience down as follows: Africa, 20 million; Latin America, 6 million; China, 19 million; other

East Asia and Pacific countries, 1 million; Europe, including the former Soviet Union, 21 million; and Near East and South Asia, 25 million. The audience, says officials, is young, male and well-educated.

You expected them maybe to say that they have 12 poor, illiterate listeners in Newark?

Hard to Hear

The Voice of Russia says that they continue to receive complaints about the "very poor audibility of our programs." Unfortunately, say officials, "in view of the almost complete lack of funds, we cannot improve anything."

"Some transmitters are not working because of a shortage of electricity and spare parts... Technical Services do not even have official information on the frequencies allotted to us. In addition," they say, "transmitters are constantly being switched off, switched over to other frequencies, or replaced." The situation, in a grand understatement, is described as "critical."

Happy 35th, BNT!

Bulgarian National TV is celebrating its 35th anniversary this month. There will be several gala parties, followed by a live 90-minute show celebrating past and present television stars. Immediately after the show, the station suspended its morning broadcast because of financial difficulties.

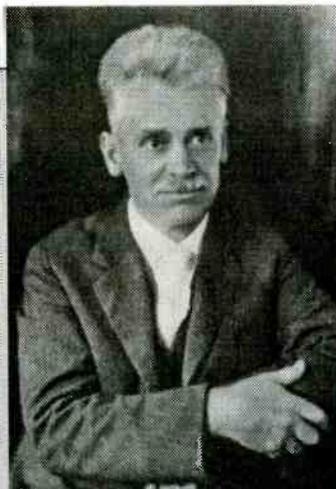
Firing Up the FCC

Not too awfully long ago, after the Clinton Administration told Congress that the FCC should be financially self-supporting through user fees, things started to happen fast.

On March 11th, the FCC adopted a Notice of Proposed Rulemaking (NPR), seeking to implement the provision of a new Section 9 of the Communications Act of 1934. Section 9 permits the FCC to assess and collect annual regulatory or "users" fees. Needless to say, the "fees" increased.

There wasn't much room for discussion.

Local, national, and international news related to radio and technology are always of interest to our readers. Be a sharp-eyed Monitoring Times reporter by sending them to the attention of the editor. You may see your name in "Communications" or other column as one of our valuable contributors!



This year is the 125th birthday anniversary of Hiram Percy Maxim, founder of the American Radio Relay League and QST magazine. The Antietam Radio Association of Hagerstown, MD, is fund-raising to erect a grave site marker in memory of his contribution to the amateur radio hobby, and is planning a special event station for the dedication weekend Sept. 3rd. See "On the Ham Bands" for additional information.

Comments on the NPR closed in three weeks; replies, 10 days later. The docket made the entire trip in less than three months! By contrast, ham radio rule making takes two years to make its way through the same bureaucracy.

By fiscal 1995, the FCC expects to collect \$130 million in licensing and regulatory fees including \$4,000 to \$18,000 from TV broadcasters alone. Cable TV operators will chip in 37 cents per subscriber.

But, surprisingly, about \$40 to 45 million in licensing fees will be diverted from the FCC's self-funding mandate, being sent to the U.S. Treasury instead. That left \$95 million in self-funding; the fiscal 1995 FCC budget is \$167.4 million.

So, now someone gets the idea to start a new fee: the Spectrum Royalty. The proposal was quietly inserted into a fiscal 1995 budget amendment by the White House. But guess what? Like the \$40 to \$45 million in license fees diverted to the U.S. Treasury instead of self-funding the FCC, the proceeds from the new Spectrum Royalty also got diverted. They will go to cover expenses generally associated with the General Agreement on Tariffs and Trade (GATT) and for jailing illegal immigrants — two decidedly non-FCC expenses.

It's complicated. It's crazy. It's America. And there's more to come.

Help in Sight for RCI?

Radio Canada International, which was nearly budget-cut out of existence in 1991, has received some significant support from a Standing Senate Committee on Transportation and Communication. "With this report the Committee has confirmed the importance of Radio Canada International to this country," said Maggy Akerblom, a spokesperson from the Coalition to Restore Full RCI Funding.

The deluge of letters from listeners around the Canada and the world has had an impact. In August 1992, even CBC President Gerard Veilleux admitted, "I learned one very important thing: that RCI was much more important than I ever thought ..."

Stay tuned and keep writing! Although the Committee recommended that funding be restored, the end result is by no means assured.

"Communications" is written by Larry Miller from a variety of sources, including material submitted by the following fine people: Dave Alpert, New York, NY; Rachel Baughn, Brassstown, NC; Matthew Canby, Seattle, WA; Sheldon Harvey, Montreal, Canada; Paul Haskjetl, Minneapolis, MN; Dean Manly, Hilo, HI; Jeff Multer, Charlotte, NC; Robin Miller, Wagontown, PA; Jim Neidlinger, Nitro, WV; "Subscriber," Dayton, OH; Gerald Witham, Keaau, HI and Conrad Wolf, Barbasol, KY. Additional information was obtained from BBC *Summary of World Broadcasts*, *National Scanning*, *Radio World* and the *W5YI Report*. Thanks to all who diligently scan their local newspapers for stories about radio and send them in. You make this column possible.

Award Winning Filters

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Here are just SOME of the premiere events:

- **Dozens of exhibitors** with the latest equipment and accessories for radio monitoring, including: Austin Antenna, Bay Area Scanner Enthusiasts (BASE Club), Bearcat Radio Club, Christian Science Monitor, Computer Aided Technologies, R.L. Drake, Grove Enterprises, ICOM America, Optoelectronics, Radio Communications Monitoring Assn. (RCMA), Scan Star, Sony Corporation, Transel Technologies, The Wireman, and many more.
- Join your fellow monitors at a **professional listening post** featuring the Grove SDU-100 Spectrum Display Unit and SP200 Sound Enhancer as well as other products designed to enhance your radio monitoring.
- A **two-hour international broadcasters forum** starts off the weekend Friday evening and is hosted by moderator Ian McFarland.
- Attend any of **over 20 seminars** covering such topics as the future of shortwave broadcasting, choosing a scanner or shortwave radio, LOWFER monitoring, digital communications, spy numbers stations, surveillance, clandestine and pirate broadcasting, antenna theory, military and aero monitoring, and much, much more!
- Saturday evening's banquet will feature **International broadcaster Ian McFarland**.
- Get your scanner charged and ready for the Saturday night **"Bug Hunt"**--a convention highlight.
- Visit **Delta Airline's Communication Center** and **Delta's Maintenance and Flight Operations Division**. Tours will be conducted on Friday.
- See the **Portable Satellite System** set up for the convention.

PRELIMINARY 1994 MONITORING TIMES CONVENTION SCHEDULE

FRIDAY

8AM - 7PM Registration open
 8:45 - 4PM Tours of Delta Maintenance, Museum, Radio Room and Dispatch
 12PM - 5PM Exhibits and Listening Post open.
 7PM - 9:15 International Broadcast Forum with host IAN MC FARLAND and panelists Tom Rodgers, International Radio Satellite Corporation; Dr. Bill Prichard, W.L. Prichard Co. of Bethesda, MD; Kim Elliott, VOA/USIA; Larry Magne, Passport to Worldband Radio; Karl Miosga, Managing Director World Radio Network, London, England.

SATURDAY

8AM - 2:30 Registration open
 8:45 - 3 Exhibits open
 9AM - 9:30 Welcome by Bob Grove

SEMINARS

9:45-10:45	Future of Satellite Broadcasting Ken Reitz	What Do Those S/W Specs Mean? Larry Magne	Federal Monitoring John Fulford	Scanning for Beginners Skip Arey
11-12	Rumblings in the Basement (Below 500kHz) Kevin Carey	Digital Monitoring Modes & Equipment Bob Evans	Antennas: Fact and Fiction Bob Grove	Shortwave for Beginners Skip Arey
3-4	TVRO, the Ideal Set-up - Ken Reitz	Pirates & More! George Zeller	Shortwave Intrigue Larry Van Horn	
4:15-5:15	Home Reception of INMARSAT John Wilson	AM/FM/TV Broadcast DXing Joe Eisenberg	Monitoring the Military Larry Van Horn	
7-9	Banquet - guest speaker IAN MC FARLAND			
9:30 - ?	Bug Hunt - John Fulford and Friends			

SUNDAY

9 - 10 AM	Aero UHF/VHF/HF Jean Baker	Weather Reception on HF FAX & SATS Jacques D'Avignon	Surveillance Techniques John Fulford
10:15-11:15	Advanced Antenna Design Dick Austin	Linking Technologies Bill Grove	All About Scanners Bob Grove
11:30-12:30	DXing the Satellite Spectrum Larry Van Horn	Radio-related Computer S/W John Catalano	Spy Number Stations John Fulford
12:45-1:15	CLOSING		

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1 ASAPS Software from Jacques d'Avignon	\$275.00
Frequency Counters from Optoelectronics	
Sangean MS103 from Christian Science Monitor	
1 SP200 from Grove Enterprises	\$249.95
plus shirts and hats from ICOM!	\$\$\$

Must be full convention registrant in attendance to be eligible.

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PRE-REGISTRATION FORM

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Don't miss this exceptional opportunity!



Several World War II era planes were on hand at the Selfridge Air National Guard Base air show, and some of them flew to commemorate the 50th anniversary of D-Day.

by Les Butler

A Day of Fun . . . A Day of Tragedy

On Saturday, June 12th, I decided to take my wife for a pleasure outing to the Selfridge Air National Guard Base. That's not quite as sadistic as it sounds; we were headed for an air show featuring the Blue Angels!

The day started off fine. I had my Pro-43, 2300 handi-counter and full cushioned headphones. There was lots of action on 163.4875 and 173.4375 for crowd control, and crash crews could be heard setting up on 173.5875 MHz. This kept my ears busy while we walked around eyeballing all the great military planes. The F-117A stealth fighter was there, but security was tight. Several armed guards with automatic rifles on their shoulders enforced the rope perimeter established around it.

What a great plane! Somewhat to my surprise, my wife Karen actually seemed to be enjoying the day, too.

I love listening to the air-air refueling missions that occur frequently in this region. Naturally, I couldn't pass up the chance to climb aboard a KC-135E Stratotanker.

Walking up into the cockpit, I had to ask: "Are you stationed here?"

"Yes, we are."

With a smile I said, "I listen to refueling missions often, what is your call sign?"

"Piston 51," he replied.

"Great!" I thought; next time I hear Piston 51 I'll know exactly what it looks like, and even be able to picture several of the crew members. This was a scannerhead's dream come true.

The tanker was set up alongside an Air Force Reserve recruiting display, so there were a few neat freebies that they passed out. I grabbed several postcards of the tanker for a keepsake and a great F-16 poster for the radio shack.

Next stop was a Coast Guard chopper; naturally, I listen to them, too. I asked about the Guard and what area they covered. The Guardsmen told me Selfridge had three choppers and they covered the area from Saginaw Bay, Michigan, to Rochester, New York.

That's a lot of flying for only three choppers to do. The Guardsmen said that they responded to 600 calls last year — enough to keep six choppers busy covering that distance, in my opinion.

Having just bought an Icom R-72 I had to ask if the crew ever used HF much. He said not very often; once in awhile they used 5 megs, but usually stuck with the UHF frequencies of 381.7 and 381.8 MHz AM mode. When I asked if the 5 meg freq was 5.696 USB, just like Camslant Chesapeake, his reply was yes. I was in hobbyist heaven: fact finding, verifying old information, adding some new information, and having a great day of fun at the same time!

Have you walked through a C-5 transport

Butler photographed this old Thunderbird T-33 trainer and its pilot, Ray Mabry of Minnesota, just prior to the accident that claimed Mabry's life (opposite page).



plane? This giant aircraft opens up in the front and the rear, and they generally allow the public to walk through it, from its massive tail, all the way to its mammoth nose. This thing looks like a giant garage inside. While there, we were treated to "The Plymouth Michigan Patriot Marching Band," which marched right through this aviation beast.

Let the Show Begin

The long walk toward the viewing field reminded us that Selfridge ANGB is a massive hunk of property. When we finally reached the grass we set up our mobile command post. The umbrella was erected, chairs set up, and a blanket spread. I turned on the radio and put on the headphones.

Again, I was treated to many comms, from maintenance to security. Active freqs during the day included 128.7 MHz, which was the "Air Boss," and various others such as 165.0125, 173.5375, 173.4375, 395.9 (Selfridge channel 5), 165.1125, 318.2, 390.0, 173.5875, 173.54, 395.9, 165.1625, and 148.05 MHz. I'll share the Blue Angel frequencies a bit later.

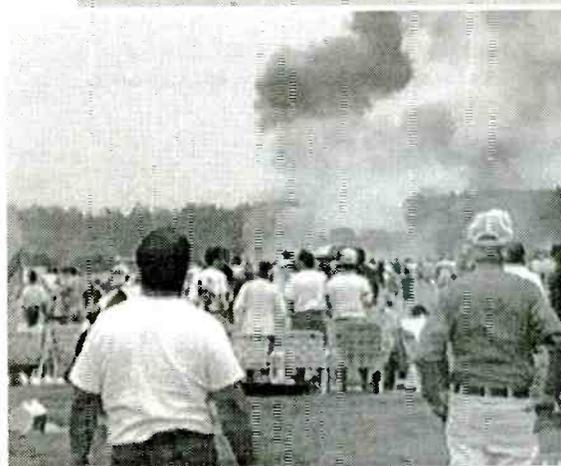
You learn a lot about this hobby by sharing with others. A friend of mine, Mark Raymond, supplied me with a list of the Selfridge push card frequencies. "Push card" freqs are pre-programmed into the radios so that a pilot can simply push the right number and not have to fumble around changing the frequency. Aircraft based at Selfridge have two 20-channel push cards: one UHF and the other VHF, as listed in Table 1 on page 17.

Knowing these frequencies makes it easy to follow a mission. As the pilot says, "Push Uniform 5," I then know to switch to UHF channel 5 and Bingo! I have the refueling mission till the end. They move around the band quite often as they complete various phases of their missions. I know I'll eventually come across a few other push cards from other hobbyists, and be able to follow missions from other bases as they fly over my home.

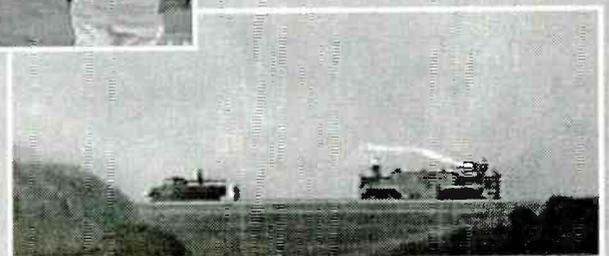
During the course of the day we were treated to fly-bys from a large assortment of aircraft. The F-16's stationed at the base made several passes, as well as a KC-135 tanker. Vintage aircraft were also a treat to watch as they buzzed the runway and performed simulated bombing runs. Explosions were set off on the runway as the planes flew past, to give the effect.

In celebration of the 50th anniversary of the Normandy Invasion, a number of planes — many owned and flown by civilians — took part in the show, including a P-51 Mustang, a P-40, and also a B-17 bomber.

"I thought, what the heck; I'll videotape this last plane and go home. I picked up the camera and panned the craft from the north to the south of the runway. He was getting lower and lower ... Suddenly, a wing touched the runway ..."



The dramatic crash of the T-33 trainer jet is captured on videotape by the author. These still-frame video captures, although quite coarse by normal publication standards, illustrate why Butler's video was shown by television news programs across the country. The first to run the video was channel 7 in Detroit which credited Butler with the shots (above)



The C-5 transport plane is like a flying garage. The Patriot Marching Band (below) marched right through it, side by side.



old ThunderBird jet I had taken a photo of earlier.

I thought, what the heck; I'll videotape this last plane and go home. I picked up the camera and panned the craft from the north to the south of the runway. He was getting lower and lower to the run-

way as he approached the south end and started a victory roll as he passed by.

Suddenly, a wing touched the runway and the plane burst into flames. The shock I felt, as I witnessed through the viewfinder flames and smoke that I knew were not part of the show, is hard to describe. I was stunned, as was everyone else.

I had captured something on video tape that will stay in my mind forever. I've seen that crash a million times in my head just in the one day since it happened.

As I ran closer to the runway and started

taping the fire trucks responding to the crash, I realized most people still thought it was part of the show. The announcer said to "Relax while we figure out what is happening." The crowd obeyed—possibly from the same state of shock in which I found myself. The announcer did a great job keeping the crowd calm and carrying on matter of factly.

Karen had packed the cellular phone that morning, so I called the local ABC station Channel-7 in Detroit. After all, I usually call them when I hear a good story on my scanner at home; why not now?

I told my contact at the station what had occurred, and that I had a video of it. She said she'd dispatch a crew and they would meet me there. I then called The Fire Notification Network of Michigan, with whom I'm a dispatcher and member of the board of directors. I called our 800 number and told the person on duty what I had, and in minutes our pagers were beeping with info on the crash.

The news crew took a while getting to Selfridge, since they were coming a long way and traffic near the base was impossibly congested. I called the reporter in the news truck and talked to her several times. Since I had an older Sony Super Beta Camera, the truck couldn't view it and I couldn't view it either. I didn't even know if the video was any good or not.

The reporter wanted to interview my wife and I, but I was concerned with getting my video to the station. I tried to leave the base to meet her out front, but the lineup to leave the show was horrendous. After I had been in line for 40 minutes, I called the news truck again. She was at the main gate interviewing several others. It would take me another 30 or 40 minutes to drive around and meet her. It was time for plan "B".

I called the station again, and this time offered to drive there and drop off the tape.

A Fiery Finish

The weather was changing back and forth (as it often does in Michigan) from sunny to cloudy and a few drops of rain hit us out in the field. Our "kids" (the dogs) had been left home for about six hours now and since two of them are getting along in their years we decided we had better sneak out early. Doing so would make us miss the Blue Angels—the main reason we came—but it had been a long day.

Karen was packing up when I saw a T-33 trainer coming in from the North. It was the



The infamous F-117A stealth plane was well guarded, but a ladder enabled the public to even see inside the cockpit.

Another 40 minutes or so were expended driving to the station. It was an odd feeling to be in possession of a "Big Story" and not be able to get it to anyone. When I did finally arrive at the station, the first person I met asked for the tape and said "follow me."

My wife and I proceeded to the dubbing room where they had video recorders of every format. We inserted the tape.

"I sure hope the camera worked and I got something," I agonized. The technician answered something to the effect of "The pressure is on you now, buddy; you better come through." Then we both laughed. He was kidding, but the sweat was pouring down my face. I definitely was feeling the pressure and the anticipation.

What we saw both horrified and pleased us. I got a decent copy of the attempted fly by that ended in flames. The news people were happy and made a copy right away so I could

get mine back. We were treated to a quick tour for our efforts,

I say "quick" because these people have very little time to wander around. They are busy answering phones, listening to scanners, planning, dispatching crews and getting ready for the broadcast. I now know what a difficult and demanding job gathering and reporting the news is. It's so much more than "Good Evening. This just came in." It's an extremely fast-paced business; an all-day effort is crammed into 30 minutes and made it look so easy.

Two Seconds of Fame

We rushed home to catch my video on the news, so I could tape my few seconds of fame. At 6 PM the news came on, leading in with my tape of the crash. Then the anchor man described the crash and went live to the reporter

I was supposed to meet. She went into a little more detail, and then they showed my video again; then it was played in slow motion with "Video by Les Butler" below it.

WOW, look at that! my wife said. The news director, Melissa, said it would be fed to the network all over the country and would appear with my name on it whenever a station used it. Then the calls came in, First came a page on my pager from Chicago; they saw it there with my name. My father-in-law paged me next and said he saw it in northern Michigan. The next day friends in San Diego sent me a message on Compuserve saying the local Fox station played it with my name, too. It was seen on all three networks.

I sure wish someone didn't have to die to give me my few seconds of fame. It was hard to enjoy it, thinking of the pilot. At least he died doing something he loved. I guess that was the feeling at the show, too, as it continued some two hours later with the Blue Angels dedicating their performance to his memory.

Blue Angels

A friend of mine, Jim Brooker, stayed at the show and confirmed the active Blue Angel frequencies for me. They were:

- 275.35 Diamond formation
- 251.6 The two soloists
- 391.9 Pre-flight ops

These were all we heard, but they were very active during the show. Jim said that "Fat Albert" opened the show for the Angels.

Fat Albert is an air transport used to shuttle the support crew of the Blue Angels around the country. Its demonstration shows off a JATO maneuver: Jet Assisted Take Off. Eight solid rocket boosters are mounted to the fuselage and lit after the plane reaches 140 mph. The plane then climbs at a 45 degree angle and it's up in no time. JATO is normally used in the field when the plane is heavily loaded or for taking off on unimproved or short runways. It only needs 1500 feet to take off fully loaded with cargo.

To finish off the scanner extravaganza weekend, around 6pm on Sunday I fired up my two 2006's and the R-7000 and started searching for returning flights. To my amazement, I heard Stealth 1 on 307.8 Cleveland Center heading 210 degrees at flight level 25; then he switched to 277.4 and asked for clearance direct to Appleton. Then I heard Blue Angel 01 calling in.

What a way to cap off a scanning weekend! Whoever said that radio was dead and TV was the great entertainer? He or she must not have a scanner.

TABLE 1

Selfridge "Push Card" Frequencies

UHF (Heard as Push Uniform 1,2,3, etc. on the radio)

Push 1	92.000	127th Tactical Fighter Wing Ops. (Call of Demon)
Push 3	275.800	Ground Control (VHF-3)
Push 4	340.700	Tower (VHF-4)
Push 5	395.900	App/Dep (VHF-5)
Push 6	270.100	ATIS (VHF-6)
Push 7	307.800	Cleveland Center (Saginaw Low Altitude Node)
Push 8	385.450	
Push 9	385.700	
Push 10	363.800	
Push 11	314.200	927th Tactical Air Group Ops
Push 12	391.900	Precision Radar Approach
Push 13	290.900	
Push 14	259.300	
Push 15	366.200	
Push 16	293.100	
Push 17	314.400	
Push 18	336.400	
Push 19	342.500	PMSV & NOTAMS
Push 20	372.200	Pilot to Dispatch

VHF (Heard as Push Victor 1,2,3 etc.. on the radio)

Push 1	43.25	
Push 2	119.00	Clearance Delivery UHF-2
Push 3	128.300	Ground Control UHF-3
Push 4	120.15	Tower UHF-4
Push 5	119.600	Approach/Departure UHF-5
Push 6	125.325	ATIS
Push 7	132.25	Cleveland Center (Algonac Low Altitude Node)
Push 8	133.850	
Push 9	40.450	
Push 10	134.100	
Push 11	119.600	
Push 12	124.700	Windsor Ontario (Canada) Tower
Push 13	125.15	Detroit Metro Approach
Push 14	118.400	Detroit Metro Tower (East Runway)
Push 15	40.65	
Push 16	139.85	
Push 17	40.85	
Push 18	41.05	
Push 19	41.25	
Push 20	4 1.45	

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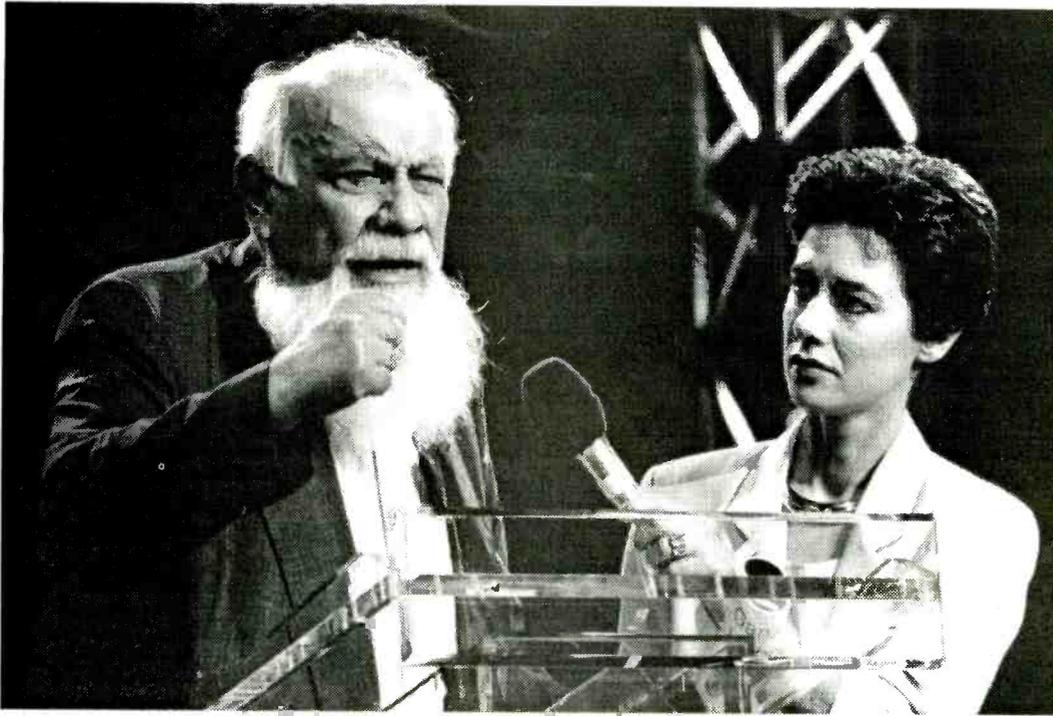
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Lew Kopelew, Russian writer and critic of the Soviet regime, who was expelled from the country in 1981 and has been resident in Germany ever since, being interviewed by Deutsche Welle journalist Sabiner Sauer.

Deutsche Welle

*Reporting the news as it is —
for better or worse*

by **Dean B. Mahin**

Deutsche Welle, Germany's international broadcasting service, recently celebrated its 40th anniversary. It began in 1953 with broadcasts only in German, using a 20 kW transmitter. In the first broadcast Federal President Dr. Theodore Heuss said Deutsche Welle would be "the voice of the father and motherland" for people of German heritage abroad. The station's signature tune was from Beethoven's opera *Fidelio* — "Es sucht der Bruder seine Brueder" (A brother seeks his brethren). Broadcasting in other languages began a year later in 1954. Forty years later Deutsche Welle is one of the five largest international broadcasters — along with the BBC, VOA, Radio Moscow, and Radio Peking.

DW's German language program has continued to have a high priority. It is the only DW service that is broadcast continuously worldwide around the clock. The target audience is German tourists and businessmen abroad, German emigrants in other countries, and German-speaking foreigners.

DW's other major objective is to be the "Voice of Germany to the World," providing accurate information about Germany to the

people of other countries. The founders insisted that DW broadcasts should not resemble in any way the Nazi propaganda broadcasts of the 1930s and 1940s. Although Deutsche Welle is funded directly by the German government, DW officials stress their independence from the government and their commitment to provide complete and unbiased coverage of developments in Germany.

Deutsche Welle's independence is guarded

by a 17-member Broadcasting Council. Although it includes representatives of the legislative and executive branches of the German government, most members are from the private sector. A number of Council members are designated by German religious, employer, labor, and sports federations. Others are appointed by the Federal President to represent German culture and science.

Facing Up to Change

Director General Dieter Weirich said recently that DW "aims to the best of its ability to convey to the world a picture of Germany that is objective, up-to-date, and independent." In the past several years conveying an accurate and objective picture of developments in Germany has been a challenging task.

The reunification of east and west Germany on October 3, 1990, increased Germany's size and influence and greatly expanded interest in German developments among overseas listeners. But the joy in 1990 at the end of 40 years of division soon gave way to a realistic and sober assessment of the many problems in the five new eastern German states. These included inadequate infrastructure, severe environmental pollution, industries unable to compete in western markets, high unemployment, and the need to retrain workers and public employees for effective participation in a democratic and capitalistic system.

DW has provided full coverage of the difficult and costly process of reintegrating the eastern brethren into German society. The

DW news programs give an unbiased picture of current economic problems in both eastern and western Germany and of the political problems of the current German government.

The recent violence against foreigners by neo-Nazi elements in Germany has undermined the reputation Germany struggled so hard to regain after the Second World War. The intolerance toward all foreigners fostered by the neo-Nazis thoroughly shocked the 2,000-person Deutsche Welle staff which is drawn from 65 countries; four-fifths of the members of the editorial staff are from other countries. DW officials point out that the success of this international staff in working together — despite different mentalities, working habits, and languages — demonstrates the advantages of a multi-cultural society.

“It is particularly annoying for the Deutsche Welle staff,” the head of the English Service, Dieter Brauer, wrote recently, “to watch the damage done by right-wing radicals in Germany to the idea of a multi-cultural society in which differences are seen as a gain rather than a disadvantage for the indigenous population. We often feel ashamed in our reporting that a relatively small group of neo-Nazis are able to tarnish the image of

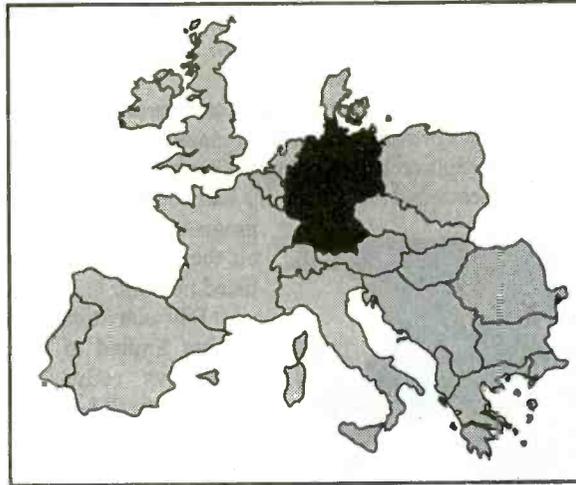
Germany in such a despicable fashion. But we have to report news as it is — for better or worse.”

The DW staff was not willing merely to provide unbiased reporting of unwelcome developments. After several violent attacks on Turkish and other foreign residents in Germany, the entire DW staff agreed at a mass meeting to take a positive stand against intolerance toward foreigners. The DW news programs gave very detailed coverage to the reactions of the majority of Germans who strongly opposed the violence against for-

eigners, including a number of demonstrations and rallies by those abhorring the neo-Nazi violence. A series of *Living in Germany* programs broadcast in November 1993 pointed out that foreign workers play essential roles in German industry and contribute about 8% of Germany’s gross national product, roughly 200 billion marks annually.

The Voice of Europe

DW covers German developments within a program structure providing some of the best coverage on western and eastern Europe on worldband radio. DW’s English Service, the only service other than the German service that is broadcast worldwide, produces fifteen 50-minute program blocks daily for broadcast to North America, Europe, Africa, and the



Germany’s strategic location makes it a natural melting pot of nations. Four-fifths of the DW staff are from other countries, and they like the multi-cultural society modeled by their station.



Asia-Pacific region. On weekdays the core of the block broadcast to North America, following an eight-minute new summary, is DW's excellent *European Journal*. The *Journal* includes reporting, interviews, and commentary from free-lance correspondents, a summary of editorial comments by major European newspapers, and a review of economic news.

European Journal is arguably the best source of news and analysis on developments and problems in both western and eastern Europe available by radio to listeners in North America. (BBC tends to give priority to developments in Britain and the Commonwealth countries, with less attention to Europe.) Excellent coverage of European affairs is also available in English from Netherlands Radio and Swiss Radio International (orwas, before their recent cutbacks in shortwave broadcasting). Special DW features for weekend listeners in North America include *Through German Eyes* (an interview with a prominent German journalist, official, or politician), *Living in Germany*, and *German by Radio*.

A Worldwide Audience

In addition to the programs in German and English broadcast worldwide, DW provides other regional programs for Africa, Asia, Iberia and Latin America, the Near and Middle East, and Europe.

Each regional program includes broadcasts in several languages. The European program broadcasts to western and eastern Europe in 20 languages. Director General Weirich says the largest concentration of DW listeners is in central, eastern, and southeastern Europe. DW built a good reputation in this region during the Cold War decades when international radio was the only reliable source of news in these countries.

Deutsche Welle broadcasts 89 hours per day in 40 languages using 41 transmitters with a combined output of 7,300 kW. Programs are beamed directly abroad from 25 transmitters in four locations in Germany, including 12 with outputs of 500 kW or higher. DW programs are rebroadcast by five DW relay stations — at Kigali in Rwanda,

Trincomalee in Sri Lanka, Sines in Portugal, Cyclops in Malta, and Antigua in the Caribbean — and by stations in Russia, Canada, Brazil, Antilles, and the Caribbean under rental or program exchange agreements. (The DW relay station in Malta was described by Charles Sorrell in *MT's* May 1993 issue.) The DW signal to Asia is considerably strengthened by relays from three transmitters in Russia which were formerly used by the Soviet government to jam DW broadcasts!

This extensive pattern of transmitters and relays provides listeners in many areas with multiple reception options. Evening listeners in eastern North America can receive DW programs in English on the frequencies listed in Table 1.

DW activities are not limited to shortwave radio broadcasting. It has produced television programs since 1965. At present 35,000 tapes of TV programs annually are produced by DW and distributed annually in 120 countries of the Third World by DW's sister organi-

zation, TransTel.

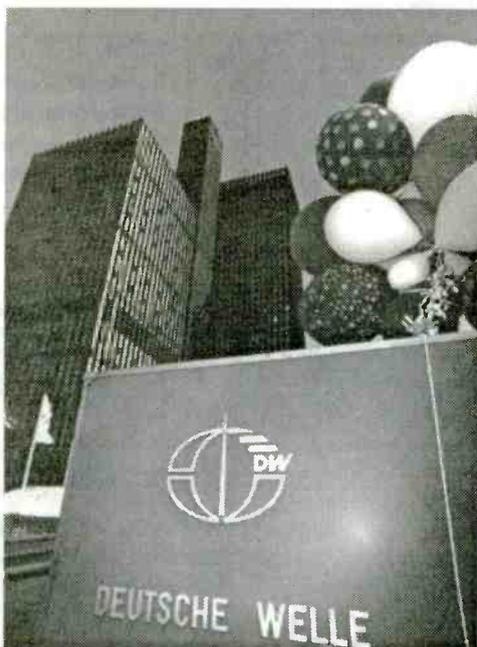
Since April 1992 Deutsche Welle has operated a satellite broadcasting service. It began with broadcasts to Europe via the EUTELSAT II-F1 satellite. Since late 1992 DW has broadcast to North, Central, and South America via the INTELSAT K and SATCOM C-4 satellites. The radio and TV programs in German, English, and Spanish are designed for reception by TV and radio stations, operators of cable networks, hotel networks, and private households equipped to receive broadcasts directly from satellites.

In 1993 DW received over 500,000 letters from listeners, up 10% from 1992. Weirich attributes the record mail to increased international interest in the reunited Germany and improved reception of DW broadcasts. If you would like to send reception reports or write to Deutsche Welle for program listings, language program information, etc. the very simple address is: Deutsche Welle, 50588 Cologne, Germany.

TABLE 1

DW Frequencies for North American listeners

0100-0150	6040	Antigua	9700	Germany
	6085	Malta, Grmy	11740	Portugal
	6145	Germany	11865	Malta
0300-0350	6085	Canada	9640	Germany
	6185	Germany	11750	Malta
	9535	Portugal		
0500-0550	5960	Germany	9670	Antigua
	9515	Germany	11705	Germany



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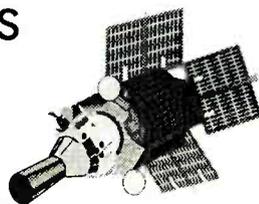
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Satellite



Communications

by Jack Sullivan

Few areas of radio monitoring offer the drama and mystery that can be found by listening to military satellite communications, called SATCOM, for short. Parked in fixed positions roughly 22,360 miles above the equator, these powerful repeater stations relay high level U.S. Government communications over the United States and most of the rest of the world.

While the reception of satellite radio signals may sound difficult or expensive, this article will show how any monitoring station can plug into the excitement to be found in this mode with only an ordinary scanner and some basic information.

Geostationary (or geosynchronous) communications satellites were first conceived in the 1950s by the famous science fiction author and futurist Arthur C. Clarke. Launched into orbit by powerful rockets, satellites positioned above the equator at the right altitude circle the planet at the same apparent rate as the Earth underneath them spins on its axis. The net effect is to make the satellite appear motionless over a fixed point of longitude on the equator.

Ground stations, ships or aircraft can use these satellites as repeaters to relay relatively low power signals pointed at the satellite to other stations which may be thousands of miles away. From their great height these satellites transmit signals that can be heard almost everywhere if one has the right equipment and knows where to listen. Just like repeaters on the ground, the listener can hear both sides of the retransmitted communications.

The primary communications satellites discussed in this article are the military "birds" which carry FLTSATCOM (Fleet Satellite Communications) and AFSATCOM (Air Force Satellite Communications). These systems operate primarily in the 225-400 MHz military UHF radio band in FM mode.

Satellite relay stations are equipped with numerous specialized repeaters known as transponders, each with its own discrete output frequency. The satellites are positioned at strategic points around the world in order to provide the overlapping communications coverage for the many government agencies that use them. Table 1 provides data on some of the

transponder output channel frequencies for the "CONUS" satellite which covers the continental United States. Frequency data and additional information on other satellites can be found in references listed in the Bibliography.

Innumerable Uses and Users

Who uses these satellites and what types of communications can be heard? The military services are the major users but any government agency or contractor can be heard on these channels.

I became personally familiar with this communications system in late 1986 with the non-

ported hearing these communications loud and clear on a Radio Shack PRO-2005 scanner using its whip antenna in his living room on a mountain in New Jersey! (While possible, this kind of reception is not common.)

Many exotic communications are heard routinely on SATCOM. The majority of the communications are digitally scrambled and consist of "noise." (Please note that it is illegal to intentionally monitor any encrypted radio communications. However, it is impossible to tune the Satcom channels without encountering just this type of transmission.)

Communications that have been heard "in the clear" include Air Force One, Cousteau's research ship *Calypso*, the POW/MIA recovery effort in Southeast Asia, FEMA, and many military stations using tactical callsigns like NORAD's BLUE CRAB and DARKSTAR NOVEMBER as they establish initial communications and then set up secure (scrambled) communications, known as GREEN.

Clear or unscrambled communications are conversely known as RED. Even the most secure communications can be occasionally heard "in the RED" due to problems with secure equipment or through inexperienced radio operators. There are also a number of non-military satellites carrying unscrambled telephone calls. Keep a tape recorder ready! For a sampling of communications logged recently by the author, see the box on page 24.

TABLE 1

Selected CONUS Satellite Frequencies Featuring Voice Communications

262.05	262.075	262.10
262.125	262.15	262.175
262.20	262.225	262.25
262.30	262.325	262.35
262.375	262.40	262.425
262.45	262.475	262.50
262.525	262.55	

stop, round-the-world flight of the aircraft *Voyager*. A friend had alerted me to its use of the transponder outputting on 262.55 MHz and, sure enough, I was able to enjoy hours of communications between the aircraft and their home base, using nothing more elaborate than a Regency MX-series scanner, RG-8 coaxial feedline and an inefficient discone antenna.

More recently, I had a front row seat at the military relief effort that followed Hurricane Andrew in South Florida. Portable SATCOM radio transceivers were very widely used along with HF for primary communications during this operation. A number of channels were active for many days, including 262.05, 262.10, and 262.15 MHz. While I had upgraded to an ICOM R-7000 receiver, low loss feedline and a CREATE log periodic beam, a friend re-

A Satcom Monitoring Post

The obvious basic equipment required to receive these signals is a sensitive frequency synthesized programmable receiver that covers the 225-400 MHz UHF military band in narrowband FM mode. Most wide coverage receivers, such as the Radio Shack PRO-2000 series and the ICOM R-7000/7100, fill this bill.

Receiving antennas are another story, however. Because of their distant location, satellite signals are relatively weak and an extra effort is needed in order to receive them with usable quality. Good quality signals can be picked up using conventional vertically polarized wideband omnidirectional antennas such as the discone or a ground plane that is cut for the frequency of the satellite transponder frequency that you wish to monitor. Low loss 50 ohm

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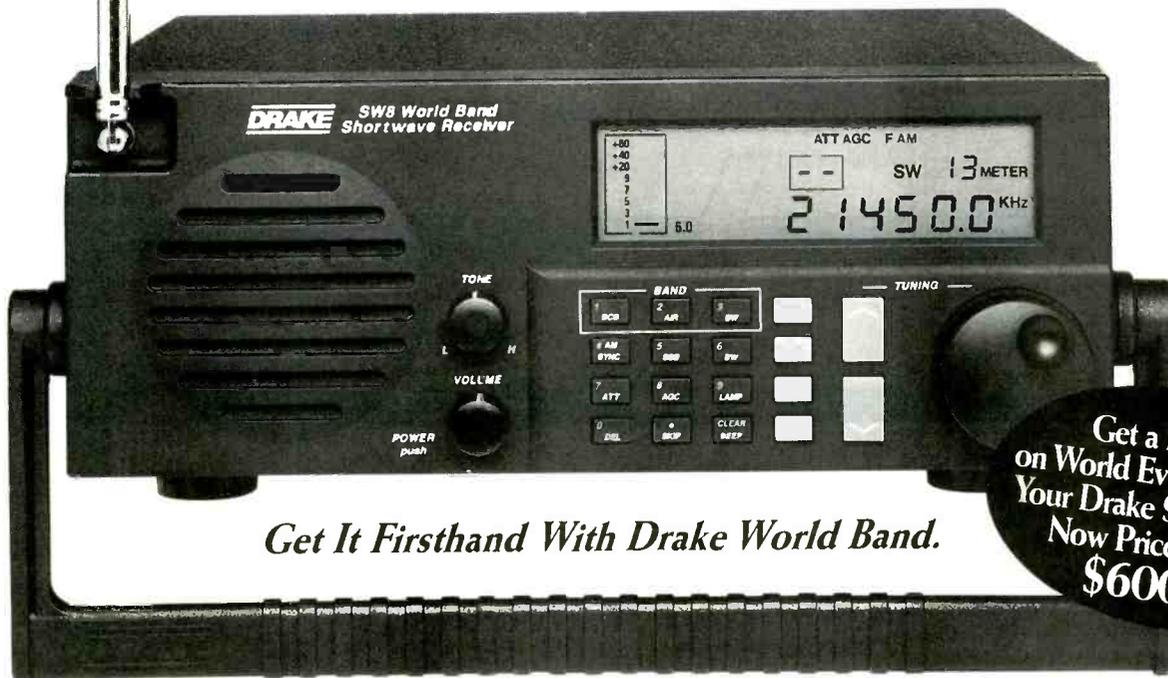
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impedance feedline such as Belden 9913 or coaxial "hardline" is very helpful in minimizing the signal loss caused by less expensive cables at these frequencies.

The stationary nature of these satellites enables the use of a directional antenna in order to get the most out of the received signal. Log periodic designs like the Grove ScannerBeam and the CREATE log periodic dipole array let you point a "beam" at the fixed satellite to achieve a double or quadruple (3-6 dB) improvement in received signal strength. However, the customary installation of these directional antennas is usually to point them at the horizon. As I found later on, Satcom signals are found to be strongest considerably above the horizon.

The use of preamplifiers is another option. Produced by Grove Enterprises, Hamtronics, and many others, these devices boost the strength of the received signal dramatically. For best results, the preamplifier should be remotely mounted near the antenna in order to minimize feedline losses.

The major problem with preamplifiers is their tendency to boost not only the desired signal but also spurious and extraneous signals generated by other sources. In my own case, with several major communications towers less than half a mile from my house, intermodulation and related forms of interference are already a nuisance without inviting extra interference problems! If you live in a relatively undeveloped area, however, a preamplifier might be exactly what you need.

These antenna and preamplifier options, however, are only compromises. You have another option to boost the signal level: a directional antenna specifically designed to receive Satcom transmissions. Antennas of this type are not commercially available at a price that would put them within the reach of the average monitoring hobbyist. While they can be occasionally found at Hamfests, the best way to

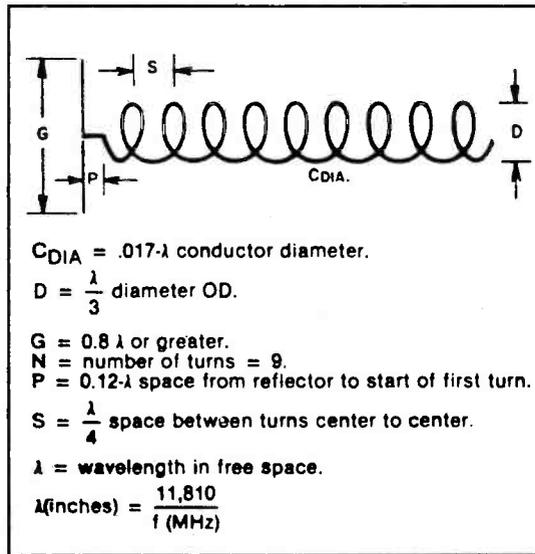


FIGURE 1: Design equations for circularly polarized antennas (courtesy of American Radio Relay League).

obtain one of these antennas is to build your own. Simple in design, the antenna described in this article can be built inexpensively by almost anyone using common tools and materials.

The FLTSATCOMs use antennas with right hand circular polarization (RHCP). This circular polarization mode is used for spacecraft because the earthbound sense of horizontal and vertical has no real meaning in space. The use of circular polarization allows for the use of directional gain antennas without any concern over losses due to polarization incompatibilities. (The ideal receiving station also has to have the complementary circular reception capability.)

There are several alternate ways to receive RHCP signals, including crossed Yagis, or two Yagis mounted on the same support but oriented 90 degrees to each other and fed 90 degrees out of phase. After studying the differ-

ent possibilities, I decided to build the helical antenna described below as the simplest and least expensive solution.

Building a Circularly Polarized Antenna

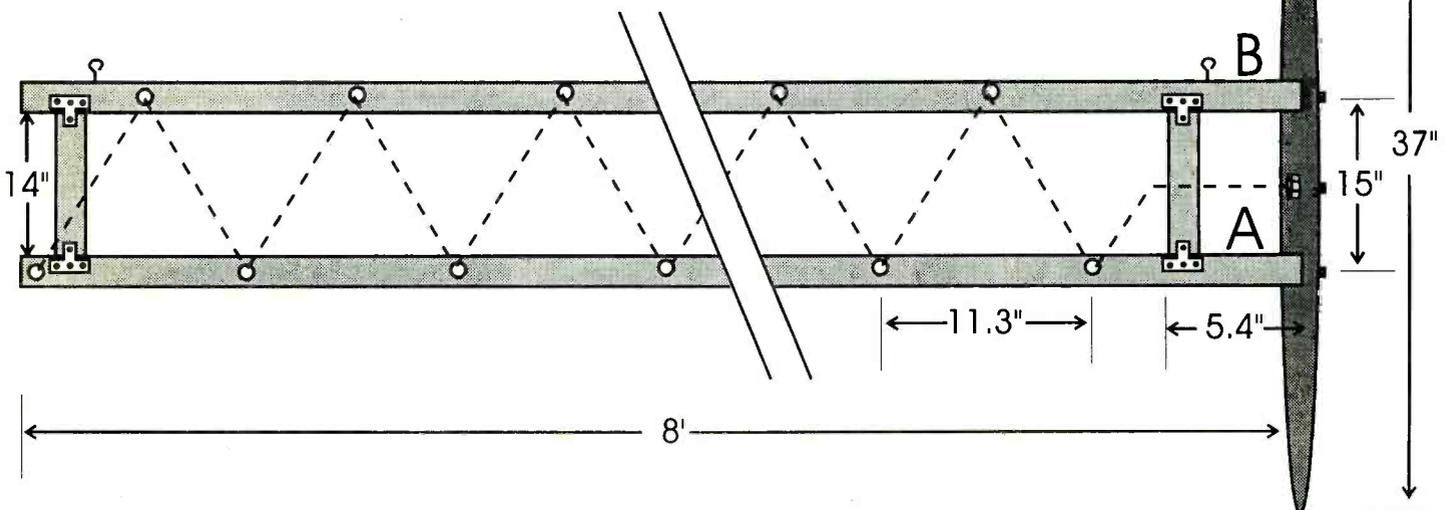
Helical antennas utilize a radiating element in the form of a right hand helix. The design theory is straightforward (Figure 1). The helix is called right hand because the radiator curves in the direction the fingers of your right hand curve when your thumb is extended straight up in the direction of the distant satellite.

Each turn of the helix is one wavelength long at the center frequency of the range over which the antenna will operate. In the case of military satellites, this is about 262 MHz, or 45 inches. The diameter (D) of the helix is a third of a wavelength, or 15 inches.

The spacing between each turn of the helix, known as the pitch or S, is a quarter wavelength, or 11.3 inches. The diameter of the reflector element, G, is 0.8 wavelength minimum, or 37 inches. All other design values were either calculated from the formulas shown in Figure 1 or resulted from other design parameters during construction.

One compromise I made was on the diameter of the conductor to be used for the radiating element (C/dia). The design equation calls for 0.77 inch but I wanted to evaluate the performance of an antenna using readily available RG-8/U coaxial cable (0.44 inch diameter). This seemed a pretty safe bet because there are other published designs where much thinner material was used as the radiator (see references in the Bibliography). I also chose a fairly rigid coax because of the difficulty of establishing and maintaining the shape of the helix spiral with smaller cable or wire.

FIGURE 2: General construction plan for RFCP Antenna (not to scale)





Components of the RHCP SATCOM antenna, shown along with the tools necessary for assembly.

Once I had settled on the basic design of the electrical parts of the antenna, I started working on how to construct it using common materials and components. The basic problem was how to build a lightweight but rigid frame that would allow me to support and hold a number of turns of coax in a helical configuration.

After a quick trip through the local home supply store, I came up with two 8-foot lengths of hardwood 1/8 inch x 1/8 inch molding at \$8

TABLE 3	
Hole locations	
A	B
11.1	16.7
22.4	28.0
33.7	39.3
45.0	50.6
56.3	61.9
67.6	73.2
78.9	84.5
90.2	95.8

each. These would accommodate an 8-turn helical antenna and would form the basis for my mechanical design (Figure 2). The two pieces of wood would be used to construct an open frame using three cross braces, standard cabinet hardware braces and wood screws. The coax would be formed into the helix by running it through properly spaced 1/2-inch holes drilled through the 8-foot wood pieces. The final helix would then be held in place in the frame with 2-inch wood screws.

I chose a solid reflector for ease of fabrica-

tion and assembly of the antenna. I had a local sheet metal shop cut a 37" disc of the type of light gauge steel that is used in home forced air heating systems. At the center is a 0.62 inch diameter hole for a chassis mount type N coaxial connector (available from Radio Shack). There are also two smaller (0.15 inch) holes at 7.5 inches on each side of the center of the reflector for attaching it to the wood pieces with standard 2-inch wood bolts.

The layout of the cross braces that I used calls for one set a few inches short of the far end (away from the reflector), one set near the reflector end, and another about midway between the end and the reflector. Each cross brace is 14 inches long. The first brace is placed so that its top is 5.4 inches above the reflector.

The 5.4 inch measurement is derived from the value for P in Figure 1, which is the distance from the reflector to the beginning of the first turn of the spiral. The coax extends vertically from its connection to the center pin of the N connector through the 1/2 inch hole in the first cross brace. This arrangement keeps the distance P fixed. From there the coax bends sharply to the left in order to reach the first guide hole. See Table 3 for the spacing of the holes.

Label the 8-foot lengths of molding A and B and measure the locations of the holes from Table 3. Drill the holes using an electric drill and 1/2-inch wood bit. (Note that the holes are canted at about a 13 degree angle in order to help form the smooth curve of the helix. This angle is fixed by measuring the exit hole 1/4 inch higher than the entry hole.)

Assemble A and B into the frame with the cross braces, cabinet braces and wood screws as in Figure 2. Install two eyelet screws, one near the far end and one near the reflector end.

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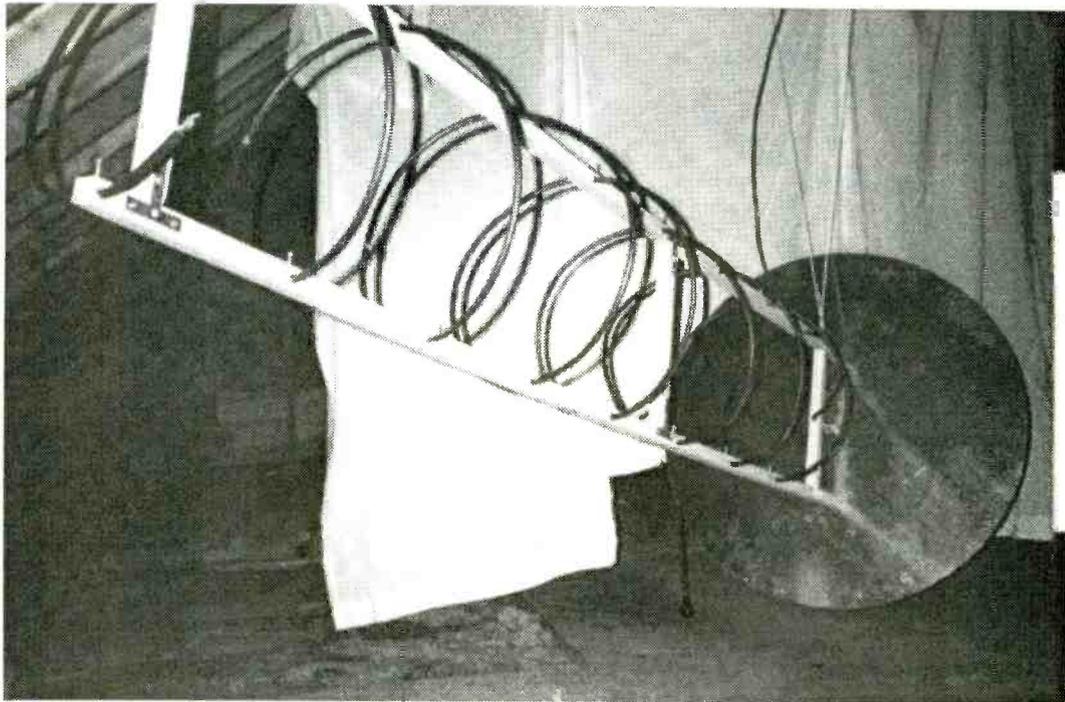
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The RG-8 radiator is installed next. I found it easiest to start with a slightly longer length of cable (31 feet) than what is actually required to equal eight wavelengths plus the 5.4 inch spacer P. I measured the 5.4 inches, then each 45 inch wavelength, and put a single loop of electrical tape at each as a reference.

Starting with the 5.4 inch length through the first brace near the bottom of the antenna, wind the cable counterclockwise through the bottom hole in A, then B, and so on to the top. At each hole place a 2-inch wood screw just short of touching the cable. Starting at the bottom of the antenna, form the cable into as smooth a circular curve as possible and then measure to ensure that it extends exactly 7.5 inches on each side of the frame. As each turn of the helix takes shape, tighten the wood screws until they just nick the plastic covering and hold the cable in place.



Above, the completed RHCP SATCOM antenna finished and in its place in author's attic.

Examine the helix critically by eye, looking down from the top toward the reflector. As a final check, measure the distance between the coax in adjacent turns of the helix. This should be a constant 11.3 inches. The rigid nature of the coax makes it nearly ideal for forming into the helical form but it still takes a fair amount of bending, twisting and adjusting to develop the final smooth and symmetrical form.

After installing the radiator, cut back about 9 inches from the length left over at the end of the helix to the piece of electrical tape marking the eighth wavelength plus the 5.4 inches. Cut off about 1 inch of the black plastic outer insulating jacket and peel back the copper braid. Twist the braid into a pigtail. Tin this with a soldering iron or gun. Remove about 1/2 inch of the plastic dielectric and tin the center conduc-

tor. Now solder the pigtail and the center conductor together. This makes both the shield and the center conductor electrically continuous, giving better efficiency to the antenna.

It is now time to screw the reflector disc to the wooden frame-cable assembly with 2-inch bolts. I found it helps to drill small pilot holes in the center of the two wood pieces. A nut driver also simplifies installing the wood bolts.

The final step is to solder the center conductor of the coax to the center pin of the N connector. Remove about 1/2 inch of black outer plastic, copper shielding and plastic dielectric from the bottom end of the RG-8. Tin this and then solder to the center pin of the connector.

The characteristic impedance of a helical antenna is approximately 140 ohms. In order to match this to a 50 ohm coaxial feedline, an 84-

ohm matching section is required. This can be made from 7.5 inches of a 75-ohm cable such as RG-59. (Anyone interested in the theory and equations involved can refer to the ARRL references in the Bibliography.) I took a slightly shorter length of RG-59/U and with a male N connector installed on one end and a female N connector on the other. The final pin-to-pin length is 7.5 inches. Solder-type connectors were used.

The matching section is connected directly to an ICOM R-7000 via 35 feet of Belden 9913 equipped with male N connectors. A lesser quality of coaxial cable can

be used, but the added losses will only subtract from the gain derived from the RHCP antenna. In order to ensure maximum overall performance, my cable assemblies were purchased professionally assembled from Nema Electronics in North Miami, FL.

The total cost to build this antenna can probably be kept to \$50 or less depending on your level of skill and the availability of materials and components. My total, including professionally cut sheet metal and the cable assemblies, came to about \$160.

Using the RHCP Antenna

The RHCP antenna built for this article was intended both for my own use in monitoring satcoms and as a prototype for this and future RHCP antenna projects. I have a generous attic space above my listening post and designed the antenna for fixed installation there. The entire assembly is held in place by nylon cord fastened to the antenna eyelets and run through eyelet screws attached to the ceiling beam. The free ends of the nylon cords are tied off, but can easily be loosened in order to move the antenna. In fact, I assembled the antenna with the wooden frame suspended in this way. I found that it greatly simplifies the job of forming and maintaining the helix.

An alternative mounting scheme could be to use an extra wooden brace at the antenna's center of gravity. The antenna could then be mounted on a photographer's tripod. The antenna can, of course, be used outdoors. The wooden parts should be coated with waterproofing urethane varnish prior to final assembly.

Initial setup of the Satcom antenna involves pointing it in the direction of the satellite of

TABLE 4

Design parameters for RHCP GOES and INMARSAT antennas

	GOES (1.691 GHz)	INMARSAT (1.537 GHz)
Wavelength	6.98	7.68
C/dia	0.12	0.13
D	2.33	2.56
G	5.6	6.14
P	0.84	0.92
S	1.75	1.92

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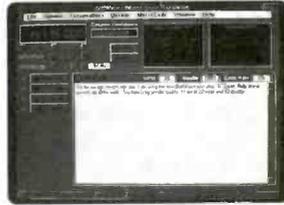
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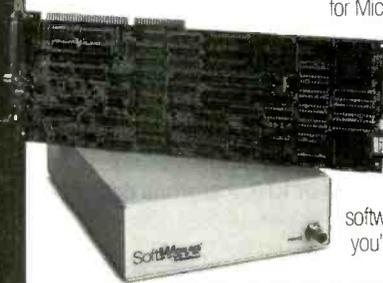


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262.075 -- TIGER SEVEN working BACKSTEP and DIAMOND-BACK.

266.9375, 269.95, 268.45 -- Foreign language telephone calls.

265.55 -- CENTRAL working SAN JOSE (FEMA?)

262.30 -- Aircraft EIGHT WHISKEY working ground station ONE HOTEL reference "Windsor Personnel."

250.65 -- Fleet Broadcast channel repeating WMMK, a commercial FM broadcast station in Washington, DC, followed by test tones.

interest. I am primarily interested in the "CONUS" (Continental United States) bird parked at 100 degrees West longitude. A glance at a world map showed that this would be southwest from my location. The eyelets were installed in the ceiling beams to give the antenna a southwest direction.

For my setup I used an ICOM R-7000 located near the antenna with the meter set for measuring S-units. The receiver was tuned to the Fleet Broadcast channel of 250.65 MHz, which transmits a wideband digital signal almost continuously. With the antenna raised just slightly above the horizontal, the signal strength on the S-meter was about S1, which was about a 6 dB improvement over the same signal received with a discone. Elevating the antenna to about a 25 degree angle increased the signal to S2, another 6 dB improvement. (The completed antenna fixed in this position is shown in the photograph.)

If you do not have access to a receiver with an S-meter, the Van Horn reference in the Bibliography gives the equations for determining the correct bearing and elevation angles for your specific location.

Day-to-day performance with my RHCP Satcom antenna is excellent. Once noisy signals are now "full quieting." There have been no problems with interference from nearby transmitters. As a bonus, the antenna also works well as a fairly broadband antenna for receiving not only the 225-400 MHz military aircraft band, but all of the standard VHF/UHF communications bands as well.

An 8-turn helical antenna has a theoretical gain of about 14 dB. While I have not yet been able to do a thorough study to optimize my antenna's performance, I am satisfied that I have achieved at least a 12 dB gain (2 S-unit) improvement. I have also satisfied myself that this particular design is not critical with respect

to the effect of measurements and workmanship on performance. Besides the compromise with the use of a thinner cable than required by the design equations, the effect of imperfections in the final shape of the helix was another concern I had - also unfounded.

Building an RHCP antenna for SATCOM was an enjoyable and educational experience. There is a tremendous amount of room for experimentation with different design and

construction options. For instance, it is not necessary to use a totally solid metal reflector, as I did. Metal screening can be used instead with no difference in performance. There are also many ways in which this basic antenna type can be physically constructed, especially with regard to mounting outdoors.

There are also other satellite systems for which this type of antenna can be used for improved reception. One interesting project would be to build a single RHCP antenna for receiving both 1.5 GHz INMARSAT communications (see *MT*, February and March, 1994) and GOES weather facsimile transmissions at 1.69 GHz (See the Taggart book noted in the Bibliography). RHCP antennas are rather broadbanded and a single antenna should work quite well on both systems.

Table 4 will suggest some construction parameters. Keep in mind that the INMARSAT and GOES satellites are parked at different locations over the equator and repositioning of the antenna would be necessary when switching reception from one to the other. Also, it may be necessary to use different low-noise amplifiers for receiving these microwave transmissions, which tend to be narrowbanded and suitable for only one system.

The much smaller wavelength of these high frequencies provides an opportunity to use very directional and very high gain RHCP antennas. The 8-foot length used in my 8-turn 262 MHz design, for example, would allow up to 54 turns at 1.5 GHz, with significantly greater gain! I believe it is feasible to attain the 20+ dB gain required to receive microwave satellites with this design. Such long RHCP antennas have been used for spacecraft telemetry, and could be interesting alternatives to using an expensive parabolic dish.

The RHCP design is easy to construct and relatively inexpensive. Give it a try and, most importantly, have fun!

Bibliography and Suggestions for Further Reading

Satellite Times, Grove Enterprises' new bimonthly publication which begins with the 1994 Sept/Oct issue. Call Grove Enterprises for a sample issue if you are not on their mailing list.

Weather Satellite Handbook, 3rd Edition, by Dr. Ralph E. Taggart. Excellent introduction to satellite communications fundamentals and monitoring weather facsimile satellites. Available from Grove Enterprises.

Directory of North American Military Aviation Communications (HF/VHF/UHF) - Second Edition. Gives all military communications transponder frequencies, satellite locations and more. Available from Grove Enterprises.

Communications Satellites - Third Edition, by Larry Van Horne. Now out of print, this thorough reference on all types of satellite monitoring will soon be replaced by a new Fourth Edition to be available from Grove Enterprises. Includes equations for calculating the exact point to aim your RHCP antenna for best reception of geosynchronous Satcoms.

"Microwave Monitoring - Build An INMARSAT System," by John Wilson. *MT*, February and March, 1994. How to tune into microwave communications satellites using dish antennas.

ARRL Antenna Handbook, American Radio Relay League, Newington, CT. See Chapter 12 (Antennas for Space Communications).

ARRL Handbook, American Radio Relay League, Newington, CT. This reference gives all of the theory behind impedance matching, feedlines, as well as information on construction techniques such as assembling coaxial connectors.

"Space Communications," in the *RCMA Journal*, P.O. Box 542, Silverado, CA 92676. This occasional monthly column features reports of satellite communications reception submitted by RCMA members. See the April 1993 column for a discussion of RHCP antenna design.

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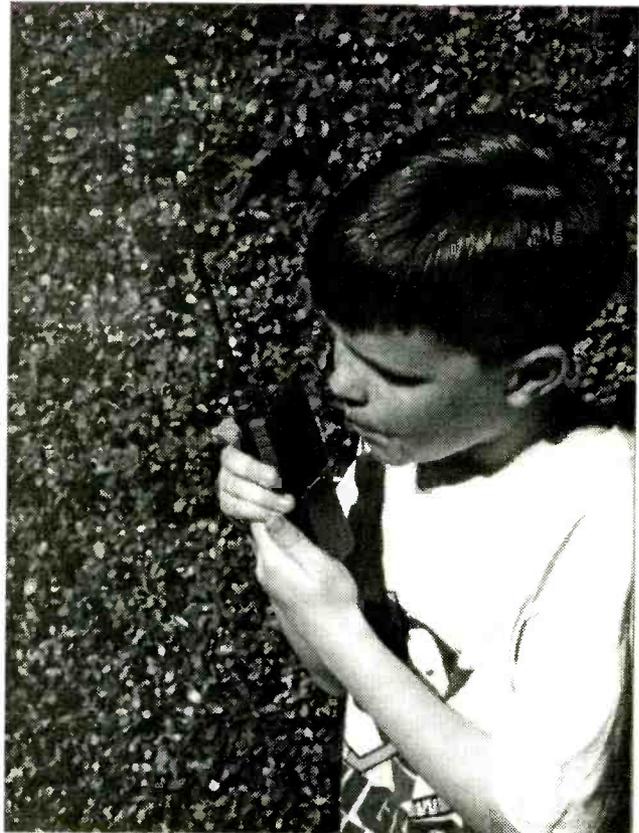
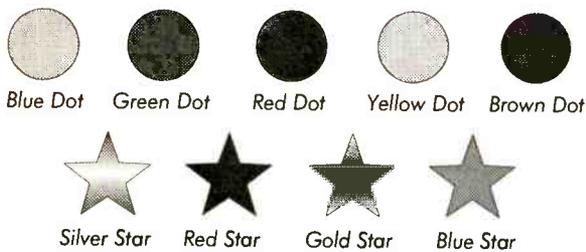
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An innocent youngster breaks the law! Received as a birthday present, this radio is on a "Red Dot" frequency and was never licensed!

Radios Show Their True Colors ...

by Larry Blass

When two-way radio was first introduced, there were only three major manufacturers offering equipment to police, fire departments and other critical agencies who needed communications and would pay any price to get it. To assist these agencies, companies chose specialized electronic "shops" to install, service and maintain their products. They were very particular as to who represented them to these agencies.

As technology changed, Japan and Korea become major players in the two-way radio industry. The original manufacturers were forced to rethink their business plan and market their radios to their customers differently.

The original "low price" of \$1800 for an industrial grade, crystal controlled, handheld portable (and even higher for a mobile unit), fell drastically, creating new marketing targets who never could afford radio in the past. Manufacturers needed to take advantage of this growing customer base, selling in volume to maintain profitability with the lower prices.

Portable radios began to appear on the shelves of retailing outlets. Everything went well, at first. A customer (radio user) would come in, purchase a pair (or more) of business band walkie-talkies (now for less than \$200

each!), present a credit card, and leave. These units made his operation so efficient, he could never figure how he had operated without them!

But wait. A radio was dropped. Or stolen. Or lost. Or run over ... whatever. What did he do? That's right! Go back and buy a replacement, charge the battery, and give it to one of his workers.

It didn't work.

This one-time happy radio user now feels that these units are more trouble than they are worth, and scraps the whole idea, after writing a letter of complaint to the manufacturer.

Matchmaker, Matchmaker ...

The problem started when he went back for the replacement. No one at the store told him what frequency he was using. We scanner buffs know that there are a lot of frequencies out there. He just took one off the shelf, as if he were buying a clock radio or TV set.

To avoid this increasing problem, many two-way radio manufacturers now build their radios with a limited choice of frequencies. To ease the confusion, Ritron (the successful manufacturer of the Jobcom walkie talkie) stamped each of their radios with a special color code to avoid confusion. Each color

represented a specific frequency. When additional radios were purchased, the customer could match the colors on the box, and know they were compatible.

Eventually, all the manufacturers followed this plan and the frequencies became known by their color!

Since these radios are purchased on a "self serve" basis, no one advises (and few know) that the purchaser must license these radios. An FCC license form is enclosed in each box, and ends up getting thrown away. Therefore, these innocent, yet illegal users will not show up in any frequency data base. That's where the fun begins!

Listen to the color-coded frequencies anywhere and you will be surprised at what you will hear: Retailers, motels, country clubs, hunters, auto parts and junk yards, fast food drive-in windows, nurseries, schools, cemeteries, campgrounds, condominium and housing complexes, security companies, movie houses, churches, synagogues, sports groups and a lot more!

How it's Meant to Work

Let's look at each frequency grouping and see what it legally should be used for, according to the FCC rules ...

Commercial Use, Base

This first group is limited to users in a "for-profit" commercial activity who will use the radios in the same location all the time. A building, hotel, or railyard is an example.

- Blue Dot 154.570
- Green Dot 154.600
- Silver Star 467.850
- Gold Star 467.875
- Red Star 467.900
- Blue Star 467.925

Most units in this group are purchased on the Blue and Green Dot freqs.

Commercial Use, Mobile

These freqs are for those commercial activities who use their radios at various locations throughout the business day...as long as they operate within 75 miles of a central location. Construction companies who go from job to job use these, again as per the FCC rules:

- Red Dot 151.625
- Brown Dot 464.500
- Yellow Dot 464.550

The most popular of these is the Red Dot freq.

Non-commercial (GMRS)

Hunters, non-profit volunteer groups, or personal users — as long as it's non-business related — can use the following frequencies anywhere. There are even repeaters available to enhance the communications range. Any business related activity in this group is strictly forbidden. These are also known as the GMRS (General Mobile Radio Service), an FM "Citizen's Band."

- White Dot..... 462.575
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This article was first published in Monitoring the Long Island Sounds.

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EDXC Annual Meeting 1994

Shortwave Broadcasting is reaching critical crossroads, Paris conferees agree

by Jacques d'Avignon

How can you explain to your wife that you have accepted an assignment in Paris in May, when she does not have any holidays scheduled for that time of the year to follow you? It's a rhetorical question — there is no good answer!

Actually, my original trip to Paris had been planned long ago so that I could meet my newest grandson born in Paris last year. During a conversation with editor Rachel Baughn, it was discovered that the annual meeting of the European DX Council was to be held in the French capital from May 20 to 23, and Rachel asked me if I would be willing to represent *Monitoring Times* at this convention. This was not a very difficult assignment to accept as it would show the *Monitoring Times* banner to our European cousins and also advertise the Atlanta *MT* Convention.

The EDXC meeting arrangements in Paris were made by Amitié Radio's president, Roland Paget, and other members of this DX club. Amitié Radio is the largest French DX listening club not only in Europe but in the world, with just over 1500 members. All the work that Roland and his group did to prepare this annual meeting really paid off: everything went like clockwork.



Andrew Sennitt, editor of WRTH, and Michael Murray led a lively debate on the future of SW broadcasting.

Registration started on Friday afternoon at the Hotel Itinéraires in Nanterre, a suburb of Paris. The participants slowly trickled in all afternoon except for those that had arrived the night before from far away places like Romania. Yes, Frederica Dochinoiu, who endeared herself to *MT* conventioners last fall, drove from Romania to attend this annual meeting.

The Friday afternoon schedule was light: a visit to the French Senate chambers and then a reception offered by Radio France Internationale at their headquarters in downtown Paris — Just enough to get the group spirit going!

The visit to the Senate located behind the Luxembourg Gardens was most interesting and a superb learning experience in French history. At the start of the tour we became aware of a small problem: most of the EDXC delegates were English speaking, and the tour guide spoke only French! I leave it to your imagination to guess who was pressed into service to do simultaneous translation. I had to learn a lot of French history in a very short time!

The reception hosted by Radio France Internationale was very well attended by the EDXC participants and by various representatives of RFI. The food and champagne was most enjoyable and the speeches were kept to a minimum. As most of the RFI delegates planned to attend some of the sessions on Saturday, EDXC participants had a second opportunity to ask as many questions as they liked.

Saturday morning arrived too early as a lot of informal sessions had lasted well into the night, but all the participants were there for the opening session co-chaired by Michael Murray, Secre-



tary General of EDXC, and Roland Paget, President of Amitié Radio and host of this year's meeting.

After the official welcome by Paget, Michael Murray gave a brief overview of the work of the Council during the last year. He deplored the fact that the EDXC newsletter had to be dropped for the time being, due to the lack of available time to devote to this activity. The number of participants to this Paris annual meeting was estimated by Michael at only 60, and a large number of the broadcasters had to bow out, some at the last minute.

The international broadcasters represented were as follows: BBC, Radio Korea, Radio Romania, Radio Turkey, Radio Austria, Radio France Internationale, Radio Vlaanderen International (Belgium Radio) and Deutsche Welle. The following broadcasters had to cancel: Radio Swiss International, Radio Sweden, Radio Exterior de Espana, Voice of America and Radio Nederlands. The general climate in the shortwave broadcasting industry is such that many stations are embarking on major re-organizations, and that is *not* the time to be away from one's office.

Michael Murray made an announcement concerning the *Monitoring Times* convention during his opening remarks and had brought with him some reprints of the registration form for this convention for distribution. The next EDXC annual convention will be held in Denmark in early June 1995.

The next presentation was made jointly by

Radio France Internationale, TéléDiffusion de France and the manufacturer Thomson CSF. They described and explained the new transmitter/antenna modules being installed at the Issoudun/Allouis TDF complex and in Montsinéry in French Guiana. Watch for a description of this interesting transmitter/antenna module in an upcoming *MT* feature article. These new modules are being erected by TDF for transmission of RFI programs. It is important to note that RFI does not transmit its own programs; the actual transmission is done by TDF from various sites all over the world. TDF is what we would call a "common carrier."

Mention was made during this presentation that sites in Thailand and Djibouti (Africa) are being considered for the building of new relay sites possibly using these new transmitter/antenna modules. South East Asia is becoming a primary target for Radio France Internationale and it is a very difficult area to reach with the available equipment, even when using the relay transmitters in Japan and China.

Andy Sennitt, editor of the *World Radio TV Handbook*, made the next presentation. His controversial topic was: "The Changing Face of International Broadcasting." This was a very frank discussion on the use of satellites to relay, for public interception, the programs of various shortwave broadcasters. The broadcasters are using this new direct broadcast technique to beam their programs into as many homes as possible in Europe. Because of the congestion of the shortwave spectrum in Europe, it would appear that this technique is having excellent results. It is obvious that the European shortwave broadcasters have identified a major target audience for their programs in the European community — the decision makers; and that satellite transmission is the easiest mean of gaining access to this very important group without interference.

One of the participants questioned this broadcasting technique when the price of satellite receiving equipment is still fairly high compared to a good shortwave radio. Andy Sennitt answered that, in Europe, it is presently possible to buy a complete satellite system to receive the ASTRA transmissions for under \$400 (US). One point that was clearly made, however, was the fact that the satellite is not completely replacing the regular transmissions on shortwave. However, one participant did note that satellite transmissions do divert some of the scarce resources away from regular shortwave transmissions. This topic sparked a lot of discussions between all the participants.

As usual, meal break is a favorite time for discussions; if you went around the room you could hear many subjects under debate by participants.

The afternoon started with a session of questions and answers on the various aspects of short-wave broadcasting. It was interesting to hear what was foreseen for the years to come. One intriguing development is a system by which your radio will know all the frequencies being transmitted by a particular station at any time and will seek out the best frequency and retune itself to give you the best quality signal. Techniques to accomplish this are readily available and are presently being customised for use on shortwave. The necessary modification to the transmitters would be very economical.

I think that we may be faced here with a "chicken and egg" situation: the broadcasters will not modify the transmitters if there are no receivers available to receive the coded data. On the other side of this equation, the manufacturer of receivers will not spend the money for the necessary circuits in the receivers if no broadcaster is transmitting the coded data! Only time will tell how this one will be resolved.

Another interesting development in the shortwave broadcaster's bag of tricks are the FM repeaters used, mostly in Africa, by RFI. The same shortwave program is piped by satellite feed to special FM repeaters, which will ensure an increase in the audience for RFI. As a matter of fact, RFI can be heard 24 hours a day in Paris on the FM band; it is also available on some cable networks in North America.

These developments bring to mind a question: "What are shortwave broadcasts being used for?" Obviously the broadcasters are trying to sell their countries to the international "decision makers," and any system which will accomplish this task may be used!

The last presentation of the afternoon was on HF propagation by the propagation forecaster from *Monitoring Times*.

Now, if you have an annual meeting in Paris, you have to include a banquet that will be remembered for months, if not years, to come! Well, this one will be remembered not only for the quality but also for the quantity of food consumed. The banquet started around 19:00 and the last plate was not cleaned off the tables till around midnight! The banquet was supposed to have been served outside along the river bank, but the weather did not cooperate. The menu had been chosen by the organizers and they had obviously made the right decision.

One of the prizes being drawn for during the evening was a one year subscription to *Monitoring Times*, and who should win it but Roland Paget's wife! Roland already gets *MT*



Hobbyists always find a way; there was more than one familiar face from past *MT* conventions present at EDXC!

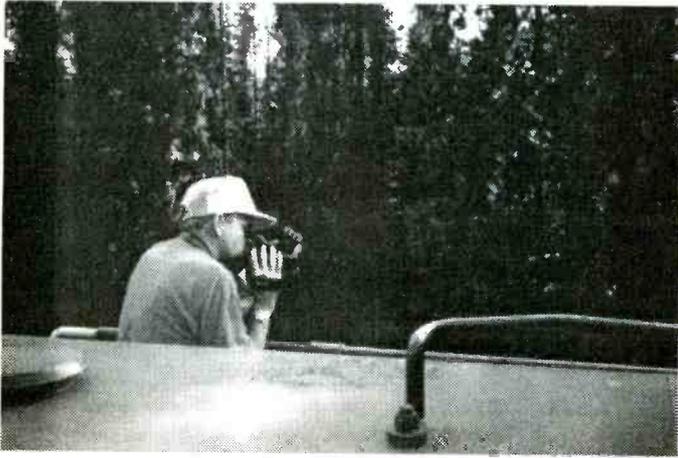
and about 15 other magazine on a monthly basis... The prize was drawn again and was won by someone who will greatly enjoy the magazine.

Sunday was devoted to meetings of various specialty groups such as broadcasters and EDXC club leaders. Also informal meetings were held between participants with similar interests. The broadcasters were recording interviews in any possible quiet spot and getting ready to pack it in and return to their stations.

The general atmosphere of this convention was very similar to the atmosphere that permeates the *MT* convention in Atlanta. Everyone present at these conventions has one thing in common: shortwave listening or broadcasting. A lot of information is exchanged and catching up on the news is also a necessary exercise. It was interesting to hear that many listeners in Europe know of *Monitoring Times*, know of the Atlanta convention and in some cases will buy *MT* occasionally at certain newsstands. (I have found that the price of specialty magazines is extremely high in France!) One major broadcaster "confessed" to me that he was receiving *MT* every month and read it cover to cover!

From the information gleaned and discussions held at this annual meeting, it is obvious that shortwave broadcasting is reaching a crossroads; in the next few years, some crucial decisions are to be made that will have serious impacts on this media and map the road of shortwave broadcasting well into the next century.

Now that I have tasted the EDXC annual meeting atmosphere, I will have to work on finding a good reason to attend the 1995 session in Denmark ... and do some fundraising! Conferencing in Europe puts rates elsewhere into a new perspective. Still, we radio hobbyists generally have the will to find a way: See you in Atlanta!



The Best of Both Worlds:

Video-Scanning on the Rails

By Arthur Edwards, WA6GRT

Most of my radio operations have been on 3-29 MHz with occasional local contacts on 2 meters (144-148 MHz). Last summer I purchased a new Icom W2A dual band transceiver for 2 meter and 70 centimeter bands. Much to my delight was the radio's very wide receiver coverage which introduced me to the intriguing world of VHF/UHF utility listening.

In August my family and I took a Pacific Northwest vacation. After landing at Sea-Tac airport in Seattle, we drove our rented Hertz mini-van east to Spokane and on St. Maries, Idaho. While passing near the Spokane International airport, we listened to the tower directing aircraft. I found it very intriguing, and it provided the seed for an idea I was to put into effect a few days later.

While staying with relatives in St. Maries, I soon began to feel the effects of the hot Idaho sun scorching my bald head. Instead of driving to the nearest drug store to buy a cap, I went to the office of the St. Maries River Railroad and bought a cap with the RR logo on it. The railroad office noticed my interest in their operation and invited me to ride in the cab of the locomotive during a run to pick up a load of logs up the river the next afternoon.

I was elated! I went to back where I was staying and made certain all of my camcorder batteries were charged. And then I remembered the pleasure the Spokane tower had provided this tourist.

I clipped my Icom W2A to my belt and drove with anticipation to the train office with an exciting idea for a video. After signing liability release forms with the railroad I was told to report to where the engineer was waiting for me. Before walking out of the depot, I asked what frequency they used for their operations. After they consulted the appropriate files, I was told 160.275 MHz. As I was walking toward the railroad yard, I put the frequency in the memory of the VHF side of the handheld transceiver.

The St. Maries River Railroad is a 51 mile portion of the now defunct Milwaukee Road. It connects with the Burlington Route at one end with the Union Pacific at the other. The main purpose of the line is to transport logs mainly for Potlatch Lumber in St. Maries.

In the cab with me was another guest, Jack Welles of Hendersonville, North Carolina, who took the picture of me videotaping from the locomotive's platform. After being introduced to the engineer, brakeman and conductor, we backed up about a mile and hooked on to 40 empty cars we were to pull upriver.

As the two units of diesel power pulled us upstream, I videotaped an Osprey swooping down and skimming off the surface of the river a healthy-looking fish. I continued to let my Ricoh 8mm camcorder roll during most of the two-hour trip.

For a period of about a half an hour, the brakeman and engineer had to communicate on 160.275 MHz. A few cars were put on a siding and uncoupled. The rest of the train would chug forward, then the engineer would slowly back up and would be told via the switchman's transceiver about 30 cars away, "Three more, two more, one more, and that'll do." Clunk!, and we coupled with our payload.

My Ricoh camcorder is a stereo model. I held my Icom W2A with my left hand next to the left microphone and the right microphone picked up the roar of the locomotive's engines. The videotape recorded the brakeman's voice and was not drowned out by the diesel engines. I shot over an hour of videotape of their operations.

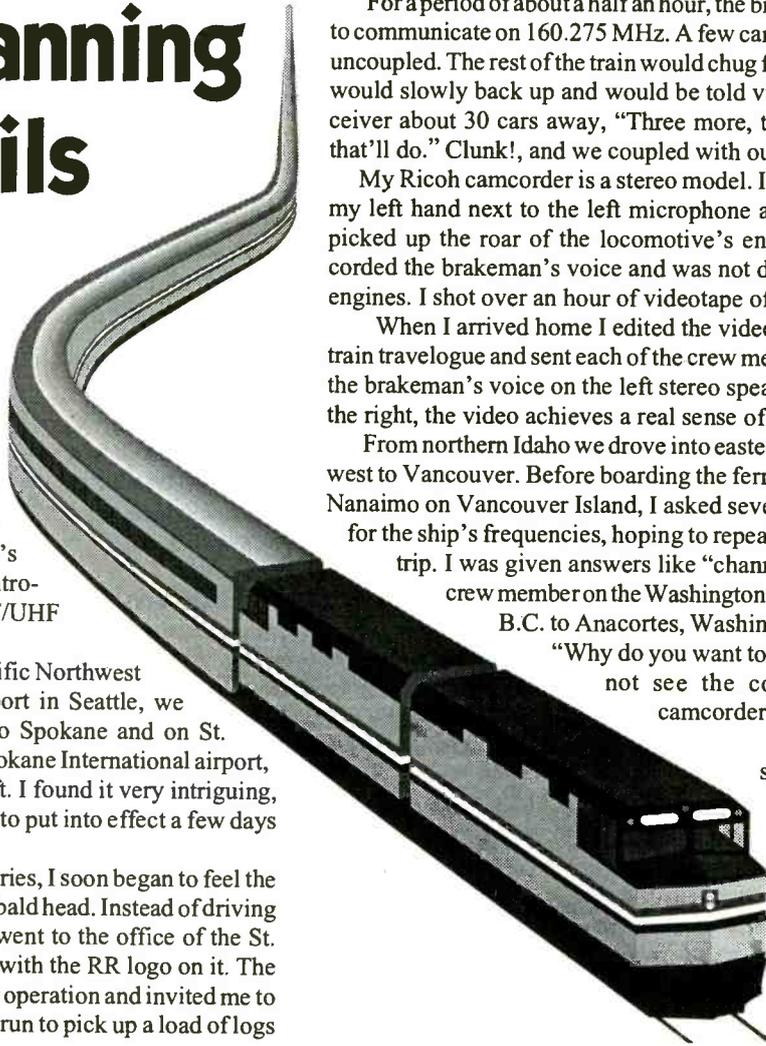
When I arrived home I edited the videography into a 40-minute train travelogue and sent each of the crew members a VHS copy. With the brakeman's voice on the left stereo speaker and the ambiance on the right, the video achieves a real sense of "presence."

From northern Idaho we drove into eastern British Columbia, then west to Vancouver. Before boarding the ferry from Horseshoe Bay to Nanaimo on Vancouver Island, I asked several B.C. Ferry personnel for the ship's frequencies, hoping to repeat my success with the rail trip. I was given answers like "channel B" or "seventy." One

crew member on the Washington State Ferry from Victoria, B.C. to Anacortes, Washington replied rhetorically, "Why do you want to know?" I guess he could not see the connection between the camcorder and the scanner.

From now on I will research transportation frequencies and program them into my scanner prior to any videotaping trips I take. I've seen books showing frequencies for planes and trains; but I'll have to look a little harder for ferryboat frequencies. With a scanner

and camcorder, any modern mode of transportation becomes an opportunity for a whole new breed of home movie! Can you think of anything better to share with your radio club when the summer's over?



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Wishing Upon a Mystic Star

"Dear Utility World, what is a Mystic Star?"
"Hey Larry, what can you tell me about the Mystic Star network?"
"Dear Dr. Ute, do you have a list of Mystic Star frequencies and designators?"

These are typical of the many questions I have received over the last several years regarding a high frequency military communications network managed by the U.S. military called "Mystic Star."

The Mystic Star network's basic mission is to provide worldwide communications support for the President, Vice President, and other high ranking government VIPs flying on military aircraft. The system is operated by the U.S. Air Force and is controlled out of Andrews AFB, MD. Mystic Star is not considered a primary military communications network from an operational standpoint. It is, however, the most important of all the back-up VIP communication systems.

Most of the Mystic Star network uses remotely operated sites consisting of HF-SSB (High Frequency-Single Side Band) transmitters and receivers linked by switched Defense Switch Network (DSN) lines and some leased phone lines. There are also indications that DSCS (Defense Satellite Communication System) satellites are used to connect some remote sites. The equipment at these sites can be tuned, keyed, and the antennas selected and pointed from communication consoles by the operators at Andrews. Antennas normally used at the remote sites are huge rotatable HF log periodics. These remote sites are located at various USAF/Army bases around the world.

Operators at Andrews select sites and frequencies to maintain continuous voice contact (on a primary frequency) with the aircraft they are supporting. Normally, a secondary frequency is also checked and maintained to smooth transitions when frequencies have to be changed. Frequencies used by the Mystic Star network are derived from a list of several hundred scattered throughout the shortwave spectrum.

Each remote site has its own block of frequencies unique to that site. Also each frequency at each site has a discrete designator (known as a Foxtrot designator/number). One of the more interesting phenomena associated with Mystic Star foxtrot designators is that one frequency can be associated with two or even more designators. For instance, 6993 kHz has three remote sites that operate on that frequency; thus warranting three separate channel designations.

When the President is flying (that aircraft then becomes Air Force One), you will hear occasional phone patches to the White House Switchboard/Communications Center (callsign - CROWN) on Mystic Star frequencies. That channel is being used as a backup link in case other communications fail or primary circuits are busy.

Most of the traffic on Mystic Star channels concerns another HF-SSB (data) circuit known as India-Oscar. India-Oscar is a full duplex encrypted data circuit that uses a special anti-multipath HF modem to pass data traffic. This circuit uses a encryption device and laptop computer to pass secure message (e-mail, etc) communications. Sometimes you will hear operators aboard the aircraft say, "meet me on the keyboard." They are referring to India-Oscar.

Over the years, some official information has surfaced about Mystic Star. One of the more interesting tidbits is the location of the remote sites.

Prior to the closure of Clark AFB in the Philippines, this was the official list of sites for the Mystic Star network:

- **Andrews AFB, MD Transmitters** - Brandywine/Receivers - Davidson, MD
- **Ascension Island Auxiliary**
- **Clark AB, Philippines** (Base now closed)
- **RAF Croughton, UK Transmitters** - Baford, St. John/Receivers - Croughton
- **Ft. Allen, PR Transmitters** - Ft. Allen/Control console and receivers - Salinas, PR
- **Hickam AFB, HI Transmitters** - Hickam/Receivers - Bellows, HI
- **Incirlik AB, Turkey** (Appears to be a backup site for Pirmasens for coverage into the Middle East and southwest Asia)
- **McClellan AFB, CA Transmitters** - Davis/Receivers - Lincoln, CA
- **Pirmasens, Germany**
- **Scott AFB, IL**
- **Yokota AB, Japan Transmitters** - Tokorozawa/Receivers - Owada
- **WHCA** - White House Communications Agency - Fixed, Mobile and Portable

As mentioned before, there are hundreds of frequencies associated with this network. To add to the monitor's misery, these frequencies are rarely mentioned by the operators on the air. Instead they refer to the foxtrot designators. A transmission might go something like this, "Air Force One this is Andy. Change primary to Foxtrot 389 Upper." The operator at Andrews has told the aircraft communicator to change to the frequency represented by F-389 and use the upper side band (USB) mode.

The misery factor for listening to the Mystic Star network is compounded by the fact that the Air Force changes their designator/frequency list about once a year, usually on April 1. (Nice April fools joke, fellas). Consequently, tracking frequency moves requires a lot of patience, constant monitoring, and luck to keep track of the various VIP flights.

Several years ago, Mystic Star lists were easier to maintain because the complete blocks of frequencies were known for each remote site, and all the sites were known; once a few designators were discovered after a change, it was only a matter of simple substitution to figure out the rest of the list.

It's not that easy any more. Based on monitoring, it would appear there are quite a few more frequencies and designators in use than there used to be. We have also lost one of the remote sites (Clark) due to a volcano, but their block of frequencies still appears to be in use. I am reasonably sure that the Air Force has established some new sites and likely gotten rid of others, in line with the down-sizing of the military.

It appears that the best way to work Mystic Star now is to monitor known active frequencies. Listen closely for frequency changes and go hunting for new designators/frequencies. Having a second receiver with computer control or memories preprogrammed really helps on these excursions. Several Utility World monitors have been doing just that, and Table One reflects their work through the last two changes.

TABLE 1: Confirmed Mystic Star Foxtrot Designators

4/1/93 List	4/1/94 List	Possible Site(s)	4/1/93 List	4/1/94 List	Possible Site(s)	4/1/93 List	4/1/94 List	Possible Site(s)
F018	18317.0	Unknown	F290	8026.0	Unknown	F555	9991.0	Ft Allen
F025	11229.0	Unknown	F295	11460.0	WHCA Block	F567	13565.0	Ft Allen
F034	11209.0	Unknown	F303	23687.0	Andrews, Scott	F576	11153.5	Unknown
F052	18175.0	Old Clark Block	F311	10153.0	11220.0 Pirmasens/Unknown	F600	13878.0	Ascension
F053	9921.0	Yokota	F315	11118.0	Unknown	F619	11153.0	Unknown
F061	13440.0	WHCA Block (Probably 2 or more sites)	F331	9017.0	Croughton	F626	18023.0	US STRATCOM channel (Andersen, Ascension, Hickam, MacDill, McClellan Discrete)
F064	6817.0	McClellan	F357	9323.0	Unknown			
F089		13204.0 Croughton	F358	9043.0	Ascension (Andrews Discrete)			
F094		9017.0 Croughton	F377	13823.0	Scott	F640	13878.0	Ascension
F103	13217.0	Unknown	F380	6756.0	Andrews	F646		13440.0 WHCA Block
F117		6993.0 Andrews, Ft Allen, Scott (Hickam Discrete)	F387	11156.0	(Andrews, McClellan Discrete)	F667		6817.0 McClellan
			F390	5823.0	Unknown	F669	13201.0	GHFS House Channel
F118	6683.0	Andrews	F404	11466.0	Andrews, Ft Allen	F670	9320.0	McClellan, Hickam, Old Clark Block
F123	11448.0	Unknown	F405	4938.0	Hickam	F690	8039.0	McClellan
F125	11615.0	Old Clark Block	F419		11407.0 Ascension	F731		6683.0 Andrews (Andersen Discrete)
F141	11226.0	Andrews	F426	9006.0	Unknown	F732		15011.0 Unknown (Andersen Discrete)
F172	15661.0	Unknown	F441	11118.0	Pirmasens			
F181	13440.0	WHCA Block	F443	11056.0	Unknown	F736	8086.0	Old Clark Block
F198	11413.0	McClellan	F452	6993.0	Andrews, Ft Allen, Scott	F757	9271.0	Unknown
F199	6693.0	Unknown	F453		6728.0 (Andrews, Croughton, Elmendorf Discrete)	F768	13205.0	Unknown
F200	11494.0	Unknown (US STRATCOM channel)	F461	13211.0	Unknown	F775	6989.0	Yokota
			F465		8040.0 WHCA Block (MacDill Discrete)	F778		18023.0 Unknown
F202	13412.0	Old Clark Block	F467		9023.0 Andrews	F846	6730.0	Andrews, US STRATCOM channel plus several stations discrete frequency
F205	8040.0	WHCA Block	F496		11059.5 Unknown			
F226		5435.5 (Analog Data) Unknown	F498		8032.0 Unknown	F867		6830.0 WHCA Block
F237	11634.0	Ascension	F515	18063.0	Unknown	F888	6812.0	Old Clark Block
F259	6830.0	WHCA	F516	8026.0	Unknown	F889	18331.0	Ascension
F266		7997.0 McClellan	F529	13565.0	Ft Allen	F906	11059.0	Unknown
F267		6730.0 Andrews	F531	18393.0	Unknown	F953	8029.0	Andrews
F277	10880.0	Hickam	F533	13825.0	Pirmasens	F957	6761.0	Unknown
F283	11052.0	Unknown	F536	11053.0	Unknown	F980	4444.0	Ft Allen
F287		11226.0 Andrews	F537	11407.0	Ascension	F988	15821.0	Pirmasens
						F989	6716.0	Unknown

Well, that about exhausts what I know about Mystic Star. I'm sorry I couldn't answer all your questions, but this column has generated a few questions of my own. They are as follows:

- What site replaced Clark when it closed?
- What other sites have been added or dropped from the network?
- Does anyone have a current, comprehensive list of designators and frequencies?

Anyone that can help fill in the pieces can drop me a line at the address in the masthead.

Utility World Pot Luck

Again this month, Pot Luck provides us with a list of intercepts categorized as "unknowns; more information requested." If you have any information on who may have made some of these transmissions, the agencies involved, etc., please drop me a line.

- 5150.0 Fireworks 32A working Fireworks 10 (USB)
- 5186.0 NCCT-1 + scrambling (USB)
- 5189.0 XOF/NMV/ABX (CW) Possible Cuban Navy/Border Guard
- 5203.5 Delta 28 working Romeo 41 (USB)
- 5207.1 AT3TVA working AT3TPA using 300 bd packet
- 5225.0 C4R/Q3R regarding RTTY setup (USB)
- 5252.0 KCAV de WFHP K (CW Marker)
- 5319.9 Mike 31 working Lima 13 (USB)
- 5332.0 FF (NCS) + single letter calls (USB)
- 5412.5 Pronto working Ambrose doing loopback RTTY ckt test (USB)
- 5420.0 Parkhill KY-75 scrambling (USB)
- 5462.0 Hilda working Red Dog (USB)
- 5587.0 Unidentified military stations with chatter (USB)
- 5606.0 N7 working B4 (USB)
- 5617.0 Residence working unidentified station followed by data (USB)

- 5691.5 Whiskey Bravo working other Whiskey units (USB)
- 5711.0 GJR working J2T (USB)
- 5828.0 Compton-Colorado (Radio side maint shop nr Al-Qaisumah)/ Metropolis working Chidsey (USB)
- 5973.5 Zeppelin 1 working Bad Boy (USB) passed #/L msg mentioned exercise
- 5992.0 Pretoria calling Paradise Down (USB)
- 6221.0 NATO Trigraph calls noted here (USB)
- 6230.0 Raider working Raider Base (USB)
- 6500.0 Aloma 93 working other Aloma calls here from 7626
- 6524.0 Zoomer 1/2/3/4 (USB) on practice bombing room near 140
- 6553.0 Scott 86 calling unidentified station (USB)
- 6636.0 L2B working K8M
- 6646.0 NATO Trigraph calls noted here (USB)
- 6701.0 Tango 01 working Delta passing reports similar to FT nets (USB)
- 6707.0 63 working 26, R08 working F26 (Burst data comms) A61 working Y06 (USB)
- 6721.5 L-TAC base, L-TAC47 and TCO base (USB)
- 6732.0 FAA/Customs type SELSCAN noted here (USB)
- 6734.0 Boulmer Flight Watch working 3XH (aircraft) passing data in numeric form on Delta Kilo (USB)
- 6770.0 British accent B3 working B4, N1 working N3, A18 working Scorpion 1, R1 working A1 (USB)
- 6788.0 Tango 06 working Romeo. Similar to FT net ops (USB) Freq ID'ed as Excalibur +5
- 6790.0 Malibu station working duplex phone patch (USB)
- 6804.0 Encrypted voice DS Type 1 (USB)
- 6818.5 Tenement working Back Bench. Tenement then working Evans to relay msg to Back Bench composed of 15 three letter/number groups (USB).
- 6875.0 Grizzly Bear calling Smokey Bear, Black Bear, Brown Bear, Polar Bear and Panda Bear for radio checks. Brown asked what type of camouflage is it? Mentioned shade type only. (USB)
- 6877.0 Land Force working Constable (USB)
- 6900.0 Possum working Groundhog (Freq Hotel), Jay Hawk working Coyote/Mongoose (USB) Charlie 10 working Tango 27 (USB) Associated with 5063.5 & 6900.0
- 6908.5 King Cole 01 working Antidote (USB) Several mentions of advance units, radio checks on HF, preplanned missions, ATC, ground alerts.
- 6909.0 Dictionary working unidentified station closing xmission (LSB)
- 6912.0 Oscar Echo Mike 5 loop tape (USB)
- 6968.5 Nightstalker working Beetlejuice (sending fax) + Workhorse, mentioned Saratoga

Abbreviations used in this column

ACC	Area Control Center	Metro	Pilot-to-Metro voice callsign
AFB	Air Force Base	MOD	Ministry of Defense
ARQ	Synchronous transmission and automatic repetition teleprinter	m/v	Motor Vessel
ARQ-E3	Single channel ARQ teleprinter system	Cps	Operations
ARQ-M2	Multiplex ARQ teleprinter system	Packet	Repetitive inter-computer mode
ASECNA	Agence pour la Securite de la Navigation Aerienne en Afrique et a Madagascar	PAP	Polska Agencja Prasowa
CAMSLANT	Communications Area Master Station Atlantic	POL-ARQ	Polish diplomatic ARQ teleprinter system
CAMSPAC	Communications Area Master Station Pacific	PTT	Post & Telegraph Administration
CGAS	Coast Guard Air Station	RAF	Royal Air Force
COMSTA	Communications Station	RTTY	Radioteletype
CVN	Multi-purpose Aircraft Carrier (Nuclear)	SAM	Special Air Mission
CW	Continuous Wave (Morse Code)	SAR	Search and Rescue
DPA	Deutsche Press Agentur	SCN	System Coordination Nets
DTRE	Direction des Telecommunications des Reseaux Exterieurs	SELSCAN	Selective Scan
FAA	Federal Aviation Administration	SITOR-A	Simplex teleprinting over radio system, mode A
Fax	Facsimile	SITOR-B	Simplex teleprinting over radio system, mode B
FFT	Training Fast Frigate	Subase	Submarine Base
GHFS	Global HF System	Twiplax	Four-frequency duplex teleprinter system
HF	High Frequency	Unid	Unidentified
ID	Identification	US	United States
LSB	Lower Side Band	USB	Upper Side Band
MFA	Ministry of Foreign Affairs	USCG	US Coast Guard
Megs	Megahertz	USCGC	US Coast Guard Cutter
Meteo	Meteorological	USS	United States Ship
		WMEC	Medium Endurance Coast Guard cutter

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

- 2270.0 Israeli Mossad number station with 5 letter groups in AM at 0434. (Bill Fernandez-MA)
- 2582.0 ZBM-Bermuda Harbor Control with navigation/weather broadcast in USB at 0440.
- 2962.0 Santa Maria ACC, Azores, working several aircraft over the Atlantic in USB at 0446. (Fernandez-MA)
- 3452.0 Recife ACC, Brasil and Dakar ACC, Senegal, working several aircraft in USB at 0502. (Fernandez-MA)
- 3494.0 Houston ARINC, TX, working an unid aircraft in USB at 0507. (Fernandez-MA)
- 4018.3 ZR05-Pretoria Meteo, RSA, with 75 baud RTTY weather codes at 0149. (Robert Hall-Capetown, RSA)
- 4028.0 Spanish female 5-digit number station in AM at 0512. (Fernandez-MA)
- 4052.0 Boeing Test Flight working Allen 02 in USB at 0305. Also heard on 5775.0 and 9017.0. (Jeffrey Jones-Tarcy, CA)
- 4207.4 PWNM-Naval Radio Belem, Brasil, with RTTY RY/ID at 0158. (Hall-RSA)
- 4415.0 German female 5-digit number station in AM at 0516. (Fernandez-MA)
- 4487.6 TNL-ASECNA Brazzaville, Congo, with weather codes ARQ-M2 channel A at 0210. (Hall-RSA)
- 4612.0 ZP72 working QAD for radio check in USB at 1624. (Ary Boender-The Netherlands)
- 4707.0 RAF Neatishead, England, working flight 'Romeo 7 Foxtrot' with radio check in USB at 2217. Also heard at 2220 in USB, 'Zero Zulu Hotel' (a female with a Dutch accent) working R7F. (Robin Hood-UK)
- 4742.0 Ascot 5943/2150 working Architect in USB at 1642/1853 respectively. (Boender-Neth) Brian Scott and Jeff Haverlah have ID'ed this one as X-209-Larry.
- 4813.2 LZA8-Sofia Meteo, Bulgaria, with 50 baud RTTY codes at 0342. (Hall-RSA)
- 5225.0 Scrambled (green) communications noted at 0415 in USB. (Dokey-CA)
- 5435.5 SAM 28000 working Andrews AFB on F-226 with analog data in USB at 0200. (Jones-CA)
- 5616.0 Gander Radio, NF Canada, working various aircraft in USB at 0100-0132. (Jim Ashe-Weymouth, MA)

- 5629.0 SYN2-Israeli Mossad number station in AM at 0532. (Fernandez-MA)
- 5680.0 Plymouth Rescue working various Rescue aircraft in USB. Also noted Edinburgh Rescue in USB. (Boender-Neth)
- 5692.0 USCG 2104 (HU-25A) working NMN-CAMSLANT Chesapeake in USB at 1433, switched to 8980.0. (Norm Pihale-Northfield, MN)
- 5696.0 USCG helicopter SAR out of San Francisco noted at 0445 in USB. (Hans Zwick-Stockton, CA) CAMSPAC San Francisco working COMSTA Kodiak, AK in USB at 0523. (Gordon Levine-Anaheim, CA)
- 5718.0 Very active, phonetic alphabet and numbers only in USB at 1600-1800. (Ashe-MA)
- 5730.0 Unid stations using secure communications in USB at 0522. (Jeff Haverlah-Houston, TX)
- 5732.0 Plantation working unid station in USB at 0025. (Jack NeSmith-FL)
- 5765.8 Possible Mexican Air Force weather transmissions using RTTY 75 baud/170 kHz shift at 1349-1351. (Brian Webb-Thousands Oaks, CA) Brian, I really appreciate you taking the time to closely check the multitude of HF Spanish transmissions out, I'm sure our readers do to, welcome aboard-Larry.
- 6483.0 PBB-Den Halder Naval, Netherlands, with 75 baud RTTY at 0106. (Jack Dix-Yonkers, NY)
- 6678.0 Italian packet pirate radio network noted at 1911 with 300 baud packet signals. (Boender-Neth)
- 6681.0 French packet pirates using 300 baud packet observed here at 1859. (Boender-Neth)
- 6688.0 Royal Navy, Portland, UK working 7UN, 7YN and 6UM all in USB at 0758. Requesting they squawk Mode 2 on HF. Very bad interference from 300 baud packet SP1RT/IT2SAM/IT2ZAT on 6688.6. (Hood-UK) Italian packet pirates noted here with 300 baud packet at 1901. (Boender-Neth)
- 6727.0 A3W working JWT in USB at 1603 asking if there were any messages for him. JWT requests switch to frequency ARCN131. (Boender-Neth)
- 6728.0 SAM 972 working Andrews AFB on F-453 in USB at 0345. (Jones-CA)
- 6730.0 Aktyubinsk Air with VOLMET broadcast in USB at 1835. Karaganda Air with VOLMET broadcast in USB at 1840. Both stations in Kazakhstan. (Boender-Neth) Nightwatch 01 working WAR46 and others in USB at 0211. (Haverlah-TX)
- 6731.0 SAM 27000 working Andrews in USB at 2303. (Haverlah-TX)
- 6735.0 Steel Jaw 01 working Hotel, FT and Golf for HF coordination in USB at 0306. (Bob Lewallyn-The Woodlands, TX)
- 6800.0 Mexican Army radio network monitored in LSB at various times. Heard messages for Comandante Segunda Region y Segunda Zona Militar (Commander, Second Region and Second Military Zone). It was about a 'guarnacion' at the 'auditorio municipal'. A 'guarnacion' is a ceremony where young men gather and some are selected for military service. (Webb-CA)
- 6830.0 Andrews working SAM 27000 in USB at 2319. (Haverlah-TX)
- 6834.5 NBL-US Navy Subase Groton, CT, at 1630 in LSB calling CQ (Armed Forces Day), said listening on 7250.0 (Baker-OH)
- 6966.8 US Navy MARS station NNOPE-1 in Iowa with SITOR-A message at 0313 regarding missing afloat net report to various stations. (Dokey-CA)
- 6970.0 NMN-CAMSLANT Chesapeake, VA, working various amateur radio stations cross-band in CW for Armed Forces Day celebration at 1530. (Baker-OH)
- 6993.0 Andrews AFB working Air Force 2 on F-117 moved from F-290 (8026.0) in USB at 0054. (Jones-CA)
- 7391.5 NNOCVG-*USS Dwight D. Eisenhower* (CVN-69) at 2035 working NNOZTI with phone patch traffic in USB. (Rick Baker-Austintown, OH)
- 7475.0 FAA SELSCAN channel 6, female operator asked if station was using P-381, other replied he would meet her on W-14 (???-Larry). In USB at 2323. (Barry Williams-AL)
- 7528.0 NELP-*USS Joseph Hewes* (FFT-1078) at 0325 working NMN-CAMSLANT Chesapeake, VA, using 75 baud RTTY. Moved to 6958.0 after voice communications on 6 megs SCN (6501.0/6200.0). (Baker-OH)
- 7755.0 Scrambled (green) communications using USB at 0455. (Dokey-CA)
- 7884.0 Scrambled (green) communications noted in USB at various times. (Dokey-CA)
- 7910.0 Scrambled (green) communications noted in USB at 0600. (Dokey-CA)

7997.0	Andrews working SAM 28000 on F-266 in USB at 0200. (Jones-CA)		
8031.0	Bravo Rear working Bravo Forward for radio check in USB AT 1857. (Jones-CA)		
8032.0	SAM 972 working Andrews AFB on F-498 with phone patch traffic in USB at 0100. (Jones-CA)	14359.1	SNN299-MFA Warsaw, Poland, with English and Polish traffic to embassies using 72 baud RTTY at 0700. (Hall-RSA)
8040.0	Andrews AFB working SAM 27000 on F-465 in USB at 0300. (Jones-CA)	14438.4	FJY234-DTRE net Crozet, Kerguelen, North Amsterdam working RFGW-Paris, France, using ARQ-E3 at 0710. (Hall-RSA)
8195.0	NFMK-USCGC <i>Seneca</i> (WMEC-906) at 1728 working COMSTA Boston, MA, with simplex phone patch in USB. (Baker-OH)	14460.0	Radio Moscow International broadcast feeder in USB at 0857. (Hood-UK)
8505.0	TBO-Turkish Naval Radio with CW marker at 1520. (Hood-UK) I would presume this is Izmir based on the callsign assignments in my references-Larry.	14642.1	MFA Cairo, Egypt with English news using SITOR-A at 0725. (Hall-RSA)
8674.4	VWM-Madras Radio, India, with CW marker at 1548. (Hood-UK)	14654.5	SPW-Warsaw Radio, Poland, with traffic list in SITOR-B at 0900. Have also noted SPW with autotelex SITOR-A on 7863.5. (Hood-UK)
8676.0	Spanish female 5-digit numbers station in AM with horrible modulation at 0211. (Lewallyn-TX)	14686.0	Atlas working Sundance 775 in USB at 2340. 775 reported he was 40 minutes from Jaguar 400.
8720.0	3K2 calling 3K1 in USB active most of the day, RTTY also noted. (Harry Riddell-Rochester, NY)	14725.5	FUX-French Navy Le Port, Reunion Island with usual crypto using 100 baud RTTY at 0730. (Hall-RSA)
8764.0	USCGC <i>Eagle</i> working COMSTA New Orleans, trying all SCN frequencies with no joy using USB. Switched to 8124.0 for data transmission to CAMSLANT Chesapeake at 0340. (Pihale-MN)	15015.0	Spar 60 working MacDill AFB with phone patch in USB at 1538. This is a VC-135B from the 58th AS at Rhein-Main AB, Germany. (Lewallyn-TX)
8967.0	McClellan Maintenance running communication checks in USB with McClellan GHFS at 1438. (Pihale)	16077.0	A3S working Lightning 01, 10 and 20 in USB at 2340. (Jones-CA)
8984.0	USCG 1719 working CGAS Clearwater, FL with messages in USB at 1420. (Pihale-MN)	16092.8	Echo chatting with Lima in Afrikaans using 300 baud packet at 1138. (Hall-RSA)
8989.0	Various Jake ## callsigns in USB at 0219. (Haverlah-TX)	16104.2	MFA Oslo, Norway with traffic at 1147 using 100 baud Twinplex. (Hall-RSA)
9017.0	Nightwatch working Golfball and Adversary with coordination on primary in USB at 0030. All advised that they were in receipt of current EAM. (Lewallyn-TX)	16114.1	Polish Diplo traffic using 100 baud POL-ARQ at 1152. (Hall-RSA)
9020.0	MacDill AFB working Mailbox (voice and autodin) in USB at 1354. (Haverlah-TX)	16125.0	RFQP-French Forces Djibouti, with Code de Voie at 1155 using ARQ-M2. (Hall-RSA)
9057.0	Nightwatch working McClellan in USB at 0320. (Lewallyn-TX)	16183.2	5YE-Nairobi Meteo, Kenya with weather codes using 100 baud RTTY at 1229. (Hall-RSA)
9112.0	Spanish female 5-digit number station in AM (noticeable AC microphone hum) at 0307. (Lewallyn-TX)	16187.0	5YE-Nairobi Meteo, Kenya with superb fax weather charts at 1231. (Hall-RSA)
10408.5	LN2A-Norwegian Telecom with CW marker at 2257. (Dix-NY)	16913.0	RFQPA-French Forces, Djibouti with message to RFFUEB-Chateaudin requesting supplies. In 200 baud ARQ-M2 at 0740. (Hood-UK)
11056.0	1X working 5G and 8S requesting battery position in USB at 1945. (Jones-CA)	16337.6	PTT Lumumbashi, Zaire with French traffic using SITOR-A at 1338. (Hall-RSA)
11059.5	SAM 201 working Andrews on F-496 in USB at 2235. (Jones-CA)	16940.7	9MR-Malaysian Naval Radio, Johore Bahru, Malaysia, with 72 baud test tape at 1205. (Hall-RSA)
11153.5	SAM 206 working Andrews on F-576 in USB at 2130. (Jones-CA)	16965.1	ZRQ6-South African Naval Radio, Capetown, RSA, with weather and storm warnings using 75 baud RTTY at 1200. (Hall-RSA)
11176.0	AHF4 Unit 1 calling AHF2 Unit 6 in USB at 1415. (Lewallyn-TX) Nike 56 with phone patch to Army Air Ops at Holloman AFB via Andrews in USB at 1731. Indicated they were an Army C-12 near Meridian, MS. (Lewallyn-TX) Reach 4R2, tail number 50275 with phone patch to Dover Metro in USB at 1830. (Boender-Neth)	17494.5	Noted tones (like GHFS type) here in USB at 1920. (Dokey-CA)
11179.0	Bear 601 calling MacDill AFB, FL, in USB at 1709. (Fernandez-MA)	17521.5	HSW61-Bangkok Meteo, Thailand, with 50 baud RTTY codes at 1243. (Hall-RSA)
11217.0	Sentry 54 (E-3) working Bayonne Global with phone patch to Griffiss Ops in USB at 2031. (Pihale-MN)	18021.8	MFA Cairo, Egypt, with SITOR-A Arabic traffic at 1544. (Hall-RSA)
11226.0	SAM 60204 (VC-20) working Andrews at 1940 on X-905 in USB. (Pihale-MN)	18365.4	6WW-French Naval Radio, Dakar, Senegal, with 96 baud RTTY crypto traffic at 1515. (Hall-RSA)
12072.7	ASECNA Libreville, Congo, with aeronautical traffic and weather using ARQ-M2 on channel A at 1239. (Hall-RSA)	18380.4	RFFXS-French Forces Versailles, France, with SITOR-A idling at 1510. (Hall-RSA)
12148.0	SOM230-PAP Warsaw, Poland, with SITOR-B Polish news at 1447. (Dix-NY)	18621.5	LRO84-Buenos Aires Meteo, Argentina, with fax weather chart at 1445. (Hall-RSA)
12626.5	UON-Baku Radio, Azerbaijan, working <i>m/v Fizulii</i> in CW at 0647. (Hood-UK)	18702.1	DPA-Spezial Bonn, Germany with German news using FEC-A at 1442. (Hall-RSA)
12690.0	EQN-Khomeyni Radio, Iran, with CW marker at 1010. (Hood-UK)	18872.2	BZR68-XNA Beijing, China with English RTTY news at 1250. (Hall-RSA)
12790.5	XFF2-Pajaritos Radio, Mexico, with DE CW marker at 2234. (Dix-NY)	19204.9	RFLI-French Forces, Fort de France, Martinique, with SITOR-A idling at 1115. (Hall-RSA)
12817.5	RSVG-Petrozavodsk Radio, Russia, working several vessels in CW at 0659 to 0710. Vessels were using 12446.0 and message headers include 'PTZ/MFR' (Petrozavodsk/Morflot). (Hood-UK)	19646.9	RFLIG-French Forces Cayenne, Guiana with SITOR-A idling at 1109. (Hall-RSA)
13207.0	Kiwi 499 calling Air Force Auckland in USB at 2117 for radio check. (Lewallyn-TX)	20091.8	MFA Cairo, Egypt, with SITOR-A Arabic traffic at 0947. (Hall-RSA)
13217.0	Nightwatch working Overflow on X-906 at 2016 in USB, switched to 11226 (X-905). (Pihale-MN)	20119.7	MFA Cairo, Egypt, with SITOR-A Arabic traffic at 0935. (Hall-RSA)
13336.0	KLM aircraft somewhere on the ground with trouble working Amsterdam LDOC in USB at 1351. (Boender-Neth)	20179.9	RFFABC-MOD Paris, France, working RRVINDI (5-letter groups) using ARQ-E3 at 0930. (Hall-RSA)
13440.0	SAM 201 working Andrews in USB at 2155. (Jones-CA)	20304.7	Egyptian embassy, Kinshasa, Zaire, with 5 letter groups and Arabic traffic for MFA Cairo using SITOR-A at 1110. (Hall-RSA)
13533.7	ZRO3-Pretoria Meteo, RSA, with weather codes using 75 baud RTTY at 1251. Also noted on 13542.1 and 13546.4. (Hall-RSA)	20820.2	CLP1-MFA Havana, Cuba working 50 baud RTTY Spanish traffic at 1220. (Hall-RSA)
13938.0	MFA Sofia, Bulgaria with Bulgarian news items (in English) then messages to various embassies using 150 baud RTTY at 0851. (Hood-UK)	20832.0	RNE38-PTT Moscow, Russia, with USB Russian voice traffic at 1226. (Hall-RSA)
13990.7	Unid Spanish language stations, probably from South America in USB. Two stations were heard. One was very weak and had a woman speaking. The other station had two men on the air. The accents were	20845.3	RFFA-MOD Paris, France, with ARQ-M2 5-letter groups at 1030. (Hall-RSA)
		20919.5	SAM-MFA Stockholm, Sweden with SWED-ARQ Swedish traffic at 1015. (Hall-RSA)
		23191.5	PTT Lumumbashi, Zaire with French SITOR-A traffic at 0850. (Hall-RSA)
		26250.0	R-Single letter channel marker in CW at 1346. (Boender-Neth)

Public Service Monitoring

What is the biggest draw to the hobby of scanning? Monitoring the public service bands, without any doubt. Police, fire, and ambulance calls continue to attract new listeners to our hobby. Listening to the public service bands, however, can be a confusing task. Neophytes will often become discouraged when they encounter a trunked system, voice protection or similar challenge.

If you're new to the hobby, or if you know someone who has recently joined our ranks, here are a few public service monitoring challenges that are more easily conquered.

The radio **10-codes** usually present the hobbyist with her/his first listening challenge. Everyone realizes that "10-4" is radio lingo for "everything is okay." The standard list of 10 codes are listed in the chart. Problems arise when police departments customize the codes to meet their individual needs. The code, "10-17," for example, may indicate that the officer is arriving at the scene, but in another town, it may

indicate that the officer is departing the scene.

Cracking the individual 10 codes requires nothing more than a pencil and paper. Simply jot down the car number and the 10-code that was used by the dispatcher. When the officer reports his findings via the radio, it should be fairly easy to figure out the meaning of the 10-code that was used. Additional codes or "lingo" that is unfamiliar can be deciphered in the same manner.

Trunked systems utilize a computer to randomly assign a variety of users to a specific group of frequencies. In a trunked system, it's not uncommon to hear the police, dog catcher and road department on the same frequency.

To monitor a trunked system, punch in the system frequencies, deactivate the delay feature, and select the top scan speed. To follow a conversation, it may be necessary to manually step your



scanner to the next frequency. Another tip is to use two scanner radios; the frequencies in radio #1 are programmed in ascending order, and in descending order in radio #2.

Encrypted transmissions provide voice privacy to local, state, and federal agencies. Years ago, the most common form of voice privacy, and the least expensive, was "Inverted Speech." A simple circuit, which could be constructed for less than \$20.00 dollars, inverted the high and low tones of the human voice. When inexpensive descrambling kits became commercially available, anyone could buy a kit and listen in.

Although inverted speech has been abandoned by most law enforcement agencies, the technology has found new life in the cordless phone market. Radio Shack's cordless phone, catalog #ET-499, utilizes inverted speech to provide voice privacy. Ramsey Electronics, 793 Canning Parkway, Victor, New York 14564, has an after-market frequency inversion kit that will provide voice protection to any cordless phone. The Ramsey kit can also be used to descramble a frequency inverted signal. For more information, contact Ramsey at (716) 924-4560.

Digital Voice Protection (DVP) is utilized by the FBI, Secret Service and other law enforcement agencies. When DVP is monitored, the listener will hear an increase in background noise — no voice will be heard. Since there's no easy method of descrambling DVP, most scanner buffs "lock out" the frequency and ignore it.

Even though you cannot decipher the communications, experienced hobbyists realize that the use of DVP usually indicates that other frequencies may be active. Suppose for a moment that you hear DVP on 418.900. A quick check of the frequency indicates that it belongs to the DEA. To hunt for clear voice transmissions, simply punch in the remaining DEA frequency assignments. It's not a foolproof method, but it has proven to be successful.

Frequency guides are another popular source for **locating those "elusive" frequencies**. A few of the popular publications are: *Police Call and Beyond Police Call*, published by Hollins Radio Data, P.O. Box 35002, Los Angeles, California 90035 and the *Scanner Master* series, published by Scanner Master Corporation, P.O. Box 428, Newton Highlands, MA 02161.

Local frequencies can also be obtained by joining a scanning club. The two most popular clubs in the Northeast are: North East Scanner Club, P.O. Box 62, Gibbstown, NJ 08027 and All Ohio Scanning Club,

TABLE 1

APCO Codes

Ten-1	Repeat your message.
Ten-2	Signal is loud and clear.
Ten-3	Stop transmitting.
Ten-4	Okay.
Ten-5	Relay information.
Ten-6	Busy.
Ten-7	Out of service.
Ten-8	In service
Ten-9	Repeat message
Ten-10	Negative "No".
Ten-11	_____ in service.
Ten-12	Stand-by.
Ten-13	Report conditions.
Ten-14	Standby for information.
Ten-15	Message delivered.
Ten-16	Reply to message.
Ten-17	In route to scene.
Ten-18	Urgent.
Ten-19	Contact _____
Ten-20	Unit location.
Ten-21	Call by telephone.
Ten-22	Cancel.
Ten-23	Arrived at scene.
Ten-24	Assignment complete.
Ten-25	Meet with _____
Ten-26	Estimated time of arrival.
Ten-27	License information.
Ten-28	Vehicle registration information.
Ten-29	Check records.
Ten-30	Use caution.
Ten-31	Pick up.
Ten-32	Additional units requested.
Ten-33	Emergency.
Ten-34	Correct time.

Note: The above codes are officially suggested by the Associated Public Safety Communications Officers (APCO). Many communities change the codes to suit their particular needs.

50 Villa Road, Springfield Ohio 45503-1036. Additional clubs are scattered throughout the country. To find a club in your area, check *MT*'s "Club Circuit." If you can't find a club or other source of frequencies nearby, drop me a note and I'll try to help. Send an SASE to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

After you have obtained a few of your local police and fire frequencies, additional signals can be found by searching through the high and low end of each band. Here's how it works: Suppose that your local police use 453.30 MHz. To find a "hidden" frequency, search between 453.00 and 454.00 megahertz. You may discover active frequencies that are not listed in local frequency guides.

The listening challenges mentioned above are only a few of the aggravating circumstances that can confront the scanning hobbyist. If you're having difficulty monitoring the scanning frequencies, send your listening questions to the Scanning Report, P.O. Box 98, Brasstown, NC 28902. For personal replies, please include an SASE.

Treasure Hunt

Mobile scanning antennas invite the curious. Folks just love to ask, "What type of antenna is that?" When a thief spots a mobile scanning antenna, he realizes that there's an expensive radio inside your car.

With today's technology, you can scan from your vehicle and no one will know that you're listening. The "No Tenna," by Grove Enterprises, is connected to a single screw inside your vehicle. The antenna provides strong, clear and continuous frequency coverage between 1 and 1000 megahertz. To win the No Tenna, provide the answers to 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 window frames, duct work, curtain rods — the uses are practically limitless! 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 on how this antenna works, call (704) 837-7081.

Frequency Exchange

The Los Angeles, California, fire department frequencies were sent in by Brian Humphrey.

Included with Brian's invitation is a two page listing of the Los

Channel	Frequency	Channel	Frequency
1	860.9375	13	857.4375
2	859.9375	14	856.4375
3	858.9375	15	859.7625
4	857.9375	16	858.7625
5	856.9375	17	857.7625
6	860.4375	18	856.7625
7	859.4375	19	866.0125
8	858.4375	20	866.5125
9	857.2375	21	867.0125
10	856.2375	22	867.5125
11	860.7625	23	868.0125
12	858.2375	24	868.5125

Angeles Operations and Control Division, and LA Fire Station location map. If you want the information, it's free for a #10 SASE. Send your request to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

An anonymous reader has sent in the official communications handbook for the Santa Barbara, California, police. Here a few frequencies from the handbook.

460.05	Santa Barbara Sheriff (Red)
460.025	Santa Barbara Sheriff (White)
460.10	Guadalupe Sheriff
460.275	Santa Barbara Sheriff (Orange)
460.325	Santa Barbara Sheriff (Yellow)
460.45	Guadalupe Sheriff

The handbook also contains the 1994 operating procedures for mobile units, as well as the standard response codes and radio codes. If you want the complete 14 page guide, I'll send it to your doorstep, but there's a catch. Please send \$3.00 dollars to cover the cost of copying and mailing the guide.

David Cimperman is a Patrolman in Cleveland, Ohio. Dave has sent in an updated frequency list for the Cleveland Police Department.

Channel	Frequency	Channel	Frequency
1	460.225	5	460.275
2	460.40	6	460.45
3	460.15	7	460.125
4	460.475	8	460.50
		9	460.35

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- 154.845 SWAT-2
- 154.830 SWAT-3
- 154.815 SWAT-4
- 154.80 SWAT-5

Officer Cimperman reports that most books list the 3rd district as "Foot Patrol." According to Officer Cimperman, there are very few foot patrols. The third district downtown frequency is used by all center city units. In addition to the above, Officer Cimperman invited everyone to listen to the Cuyahoga Metro Housing Authority on 453.775 MHz.

Anyone care to visit the Big Apple? Vincent Picone Jr., lives in **Yaphank, New York**, and his frequency list includes police and fire frequencies.

- 46.30 Fireground
- 46.34 Babylon
- 46.40 Brookhaven South
- 46.44 ISLIP/Smithtown F-1
- 46.60 Countywide, Suffolk
- 154.845 2nd Precinct
- 155.655 Detective Band
- 155.70 1st Precinct
- 477.2375 1st & 2nd Precinct
- 478.7125 Detective Band
- 478.9375 Detective Band

An anonymous reader from **Fairfield County, Connecticut**, has provided the following frequencies:

- 42.04 State Police
- 42.18 State Police
- 42.24 State Police radar
- 42.36 State Police Channel #2
- 42.58 State Police radar
- 42.64 State Police radar
- 47.30 Department of Transportation
- 153.695 Haddam Neck Nuclear Plant
- 453.95 Bridgeport Rehab vans
- 460.0875 Bridgeport Mental Rehab security
- 460.525 Yale University, Campus Police
- 464.65 G.E. Hdqtrs Security
- 464.75 Breezy Point Garage
- 464.825 Bridgeport Hospital Security
- 851.5375 Bridgeport Cable vision

Our last stop is with Brian Scott. Brian's home is in **Carswell, Texas**, and here are his favorite frequencies:

- 119.800 Lockheed Corp.
- 121.850 Lockheed Aircraft Corp.
- 123.200 Lockheed Aircraft Corp.
- 413.10 Carswell AFB (War games)
- 413.20 Carswell AFB (War games)
- 413.50 Carswell AFB (War games)

Brian's list included a map of the Lockheed local test flight area. The map is free for a #10 SASE. Send your request to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Do you have frequency lists, maps, or similar items of interest? If so, we invite you to share them with other *MT* readers. Send your information to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

Moving Up

Here's your chance to become a reporter for *MT*. We're looking for information on local police departments that have moved to the new 800 megahertz trunked system. A few of the questions that are of particular interest are: (1) How much did the new radio system cost? (2) Who installed the new system? (3) What technical problems were encountered, and how were they resolved?

Send your information and comments to the Scanning Report, P.O. Box 98, Brasstown, NC 28902. If you want news items returned, please include an SASE with sufficient postage.

Lawyer Chit-Chat

The Massachusetts Bar Association has advised its members to use caution when utilizing a cellular phone. "People on cellular phones have no idea that people are listening to them," said Criminal Defense Lawyer, Thomas M. Hoopes.

According to Richard N. Koch, President of "SafeCall," a Boston company that provides cellular scrambling devices, 80 percent of all cellular telephone traffic is monitored by third parties. And 60 percent of the calls are taped and reviewed by hackers who listen for marketable information.

Based on this information, the Bar Association is advising lawyers that they should not discuss confidential information on a cellular telephone. (News clipping from Alan Henney.)

Firecon '94

The first international Convention for fire buffs was recently held in Los Angeles, California. Hosting the show was the "Box 15 Club." The club is an enthusiast organization with open membership, devoted to the historical preservation and appreciation of the fire service. Nearly all members of the Box 15 Club share an interest in monitoring public safety radio communications.

The club takes its name from the street fire alarm box number 15. The box was located at berth 90, San Pedro, and was the first box to be pulled when the *SS Markay* exploded and burned in LA harbor on June 22, 1947. This event marked the greatest movement of fire apparatus in the city's history.

For more information, contact the Box 15 Club, P.O. Box 86547, Los Angeles, CA 90086-0547. Don't forget to mention *MT*!

Cordless Frequencies

The new cordless phone frequencies can be located by searching between 902.00 and 928.00 megahertz. As most of you already know, this particular frequency range also contains bothersome signals from microwave ovens, medical equipment and a variety of gadgets.

To help narrow your search, Neal Griggs has provided a group of frequencies that are utilized by "Panasonic" phones.

Base	Handset
902.10	926.10
902.13	926.13
902.16	926.16
902.19	926.19
902.22	926.22
902.25	926.25
902.28	926.28
902.31	926.31
902.34	926.34
902.37	926.37
902.40	926.40
903.87	927.87

If you know of additional 900 megahertz phone frequency assignments, please let us know. Send your information to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

Will we see you in September? Check your subscription expiration date.

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CALIFORNIA, STATE OF KME385 75,7600 FX1
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CALIFORNIA, STATE OF KSO845 154,3200 FB
CALIFORNIA, STATE OF WNBV336 155,4750 FB

800MHZ PUBLIC SAFETY
CALIFORNIA, STATE OF KNBG973 857,7375 FB2
CALIFORNIA, STATE OF KNCM203 857,9375 FB
CALIFORNIA, STATE OF WNN5451 858,2625 FB2
CALIFORNIA, STATE OF WNN5451 859,2625 FB2
CALIFORNIA, STATE OF WNN5451 860,2625 FB2
CALIFORNIA, STATE OF KNBG973 860,7375 FB2
CALIFORNIA, STATE OF WPBQ561 867,5375 FB2

FIRE
CALIFORNIA, STATE OF KPC41 33,8600 FX1
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CALIFORNIA, STATE OF KQP617 154,1600 FB2

LOCAL GOVERNMENT
CALIFORNIA, STATE OF WNKQ748 37,2600 FB2
CALIFORNIA, STATE OF KJS712 153,7550 FB2

FORESTRY CONSERVATION
CALIFORNIA, STATE OF WNU2478 44,6400 FB2
CALIFORNIA, STATE OF KWE503 44,8000 FB
CALIFORNIA, STATE OF KWE503 44,8900 FB
CALIFORNIA, STATE OF KWE503 44,9600 FX1
CALIFORNIA, STATE OF KBA647 151,2500 FB2
CALIFORNIA, STATE OF KBA647 151,3550 FB2
CALIFORNIA, STATE OF KBA647 151,3650 FB2
CALIFORNIA, STATE OF WNU2479 151,4150 FB2
CALIFORNIA, STATE OF KVV51 159,2700 FX1
CALIFORNIA, STATE OF KVV51 159,3000 FX1
CALIFORNIA, STATE OF KVV51 159,3300 FX1
CALIFORNIA, STATE OF KVV51 159,4050 FX1
CALIFORNIA, STATE OF WGC781 169,5000 FX0
CALIFORNIA, STATE OF KOO93 171,9250 FX0

HIGHWAY MAINTENANCE
CALIFORNIA, STATE OF KAE7576 453,8500 FX0
CALIFORNIA, STATE OF WGU627 47,2000 FB
CALIFORNIA, STATE OF KXQ825 452,9750 FX1
CALIFORNIA, STATE OF WPEB772 453,8500 FX0

COUNTY GOVERNMENT

POLICE
DEL NORTE, COUNTY OF WCL735 154,8150 FX1

FIRE
DEL NORTE, COUNTY OF WNGY237 154,0100 FX1
DEL NORTE, COUNTY OF WNGY237 154,2500 FB
DEL NORTE, COUNTY OF WNGY237 154,4150 FB2
DEL NORTE, COUNTY OF WNGY237 154,4450 FB

LOCAL GOVERNMENT
DEL NORTE, COUNTY OF WNGE47 39,8200 FB
DEL NORTE, COUNTY OF KSS224 153,9800 FB2
DEL NORTE, COUNTY OF WKM681 154,0850 FB
DEL NORTE, COUNTY OF WCP760 155,9850 MO1

SPECIAL EMERGENCY

DEL NORTE, COUNTY OF WCL656 462,5250 FX2
DEL NORTE, COUNTY OF KIB954 463,0000 FB
DEL NORTE, COUNTY OF KIB954 463,0250 FB
DEL NORTE, COUNTY OF KIB954 463,0500 FB
DEL NORTE, COUNTY OF KIB954 463,0750 FB
DEL NORTE, COUNTY OF KIB954 463,1000 FB
DEL NORTE, COUNTY OF KIB954 463,1250 FB
DEL NORTE, COUNTY OF KIB954 463,1500 FB
DEL NORTE, COUNTY OF KIB954 463,1750 FB

HIGHWAY MAINTENANCE
DEL NORTE, COUNTY OF WZJ219 156,2400 FB2
DEL NORTE, COUNTY OF KA48363 159,0150 MO

CRESCENT CITY

FIRE
CRESCENT FIRE PROTEC WNKJ623 154,2500 FB
CRESCENT FIRE PROTEC WNKJ623 154,2800 MO
CRESCENT FIRE PROTEC WNKJ623 154,4450 FB

LOCAL GOVERNMENT
CRESCENT CITY, CITY OF KDV790 156,0000 FB

SPECIAL EMERGENCY

AIR MED EVAC WNCX894 155,2200 FB
DEL NORTE AMBULANCE INC KD20629 150,7750 MO3
DEL NORTE AMBULANCE INC WPCB896 155,1750 FB
DEL NORTE UNIFIED SCHOOL DIS WNYW708 155,2800 FB
SUTTER COAST HOSPITA WNCJ425 155,2350 FB
SUTTER COAST HOSPITA KNDV810 463,0000 FB
SUTTER COAST HOSPITA KNDV810 463,0250 FB
SUTTER COAST HOSPITA KNDV810 463,0500 FB
SUTTER COAST HOSPITA KNDV810 463,0750 FB
SUTTER COAST HOSPITA KNDV810 463,1000 FB
SUTTER COAST HOSPITA KNDV810 463,1250 FB
SUTTER COAST HOSPITA KNDV810 463,1500 FB
SUTTER COAST HOSPITA KNDV810 463,1750 FB

KLAMATH RIVER

FIRE
KLAMATH FIRE PROTECTION DIST KNAJ398 153,7700 FB

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FIRE
SMITH RIVER FIRE PROTECTION KJS725 154,2500 FB

MISCELLANEOUS

AF AERONAUTICAL RADIO INC WCE8 130,2500 FA
AF AERONAUTICAL RADIO INC WCH3 129,1800 FA
MC ALIOTO FISH CO INC WHU786 158,8000 FC
IB AMERICAN SERVICE SERVICES WNGM243 151,7150 FB
IF ARCATIA REDWOOD CO WRI92 154,5400 FB
IF ARCATIA REDWOOD COMPANY KMB877 48,8400 FX1
IF ARCATIA REDWOOD COMPANY KMB877 48,1200 MO
IF ARCATIA REDWOOD COMPANY KMB877 49,2000 FB2
IF ARCATIA REDWOOD COMPANY KMB877 451,7125 MO
IF ARCATIA REDWOOD COMPANY KMB877 451,7125 MO
IF BAKER CHOPPING KEB2796 183,9850 MO
IF BAKER, GALE KDB2540 183,3850 MO
BA BERTEC BROADCASTING INC WLP746 847,8950 F4
BA BERTEC BROADCASTING INC WLP746 848,1250 FA
IF BETTENDORF TRUCKING WNCJ878 153,2750 FB4
IF BETTENDORF TRUCKING WNCJ876 156,4150 FX1
IF BETTENDORF TRUCKING WNCJ878 159,5150 FX1
IB BLISS, ROBERT M BLISS, DOROT WNNR984 151,8850 FB
IF BLUE STAR GAS CO C3851 166,1600 FB
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Ever since the first SPUTNIK was launched on October 4, 1957, folks have had a fascination with satellites. Of course those of us who are fans of science fiction know that Arthur C. Clarke postulated the design and use of communications satellites many years before the Russians beat us out of planet Earth's gravity well. Those of us who are amateur radio operators look back fondly on the launch of the first of the OSCAR (Orbital Satellite Carrying Amateur Radio) series of satellites on December 12, 1961. The next thirty-plus years would fill the spaceways with hundreds of orbiting spacecraft happily relaying signals to and from good old Mother Earth.

You may not realize it, but you are receiving satellite signals in your home every day. Commercial radio and television stations use satellites to relay up to the minute news and information around the world and into your home by way of their regular programming. Your local weather station gets much of its information from orbiting weather satellites that send pictures of the movements of the atmosphere back to earth. If you live in an area that is serviced by cable TV, much of the programming comes to your local CATV outlet from satellites.

Your computer system at work may be linked to others on a worldwide network by way of satellites. Now, even campers and boating enthusiasts can take advantage of satellite based navigation by way of handheld Global Positioning System (GPS) units. In other words, satellites permeate our communications experiences so seamlessly that we barely notice their presence.

Radio monitors, being curious folks by nature, like to get a little closer to the satellite experience. It can be fun to receive satellite signals directly instead of waiting for the CATV people to relay them down the cable. Amateur radio operators have even perfected the process of sending and receiving signals through amateur designed satellites that ride into space on "piggyback" with professionally launched satellites.

Interest in satellite monitoring is growing. *Monitoring Times* has long carried Ken Reitz's "Satellite TV" column. Grove Enterprises has now taken the next step by announcing a new magazine called *Satellite Times*. It becomes obvious that Old Uncle Skip should pull together a column that could tell beginners a little bit about how satellites work and how they might get in on some of the fun.

WHY DO SATELLITES MAKE ANY SENSE???

After all, it costs more money than you and I are ever likely to see to get one of these birds up and into orbit!

To get an idea of why satellites are a great way to go, you first have to look at how radio signals normally work. Signals in the HF "shortwave" bands (roughly 3 to 30 MHz) travel around the world by bounc-

ing off the various layers of the earth's ionosphere (see Fig. 1). As most of you know from monitoring the HF spectrum, signals in this range are subject to atmospheric and man made noise. These signals also fade and vary in strength depending on such things as time of day and solar conditions.

Why can't HF signals be more well behaved? Why can't they be more like VHF, UHF and higher frequencies? Signals above 30 MHz are less likely to be bothered by noise and atmospheric conditions.

Well, VHF and higher signals have their own set of problems. First of all, they tend to work best only within "line of sight" situations. Further, they usually cannot bounce off of the upper reaches of the atmosphere like their HF cousins. Most signals in the VHF and above range punch right out through the ionosphere and off into space. Folks living out near the star Pollux in the Gemini constellation are probably just now getting a kick out of "I Love Lucy," "Leave

It to Beaver," and "The Mickey Mouse Club" as we speak for this very reason.

Science and engineering provided the perfect solution to combine the best of both radio frequency worlds. The solution was to put something up in the sky to "bounce" VHF and higher frequencies off of. One early series of satellites, called ECHO, literally did just this. ECHO was little more than a 100 foot tall metal foil covered balloon put up around 100 miles that allowed signals to be reflected off of its surface.

I can remember tracking ECHO with the naked eye when I was a kid. Obviously much better efficiency came about when engineers developed satellites' onboard electronics into sophisticated receiving and retransmitting units known as TRANSPONDERS. Transponders allow for a chunk of the VHF, UHF or higher bands to be received from earth stations and then be retransmitted back to earth with great efficiency. Any two stations that could point their antenna at a satellite could talk to one another (Fig. 2). Pretty neat, huh?

You also have to realize that this technology has gone from a weak CW signal to the pictures you see everyday on CNN in less than 30 years!

Okay, so one station can send a signal up to a satellite and another station on the ground can receive it. Sounds easy enough, right? Oh, did I mention that these thingys need to move constantly at high rates of speed (in excess of 18,000 miles per hour) at all times to keep from falling back to earth? Not so easy, right?

Well, we owe a lot of our satellite launching abilities to Johannes Kepler, a German mathematician/astronomer who hung with guys like Galileo Galilei and Tycho Brahe back in the good old days of the 16th century and the Holy Roman Empire. Kepler developed three mathematical ideas that explained how objects move in orbit. Of course Kepler applied his laws to the movement of the planets around the sun and the moon around the earth, because folks were still a good 300 years from

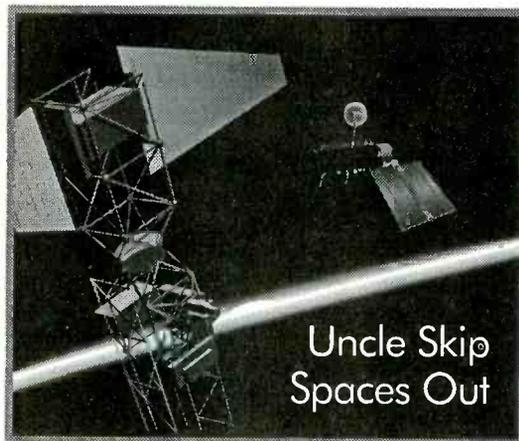
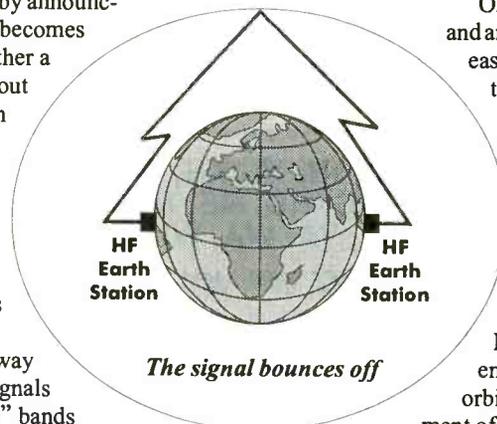


Fig. 1: IONOSPHERE



figuring out how to toss anything up into the sky and making it stick.

Anyway, by applying Keppler's three laws, a satellite can be launched into a predictable orbit that will put it on the track desired by the earth stations planning to use it. You cannot only control the route the satellite will travel but, by stretching the orbit into an ellipse, you can control how long it appears over any particular location. Kepler's three laws can be stated in a paragraph but would probably take several articles to fully explain. If you're really interested, remember that summer is a great time to head for the library to cool off in the air conditioning and to learn some new things. Head for the astronomy section first.

Can you make a satellite stay in one spot all the time? Yes and no! As I said earlier, satellites have to keep on truckin' at over 18K mph to keep from burning up in the atmosphere, like Scotty was always warning Captain Kirk the *Enterprise* was going to do. But there is a neat trick that can make a satellite remain over one place and still not crash to earth. You can launch a satellite up to 22,300 miles above the earth's equator. At this height, the orbital speed needed to keep a satellite "satelliting" matches the speed of the earth's rotation match up.

Satellites placed on this particular orbital path are considered to be in SYNCHRONOUS ORBIT with the earth. All you need to do is put up three "birds" in synchronous orbit spaced 120 degrees apart and you have continuous worldwide coverage. This is how we currently get much of our international television and other forms of communication.

Not all satellites are intended for synchronous orbit. Satellites are launched in various directions and at various heights to accomplish everything from communications and exploration to weather forecasting and spying. Tracking satellites with any precision will make you break out a calculator to do the math, but it really is not that difficult. Now that chasing satellite signals has become popular, you will find a growing number of books and even computer programs to help you learn what's up in the sky and where. Check out the catalogs of the advertisers in *MT*, especially those who service the amateur radio community. Getting in on the ground floor of satellite monitoring is going to take a bit more than reading Old Uncle Skip's columns, but help a plenty is out there.

Serious satellite monitoring will lead you to acquire some new equipment. If your interest develops beyond occasional eavesdropping, you may get into constructing or purchasing directional antenna systems (such as this month's feature article on milsats) and azimuth and elevation rotators. Don't figure on mortgaging the house to do this, though. Hams have come up with all sorts of ways to track satellites on a shoestring budget.

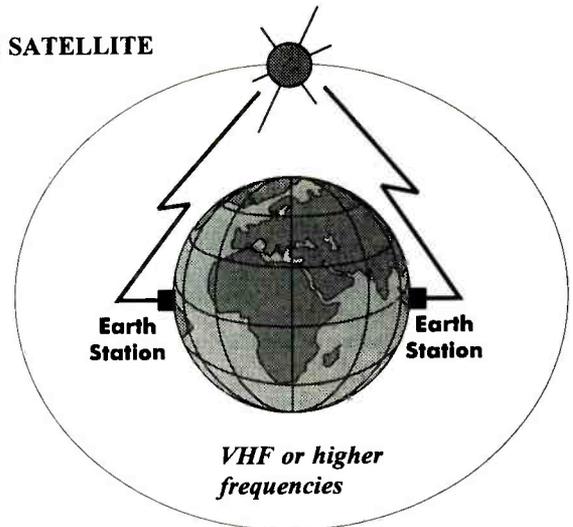
Before you run out and buy that military surplus radar dish to scare your neighbors with, however, let's take a look at a satellite you can hear right now with your average scanner. An outside antenna — especially a discone — will help a lot, but this bird can be monitored on a handheld scanner when the time is right.

145.825 FM

Plug this frequency into your scanner, wait a bit and you will hear the beacon signal of the DOVE. Dove stands for Digital Orbiting Voice Encoder. It is a satellite put up through the efforts of Dr. Junior Torres de Castro PY2BJO, a Brazilian ham, and BRAMSAT, a Brazilian amateur satellite group — hence it is also considered to be OSCAR 17. When the Dove flies over your location you will hear bursts of packet radio noise, but you will also hear a synthesized voice "speaking." If you have the ability to intercept and decode packet radio signals, so much the better. Dove uses ham standard AX.25, 1200 bps packet protocols.

Dove is likely to pass over your location at least four times in any twenty-four-hour period. Plug the frequency into a priority channel and you won't miss it on its next pass. If you do happen to hear the voice of the Dove you can send reception reports to Dr. Junior Torres de Castro (PY2BJO), 119 Macaubal, Sao Paulo, Brazil 01254.

Fig. 2: SATELLITE



Tracking and monitoring satellites can be seriously addictive. In addition to the usual pleasure of satiating one's curiosity, you get the additional rush that can only come from learning something new. If you're willing to take the few extra steps to get your No-Code Technician's Class ham license, you can even get in on the fun of sending your own signals through space. If, during your monitoring, anyone from the Gemini constellation contacts you, be sure to tell them that Uncle Skip says Hi!

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Further publications available are *Guide to Facsimile Stations*, *Air and Meteor Code Manual* (13th editions) and *Radioteletype Code Manual* (12th edition). We have published our international radio books for 24 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. For recent book reviews see Larry Miller in *MT* 9/93 pages 90/92 and Bob Evans in *MT* 10/93 page 57. All manuals are published in the handy 17 x 24 cm format, and of course in English.

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ALBANIA R. Tirana announced its First Program would be on SW 6100 at 0300-2200; Second on 6145 at 0900-1400 (BBCM) 6100v already heard for a long time (Wolfgang Büschel, Germany) see SERBIA

ANGOLA R. Nacional, Benguela, active on 5043 and 6154; only Luanda frequency active is 3354.3, irregular (Vashek Korzinek, South Africa, *Play-DX*)

AUSTRALIA Brisbane isn't back on 9660, but R. Australia's 10 kW unit in nearby Brandon, 10° to PNG at 2100-0800, in English except 0000-0030 French (Mike Bird, Radio Netherlands *Media Network*) RA Darwin has two new transmitters, but not much more frequency usage since they are cheaper to operate than old ones, and of the total five, one is usually on standby (Derek White, RA GM on RNMN) BBC now relayed by RA Shepparton, 11695 at 2200-2300, 100 kW, 355° to SE Asia (BBC via Dan Ferguson, VOA, USENET via George Thurman)

Australian Defence Forces Radio (Ex-AAFR), now via Exmouth 10848.5 USB Mon. & Fri. only at 1600-1700 to Somalia, likely to increase; Belconnen 18735 USB (or standby 13525) 0430-0530 a live program repeated at 0930-1030 & 0100-0200 to Malaysia; both 40 kW. Reports welcome to Hugh McKenzie, ADFR, ANZAC Park West 1/B/07, Reid, ACT 2601 (*DX Window* via DSWCI *SW News*)

BANGLADESH RB English at 1230-1300 on 11895, 13615, 1815-1900 on 7190, 9680 (Mike Hardester, NC, via Arthur Cushen, RNZI)

BOLIVIA New transmitter heard testing on 4632.4 in late May for a new station in Guayaramerin, 2230 non-stop music to 2320 announcement as 4630, again at 2327-2344, 2359-0025; the tester called Guayaramerin so this came from somewhere else (Henrik Klemetz, Colombia, *Play-DX*)

BOUGAINVILLE R. United Bougainville, 3880, had been threshold until mid-May 1147-1207*, closing with ID and anthem at 1205 (Guy Atkins, WA, HCJB *DX Partyline*)

CANADA CFRB now offers Toronto-area listeners a free daily fax newsletter of top news and program highlights; local callers only press (416) 928-2827 for menu item 4 (Nigel Allen, *ibid.*, USENET)

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COSTA RICA For third quarter RFPI retains *World of Radio* at: Fri. 2000, Sat. 0400, 1200, 1800, Sun. 0200, 1000, 2300, Mon. 0700, Tue. 1900, Wed. 0300, 1100 on some of: 21465, 15030, 9400, 7375. RFPI is at a critical financial point; one way to help is to sign up for *Peacecom*, long distance service at a saving, yet RFPI gets a cut; info from 503-345-3326, ext. 7456 (RFPI *Vista*) Some subjects of *Far Right Radio Review*, Fri. 1830, Sun. 2230 plus repeats, have retaliated with name-calling; the Neo-Nazi *American Dissident Voices* calls RFPI "neo-communist," while Pastor Pete Peters, *Scriptures for America* goes with just plain "communist" (gh) RFPI now has weekly hour for young people, Suns

All times UTC; all frequencies kHz. *Asterisk before/after time station sign-on/sign-off; // parallel; + means continuing but not monitored; = 2 x indicates 2nd harmonic of following frequency.

1800 plus repeats, *Working Together*, and *My Green Earth* (RFPI Mailbags)

CUBA Keith Perron of Laval, Quebec, is going on a new adventure to work for RHC; listen for his voice on the air shortly (*International Radio Report*, CKUT Radio McGill via CIDX) [non] **La Voz del CID** finally

disappeared from 6305 and 9942 in mid-May; Húber Matos confirms they are off but holding onto transmitter site in Central America for possible return. Rumors are that CIA cut funding, and not enough could be raised from exiles (Jeff White, *Radio-Enlace*) CID was still going May 5 on 6305.8 (Takeshi Sejimo, Japan, *Radio Nuevo Mundo*)

LA VOZ DEL CID
Cuba Independiente y Democrática
CERTIFICADO DE SINTONIA

CZECH REPUBLIC R. Metropolis granted license to operate a foreign service, from summer onwards, on SW to C&W&E Europe, N. America, in Czech, English, Russian, gradually increasing to 20 hr per day (*Mlada Fronta Dnes* via BBCM) In addition to R. Prague, but on whose transmitters?

EQUATORIAL GUINEA New address for Panamerican, which QSLs for R. Africa: 20410 Town Center Lane, Suite 200, Cupertino, CA 95014-3230 (Andy Sennitt, RNMN)

ETHIOPIA VOE, 7110.05, *0359-0410 opening with usual "jack-in-the-box" IS, weak but weaker on /9705, 5990, UT Sunday when opens half an hour later than other days (Brian Alexander, PA)

FRANCE R. Nostalgie/Neige, NBFM from ski-lifts on 25710, 25900, 26070, has 42 transmitters from 5 to 150 watts active in winter, but only three in summer. For QSL best send tape to tech. mgr. Hervé Pichat, R. Nostalgie, 9-11 Rue Franquet, 75015 Paris (Risto, Finland, Internet via HCJB *TLC*)

HAWAII Last month's item about AWR must be a case of mistaken identity. AWR is expanding but not looking for property in Hawaii; already is expanding excellent station on Guam, with Europe and Africa to follow, and unlikely to invest in expensive 500 kW transmitters (Adrian Peterson, IN, AWR) See USA

HONDURAS R. *Internacional*, 4930, had a long special bilingual mailbag on a UT Sunday at 0130-0430* replying to many DX reports, the next to be two weeks later (Henrik Klemetz, *Play-DX*) Full address on QSL from Victor Antonio (Tito) Handal, gerente propietario, is Primera Calle, 4-5 Avenida N.E., Edificio Bendeck, Apartado 1473, San Pedro Sula; started April 15 (Jorma Mantyla, Finland, USENET via Thurman) DST of UT-5 began May 11, so programs one hour earlier, and *1000v weekdays *1100v Suns (Takayuki Inoue N., *Relámpago DX* via RNM) **R. Copán**, 15675 has new DX program *Radio Waves*, from Global DX Club, Alabama, by David Williams, 2nd & 4th Sats. 2215 (HCJB *TLC*)

INDIA AIR GOS in English complete: 2245-0045 on 9950, 15110, 1800, 9705, 11745, 15145; 1000-1100 on 15050, 17895, 15180, 17387, 21460; 1330-1500 on 15120, 13750; 1745-1945 on 11935, 15075, 9650, 9950, 7412, 11620; 2045-2230 on 9950, 9910, 11715, 15225, 7412, 11620 (Alok Das Gupta, Calcutta, DSWCI *SWN*) First broadcast also heard on 13750 (Bob Padula, Australia, *ibid.*, and Brian Alexander, PA) 1330 actually on 13732 (Ralph Famularo, Japan, *SPEEDX*)

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WA & BC, FT) Which would be TIMOR EAST.

IRAN *Glas Islamske Republike Iran* has new Serbo-Croat service for Bosnia, 1830-1900 on 500 kW 9745 (BBCM) VIRI, English at 1930-2027 on 9022 and new 11965 (RVI *Radio World* via BDXC *Communication*)

JORDAN R. Jordan in Arabic at 2145 on 11940 // 12000—spur or new freq? (Hans Johnson, MD, HCJB TLC)

KOREA NORTH **Young Solders Broadcasting Station**, has been around for about five years; since 1992 on 1615-v kHz, hyper-power overriding Japanese traffic outlets on 1620 after *1445. Different programs on 3025 but same ID and program pattern like other NK stations filled with perpetual praise of Great & Dear Leaders, but more emphasis on badly-acted anti-Imperialist war plays; music is different from that heard on KCBS and PBS. On one occasion, 3025 was already on at 1350. Similar station but never any ID, and not // on 2625 almost nightly from 1500, sometimes as early as 1400 or 1320 (Tsunaaki "Sonny" Ashimori, Japan, *SPEEDX SW Radio Today*) **R. Pyongyang's** prolific harmonics: from 7250 on 14500, 21750 and 29000 at 0840; from 6400 on 19200, 25600, but 12800 covered by ute at 0852 (Ralph Famularo, Japan, *SPEEDX*)

LITHUANIA R. Vilnius announced new 9530 for 2030 broadcast, still heard at 2300 on 11770 (Vasbir Singh, NJ) English at 2030 supposed to be daily, unlike 2300

MADAGASCAR RTVM active on 7154.8 +0500-0800+ (Vashek Korzinek, RSA, *Play-DX*)

MALDIVES VOM testing SW again for external service to neighbors, 7350 heard at 0400-0800 relaying domestic with some English announcements, very good modulation so new transmitter; first SW in five years (Jose Jacob, Hyderabad, India, via Goonetilleke, Shri Lanka, *RNMN*)

MONGOLIA RUB in English, as monitored mid-May, subject to variation: daily 0910-0940 on 12015, 11850; Mon., Wed., Thu., Sat. 1200-1230 on same; daily 1445-1515 on 13780, 7260v, and 1940-2010 on 12015, 11790; Sunday only at 0520-0550 on 12015 (BBCM) 0520 Sun. actually monitored in Japanese (Y. Kato, *RJMR*)

MOZAMBIQUE V. of Renamo, presumably from own transmitter, Gorongosa (Sofala), no longer clandestine, heard since 17th May in Portuguese: 0500-0600 on 6145, 1045-1145 on 9900, 1600-1700 on 5180; from last Oct. to Dec. it used Swazi Radio facility (BBCM) Catholic Church plans a new station before the Oct. 1994 elections serving 500 km radius from Beira, so must be SW (*Beacon*, WACC newsletter via HCJB *DXPL*) In 1972 they had **R. Pax** there on 3960, 7205 (*Broadcasting Stations of the World*)

MYANMAR (non) Democratic V. of Burma, via Norway, announced on the 1430-1455 broadcast on 11850 it was adding two more, at 0000 on 19m, 0030 on 19 and 25m (BBCM)

NEW ZEALAND RNZI staff hail from Fiji, Cook Islands, Western Samoa, Switzerland, Netherlands, Aotearoa—Linden Clark, Myra Oh, Walter Zweifel, Elma MaUa, Bruce Hill, Greg Tatere, Florence de Ruiter,

Kay Edwards, Brian Strong, Niva Retimanu, Adrian Sainsbury (Sainsbury, via Jim Jowski, Fidonet *SW Echo* via Thurman) Surely Rudi Hill and Arthur Cushen should also be mentioned! (gh) Fax us at 64-4-4741-433; phone 64-4-4741-437 (RNZI Mailbox)

Kiwi Radio has been active almost every Sunday on 7445 USB between 0400 and 0900, typically 0600-0800; better signal with antenna trimmed; stereo on 7455.1 and 7454.9. **ANZAC Radio** also

heard via Kiwi; and **Radio G'day**, Australia which has been unable to safely broadcast from there due to crackdown, threat of A\$10K fine, confiscation of all possessions from site. Will be on one Sunday a month via Kiwi 7445, times and dates TBA (Craig Edwards, Australia, *Fine Tuning*) Illustration via Gigi Lytle

PALESTINE A station at Ramallah has been restored, PLO wanted to call it Voice of Palestine, but may settle for **Voice of the Palestinian People** because of Israeli objections. Israeli customs held up delivery of \$250K worth of radio equipment donated by Germany, Europe (AFP and AP via Ken Mason, DC) **R. Monte Carlo Middle East** is in charge of setting up the new Palestinian radio (AFP via BBCM)

PAPUA NEW GUINEA NBC shut down two provincial stations in Kundi Service, says the *Post-Courier* newspaper, **Radio Western** and **Radio Northern**. There might be more closures the following month. **R. Milne Bay** reduced nightly broadcast from 6 to 3 hours after air conditioning broke down. Health authorities say **R. Gulf office complex** is a health hazard (R. Australia via BBCM) Respective freqs: 3305, 3345, 3365, 3245 (**WRTH**) One morning in May around 1030, 3365 was heard; 3305, 3345 and 3375 were not on; 3245, 3325 and 2410 were not heard (Hans Johnson & Dave Valko, MD, FT) Fabulous opening the next day at 0930-1015; these logged: 3205, 3235, 3245, 3265, 3275, 3315, 3355, 3375, 3385, 3395 (Ben Krepp, MA, FT) By mid-June 3345 was back on, excellent, but these were missing: 3275, 3375; blocked by utes were 2410, 3365. All those were // for news at 0900 (John Bryant, BC, FT)

PERÚ **R. Otorongo** (name of a local jaguar) is new on 4108v, from Maipuco, Loreto, irregular usually as a point to point link with Iquitos (J. Jáuregui, *La Voz de la Selva*, *WRTH LA-Newsletter* via *Play-DX*) **R. Tarma Internacional**, 4775, asks for reports, to be answered on *Alegre amanecer*; may have pennants. **R. La Oroya**, 4904.9, opening varies widely, *0935 one day, missing; still at 1100 another; announced Suns. from *1500, heard closing at 0005*. **R. Madre de Dios**, 4950.1, ex-4953 UT Mons. until 0200v* includes taped reports from RAI, BBC, RN, REE and DX reports from abroad. **R. Ilucán** returned to 5614v after 3+ months on 5422.2. **R. América**, Lima on 6010.6 at 2330, exactly the same decimal as **R. Mundial** 1040, Venezuela, audible earlier at 2058. **R. Huancabamba**, 6281.7, raised power so better signal, from 6:30 a.m. local to late at night (Henrik Klemetz, *Dateline Bogotá*) **R. Oriente**, 6190, reactivated early June after 6 weeks, rooster at 1000 (Hans Johnson, MD, HCJB TLC)

PHILIPPINES FEBC March-Sept. English guide no longer shows any DX segments.

Good Morning from Manila, on 15450 at 0000-0200 (Sat., Sun. - 0130) has different



theme each day: Sun., Family; Mon., English practice; Tue., Science, Tech., World Around Us; Wed., Health & Character; Thu., Culture; Fri., Keeping in Touch; Sat., Arts, Crafts and Hobbies including Cooking (FEBC Radio International)



Kiwi Radio

Q.S.L.

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Glenn Hauser, Box 1684-MT, Enid, OK 73702

PORTUGAL R. Renascença, Catholic station sked differs greatly from *WRTH-94*: to Brazil, daily 0015-0130 on 9600; to Europe. Mon.-Fri. 0300-0500 on 6100, Sat. 0845-1000 on 9575, Sat. & Sun. 1300-1600 and daily 1600-1800 on 9680. Euro service one hour later in winter. Fax +351-1-3422658 (BBCM)

RUSSIA Christian Radio Stn. Alpha & Omega, via 200 kW Yekaterinburg on 9865 daily 1400-1500 in Russian; one hour later in winter. Phone Moscow 259-9397. R. Stantsiya Tikhyy Okean, Vladivostok, Russian 0715-0800 includes English news Sat. 0750-0753, on 17860, 17850, 17805, 17645, 17610, 17590, 15535, 15425, 15415, 15180, 12070, 12050, 12010, 9865, 9820, 9780, 9670, 9635, 7210, 7185, 243; one hour later in winter (BBCM)

R. Moscow's *Audio Book Club* is scheduled: Mon. 0930, 1331, 1631, Tue. 0231, 0731, 2231, Wed. 1031, Thu. 0231, 0731, 1331, 2231, Fri. 1031, 1631, Sat. 0231, 0731, 1331, Sun. 0031, 1031, 1631, 2231 (via Daryl Rocker, NY, and Alex Ageenkov, USENET via Thurman, R.I.B.)

World University Network with Dr. Gene Scott heard on 15500 at 1520 and 0815, presume via Russia (Tony Rogers, BDXC *Communication*)

RWANDA (non?) R. Muhabura on 6285.0 until 2006*, from *0410 on 6275 (Vashek Korzinek, RSA, *Play-DX*) Spanish nuns heard this station tell how to torture and dispose of bodies (*Distance Unknown*, Spanish Foreign Radio)

SERBIA R. Yugoslavia, mostly via Bijeljina, eastern Bosnia, English complete: 0000-0030 Mon.-Sat. to Am. 11870, 9580; 0430-0500 daily on same. 1830-1900 Eu/Af 9720, 6100; 2030-2100 Eu 9620; 2100-2130 Eu 9595, 7265. Spanish daily 1900-1930 on 7220, 6100; 2300-2330 on 11835, 9720. Serbian to America, 2130-2200 on 9595, 7265 (at 2155 R. of the Serbian Republic of Bosnia-Herzegovina); 2330-2400 daily, 0000-0030 Sun., 0030-0100 daily on 11870, 9580. Note RY uses 6100 at various times between 1530/2100 despite ALBANIA (BBCM)

SPAIN RNE-RE has service in unspecified language to Equatorial Guinea at 1600-1700 on 17755; Sephardic (Ladino) to S. America UT Fri. 0115-0135 on 15325; N. America Fri. 0415-0435 on 9690 (REE) Pseudo-DX program UT Sun. around 0015, 0115, 0515 on 9540 has been renamed *Distance Unknown* (Diane Mauer, WI)

SWEDEN R. Sweden 0230 & 0330 on new 6155 // 6040, 9850 (Bob Thomas, CT) Ex-6040 (*SCDX-Mediascan*) At 0030 on new 9810 // 6065 (Marie Lamb, NY, HCJB *DXPL*)

THAILAND R. Thailand will begin worldwide SW service via VOA Udorn transmitter June 4, totalling 25 hpd in English, French, German, Mandarin, Malaysian, Indonesian, Japanese, and lots of Thai (R. Thailand via BBCM) Facility was dedicated June 4, cost \$120M, with 7 x 500 kW, one of which is for RT; transmitters remote-controllable from Washington control room; new ones are high-tech, better audio, more efficient, and relieving load on vulnerable Philippine relay (Bill Whitacre, *VOA Communications World*) satellite transmitter link problems delayed RT usage of VOA until July, but began new programming anyway June 4 via own old site, 1700-0600 in 12 languages to ME/Eu/Af/Am; 1000-1700 as before to Asia; English at 0000-0100, 1130-1330, 1900-2000, 2100-2300; mixed with Thai 0100-0600 on 4830, 9655, 11905. Udorn will use 35 fqs 6020-15445 at 1700-0600 (Miss Amphorn, RT External Service Chief, via Tetsuya Kondo, ABI, *RJMR*) Room to add 4 more 500 kW; has 25 slewable curtains (Amphorn & Dondo, *RNMN*) Changed plans to use Udorn for all services when satellite link ready, target date July 1 (Amphorn & Kondo, *RJMR*)

URUGUAY SODRE has started tests via CXA-5, 6010 LSB, to the Uruguayan base in Antarctica, with CX-26 news, music, sports and other programs, Mon.-Fri. 1000-1600, Sat. & Sun. 1400-1500, 1800-2200. Is 150 W PEP, half-wave sloper dipole; soon increasing to 1 or 1.5 kW with linear. If satisfactory may use 25 mb on SSB, not 15275. Transmitter adapted by my ham friend and tech. mgr. of SODRE SW, Francisco

Escobar; report to him at P.O. Box 1412, 11000 Montevideo (Horacio A. Nigro, Montevideo, *World of Radio*) Coincidence it's on inactive AFAN frequency? (gh) 25m used to be 11855 (Inoue, *RPDX* via *RNM*)

USA WRMI, 9955, resumed testing in late May, 2315-2400* (gh) No more harmonic complaints, began programming UT June 14, 0100-0400 Tue.-Sun., with *Viva Miami* in English at 0100, Spanish 0130; *La Voz de la Fundación* 0200-0400; soon to be expanded (RMI) Heard inaugural broadcast; congrats, Jeff! Most signal goes to S. America, and during initial subnormal propagation, audible but not very strong here. GH invites evaluations from listeners around N. America on whether it would be useful to place *World of Radio* or *DX Daily* on WRMI. An open carrier would with intermittent tones come on 9958 around 0130, to interfere? WRMI tried Creole before 0030, and on *Viva Miami* UT Weds 0100 "Around the World with Marcel Rommerts" feature; UT Tue piloted music show "Caribbean Ticket with Tony Lee." WRMI seems undermodulated (gh)

World of Radio change to the schedule last month: WWCR, 7435, UT Sun. 0400 ex-0315; see also COSTA RICA.

The Old Radio Shop also shifted, to Sun. 0430 on 7435. *The Big Backyard*, Aussie music, moved to Mon. 0530 on 5810 (Adam Lock, WWCR) Also new on WWCR sked; *Extraordinary Science Radio Hour*, Fri. 0300-0400 from International Tesla Society on 7435; Willie Nelson's *Outlaw for Peace*, tentatively Sun. 2200-2300 on 12160 (WWCR) First Tesla show was on fluoridation conspiracy (gh)

Now that Joe Brashier has moved from WWCR to WHR, he can do his southern gospel music show, *Turn Your Radio On*: Sat. 0700 on 7315 and 9495; Sun. 0500 on 9495; Sat. 1600 and Sun. 1700 on 7425. *Sound Currents of the Spirit* Sat. 1500 on 9930, Sun. 1600 on 7425 (WHR *DX Radio Show*)

MRI plans to implement in September a program concept known as *continuous stream programming*, incorporating updates throughout the broadcast day (C. Ed Evans, WSHB, USENET via Thurman)

WVHA Since Scott's Corners is a made-up name not to be found on road maps, WCSN Manager Stes Stessel thoughtfully provides this map on the bck of his business card showing how to find WCSN in Maine. Now is a good time to visit, before *WVHA* takes over Sept. 19



WCSN

An International Shortwave Radio Station

VOA cancelled Portuguese to Brazil in April on shortwave, but after listener protest,

announced it would resume June 20, weekdays 2200-2230 on 11680, 15330, 9455, 17740 all via Greenville. But from June 21, VOA dumped second hour of weekday Spanish, now just 0200-0300 (via John Vodenik, OH) VOA sources deny the HCJB report in our May column that SW will soon be totally dropped by VOA (gh)

More 26-MHz DX thanks to sporadic E: WMAR-TV, Baltimore, on 2635* at 2155; WLW, 700, Cincinnati on 26450 and new WCKY, 550 on 26110 (Alan Roberts, PQ, *World of Radio*)

UZBEKISTAN R. Tashkent, undated schedule includes: *Life in the Village*, Wed. 1200. *Munosabat*, 4th Thu. 1330, repeated 1st Thu. 1330, 2nd Sat. 0100. *Assalom Aleikum, Asia!*, 3rd Fri. 1200 & 1330. *DX Programmes*, 2nd Sat. 1330, repeated 3rd Fri. 0100 (via Daryl Rocker, NY) 1200 & 1330 on 15495 & 17815 ex-15420 & 17745, not heard on announced 9715, 6025 (Eugene, RVI *Radio World*)

YEMENS Instead of a 9th harmonic, believe Sana'a on 9069v is a mixing product between 9780v and MW 711 kHz, since both varied but stayed exactly 711 kHz apart at two different times: on extended sked to 2305* on 9780.32 and 9069.32; at 0302 on 9779.77 and 9068.77 (Brian Alexander, PA, *W.O.R.*) Fine example of usefulness of precision frequency measurement! (gh) But MW and SW sites are different if *WRTH* is correct (Bill Westenhaver, *SPEEDX*)

Until the next, Best of DX and 73 de Glenn!

Broadcast Loggings



Gayle Van Horn

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

0017 UTC on 4950

PERU: Radio Madre de Dios. Spanish. Sermon text to religious vocal. Numerous IDs with frequency quote. FM outlet frequency mentioned as 92.5 with identification. (Giovanni Serra, Rome, Italy)

0026 UTC on 13700

CUBA: Radio Havana. Mailbag to *Top Ten* featuring music from Cuba. (John Sedlacek, Omaha, NE) Cuban tunes into national newscast at 0121 on 6010, 13700 khz. (Jim Moats, Ravenna, OH) *DXers Unlimited* audible on 9820 khz at 0330. (Sedlacek, NE)

0027 UTC on 11695

UNITED STATES: Voice of America. Feature, *Report to the Caribbean*. Sports and weather report into program *Music USA*. Standards presented by Willis Conover at 0030. (Moats, OH)

0054 UTC on 9745

ECUADOR: HCJB. *What's Cooking in the Andes* show, with hints for cooking at elevated altitudes! (Gerry Le Strange, Brunswick, NJ) *Ecuadorian Moments*, cars in Ecuador, 17790 kHz at 1920. (Bob Fraser, Cohasset, MA)

0142 UTC on 9420

GREECE: Voice of Greece. Greek music. Cultural report on new book on the history of Greece, Macedonia and Rome. (Le Strange, NJ)

0245 UTC on 4845

GUATEMALA: Radio Kek'chi. Spanish/Kek'chi. Choral hymn to 0247. Sermon to local announcements. Spanish ID with frequency quote. Sign-off 0305. *Buenas Nuevas* station on 4799 kHz at 0320. Spanish announcer with regional chat. Fair signal for rustic tunes. (Sam Wright, Biloxi, MS)

0257 UTC on 4824

PERU: *La Voz de la Selva*. Spanish. Announcer talking at tune-in. Station ID at 0300, followed by time check. Station frequency and announcement to national anthem and sign-off. Tentative logging on *Radio Melodia* on 5995 kHz at 0248. (Brian Bagwell, St. Louis, MO)

0310 UTC on 4820

HONDURAS: La Voz Evangelica. Spanish. Religious sermon to hymns. Prayers, sermonette, and ID at 0330. (Bagwell, MO)

0330 UTC on 4930

HONDURAS: Radio International. Spanish. Announcer duo at tune-in. Station ID, "esta es Radio International de Honduras." Spanish pops to classical American tune. (Bagwell, MO)

0338 UTC on 9400

COSTA RICA: Radio for Peace International. Mailbag on USB and parallel 7375 kHz. (Sedlacek, NE) Also heard, 0254 on 9400 USB, 0737 on 7375, 2152 on 21465 USB. (Gerald R. Brookman, Kenal, AK)

0359 UTC on 7110

ETHIOPIA: Voice of Ethiopia. Station sign-on with distinctive "Jack-in-the-Box" interval signal melody. Station ID and male announcer in unknown African dialect. Talk and regional style music on // 5990 and 9705 kHz, fair signal quality. (Garland J. Thomas, Cleveland, OH)

0359 UTC on 5050

TANZANIA: Radio Tanzania. Celeste interval signal to 0400. Time signal pips to station identification. Fair-poor signal quality during English news service. Regional style music. (Bagwell, MO)

0430 UTC on 4885

BRAZIL: *Radio Clube do Para*. Portuguese. U.S. and Brazilian pop vocals. "Canned" commercials and IDs. Brazil's *Radio Difusora* in Caceres monitored on 5055 kHz from 2325-2345. *Radio Cacao Nova* heard on 4825 kHz at 0430, with religious music & ID. (Thomas, OH)

0512 UTC on 4765

CONGO: Radio Congo. French/Regional dialect. French announcer's brief update to "Radio Congo" identification. African pop tune. Still waiting on my '93 reception report! (Alex R. Johnson, Atlanta, GA)

0840 UTC on 5040

COLOMBIA: La Voz de Yopal. Local time check at tune-in. Coffee and cola ads to Spanish pop style vocal. Caracol network IDs to promotional. (Frank Hillton, Charleston, SC)

0848 UTC on 15170

ARMENIA: Radio Yerevan. French. Program on politics, cinema and "man-on-the-street" interview segment. Frequency quote to ID. Armenian announcement to national anthem 0859". 17770 kHz. (Serra, Italy) Station on 11790 kHz with IDs, newscast and folk music. Spanish service at 2145 on // 11920, 11945 kHz. (Ken Varian, Bangor, ME)

0859 UTC on 4874

INDONESIA: RRI-Sorong. Indonesian. Closing thirty seconds of pop vocal music to announcer's ID. SCI (*Song-of-the-Coconut-Island*) interval signal. Jakarta news relay, regional news update. Good signal despite summer static! (Tod Williamson, Santa Monica, CA)

0955 UTC on 4858

PERU: *Radio La Hora*. Spanish. Male announcement to 1000 ID and frequency quote. Peruvian anthem to religious hymn and text. Peru's *Radio Mundo* monitored with poor signal quality at 1005 on 5082 kHz. Peruvian vocals, commercial and "Radio Mundo" ID. (Hillton, SC)

1016 UTC on 6010

MEXICO: Radio Mil. Spanish. Ranchera vocal to station ID and frequency quote. Nice signal for announcer's talk and local commercial. Jingles, promos and time check. (Wright, MS)

1030 UTC on 9505

CZECH REP: Radio Prague. Station IS and ID. Editorials and *Live in Prague* feature. Audible on 7345 kHz and 5930 kHz at 1705. National news to IDs and program on Czech culture. (Williamson, CA)

1100 UTC 15565

AUSTRALIA: Radio Australia. International to national headlines. IS to pop music. Additional programming on; 21725 kHz at 0923, 21595, 17715 kHz at 0550. (Serra, Italy) Station monitored on 17860 kHz at 2339, with US Ambassador to Australia. (Le Strange, NJ); (Williamson, CA) ID to time signal pips, national news. // 15365 kHz. (Moats, OH)

1102 UTC on 6005

GERMANY: Deutschland Radio. German. New station replacement for former RIAS station. Male announcer. Pop music from Sting to station ID as, "Deutschland Radio, Berlin." (Serra, Italy)

1219 UTC on 15445

BRAZIL: *Radio Bras*. Discussion on Brazil's plan to compete for 2004 Olympics, with estimated cost at \$5 billion! (Le Strange, NJ) Brazil's *Radio Rural* audible on 4765 kHz. Portuguese vocals, and station promotional from 0040-0105. (Tom Banks, Dallas, TX)

1248 UTC on 15240

SWEDEN: Radio Sweden. *Media Scan* show with George Wood on study of the effects of TV viewing. (Moats, OH) Station monitored on 6065 at 1620 with newscast. (Banks, TX)

1505 UTC on 7490

1718 UTC on 13785

NORTH KOREA: Radio Pyongyang. Fair signal for usual North Korean flair. (Brookman, AK) Additional English programming observed at 2020 on 6576, 9977, 9345 kHz. (John Guilky, Des Moines, IA)

1736 UTC on 21590

MADAGASCAR: Radio Netherlands relay. Newscast to IDs. *Newsline*, time check and feature. Parallels on 17655, 7120 kHz. (Serra, Italy)

1850 UTC on 4957

AZERBAIJAN: Radio Baki. Azeri/English. Lady announcer regional tune to organ interval music. English ID as, "this is the Voice of Azerbaijan" to newscast. (Serra, Italy)

1937 UTC on 4845

MAURITANIA: Radio Mauritanie. French/Arabic. Soccer commentary, followed by Arabic recitations. Regional Arabic music to IDs and French newscast. (Serra, Italy)

2000 UTC on 15570

VATICAN CITY STATE: Vatican Radio. News on Bishop's Congress in Africa and other ecumenical news. (Fraser, MA) English noted on 1600-1620 on 15595, 15585 kHz. (Jasbir Singh, Parlin, NJ)

2100 UTC on 9700

BULGARIA: Radio Bulgaria. Report on the Indonesian foreign minister visiting Bulgaria. ID varies as "Radio Bulgaria" and "Radio Sofia Bulgaria." Additional monitoring on 11645 kHz at 2108. (Le Strange, NJ)

2105 UTC on 11925

GABON: Radio Japan relay. Report on the investigation of the plane crash at Nagoya. (Fraser, MA) Radio Japan heard on 11885 kHz at 0600. (Todd Dokey, Lodi, CA)

2120 UTC on 12085

SYRIA: Radio Damascus. Fair signal for this frequency and parallel 15095 kHz. English news heard despite poor audio level. Pop music and program feature monitored to 2135. (Banks, TX)

2215 UTC on 11805

RUSSIA: Radio Moscow. *Commonwealth Update* program on the continuing Crimean crisis. (Fraser, MA) *News and Views* program featuring domestic issues, on 15180 kHz at 0410. (Sedlacek, NE)

The QSL Report

Gayle Van Horn

SHORTWAVE BROADCASTING

Ready for a new slant on QSLing? Why not QSL all the stations in a particular country! One of my favorite countries to monitor is Morocco, located in northwest Africa.

By far, the easiest station to log and verify is the Voice of America relay station in Tangiers. Programming is beamed to Africa and Europe, and easily heard daily in North America. For country counting, this site counts as Tangier (Morocco).

Radiodiffusion Television Marocaine broadcasts daily in English, Spanish, French, Arabic and regional languages. RDTM is a good verifier; however, return postage or IRCs will ensure your



It took two years for the editor to acquire a Radio Medi Un verification with this sticker.

QSL from an English report. Send details to: Boite Postal 1042, Rabat, Morocco. Count this QSL as French Morocco (Morocco).

Ready for a challenge? Radio Mediterranee International, also known as "Radio Medi Un" or "Medi 1," requires your persistence and patience to log! Medi 1 broadcasts in French and Arabic to Europe, and your French report is preferred, with return postage. Check below for my personal QSL details for this station.

Refer to *World Radio TV Handbook* for specific program schedules and frequencies. Morocco may become a favorite for you, too!

CHINA

China Radio International, 9690/15110 kHz. Full data QSL cards, without veri signers. Station stickers and program schedule included. Received in 21/27 days for English reports. Station address: c/o English Service, 2 Fuxingmenweist, Beijing 100866 China. (Gerry LeStrange, East Brunswick, NJ; Michael J. McFerrin, Brights Grove, Ontario, Canada)

ECUADOR

Radio Centro, 3290 kHz. Partial data letter signed by Luis A. Gamboa T.-Director Gerente. Station sticker included. Received in 32 days for a Spanish report, cassette tape, and one U.S. dollar. Station address: Apartado Postal 18-01-0574, Ambato, Ecuador. (Charlie Washburn, North Perry, ME)

EQUATORIAL GUINEA

Radio Africa, 7190 kHz. Full data yellow QSL card unsigned, form letter signed by Bonnie Longman. Received in 95 days for an English report and one U.S. dollar. Station address: Radio Africa/Pan American Broadcasting, 10201 Torre Ave., Suite 320, Cupertino, CA 95014-2132. (Randy Stewart, Springfield, MO)

LEBANON

Wings of Hope, 11530 kHz. Full data map card unsigned. Received in 163 days for an English report, 2 IRCs, and address label (used). Station address: c/o High Adventures Missionaries, Box 7466, Van Nuys, CA 91409. (Mike Hardester, Jacksonville, NC)

MADAGASCAR

Radio Netherlands relay, 11655 kHz. Full data floral QSL card unsigned. Received in 97 days for an English report. Station address: Postbus 222, NL-1200 JG Hilversum, Netherlands. (Thomas P Risher, Whittier, CA)

MEXICO

Radio Huayacocotla ("La Voz de los Campesinos"), 2390 kHz. Station returned the prepared QSL card with partial data noted, signed by Felipe de Jesus Martinez Sosa-Religious Co-Worker, and Martha Silvia Ortiz Lopez-Director

of the Program: News of the Province. Station included a copy of the 28th Anniversary booklet. Received in 120 days for a Spanish report, one U.S. dollar, and an address label (used). Station address: Calle Guterrez Najera #7, Apartado Postal 13, Huayacocotla, Veracruz, Mexico C.P. 92600. Hardester, NC)

MOROCCO

Radio Mediterranee International, 9575 kHz. Full data station logo card, with illegible signature. Station sticker included with 2 page station info sheet. Received in 58 days for a French report, mint stamps of Morocco, and souvenir postcard. Station address: 3 et 5, Rue Emsallah, Boite Postal 2055, Tanger, Morocco. (GVH/NC)

NEW ZEALAND

Radio New Zealand International, 9700 kHz. Full data QSL card. Received in 28 days for an English report, 3 IRCs, and souvenir postcard. Station address: P.O. Box 2092, Wellington, New Zealand. (Don Dacus, Russellville, AR)

PORTUGAL

Radio Portugal, 9570 kHz. Full data station QSL card verified, and frequency schedule included. Received in 35 days for an English report. Station address: P.O. Box 1011, Lisbon 1001, Portugal. (John Neves, New York, NY)

SHIP TRAFFIC

GEORGIA RAINBOW II-3ERJ8, 156.65 MHz (Open Bulk Carrier). Full data prepared QSL card verified. Received in 72 days for an English utility report, and one U.S. dollar. Ship address: Tokai Shipping Co. Ltd., T.B.R. Building, 10-2, 2-chome, Nagatacho, Chiyoda-ku, Tokyo, 100 Japan. (Hank Holbrook, Dunkirk, MD)

ZIM MIAMA-4XID, 156.65 MHz (General Cargo). Full data prepared QSL card verified. Received in 226 days for an English utility report, and U.S. mint stamps. Ship address: Ship address: Zim American Israeli Shipping Co. Inc., Suite 2969N, One World Trade Center, New York, NY 10048. (Holbrook, MD)

USCGC TAMPA (WMEC-902) NIKL, 2670 kHz. Full data prepared QSL card signed by Ronald Green-RMC. Received in 63 days for an

English utility report. Ship address: 4000 Coast Guard Blvd., Portsmouth, VA 23703-2199. (Steve McDonald, Pt Coquitlam, B.C., Canada)

M/V MARIROULI-C4PC, 8375 kHz (General Cargo). Full data prepared QSL card signed by A.D. Agena-Radio Officer. Received in 24 days for an English utility report. Ship address: 67 Akti, Miaouli St., Piraeus, Greece. (McDonald, CAN)

SINGAPORE

Singapore Broadcasting Corp., 7170 kHz. Full data scenery card, signed by General Manager. Personal letter included, signed by Lee Wai Meng. Received in 18 days for an English report. Station address: Caldecott Hill, Andrew Road, Singapore 1129. (Risher, CA)

SLOVAKIA

Adventist World Radio-Europe test transmission via Rimavska Sobota, 7115 kHz. Full data QSL card with "Voice of Hope" in six languages, unsigned. Frequency schedule included. Received in 90 days for an English report and 2 IRCs. Station address: AWR Europe, Postfach 100252, 64202 Darmstadt, Germany. Letter postmarked from Denmark. (Stewart, MO)

UNITED STATES

WTOP-97.1 FM. Full data station QSL card, unsigned. Received in 11 months for an English FM report. Station address: 3400 Idaho Ave. N.W., Washington, DC 895-5000. (Walter Szczepaniak, Philadelphia, PA)

KWCO-1560 AM. Full data QSL letter, station profile sheet, coverage map, and brochures. Two station vintage bumper stickers and monitor QSL from John S. Carson-News Director. QSL was for special DX test. Received in 16 days for an English AM report, and one U.S. dollar. Station address: P.O. Box 1268, Chickasha, OK 73023. (Patrick M. Griffith-N0NNK, Federal Heights, CO)

VIETNAM

Voice of Vietnam, 12020 kHz. Full data station card, with illegible signature. Received in 96 for an English report. Station address: c/o Overseas Service, 58 Quan Su, Hanoi, Socialist Republic of Vietnam. (LeRoy Long, Edmond, OK)

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 "Newswire" 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.

Radio Program Guide

This section, published quarterly, lists programs with news and information about shortwave radio for listeners. For brevity, only programs with at certain peak listening times are included. Corrections and additions are appreciated.

Sundays	2110	Voice of America (as): "Communications World"	0249	Radio Sweden: "Media Scan"	2115	WWCR #1: "World of Radio"
0013 Spanish National Radio: "DX Spot"	2125 <td>Radio Japan: "Media Roundup"</td> <td>0300 <td>Radio For Peace Int'l: "World of Radio"</td> <td>2120 <td>Radio Budapest Int'l: "Radio Budapest DX News"</td> </td></td>	Radio Japan: "Media Roundup"	0300 <td>Radio For Peace Int'l: "World of Radio"</td> <td>2120 <td>Radio Budapest Int'l: "Radio Budapest DX News"</td> </td>	Radio For Peace Int'l: "World of Radio"	2120 <td>Radio Budapest Int'l: "Radio Budapest DX News"</td>	Radio Budapest Int'l: "Radio Budapest DX News"
0039 HCJB: "DX Partyline"	2145 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> <td>0349 <td>Radio Sweden: "Media Scan"</td> <td>2210 <td>Radio Australia: "Feedback"</td> </td></td>	Radio Bulgaria: "Radio Bulgaria Calling"	0349 <td>Radio Sweden: "Media Scan"</td> <td>2210 <td>Radio Australia: "Feedback"</td> </td>	Radio Sweden: "Media Scan"	2210 <td>Radio Australia: "Feedback"</td>	Radio Australia: "Feedback"
0110 Voice of America (am/ca): "Communications World"	2235 <td>Radio Korea: "Shortwave Feedback"</td> <td>0435 <td>Radio Havana Cuba: "DXers Unlimited"</td> <td>2300 <td>WHRR #2: "World of Radio"</td> </td></td>	Radio Korea: "Shortwave Feedback"	0435 <td>Radio Havana Cuba: "DXers Unlimited"</td> <td>2300 <td>WHRR #2: "World of Radio"</td> </td>	Radio Havana Cuba: "DXers Unlimited"	2300 <td>WHRR #2: "World of Radio"</td>	WHRR #2: "World of Radio"
0113 Spanish National Radio: "DX Spot"	2253 <td>Vatican Radio: "Vatican On-the-Air"</td> <td>0535 <td>Radio Havana Cuba: "DXers Unlimited"</td> <td>2330 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> </td></td>	Vatican Radio: "Vatican On-the-Air"	0535 <td>Radio Havana Cuba: "DXers Unlimited"</td> <td>2330 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> </td>	Radio Havana Cuba: "DXers Unlimited"	2330 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td>	Radio Bulgaria: "Radio Bulgaria Calling"
0130 Radio Havana Cuba: "DXers Unlimited"	2300 <td>Radio For Peace Int'l: "World of Radio"</td> <td>0705 <td>HCJB: "The Latest Catch"</td> <td></td> <td></td> </td>	Radio For Peace Int'l: "World of Radio"	0705 <td>HCJB: "The Latest Catch"</td> <td></td> <td></td>	HCJB: "The Latest Catch"		
0130 WHRR #2: "World of Radio"	2300 <td>WWCR #1: "World of Radio"</td> <td>0800 <td>HCJB: "Ham Radio Today"</td> <td></td> <td></td> </td>	WWCR #1: "World of Radio"	0800 <td>HCJB: "Ham Radio Today"</td> <td></td> <td></td>	HCJB: "Ham Radio Today"		
0200 Radio For Peace Int'l: "World of Radio"			0830 <td>Radio New Zealand Int'l: "Mailbox"</td> <td></td> <td></td>	Radio New Zealand Int'l: "Mailbox"		
0200 WWCR #3: "Spectrum"	Mondays		1030 <td>HCJB: "Ham Radio Today"</td> <td>Saturdays</td> <td></td>	HCJB: "Ham Radio Today"	Saturdays	
0215 KSDA (Guam): "DX Asiawaves"	0100 <td>WHRR #1: "World of Radio"</td> <td>1100 <td>Radio For Peace Int'l: "World of Radio"</td> <td>0010 <td>Radio Australia: "Feedback"</td> </td></td>	WHRR #1: "World of Radio"	1100 <td>Radio For Peace Int'l: "World of Radio"</td> <td>0010 <td>Radio Australia: "Feedback"</td> </td>	Radio For Peace Int'l: "World of Radio"	0010 <td>Radio Australia: "Feedback"</td>	Radio Australia: "Feedback"
0245 Radio Romania Int'l: "DX Mailbag"	0125 <td>Radio Japan: "Media Roundup"</td> <td>1235 <td>Polish Radio: "DX Program"</td> <td>0146 <td>Radio Portugal Int'l: "Radio Portugal DX"</td> </td></td>	Radio Japan: "Media Roundup"	1235 <td>Polish Radio: "DX Program"</td> <td>0146 <td>Radio Portugal Int'l: "Radio Portugal DX"</td> </td>	Polish Radio: "DX Program"	0146 <td>Radio Portugal Int'l: "Radio Portugal DX"</td>	Radio Portugal Int'l: "Radio Portugal DX"
0258 Vatican Radio: "Vatican On-the-Air"	0415 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> <td>1315 <td>FBC (Philippines): "DX Report"</td> <td>0210 <td>Radio Australia: "Feedback"</td> </td></td>	Radio Bulgaria: "Radio Bulgaria Calling"	1315 <td>FBC (Philippines): "DX Report"</td> <td>0210 <td>Radio Australia: "Feedback"</td> </td>	FBC (Philippines): "DX Report"	0210 <td>Radio Australia: "Feedback"</td>	Radio Australia: "Feedback"
0309 HCJB: "DX Partyline"	0430 <td>Radio New Zealand Int'l: "Mailbox"</td> <td>1505 <td>Polish Radio: "DX Program"</td> <td>0235 <td>RAE Argentina: "DXers Special"</td> </td></td>	Radio New Zealand Int'l: "Mailbox"	1505 <td>Polish Radio: "DX Program"</td> <td>0235 <td>RAE Argentina: "DXers Special"</td> </td>	Polish Radio: "DX Program"	0235 <td>RAE Argentina: "DXers Special"</td>	RAE Argentina: "DXers Special"
0313 Voice of Turkey: "DX Corner"	0620 <td>Voice of Med. (Malta): "VOM DX Corner"</td> <td>1511 <td>Radio Prague: "Calling All Listeners"</td> <td>0251 <td>Radio Budapest Int'l: "DX World"</td> </td></td>	Voice of Med. (Malta): "VOM DX Corner"	1511 <td>Radio Prague: "Calling All Listeners"</td> <td>0251 <td>Radio Budapest Int'l: "DX World"</td> </td>	Radio Prague: "Calling All Listeners"	0251 <td>Radio Budapest Int'l: "DX World"</td>	Radio Budapest Int'l: "DX World"
0315 WWCR #1: "World of Radio"	0639 <td>Radio Vlaanderen Int'l: "Radio World"</td> <td>1710 <td>Radio Prague: "Calling All Listeners"</td> <td>0400 <td>Radio For Peace Int'l: "World of Radio"</td> </td></td>	Radio Vlaanderen Int'l: "Radio World"	1710 <td>Radio Prague: "Calling All Listeners"</td> <td>0400 <td>Radio For Peace Int'l: "World of Radio"</td> </td>	Radio Prague: "Calling All Listeners"	0400 <td>Radio For Peace Int'l: "World of Radio"</td>	Radio For Peace Int'l: "World of Radio"
0330 Radio Havana Cuba: "DXers Unlimited"	0640 <td>Radio Korea: "Shortwave Feedback"</td> <td>1710 <td>HCJB: "Ham Radio Today"</td> <td>0600 <td>KWHR (Hawaii): "World of Radio"</td> </td></td>	Radio Korea: "Shortwave Feedback"	1710 <td>HCJB: "Ham Radio Today"</td> <td>0600 <td>KWHR (Hawaii): "World of Radio"</td> </td>	HCJB: "Ham Radio Today"	0600 <td>KWHR (Hawaii): "World of Radio"</td>	KWHR (Hawaii): "World of Radio"
0410 Radio Australia: "Feedback"	3700 <td>Radio For Peace Int'l: "World of Radio"</td> <td>1730 <td>HCJB: "Ham Radio Today"</td> <td>0600 <td>WHRR #1: "World of Radio"</td> </td></td>	Radio For Peace Int'l: "World of Radio"	1730 <td>HCJB: "Ham Radio Today"</td> <td>0600 <td>WHRR #1: "World of Radio"</td> </td>	HCJB: "Ham Radio Today"	0600 <td>WHRR #1: "World of Radio"</td>	WHRR #1: "World of Radio"
0509 HCJB: "DX Partyline"	0720 <td>Voice of Med. (Malta): "VOM DX Corner"</td> <td>1820 <td>RAE Argentina: "DXers Special"</td> <td>0600 <td>WHRR #2: "World of Radio"</td> </td></td>	Voice of Med. (Malta): "VOM DX Corner"	1820 <td>RAE Argentina: "DXers Special"</td> <td>0600 <td>WHRR #2: "World of Radio"</td> </td>	RAE Argentina: "DXers Special"	0600 <td>WHRR #2: "World of Radio"</td>	WHRR #2: "World of Radio"
0513 Spanish National Radio: "DX Spot"	0909 <td>Radio Vlaanderen Int'l: "Radio World"</td> <td>1930 <td>HCJB: "Ham Radio Today"</td> <td>0600 <td>WWCR #1: "World of Radio"</td> </td></td>	Radio Vlaanderen Int'l: "Radio World"	1930 <td>HCJB: "Ham Radio Today"</td> <td>0600 <td>WWCR #1: "World of Radio"</td> </td>	HCJB: "Ham Radio Today"	0600 <td>WWCR #1: "World of Radio"</td>	WWCR #1: "World of Radio"
0525 Radio Japan: "Media Roundup"	1245 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> <td>2010 <td>Radio Prague: "Calling All Listeners"</td> <td>0639 <td>Radio Vlaanderen Int'l: "Radio World"</td> </td></td>	Radio Bulgaria: "Radio Bulgaria Calling"	2010 <td>Radio Prague: "Calling All Listeners"</td> <td>0639 <td>Radio Vlaanderen Int'l: "Radio World"</td> </td>	Radio Prague: "Calling All Listeners"	0639 <td>Radio Vlaanderen Int'l: "Radio World"</td>	Radio Vlaanderen Int'l: "Radio World"
0600 KWHR (Hawaii): "World of Radio"	1310 <td>Radio Vlaanderen Int'l: "Radio World"</td> <td>2015 <td>Polish Radio: "DX Program"</td> <td>0715 <td>BBC: "Waveguide"</td> </td></td>	Radio Vlaanderen Int'l: "Radio World"	2015 <td>Polish Radio: "DX Program"</td> <td>0715 <td>BBC: "Waveguide"</td> </td>	Polish Radio: "DX Program"	0715 <td>BBC: "Waveguide"</td>	BBC: "Waveguide"
0600 WWCR #3: "World of Radio"	1420 <td>Voice of Med. (Malta): "VOM DX Corner"</td> <td>2130 <td>HCJB: "The Latest Catch"</td> <td>0739 <td>HCJB: "DX Partyline"</td> </td></td>	Voice of Med. (Malta): "VOM DX Corner"	2130 <td>HCJB: "The Latest Catch"</td> <td>0739 <td>HCJB: "DX Partyline"</td> </td>	HCJB: "The Latest Catch"	0739 <td>HCJB: "DX Partyline"</td>	HCJB: "DX Partyline"
0610 Radio Australia: "Feedback"	1445 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> <td>Thursdays</td> <td></td> <td>0900 <td>KWHR (Hawaii): "World of Radio"</td> </td>	Radio Bulgaria: "Radio Bulgaria Calling"	Thursdays		0900 <td>KWHR (Hawaii): "World of Radio"</td>	KWHR (Hawaii): "World of Radio"
0630 Radio Havana Cuba: "DXers Unlimited"	1500 <td>Radio For Peace Int'l: "World of Radio"</td> <td>0014 <td>Radio Prague: "Calling All Listeners"</td> <td>0940 <td>FBC (Philippines): "DX Dial"</td> </td></td>	Radio For Peace Int'l: "World of Radio"	0014 <td>Radio Prague: "Calling All Listeners"</td> <td>0940 <td>FBC (Philippines): "DX Dial"</td> </td>	Radio Prague: "Calling All Listeners"	0940 <td>FBC (Philippines): "DX Dial"</td>	FBC (Philippines): "DX Dial"
0720 Radio Japan: "Media Roundup"	1520 <td>Voice of Med. (Malta): "VOM DX Corner"</td> <td>0100 <td>HCJB: "Ham Radio Today"</td> <td>1010 <td>Voice of America (as): "Communications World"</td> </td></td>	Voice of Med. (Malta): "VOM DX Corner"	0100 <td>HCJB: "Ham Radio Today"</td> <td>1010 <td>Voice of America (as): "Communications World"</td> </td>	HCJB: "Ham Radio Today"	1010 <td>Voice of America (as): "Communications World"</td>	Voice of America (as): "Communications World"
0810 Radio Australia: "Feedback"	1910 <td>Voice of Israel: "Calling All Listeners"</td> <td>0114 <td>Radio Prague: "Calling All Listeners"</td> <td>1030 <td>BBC: "Waveguide"</td> </td></td>	Voice of Israel: "Calling All Listeners"	0114 <td>Radio Prague: "Calling All Listeners"</td> <td>1030 <td>BBC: "Waveguide"</td> </td>	Radio Prague: "Calling All Listeners"	1030 <td>BBC: "Waveguide"</td>	BBC: "Waveguide"
0835 Radio Korea: "Shortwave Feedback"	2141 <td>Voice of Israel: "Calling All Listeners"</td> <td>0130 <td>BBC: "Waveguide"</td> <td>1200 <td>Radio For Peace Int'l: "World of Radio"</td> </td></td>	Voice of Israel: "Calling All Listeners"	0130 <td>BBC: "Waveguide"</td> <td>1200 <td>Radio For Peace Int'l: "World of Radio"</td> </td>	BBC: "Waveguide"	1200 <td>Radio For Peace Int'l: "World of Radio"</td>	Radio For Peace Int'l: "World of Radio"
0940 FBC (Philippines): "DX Report"	2150 <td>Radio Vilnius: "Radio Vilnius DX Program"</td> <td>0152 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1210 <td>Voice of America (as): "Communications World"</td> </td></td>	Radio Vilnius: "Radio Vilnius DX Program"	0152 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1210 <td>Voice of America (as): "Communications World"</td> </td>	Radio Netherlands Int'l: "Media Network"	1210 <td>Voice of America (as): "Communications World"</td>	Voice of America (as): "Communications World"
1000 Radio For Peace Int'l: "World of Radio"	2151 <td>Voice of Israel: "DX Corner"</td> <td>0200 <td>HCJB: "The Latest Catch"</td> <td>1245 <td>Voice of Turkey: "DX Corner"</td> </td></td>	Voice of Israel: "DX Corner"	0200 <td>HCJB: "The Latest Catch"</td> <td>1245 <td>Voice of Turkey: "DX Corner"</td> </td>	HCJB: "The Latest Catch"	1245 <td>Voice of Turkey: "DX Corner"</td>	Voice of Turkey: "DX Corner"
1037 Radio Korea: "Shortwave Feedback"	Tuesdays		0314 <td>Radio Prague: "Calling All Listeners"</td> <td>1310 <td>Radio Vlaanderen Int'l: "Radio World"</td> </td>	Radio Prague: "Calling All Listeners"	1310 <td>Radio Vlaanderen Int'l: "Radio World"</td>	Radio Vlaanderen Int'l: "Radio World"
1120 Radio Japan: "Media Roundup"	1147 <td>Radio Sweden: "Media Scan"</td> <td>0330 <td>HCJB: "Ham Radio Today"</td> <td>1344 <td>Radio Romania Int'l: "DX Mailbag"</td> </td></td>	Radio Sweden: "Media Scan"	0330 <td>HCJB: "Ham Radio Today"</td> <td>1344 <td>Radio Romania Int'l: "DX Mailbag"</td> </td>	HCJB: "Ham Radio Today"	1344 <td>Radio Romania Int'l: "DX Mailbag"</td>	Radio Romania Int'l: "DX Mailbag"
1235 Radio Korea: "Shortwave Feedback"	1230 <td>WWCR #1: "World of Radio"</td> <td>0344 <td>Radio Prague: "Calling All Listeners"</td> <td>1345 <td>Radio Tashkent: "DX Program"</td> </td></td>	WWCR #1: "World of Radio"	0344 <td>Radio Prague: "Calling All Listeners"</td> <td>1345 <td>Radio Tashkent: "DX Program"</td> </td>	Radio Prague: "Calling All Listeners"	1345 <td>Radio Tashkent: "DX Program"</td>	Radio Tashkent: "DX Program"
1307 Voice of Israel: "Calling All Listeners"	1249 <td>Radio Sweden: "Media Scan"</td> <td>0400 <td>HCJB: "The Latest Catch"</td> <td>1440 <td>FBC (Philippines): "DX Dial"</td> </td></td>	Radio Sweden: "Media Scan"	0400 <td>HCJB: "The Latest Catch"</td> <td>1440 <td>FBC (Philippines): "DX Dial"</td> </td>	HCJB: "The Latest Catch"	1440 <td>FBC (Philippines): "DX Dial"</td>	FBC (Philippines): "DX Dial"
1308 Radio Korea: "Shortwave Feedback"	1349 <td>Radio Romania Int'l: "For Radio Amateurs"</td> <td>0530 <td>HCJB: "Ham Radio Today"</td> <td>1445 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> </td></td>	Radio Romania Int'l: "For Radio Amateurs"	0530 <td>HCJB: "Ham Radio Today"</td> <td>1445 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> </td>	HCJB: "Ham Radio Today"	1445 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td>	Radio Bulgaria: "Radio Bulgaria Calling"
1319 Voice of Israel: "DX Corner"	1349 <td>Radio Sweden: "Media Scan"</td> <td>0752 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1610 <td>Voice of America (as/me): "Communications World"</td> </td></td>	Radio Sweden: "Media Scan"	0752 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1610 <td>Voice of America (as/me): "Communications World"</td> </td>	Radio Netherlands Int'l: "Media Network"	1610 <td>Voice of America (as/me): "Communications World"</td>	Voice of America (as/me): "Communications World"
1353 Vatican Radio: "Vatican On-the-Air"	1505 <td>Polish Radio: "DX Program"</td> <td>0910 <td>Radio New Zealand Int'l: "Mailbox"</td> <td>1615 <td>KSDA (Guam): "DX Asiawaves"</td> </td></td>	Polish Radio: "DX Program"	0910 <td>Radio New Zealand Int'l: "Mailbox"</td> <td>1615 <td>KSDA (Guam): "DX Asiawaves"</td> </td>	Radio New Zealand Int'l: "Mailbox"	1615 <td>KSDA (Guam): "DX Asiawaves"</td>	KSDA (Guam): "DX Asiawaves"
1425 Radio Japan: "Media Roundup"	1634 <td>Radio Sweden: "Media Scan"</td> <td>0952 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1800 <td>Radio For Peace Int'l: "World of Radio"</td> </td></td>	Radio Sweden: "Media Scan"	0952 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1800 <td>Radio For Peace Int'l: "World of Radio"</td> </td>	Radio Netherlands Int'l: "Media Network"	1800 <td>Radio For Peace Int'l: "World of Radio"</td>	Radio For Peace Int'l: "World of Radio"
1436 Radio Korea: "Shortwave Feedback"	1749 <td>Radio Sweden: "Media Scan"</td> <td>1152 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1809 <td>Radio Vlaanderen Int'l: "Radio World"</td> </td></td>	Radio Sweden: "Media Scan"	1152 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1809 <td>Radio Vlaanderen Int'l: "Radio World"</td> </td>	Radio Netherlands Int'l: "Media Network"	1809 <td>Radio Vlaanderen Int'l: "Radio World"</td>	Radio Vlaanderen Int'l: "Radio World"
1615 KSDA (Guam): "DX Asiawaves"	1900 <td>Radio For Peace Int'l: "World of Radio"</td> <td>1352 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1909 <td>HCJB: "DX Partyline"</td> </td></td>	Radio For Peace Int'l: "World of Radio"	1352 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1909 <td>HCJB: "DX Partyline"</td> </td>	Radio Netherlands Int'l: "Media Network"	1909 <td>HCJB: "DX Partyline"</td>	HCJB: "DX Partyline"
1635 Radio Korea: "Shortwave Feedback"	2049 <td>Radio Sweden: "Media Scan"</td> <td>1552 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1945 <td>Radio Romania Int'l: "DX Mailbag"</td> </td></td>	Radio Sweden: "Media Scan"	1552 <td>Radio Netherlands Int'l: "Media Network"</td> <td>1945 <td>Radio Romania Int'l: "DX Mailbag"</td> </td>	Radio Netherlands Int'l: "Media Network"	1945 <td>Radio Romania Int'l: "DX Mailbag"</td>	Radio Romania Int'l: "DX Mailbag"
1725 Radio Japan: "Media Roundup"	2135 <td>Radio Havana Cuba: "DXers Unlimited"</td> <td>1752 <td>Radio Netherlands Int'l: "Media Network"</td> <td>2030 <td>Voice of Turkey: "DX Corner"</td> </td></td>	Radio Havana Cuba: "DXers Unlimited"	1752 <td>Radio Netherlands Int'l: "Media Network"</td> <td>2030 <td>Voice of Turkey: "DX Corner"</td> </td>	Radio Netherlands Int'l: "Media Network"	2030 <td>Voice of Turkey: "DX Corner"</td>	Voice of Turkey: "DX Corner"
1815 KSDA (Guam): "DX Asiawaves"	2149 <td>Radio Sweden: "Media Scan"</td> <td>1952 <td>Radio Netherlands Int'l: "Media Network"</td> <td>2039 <td>HCJB: "DX Partyline"</td> </td></td>	Radio Sweden: "Media Scan"	1952 <td>Radio Netherlands Int'l: "Media Network"</td> <td>2039 <td>HCJB: "DX Partyline"</td> </td>	Radio Netherlands Int'l: "Media Network"	2039 <td>HCJB: "DX Partyline"</td>	HCJB: "DX Partyline"
1911 Voice of Israel: "Calling All Listeners"	2235 <td>Radio Havana Cuba: "DXers Unlimited"</td> <td>2110 <td>Radio Prague: "Calling All Listeners"</td> <td>2105 <td>Radio Vlaanderen Int'l: "Radio World"</td> </td></td>	Radio Havana Cuba: "DXers Unlimited"	2110 <td>Radio Prague: "Calling All Listeners"</td> <td>2105 <td>Radio Vlaanderen Int'l: "Radio World"</td> </td>	Radio Prague: "Calling All Listeners"	2105 <td>Radio Vlaanderen Int'l: "Radio World"</td>	Radio Vlaanderen Int'l: "Radio World"
1923 Voice of Israel: "DX Corner"	2235 <td>Radio Sweden: "Media Scan"</td> <td>Fridays</td> <td></td> <td>2110 <td>Voice of America (af/me): "Communications World"</td> </td>	Radio Sweden: "Media Scan"	Fridays		2110 <td>Voice of America (af/me): "Communications World"</td>	Voice of America (af/me): "Communications World"
2038 Radio Korea: "Shortwave Feedback"	2249 <td>Radio Sweden: "Media Scan"</td> <td>0052 <td>Radio Netherlands Int'l: "Media Network"</td> <td>2135 <td>Radio Havana Cuba: "DXers Unlimited"</td> </td></td>	Radio Sweden: "Media Scan"	0052 <td>Radio Netherlands Int'l: "Media Network"</td> <td>2135 <td>Radio Havana Cuba: "DXers Unlimited"</td> </td>	Radio Netherlands Int'l: "Media Network"	2135 <td>Radio Havana Cuba: "DXers Unlimited"</td>	Radio Havana Cuba: "DXers Unlimited"
	2349 <td>Radio Sweden: "Media Scan"</td> <td>0115 <td>Radio Tashkent: "DX Program"</td> <td>2213 <td>Voice of Turkey: "DX Corner"</td> </td></td>	Radio Sweden: "Media Scan"	0115 <td>Radio Tashkent: "DX Program"</td> <td>2213 <td>Voice of Turkey: "DX Corner"</td> </td>	Radio Tashkent: "DX Program"	2213 <td>Voice of Turkey: "DX Corner"</td>	Voice of Turkey: "DX Corner"
	Wednesdays		0252 <td>Radio Netherlands Int'l: "Media Network"</td> <td>2235 <td>Radio Havana Cuba: "Xers Unlimited"</td> </td>	Radio Netherlands Int'l: "Media Network"	2235 <td>Radio Havana Cuba: "Xers Unlimited"</td>	Radio Havana Cuba: "Xers Unlimited"
	0035 <td>Radio Havana Cuba: "DXers Unlimited"</td> <td>0352 <td>Radio Netherlands Int'l: "Media Network"</td> <td>2315 <td>KSDA (Guam): "DX Asiawaves"</td> </td></td>	Radio Havana Cuba: "DXers Unlimited"	0352 <td>Radio Netherlands Int'l: "Media Network"</td> <td>2315 <td>KSDA (Guam): "DX Asiawaves"</td> </td>	Radio Netherlands Int'l: "Media Network"	2315 <td>KSDA (Guam): "DX Asiawaves"</td>	KSDA (Guam): "DX Asiawaves"
	0049 <td>Radio Sweden: "Media Scan"</td> <td>1546 <td>Radio Portugal Int'l: "Radio Portugal DX"</td> <td>2338 <td>Radio Vlaanderen Int'l: "Radio World"</td> </td></td>	Radio Sweden: "Media Scan"	1546 <td>Radio Portugal Int'l: "Radio Portugal DX"</td> <td>2338 <td>Radio Vlaanderen Int'l: "Radio World"</td> </td>	Radio Portugal Int'l: "Radio Portugal DX"	2338 <td>Radio Vlaanderen Int'l: "Radio World"</td>	Radio Vlaanderen Int'l: "Radio World"
	0149 <td>Radio Sweden: "Media Scan"</td> <td>1916 <td>Radio Portugal Int'l: "Radio Portugal DX"</td> <td></td> <td></td> </td>	Radio Sweden: "Media Scan"	1916 <td>Radio Portugal Int'l: "Radio Portugal DX"</td> <td></td> <td></td>	Radio Portugal Int'l: "Radio Portugal DX"		
	0220 <td>RAE Argentina: "DXers Special"</td> <td>1930 <td>Radio New Zealand Int'l: "Mailbox"</td> <td></td> <td></td> </td>	RAE Argentina: "DXers Special"	1930 <td>Radio New Zealand Int'l: "Mailbox"</td> <td></td> <td></td>	Radio New Zealand Int'l: "Mailbox"		
	0235 <td>Radio Havana Cuba: "DXers Unlimited"</td> <td>1945 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> <td></td> <td></td> </td>	Radio Havana Cuba: "DXers Unlimited"	1945 <td>Radio Bulgaria: "Radio Bulgaria Calling"</td> <td></td> <td></td>	Radio Bulgaria: "Radio Bulgaria Calling"		
			2000 <td>Radio For Peace Int'l: "World of Radio"</td> <td></td> <td></td>	Radio For Peace Int'l: "World of Radio"		

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Next Reporting Deadline
August 23, 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.

0000 UTC (8:00 PM EDT, 5:00 PM PDT) BBC CBC Northern Quebec Service China Radio Int'l Monitor Radio Int'l [T-F] Radio Australia Radio Havana Cuba [T-S] Radio Moscow Radio New Zealand Int'l [M-A] Radio Prague Radio Thailand Radio Ukraine Int'l Radio Yugoslavia [M-A] Spanish National Radio Voice of America (am/as/ca)	Radio Japan Radio Korea Radio Moscow Radio New Zealand Int'l [M-A] Radio Norway Int'l [M] Radio Prague Radio Tashkent Radio Thailand Spanish National Radio Swiss Radio Int'l Voice of America (am/as/ca) Voice of Indonesia	Radio Nepal 0230 Radio Budapest Int'l Radio Havana Cuba [T-A] Radio Moscow Radio Netherlands Int'l Radio Pakistan Radio Sweden [T-A] Radio Tirana 0245 Radio Yerevan	0332 Radio Prague [A] 0340 Voice of Greece [M-A] 0355 Radio Japan	Christian Science Sentinel [S] Deutsche Welle HCJB Monitor Radio Int'l [T-F] Radio Australia Radio Cameroon Radio Canada Int'l [M-F] Radio Havana Cuba [T-S] Radio Japan Radio Moscow Radio New Zealand Int'l [M-F] Radio Norway Int'l [M] Radio Thailand Spanish National Radio Swiss Radio Int'l (eu) Vatican Radio [T/F] Voice of America (af/me)
0003 Radio Pyongyang 0009 BBC* China Radio Int'l* 0010 Radio Havana Cuba [T-S]* Voice of America (ca) [T-A]* 0030 HCJB Radio Havana Cuba [T-A] Radio Moscow Radio Nacional de Venezuela [T-S] Radio Netherlands Int'l Radio New Zealand Int'l [M-F] Radio Sweden [T-A] Voice of America (am) [T-S] (Special English) Voice of America (as) (Special English) 0050 RAI Italy 0055 Vatican Radio [S-W-F] 0057 Spanish National Radio [F]	0110 Radio Australia [M-F]* Radio Havana Cuba [S/T-F]* Radio Japan [A]* 0130 BBC (as)* Radio Austria Int'l Radio Havana Cuba [T-A] Radio Moscow [T-A] Radio Netherlands Int'l Radio Portugal Int'l [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]	0300 UTC (11:00 PM EDT, 8:00 PM PDT) BBC CBC Northern Quebec Service China Radio Int'l Deutsche Welle HCJB KVOH [T-A] Monitor Radio Int'l [T-F] Radio Australia Radio Havana Cuba [T-S] Radio Japan Radio Moscow Radio New Zealand Int'l [M-A] Radio Prague Radio Thailand Radio Ukraine Int'l 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'l* 0310 Radio Havana Cuba [S/T-F]* 0315 Radio Cairo 0320 Radio Philippines [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'l Radio Prague Radio Sweden [T-A]	0400 UTC (12 AM EDT, 9 PM PDT) BBC ("Newsdesk") BBC (af) CBC Northern Quebec Service Channel Africa China Radio Int'l Christian Science Sentinel [A] Deutsche Welle Monitor Radio Int'l [T-F] Radio Australia Radio Canada Int'l Radio Havana Cuba [T-S] Radio Moscow Radio New Zealand Int'l [A] Radio New Zealand Int'l [M-F]* Radio Romania Int'l Radio Tanzania Radio Thailand Swiss Radio Int'l Voice of America (af/me) Voice of Israel WHRI (7315) [T-H/A] 0403 Radio Pyongyang 0409 BBC (af) [T-S]* China Radio Int'l* 0410 Radio Havana Cuba [T-S]* 0411 Channel Africa [T] 0415 RAI Italy 0430 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]*	Channel Africa [S-F] Radio Austria Int'l Radio Dubai Radio Havana Cuba [T-A] Radio Moscow Radio Romania Int'l Radio Thailand Voice of Nigeria 0555 Radio Japan [A]
0100 UTC (9:00 PM EDT, 6:00 PM PDT) All India Radio BBC CBC Northern Quebec Service [S/T-F] Deutsche Welle FEBC (Philippines) Monitor Radio Int'l [T-F] R Slovakia Int'l [T-S] Radio Australia Radio Budapest Int'l Radio Canada Int'l Radio Havana Cuba [T-S]	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'l [T-F] Radio Australia Radio Canada Int'l Radio Havana Cuba [T-S] Radio Moscow Radio New Zealand Int'l [M-A] Radio Romania Int'l 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 [T-S]* 0215 Radio Cairo	0500 UTC (1 AM EDT, 10 PM PDT) BBC ("Newshour") CBC Northern Quebec Service Cannel Africa	0600 UTC (2 AM EDT, 11 PM PDT) BBC BBC (af) [A-S]* BBC (af) [M-F] Channel Africa Deutsche Welle Monitor Radio Int'l [T-F] Radio Australia Radio Havana Cuba Radio Japan Radio Korea Radio Moscow Radio New Zealand Int'l Radio Prague Swiss Radio Int'l Channel Africa [T/H/F] 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-H] 0603 Radio Pyongyang	

0609
BBC*
0610
 Radio Havana Cuba [S/T-F]*
0627
BBC (af) [M-F]*
0630
 Radio Austria Int'l [T-S]
 Radio Havana Cuba [T-A]
 Radio Japan [A]*
 Radio Moscow
 Radio Vlaanderen Int'l
 Vatican Radio [M-A]
 Voice of Nigeria [M-F]
0632
 Radio Romania Int'l
0640
 Vatican Radio [T]
0645
 Radio Finland
 Radio Romania Int'l
 Voice of Nigeria [M-F]*
0655
 Voice of Med. (Malta) [M-F]

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)
BBC
 Monitor Radio Int'l [T-F]
 Papua New Guinea
 Radio Australia
 Radio Ghana
 Radio Japan
 Radio Moscow
 Radio New Zealand Int'l [M-F]*
 Voice of Myanmar (Burma)
0703
 Radio Pyongyang
 Voice of Free China
0710
 Radio Australia [W]*
0730
BBC (af) [A]*
 HCJB
 Radio Austria Int'l [T-S]
 Radio Japan [A]*
 Radio Moscow [M-A]
 Radio Netherlands Int'l
 Radio Prague
0740
 Voice of Greece
0750
 Radio New Zealand Int'l [M-F]*
0755
 Radio Japan
 Voice of Med. (Malta) [M-F]

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)
BBC
 Christian Science Sentinel [T/F]
 KNLS
 Monitor Radio Int'l [T-F]
 Radio Australia
 Radio Finland
 Radio Korea
 Radio Moscow
 Radio New Zealand Int'l [S-F]
 Voice of Indonesia [A-H]
 Voice of Malaysia
0803
 Radio Pyongyang
0810
 Radio New Zealand Int'l [M-F]*
0830
 R Slovakia Int'l

Radio Austria Int'l
 Radio Moscow
 Radio Netherlands Int'l
0845
 Radio Yerevan [S]
0855
 Voice of Indonesia [A-H]

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
BBC
 China Radio Int'l
 Christian Science Sentinel [T/F]
 Deutsche Welle
 Monitor Radio Int'l [M-F]
 Papua New Guinea [M]*
 Radio Australia
 Radio Japan
 Radio Moscow
 Radio New Zealand Int'l [M-F]
 Radio Vlaanderen Int'l [M-A]
 Swiss Radio Int'l
0909
 China Radio Int'l*
0930
 FEBC (Philippines)
 Radio Japan [A]*
 Radio Moscow
 Radio Netherlands Int'l
0940
 Voice of Greece
0945
 Deutsche Welle [M-F]*
0955
 Radio Japan

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
BBC
 China Radio Int'l
 Christian Science Sentinel [A]
 FEBC (Philippines) [M-F]*
 HCJB
 Monitor Radio Int'l [M-F]
 Papua New Guinea
 Radio Australia
 Radio Moscow
 Radio New Zealand Int'l [S-F]
 Radio Tanzania
 Swiss Radio Int'l (eu)
 Vatican Radio [M-A]
 Voice of America (as/ca)
 Voice of Israel
 Voice of Kenya
 WWCR (15685) [M-F]
 WYFR (Satellite Network) [M-A]
1009
 China Radio Int'l*
1010
 Radio New Zealand Int'l [M-F]*
1030
 Radio Austria Int'l [M-A]
 Radio Dubai
 Radio Korea
 Radio Moscow
 Radio Netherlands Int'l
 Radio Prague
 Voice of Nigeria
1045
 Radio New Zealand Int'l [M-F]*
 Voice of Nigeria [A-S]*

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
BBC ("Newsdesk")

Channel Africa
 Christian Science Sentinel [A]
 Deutsche Welle
 Monitor Radio Int'l [M-F]
 Papua New Guinea
 Radio Australia
 Radio Ghana [A-S]
 Radio Japan
 Radio Jordan
 Radio Moscow
 Radio Mozambique
 Radio New Zealand Int'l
 Radio Pakistan
 Radio Singapore Int'l
 Swiss Radio Int'l
 Swiss Radio Int'l (eu)
 Voice of America (as/ca)
1103
 Radio Pyongyang
1110
 Radio Australia*
1130
 Radio Austria Int'l
 Radio Finland [M-A]
 Radio Japan [A]*
 Radio Moscow
 Radio Nacional de Venezuela [M-A]
 Radio Netherlands Int'l
 Radio Singapore Int'l
 Radio Sweden [M-F]
 Voice of Asia
 WYFR (Satellite Network) [M-A]
1135
 Radio Thailand
1145
 Deutsche Welle [M-F]*
1155
 Radio Japan

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC
 China Radio Int'l
 Christian Science Sentinel [A]
 Monitor Radio Int'l [M-F]
 Papua New Guinea
 Radio Australia
 Radio Bulgaria
 Radio Canada Int'l [M-F]
 Radio France Int'l
 Radio Moscow
 Radio New Zealand Int'l
 Radio Norway Int'l [S]
 Radio Singapore Int'l
 Radio Tashkent
 Radio Thailand
 Voice of America (as)
 WYFR (Satellite Network) [M-A]
1203
 HCJB [M-F]
 Radio Korea
1209
BBC [W]*
 China Radio Int'l*
1230
 HCJB [M-F]
 Radio Bangladesh [S-M]
 Radio Cairo
 Radio Canada Int'l
 Radio Finland [M-A]
 Radio Moscow [M-A]
 Radio Netherlands Int'l
 Radio Singapore Int'l
 Radio Sweden [M-F]
 Radio Vlaanderen Int'l [S]

Swiss Radio Int'l (eu)
 Voice of Turkey
 Voice of Vietnam
 WYFR (Satellite Network) [M-A]
1240
 Voice of Greece
1258
 Africa No. 1 (Gabon)

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC ("Newshour")
 CBC Northern Quebec Service [S]
 China Radio Int'l
 Christian Science Sentinel [A]
 KNLS
 Monitor Radio Int'l [M-F]
 Papua New Guinea
 Radio Australia
 Radio Canada Int'l [S]
 Radio Ghana
 Radio Korea
 Radio Moscow
 Radio Norway Int'l [S]
 Radio Romania Int'l [M-A]
 Radio Singapore Int'l
 Radio Tanzania [A-S]
 Radio Tashkent [S]
 Radio Vlaanderen Int'l [M-A]
 Swiss Radio Int'l
 Voice of America (as)
 Voice of Israel [S-H]
 Voice of Kenya
 WWCR (15685) [M-F]
 WYFR (Satellite Network) [M-A]
1301
 Radio Romania Int'l [S]
1303
 Radio Pyongyang
1309
 China Radio Int'l*
1310
 Radiobras [M-F]
1324
 HCJB [M-F]
1328
 Radio Cairo
1330
 All India Radio
 FEBC (Philippines)
 Radio Austria Int'l
 Radio Canada Int'l
 Radio Dubai
 Radio Finland
 Radio Moscow
 Radio Netherlands Int'l
 Radio Singapore Int'l [S-F]
 Radio Sweden [M-F]
 Radio Tashkent [M-A]
 Voice of America (as) (Special English)
 Voice of Vietnam
1335
 Voice of Greece
1355
 Radio Singapore Int'l

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
 All India Radio [M/W/F]
BBC
 BBC (as) [M-F]*
 CBC Northern Quebec Service [S]

China Radio Int'l
 Christian Science Sentinel [A]
 Monitor Radio Int'l [M-F]
 Radio Australia
 Radio Bulgaria
 Radio Cameroon
 Radio Canada Int'l [S]
 Radio France Int'l
 Radio Ghana
 Radio Japan
 Radio Jordan [A]
 Radio Korea
 Radio Moscow
 Voice of America (as)
 WWCR (15685) [M-F]
1409
 China Radio Int'l*
1410
 Radio Japan [M-F]*
1415
 Radio Nepal
1424
 HCJB [M-F]
1430
 FEBC (Philippines)
 Radio Austria Int'l
 Radio Moscow
 Radio Nacional de Venezuela [M-A]
 Radio Netherlands Int'l
 Radio Romania Int'l [T-S]
 Radio Tirana
 RTM Morocco [S]
 Voice of Myanmar (Burma)
 WYFR (Satellite Network) [M-F]
1431
 Radio France Int'l [T]*
 Radio Romania Int'l [M]
1440
 FEBC (Philippines) [S-F]*
1445
 BBC (as) [M-F] (Special English)
 Voice of Myanmar (Burma)
1450
 All India Radio
1455
 All India Radio
 Radio Japan [A]
 Voice of Med. (Malta) [M-F]

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
BBC
 BBC (af) [M-F]
 CBC Northern Quebec Service [S]
 Channel Africa
 China Radio Int'l
 Christian Science Sentinel [A]
 Deutsche Welle
 Monitor Radio Int'l [M-F]
 Radio Australia
 Radio Canada Int'l [S]
 Radio Japan
 Radio Jordan
 Radio Moscow
 Radio Omdurman
 Radio Prague
 Radio Tallinn
 Swiss Radio Int'l
 Voice of America (as/me)
 WHRI (9465) [A]
 WRNO [W]

1509
China Radio Int+*
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+
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int+
Radio Portugal Int+ [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+
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int+ [M-F]
Radio Australia
Radio France Int+
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+*
1611
Radio France Int+ [T]*
1615
Radio Sweden [M-F]
1630
Radio Canada Int+
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+ [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
BBC (af)
Channel Africa
China Radio Int+
Christian Science Sentinel [A]

HCJB [M-F]
Monitor Radio Int+ [M-F]
Polish Radio
Radio Australia
Radio Japan
Radio Moscow
Radio New Zealand Int+ [M-F]*
Radio Pakistan
Radio Prague
RTM Morocco [A]
Swiss Radio Int+
Voice of America (af/as/me)
WWCR (15685) [M-F]
WWCR (15610) [S-F]
1703
Radio Pyongyang
1709
China Radio Int+*
1710
Radio Australia*
1725
Radio New Zealand Int+ [F]*
1730
Radio Moscow
Radio Netherlands Int+
Radio Romania Int+
Radio Sweden [M-F]
Voice of America (af) [S]
1740
BBC (af)*
1745
All India Radio
1755
Radio Japan [A]
Radio New Zealand Int+ [M-H]*

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC ("Newsdesk")
Christian Science Sentinel [A]
Monitor Radio Int+ [M-F]
Radio Australia
Radio Cameroon
Radio Moscow
Radio Mozambique
Radio New Zealand Int+ [M-F]*
Radio Norway Int+ [S]
Radio Omdurman
Radio Tanzania
Radio Vlaanderen Int+
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+ [H-F]*
1830
R Slovakia Int+
Radio Austria Int+
Radio Kuwait
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int+
Radio Yugoslavia
Voice of America (af) [A-S]
(Special English)
Voice of America (me) (Special English)

1835
Radio New Zealand Int+ [F]*
1840
Voice of Greece [M-A]
1845
Radio Yerevan
1855
Radio New Zealand Int+ [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+
Christian Science Sentinel [A]
Deutsche Welle
HCJB
Monitor Radio Int+ [M-F]
Radio Australia
Radio Budapest Int+
Radio Bulgaria
Radio Finland
Radio Japan
Radio Moscow
Radio New Zealand Int+
Radio Portugal Int+ [M-F]
Radio Romania Int+ [T-S]
Spanish National Radio
Swiss Radio Int+ (eu)
Voice of America (af/as/me)
Voice of Israel
WHRI (9485) [M-F]
WWCR (15610)
1901
Radio Romania Int+ [M]
1909
China Radio Int+*
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+
1933
Deutsche Welle [M]*
1935
RAI Italy
1955
Radio Japan

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
China Radio Int+
Deutsche Welle
KVOH [A-S]
Monitor Radio Int+ [M-F]
Radio Australia
Radio Moscow
Radio New Zealand Int+ [S-F]
Radio Norway Int+ [S]
Radio Prague
Swiss Radio Int+
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+*
2010
Radio New Zealand Int+ [S-H]*
2025
RAI Italy
2030
HCJB
Radio Canada Int+
Radio Korea
Radio Moscow
Radio Riga Int+ [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+
Deutsche Welle
KVOH [S]
Monitor Radio Int+ [M-F]
Radio Australia
Radio Budapest Int+
Radio Bulgaria
Radio Cameroon
Radio Canada Int+ [A-S]
Radio Damascus [F]
Radio Havana Cuba [M-A]
Radio Japan
Radio Moscow
Radio New Zealand Int+ [A-H]
Radio Prague
Radio Romania Int+
Radio Ukraine Int+
Radio Vlaanderen Int+ [M-F]
Radio Yugoslavia
Spanish National Radio
Voice of America (af/as/me)
WWCR (15610) [S-F]
2109
China Radio Int+*
2110
Radio Damascus [S-M]
Radio New Zealand Int+ [S-H]*
2112
Radio Damascus [F]
2115
BBC (ca) [M-F]*
2120
Radio Cairo
2125
Radio Canada Int+ [M-F]
2130
Radio Austria Int+
Radio Cairo
Radio Havana Cuba [M-A]
Radio Havana Cuba*
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+
Christian Science Sentinel [A]
Monitor Radio Int+ [M-F]
Radio Australia
Radio Canada Int+
Radio Havana Cuba [M-A]
Radio Korea
Radio Moscow
Radio New Zealand Int+
Radio Tirana
Radio Yugoslavia
RAI Italy
All India Radio (as)
Voice of Turkey
WWCR (12160) [S-F]
2203
Voice of Free China
2209
China Radio Int+*
2215
All India Radio [M/W/F]
Radio Cairo
2230
Radio Canada Int+ [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+ [M-F]
Radio Australia
Radio Canada Int+ [A-S]
Radio Japan
Radio Moscow
Radio New Zealand Int+ [A]
Radio Norway Int+ [S]
Radio Singapore Int+
Radio Vilnius [M-A]
Radio Vlaanderen Int+
Voice of America (as)
WWCR (5810/12160) [A]
2303
Radio Pyongyang
2330
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int+
Radio Sweden [M-F]
SLBC (Sri Lanka) [M]
2335
Voice of Greece [S-F]
2355
Radio Japan

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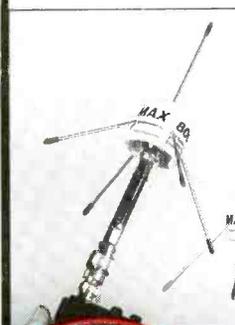
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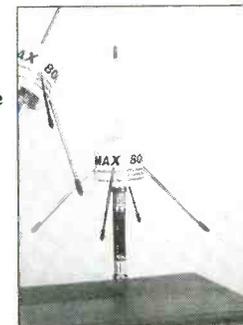
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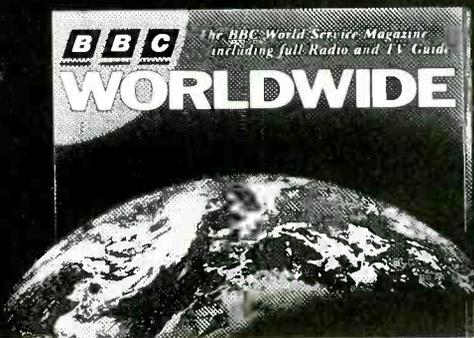
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FREQUENCIES

0000-0100	Australia, Radio	13605pa 15510pa	13745as 17750as	15320pa 17860as	15365as	0000-0100	Thailand, Radio		9655as	11905as	
0000-0100 vl	Australia, VLBA Alice Spg	4835do				0000-0100	Ukraine, R Ukraine Intl	7285na 12030na	9685na 15180na	9860na 15580na	11720na
0000-0100 vl	Australia, VL8K Katherine	5025do				0000-0100	United Kingdom, BBC London	5965as 9580as 15260sa	5975na 9915na 15310as	6175na 11750sa 15360as	7325na 12095sa
0000-0015	Cambodia, Natl Voice of	11940as				0000-0100	USA, KCBI Dallas TX	13740na			
0000-0100 vl	Canada, CBC N Quebec Sce	9625do				0000-0100	USA, KTVN Salt Lk City UT	15590am			
0000-0100	Canada, CFCX Montreal	6005do				0000-0100	USA, KVOH Los Angeles CA	17775am			
0000-0100	Canada, CFRX Toronto	6070do				0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	Canada, CFVP Calgary	6030do				0000-0100	USA, Monitor Radio Intl	5850na	9430ca		
0000-0100	Canada, CHNX Halifax	6130do				0000-0030	USA, R Bosnia H via WHRI	7315am			
0000-0100	Canada, CKZU Vancouver	6160do				0000-0100	USA, VOA Washington DC	5995am 9455am 11695am 15205am	6130am 9770au 11760as 15290as	7215au 9775am 15120am 17735as	7405am 11580am 15185as 17765as
0000-0100	China, China Radio Intl	9780na	11715na			0000-0100	USA, WCSN Scotts Cor ME	9855af			
0000-0100 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	0000-0100	USA, WEWN Birmingham AL	7425na	9410eu	9985sa	
0000-0100	Cuba, Radio Havana Cuba	6010na	13700na			0000-0100 vl	USA, WHRI Noblesville IN	7315am			
0000-0027	Czech Rep, Radio Prague	7345na	9485na			0000-0100	USA, WINB Red Lion PA	11950am			
0000-0045	India, All India Radio	9705as	11745as	15110as	15145as 17800as	0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100 vl	Italy, IRRS Milano	7125eu				0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100 vl	Malaysia, RTM Kota Kinaba	5980do				0000-0100	USA, WWCR Nashville TN	5810am	7435am	13845am	
0000-0100 vl	Malaysia, RTM Sarawak	4950do	7160do			0000-0100	USA, WYFR Okeechobee FL	6085na			
0000-0030	Netherlands, Radio	6020na	6165na			0030-0100	Australia, Radio	11720pa 13755as	11880pa 15240pa	13605pa 15415as	13745as
0000-0100	New Zealand, R NZ Intl	15115pa				0030-0100	Ecuador, HCJB Quito	9745am	11925am	17490am	
0000-0050	North Korea, R Pyongyang	11335na	13760na			0030-0100	Iran, VOIRI Tehran	7100na	9022na		
0000-0100 mtwhfa	Palau, KHBV Voice of Hope	11980as				0030-0100	Netherlands, Radio	6020na	6165na	9840na	9860as 12025as
0000-0100 vl	Papua New Guinea, NBC	9675do				0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0000-0100	Philippines, FEBC Manila	15450as				0030-0100	Sweden, Radio	6065sa	9810na	9850sa	
0000-0100	Russia, Radio Moscow Intl	5980na 9765na 12050na 17890as	7295na 11750na 15290na 21625as	9480na 11790na 15410na 15425na	9750na 11805na	0050-0100	Italy, RAI Rome	9725na	11800na		
0000-0030 mtwhfa	Serbia, Radio Yugoslavia	9580na	11870na								
0000-0100	Spain, Spanish Natl Radio	9540na									

SELECTED PROGRAMS

Sundays

- 0000 WWCR #3: World of Prophecy. Texe Marrs.
- 0013 Spanish National Radio: Spanish Radio DX Spot. A program for shortwave listeners and DXers.
- 0015 BBC: Good Books. Recommendation of a book to read.
- 0027 Spanish National Radio: Spain Speaking. Interviews with people of all walks of life.
- 0030 BBC: The John Dunn Show. A melodic mix of songs old and new.
- 0030 Radio Sweden: People and Ideas. A magazine program about the Swedish people and the arts.
- 0040 Spanish National Radio: Grass Roots. Everyday life in Spain.
- 0053 Spanish National Radio: Program Announcements. Descriptions of Spanish National Radio's programs and schedule information.

Mondays

- 0011 Spanish National Radio: Grass Roots. See S 0040.
- 0030 BBC: In Praise of God. Weekly programme of worship and meditation.
- 0030 Radio Sweden: In Touch with Stockholm (biweekly). See S 1130.
- 0030 Radio Sweden: Sounds Nordic (biweekly). See S 1130.
- 0034 Spanish National Radio: Visitors Book. Who's visiting Spain this week.
- 0044 Spanish National Radio: Radio Club. Listener letters are answered and music requests played.
- 0055 Spanish National Radio: Program Announcements. See S 0053.

Tuesdays

- 0000 WWCR #3: America's Town Forum. Tom Donahue hosts this talk show with ultra-conservative themes.
- 0015 BBC: A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way.
- 0015 Spanish National Radio: Panorama. A magazine program focusing on everything that's happening in Spain.
- 0020 Spanish National Radio: Commentary. An editorial.
- 0023 Spanish National Radio: Press Review. Review of the Spanish press.
- 0029 Spanish National Radio: Sports Spotlight. Summary of the weekend's sports results.
- 0030 Radio Sweden: Sixty Degrees North. See M 1130.
- 0040 Spanish National Radio: Cultural Encounters. Featuring cultural interaction between Spain and North America.

- 0048 Radio Sweden: Sports Scan. See M 1148.
- 0048 Spanish National Radio: Spanish Course by Radio. A course in Spanish with English commentary.
- 0057 Spanish National Radio: Program Announcements. See S 0053.

Wednesdays

- 0000 WWCR #3: America's Town Forum. See T 0000.
- 0015 BBC: Concert Hall. See S 1515.
- 0015 Spanish National Radio: Panorama. See T 0015.
- 0020 Spanish National Radio: Press Review. See T 0023.
- 0026 Spanish National Radio: Review of the Spanish Economy. Spain's status in financial matters.
- 0030 Radio Sweden: Sixty Degrees North. See M 1130.
- 0034 Spanish National Radio: Stage and Screen. The latest in entertainment.
- 0047 Spanish National Radio: Spanish Course by Radio. See T 0048.
- 0049 Radio Sweden: Media Scan (1&3). See T 1147.
- 0056 Spanish National Radio: Program Announcements. See S 0053.

Thursdays

- 0000 WWCR #3: America's Town Forum. See T 0000.
- 0015 BBC: The Greenfield Collection. This classical music program replaces Ray on Record.
- 0015 Spanish National Radio: Panorama. See T 0015.
- 0025 Spanish National Radio: Press Review. See T 0023.
- 0030 Radio Sweden: Sixty Degrees North. See M 1130.
- 0032 Spanish National Radio: As Others See Us. The mailbag.

- 0038 Spanish National Radio: The Natural World (biweekly). Ecological and environmental news and developments.
- 0040 Spanish National Radio: Science Desk (biweekly). Developments in science and technology.
- 0047 Radio Sweden: Money Matters. See W 1149.
- 0048 Spanish National Radio: Spanish Course by Radio. See T 0048.
- 0056 Spanish National Radio: Program Announcements. See S 0053.

Fridays

- 0000 WWCR #3: America's Town Forum. See T 0000.
- 0015 BC: Music Review. News and views from the world of music.
- 0015 Spanish National Radio: Panorama. See T 0015.
- 0025 Spanish National Radio: Press Review. See T 0023.
- 0029 Spanish National Radio: People of Today. Focus on a Spaniard of note.
- 0030 Radio Sweden: Sixty Degrees North. See M 1130.
- 0036 Spanish National Radio: Social Clippings. What's going on in Spain.
- 0046 Radio Sweden: Green Scan. See H 1146.
- 0046 Radio Sweden: Horizon (4). See H 1146.
- 0047 Spanish National Radio: Spanish Course by Radio. See T 0048.

Saturdays

- 0000 WWCR #3: America's Town Forum. See T 0000.
- 0015 Spanish National Radio: Panorama. See T 0015.
- 0022 Spanish National Radio: Press Review. See T 0023.
- 0029 Spanish National Radio: Window on Spain. A different region of Spain is described each week.
- 0030 BBC: From the Weeklies. Review of the British weekly press.
- 0030 Radio Sweden: Sixty Degrees North. See M 1130.
- 0035 Radio Sweden: A Review of the Newsweek. See F 1135.
- 0036 Spanish National Radio: Arts in Spain. A review of cultural activities.
- 0045 BBC: The Learning World. See M 0615.
- 0048 Spanish National Radio: Spanish Course by Radio. See T 0048.
- 0056 Spanish National Radio: Program Announcements. See S 0053.

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FREQUENCIES

0200-0300 mtwhf	Argentina, RAE	11710am				0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0200-0300	Australia, Radio	11880pa	13605as	15240pa	15365pa	0200-0300	Taiwan, VO Free China	5950na	9680na	9765au	11740ca
		15415as	15510as	17630as	17715as			11860as	15345as		
		17750as	17795pa	17860pa	17880as	0200-0300	Thailand, Radio		9655as	11905as	
0200-0300 vl	Australia, VL8A Alice Spg	4835do				0200-0300	United Kingdom, BBC London	5975na	6175na	6195me	7155me
0200-0300 vl	Australia, VL8K Katherine	5025do						7235me	9410eu	9630af	9915am
0200-0300 vl	Australia, VL8T Tent Crk	4910do						11750sa	11955me	15260sa	15360as
0200-0300 vl	Canada, CBC N Quebec See	9625do				0200-0230 vl	USA, KCBI Dallas TX	9815am	13740am		
0200-0300	Canada, CFCX Montreal	6005do				0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0300	Canada, CFRX Toronto	6070do				0200-0230	USA, KVOH Los Angeles CA	17775am			
0200-0300	Canada, CFVP Calgary	6030do				0200-0300	USA, KWHR Naalehu HI	17510as			
0200-0300	Canada, CHNX Halifax	6130do				0200-0300	USA, Monitor Radio Intl	5850na	9430ca		
0200-0300	Canada, CKZN St John's	6160do				0200-0230 twhfa	USA, VOA Washington DC	5995am	6130am	7405am	9775am
0200-0300	Canada, CKZU Vancouver	6160do						11580am	15120am	15205am	
0200-0230	Canada, RCI Montreal	6120na	9535am	9755na	11845na	0200-0300	USA, VOA Washington DC	7115as	7205as	7651as	9740as
		11940am						11705as	15250as	17740as	21550as
0200-0300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	0200-0300	USA, WCSN Scotts Cor ME	7465am			
0200-0300	Cuba, Radio Havana Cuba	6010na	9820na			0200-0300	USA, WEWN Birmingham AL	7425na			
0200-0300	Ecuador, HCJB Quito	9745am	11925am	17490am		0200-0300	USA, WHRI Noblesville IN	7315am			
0200-0300	Egypt, Radio Cairo	9475na	11600na			0200-0300	USA, WINB Red Lion PA	11950am			
0200-0250	Germany, Deutsche Welle	7285as	9580as	9615as	9690as	0200-0300	USA, WJCR Upton KY	7490na	13595na		
		11945as	11965as	12045as	15185as	0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300 as	Guam, KSDA AWR Agat	13720as				0200-0300	USA, WWCR Nashville TN	5810am	5935am	7435am	
0200-0300 vl	Italy, IRRS Milano	7125eu				0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200-0230 mtwhfa	Kenya, Kenya BC Corp	4935do				0200-0245	USA, WYFR Okeechobee FL	15440na			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do				0215-0255	Nepal, Radio	5005do	7165do		
0200-0230	Myanmar, Radio	7185do				0230-0245	Albania, R Tirana Intl	9580na	9760na		
0200-0300	Netherlands, Radio	9860as	12025as			0230-0300	Hungary, Radio Budapest	5970na	9835na	11910na	
0200-0300	New Zealand, R NZ Intl	15115pa				0230-0300 s	Kenya, Kenya BC Corp	4935do			
0200-0300 vl	Papua New Guinea, NBC	9675do				0230-0245	Pakistan, Radio	7290as	15190as	17525as	17705as
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na			21730as			
		11940na				0230-0300	Sweden, Radio	6040na	6155na	9850na	
0200-0300	Russia, Radio Moscow Intl	7205af	7295na	9530na	9620na	0250-0300	Vatican State, Vatican R	6095na	7305na		
		9685af	9695af	9765af	11665na						
		11805na	12050as	15410na	15425na						
		17570as	17655au	21625na							

SELECTED PROGRAMS

Sundays

- 0230 Radio for Peace Int'l: RFPI Reports. Daily news program of Latin American and Caribbean topics not generally heard in the mainstream media.
 - 0230 Radio Sweden: People and Ideas. See S 0030.
 - 0245 Radio for Peace Int'l: United Nations. A variable program produced by the United Nations Radio Service.
 - 0250 Vatican Radio: With Heart and Mind.
 - 0258 Vatican Radio: Vatican On-the-Air.
- Mondays**
- 0200 Radio for Peace Int'l: Working Together (biweekly). A program for both children and their families about the concerns expressed by youth.
 - 0200 WWCR #1: World of Prophecy. Texe Marrs.
 - 0230 Radio for Peace Int'l: Peace Forum. A grab bag of individual programs and special short series received by RFPI.
 - 0230 Radio Sweden: In Touch with Stockholm (biweekly). See S 1130.
 - 0230 Radio Sweden: Sounds Nordic (biweekly). See S 1130.
 - 0250 Vatican Radio: Catholic Writes.

Tuesdays

- 0200 Radio for Peace Int'l: Unconventional Wisdom. Analyzing key issues of US foreign policy.
- 0200 WWCR #1: Truth House. See M 1100.
- 0205 WWCR #3: Radio Free America (live). Tom Valentine hosts this talk/interview program.
- 0230 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 0230 Radio Sweden: Sixty Degrees North. See M 1130.
- 0235 Radio for Peace Int'l: United Nations. See S 0245.
- 0248 Radio Sweden: Sports Scan. See M 1148.
- 0250 Vatican Radio: A Room with a View of the Vatican.

Wednesdays

- 0200 Radio for Peace Int'l: Second Opinion. Erwin Knoll, editor of "the Progressive", talks to a wide variety of guests.
- 0200 WWCR #1: Truth House. See M 1100.
- 0205 WWCR #3: Radio Free America (live). See T 0205.
- 0230 BBC: Andy Kershaw's World of Music. Recordings of diverse music from around the world.
- 0230 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 0230 Radio Sweden: Sixty Degrees North. See M 1130.
- 0249 Radio Sweden: Media Scan (1&3). See T 1147.
- 0250 Vatican Radio: The Rome Report.

- 0254 Radio for Peace Int'l: Along the Color Line. Commentaries on contemporary issues relevant to the African-American community.
- Thursdays**
- 0200 Radio for Peace Int'l: Amnesty International Reports (monthly). Human rights records of culpable countries are examined.
 - 0200 WWCR #1: Truth House. See M 1100.
 - 0205 WWCR #3: Radio Free America (live). See T 0205.
 - 0230 BBC: Omnibus. See T 2330.
 - 0230 Radio for Peace Int'l: RFPI Reports. See S 0230.
 - 0230 Radio Sweden: Sixty Degrees North. See M 1130.
 - 0240 Radio for Peace Int'l: UNESCO Program. See M 2330.
 - 0247 Radio Sweden: Money Matters. See W 1149.
 - 0250 Vatican Radio: Vatican Week.
 - 0256 Vatican Radio: Pilgrim City.
- Fridays**
- 0200 Radio for Peace Int'l: Living Enrichment Center. See M 0400.

- 0200 WWCR #1: Truth House. See M 1100.
 - 0205 WWCR #3: Radio Free America (live). See T 0205.
 - 0230 Radio for Peace Int'l: RFPI Reports. See S 0230.
 - 0230 Radio Sweden: Sixty Degrees North. See M 1130.
 - 0246 Radio Sweden: Green Scan. See H 1146.
 - 0246 Radio Sweden: Horizon (4). See H 1146.
 - 0250 Vatican Radio: Cross Reference.
- Saturdays**
- 0200 Radio for Peace Int'l: Common Ground. See W 2300.
 - 0200 WWCR #1: Truth House. See M 1100.
 - 0205 WWCR #3: Radio Free America (live). See T 0205.
 - 0230 BBC: People and Politics. Background to the British political scene.
 - 0230 Radio for Peace Int'l: The Far Right Radio Review. See M 0630.
 - 0230 Radio Sweden: Sixty Degrees North. See M 1130.
 - 0235 Radio Sweden: A Review of the Newsweek. See F 1135.
 - 0250 Vatican Radio: Orders of the Day.

THANK YOU ...

Additional contributors to this month's Shortwave Guide:

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FREQUENCIES

0300-0400	Australia, Radio	11880pa 15365pa 17715as 17880as	13605pa 15415as 17750as	13650pa 15510as 17795pa	15240pa 17630as 17860pa	0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Taiwan, VO Free China					0300-0400		5950na 15345as	9680na	9765au	11740as
0300-0400 vl	Australia, VL8A Alice Spg	4835do				0300-0400	Thailand, Radio	9655as		11905as	
0300-0400 vl	Australia, VL8K Katherine	5025do				0300-0350	Turkey, Voice of	9445na			
0300-0400 vl	Australia, VL8T Tent Crk	4910do				0300-0400 vl	Uganda, Radio	4976do			
0300-0400	Bahrain, Radio	6010do				0300-0400	Ukraine, R Ukraine Intl	9620na 12030na	9685na	9860na	11720na
0300-0400 vl	Canada, CBC N Quebec Sce	9625do				0300-0330	United Kingdom, BBC London	6175na 15260sa	7235me	7325na	9915sa
0300-0400	Canada, CFCX Montreal	6005do				0300-0400	United Kingdom, BBC London	3255af 6190af 11730af 15310me	5975na	6005af	6180eu 9410eu 15280as
0300-0400	Canada, CFRX Toronto	6070do				0300-0400	USA, KCBi Dallas TX	9815am			
0300-0400	Canada, CFVP Calgary	6030do				0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	Canada, CHNX Halifax	6130do				0300-0400	USA, KVDH Los Angeles CA	9785am			
0300-0400	Canada, CKZN St John's	6160do				0300-0400	USA, KWHR Naalehu HI	17510as			
0300-0400	Canada, CKZU Vancouver	6160do				0300-0400	USA, Monitor Radio Intl	5850na			
0300-0400	China, China Radio Intl	9690na	9780na	11715na		0300-0400	USA, VOA Washington DC	7105af 7405af	7265af	7280af	7340af
0300-0400	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	0300-0400	USA, WCSN Scotts Cor ME	7465am			
0300-0400 vl	Costa Rica, Faro del Carib	5055do				0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	Cuba, Radio Havana Cuba	6010na	9820na			0300-0400	USA, WHRI Noblesville IN	7315am			
0300-0327	Czech Rep, Radio Prague	5930na	7345na			0300-0400	USA, WINB Red Lion PA	11950eu			
0300-0400	Ecuador, HCJB Quitto	9745am	11925am			0300-0400	USA, WJCR Upton KY	7490na		13595na	
0300-0330	Egypt, Radio Cairo	9475na	11600na			0300-0400	USA, WRND New Orleans LA	7395am			
0300-0350	Germany, Deutsche Welle	6085na 11750na	6185na	9535na	9640na	0300-0400	USA, WWCR Nashville TN	5810am	5935am	7435am	
0300-0400	Guatemala, Radio Cultural	3300do				0300-0400	USA, WYFR Dkeechobee FL	9380na	9420na	11645na	
0300-0400 vl	Italy, IRRS Milano	7125eu				0315-0330 sh	Greece, Voice of	9380na	9420na	11645na	
0300-0400	Japan, NHK/Radio	5960am 15325am	9610as	11875am	15210am	0315-0345	Vatican State, Vatican R	7360af	9695af		
0300-0330	Japan, NHK/Radio	11885na	11895na	15230na		0330-0400	Bulgaria, Radio	9700na	11720na		
0300-0400	Kenya, Kenya BC Corp	4935do				0330-0357	Czech Rep, Radio Prague	5930eu	9440eu	11640af	
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do				0330-0400	Netherlands, Radio	6165na	9590na		
0300-0325	Netherlands, Radio	9860as	12025as			0330-0400	Sweden, Radio	6040na	6155na	9850na	
0300-0400	New Zealand, R NZ Intl	15115pa				0330-0400	Tanzania, Radio	5050af			
0300-0350	North Korea, R Pyongyang	6522eu	9345eu			0330-0357	UAE, Radio Dubai	11945na 21485na	13675na	15400eu	17890eu
0300-0400 vl	Papua New Guinea, NBC	9675do				0340-0350	Greece, Voice of	9380na	9420na	11645na	
0300-0400	Russia, Radio Moscow Intl	7150na 9765na 12050as 15375as 15470as	7205na 9880as 13615na 15385as 15525na	7295na 11665as 15265as 15410na 15535as	9530na 11690as 15360as 15425na 17720as	0345-0400	Tajikistan, Radio	7245as			
0300-0400	S Africa, Channel Africa	3220af	5955af								

SELECTED PROGRAMS

Sundays

- 0300 Radio for Peace Int'l: CounterSpin. Fairness and Accuracy in Media (FAIR) examines how the media reports key stories.
- 0300 WWCR #3: Morning Watch Chapel. Terry Parker.
- 0310 Radio Japan: Hello from Tokyo. The weekend magazine program.
- 0315 Radio Japan: Let's Learn Japanese. A course in the Japanese language.
- 0330 BBC (eu): Europe Today. News, features, profiles and trends for the new Europe.
- 0330 Radio for Peace Int'l: RFPI's Mailbag. The latest news and happenings at RFPI and responses to listener letters.
- 0330 Radio Sweden: People and Ideas. See S 0030.
- 0335 BBC (af): Postmark Africa. Expert answers to any question under the sun.
- 0350 Radio Japan: Viewpoint. Opinions of a guest personality.

Mondays

- 0300 Radio for Peace Int'l: New Dimensions Radio. Conversations with innovative thinkers whose ideas are on the leading edge of change.
- 0315 Radio Japan: Radio Japan Magazine Hour. The weekday magazine program.
- 0330 BBC (eu): Europe Today. See S 0330.
- 0330 Radio Sweden: In Touch with Stockholm (biweekly). See S 1130.
- 0330 Radio Sweden: Sounds Nordic (iweekly). See S 1130.
- 0333 BBC (af): Network Africa. Breakfast show of news, sport, personalities, music, and listener's comments.
- 0350 Radio Japan: Close Up. Featuring a Japanese person of note

Tuesdays

- 0300 Radio for Peace Int'l: Steppin' Out of Babylon. Sue Supriano interviews people who speak out against injustice and stand up for freedom and liberty.
- 0304 Vatican Radio: Ask the Abbot.
- 0305 WWCR #3: Radio Free America (live). See T 0205.
- 0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0319 Radio Japan: News Commentary. See M 0515.
- 0326 Radio Japan: Japan Diary. See M 1526.
- 0330 BBC (eu): Europe Today. See S 0330.

- 0330 Radio for Peace Int'l: Voices of Dur World. A social justice magazine program.
- 0330 Radio Sweden: Sixty Degrees North. See M 1130.
- 0333 BBC (af): Network Africa. See M 0333.
- 0348 Radio Sweden: Sports Scan. See M 1148.
- 0350 Radio Japan: Close Up. See M 0350.

Wednesdays

- 0305 WWCR #3: Radio Free America (live). See T 0205.
- 0306 Vatican Radio: What Can I Do?
- 0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0330 BBC (eu): Europe Today. See S 0330.
- 0330 Radio for Peace Int'l: RFPI's Mailbag. See S 0330.
- 0330 Radio Sweden: Sixty Degrees North. See M 1130.
- 0333 BBC (af): Network Africa. See M 0333.
- 0349 Radio Sweden: Media Scan (1&3). See T 1147.
- 0350 Radio Japan: Close Up. See M 0350.

Thursdays

- 0300 Radio for Peace Int'l: Peace Forum. See M 0230.
- 0305 Vatican Radio: Postcards from Rome.

- 0305 WWCR #3: Radio Free America (live). See T 0205.
- 0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0319 Radio Japan: News Commentary. See M 0515.
- 0326 Radio Japan: Japan Diary. See M 1526.
- 0330 BBC (eu): Europe Today. See S 0330.
- 0330 Radio for Peace Int'l: New Dimensions Radio. See M 0300.
- 0330 Radio Sweden: Sixty Degrees North. See M 1130.
- 0333 BBC (af): Network Africa. See M 0333.
- 0347 Radio Sweden: Money Matters. See W 1149.
- 0350 Radio Japan: Close Up. See M 0350.

Fridays

- 0300 Radio for Peace Int'l: Alternative Radio. See T 0400.
- 0305 WWCR #3: Radio Free America (live). See T 0205.
- 0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0319 Radio Japan: News Commentary. See M 0515.
- 0326 Radio Japan: Japan Diary. See M 1526.
- 0330 BBC (eu): Europe Today. See S 0330.
- 0330 Radio Sweden: Sixty Degrees North. See M 1130.
- 0333 BBC (af): Network Africa. See M 0333.
- 0346 Radio Sweden: Green Scan. See H 1146.
- 0346 Radio Sweden: Horizon (4). See H 1146.
- 0350 Radio Japan: Close Up. See M 0350.

Saturdays

- 0300 Radio for Peace Int'l: New Dimensions Radio. See M 0300.
- 0304 Vatican Radio: By the Way....
- 0305 WWCR #3: Radio Free America (live). See T 0205.
- 0310 Radio Japan: This Week. See S 0110.
- 0330 BBC (eu): Europe Today. See S 0330.
- 0330 Radio Japan: The Week in Review. Looking back at the events that made the news last week.
- 0330 Radio Sweden: Sixty Degrees North. See M 1130.
- 0335 Radio Sweden: A Review of the Newsweek. See F 1135.

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

Distributor for ASAPS,
propagation software
Compuserve: 70531,140

FREQUENCIES

0500-0530	Australia, ADF Radio	18735as				0500-0600	Spain, Spanish Natl Radio	9540na			
0500-0600	Australia, Radio	6015as	13605pa	15240pa	15365pa	0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
		15415pa	17630pa	17715pa	17750as	0500-0600	Swaziland, Swazi Radio	6155af			
		17795pa	17860pa	17880as	21595as	0500-0530	Swaziland, Trans World R	5055af	7200af	7215af	
0500-0600 vl	Australia, VLA Alice Spg	4835do				0500-0515	Switzerland, Swiss R Intl	3985eu	6165eu		
0500-0600 vl	Australia, VL8K Katherine	5025do				0500-0600	Thailand, Radio		9655as	11905as	
0500-0600 vl	Australia, VLBT Tent Crk	4910do				0500-0600 vl	Uganda, Radio		4976do		
0500-0600	Bahrain, Radio	6010do				0500-0600	United Kingdom, BBC London	3255af	5975na	6005af	6180eu
0500-0600	Canada, CFCX Montreal	6005do						6190af	6195eu	9410eu	9640na
0500-0600	Canada, CFRX Toronto	6070do						11760me	12095eu	15280as	15310as
0500-0600	Canada, CFVP Calgary	6030do						15360as	15400af	15420af	15575as
0500-0600	Canada, CHNX Halifax	6130do				0500-0600	USA, KCBI Dallas TX	9815am			
0500-0600	Canada, CKZU Vancouver	6160do				0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0530 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	15430af	0500-0600	USA, KVOH Los Angeles CA	9785am			
		7840af				0500-0600	USA, KWHR Naalehu HI	17780as			
0500-0600	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	0500-0600	USA, Monitor Radio Intl	9840af			
0500-0600	Cuba, Radio Havana Cuba	6010na	9820na			0500-0600	USA, VOA Washington DC	6035af	7405af	9665af	11965af
0500-0600	Ecuador, HCJB Quito	11925am	21455am					12080af	15600af		
0500-0600 as	Eqt Guinea, R East Africa	9585af				0500-0530	USA, VOA Washington DC	5995eu	6140eu	6873eu	7170eu
0500-0550	Germany, Deutsche Welle	5960na	9515na	9670na	11705na			9530eu	9700eu	11825me	15205me
0500-0600 vl	Italy, IRRS Milano	7125eu				0500-0600	USA, WHRI Noblesville IN	7315am			
0500-0600	Japan, NHK/Radio	5975eu	7230eu	9610as	9725am	0500-0600	USA, WINB Red Lion PA	11950am			
		11740as	11885na	15410as	17810as	0500-0600	USA, WJCR Upton KY	7490na			
0500-0600	Kenya, Kenya BC Corp	4935do				0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600 mtwhf	Lebanon, Wings of Hope	9960me				0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	Malaysia, RTM Radio 4	7295do				0500-0600	USA, WWCR Nashville TN	5810am	5935am	7435am	
0500-0600	New Zealand, R NZ Intl	11900pa				0500-0600	USA, WYFR Okeechobee FL	5985na			
0500-0600	Nigeria, Radio	3326do	4770do	4990do		0500-0545	USA, WYFR Okeechobee FL	9870af			
0500-0600	Nigeria, Voice of	7255af				0500-0530	Vatican State, Vatican R	9695af	11625af	15090af	
0500-0550	North Korea, R Pyongyang	9640me	9977af			0500-0520	Vatican State, Vatican R	3945eu	3975eu	6245eu	
0500-0530 m	Norway, Radio Norway Intl	9590na	11865na			0510-0520	Botswana, Radio	3356af	4830af	7255af	
0500-0600 vl	Papua New Guinea, NBC	9675do				0520-0550 s	Mongolia, R Ulaanbaatar	12015as			
0500-0600	Russia, Radio Moscow Intl	7165na	9530na	9750na	9760na	0525-0600	Ghana, GBC Radio 2	3366do			
		9880as	12010na	12050na	15180na	0530-0600	Austria, R Austria Intl	6015na			
		15425na	15465af	15590na	17570af	0530-0600	Georgia, Radio	11910as			
		17590af	17610me	17835af		0530-0600	Romania, R Romania Intl	11810af	15340af	15380af	17790af
0500-0600	S Africa, Channel Africa	5995af	9695af			0530-0600	Swaziland, Trans World R	7200af	11740af		
0500-0553 f	Seychelles, FEBA Radio	17750me				0530-0600	UAE, Radio Dubai	15435as	17830as	21700as	

SELECTED PROGRAMS

Sundays

- 0500 Radio for Peace Int'l: Focus on Haiti. Interviews with leaders in the struggle for a return to democracy in Haiti.
- 0510 Radio Japan: Let's Learn Japanese. See S 0315.
- 0511 Vatican Radio: Vatican Week.
- 0513 Spanish National Radio: Spanish Radio DX Spot. See S 0013.
- 0525 Radio Japan: Media Roundup. Reception reports, DX/media news, and equipment reviews.
- 0527 Spanish National Radio: Spain Speaking. See S 0027.
- 0530 BBC (eu): Europe Today. See S 0330.
- 0530 Radio for Peace Int'l: Science and Spirit (biweekly). The findings of science and ancient wisdom teachings.
- 0530 Radio for Peace Int'l: Wisdom School of the Air (biweekly). Lectures of the late Manly P. Hall, founder of the Philosophical Research Society.
- 0540 Spanish National Radio: Grass Roots. See S 0040.
- 0550 Radio Japan: Viewpoint. See S 0350.
- 0553 Spanish National Radio: Program Announcements. See S 0053.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

- 0500 Radio for Peace Int'l: Sound Currents of the Spirit. See M 0430.
- 0511 Spanish National Radio: Grass Roots. See S 0040.
- 0514 Vatican Radio: Questions on the Faith.
- 0515 Radio Japan: Current Views. A Radio Japan editorial.
- 0520 Radio Japan: Spectrum. Focus on a topic of interest in Japan.
- 0530 BBC (eu): Europe Today. See S 0330.
- 0534 Spanish National Radio: Visitors Book. See M 0034.
- 0544 Spanish National Radio: Radio Club. See M 0044.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

- 0500 Radio for Peace Int'l: United Nations. See S 0245.
- 0500 Vatican Radio: Vatican Viewpoint.
- 0515 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 0515 Radio Japan: Current Views. See M 051.
- 0515 Spanish National Radio: Panorama. See T 0015.
- 0515 Vatican Radio: Ask the Abbot.
- 0520 Radio Japan: Enjoy Japanese. Learn and practice the Japanese language.

- 0520 Spanish National Radio: Commentary. See T 0020.
 - 0523 Spanish National Radio: Press Review. See T 0023.
 - 0529 Spanish National Radio: Sports Spotlight. See T 0029.
 - 0530 BBC (eu): Europe Today. See S 0330.
 - 0530 Radio for Peace Int'l: Food Not Bombs Radio Network (monthly). See S 1500.
 - 0540 Spanish National Radio: Cultural Encounters. See T 0040.
 - 0548 Spanish National Radio: Spanish Course by Radio. See T 0048.
 - 0555 Radio Japan: Tokyo Pop-In. See S 0155.
- ### Wednesdays
- 0500 Radio for Peace Int'l: UNESCO Program. See M 2330.
 - 0500 Vatican Radio: Vatican Week.
 - 0515 Radio for Peace Int'l: RFPI Reports. See S 0230.
 - 0515 Radio Japan: Current Views. See M 0515.
 - 0515 Spanish National Radio: Panorama. See T 0015.
 - 0520 Radio Japan: Spectrum. See M 0520.
 - 0520 Spanish National Radio: Press Review. See T 0023.
 - 0526 Spanish National Radio: Review of the Spanish Economy. See W 0026.
 - 0530 BBC (eu): Europe Today. See S 0330.
 - 0530 Radio for Peace Int'l: WINGS. Women's news and current affairs by the Women's International News Gathering Service.
 - 0534 Spanish National Radio: Stage and Screen. See W 0034.
 - 0547 Spanish National Radio: Spanish Course by Radio. See T 0048.
 - 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

- 0500 Radio for Peace Int'l: United Nations. See S 0245.
- 0500 Vatican Radio: Talking Point.
- 0515 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 0515 Radio Japan: Current Views. See M 0515.
- 0515 Spanish National Radio: Panorama. See T 0015.
- 0520 Radio Japan: Enjoy Japanese. See T 0520.
- 0525 Spanish National Radio: Press Review. See T 0023.
- 0530 BBC (eu): Europe Today. See S 0330.
- 0530 Radio for Peace Int'l: Vietnam Veterans Radio Network. See S 0630.
- 0532 Spanish National Radio: As Others See Us. See H 0032.
- 0540 Spanish National Radio: Planet Earth (biweekly). Ecological news and developments in Spain.

- 0540 Spanish National Radio: Science Desk (biweekly). See H 0040.
- 0547 Spanish National Radio: Spanish Course by Radio. See T 0048.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

- 0500 Vatican Radio: Cultural Notebook.
- 0500 Vatican Radio: The Church Today.
- 0515 Radio Japan: Current Views. See M 0515.
- 0515 Spanish National Radio: Panorama. See T 0015.
- 0520 Radio Japan: The Travel and Book Beat. The weekly magazine program that focuses on tourism and literature.
- 0521 Radio Japan: Japan Travelogue. Looking at a place or event in Japan of interest to visitors.
- 0525 Spanish National Radio: Press Review. See T 0023.
- 0529 Spanish National Radio: People of Today. See F 0029.
- 0530 BBC (eu): Europe Today. See S 0330.
- 0535 Radio Japan: Short Story. Narration of a short story by a Japanese author.
- 0536 Spanish National Radio: Social Clippings. See F 0036.
- 0545 Radio Japan: Book Review. Discussing a current book in print.
- 0547 Spanish National Radio: Spanish Course by Radio. See T 0048.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

- 0500 Radio for Peace Int'l: United Nations. See S 0245.
- 0500 Vatican Radio: Orders of the Day.
- 0510 Radio Japan: This Week. See S 0110.
- 0512 Vatican Radio: Orders of the Day.
- 0515 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 0515 Spanish National Radio: Panorama. See T 0015.
- 0520 Vatican Radio: By the Way....
- 0522 Spanish National Radio: Press Review. See T 0023.
- 0529 Spanish National Radio: Window on Spain. See A 0029.
- 0530 BBC (eu): Europe Today. See S 0330.
- 0530 Radio for Peace Int'l: Working Together (biweekly). See M 0200.
- 0536 Spanish National Radio: Arts in Spain. See A 0036.
- 0547 Radio Japan: Music Gallery. See S 0147.
- 0548 Spanish National Radio: Spanish Course by Radio. See T 0048.

FREQUENCIES

0600-0700	Australia, Radio	13605pa 15510as 17795pa	15240pa 15565as 17880as	15320pa 17670as 17715pa	15360as 17715pa	0600-0630 vl 0600-0700 0600-0700 0600-0700 0600-0630	Solomon Islands, SIBC South Korea, KBS/R Korea Swaziland, Swazi Radio Swaziland, Trans World R Switzerland, Swiss R Intl	5020do 11945na 6155af 5055af 3985eu 15430af	9545do 15155na 7200af 6165eu 9885af 13635af		
0600-0700 vl	Australia, VLBA Alice Spg	4835do				0600-0700	United Kingdom, BBC London	6005af 9640na 12095eu 15360as 17830as	6180eu 11760me 15070af 15400af 17885af	6195af 11940af 15280as 15575eu 17790as	9410eu 11955as 15310as 17790as
0600-0700 vl	Australia, VL8K Katherine	5025do				0600-0700	USA, KCBI Dallas TX	9815am			
0600-0700 vl	Australia, VLBT Tent Crk	4910do				0600-0700	USA, KTBN Salt Lk City UT	7510na			
0600-0700	Bahrain, Radio	6010do				0600-0700	USA, KVOH Los Angeles CA	9785am			
0600-0700	Canada, CFCX Montreal	6005do				0600-0700	USA, KWHR Naalehu HI	17780as			
0600-0700	Canada, CFRX Toronto	6070do				0600-0700	USA, Monitor Radio Intl	9840eu	9870eu		
0600-0700	Canada, CFVP Calgary	6030do				0600-0700	USA, VOA Washington DC	6035af 9665af 15600af	7120af 11950af	7405af 12080af	9530af 15080af
0600-0700	Canada, CHNX Halifax	6130do				0600-0630	USA, VOA Washington DC	3980eu 6140eu 7325eu	5995eu 6873eu 11805me	6040eu 7120eu 11825me	6060eu 7170eu 15205me
0600-0700	Canada, CKZU Vancouver	6160do				0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	0600-0700	USA, WMLK Bethel PA	9465eu			
0600-0700	Cuba, Radio Havana Cuba	9820na				0600-0700	USA, WWCR Nashville TN	5810am	5935am	7435am	
0600-0627	Czech Rep, Radio Prague	7345eu	9505eu	11990eu		0600-0700	USA, WYFR Okeechobee FL	5985na	7355eu	11770eu	13695af
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am		0600-0610 mtwhfa	Vatican State, Vatican R	3945eu 15210eu	6245eu	7250eu	9645eu
0600-0700 as	Eqt Guinea, R East Africa	9585af				0625-0700	Kenya, Kenya BC Corp	4935do			
0600-0650	Germany, Deutsche Welle	11915af 17820af	13790af 17875af	15185af 21680af	15205af	0630-0700	Australia, Radio	580pa 15240as	9860as 21725as	11880as 11910as	
0600-0630	Ghana, GBC Radio 1	4915do				0630-0700	Austria, R Austria Intl	6015na			
0600-0615	Ghana, GBC Radio 2	3366do				0630-0700	Belgium, R Vlaanderen Int	6015eu	9925au		
0600-0700 vl	Italy, IRRS Milano	7125eu	21610as			0630-0700	Vatican State, Vatican R	9725af	11625af	15570af	
0600-0700	Japan, NHK/Radio	11860as				0632-0641	Romania, R Romania Intl	7225eu	9550eu	9665eu	11810eu
0600-0625	Kenya, Kenya BC Corp	4935do				0640-0700	Monaco, Trans World Radio	7385eu			
0600-0700 vl	Kiribati, Radio	9825do				0645-0700	Finland, YLE/Radio	6120eu	9560eu	11755eu	
0600-0630	Laos, National Radio of	7116as	9750as	15295as		0645-0700	Romania, R Romania Intl	11775pa 17805pa	15250pa	15335pa	17720pa
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									
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									

SELECTED PROGRAMS

Sundays

- 0600 Radio for Peace Int'l: Science and Spirit (biweekly). See S 0530.
- 0600 Radio for Peace Int'l: Wisdom School of the Air (biweekly). See S 0530.
- 0600 WWCR #3: World of Radio, Glenn Hauser's communications program for shortwave radio listeners.
- 0605 BBC (af): Postmark Africa. See S 0335.
- 0610 Radio Japan: Hello from Tokyo. See S 0310.
- 0615 BBC: Letter from America. Alistair Cooke shares his inimitable view of contemporary American life.
- 0630 BBC (af): African Perspective. See S 0409.
- 0630 BBC: Jazz for the Asking. Record requests with Malcolm Laylock.
- 0630 Radio for Peace Int'l: Vietnam Veterans Radio Network. Bringing to light the real stories behind the Vietnam War.
- 0650 Radio Japan: Viewpoint. See S 0350.
- 0655 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

- 0600 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The Learning World. News and views about worldwide education.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 Radio for Peace Int'l: The Far Right Radio Review. The program that analyzes the growing phenomenon of far right/hate programming on radio.
- 0650 Radio Japan: Close Up. See M 0350.
- 0655 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

- 0600 Radio for Peace Int'l: CounterSpin. See S 0300.
- 0600 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The World Today. Examines thoroughly a topical aspect of the international scene.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0630 BBC (af): Network Africa. See M 0333.

- 0630 Radio for Peace Int'l: New Dimensions Radio. See M 0300.
- 0650 Radio Japan: Close Up. See M 0350.
- 0655 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

- 0600 Radio for Peace Int'l: Peace Forum. See M 0230.
- 0600 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The World Today. See T 0615.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC: Meridian Documentary. One of three topical programmes weekly about the world of the arts.
- 0650 Radio Japan: Close Up. See M 0350.
- 0655 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

- 0600 Radio for Peace Int'l: Peace Forum. See M 0230.
- 0600 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The World Today. See T 0615.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC: Assignment. A weekly examination of a topical issue.
- 0650 Radio Japan: Close Up. See M 0350.
- 0655 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

- 0600 Radio for Peace Int'l: Dialogue. See T 2330.
- 0600 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 0602 BBC (af): Network Africa. See M 0333.
- 0615 BBC: The World Today. See T 0615.
- 0615 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC: Meridian Books. See W 0630.
- 0630 Radio for Peace Int'l: Steppin' Out of Babylon. See T 0300.
- 0630 Radio for Peace Int'l: The Practice of Peacemaking. Ian Harris hosts a talk show about violence.
- 0650 Radio Japan: Close Up. See M 0350.
- 0655 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

- 0600 Radio for Peace Int'l: Unconventional Wisdom. See T 0200.
- 0600 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 0610 Radio Japan: This Week. See S 0110.
- 0615 BBC: The World Today. See T 0615.
- 0622 Radio Japan: Japan Scene. A segment of the Magazine Hour about a current event in Japan.
- 0630 BBC (af): Spce Taxi. A sideways look at African culture, from presidential style to cult films.
- 0630 BBC: Meridian Reports. See W 0630.
- 0630 Radio for Peace Int'l: Second Opinion. See W 0200.
- 0630 Radio Japan: The Week in Review. See A 0330.
- 0655 Radio Japan: Tokyo Pop-In. See S 0155.

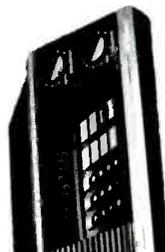
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FREQUENCIES

0700-0800	Australia, Radio	6080pa	9580pa	9860pa	11720pa	0800-0900	Australia, Radio	6020pa	6080pa	7240pa	9580as
		11880pa	11910pa	13605pa	15240pa			9710pa	9860pa	11720pa	11910pa
		15565as	17695as	17750as	21595as			15170pa	15240pa	17695as	17750as
		21715as						21525as			
0700-0800 vl	Australia, VL8A Alice Spg	4835do				0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do				0800-0830 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do				0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio	6010do				0800-0900	Bahrain, Radio	6010do			
0700-0800	Canada, CFCX Montreal	6005do				0800-0900	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do				0800-0900	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFPV Calgary	6030do				0800-0900	Canada, CFPV Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do				0800-0900	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do				0800-0900	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	0800-0900	Costa Rica, AWR	6150am	9725am		
0700-0800	Ecuador, HCJB Quito	6205eu	9600eu	9745au	11835eu	0800-0900	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
		11925eu	21455eu			0800-0830	Ecuador, HCJB Quito	6205eu	9600eu	9745pa	11835eu
								11925pa	17490au	21455eu	
0700-0800 as	Eqt Guinea, R East Africa	9585af				0800-0900 as	Eqt Guinea, R East Africa	9585af			
0700-0730	Georgia, Radio	11910as				0800-0900	Finland, YLE/Radio	15445au	17800as		
0700-0715	Ghana, GBC Radio 1	4915do				0800-0805 s	Ghana, GBC Radio 1	4915do			
0700-0715	Ghana, GBC Radio 2	3366do				0800-0805 s	Ghana, GBC Radio 2	3366do			
0700-0800 vl	Italy, IRRS Milano	7125eu				0800-0900	Guam, KTWR Agana	9785as			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11740af	15270af	0800-0900	Indonesia, Voice of	9675as	11752as		
		15380me	15410as	17810me	21610au	0800-0900 vl	Italy, IRRS Milano	7125eu			
						0800-0900	Kenya, Kenya BC Corp	4935do			
0700-0800	Kenya, Kenya BC Corp	4935do				0800-0900	Lebanon, Wings of Hope	9960me			
0700-0800 vl	Kiribati, Radio	9825do				0800-0830 mtwhf	Liberia, Radio ELWA	4760do			
0700-0800 mtwhf	Lebanon, Wings of Hope	9960me				0800-0900	Malaysia, RTM Radio 4	7295do			
0700-0800	Liberia, Radio ELWA	4760do				0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do				0700-0800 mtwfta	Monaco, Trans World Radio	7385eu			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as		0700-0730	Myanmar, Radio		9730do		
0700-0800 mtwfta	Monaco, Trans World Radio	7385eu				0700-0800	New Zealand, R NZ Intl	6100pa			
0700-0730	Myanmar, Radio		9730do			0700-0800	Nigeria, Radio	3326do	4770do	4990do	
0700-0800	New Zealand, R NZ Intl	6100pa				0700-0800	Nigeria, Voice of	7255af			
0700-0800	Nigeria, Radio	3326do	4770do	4990do		0700-0800 vl	Papua New Guinea, NBC	4890do			
0700-0800	Nigeria, Voice of	7255af				0700-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
0700-0800 vl	Papua New Guinea, NBC	4890do						17805pa			
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	6005eu	6180eu	6190af	6195eu						
		7325eu	9410eu	9600af	9640na						
		11760me	11940af	11955as	12095eu						
		15070eu	15280af	15310as	15360as						
		15400eu	15575eu	17790as	17830as						
		17885af	21660af								
0700-0800	USA, KCBI Dallas TX	9815na				0800-0900	USA, KCBI Dallas TX	9815am			
0700-0800	USA, KTBN Salt Lk City UT	7510na				0800-0900 vl	USA, KNLS Anchor Point AK	9615as			
0700-0800	USA, KVOH Los Angeles CA	9785am				0800-0900	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KWHR Naalehu HI	17510as				0800-0900	USA, KWHR Naalehu HI	9930as			
0700-0800	USA, Monitor Radio Intl	9840eu				0800-0900	USA, Monitor Radio Intl	13615au			
0700-0800	USA, WEWN Birmingham AL	7425am	9350am	13615am		0800-0900 vl	USA, WEWN Birmingham AL	7425sa	9350na		
0700-0800 vl	USA, WHRI Noblesville IN	7315am	9495am			0800-0900 vl	USA, WHRI Noblesville IN	7315am	7355am		
0700-0800 vl	USA, WINB Red Lion PA	11950na				0800-0900 vl	USA, WINB Red Lion PA	11950na			
0700-0800	USA, WJCR Upton KY	7490na	13595na			0800-0900	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu				0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5935am	7435am			0830-0845 s	USA, WWCR Nashville TN	5810am	5935am	7435am	
0700-0800	USA, WYFR Okeechobee FL	13695af				0830-0900 vl	Armenia, Radio Yerevan	15170eu	15400eu	17700eu	
0700-0745	USA, WYFR Okeechobee FL	7355eu	11770eu			0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0730-0800	Austria, R Austria Intl	6155eu	13710eu	15410me	17870me	0830-0900 vl	Australia, VL8K Katherine	2485do			
0730-0757	Czech Rep, Radio Prague	15605as	17535as	21705pa		0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0730-0745 sh	Greece, Voice of	9425eu	11645eu	15650eu		0830-0900	Austria, R Austria Intl	15450au	17870au		
0730-0745 mtwhf	Iceland, Natl BC Service	9265am				0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0730-0800	Netherlands, Radio	9630pa	9720pa			0830-0900	Netherlands, Radio	9555eu	9720pa	9895pa	
						0830-0900	Slovakia, AWR Europe	7180as			
						0835-0845 s	Monaco, Trans World Radio	7385eu			
						0855-0900	Guam, KTWR Agana	11805au			

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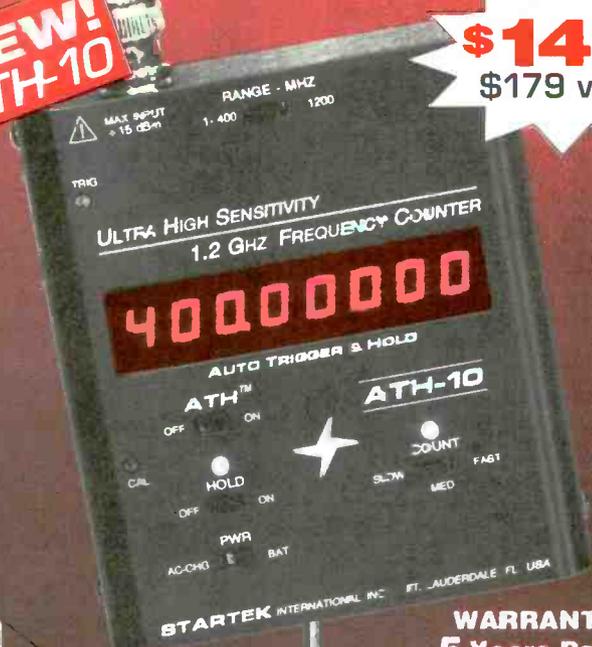
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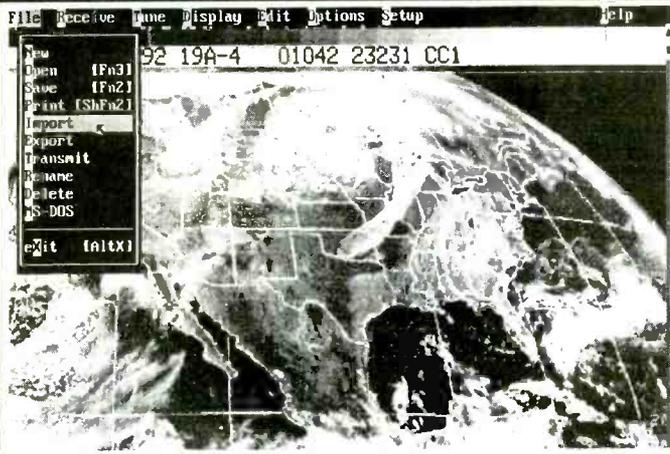


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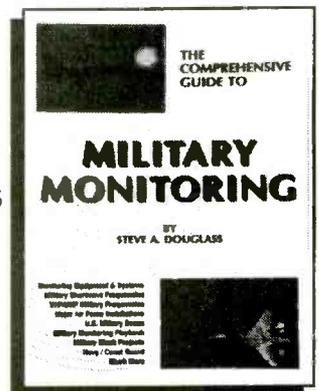
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FREQUENCIES

0900-1000	Australia, Radio	9510as 15170as	9580pa 21725as	9860pa	13605as						
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	8450au	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	Eq 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, KTWB Agana	11805au									
0900-0915	Guam, KTWB 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 mtwfta	Palau, KHBN Voice of Hope	9830as									
0900-1000 vl	Papua New Guinea, NBC	4890do									
0900-1000	Russia, Radio Moscow Intl	9680eu 15210eu 15440eu 17605eu	12070eu 15290as 15495eu 17760eu	13650eu 15345eu 15540eu 21515eu	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 11750as 15070eu 17640eu 17885af	6195as 11760me 15190sa 17705eu 21660af	9410eu 11940af 15310as 17790af 21715as	9740as 12095eu 15575me 17830as						
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	17555au						
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 smtwf	USA, WMLK Bethel PA	9465eu									
0900-1000	USA, WWCR Nashville TN	5810am									
0910-0940	Mongolia, R Ulaanbaatar	11850as	12015as								
0915-1000	Ghana, GBC Radio 2	6130do	7295do								
0920-0935 sh	Greece, Voice of		15650au	17525au							
0930-1000	Australia, ADF Radio	18735as									
0930-1000	Canada, CKZN St John's	6160do									
0930-1000	Netherlands, Radio	5955eu	9715pa	9720pa	9810eu						
		9895eu	12065as	15470as							
0930-1000	Philippines, FEBC Manila	11690as									
0940-0950	Greece, Voice of	15650au	17525au								
1000-1030	Australia, ADF Radio	18735as									
1000-1100	Australia, Radio	9580pa	9710pa	9860pa	15170as						
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	8450au	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	Eq Guinea, R East Africa	9585af									
1000-1100	Ghana, GBC Radio 2	6130do									
1000-1100	India, All India Radio	15050as 21460as									
1000-1030	Israel, Kol Israel	15640na	15650as	17575eu							
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									
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 9740as 2095eu 1 15400eu 17790me 21660af	6195as 11750as 5070eu 15575me 17830af	7160as 11760me 15190sa 17640eu 17885af	9410eu 11940af 15310as 17705eu 21470af						
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	7465na	13625pa	17555as						
1000-1100	USA, VOA Washington DC	5985as	7405am	9590am	11915am						
		15120am									
1000-1100	USA, WEWN Birmingham AL	9370as									
1000-1100 vl	USA, WHRI Noblesville IN	7315am	7355am								
1000-1100 vl	USA, WINB Red Lion PA	11950na									
1000-1100	USA, WJCR Upton KY	7490na	13595na								
1000-1100	USA, WWCR Nashville TN	5935am	15685am								
1000-1100	USA, WYFR Okeechobee FL	5950na									
1000-1030	Vietnam, Voice of	9840as	12020as	15010as							
1020-1030 mtwfta	Vatican State, Vatican R	6245eu	11740af	15210af	21515me						
		21730me									
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						

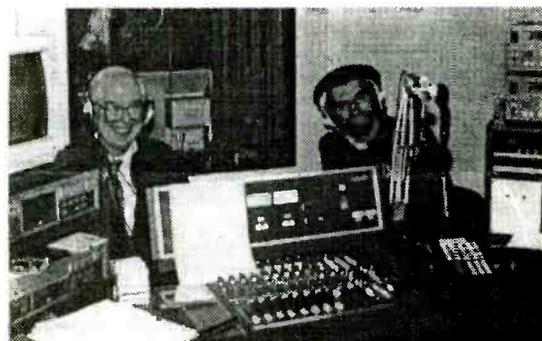
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Deacon Bill Steltemeier and Father John Mary Klobuchar in WEWN Catholic Radio studio.



FREQUENCIES

1100-1200	Australia, Radio	9710pa	9860pa	15565as	1100-1200	Singapore, SBC Radio One	6155do	9530do
1100-1130	Australia, Radio	9510as	9580pa	13605as	15170pa	Singapore, R Singapore Int	9530as	
1100-1200 vl	Australia, VLBA Alice Spg	2310do			1100-1130	Sri Lanka, SLBC Colombo	11835au	15120as 17850as
1100-1200 vl	Australia, VL8K Katherine	2485do			1100-1130	Switzerland, Swiss R Int'l	6165eu	9535eu 13635as 15505as
1100-1200 vl	Australia, VL8T Tent Crk	2325do					17515as	
1100-1200	Bahrain, Radio	6010do			1100-1200	United Kingdom, BBC London	5975na	6190af 6195na 7160as
1100-1200	Canada, CFCX Montreal	6005do					9410eu	9515na 9660eu 9740na
1100-1200	Canada, CFRX Toronto	6070do					11750as	11760me 11940af 12095af
1100-1200	Canada, CFVP Calgary	6030do					15070eu	15310as 15575as 17640eu
1100-1200	Canada, CHNX Halifax	6130do					17885af	21660af
1100-1200	Canada, CKZN St John's	6160do			1100-1130	United Kingdom, BBC London	5965na	6110as 15400eu 17790sa
1100-1200	Canada, CKZV Vancouver	6160do			1100-1200	USA, KCBI Dallas TX	9815am	
1100-1200	Costa Rica, R Peace Int'l	7375am	9400am	15030am	21465am	USA, KTBN Salt Lk City UT	7510na	
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	1100-1200	USA, KWHR Naalehu HI	9930as	
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af	USA, Monitor Radio Int'l	7395ca	7465na 9425pa
		17800af	17860af	21600af		USA, VOA Washington DC	5985as	6110as 7405am 9590am
		4915do					9645as	9760as 11720au 11915am
1100-1115	Ghana, GBC Radio 1	4915do					15120as	15160au 15425as
1100-1200 vl	Italy, IRRS Milano	7125eu			1100-1200	USA, WEWN Birmingham AL	9350na	9370as
1100-1200	Japan, NHK/Radio	6120na	9610as	15295as	1100-1200 vl	USA, WHRI Noblesville IN	7315am	9850am
1100-1200 mtwhf	Lebanon, Wings of Hope	9960me			1100-1200	USA, WJCR Upton KY	7490na	13595na
1100-1200 vl	Malaysia, RTM Kota Kinabalu	5980do			1100-1200	USA, WWCR Nashville TN	5810am	5935am 15685am
1100-1200	Malaysia, RTM Radio 4	4950do	7295do		1100-1200	USA, WYFR Okeechobee FL	5950na	11830na
1100-1200 vl	Malaysia, RTM Sarawak	4950do	7160do		1130-1200	Austria, R Austria Int'l	6155eu	13730na
1100-1200	New Zealand, R NZ Int'l	6100pa			1130-1200	Ecuador, HCJB Quito	11925am	15115am 17890am 21455am
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	1130-1200 mtwhfa	Finland, YLE/Radio	11900na	15400na
1100-1120	Pakistan, Radio	17900as	21520as		1130-1200	Iran, VOIRI Tehran	9525me	11715me 11790as 11910as
1100-1200 mtwhf	Palau, KHBN Voice of Hope	9830as					11930as	
1100-1200 vl	Papua New Guinea, NBC	4890do			1130-1200	Netherlands, Radio	5955eu	9850eu
1100-1200	Russia, Radio Moscow Int'l	7305eu	11705af	11800as	11900as	Sweden, Radio	13775as	15120as 15240au
		11990as	12015eu	12020eu	15105as	Thailand, Radio	655as	11905as
		15120as	15170as	15210eu	15290as	Vietnam, Voice of	6115as	10059as 12025as 15010as
		15320as	15335eu	17710as	17825as			

SELECTED PROGRAMS

Sundays

- 1100 Radio for Peace Int'l: CounterSpin. See S 0300.
- 1100 WWCR #1: Apostolic Assembly. Lonnie Woolard.
- 1100 WWCR #3: The Overcomer Broadcast (live). Brother R. G. Stair preaches about the last days.
- 1115 Radio Japan: Let's Learn Japanese. See S 0315.
- 1120 Radio Japan: Media Roundup. See S 0525.
- 1130 Radio for Peace Int'l: RFPI's Mailbag. See S 0330.
- 1130 Radio Sweden: In Touch with Stockholm (biweekly). A mailbag program with on-the-air link-ups.
- 1130 Radio Sweden: Sounds Nordic (biweekly). The very latest in trends and music.
- 1130 WWCR #1: Staff of Life. Irene Armstrong.
- 1145 WWCR #1: Weekly Presidential Radio Address. Bill Clinton.
- 1150 Radio Japan: Viewpoint. See S 0350.

Mondays

- 1100 Radio for Peace Int'l: New Dimensions Radio. See M 0300.
- 1100 WWCR #1: Truth House. Evangelistic teachings by E. C. Fultcher and his global shortwave club.
- 1100 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1130 Radio Sweden: Sixty Degrees North. Reports, interviews and analysis from Stockholm and other Nordic capitals.
- 1148 Radio Sweden: Sports Scan. A weekly review of all the news in sports.

Tuesdays

- 1100 Radio for Peace Int'l: Steppin' Out of Babylon. See T 0300.
- 1100 WWCR #1: Truth House. See M 1100.
- 1100 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 1130 Radio for Peace Int'l: Voices of Our World. See T 0330.
- 1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1130 Radio Sweden: Sixty Degrees North. See M 1130.
- 1132 Radio Japan: Japan Diary. See M 1526.
- 1137 Radio Japan: Japanese Culture Today. Comparing modern-day Japan with the customs of old.
- 1145 Radio Japan: When Women Shine. Examples of the achievements of women in modern Japan.
- 1147 Radio Sweden: Media Scan (1&3). Satellite news 85%; medium wave and shortwave news 15%.

Wednesdays

- 1100 WWCR #1: Truth House. See M 1100.
- 1100 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 1130 Radio for Peace Int'l: RFPI's Mailbag. See S 0330.
- 1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.

- 1130 Radio Sweden: Sixty Degrees North. See M 1130.
- 1149 Radio Sweden: Money Matters. Economic and financial trends.

Thursdays

- 1100 Radio for Peace Int'l: Peace Forum. See M 0230.
- 1100 WWCR #1: Truth House. See M 1100.
- 1100 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 1130 Radio for Peace Int'l: New Dimensions Radio. See M 0300.
- 1130 Radio Japan: Japan Diary. See M 1526.
- 1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1130 Radio Sweden: Sixty Degrees North. See M 1130.
- 1136 Radio Japan: Close Up. See M 0350.
- 1140 Radio Japan: Crosscurrents. Radio Japan's mailbag program.
- 1146 Radio Sweden: Green Scan. Environmental concerns and solutions.
- 1146 Radio Sweden: Horizon (4). Science and technology in Sweden.

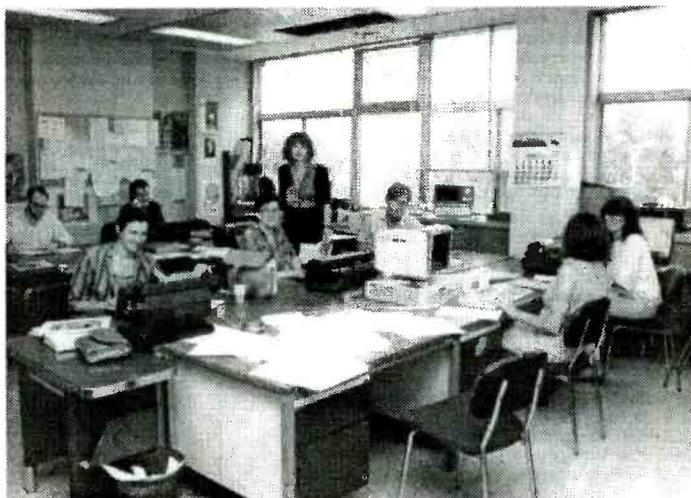
Fridays

- 1100 Radio for Peace Int'l: Alternative Radio. See T 0400.
- 1100 WWCR #1: Truth House. See M 1100.
- 1100 WWCR #3: The Overcomer Broadcast (live). See S 1100.
- 1130 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1130 Radio Sweden: Sixty Degrees North. See M 1130.
- 1135 Radio Sweden: A Review of the Newsweek. Looking back at the week's news events.

Saturdays

- 1100 Radio for Peace Int'l: New Dimensions Radio. See M 0300.
- 1110 Radio Japan: This Week. See S 0110.
- 1115 WWCR #1: Unshackled. Pacific Garden Mission's radio drama.
- 1130 Radio Japan: The Week in Review. See A 0330.
- 1130 Radio Sweden: People and Ideas. See S 0030.
- 1145 WWCR #1: Focus on the Family (Weekend Edition). James Dobson.

The English broadcasting staff of Spanish Foreign Radio, Madrid.



FREQUENCIES

Frequency	Country	Station	Frequency	Country	Station	Frequency	Country	Station
1200-1300	Australia	Radio	5995pa	Russia	Radio Moscow Intl	9835af		
			6060pa			11705as		
			6080pa			15105af		
			7240pa			15335af		
1200-1300 vl	Australia	VL8A Alice Spg	11800pa			15485eu		
1200-1300 vl	Australia	VL8K Katherine	2310do			15525af		
1200-1300 vl	Australia	VL8T Tent Crk	2485do			9530do		
1200-1300	Bahrain	Radio	2325do	1200-1300	Singapore	SBC Radio One	6155do	
1200-1300	Brazil	Radiobras	6010do	1200-1300	Singapore	R Singapore Int	9530as	
1200-1300	Bulgaria	Radio	15445na	1200-1300	South Korea	KBS/R Korea	7180as	
1200-1215	Cambodia	Natl Voice of	17625au	1200-1230	Thailand	Radio	9655as	11905as
1200-1300	Canada	CFCX Montreal	11940as	1200-1300	United Kingdom	BBC London	6190af	6195na
1200-1300	Canada	CFRX Toronto	6005do				9515na	9760eu
1200-1300	Canada	CFVP Calgary	6070do				11760me	11940af
1200-1300	Canada	CHNX Halifax	6030do				15220na	15310as
1200-1300	Canada	CKZN St John's	6130do				17790af	17885af
1200-1300	Canada	CKZU Vancouver	6160do	1200-1300	USA	KCBI Dallas TX	9815am	
1200-1300 mtwhf	Canada	RCI Montreal	6160do	1200-1300	USA	KTBN Salt Lk City UT	7510am	
1200-1300	China	China Radio Intl	9635na	1200-1300 vl	USA	KWHR Naalehu HI	9930as	
			8425as	1200-1300	USA	Monitor Radio Intl	7465ca	9425pa
			15210na	1200-1300	USA	VOA Washington DC	6110as	9560as
1200-1300	Costa Rica	R Peace Intl	7375am				15160as	15425as
1200-1300	Ecuador	HCBJ Quito	11925am	1200-1300	USA	WEWN Birmingham AL	9350na	9985ca
			21455am	1200-1300 vl	USA	WHRI Noblesville IN	7315am	9850am
1200-1300	France	Radio France Intl	9805eu	1200-1300	USA	WJCR Upton KY	7490na	13595na
			15195eu	1200-1300	USA	WWCR Nashville TN	5810am	13845am
1200-1230	Iran	VOIRI Tehran	9525me	1200-1300	USA	WYFR Okeechobee FL	5950na	6015na
			11930as	1200-1230	Uzbekistan	R Tashkent	15295as	17815as
1200-1300 vl	Italy	IRRS Milano	7125eu	1200-1300	Vietnam	Voice of	6115as	10059as
1200-1300	Jordan	Radio	9560eu	1207-1300	New Zealand	R NZ Intl	6100pa	
1200-1300 vl	Malaysia	RTM Kota Kinaba	5980do	1215-1300	Egypt	Radio Cairo	17595as	
1200-1300	Malaysia	RTM Radio 4	7295do	1220-1230 vl	Ghana	GBC Radio 1	4915do	
1200-1230 mwha	Mongolia	R Ulaanbaatar	11850as	1230-1300	Bangladesh	Radio	11895as	13615as
1200-1300	Netherlands	Radio	5955eu	1230-1300 s	Belgium	R Vlaanderen Int	15545na	17775as
1200-1206	New Zealand	R NZ Intl	6100pa	1230-1300	Canada	RCI Montreal	9660as	15195as
1200-1230 s	Norway	Radio Norway Intl	17860as	1230-1300 mtwhfa	Finland	YLE/Radio	11900na	15400na
1200-1300 mtwhf	Palau	KHBN Voice of Hope	9830as	1230-1300	Ghana	GBC Radio 2	6130do	7295do
1200-1230 a	Palau	KHBN Voice of Hope	9830as	1230-1300	Sri Lanka	SLBC Colombo	6075as	9720as
1200-1300 vl	Papua New Guinea	NBC	4890do	1230-1300	Sweden	Radio		15240na
				1230-1300	Switzerland	Swiss R Intl	6165eu	9535eu
				1230-1300	Turkey	Voice of	9675as	
				1240-1250	Greece	Voice of	11645af	

SELECTED PROGRAMS

Sundays

- 1218 Radio France Int'l: Spotlight on Africa. Correspondent reports and interviews on African affairs.
- 1230 Radio Sweden: In Touch with Stockholm (biweekly). See S 1130.
- 1230 Radio Sweden: In Touch with Stockholm (biweekly). See S 1130.
- 1230 Radio Sweden: Sounds Nordic (biweekly). See S 1130.
- 1230 Radio Sweden: Sounds Nordic (biweekly). See S 1130.
- 1230 WWCR #1: Words of Hope. Paul Bryson or Eugene Brown.
- 1232 Radio France Int'l: Club 9516. Listener letters are read in this mailbag program.

Mondays

- 1200 Radio for Peace Int'l: Living Enrichment Center. See M 0400.
- 1200 WWCR #1: End Time Revival Network. Various speakers present an evangelical program.
- 1209 BBC: Words of Faith. People of all faiths share how their scripture gives authority and meaning to their lives.
- 1230 Radio for Peace Int'l: Sound Currents of the Spirit. See M 0430.
- 1230 Radio Sweden: Sixty Degrees North. See M 1130.
- 1230 WWCR #1: Bread of Life (1). Jack Meeks.
- 1230 WWCR #1: Reaching the World (2). Lloyd Yearwood.
- 1231 Radio France Int'l: RFI Europe. Focus on current affairs in other countries of the region.
- 1238 Radio France Int'l: Sports. Weekend sports results on Mondays and sports news on Thursdays.
- 1246 Radio France Int'l: North/South (biweekly). Regional affairs.
- 1246 Radio France Int'l: Planet Earth (biweekly). An interview with an expert on ecological matters.
- 1246 Radio Sweden: Sports Scan. See M 1148.

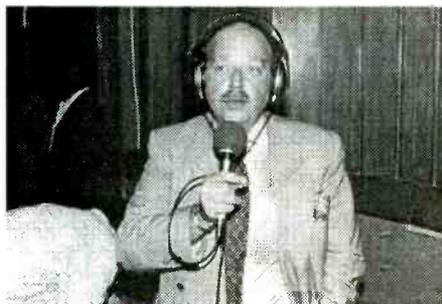
Tuesdays

- 1200 Radio for Peace Int'l: Alternative Radio. See T 0400.
- 1200 WWCR #1: End Time Revival Network. See M 1200.
- 1209 BBC: Words of Faith. See M 1209.
- 1215 BBC: Multitrack: Hit List. See M 2330.
- 1230 Radio Sweden: Sixty Degrees North. See M 1130.
- 1231 Radio France Int'l: RFI Europe. See M 1231.
- 1240 Radio France Int'l: Books. New books, publishing trends, and authors.

- 1249 Radio France Int'l: Science Notes. Developments in the world of science, technology, and health.
- 1249 Radio Sweden: Media Scan (1&3). See T 1147.

Wednesdays

- 1200 Radio for Peace Int'l: Peace Forum. See M 0230.
- 1200 WWCR #1: End Time Revival Network. See M 1200.
- 1209 BBC: Words of Faith. See M 1209.
- 1215 BBC: New Ideas. Window on the world of technology, innovation and new products.
- 1230 Radio for Peace Int'l: Focus on Haiti. See S 0500.
- 1230 Radio Sweden: Sixty Degrees North. See M 1130.
- 1230 WWCR #1: What a Fellowship Hour. Clay Evans.
- 1231 Radio France Int'l: RFI Europe. See M 1231.
- 1238 Radio France Int'l: Counterpoint. A specific human rights issue is examined.
- 1246 Radio France Int'l: Land of France. A feature on life and times in France.
- 1247 Radio Sweden: Money Matters. See W 1149.



Radio France International provides considerable coverage of African sports.

Thursdays

- 1200 Radio for Peace Int'l: New Dimensions Radio. See M 0300.
- 1200 WWCR #1: End Time Revival Network. See M 1200.
- 1209 BBC: Words of Faith. See M 1209.
- 1215 BBC: Multitrack: X-Press. See W 2330.
- 1230 Radio for Peace Int'l: Voices of Our World. See T 0330.
- 1230 Radio France Int'l: Sports. See M 1238.
- 1230 Radio Sweden: Sixty Degrees North. See M 1130.
- 1230 WWCR #1: We Believe. Jim Walsh.
- 1233 Radio France Int'l: RFI Europe. See M 1231.
- 1241 Radio France Int'l: The Americas Magazine. NEW! Focus on a subject relating to a country of the western hemisphere.
- 1246 Radio Sweden: Green Scan. See H 1146.
- 1246 Radio Sweden: Horizon (4). See H 1146.
- 1248 Radio France Int'l: Arts in France. Profile on the work of a French artist or a cultural activity such as music.

Fridays

- 1200 Radio for Peace Int'l: Food for the Thoughtful. See F 0400.
- 1209 BBC: Words of Faith. See M 1209.
- 1230 Radio for Peace Int'l: WINGS. See W 0530.
- 1230 Radio Sweden: Sixty Degrees North. See M 1130.
- 1230 WWCR #1: Battle Cry Sounding. Deborah Green.
- 1231 Radio France Int'l: RFI Europe. See M 1231.
- 1235 Radio Sweden: A Review of the Nwsweek. See F 1135.
- 1238 Radio France Int'l: Made in France. See H 1447.
- 1245 Radio France Int'l: Film Reel. Interview with an performer or film maker.

Saturdays

- 1200 WWCR #1: Focus on the Family (Weekend Edition). James Dobson.
- 1209 BBC: Words of Faith. See M 1209.
- 1215 BBC: Multitrack: Alternative. See F 2330.
- 1215 WWCR #1: First Hand. Rick Livingood.
- 1229 Radio France Int'l: Spotlight on Africa. See S 1218.
- 1230 Radio for Peace Int'l: RFP's Mailbag. See S 0330.
- 1230 Radio Sweden: People and Ideas. See S 0030.
- 1230 WWCR #1: Prophecy Flash. William F. Dankenbring.
- 1242 Radio France Int'l: French Lesson. Learn French by radio.

FREQUENCIES

1300-1400	Australia, Radio	5995pa 11800pa	7240pa 13755pa	7260as 11695as	1300-1400	Singapore, SBC Radio One	6155do 9530do	9530do
1300-1400 vl	Australia, VL8A Alice Spg	2310do			1300-1400	Singapore, R Singapore Int	9530as	
1300-1400 vl	Australia, VL8K Katherine	2485do			1300-1330	South Korea, KBS/R Korea	9570as	13670as
1300-1400 vl	Australia, VL8T Tent Crk	2325do			1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as 15425as
1300-1400	Bahrain, Radio	6010do			1300-1330	Switzerland, Swiss R Intl	7480as	11690as 13635as 15505as
1300-1330 mtwfta	Belgium, R Vlaanderen Int	15545na	17775as		1300-1400	United Kingdom, BBC London	6190af 9410eu 11750as	6195na 7160as 7180as 9515na 9580as 9740as 11760me 11765as 11820na
1300-1320	Brazil, Radiobras	15445na			1300-1400	USA, KCBI Dallas TX	9815am	
1300-1400	Canada, CFCX Montreal	6005do			1300-1400	USA, KJES Mesquite NM	11715na	
1300-1400	Canada, CFRX Toronto	6070do			1300-1400 vl	USA, KNLS Anchor Point AK	7355as	
1300-1400	Canada, CFVP Calgary	6030do			1300-1400	USA, KTBN Salt Lk City UT	7510am	
1300-1400	Canada, CHNX Halifax	6130do			1300-1400	USA, Monitor Radio Intl	7465na	13625as
1300-1400	Canada, CKZN St John's	6160do			1300-1400	USA, VOA Washington DC	6110as 15160as	9560as 9760as 11715au 15425as
1300-1400	Canada, CKZJ Vancouver	6160do			1300-1400	USA, WEWN Birmingham AL	9350na	15695na
1300-1400 s	Canada, RCI Montreal	11955na	17820na		1300-1400	USA, WHRI Noblesville IN	9465am	15105am
1300-1400	China, China Radio Intl	7405pa 15440pa	8425as 9715as	11660as	1300-1400	USA, WJCR Upton KY	7490na	13595na
1300-1400 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am 21465am	1300-1400	USA, WWCR Nashville TN	13845am	15685am
1300-1400	Ecuador, HCJB Quito	11925am 21455am	15115am 17490am 17890am		1300-1400	USA, WYFR Okeechobee FL	5950na 13695na	6015na 11550as 11830na 17750na
1300-1330	Egypt, Radio Cairo	17595as			1300-1330	Vietnam, Voice of	6115as	10059as 12025as 15010as
1300-1330	Ghana, GBC Radio 1	4915do			1330-1400	Austria, R Austria Intl	15450as	
1300-1325 smtwh	Israel, Kol Israel	15640na	15650as		1330-1400	Canada, RCI Montreal	9535as	11795as 11935as 15315eu
1300-1400 vl	Italy, IRRS Milano	7125eu			1330-1400		15325eu	17820eu 17895af 21455eu
1300-1400 mtwhf	Lebanon, Wings of Hope	9960me			1330-1400	Finland, YLE/Radio	11900na	15400na
1300-1400 vl	Malaysia, RTM Kota Kinaba	5980do			1330-1400 tw	Ghana, GBC Radio 1	4915do	
1300-1400	Malaysia, RTM Radio 4	7295do			1330-1400	India, All India Radio	13750as	15120as
1300-1325	Netherlands, Radio	5955eu	9650eu		1330-1400	Laos, National Radio of	7116as	
1300-1400 ocasnal	New Zealand, R NZ Intl	6100pa			1330-1400	Netherlands, Radio	9890as	13700as 15150as
1300-1350	North Korea, R Pyongyang	13760na	15230na		1330-1400	Sweden, Radio	15240na	17870na
1300-1330 s	Norway, Radio Norway Intl	9590eu			1330-1400	UAE, Radio Dubai	13675eu	15320eu 15435as 21605as
1300-1400 mtwhf	Palau, KHBV Voice of Hope	9830as			1330-1400	Uzbekistan, R Tashkent	15295as	17815as
1300-1400 vl	Papua New Guinea, NBC	4890do			1335-1345	Greece, Voice of	15630na	17520na
1300-1400	Philippines, FEBC Manila	11995as			1345-1400 vl	Myanmar, Radio	7185do	
1300-1355	Poland, Polish R Warsaw	6135eu 11815eu	7145eu 7270eu 9525eu		1345-1400	Vatican State, Vatican R	12050as	15585as 17525au
1300-1400	Romania, R Romania Intl	11940eu	15365eu 17720eu					
1300-1400	Russia, Radio Moscow Intl	6025as 9825af 15105eu 15360eu 17570eu	7305as 9560as 9755as 9895eu 11705eu 11960as 15290me 15320me 15355me 15440eu 15455me 15470me 17590eu 17755eu 21740af					

SELECTED PROGRAMS

Sundays

- 1300 KNLS (Alaska): Music/News/Commentary.
- 1300 Radio for Peace Intl: Focus on Haiti. See S 0500.
- 1300 WWCR #1: Focus on the Family. Evelyn Wyatt.
- 1330 Radio for Peace Intl: Science and Spirit (biweekly). See S 0530.
- 1330 Radio for Peace Intl: Wisdom School of the Air (biweekly). See S 0530.
- 1330 WWCR #1: Wayne Avenue Church of God. J. C. Wilber.
- 1345 Vatican Radio: With Heart and Mind.
- 1353 Vatican Radio: Vatican On-the-Air.

Mondays

- 1300 KNLS (Alaska): Music/News/Commentary.
- 1300 Radio for Peace Intl: Sound Currents of the Spirit. See M 0430.
- 1303 WWCR #1: Focus on the Family. James Dobson.
- 1330 Radio for Peace Intl: World Goodwill Forum. Lectures on the needs of humanity.
- 1330 Radio Sweden: Sixty Degrees North. See M 1130.
- 1330 WWCR #1: Oasis. Carl Richardson.
- 1335 WWCR #1: The Brite Spot Hour. Harold Sightler.
- 1345 Vatican Radio: Catholic Writers.
- 1346 Radio Sweden: Sports Scan. See M 1148.

Tuesdays

- 1300 KNLS (Alaska): Music/News/Commentary.
- 1300 Radio for Peace Intl: United Nations. See S 0245.
- 1303 WWCR #1: Focus on the Family. James Dobson.
- 1315 Radio for Peace Intl: RFPI Reports. See S 0230.
- 1330 Radio for Peace Intl: Food Not Bombs Radio Network (monthly). See S 1500.
- 1330 Radio Sweden: Sixty Degrees North. See M 1130.
- 1330 WWCR #1: Oasis. Carl Richardson.
- 1335 WWCR #1: The Brite Spot Hour. Harold Sightler.
- 1345 Vatican Radio: A Room with a View of the Vatican.
- 1349 Radio Sweden: Media Scan (1&3). See T 1147.
- 1359 Vatican Radio: Ask the Abbot.

Wednesdays

- 1300 KNLS (Alaska): Music/News/Commentary.

- 1300 Radio for Peace Intl: UNESCO Program. See M 2330.
- 1303 WWCR #1: Focus on the Family. James Dobson.
- 1315 Radio for Peace Intl: RFPI Reports. See S 0230.
- 1330 Radio for Peace Intl: WINGS. See W 0530.
- 1330 Radio Sweden: Sixty Degrees North. See M 1130.
- 1330 WWCR #1: Oasis. Carl Richardson.
- 1335 WWCR #1: The Brite Spot Hour. Harold Sightler.
- 1345 Vatican Radio: The Rome Report.
- 1347 Radio Sweden: Money Matters. See W 1149.

Thursdays

- 1300 KNLS (Alaska): Music/News/Commentary.
- 1300 Radio for Peace Intl: United Nations. See S 0245.
- 1303 WWCR #1: Focus on the Family. James Dobson.
- 1315 Radio for Peace Intl: RFPI Reports. See S 0230.
- 1330 Radio for Peace Intl: Vietnam Veterans Radio Network. See S 0630.
- 1330 Radio Sweden: Sixty Degrees North. See M 1130.
- 1330 WWCR #1: Oasis. Carl Richardson.
- 1335 WWCR #1: The Brite Spot Hour. Harold Sightler.
- 1345 Vatican Radio: Vatican Week.
- 1346 Radio Sweden: Green Scan. See H 1146.
- 1346 Radio Sweden: Horizon (4). See H 1146.
- 1351 Vatican Radio: Pilgrim City.

Fridays

- 1300 KNLS (Alaska): Music/News/Commentary.
- 1300 Radio for Peace Intl: Dialogue. See T 2330.
- 1303 WWCR #1: Focus on the Family. James Dobson.
- 1315 Radio for Peace Intl: RFPI Reports. See S 0230.
- 1330 Radio for Peace Intl: Steppin' Out of Babylon. See T 0300.
- 1330 Radio Sweden: Sixty Degrees North. See M 1130.
- 1330 WWCR #1: Oasis. Carl Richardson.
- 1335 Radio Sweden: A Review of the Newsweek. See F 1135.
- 1335 WWCR #1: The Brite Spot Hour. Harold Sightler.
- 1345 Vatican Radio: Cross Reference.

Saturdays

- 1300 KNLS (Alaska): Music/News/Commentary.
- 1300 Radio for Peace Intl: United Nations. See S 0245.

- 1300 WWCR #1: Church of the Lord Jesus Christ. A. W. McKenzie.
- 1315 Radio for Peace Intl: RFPI Reports. See S 0230.
- 1330 Radio for Peace Intl: Working Together (biweekly). See M 0200.
- 1330 Radio Sweden: People and Ideas. See S 0030.
- 1330 WWCR #1: Hour of Reasoning. P. Mobley.
- 1345 Vatican Radio: Orders of the Day.
- 1359 Vatican Radio: By the Way.



Tommy Vance presents a new series of Rock Salad on BBC.

FREQUENCIES

1500-1600	Australia, Radio	5995pa 7240pa 9710pa 11800pa	6020as 7260as 9770as	6060pa 9510as 11660as	6080pa 9645as 11695pa
1500-1600 vl	Australia, VL8A Alice Spg	2310do			
1500-1600 vl	Australia, VL8K Katherine	2485do			
1500-1600 vl	Australia, VL8T Tent Crk	2325do			
1500-1600	Bahrain, Radio	6010do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955na	17820na		
1500-1600	China, China Radio Intl	4200as	7405na	11815as	15165as
1500-1600 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1500-1527	Czech Rep, Radio Prague	5930as	7345eu	13580me	
1500-1600	Ecuador, HCJB Quito	11925am 21455am	15250am	17490am	17890am
1500-1600	Ethiopia, Volce of	7165do	9560do		
1500-1550	Germany, Deutsche Welle	7185af	9735af	11965af	21600af
1500-1600	Guam, KTWR Agana	12025as			
1500-1600	Iraq, Radio Iraq Intl	15250as			
1500-1600 vl	Italy, IRRS Milano	7125eu			
1500-1600	Japan, NHK/Radio	9535na	9750as	11955na	15355af
1500-1600	Jordan, Radio	9560eu			
1500-1600 mtwhf	Lebanon, Wings of Hope	9960me			
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			
1500-1515	Mongolia, R Ulaanbaatar	7260as	13780as		
1500-1525	Netherlands, Radio	9890as	13700as	15150as	
1500-1600 ocasnal	New Zealand, R NZ Intl	6100pa			

1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13185eu
1500-1600	Philippines, FEBC Manila	11995as			
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as	
1500-1600	Russia, Radio Moscow Intl	6025eu	7305eu	9540eu	9560eu
		9755af	9825eu	9895as	11675eu
		11695eu	11875eu	12030as	15105eu
		15180eu	15210as	15290na	15320as
		15425eu	15470as	15540eu	15550eu
1500-1600	S Africa, Channel Africa	4945af	11770af		
1500-1543 mtwhfa	Seychelles, FEBA Radio	7170as	11870as		
1500-1600	Singapore, SBC Radio One	6155do	9530do		
1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1500-1530	Switzerland, Swiss R Intl	11960as	13635as	15505as	
1500-1600	United Kingdom, BBC London	6190af	6195as	7180as	9410eu
		9515na	9740as	11750as	11940af
		12095eu	15070af	15260na	15310as
		15400af	15420af	17705eu	17840na
		17880af	21470af	21490af	21660af
1500-1600	USA, KCBi Dallas TX	15725am			
1500-1600	USA, KJES Mesquite NM	11715na			
1500-1600	USA, KTVN Salt Lk City UT	7510na			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, VOA Washington DC	7245as	9510as	9770as	11785as
		15160as	15385as	15395as	17640as
		17730as	17800as	17830as	19379eu
1500-1600	USA, WCSN Scotts Cor ME	15665eu			
1500-1600	USA, WEWN Birmingham AL	9350na	17510eu		
1500-1600	USA, WHRI Noblesville IN	9465am	15105am		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WRNO New Orleans LA	15420na			
1500-1600	USA, WWCR Nashville TN	13845am	15685am		
1500-1600	USA, WYFR Okeechobee FL	11705na	11830na	17750na	
1530-1600	Austria, R Austria Intl	11780as			
1530-1600 mtwhf	Portugal, Radio	21515me			
1545-1600	Vatican State, Vatican R	12050as	15585as		

SELECTED PROGRAMS

Sundays

- 1500 BBC (af): Postmark Africa. See S 0335.
- 1500 Radio for Peace Int'l: Food Not Bombs Radio Network (monthly). North America's homeless problems and government oppression at home and abroad.
- 1510 Radio Japan: Hello from Tokyo. See S 0310.
- 1530 Radio for Peace Int'l: United Nations. See S 0245.
- 1545 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 1550 Radio Japan: Viewpoint. See S 0350.
- 1555 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

- 1510 Radio Japan: Today's Top News Asia. See M 1410.
- 1515 BBC (af): Focus on Africa. Up-to-the-minute reports on the day's events from all over the continent.
- 1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1519 Radio Japan: News Commentary. See M 0515.
- 1526 Radio Japan: Japan Diary. An interesting segment of the Magazine Hour about life in Japan.
- 1545 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 1555 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

- 1500 Radio for Peace Int'l: New Dimensions Radio. See M 0300.
- 1510 Radio Japan: Today's Top News Asia. See M 1410.
- 1515 BBC (af): Focus on Africa. See M 1515.
- 1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1519 Radio Japan: News Commentary. See M 0515.
- 1526 Radio Japan: Japan Diary. See M 1526.
- 1530 Radio for Peace Int'l: UNESCO Program. See M 2330.
- 1543 Radio Japan: Close Up. See M 0350.
- 1545 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 1555 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

- 1500 Radio for Peace Int'l: Der Dritte Weg (German). See T 2300.
- 1510 Radio Japan: Today's Top News Asia. See M 1410.
- 1515 BBC (af): Focus on Africa. See M 1515.
- 1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1519 Radio Japan: News Commentary. See M 0515.
- 1525 Radio Japan: Japan Diary. See M 1526.
- 1530 Radio for Peace Int'l: Dialogue. See T 2330.

- 1531 Radio Japan: Asian Report. Looking at events in the Asia-Pacific region.
- 1543 Radio Japan: Close Up. See M 0350.
- 1545 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 1555 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

- 1500 Radio for Peace Int'l: Common Ground. See W 2300.
- 1510 Radio Japan: Today's Top News Asia. See M 1410.
- 1515 BBC (af): Focus on Africa. See M 1515.
- 1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1519 Radio Japan: News Commentary. See M 0515.
- 1525 Radio Japan: Japan Diary. See M 1526.
- 1530 Radio for Peace Int'l: UNFPA/FAO. See W 2330.
- 1531 Radio Japan: Crosscurrents. See H 1140.
- 1543 Radio Japan: Close Up. See M 0350.
- 1545 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 1555 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

- 1500 Radio for Peace Int'l: Peace Talks. See H 2300.
- 1510 Radio Japan: Today's Top News Asia. See M 1410.
- 1515 BBC (af): Focus on Africa. See M 1515.
- 1515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1519 Radio Japan: News Commentary. See M 0515.
- 1525 Radio Japan: Japan Diary. See M 1526.
- 1530 Radio for Peace Int'l: United Nations. See S 0245.
- 1543 Radio Japan: Close Up. See M 0350.
- 1545 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 1555 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

- 1500 BBC (af): Splice Taxi. See A 0630.
- 1500 Radio for Peace Int'l: Der Dritte Weg (German). See T 2300.
- 1510 Radio Japan: This Week. See S 0110.
- 1522 Radio Japan: Japan Scene. See A 0622.
- 1530 Radio for Peace Int'l: World Citizens Weekly Commentary. See F 2330.
- 1530 Radio Japan: The Week in Review. See A 0330.
- 1545 Radio for Peace Int'l: RFPI Reports. See S 0230.



Radio Japan QSL. Thanks to J.R. Mason of Worchester, England.

FREQUENCIES

1600-1700	Algeria, R Algiers Intl	9535eu	15160eu	1600-1700	South Korea, KBS/R Korea	5975as		
1600-1700 mf	Australia, ADF Radio	10848af		1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as	15425as
1600-1700	Australia, Radio	6020pa	6060pa 6080pa 7240pa	1600-1700	Swaziland, Trans World R	9500af		
		7260as	9770as 9860pa 11660pa	1600-1645	UAE, Radio Dubai	11795af	13675eu	15435eu 21605eu
		11695pa	11800pa 11880pa	1600-1700	United Kingdom, BBC London	3915as	6190af	6195eu 7160as
1600-1700 vl	Australia, VL8A Alice Spg	2310do				9410eu	9515na	9580as 9740as
1600-1700 vl	Australia, VL8K Katherine	2485do				11750as	12095eu	15070af 15260na
1600-1700 vl	Australia, VL8T Tent Crk	2325do				15310as	15400af	17640af 17880af
1600-1700	Bahrain, Radio	6010do				1470af	21660af	
1600-1700	Canada, CFCX Montreal	6005do		1600-1700	USA, KCBI Dallas TX	15725am		
1600-1700	Canada, CFRX Toronto	6070do		1600-1700	USA, KTVN Salt Lk City UT	15590am		
1600-1700	Canada, CFPV Calgary	6030do		1600-1700	USA, KWHR Naalehu HI	7425as		
1600-1700	Canada, CHNX Halifax	6130do		1600-1700	USA, Monitor Radio Intl	13625af		
1600-1700	Canada, CKZN St John's	6160do		1600-1700	USA, VOA Washington DC	6110as	6180eu	7125as 9645as
1600-1700	Canada, CKZU Vancouver	6160do				9700as	9760as	11855eu 11930af
1600-1700	China, China Radio Intl	4130af	11575af 15110af 15130af			12040af	13710af	15205as 15255af
1600-1700 vl	Costa Rica, R Peace Intl	7375am	9400am 15030am 21465am			15320af	15395as	15410af 15445af
1600-1700	Ecuador, HCJB Quito	21455am				17790af	19379eu	
1600-1700	France, Radio France Intl	6175eu	11700af 12015af 15530me	1600-1700	USA, WCSN Scotts Cor ME	15665eu		
		17795af	17850af	1600-1700	USA, WEWN Birmingham AL	13615na		
1600-1650	Germany, Deutsche Welle	6170as	7225as 9875as 15595as	1600-1700 vl	USA, WHRI Noblesville IN	9465am	15105am	
		17810as	21680as	1600-1700	USA, WINB Red Lion PA	15715eu		
1600-1700	Guam, KSDA AWR Agat	7455as		1600-1700	USA, WJCR Upton KY	7490na	13595na	
1600-1615	Guam, KTWR Agana	12025as		1600-1700	USA, WRNO New Orleans LA	15420am		
1600-1627	Iran, VOIRI Tehran	11790eu		1600-1700	USA, WWCR Nashville TN	13845am	15685am	
1600-1700	Iraq, Radio Iraq Intl	15250as		1600-1700	USA, WYFR Okeechobee FL	11705na	11830na	15355eu 17750na
1600-1700 vl	Italy, IRRS Milano	7125eu				21525af	21615eu	
1600-1700	Jordan, Radio	9560eu		1600-1630	Vietnam, Voice of	9840af	12020af	15010af
1600-1630 mtwhf	Lebanon, Wings of Hope	9960me		1615-1645	Sweden, Radio	6065eu		
1600-1630	Netherlands, Radio	5995eu	9890as 13700as 15150as	1615-1630	Vatican State, Vatican R	6245eu	7250eu	9645eu
1600-1649 ocasnal	New Zealand, R NZ Intl	6100pa		1620-1630 mtwtf	Estonia, Estonian Radio	5925eu		
1600-1630	Pakistan, Radio	9470as	11470as 11570as 15555as	1630-1700	Canada, RCI Montreal	7150as	9550as	
		15590as	15605as 17660as	1630-1700	Ecuador, HCJB Quito	15270me	17790me	
1600-1655	Poland, Polish R Warsaw	7285eu	9525eu	1630-1700	Egypt, Radio Cairo	15255af		
1600-1700	Russia, Radio Moscow Intl	6025eu	7250na 7260na 7345na	1630-1700 s	Guam, KTWR Agana		12025as	
		9540na	9560na 9755eu 9880eu	1630-1700	Liberia, Radio ELWA	4760do		
		11630eu	11940eu 11945eu 11960eu	1630-1700	United Kingdom, BBC London	3255af	5965as	5975as 7180as
		12030eu	15105na 15290eu 15320na			9630af	15420af	
		15385eu	17760eu 17875eu 21740as	1645-1700	Afghanistan, Radio	9635as		
1600-1700	S Africa, Channel Africa	4945af	11770af	1645-1700	Tajikistan, Radio	7245as		
1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu	1650-1700 mtwtf	New Zealand, R NZ Intl	6100pa		

SELECTED PROGRAMS

Sundays

- 1600 WWCR #1: Latin Catholic Mass. Gommar De Pauw.
- 1615 Radio Sweden: In Touch with Stockholm (biweekly). See S 1130.
- 1615 Radio Sweden: Sounds Nordic (biweekly). See S 1130.
- 1618 Radio France Int'l: Report on Asia. Correspondent reports and interviews on Asian affairs.
- 1630 WWCR #1: Voice of Victory (Persian). James Fourrozi.
- 1632 Radio France Int'l: Club 9516. See S 1232.
- 1645 BBC (as): South Asia Report. Regional daily current affairs program.

Mondays

- 1615 Radio Sweden: Sixty Degrees North. See M 1130.
- 1631 Radio France Int'l: RFI Europe. See M 1231.
- 1631 Radio Sweden: Sports Scan. See M 1148.
- 1638 Radio France Int'l: Sports. See M 1238.
- 1645 BBC (as): South Asia Report. See S 1645.
- 1645 WWCR #1: The Living Word. Evangelization by Bobby Hoover.
- 1646 Radio France Int'l: North/South (biweekly). See M 1246.
- 1646 Radio France Int'l: Planet Earth (biweekly). See M 1246.

Tuesdays

- 1611 Radio France Int'l: France Today. See T 1431.
- 1615 Radio Sweden: Sixty Degrees North. See M 1130.
- 1631 Radio France Int'l: RFI Europe. See M 1231.
- 1634 Radio Sweden: Media Scan (1&3). See T 1147.
- 1641 Radio France Int'l: Books. See T 1240.
- 1645 BBC (as): South Asia Report. See S 1645.
- 1645 WWCR #1: The Living Word. See M 1645.
- 1647 Radio France Int'l: Drumbeat (biweekly). African feature.
- 1647 Radio France Int'l: Silk Roads (biweekly). Focus on South Asia.

Wednesdays

- 1615 Radio Sweden: Sixty Degrees North. See M 1130.
- 1631 Radio France Int'l: RFI Europe. See M 1231.
- 1632 Radio Sweden: Money Matters. See W 1149.
- 1639 Radio France Int'l: Counterpoint. See W 1238.

- 1645 BBC (as): South Asia Report. See S 1645.
- 1645 WWCR #1: The Living Word. See M 1645.
- 1646 Radio France Int'l: Land of France. See W 1246.

Thursdays

- 1615 Radio Sweden: Sixty Degrees North. See M 1130.
- 1631 Radio France Int'l: Sports. See M 1238.
- 1631 Radio Sweden: Horizon (4). See H 1146.
- 1633 Radio France Int'l: RFI Europe. See M 1231.
- 1641 Radio France Int'l: Science Notes. See T 1249.
- 1641 Radio Sweden: Green Scan. See H 1146.
- 1645 BBC (as): South Asia Report. See S 1645.
- 1645 WWCR #1: The Living Word. See M 1645.
- 1647 Radio France Int'l: Arts in France. See H 1248.

Fridays

- 1615 Radio Sweden: Sixty Degrees North. See M 1130.

- 1620 Radio Sweden: A Review of the Newsweek. See F 1135.
- 1631 Radio France Int'l: RFI Europe. See M 1231.
- 1638 Radio France Int'l: Made in France. See H 1447.
- 1645 BBC (as): South Asia Report. See S 1645.
- 1645 Radio France Int'l: Film Reel. See F 1245.
- 1645 WWCR #1: The Living Word. See M 1645.

Saturdays

- 1615 Radio Sweden: People and Ideas. See S 0030.
- 1615 WWCR #1: Amazing Facts. Joe Crews.
- 1624 Radio France Int'l: Focus on France. See A 1423.
- 1627 Radio France Int'l: Spotlight on Africa. See S 1218.
- 1640 Radio France Int'l: French Lesson. See A 1242.
- 1645 BBC (as): South Asia Report. See S 1645.
- 1645 WWCR #1: Weekly Presidential Radio Address. See S 1145.
- 1645 WWCR #1: Words of Hope. See S 1230.

HCJB Ham Radio Today

Topics announced long ago in HCJB Program Notes for Ham Radio Today are, Weds: Aug 24, phonetics, seasonal propagational cycle, inverted vee antenna, Hallicrafters radio, W9AC. Aug. 31, ITU and IARU, geographical considerations of prop., delta loop ant., Leyden's magic jar. Glenn Hauser reports that HCJB from 0030 switched to 11700 but kept announcing 11925.

FREQUENCIES

1700-1800	Australia, Radio	6020pa	7260as	9580pa	9860pa				
		11660as	11695as	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	4130af	7405af	9535af	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							
1700-1713 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	13785af					
1700-1750	Pakistan, Radio	7485eu	9855eu						
1700-1800	Russia, Radio Moscow Intl	6025eu	6120eu	6970eu	9510eu				
		9560eu	9880na	11705af	11995af				
		12050af	13665eu	15105na	15180na				
		15190na	15290na	15385na	15500af				
		15520af	17760eu	17875as	21740af				
		4945af	11770af						
1700-1800	S Africa, Channel Africa	9705eu	9720eu						
1700-1800	Saudi Arabia, BSKSA	13595as	15625as						
1700-1800	Slovakia, AWR Europe	6075as	9720as	15425as					
1700-1730	Sri Lanka, SLBC Colombo	7120af							
1700-1715	Swaziland, Trans World R	9885af	13635me	15635af					
1700-1730	Switzerland, Swiss R Intl	3255af	3915as	5975as	6180eu				
1700-1800	United Kingdom, BBC London	6190af	6195eu	7160me	9410eu				
		9630af	9740as	11750as	11940af				
		12095af	15070af	15260af	15400af				
		15420af	17880af						
1700-1800	USA, KCBI Dallas TX	15725am							
1700-1800	USA, KTVN 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				
		19379eu							
1700-1800	USA, WCSN Scotts Cor ME	15665eu							
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	7120af	9605af	17655af				
		21590af							
1730-1800	Romania, R Romania Intl	11830af	15340af	15365af	17805af				
1730-1800	Sweden, Radio	6065eu	9655af	9655af	15390me				
1730-1800	Vatican State, Vatican R	9695af	11625af	15570af					
1745-1800	India, All India Radio	7412eu	9650me	9950me	11620eu				
		11935af	15075af						
1800-1900	Argentina, RAE	15345eu							
1800-1900	Australia, Radio	6060as	6080as	7240pa	7260as				
		9560as	9860as	11660pa	11695as				
		11880as							
1800-1900 vl	Australia, VL8A Alice Spg	2310do							
1800-1900 vl	Australia, VL8T Tent Crk	2325do							
1800-1900	Bahrain, Radio	6010do							
1800-1830	Belgium, R Vlaanderen Int	5910eu	15550af						
1800-1900	Brazil, Radiobras	15268eu							
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	9650me	9950me	11620eu				
		11935af	15075af						
		7125eu							
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							
1800-1850	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	6120eu	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	5975as	6005af	6180eu				
		6190af	6195eu	7110as	9410eu				
		9630af	9740me	11940af	12095af				
		15070af	15400af	15420af	17880af				
1800-1900	USA, KCBI Dallas TX	15725am							
1800-1900	USA, KJES Mesquite NM	15385na							
1800-1900	USA, KTVN Salt Lk City UT	15590am							
1800-1900	USA, KWHR Naalehu HI	13625as							
1800-1900	USA, Monitor Radio Intl	13770eu	17510af						
1800-1900	USA, VOA Washington DC	6040eu	6040eu	9700eu	9760eu	11920af			
		12040af	13675af	13710af	15205af				
		15410af	15580af	17800af	17895af				
		19379eu							
1800-1900 vl	USA, WEWN Birmingham AL	13615na	15695eu	18930sa					
1800-1900	USA, WHRI Noblesville IN	9485am	13760am						
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						
1815-1900	Bangladesh, Radio	7190eu	9680eu						
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880me	13730af				
1830-1900	Serbia, Radio Yugoslavia	6100eu	9720af						
1840-1850 mtwhfa	Greece, Voice of	15650af	17525af						
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do					
1850-1900	New Zealand, R NZ Intl	11735pa							



The BBC Symphony plays Mozart and Beethoven in the Proms.

QSL from Latvia Radio Riga sent to us courtesy of Anthony Santora of South Britain, Ct.



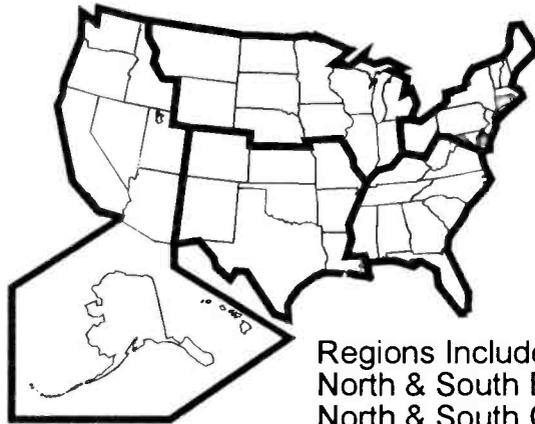
FREQUENCIES

1900-2000	Australia, Radio	6060as 9560pa 11880pa	6080as 9860as	7240pa 11660pa	7260as 11695as				
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	6955me	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	9650me	9950me	11620eu				
		11935af	15075af						
1900-1930	Israel, Kol Israel	9435eu	11603na	11675na	15640na				
		17575af							
1900-2000 vl	Italy, IRRS Milano	7125eu							
1900-2000	Japan, NHK/Radio	6150as 9610as	7140au	9535as	9580au				
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	4890do							
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	6120eu	6970eu	7105eu	7170na				
		7260eu	9685eu	12050eu	13665eu				
		15105af	15180eu	15290af	15425na				
		15525af	15580af	17560af	17605eu				
		17760eu	17875af						
1900-2000	Saudi Arabia, BSKSA	9705eu							
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	6180eu	6195eu	7110as				
		7160me	9410eu	630af	9740me	11955as	12095af		
		15070af	15400af	17880af					
1900-2000	USA, KCBI Dallas TX	15725am							
1900-2000	USA, KTBN Salt Lk City UT	15590am							
1900-2000 as	USA, KVOH Los Angeles CA	17775am							
1900-2000	USA, KWHR Naalehu HI	13625as							
1900-2000	USA, Monitor Radio Intl	13770eu	15665eu	17510af					
1900-2000	USA, VOA Washington DC	3980eu	6040eu	9525as	9700eu				
		9760eu	11870as	11920af	12040af	13710af			
		15180au	15205na	15410na	15445af	15580af	17800af		
		7939eu							
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	9575eu						
1940-2000	Mongolia, R Ulaanbaatar	11790as	12015eu						
2000-2100 vl	Australia, VL8A Alice Spg	2310do							
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	6950eu	8260eu	9440af					
		9920eu	11715af	15110af					
		9920eu	9400am	15030am	21465am				
		9920eu	7345eu	9485eu					
2000-2100	Costa Rica, R Peace Intl	7375am							
2000-2027	Czech Rep, Radio Prague	5930eu							
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	9395eu							
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							
2000-2100	North Korea, R Pyongyang	6576eu	9345eu	9977eu					
2000-2030 s	Norway, Radio Norway Intl	9590eu	15220af						
2000-2100 vl	Papua New Guinea, NBC	4890do							
2000-2100	Russia, Radio Moscow Intl	6120eu	7250eu	7260eu	9190na				
		9450na	9620na	9685na	9880na				
		9895na	11630eu	11675eu	11715eu				
		11730na	11760eu	11805na	11940eu				
		12050na	15290eu	15425eu	15580na				
		9705eu	9720eu						
2000-2100	Saudi Arabia, BSKSA	9705eu							
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	1	3635af	15505af			
2000-2050	Turkey, Voice of	9900eu							
2000-2100 vl	Uganda, Radio	4976do							
2000-2030	United Kingdom, BBC London	7160me	9630af	9740me	17880af				
2000-2100	United Kingdom, BBC London	3255af	6180eu	6195eu	7110as				
		7325eu	9410eu	12095af	15070af				
		15260sa	15400af						
2000-2100	USA, KCBI Dallas TX	15725am							
2000-2100	USA, KTBN Salt Lk City UT	15590am							
2000-2100 as	USA, KVOH Los Angeles CA	17775am							
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	USA, WEWN Birmingham AL	13615na							
2000-2100	USA, WHRI Noblesville IN	9485am	13760am						
2000-2100	USA, WINB Red Lion PA	15715eu							

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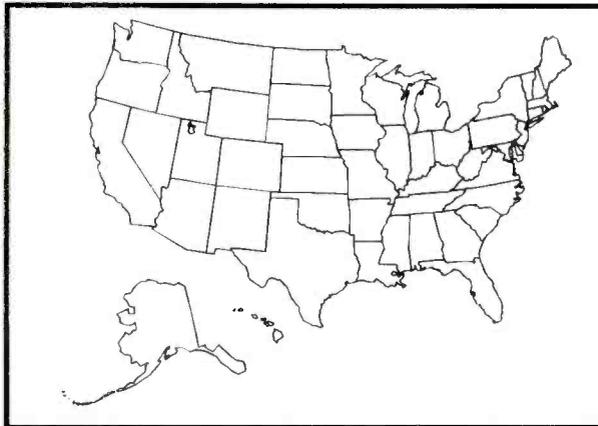
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FREQUENCIES

2100-2200	Australia, Radio	6060as	6080as	7240pa	7260pa
		11855pa	11880as		
2100-2130 vl	Australia, VL8A 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 Sce	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	4130eu	6950eu	8260eu	9920eu
2100-2130	China, China Radio Intl	3985eu	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
		11715eu	15225pa		
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	4890do			
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	6120eu	6970na	7150na	9470eu
		9550eu	9685eu	9750eu	9820eu
		9880eu	9895as	11730na	11760na
		11770na	11805na	11920na	12050na
		15290na	15425na	15580na	17605na
2100-2130	Serbia, Radio Yugoslavia	7265eu			
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	3915as	5975na	6005af
		6180eu	6195eu	7110as	7180as
		7325eu	9410eu	11955as	12095af
		15070eu	15260sa	15370as	15400na
		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	15665as	
2100-2200	USA, VOA Washington DC	6040eu	6095eu	9760eu	11870as
		13710as	15185au	15205af	15410af
		15445af	15580af	17735as	17800af
		19379me	21485af		
		13615na	18930sa		
2100-2200	USA, WEWN Birmingham AL	13760am			
2100-2200 vl	USA, WHRI Noblesville IN	15715eu			
2100-2200	USA, WINB Red Lion PA	7490na	13595na		
2100-2200	USA, WJCR Upton KY	9465na			
2100-2200	USA, WMLK Bethel PA	15420am			
2100-2200	USA, WRNO New Orleans LA	13845am	15610am	15685am	
2100-2200	USA, WWCN Nashville TN	15566eu	17612af	21525af	
2100-2200	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	
2130-2145 s	Armenia, Radio Yerevan	11790eu	11945eu	11960eu	11960eu
2130-2200	Australia, Radio	15365pa	17795pa	17860pa	
2130-2200 vl	Australia, VL8A 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	21455eu
2130-2200	Israel, Kol Israel	7465eu	9435sa	11603na	11675na
		15755sa			
2130-2200	Sweden, Radio	6065eu			
2138-2200	New Zealand, R NZ Intl	15115pa			

2200 UTC

2200-2300	Australia, Radio	11695as	11855as	11880as	13755pa
		15365pa	17795pa	17860pa	
2200-2300 vl	Australia, VL8A 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	9880eu			
2200-2300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2200-2300	Cuba, Radio Havana Cuba	9550na			
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	15225eu		
2200-2300 vl	Italy, IRRS Milano	7125eu			
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
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	9770na	11885na	13605na	
2200-2300	United Kingdom, BBC London	3915as	3955eu	5975na	6195eu
		7180as	7325eu	9410eu	9570as
		9590na	9915am	11695as	11750sa
		11955as	12095af	15070eu	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, WWCN 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	7420eu			
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	9705as	9950as	11745as	15110as
		15145as	17800as		
2245-2300 mtwhf	USA, Voice of the OAS	9670am	11835am	15160am	
2245-2300	Vatican State, Vatican R	9600as	11830au		

FREQUENCIES

2300-0000	Australia, Radio	11695as	11855as	11880as	11885pa	2300-0000 mtwhfa	Palau, KHBN Voice of Hope	11980as			
		13755as	15365pa	17795pa	17860pa	2300-0000 vl	Papua New Guinea, NBC	9675do			
2300-0000 vl	Australia, VLBA Alice Spg	4835do				2300-0000	Russia, Radio Moscow Intl	9620na	9695na	9750na	11665as
2300-0000 vl	Australia, VLBK Katherine	5025do						11750as	11805na	12050na	15290as
2300-0000 vl	Australia, VLBT Tent Crk	4910do						15410as	15425na	17610as	17690na
2300-2345	Bulgaria, Radio	9700na	11720na			2300-0000	Thailand, Radio	21480na			
2300-0000 vl	Canada, CBC N Quebec Sce	9625do				2300-0000	UAE, Radio Abu Dhabi	9770na	11905as		
2300-0000	Canada, CFCX Montreal	6005do				2300-0000	United Kingdom, BBC London	5975na	11885na	13605na	
2300-0000	Canada, CFRX Toronto	6070do						9590na	6175na	6195na	9570as
2300-0000	Canada, CFVP Calgary	6030do						15260sa	9915am	11945as	11955as
2300-0000	Canada, CHNX Halifax	6130do				2300-0000	USA, KCBI Dallas TX	13740am	15370as		
2300-0000	Canada, CKZN St John's	6160do				2300-0000	USA, KTVN Salt Lk City UT	15590na			
2300-0000	Canada, CKZU Vancouver	6160do				2300-0000	USA, KWHR Naalehu HI	17510as			
2300-0000	Canada, RCI Montreal	5960na	9755na	13670na		2300-0000	USA, Monitor Radio Intl	13625as	13770na	15405as	17555sa
2300-0000 as	Canada, RCI Montreal	11940am	15235am			2300-0000	USA, VOA Washington DC	7215as	9770as	11760as	15185as
2300-0000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am			15290as	15305as	17735as	17820as
2300-0000	Ecuador, HCJB Quito	21455am				2300-0000	USA, WEWN Birmingham AL	9985eu	11820sa	13615na	
2300-0000	Guam, KSDA AWR Agat	15610as				2300-0000 vl	USA, WHRI Noblesville IN	7315am			
2300-0000	India, All India Radio	9705as	9950as	11745as	15145as	2300-0000	USA, WINB Red Lion PA	15715eu			
		17800as				2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000 vl	Italy, IRRS Milano	7125eu				2300-0000	USA, WRNO New Orleans LA	7355am			
2300-0000	Japan, NHK/Radio	5975eu	6125eu	6185as	9610as	2300-0000 vl	USA, WWCR Nashville TN	5810am	13845am	15685am	
		9625as				2300-2315	Vatican State, Vatican R	9600as	11830au		
2300-2330 as	Lithuania, Radio Vilnius	9400eu	11770eu			2330-0000	Belgium, R Vlaanderen Int	11740na	13655sa		
2300-0000 vl	Malaysia, RTM Kota Kinaba	5980do				2330-0000	Netherlands, Radio	6020na	6165na		
2300-0000 smtwha	Malaysia, RTM Radio 4	7295do				2330-0000 m	Sri Lanka, SLBC Colombo	15425na			
2300-0000	New Zealand, R NZ Intl	15115pa				2330-0000	Sweden, Radio	11910as			
2300-2350	North Korea, R Pyongyang	11700na	13650na			2330-0000	USA, R Bosnia H via WHRI	7315am			
2300-2330 s	Norway, Radio Norway Intl	9655sa	11860na			2330-0000	Vietnam, Voice of	9840as	12020as	15010as	
						2335-2345 smtwhf	Greece, Voice of	9380sa	11595sa	11645sa	

SELECTED PROGRAMS

Sundays

- 2310 Radio Japan: Hello from Tokyo. See S 0310.
- 2330 WWCR #1: The Gospel Hour. Malcolm Lavender.
- 2345 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 2345 WWCR #1: Words of Hope. See S 1230.
- 2350 Radio Japan: Viewpoint. See S 0350.

Mondays

- 2300 Radio for Peace Int'l: New Dimensions Radio. See M 0300.
- 2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 2330 BBC: Multitrack: Hit List. The UK Top 20.
- 2330 Radio for Peace Int'l: UNESCO Program. A feature program of the United Nations focusing on world educational, scientific, or cultural matters.
- 2330 Radio Sweden: Sixty Degrees North. See M 1130.
- 2330 WWCR #1: Focus on the Family. James Dobson.
- 2345 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 2346 Radio Sweden: Sports Scan. See M 1148.
- 2350 Radio Japan: Close Up. See M 0350.

Tuesdays

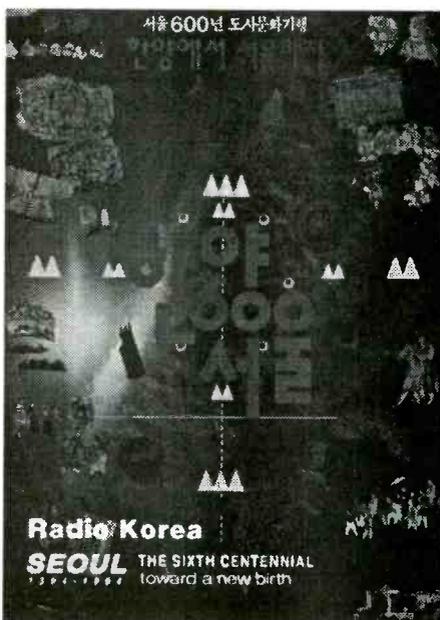
- 2300 Radio for Peace Int'l: Der Dritte Weg (German). News briefs and information about Central America with monthly Red Cross and Duetsche Welle programs.
- 2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 2330 BBC: Omnibus. Each week a half-hour programme on practically any topic under the sun.
- 2330 Radio for Peace Int'l: Dialogue. A University for Peace news magazine.
- 2330 Radio Sweden: Sixty Degrees North. See M 1130.
- 2330 WWCR #1: Focus on the Family. James Dobson.
- 2345 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 2349 Radio Sweden: Media Scan (1&3). See T 1147.
- 2350 Radio Japan: Close Up. See M 0350.

Wednesdays

- 2300 Radio for Peace Int'l: Common Ground. Radio series on world affairs featuring talks with leaders in their fields.
- 2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 2330 BBC: Multitrack: X-Press. New pop records, interviews, news and competitions.
- 2330 Radio for Peace Int'l: UNFPA/FAO. A United Nations program on food and agriculture.
- 2330 Radio Sweden: Sixty Degrees North. See M 1130.
- 2330 WWCR #1: Focus on the Family. James Dobson.
- 2345 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 2347 Radio Sweden: Money Matters. See W 1149.
- 2350 Radio Japan: Close Up. See M 0350.

Thursdays

- 2300 Radio for Peace Int'l: Peace Talks. Focus on topics such as peace education, development and peace, and women and peace.
- 2300 Vatican Radio: Postcards from Rome.
- 2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 2330 Radio for Peace Int'l: United Nations. See S 0245.
- 2330 Radio Sweden: Sixty Degrees North. See M 1130.
- 2330 WWCR #1: Focus on the Family. James Dobson.
- 2345 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 2346 Radio Sweden: Green Scan. See H 1146.
- 2346 Radio Sweden: Horizon (4). See H 1146.



Thanks to Paul Gager of Austria for sharing this QSL from Radio Korea, Seoul.

- 2350 Radio Japan: Close Up. See M 0350.

Fridays

- 2300 Radio for Peace Int'l: Der Dritte Weg (German). See T 2300.
- 2315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 2330 BBC: Multitrack: Alternative. Latest developments on the British music scene.
- 2330 Radio for Peace Int'l: World Citizens Weekly Commentary. Military conversion, world debt, current events in the UN, and other global issues are covered.
- 2330 Radio Sweden: Sixty Degrees North. See M 1130.
- 2330 WWCR #1: Focus on the Family. James Dobson.
- 2335 Radio Sweden: A Review of the Newsweek. See F 1135.
- 2345 Radio for Peace Int'l: RFPI Reports. See S 0230.
- 2350 Radio Japan: Close Up. See M 0350.

Saturdays

- 2300 Radio for Peace Int'l: Food Not Bombs Radio Network (monthly). See S 1500.
- 2310 Radio Japan: This Week. See S 0110.
- 2315 WWCR #1: The Blessed Word of Life. Perry Johnson.
- 2330 Radio for Peace Int'l: United Nations. See S 0245.
- 2330 Radio Japan: The Week in Review. See A 0330.
- 2330 Radio Sweden: People and Ideas. See S 0030.
- 2330 WWCR #1: The People's Gospel Hour. Perry Rockwood interprets scripture for Christian life.
- 2345 Radio for Pace Int'l: RFPI Reports. See S 0230.

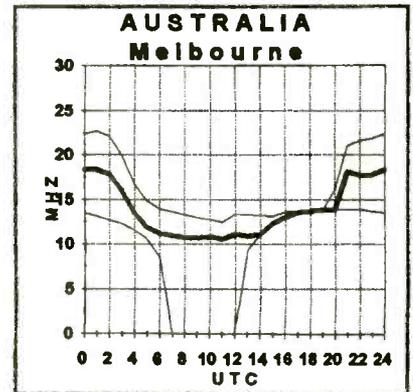
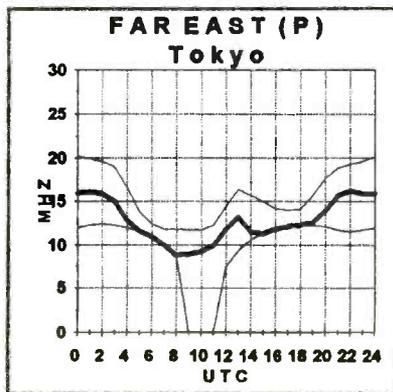
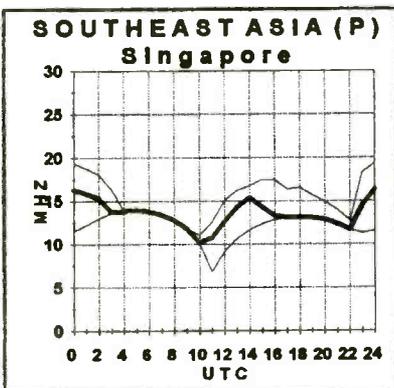
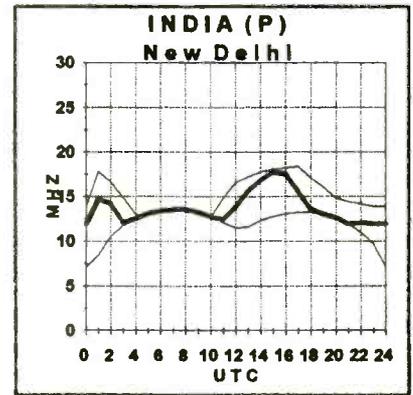
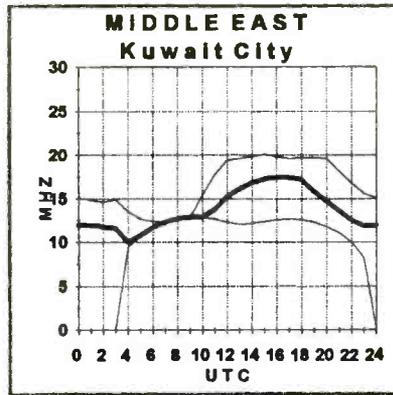
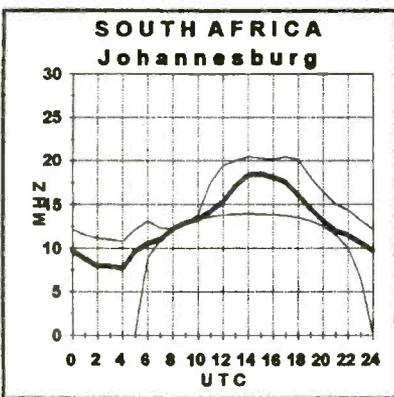
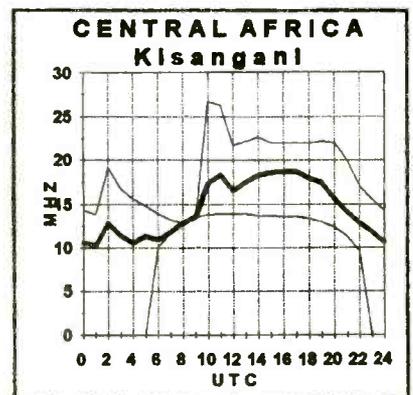
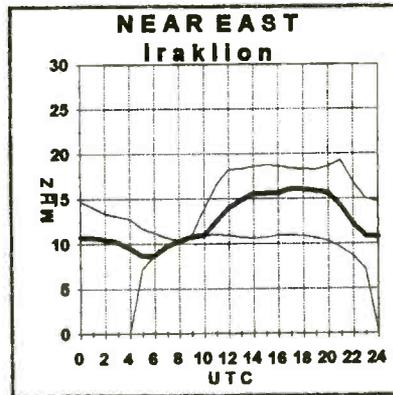
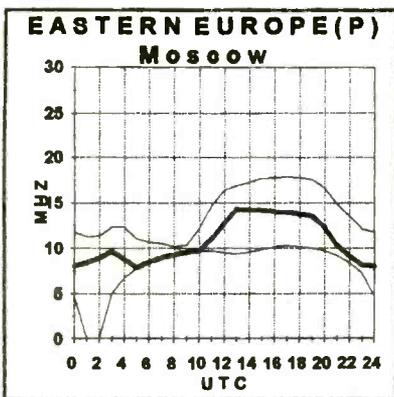
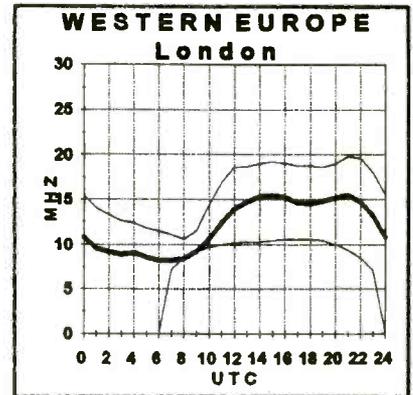
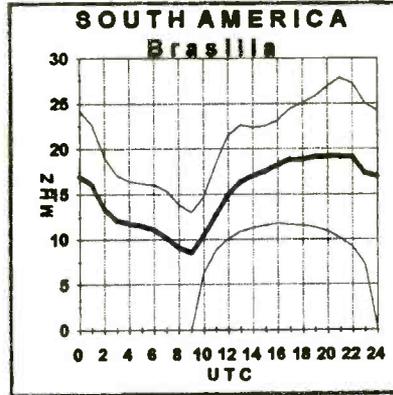
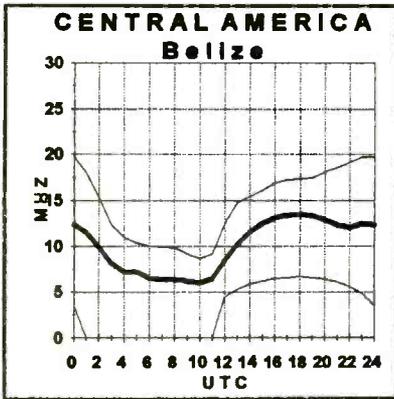
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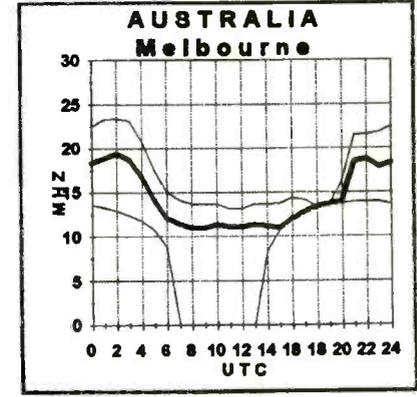
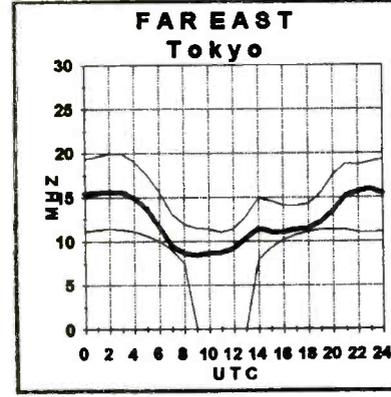
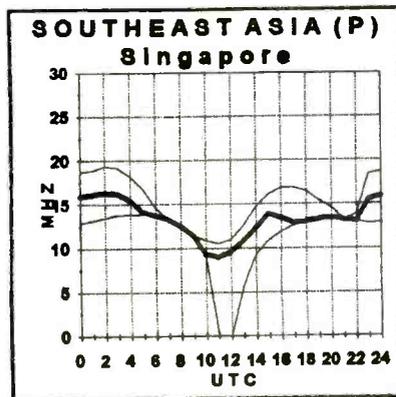
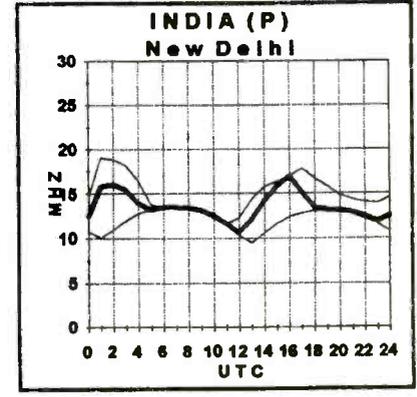
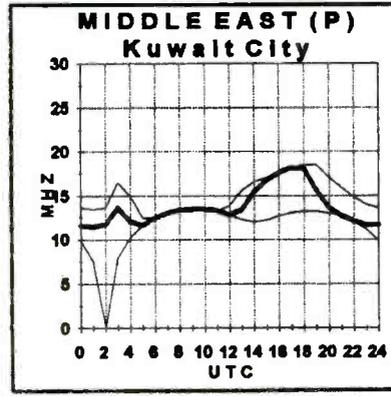
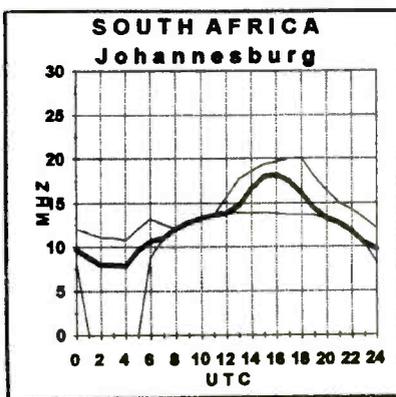
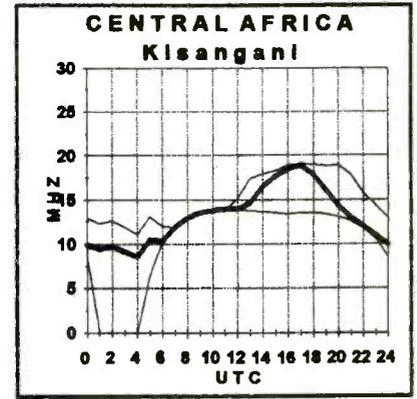
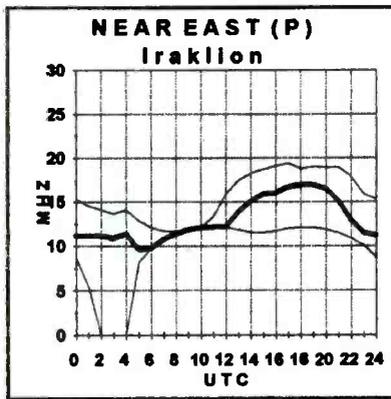
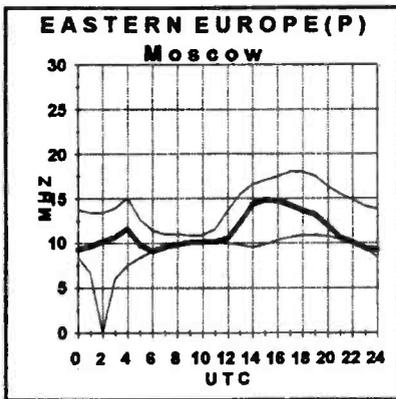
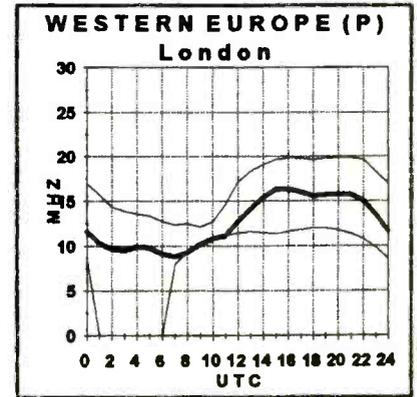
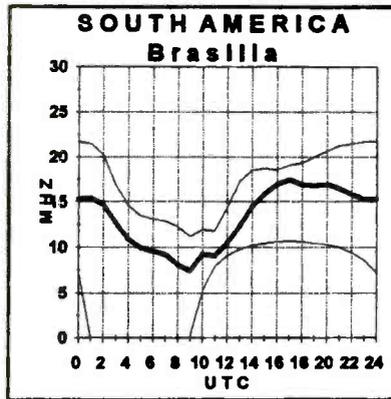
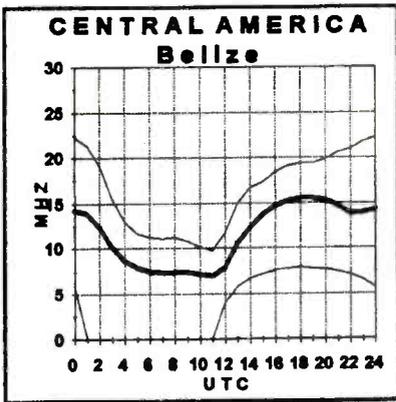
Propagation conditions: Eastern United States

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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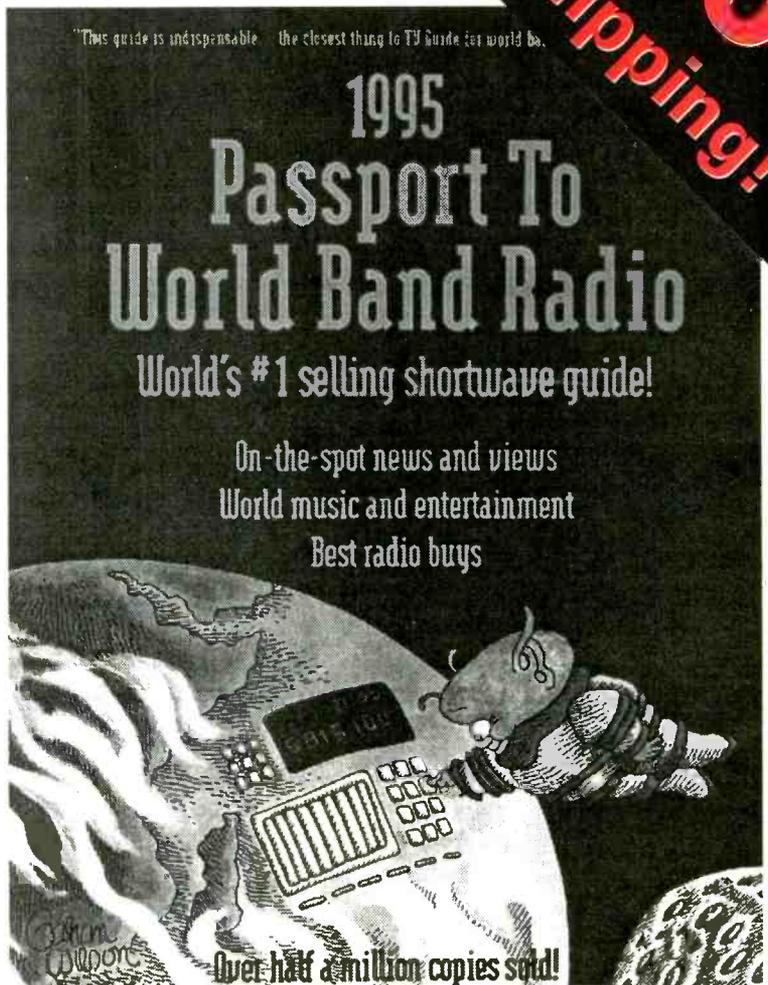
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CRR Matching case for FR-1	\$14.95

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PR-2 Specifications: Gain: 25dB, Noise Figure: 2.5 dB, Input/Output Impedance: 50-75 ohms, Compression point: +18 dBm

PR-2 Broadband Preamp, Fully Wired and Tested	\$59.95
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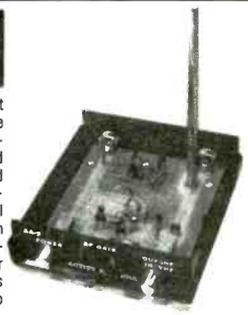
FM-10A Stereo transmitter kit	\$34.95
CFM Case, whip ant set	\$14.95



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Cramped for space? Get longwire performance with this desktop antenna. Properly designed unit has dual HF and VHF circuitry and built-in whip antenna, as well as external jack. RF gain control and 9V operation makes unit ideal for SWLs, traveling hams or scanner buffs who need hotter reception. The matching case and knob set gives the unit a hundred dollar look!

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Tune into the exciting world of aviation. Listen to the airlines, big business corporate jets, hot-shot military pilots, local private pilots, control towers, approach and departure radar control and other interesting and fascinating air-band communications. You'll hear planes up to a hundred miles away as well as all local traffic. The AR-1 features smooth varactor tuning of the entire air band from 118 to 136 MHz, effective AGC, superheterodyne circuitry, squelch, convenient 9 volt operations and plenty of speaker volume. Don't forget to add our matching case and knob set for a fine looking project you'll love to show. Our detailed instruction manual makes the AR-1 an ideal introduction to two life-long, fascinating hobbies at once-electronics and aviation! See *Kit Planes* magazine (January 1991) or *Popular Electronics* (January 1993) for excellent product reviews of the AR-1.

AR-1 Aircraft Receiver Kit	\$29.95
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Locate hidden or unknown transmitters fast. The Foxhound direction finder connects to the antenna and speaker jack on any radio receiver, AM or FM from 1 MHz to 1 GHz. The antenna (a pair of dipole telescopic whips) is rotated until the Null meter shows a minimum. A pair of LEDs indicate to turn Left or Right. The Foxhound is ideal to use with a walkie-talkie, if you wish to transmit, go ahead, a built-in T/R switch senses any transmitted RF and switches itself out of circuit while you talk. It doesn't get any easier than this! We provide all parts except for a few feet of 1/2 inch PVC pipe available at any hardware store for a dollar or two. Add our matching case set for a complete finished unit. Be the one with the answers, win those transmitter hunts and track down those jammers, you'll do it all with your Foxhound.

DF-1 Foxhound direction finder kit	\$59.95
CDF Matching case set for DF-1	\$14.95
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CFHT Heavy duty metal case set for FHT-1	\$29.95



SHORTWAVE CONVERTER

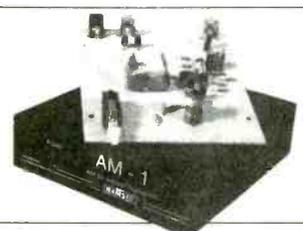
The SC-1 converter brings the sounds of the world right into your car radio or home stereo (set to AM broadcast band). Front panel push switches let you choose easily between regular AM radio and the shortwave bands. An additional switch allows the selection of any two bands of interest, each 1 MHz wide. Set one range for daytime frequencies and one for nighttime when propagation is different, choose any two frequencies between 3 and 22 MHz. Frequencies are tuned on your AM radio, making it easy to log stations or set presets. A built-in antenna switch automatically switches the existing AM antenna to either the radio or converter, making hook-up easy and fast. As with many of our kits, a handsome matching case and knob set is available to put the finishing touches on your kit.

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McMurdo Silver — a Radio Enigma

by Linton G. Robertson

The history of early radio is replete with odd and peculiar characters, but one of the oddest is that of a man with an odd name as well, that of McMurdo Silver. Enigmatic, aloof, fiercely competitive and incredibly intelligent, his story remains a singular and tragic reminder that all was not sweetness and light in the early days of radio.

Mr. Silver was born in the town of Geneva, New York, on March 15, 1903. His parents were Dr. John Archer and Agnes (McMurdo) Silver. Why he was given his mother's surname is not known; it's just one more puzzle in the story of his life. Neither of his parents, contrary to some information, appear to have been first-generation immigrants—his father was from a line established in Maryland, and his mother's family came from Virginia and Kentucky.

It seems that his early life had been uneventful enough, but this was only the calm before the storm. When he was just 13 years old, his father died—a terrible event for a thirteen year old boy. Two short, and probably very painful years later, McMurdo quit school and went to work for the brokerage firm of Post and Flagg at the age of fifteen, presumably to help support his family. He did fairly well with the firm.

During his teens his interest in radio blossomed, and by the time war was declared on Germany he was already known country-wide for his activity and enthusiasm in radio communications. Unfortunately, the government clamped down on all radio activities at this time, and Silver had to find another hobby to pour his interest and drive into. Antique arms appealed to him, and he later amassed quite a collection.

It will later be seen that it might have been much better if he had chosen stamp collecting.

His association with the brokerage firm proved a good one; Silver got several promotions, and, when amateurs got their radio rights back after WWI, he plunged back into radio at full steam. A "Wall Street Messenger" by day, by night he started his own small business constructing small radio sets and



Fully six feet high, in a custom cabinet of rich hardwoods, the Masterpieces boasted a tuning range from LF to VHF.

selling parts. Eventually, in 1920, he quit the firm and went to work as a lab assistant for Westinghouse's vacuum tube operation at the Bloomfield, New Jersey, lab; it was here that he decided to become an engineer.

Finishing his high school requirements, he went to night school at Cooper Union in New York City. In early 1922 he went to work for a radio and electrical jobber, and became an assistant engineer and the first employee of Haynes-Griffin, a very early radio supply operation. His interest in firearms grew as well, as did his collection; things seemed to be coming up roses for Mr. Silver.

Although only 20 years old, in 1923 Silver had such a mastery of the superheterodyne circuit, that the Haynes Superhet, when introduced, was almost completely derived from his improvements and refinements: Silver had, at this tender age, built nearly all the

experimental models and done all the testing and design!

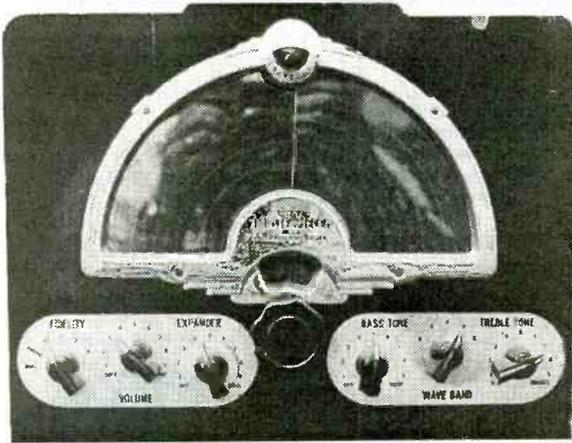
His abilities were gradually becoming well-known, and, as Silver had started studying the business end of radio production, thoughts started to fill his head about owning his own operation. In 1924, his grandfather died, leaving him a substantial amount of money with which Silver set up shop in Chicago with John R. Marshall, his cousin. The outfit was called Silver-Marshall, and did excellent business. Shortly thereafter, though, some friction developed between Silver and Marshall; Marshall retired. McMurdo Silver pressed on and wound up as president of the company by 1927. At the age of 24, Silver was president of a company that was the largest distributor of radio kits and parts! The man seemed unstoppable. Unfortunately, about this time his nemesis appeared—a man named Scott.

Scott, of Scott Radio, was definitely a patrician. His radios were fine enough, but his sales campaigns definitely swung toward snob appeal. His motto, plastered over many of his ads, was "If you can tolerate any other radio, please don't buy a Scott!" Egads!

Both based in the Chicago area, they came to each other's attention soon enough, and, the story goes, hated each other at first sight. It may have been because they were so much alike. Whatever the reason, both men detested each other to an almost pathological degree, and, both being fiercely competitive, resolved to bump each other out of the market for top-end radios. Scott was on a roll, Silver was on a roll, but Silver was the first to lose his luck. On October 5, 1929, Silver had a severe accident, and things began to skid.

Suffering severe impairments from the incident, Silver was in no shape to run a business, but tried anyway. Unwise overexpansion took place, the depression set in, the company took a steep dive, and went bust on October 8, 1932. While Scott snickered, Silver picked up the pieces and started McMurdo Silver, Inc.

Silver, though he suffered for years from the effects of the mishap, still had his techni-



cal abilities intact, along with his desire to out-do Scott. His popularity continued to climb with every technical paper he published. The accolades of the press were his; he became a Fellow of the Radio Club of America and an associate of the Institute of Radio Engineers.

A flood of brilliant technical papers continued to pour forth. Scott must have stopped snickering and turned red with fury when Admiral Byrd, so impressed with Silver's knowledge and expertise, called upon him to furnish broadcast receivers for the Second Byrd Antarctic Expedition. Plunging ahead, he created what are probably the finest and most expensive consumer radios ever produced in the 30's; the McMurdo Silver Masterpiece series.

I've been lucky enough to be in the same room with some of these sets; the first impulse of which I was conscious upon viewing one was to fall down and worship it. Fully six feet high, in a custom cabinet of rich hardwoods, the Masterpieces boasted a tuning range from LF to VHF, a gear reduction dial tuning system, an enormous 18-inch theater speaker (courtesy of Silver's friend, Peter Jensen), and 20+ tubes. Though a close match, collectors I've talked with who possess both Scotts and Masterpieces, usually, with only one or two exceptions, give the performance bow to the Masterpiece. But, unfortunately, the "best man" may not have won in the end.

The rivalry between Scott and Silver heated up. Advertising campaigns got rather nasty with each man slamming the other's product in the press. Legal rumblings shook the foundations of the two companies. "Twenty-five tubes where ten are needed," howled the ads, and so forth. Silver charged—rightly, as it turns out—that Scott wasn't even making his own sets; Hallicrafters and Howard Radio were putting them together in a hush-hush deal! (To this day, many Scott owners are not aware that they might be looking at a Hallicrafters ... ouch.)

On occasion, Scott and Silver would race each other in their hot 30's cars through the streets of Chicago, and out in the flats at speeds of over 100 miles an hour. The battle between the two men, now fully joined, was about to break. Scott had always been a better businessman than Silver; this may or may not have reflected in his business ethics. In any case, Silver over-spent on his wonderful sets, the company went into the red, and McMurdo-Silver went under the waves in the late 30's.

Defeat, in such a contest of wills, is hard enough for the loser; ignominious defeat is worse. Silver, in a decision that must have nearly killed him, accepted Scott's offer to buy him out, though he probably would have preferred to see his factory burn to the ground first. It seems that the jobs that would be saved in the process might have swayed him to accept ... at least this way some people would keep on eating. In any case, it was a blow from which Silver never recovered.

It was at this time that, the story goes, his personality started to change. Never characterized as an elbow-rubbing gregarious, Silver became more aloof, autocratic, and unfriendly at times. It could be argued that the injuries he received from the accident may have had some delayed effect on his mental or emotional state; becoming more and more reclusive and eccentric, he became a very difficult man to see. Never a photographer's dream, he now became impossible to photograph; to this day photos of him are very rare. He must have been very low indeed when WWII broke out.

Silver threw himself into the war effort, joined Browning-Drake, and gave it his full effort. The war years must have brought him some solace in the frenzy of war production, but at its end, things didn't go very well. He started out again to produce a line of amateur test equipment, but the results were far short of his earlier excellence. The equipment was

poorly constructed and failed to win great approval. Silver's fortunes continue to slide. In 1947, at the age of 44, divorced, nearly friendless, and living in a hotel room in Hartford, Connecticut, Silver took one of his beloved Colts from his gun collection, walked outside the hotel and shot himself through the head. He died instantly.

Scott's reaction is not recorded.

So passed McMurdo Silver, radio pioneer, genius, and personal enigma. His story is unique to the annals of radio, as was the man himself.

The author gratefully acknowledges assistance from the following sources:

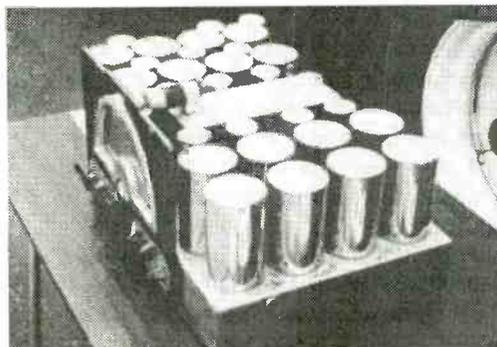
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Low Power TV Stations: The Next DX Challenge

Many of you who have tuned the entire UHF television spectrum have noticed things like home shopping channels or religious programming appear seemingly out of nowhere. A few years back, the FCC decided to open up unused UHF television channels to a new service to replace the older TV translator service.

Translators have been around a long time, bringing reception of hard-to-get broadcast signals to small towns with difficult reception. By simply placing a good antenna on a tower to pick up the desired station and retransmitting it on an unused UHF or sometimes VHF TV channel, the community could enjoy non-cable reception of broadcast TV. Before the advent of cable, translators were the only means many towns (and rural areas like Brasstown, NC) had of getting adequate TV service.

Translators were only allowed to rebroadcast the one station to which they were dedicated, and could originate no programming of their own. But, in the early 1980's, the FCC began to permit such programming as local news or commercials, to help pay for the cost of maintaining the translators. They went one step further in allowing translator-like licenses to be granted in communities already served adequately by television broadcasters. These new stations, called Low-Power Television,

or LPTV, were allowed to either translate other broadcast signals or to originate their own programming completely.

This development brought the possibility of local news and commercials to towns too small to support a full-sized television station. Some entrepreneurs saw the potential for non-cable outlets for such cable successes as home shopping networks and religious channels. Lotteries were held to dole out the licenses, and the rush was on to build these mini-TV stations.

LPTV is restricted to 1 kW or less, but effective radiated power is unlimited. So, with an effective antenna, a major city can be well covered by a 1,000 watt TV station. With most commercial UHF stations measuring their effective radiated power in megawatts, these LPTV outlets are a lot weaker and cover a much smaller geographic area.

For TV DXers, LPTV presents a special challenge. The FCC retained the simple station ID requirements reserved for translators. They only require that the identification be sent once an hour and not necessarily on the video. In fact, most have no ID at all that the average viewer can see, except for the ID of their program source, such as a network or local TV station. The ID is often transmitted as Morse Code by shifting the main video carriers slightly, making for an FSK (frequency shift keying) signal when heard on a CW or SSB receiver tuned to the carrier frequency.

Unless you have a receiver capable of tuning those frequency modes, using the programming is still the most effective way to identify LPTV stations. If it is a translator, you will see the ID of the main TV station. If it is a network, just make note of the channel



and the network carried. Writing to the network or the TV station carried by the translator will usually result in a positive identification and a chance for a QSL.

LPTV stations do have call letters that are similar to amateur callsigns. They consist of a W or K, followed by two digits which signify the channel number, followed by two letters. W39AN would mean the station is on UHF channel 39. During times of intense tropospheric conditions (tropo), the UHF TV band can be filled with all sorts of interesting stations you may never have seen before.

Here in Lincoln, we have a channel 22, which translates channel 4, KSNB-TV from Superior, Nebraska, which in turn is a full-power satellite of KHGI-TV 13 of Kearney, Nebraska. This setup can be interesting as the channel 22 translator receives channel 4 from Lincoln, about 80 miles away. Any changes in propagation, including tropo and e-skip, can be seen by watching channel 22. In the three weeks this translator has been on, I have seen numerous other channel 4 stations vying for the translator receiver, obliterating the Supe-

Skipping In . . .

KRQQ 93.7 Tucson, AZ 0101Z. Heard ID as "93-KRQ".

WMJY 93.7 Biloxi, MS 0138Z. "Magic 93.7" Mostly light popular music, and ads for Biloxi area casinos.

WKNN 99.1 Pascagoula, MS 0145Z. "K-99 FM" Country music and commercials for area casinos and tourist spots.

KCFX 101.1 Kansas City, MO 1304Z "The Fox" Classic rock from A-Z with songs played in alphabetical order.

rior station. When the skip is very intense, the translator fails to get a good enough signal to lock in on and has been known to shut itself down.

Bits and Pieces

- Have you been chosen to fill out a diary for one of the radio ratings services? It can be fun, and will give you a better idea of your own listening habits. Make sure not to enter distance reception (DX), though, as that might confuse their data. Simply do not show listening unless you are tuned to a local or near-local signal. The ratings are very important to broadcasters. They appreciate your honesty in completing the diaries or forms accurately, so that they can plan future programming. You may enter shortwave listening as long as it is to a station with domestic call letters, such as WWCN or WRNO. Being picked to be a part of this effort can be an educational experience.
- Are you ready for small dish home digital radio? DirecTV is rolling out its 80-channel satellite service this summer, and one of the services will be the 30-channel Digital Cable Radio. Listeners can choose from 30 different commercial-free music formats from classic rock to current hits to big bands. All of this comes to you via an 18" spoon-shaped dish! The dish needs no rotators and mounts as easy as any small antenna on your roof. This new service will bring previously unavailable formats nationwide with CD quality digital sound.
- *MT* reader Howard Dutcher reports being able to hear two stations previously inaudible in New York City while WINS 1010 was off the air. He caught WBNP 1000 and CFRB

1010 during WINS's maintenance down time. Keep your ears open for information from broadcast engineers that may know when a station in your area will be off the air so you can hear what you have been missing! Sometimes a storm can take a local station off the air. Remember to check your local stations after a big storm for possible outages that bring DX opportunities.

- A recent Radio Shack sale flyer featured the DX-380, a LW/MW/SW/FM receiver being closed out. If you are an FM DXer and can still find one of these gems, snatch it up! The performance on FM is nothing short of astounding! It is not often that a multi-band radio has such a good FM section. The DX-380 also allows for stereo FM listening when a stereo headset is plugged in. At \$129, it is a good deal for SW and AM listening as well.
- Coming soon: a look at a state of the art AM/FM station. We will also look at all digital radio stations. Records and tape cartridges have been replaced by CDs and hard drives. Coming in a future column, we will learn how to save station IDs on your own home computer and swap them via bulletin boards.

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Have you heard some good DX lately? Send it to American Bandscan in care of *Monitoring Times* at the Brasstown address or directly to me via e-mail at JPGC40A on Prodigy or via the Internet at jpgc40a@prodigy.com or via the Grove BBS. Don't forget to send us your clippings of happenings of *your* local broadcasters.



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Strange Sounds on the Federal Channels

If you have been monitoring the channels of the FBI, Secret Service, or the Customs Service, by now you have heard them carrying data-type transmissions which have appeared over the past few months.

I first noticed this packet-like sound at 0700 hrs on the main customer channel, 165.2375 MHz. At first I thought it was a data system they were testing for base to car transmissions, but the transmissions were only heard during a narrow time frame in the morning, usually 0700-0715 hrs local.

An attempt was made to decode the transmissions using packet equipment — no luck. The signal was then run through a multi-mode data decoder — this time things got more interesting. A definite transmission sequence could be seen, but there was still nothing that made sense.

Finally, a friend of mine in the Treasury Department let me see his new radio he had just received. Mystery solved.

The FBI, Secret Service, and the Customs Service are now using the Motorola Syntor X 9000 and Saber III radios which are computer controlled over the air. These radios are equipped with DES (Digital Encryption Standard — also known as Securenet), for total encryption of the voice transmissions and heightened security of the mission. There is no loss of range in the digital mode using this new type of DES, known as DES-XL.

Each Saber radio is equipped with six (6) zones, which allow 72 conventional channels. The Syntor X 9000 allows up to 32 different frequencies. These radios are very broad banded; for example, the FBI radios spread from the 150 MHz region up through the usual 163/167 MHz channels, and terminate with the new 171-174 MHz frequencies.

Each morning — at least down here in Florida — at 0700 hrs, the Customs Communications Center in Miami, a.k.a. Sector, sends out the data bursts to these radios out in the field. Each radio is individually programmed for the mission of the day. If a radio is stolen, then the radio is “shut down” and will not work. Turning off the radio is no help. The next time it is turned on, Sector will see it and shut the radio down again. I have heard that some of the radios have the capability to be

remotely keyed up without the operator knowing it, so the base station can monitor what is going on around the radio. This comes in handy if an officer is down, or the radio is stolen and radio direction finding is initiated.

Each field office has the capability of programming its own radios out in the field, without the operator really knowing what is going on. This offers all sorts of possibilities. With the Customs Service, for example, one group can be programmed for port operations, another group for interdiction operations, and



a third group for internal affairs.

Since two agencies of the Treasury Department — Secret Service and the Customs Service — are already using this format, look for other Treasury Department agencies such as ATF and Internal Revenue Service to incorporate this format into their communications systems in the future, as well.

While we are discussing the Customs Service, it was just learned that the city of Orlando, Florida, has entered into an agreement with the Customs Service to move the communications office — Sector — from Miami to Orlando. The Miami Communications Complex was destroyed by hurricane Andrew and they have been operating at less than top performance. The Naval Installation at Or-

lando, which was a basic recruit depot, will be used for the new home of Sector. This recruit depot is on the list of base closures.

Intelligence Continued

Last month we went into detail on electronic surveillance transmitters. This month let's look at the receiving end. The basic intelligence kit, as manufactured by audio intelligence devices, KEL, and others, are composed of a transmitter, a receiver, and a tape recorder. Oh yes: don't forget the heavy-duty Ni-Cad batteries used to power the unit.

The first units I ever worked with were manufactured by A.I.D. and were built into a case the size of a medium sized suitcase. In this case was a reel to reel tape recorder — we didn't have cassette recorders back then — a six channel VHF receiver, and the batteries. Usually the biggest guy in the unit carried this equipment. It must have weighed in at twenty five pounds at least.

The new intelligence kits are built into a brief case, have a cassette recorder, and a receiver. The A.I.D. units still use the basic six channel receivers. These receivers also tune the 30-50 MHz range in the wide band format.

“Now what,” you may ask, “is down there?”

Well, A.I.D. and others manufacture numerous devices in the 35-40 MHz region. One unit looks like a wall socket. It comes in different colors and styles. The wall socket in the target area is replaced — usually with the power never turned off — with one of these units. It is in the 35-40 MHz region and couples back into the power lines for its antenna. As long as the bad guy pays his power bill, you get to listen.

There are several other devices in this range manufactured for intelligence work. One is a little device that hangs behind a curtain. It is a free running oscillator powered by a hearing aid battery. It puts out about one milliwatt and transmits for about a week without a battery change. Being wideband, it sounds good. There is also a drop-in telephone mouthpiece that receives its power from the phone lines. Just unscrew the telephone mouthpiece, take out the old one, and drop in the new one. Works great.

The intelligence kits have a cassette recorder and a Ni-Cd power supply, along with the charging circuitry. The price, which includes the transmitter, receiver, cassette recorder, and power supply, is in the five to seven thousand dollar range. They can be built for a lot less.

Frequencies

I was in New York City recently and found some very interesting federal transmissions. They were:

- 414.75 Postal inspectors in the clear
- 418.725 Surveillance operations in the clear
- 173.01 Clear voice, repeater out, surveillance
- 172.475 Repeater out. Running tags in the clear. Identified as the Charlie 11 Units.
- 170.425 Repeater out, digital voice
- 170.900 Repeater out, digital voice

Attorney General Janet Reno was in town. The protection people were using 172.425 for all of the administrative and protection detail operations.

Agency of the month: Center for Disease Control

The Center for Disease Control is based in Atlanta, Georgia, and does the research and testing for all types of communicable diseases. This is a heavily guarded installation. Recently CNN News carried a story about the last remaining small pox virus in the world, which was stored there. Some people wanted it destroyed, others wanted it kept ... just for research.

In the end, they kept it and it is still stored there. With the *Monitoring Times* convention just a couple of months away, and in the vicinity of the CDC complex, here are the frequencies we can monitor while we are there:

- 163.8125 guards
- 415.6250 guards
- 417.7000 guards
- 419.6000 guards

The private guards on the grounds of the installation are employed by Koger Properties and use 464.2625 and 467.0625 MHz.

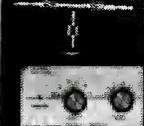
Bringing Up the Tail

Before I finish this month, I recently saw a vehicle here in South Florida at a traffic light with a VHF cubical quad antenna attached to it. When I finally got to talk to the occupants, it was found that they were from the U.S. Fish

and Wildlife Service out of Atlanta. The antenna was for tracking the telemetry transmitters affixed to turtles, alligators, etc., in the Southeast United States region.

Here is the frequency breakdown. I don't know what you'll hear, but if you do, it's probably close!

Use	Ch.#	Freq.
Atlanta Tracking	1	164.4375
Cape Canaveral turtles	2	164.4625
Cape Lookout turtles	3	164.4875
Cumberland Island turtles	4	164.5125
Great Smoky Mountains	5	164.5375
Fla Everglades alligators	6	164.5625
Ft. Jefferson Wildlife	7	164.5875
Unassigned	8	164.6125
Unassigned	9	164.6375
Unassigned	10	164.6625
Unassigned	11	164.6875
Unassigned	12	164.7125



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Well, that's it for this month. Make your plans today to make it to Atlanta in October for more rag-chewing about monitoring the federal bands.



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Getting to Know Denver International

Welcome aboard! Today we'll take a look at Denver International Airport (DIA), some loggings, and airline addresses. Fasten your seat belts and we're off!

After countless delays and seemingly insurmountable examples of Murphy's Law, the new Denver International Airport will soon be open. Beset with problems and setbacks, the major one involved their new automated baggage handling system which was spilling and mangling baggage destined for concourses A and B.

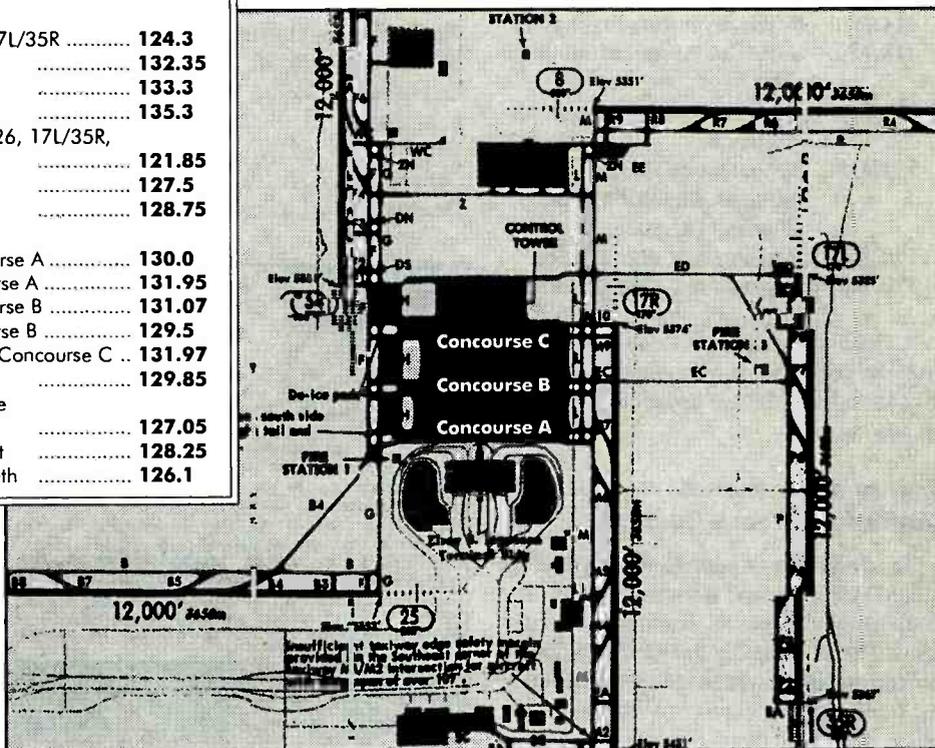
Other problems still causing snafus were the laser-scanning system (which reads baggage claim-ticket bar codes), security systems, arrival/departure display screens, concessions, and other areas that weren't quite ready. It appeared that this airport had more on its plate than could be handled. One at a time, these snags and glitches are being put together and hopefully smoothed out.

Although the physical location of the runways will be changed from Stapleton (the old airport), the new airport's 3-letter code will remain DEN. This is a precedent-setter because almost every time a new airport opens in a city, the 3-letter code is changed from the one previously used. Frequencies that had been associated with DEN (VOR and voice) will not remain the same, which creates a problem with pilots who fly with outdated charts, etc. Presumably, the DEN identification is being retained because doing so saves an estimated \$9 million by avoiding the need to change the identifier on baggage claim tickets, etc.

Air Traffic Controllers will be able to shift traffic quickly from one runway to another depending on the wind direction, with minimal delays or disruption of air traffic. A "flow-through" traffic pattern will allow aircraft to land, taxi to concourse gates, and take off in one direction. Time spent waiting on runways and taxiways will be greatly reduced.

The new Denver International encompasses fifty-four square miles, large enough

ATIS Departure	134.02
Denver Clearance	118.75
Denver Tower	
Rwys 8/26, 17L/35R	124.3
Rwy 17R/35L	132.35
Rwy 7/25	133.3
Rwy 16/34	135.3
Ground Rwys 8/26, 17L/35R,	
17R/35L	121.85
Rwy 7/25	127.5
Rwy 16/34	128.75
Ramp Control	
N. of Concourse A	130.0
S. of Concourse A	131.95
N. of Concourse B	131.07
S. of Concourse B	129.5
Both sides of Concourse C ..	131.97
Cargo Ramp	129.85
Denver Departure	
North	127.05
East and West	128.25
West and South	126.1



to contain the old airport (Stapleton International), Dallas/Fort Worth International, and JFK with room to spare! There are five 12,000-foot runways in service, allowing arrivals and departures in four directions. A 16,000-foot runway is in the planning stage, with construction possibly starting in late 1994.

According to the promo booklets that were sent to me by the DIA information office from the Aviation Division of the City and County of Denver, air traffic will be directed from a 327-foot control tower, the tallest ever built for the FAA. None of the runways intersect, minimizing the chance of aircraft traffic jams or incursions. An innovative runway/taxiway lighting system, with lights imbedded in the concrete to form centerlines and stop bars at intersections, is another safety feature to guide taxing aircraft in times of low visibility.

With more than a 4,300 foot separation between runways and high-resolution final approach monitors, as many as three aircraft can land at the same time on parallel runways

during bad weather. With four separate deicing stations set up near the takeoff runways, planes can depart immediately without taxiing back to the gate to be sprayed, eliminating the chance for ice to build up again. DIA will have the safest and most efficient facilities in the world for deicing aircraft before takeoff.

Here's a trivia item of interest: The main hall of the terminal alone stretches three football fields in length! Like Atlanta's Hartsfield International, for passenger convenience, underground trains that carry passengers from the main terminal to the concourses will leave the terminal every two minutes; the trip to the most distant concourse (C) takes only four minutes.

All-in-all, approximately three dozen passenger and cargo carriers will eventually be serving DIA. United Airlines is the city's number-one carrier with close to 248 daily jet departures, not counting their commuter service — United Express. However, Continen-

tal, which also had a hub in Denver, is cutting by more than one-half its daily departure and arrival service. This will leave quite a few empty gates. Hopefully, other airlines will expand their services to DIA, and/or decide to place a hub there. With so many new start-up airlines in existence now, it isn't too far-fetched an idea.

On opening day, Concourses A, B, and C will house approximately 90 full-service gates. Continental will use gates on Concourse A and four gates will be utilized by international flights. There will be 23 gates on this concourse altogether. United will have 44 gates on Concourse B, and other airlines will be located in C, which has 20 gates.

The frequencies depicted here and on the accompanying chart will most likely be the ones in use. If there are any changes, we'll be sure to put them in the column, ASAP. By the way, the approach frequencies will be: (N) 119.3 & (S) 118.97; and arrival ATIS: 125.600.

Here are a few company frequencies you may want to monitor as you pass through DIA. Since there will be so many companies with service to and from Denver, we'll list more of them as soon as possible.

TWA: 129.100
FedEx: 131.925
American: 131.950
Delta: 129.550
Northwest: 131.700
United: 129.300, 129.400,
 129.425, 129.500, 131.075,
 131.350
Continental: 129.925, 130.250,
 130.350, 130.775, 130.900
Midwest: 129.250
Denver Beech: 130.575

Many thanks to *MT* subscriber, Frank Vacanti; Flight Instructor Harry LaForge; Airline Pilot and *MT* subscriber, Doug Bauder; and the DIA Information Office for providing information and material used in the preceding feature.

New Twist on an Old Line?

Speaking of start-up airlines, like the Phoenix arising from the ashes, Eastern and Pan Am may be flying again. Former employees and other interested parties are rumored to be reviving these two old favorites. And another old favorite, Midway Airlines, is in, or will be in operation again by the time you read this.

Reader's Corner

Tim Rogers (Knoxville, TN) would like to contact other monitors in his area. Folks in and around Knoxville who are interested in getting in touch with him may send me your contact information and I'll see that it gets to Tim.

Gordon Levine (Anaheim, CA) monitored the following HF transmissions recently:

Freq	Time	Traffic
4357	(0427)	KMI working Nordic Prince on 4071
5547		SF and Canadian 27, switched to 2869 and then back to 5547
5598	(0408)	SWISSAIR 0101 working Gander
"	(0411)	AIR MEXICO working NY
9187	(0525)	Simplex bull session, no I.D.s
11176	(0020)	AUSSIE 095 (130) working McClellan
11176	(0027)	NIGHT WATCH 1 working ASCENSION
11176	(1727)	AIREVAC 40631 working ALBROOK
11176	(1737)	REACH 18185 working HICKAM

Gordon mentions that he has heard a number of stations, possibly illegals, between assigned frequencies on both the aero and maritime bands (see above). Sometimes they're in Spanish, sometimes in English, and sometimes an Asian language. They're informal bull sessions with no IDs.

This writer has also come across them and they are extremely annoying. Has anyone else heard them? Are they from fishing boats or what? The ones that converse in English use four-letter words that have no business being used over the air. Wish someone would catch them in the act.

That's it for this time. Coming up in October is a feature on how airlines flying over the Pacific are allocated frequencies, and which freqs are used when and how by the individual ground stations; book reviews; and a surprise or two.

I'm looking forward to seeing all of you at the Convention again this year! Until then, 73 and out.

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 CAIRO INTERNATIONAL AIRPORT
 Cairo, Egypt United Arab Republic

DRAGONAIR-HONG KONG
 12/F, Tower 6
 33 Canton Road
 Kowloon, Hong Kong

FINNAIR
 Mannerheimintie 102
 01250, Helsinki 25, Finland

TOWER AIR
 Hangar No. 8/Second Floor
 JFK International Airport
 Jamaica, NY 11430 U.S.A.

SAUDI ARABIAN AIRLINES
 SAUDIA BLDG., P.O. Box 620
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AMERICAN TRANS AIR
 7337 West Washington Street
 Indianapolis, IN 46231 U.S.A.

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 Reykjavik, Iceland

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 P.O. Box 394, Fahad
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Satellite TV Comes Of Age

Since the early part of this century achievements in electronics have fired our imaginations. The idea of transmitting wireless messages using Morse Code so thrilled a generation of Americans that thousands of radio clubs and dozens of publications sprang up all across the country. Mail order companies kept experimenters supplied with wire, galena, headphones and other necessities. Breadboards disappeared from kitchens everywhere.

The popular culture reflected the radio craze with songs, books and moving pictures depicting the heroics of the wireless operator. The early days of radio broadcasting in America were a free-for-all. Commercial, amateur and government transmitters jammed the same frequency band. The station with the highest power wins!

With design refinements and large scale production, prices of store-bought receivers tumbled and, in a short time, millions were tuning in to what later became known as the Golden Age of Radio.

A Familiar Story

A strikingly familiar story is also told of the satellite TV industry. In the late 1970s, satellites were being actively used to transmit network news and other programming. When Time, Inc. launched its Home Box Office channel to America's burgeoning Community Antenna Television systems (as Cable-TV was originally known), additional programming followed.

Due to the expense and complexity of such receiving systems, however, the programming industry never imagined a home consumer market outside of old fashioned cable TV. It fell to the experimenters to figure out how to receive these signals on homebuilt equipment.

Once again, magazines and other publishers churned out dozens of articles and books on satellite TV. By the early 1980s thousands of dealers had sprung up across the country hawking all manner of receiving equipment.

Just as with the infant radio industry, fortunes were made and lost, manufacturers came and went, and a surprising number of systems were sold. At the peak of the satellite TV craze in 1986 dealers were installing systems at the rate of 90,000 per month!

The Hand of Regulation

Similar to the early days of radio, however, the legal structure to regulate the new industry had not yet evolved. But, programmers weren't waiting around to see what the courts or lawmakers thought. They commenced an aggressive plan to encrypt the programming, thereby preserving it for its intended, paying, cable customers. The proverbial bottom fell out of



John Locker of Merseyside, England, says, "With recent events in South Africa a great number of feeds made their second 'hop' via Intelsat K at 21 degrees West." See final "Mailbag" item at right.

the satellite TV market with an economic resonance. Thousands of dealers went out of business, dozens of manufacturers went bankrupt, their huge, optimistic inventories in the hands of distributors without dealers.

Two million happy dish owners, sporting their three to six thousand dollar investments proudly on their lawns, were suddenly faced with a dilemma: Either cough up another \$400 for a decoder and an additional \$400 for programming, or do without. Many did without. Others resorted to piracy. Millions more were turned away. Monthly installations dropped to less than 20,000 units per month.

Meanwhile, government regulators charged ahead with the speed of snails and by 1989 finally legalized something for everyone: satellite TV viewing and the practice of encrypting and charging for programming.

In The End

Except for the tens of thousands of people who lost their jobs and/or their fortunes (which also happened in wireless), the whole industry and general population is recovering. Program-

mers have grudgingly come to see the two million satellite viewers legally watching their programming as the biggest single "cable" system in the country — and they don't even have to shell out a dime for maintenance.

For consumers, prices are on par or lower than their wired cable cousins; dozens of extra channels (including pay-per-view features still not available on many systems) are available with more on the way; better, less expensive equipment is widely available through thousands of dealers and discounters.

Today, according to industry sources, monthly sales of satellite systems are around 40,000 per month. Consumers no longer think of TVRO as an exotic and elaborate television receiving system, but rather as a different form of entertainment. The bulk of all systems in the field right now are for entertainment (and shopping) purposes only. Comparatively few are in the curious hands of experimenters.

That's actually good news for hobbyists. It means lower prices on new equipment, lots of gear destined for the used market and a general acceptance of big antenna structures on the part of the general public.

The introduction and anticipated growth of satellite television due to Direct Broadcast Satellites (DBS) will doubtless improve the industry even more. Competition is always good for the market place.

This general and growing acceptance of satellite television has added the previously wary and the skeptical to the growing number of newcomers in need of information on this aspect of the monitoring hobby — and that's one of the purposes of this column.

MAILBAG

• Douglas Wilson, N5YTX of Porter, TX, has been making use of information in this column to write for various catalogs etc. He writes: "...Since I know very little about satellite TV equipment, I have two questions: 1. [In The Name Brands Only Catalog] they mention satellite home cable TV programming. What are they programming on a yearly basis? 2. I live in East Texas which has quite a few trees; how can I tell if I even have a clear shot at a satellite?"

NBO and the many other mail order suppliers and hometown dealers, for that matter, offer packages of cable fare programming to folks buying their satellite TV systems. They are

known as Third Party Programming Packagers, which is to say that they are authorized by the various entertainment programmers (HBO, SHOWTIME, The Weather Channel, ESPN, etc.) to sell the programming to consumers. This is a lucrative deal because the dealers get a certain commission on each programming package sold. This was another of the hard-won concessions which dealers got from programmers.

In 1986 annual subscriptions to encrypted channels were available only through the originating programmer. This set up a needlessly adversarial relationship between program providers and reception equipment providers. Now, competition among Third Party Providers has kept subscription prices lower than most cable systems where there is no competition. Shop around for the best deal.

With regard to your second question: There are several ways to determine whether you have enough of an opening in your yard to see if installing a system is worthwhile. The best way, particularly if you're serious about putting in a satellite system, is to call your local dealer (there should be plenty listed in your Yellow Pages).

Most dealers will do a site survey for you for free. Usually, this entails roaming about your estate with a tool designed to see how much of the Clarke Belt is visible. Some dealers will actually bring out a satellite system on a trailer and set it up in the most likely place and let you watch what you're missing. This method is almost always a sure-fire seller. Drooling consumers are seen groping for pens and asking where to sign.

The Cheapskate's Approach is to scrounge in your kid's desk for a protractor; in your wife's sewing kit for a piece of string (ten inches will do); and in your neighbor's workbench for a nut, bolt, or other fairly heavy object. Attach one end of the string to the nut and the other end through that hole in the flat side of the protractor (hadn't you always wondered why they put that hole there?). Assuming an air of confidence, wander about the property sighting along the flat edge of the protractor from areas where (A) you'd like to see a dish or, (B) you think is the best spot.

Holding the protractor flat side to the sky, the string bisects the 90 degree line. Sighting along the edge toward the horizon, allow the string to slide freely along the curved edge. Press the string against the protractor and count the number of degrees between the 90 and where the string is now. Given your location in Texas, you should have at least 10 degrees above the Western horizon and 45 degrees above the Southern horizon. To the East it would be nice to have 25 degrees. (These optimum angles vary according to the viewer's latitude and longitude.)

Don't despair if you aren't even close. There are some 33 C and Ku band satellites in the

space above your house, and you will undoubtedly see enough birds to still have fun.

• James Snow, O.D., of Darien, GA, writes: "I would like to inform your readers of the experience I have had with the KU band satellite system that I recently purchased from one of your advertisers (R.C. Distributors, South Bend, IN)...I have received such excellent service from them in addition to support on subsequent questions I had regarding reception of signals...on the Southeast Coast of Georgia. I can receive six crystal clear satellites and could possibly receive more if I did some tree trimming...my home is surrounded by large oak trees with only a small opening through which we can 'see' the satellites with a small (3 foot) dish.

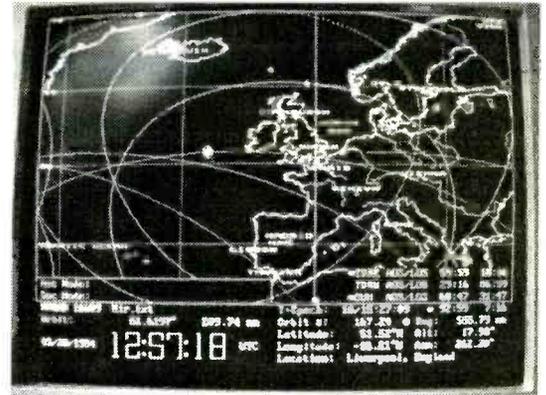
"We have had quite a lot of fun once we got the hang of it with just manual adjustment. Even changing the polarity by hand from horizontal to vertical, moving the LNB was easy. The receiver that was sent with this system...also receives the C band...The ease and clarity of reception on these dishes from these satellites is absolutely amazing...I would like to hear about the experiences of other readers and their opinions..."

Well, James, so would I. Thanks for your enthusiastic response and welcome to the fabulous world of satellite TV monitoring; you'll have many years of interesting watching with your system. Readers, step forward, let's hear what you've seen and heard with your satellite system, no matter how big or small.

• Rob Cave, of Princeton, TX, enjoyed a past column about DBS. He writes: "...I think I heard or read there are eight DBS slots on circularly polarized Ku band and a receiver/decoder for one system won't work on the other systems yet to come out. Is this true? What is the consumer to do: buy eight fixed dishes and have eight boxes on his TV set?!" Rob also points out that in his location near Dallas/Ft. Worth, he receives no fewer than 17 over-the-air TV stations.

Rob, I believe that whether or not the various DBS systems are compatible will be a moot point, because they are all trying to build the same product. All systems, once in place and finally functioning, will offer essentially the same programming. The differences will be subtle ones: for example, if you want to subscribe to X*Press Information Services (the computer based digital information service) you'll have to go with PrimeStar which, so far, is the only DBS system to carry it.

Meanwhile, old-fashioned C band systems continue to add channels to the line-up. Among the expected crowd are Classic Arts Showcase (classical, ballet, opera etc, videos); America's Talking (another chat show channel); Indepen-



dent Film Channel (this one's from the folks at Bravo); The Military Channel (for those who didn't get enough D-Day coverage); The Classic Music Channel (who's paying for all this anyway?); The Golf Channel (sponsored by NoDoz®?); and, well, there doesn't seem to be any end to the funding for these niche channels.

• And, finally, The Locker Report. As usual, my man in Merseyside has sent a couple of photos taken from his monitoring post. John Locker finds it interesting to see what international events the media finds worthy of coverage (opposite). The photo above is a computer display of the 'Mir' space station as tracked by the PC program STSPPlus.

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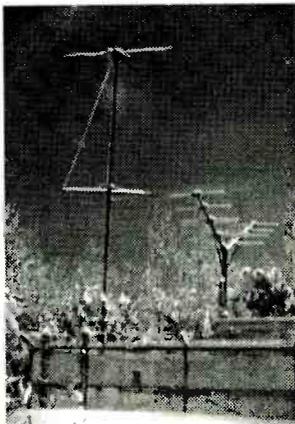
Whenever I think of beacons in the New England states, the first one that comes to mind is TUK (194 kHz) on Nantucket Island. This 4 kW giant is clearly heard throughout the northeastern U.S. and is one of the few that still transmits aviation weather forecasts. There are, however, many other beacons to hear, and this month we'll focus on those beacons operating in the state of Massachusetts.

With over 175 miles of Atlantic coastline, and many busy airports, Massachusetts sports a wide variety of marine and aviation beacons. Bob Fraser of Cohasset, Ma., has been monitoring beacons in this area for some time and has compiled a list of those he hears most frequently. Bob discovered many of these beacons listed in the *Official Massachusetts Scanner Guide 5th Edition*, but strangely, the listings did not include the CW ID used on the air. Instead it listed call signs with a "WRLB" prefix and showed the licensee as "Massachusetts Commonwealth."

After some on-the-air research, Bob determined the actual IDs used by the beacons. Table 1 shows his results along with some additional listings taken from the *Aero/Marine Beacon Guide*. Most of these beacons run low power (50 watts or less) and make for excellent DXing targets.

Mailbag

I've always felt that longwave DXers are a special breed. They put up with brutal static crashes, overlapping IDs and fading signals—all for the purpose of hearing signals on frequencies that most people consider unusable. Indeed, it can be lonely once you drop below the bottom of the AM band. Nevertheless, for those of us bitten by the LF bug, we'd have it no other way.



Outer Marker Beacon, "AS" (359 kHz), Amherst, NH (Photo by Sherman Wolf).

Peter Warncke of Vallejo, Ca., put some of his special feelings for the band on paper recently. His words touched a chord in me, and I think you'll enjoy reading what he had to say. Below is his poem, *Beacon of Hope*.

During the warmer weather, many of us long for the clear, static-free days of winter for longwave DXing. While we can't speed up the calendar, Sherman Wolf of Amherst, NH, did send some inspiring photos of "AS" (359 kHz) taken right after a late winter snow storm. The beacon antenna is of the new tophat design being used at many new and refurbished FAA sites. These antennas can be tuned for operation anywhere between 190 and 535 kHz. Also shown is a 75 MHz marker antenna (right side of the picture). Thanks, Sherman for your contribution.

Beacon of Hope

By Peter F Warncke
April, 1994

It's lonely out there
In the great by and by
Be it roaring ocean
Or deep, trackless sky.

The mariner lost
And airman will quote
A life saving tale
'Bout the Beacon of Hope.

All else had failed that day
The gods were certainly deaf
One slim chance remained
An old surplus RDF.

Neglected for years
It sure looked a mess
Bypassed in favor
Of the new GPS.

Its case rusty and flecked
Hadh't been touched for a while.

Chipped knobs, some frozen
And a barely readable dial.

Throw on the power
Tubes light and hum
Crackles out of the speaker
It looks like she's ready to run.

Nervous the hands
That harry the dial
Faint dots and dashes,
Break out in a smile.

Turn the loop
Center on null
Arrow fics rose
True bearing the call.

Just three coded voices
Positions to plot
Triangular magic
From twenty five watts.

Trusted friend
You saved us in a bind
It's time to get you over-
hauled,
Tuned up, and aligned.

Warm is comfort
When lost are found
Calm the blue
When you're homeward
bound.

An inkling perhaps
A thought not quite clear,
That a bit something extra
Helped work this old gear.

TABLE 1

Massachusetts Loggings

FREQ	ID	LOCATION
194	TUK	Nantucket
205	ORE	Orange
220	IHM	Mansfield
227	TAN	Taunton
232	RZP	Provincetown
257	FFF	Plymouth
269	TOF	Beverly
279	CQX	Chatham
285	NS	Nantucket Shoals
291	NP	Nobaska Point
295	SH	Scituate Harbor
325	EP	Glouster Harbor
342	FAW	Northampton
342	HY	Hyannis
346	LI	Boston
365	FIT	Fitchburg
368	IMR	Marshfield
370	DXT	Dalton
375	BO	Boston
382	LQ	Boston
392	CLY	Worcester
406	FLR	Fall River
414	FJM	Framingham

Mystery Beacons

For several months now, PYD (412 kHz) has been reported by many west coast DXers. At this writing there are still no solid clues to its location or the agency that operates it. I would appreciate any reports from listeners who hear this beacon along with an assessment of its signal strength. I will assemble all of the reports and try to determine a rough location for the beacon. Directional headings on PYD, no matter how coarse, would also be appreciated.

End Notes

Be sure to mark your calendar for October 21, 22, 23, 1994. These are the dates for the upcoming MT Convention in Atlanta. I'm looking forward to meeting many of you in person at the show. My seminar, *Rumblings in the Basement*, will be an opportunity to gather with some of your fellow DXers and pick up some new tips for exploring the band. Feel free to bring copies of your favorite longwave QSL cards, too. I will have a board to display them at the seminar, and will be running some of the best ones in future issues of *Monitoring Times*.

You don't have to wait until the convention to tell me what you're hearing! Why not drop a line today to *Below 500 kHz* with your summer-time loggings?

See you next month.

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Building Your First Station

Several months ago I began a search for an easy-to-build receiver that the first time builder would have no trouble putting together and operating. After assembling a dozen different receiver circuits I was nearly ready to give up. My major criteria were: low parts count, simple construction, decent performance, and reasonable price. The receiver was going to be part of an integrated package that would allow a new ham to get on the air with a reliable station. Simplicity I could get, but not performance.

In January 94 Ten-Tec announced they were producing a line of kits for hams. The prices sounded good and Ten-Tec's reputation is excellent. I purchased one of their model 1056 any band CW-SSB receiver kits. At a cost of \$27.00 I figured I could not go too far wrong!

The 1056 is a direct conversion receiver using a NE612 mixer-oscillator chip. Use of this chip really reduces the number of parts required to produce a decent performing receiver and eliminates many of the construction problems associated with receiver building. Ten-Tec includes all the parts required to put this receiver on any band from 160 to 10 meters. The builder chooses the parts for the band he wants to operate on. (Note: Ten-Tec is now kitting a switching board so the 1056 can be turned into a multi-band receiver, at a price of about ten dollars for the board.)

When the kit arrived I opened the box and read the 22-page instruction manual. Of the 22 pages, only four are dedicated to the excellent step-by-step instructions. The balance of

the manual describes testing, troubleshooting, and how to use the unit.

I decided to put the receiver on 40 meters initially and proceeded to build the unit. From start to finish the project took just a bit over four hours (time will vary depending on building skill). Upon connecting a 10 foot antenna and 12 volts of power, the earphones were filled with signals, but not in the ham band. Alignment of the receiver took about five minutes; I simply tuned until I heard amateur CW signals, then peaked the antenna coil. To do the alignment according to the instructions will take a bit longer, since either a known signal source or a calibrated receiver is required.

The 1056 includes a tuning control and a band spread control. Use the tuning control to put you into the part of the band you want and use the bandspread to look at a small portion of the band (about 15 kHz on 40). The 1056 board has provision for mute switching (while transmitting), sidetone input (to monitor sending), a frequency counter input (so you can see the tuned frequency on a counter) and speaker output.

For \$27.00 this is one heck of a receiver!

At first I was just a bit disappointed with the audio; it was too low. Upon examination, it was discovered that the audio output chip was bad; a quick call to Ten-Tec produced a new chip in two days and now the little receiver drives a 4-inch speaker to room filling volume.

The photo below is a barebones (before mounting in case) shot of the 1056. Ten-Tec

sells a housing and connector/knob kit for about \$20.00. However, the average ham will have no problem finding a suitable enclosure. There is no need for a mechanical drive for the tuning system as the receiver uses varactor diode tuning and 10k potentiometers do the mechanical tuning (which is very smooth). In addition the 1056 has a variable bandpass control which provides excellent selectivity.

So far I have tried the 1056 on 160, 80, 40, 30, 20, 17 and 15 meters. Results are impressive on all bands except that on 15 meters sensitivity is a bit low, although the receiver still does a fine job on that band. Ten meters was not tried since conditions were terrible at the time the tests were being conducted.

Used with a 5 watt transmitter on 40 meters, stations all over the US were worked, with the best DX being a station in Oregon. On 20 meters using 3 watts, stations in Europe, South America, North America and Oceania were worked. One watt on 80 meters produced 23 contacts in the Novice portion of the band with best DX being a station in Iowa (about 1500 miles).

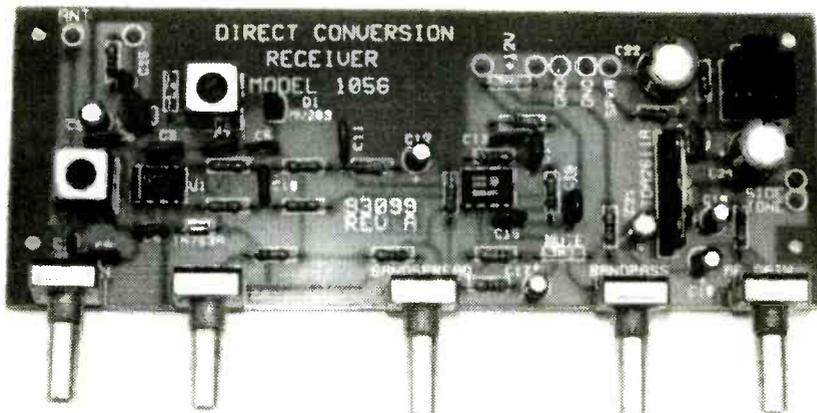
In up-coming columns I will describe some more circuits, such as an easy-to-build transmitter, a sidetone generator, and antenna switching, to be used with this receiver.

The 1056 is available from Ten-Tec, 1185 Dolly Parton Parkway, Sevierville, TN 37862-3710. For credit card orders, the phone number is 1-800-833-7373. Information can be had by phoning 1-615-453-7172 or fax 1-615-428-4483. They have other kits available, so ask for a catalog.

W1AW

Many of you know station W1AW was the call originally held by Hiram P. Maxim, who was the driving force behind the ARRL and is often called the father of Amateur Radio. 1994 is the 125th anniversary of Hiram Maxim's birth.

Hiram Maxim died in 1936 and is buried in Rose Hill Cemetery in Hagerstown, MD. There is no individual headstone on Maxim's grave, only an engraving of his name on the Hamilton family marker (his wife was the daughter of Maryland's governor Hamilton). The Antietam Radio Association has adopted the project of placing a marker of Hiram P. Maxim at the gravesite. Dedication of the



Ten-Tec 1056 CW-SSB receiver kit in its bare bones configuration.

Rob Gerard's

Ham DX Tips

This is the month when most of France is on vacation, but you don't have to go on vacation to enjoy August. The following DX info will help you do that:

BELIZE V31PA has been active on 14150 kHz between 2030 to 2200 UTC. He will remain here till sometime in September. Send QSL requests to: G6MDM, P.J. Smyth, 7 Wooldridge Crescent, Odiham, Basingstoke, Hants, England, United Kingdom. **BOSNIA** T92X is quite active on all modes, but this country is far rarer on RTTY, which he operates around 14088 to 14092 kHz starting at 2000 UTC. His listed QSL manager is: KA9WON, Lonnie Miller, 12031 Blue Spruce Dr., Roscoe, IL 61073. **CONTESTS** There are quite a few contests this month, starting on the weekend of 6th and 7th with the *YO (Romanian) DX contest*. This HF contest is a SSB and CW contest taking place on 80, 40, 20, 15, and 10 meters. That same weekend is the *ARRL UHF contest*, whose popular frequencies to monitor or operate on are: 223.500, 223.600, 223.700, 223.800, 223.900, and 446.000 FM simplex (repeater contacts are NOT allowed); SSB/CW action will take place between 222.100 to 222.120 and 432.100 to 432.120 MHz. Activity will also take place on higher UHF frequencies like 126.100 and 902.100 MHz, mostly in CW with some SSB and their FM equivalents. The weekend of the 20th to 21st will see the *Southeast Asia Network (SEANET)* SSB contest taking place on 80, 40, 20, 15, and 10 meters. **JAPAN** Japanese amateurs have been granted a new block of frequencies in the 80 meter band—3747 to 3754 kHz—adding to their present allocations of 3500 to 3575 kHz CW, and 3791 to 3805 kHz SSB. It was not announced if this new allocation is SSB or CW. Airmail postage rates in Japan have increased. It now costs 110 Yen to mail a QSL to Europe and N. America, and 130 Y to S. America. The good news: one IRC is valued at 110 Y. **ST. PAUL ISLAND** The demand for this DXCC country (a Canadian island off the coast of Newfoundland), should decrease with two upcoming DXpeditions to take place. August 12th to 16th will see CY9CWI in operation by members of the West Island Amateur Radio Club of Montreal, Quebec. Look for this effort on: 3780 to 3800 kHz, 7250, 14195, 18120, 21320, 24940, 28495 kHz SSB, 1830 to 1850, 3505 to 3515 kHz, 7040 to 7060 kHz, 10110, 14040, 18080, 21040, 28120 kHz CW and 14090, 21090, and 28090 RTTY. QSL to: W1ARC, P.O. Box 884, Point Claire/Dorval, PQ, H9R 4Z6, Canada. In September look for noted DXers N0TG/CY9 and WA4DAN/CY9 on 160 to 10 meters CW and SSB. QSL to N0TG, Randy Rowe, 640 Rolling Hills Dr., Waxahachie, TX 75165. **SLOVAK REPUBLIC** 0M9SMP is a special events station that is celebrating the independence of this Central European country, which recently separated from the Czech Republic. It has been frequenting 14235 kHz at 2145 UTC, though is supposed to be active on all bands at various times. QSL's go to OM3LA, Ivan Dobrocky, P.O. Box 1, 85299 Bratislava, Slovakia, Europe. **TRINIDAD ISLAND** PY0TUP will be active till the end of August, at which time he will return to mainland Brazil. But for now you can log this DXCC country on 14230 kHz SSB at 2000 UTC most days. QSL's for SSB contacts and receptions only, go to: Milton Daniel Moutinho de Assuncao, Box 3230, Jaunerio do Norte, CE, Brazil. **USA** If you would like to meet famous DXpeditioners, and others who share your interest in amateur DXing, then you might consider attending the annual *New Orleans DX Convention* September 2nd and 3rd at the Royal Sonesta Hotel in New Orleans. For details contact Michael Mayer W5ZPA, 5836 Marcia Ave., New Orleans, LA 70124 or during the day at this telephone number: (504) 283-4143. The *Antietam Radio Association* of Hagerstown, Maryland, will be operating W3CWC starting at 1500 UTC on Sept. 2nd until 0400 UTC 4 September. The frequencies of operation are: CW 3640, 7045, 14040, 21040, and 28040; SSB: 3920, 7240, 14240, 21295, 28350 kHz. A commemorative certificate can be obtained for contacts and receptions with an SASE to: Antietam Radio Association, Att: Special Event Station W3CWC, P.O. Box 52, Hagerstown, MD 21741-0052.

Are you a six meter DXer? Are you an SWL whose equipment allows you to monitor 50 MHz SSB/CW signals? If so, you can log me, N9LAG. I am active almost daily on 50.125 MHz and above SSB. If you log me you may QSL to P.O. Box 91, Benton, IL 62812. Please do not use any other address; thank you.

This brings us to the end of another month's tips, enjoy the rest of your summer and the DX that is available. 73 de Rob.

marker is planned for the weekend of September 3rd, 1994. Fundraising is underway for this project and individuals who would like to contribute a few dollars should send donations to HPM Marker c/o Antietam Radio Association, PO Box 52, Hagerstown, MD 21741. Make checks payable to Antietam Radio Association. See Gerard's DX Tips for special event station information.

The World of HamRadio

This is the title of a CD-ROM being produced by AmSoft, PO Box 666 New Cumberland, Pa 17070-3036.

There are many nice features about this CD; the one I like best is the ability to run any of the hundreds of ham radio, SWL, programs directly from the CD without transferring to another drive. In addition, there are nearly 1 million callsigns on the CD. There is enough ham radio theory to take the newcomer from novice to extra class. Any ham, SWL or electronic student will find a lot of interesting features on this fine CD.

I am currently using a logging program found on this CD, which I like very much, called LOG-EQF. Several contest logging programs are also included, along with Morse code trainers, antenna programs, FCC exam questions and tests, data bases for the Ham and SWL, as well as more than 1000 equipment modifications for ham gear, RTTY, packet, satellite and shuttle tracking, weather, propagation prediction, programs for Windows and some neat clip art for ham radio. Price of the CD is \$40.00 plus shipping. Call Amsoft at 1-717-938-8249.

Propagation

Yeah, I know, there ain't much! While conditions on the high HF bands have been terrible, there is still plenty of activity. Six meters was very good during June with propagation into South America; some reception from Europe has been reported, and many good 1500 to 2000 mile openings via E_s. The same E_s has been making things interesting on 144 and 432, too. DX on the order of 1800 miles has been common on two meters this past season with more to come. HF ops who catch the quiet nights find DX on 40 has been very good, whereas 20 meters, the mainstay for DXers, has had some rough times. Sun activity has been very low (80's and lower!).

But keep at it. Fall is just around the corner, and with reduced noise levels during autumn and winter, 80 and 160 will become superb DX producers.

That's all for August; send me some photos, and tell me about your summer activity.

73 de Ike, N3IK

Ex-Alpha 66 Cuban Rebels Arrested

According to the *New York Times*, the former chief of operations of Alpha 66 was arrested in Miami on June 4, charged with attempting "to buy a Stinger missile and other advanced weapons from an undercover federal agent posing as a corrupt army sergeant." Rodolfo Frometa, who spent ten years in a Cuban prison for "fomenting rebellion" while an Alpha 66 member, was arrested with Fausto Marimon.

Both Frometa and Marimon are leaders of Comandos F-4, a splinter group that left Alpha 66 during the spring. Alpha 66 has always sponsored paramilitary training for anticipated attacks on Cuba, but Comandos F-4 advocates an even more aggressive stance against Fidel Castro.

The *Times* report says that the arrests came after Frometa and Marimon transferred a \$5,000 down payment to the federal agent for a weapons order "of missiles, anti-armor rockets, grenade launchers and explosives." U.S. Attorney Kendall Coffey said that the Clinton administration was enforcing U.S. neutrality and weapons laws.

Alpha 66 is a well known name in shortwave DXing, given its longtime operation of **La Voz de Alpha 66**. Since an FCC bust of their former 6666.6 kHz mobile transmitter, this clandestine has purchased airtime on licensed USA shortwave broadcast stations such as **WHRI**.

The organizational split between Alpha 66 and Comandos F-4 has not hindered the clandestine QSL process. *MT* reader Terry Provance of Zanesville, OH, reports a recent full data QSL card from **La Voz de Alpha 66**. He sent his report through the usual address of Radio Miami International, but the verie arrived with the signature of longtime station operator Diego Medina.

Radio Patria Libre

Last month's *MT* coverage of the **Radio Patria Libre** situation deserves an update. The Colombian military claims that it has captured this clandestine's transmitter. Following this military announcement, the 49 meter frequencies formerly used by Patria Libre have been silent. But, the station is still regularly audible on 19 meters in the morning and afternoon, using a schedule of 1330-1415 and 2100-2145 UTC on 15050 kHz. I've observed them using either AM or upper side-

band modulation on different days. We still are searching for a valid address for this station and/or its sponsoring group, the ELN.

Howard Stern Jammed

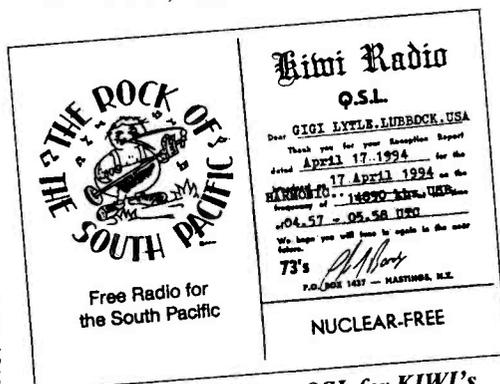
According to the *Cleveland Plain Dealer*, a live broadcast of Howard Stern's morning radio show from a strip club in Cleveland's "Flats" district was maliciously jammed by an unknown powerful pirate signal on June 10. Stern's studio to transmitter link was temporarily blocked, but his show quickly resumed via a cellular telephone. Stern was in Ohio to celebrate his #1 Cleveland market rating on **WNCX** through a mock execution of rival morning radio personalities at **WMJI** and **WMMS**.

In a related incident, Cleveland police arrested a technician at **WMMS**, who allegedly cut Stern's broadcast cable. A **WMMS** spokesman said that the station had no prior knowledge of this incident.

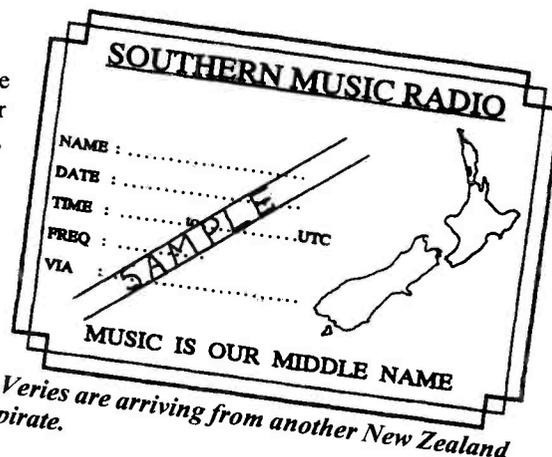
KIWI Active Again

There have been many recent reports of North American reception of **KIWI**, the longtime Oceania pirate station that operates from New Zealand. Given a recent tough stance against unlicensed broadcasting by radio authorities in Australia, **KIWI** has also been relaying Australian pirate **Radio G'Day** in recent weeks.

MT reader Gigi Lytle of Lubbock, TX deserves an award for one of the most unusual pirate QSL's ever. **KIWI** normally operates on 7445 kHz, with



Gigi Lytle's remarkable QSL for **KIWI**'s first harmonic.



best North

American reception noted after 0600 UTC on weekend evenings. Gigi heard and verified the station on its *second harmonic* frequency of 14890 kHz. We picture Gigi's prize catch this month. Congratulations!

This is not a routine or easy DX catch. But, since many people have been hearing it, why not check out both 7445 and 14890 kHz next weekend? Broadcasts are continual but intermittent, so do not be too disappointed if you do not find the station on any particular night. **KIWI** is an excellent verifier of reception reports, which should be sent to PO Box 1437, Hastings, New Zealand. \$1.00 US should be enclosed to cover return postage.

New FCC DF Cars

The FCC got a considerable amount of recent press attention from an announcement that it has acquired a fleet of state-of-the-art direction-finding cars. Each \$70,000 surveillance car is equipped with new direction finding apparatus that uses the Global Position System satellite network. Visual Basic software permits the 1990 Chevrolet Caprice cars to pinpoint signal locations, supposedly even after a station signs off the air.

FCC chief of field operations Dick Smith, quoted in *Billboard* magazine, said, "This is the future of the agency." Twelve cars are scheduled for deployment by fall 1994. The FCC hopes to have 70 vehicles by 1997, but this will depend upon congressional appropriations.

So far these direction finding autos have not made a dent in pirate radio activity, which continues at a very brisk pace this summer. Thanks go to several *MT* readers

who sent in press accounts, including Scott Krauss of Cleveland, OH, Terry Powers of San Diego, CA, and Gigi Lytle.

Pirate Pages Returns

Last month we mentioned the temporary suspension during summer months of the *Pirate Pages* newsletter. Editor Andrew Yoder has announced that "PiPa" should be back in publication by the time that you read this. Subscription details for this biweekly pirate summary are available for an SASE through the Blue Ridge Summit maildrop.

Many pirate radio buffs missed the newsletter while it was dormant. A temporary replacement, called *The Free Radio Page*, was published during the late spring and early summer months of this year. Editor Chris Lobdell distributed the publication through the Stoneham, MA, maildrop. If you want back issues, an SASE with \$1 for postage to Stoneham should do the trick.

What We Are Hearing

Pirate activity has continued at a brisk pace throughout 1994. I've dipped into my own log book this time, but YOUR pirate logs are very welcome. Send them in to Brasstown!

Our logs indicate frequencies in kHz and times in UTC. Maildrop addresses used by these North American pirate broadcasters include PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 25302, Pittsburgh, PA 15242; PO Box 146, Stoneham, MA 02180; PO Box 605, Huntsville, AL 35804; PO Box 17534, Atlanta, GA 30616; PO Box 293, Merlin, Ontario N0P 1W0; PO Box 2024, Faribault, MN 55021; and PO Box 220342, D-42373 Wuppertal, Germany.

6YVOS- 3400 at 0330. This is an overtly Jamaican station, given its reggae music, its announcer with a Caribbean accent, and its call letters. But, Grateful Dead rock is mixed in for some reason during this new pirate's shows. The station uses a "Voice of Smoke" slogan. Addr: Wellsville. (William Hassig, Mt. Prospect, IL; Randy Ruger, Brandon, FL)

K-2000- 7385 at 0145. This clever DX parody station is back. Their latest effort featured an amusing phony interview with MT's Glenn Hauser, including songs about Glenn by the Chipmunks. Addr: Stoneham. (Zeller)

KDED- 7445 at 0000. "The Voice of the Grateful Dead" put a fine signal into the southwest, proving that they have achieved nationwide coverage. Addr: Wellsville. (Steve Schmidt, Glendale, AZ)

Kranker Radio International- 7414 at 2345. The station has returned after a long silent period with a professionally produced rock oldies format, public service announcements, and very slick jingles. They sound like a major radio market commercial station. Addr: Pittsburgh. (Hassig)

KTVI- 7385 at 0000. Amateur radio operators may shudder at the Television Interference call

letters used by this new station. Announcer Emanuel Goldstein features rock (especially Pink Floyd) and hellos to several other pirate stations. Note their use of a new pirate maildrop. Addr: Faribault. (George Zeller, Cleveland, OH)

North Jersey Coast Radio- 7385 at 0000. Bruce DiVito's station usually programs local music, sponsored by Snapple drinks and Wa Wa markets. A recent jazz show profiled New Jersey native Count Basie. Addr: Merlin. (David Chapchuk, Scranton, PA)

Patriotic Front for the Liberation of America- 7415 at 0000. We are swimming in new stations this month. This one emphasizes libertarian themes, with parody songs stolen from Rush Limbaugh's show. The station often uses a "Drognet" theme song, perhaps as an interval signal of sorts. Addr: None. (Zeller)

Pirate Radio Homosexuality- 7385 at 0230. The theme on this new pirate is gay advocacy, with Captain Bruce and Big Austin at the microphone. Addr: None, but verifies loggings printed in *The ACE* bulletin. (Direct from the station)

Radio Azteca- 7412 at 2300. Bram Stoker's DX program parodies are among the funniest programs heard on shortwave radio. You might hear your own name in his skits! Scott QSL'ed them in only 21 days. This was Randy's 100th pirate log; congratulations! Addr: Wellsville. (Krauss, Ruger)

Radio Fluffernut- 7385 at 0200. William enjoyed their usual rock music show, but was annoyed by several VFO adjustments to their frequency while in upper sideband mode. Addr: Merlin. (Hassig)

Radio Free Jesus- 7385 at 0000. Here's another new religious pirate; it also uses an identification of RFJ. Programming is not exclusively sacred. They frequently advocate that the FCC should license an amateur broadcasting service in the USA. Addr: Unclear; Faribault might work. (Robert Thompson, Kilgore, TX)

Radio Free Salvation- 7385 at 0115. Pastor Billy's shows feature religious sermons and prayers for pirate DX-ers. He straddles the line between a genuine down to earth religious program and a parody of shortwave preachers. The result is entertaining. Addr: Huntsville. (Chapchuk)

Radio Peace in Action- 7385 at 0000. This Europirate has joined a flood of stations that now use USA pirate relays for its shows. Its format is similar to Costa Rica's **Radio For Peace International**. Addr: Wuppertal. (Hassig)

Rasin Radio- 7414 at 2245. The man who operates this new rock and soul oldies operation has so far provided little information about his station, but his signal has been getting out. The spelling here is not a typo. Addr: None. (Jerry Coatsworth, Port Stanley, Ontario)

RBCN- 9990 at 1900. Radio Bob's Communications Network is back with a new hilarious program of good ol' boy southern humor, such as the 100 meter cow race at Route 9 Dragway. Note the unusual frequency; they also used 15050 kHz recently. This pirate unofficially adopted the *Monitoring Times* convention in the past; they might reappear in October. Addr: Atlanta. (Zeller)

Southern Music Radio- 7384 at 0030. This New Zealand pirate has been widely heard in North America through a relay by **Omega Radio**. Its format is dominated by New Zealand and Australian pop music. A station news release indicates that they also maintain relays in Ireland, Italy and Sweden, plus a standard relationship with **KIWI**. Addr: Wellsville. (Direct from the station)

Up Against the Wall Radio- 7385 at 0045. The announcer at this new station recreates the leftist mood of the early 1970's with rock music and

political advocacy. It's hard to believe that this genre is 25 years old; it almost makes this one a nostalgia station. Addr: Wellsville; program comments required for QSL's. (Zeller)

Voice of Global Free Radio- 3400 at 0345. This station, another new one this month, pioneered some recent pirate activity on 90 meters. Their format mixes rock music and humor sketches. Addr: Wellsville. (Zeller)

Voice of Laryngitis- 7385 at 0230. Genghis and Stanley Huxley's tenth anniversary show has been transmitted several times. It features highlights from the Huxley family's hilarious productions during the last decade. William liked their hymn to the Three Stooges. Addr: Wellsville. (Hassig)

Voice of the Runaway Maharishi- 7465 at 2300. We have been listing this pirate under the ID of **Radio Free Euphoria**, since Maharishi Hashish Ali Ganja is one of the characters on the station. But, Scott received a Maharishi QSL in only 18 days, so perhaps it should be upgraded to a station, not a program name. Addr: Wellsville. (Krauss)

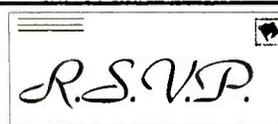
WATF- 7385 at 0115. This new station appeared on a weeknight with test announcements, but regular programming has not yet materialized. Could the call letters refer to the Bureau of Alcohol, Tobacco, and Firearms? Addr: None. (Zeller)

Wire Line Radio- 7440 at 2315. This one uses one of the most powerful pirate transmitters heard in North America, so its rock music and FCC bashing often are heard with good signals. Mark didn't like their animal abuse parody. Addr: Blue Ridge Summit. (Mark Spat, West Swanzey, NH)

WJLR- 7415 at 0030. Dave Stone features a well produced blend of classic rock music on "John Lennon Radio." Our reporter David was alarmed at their recent "final broadcast" announcement, but they often do this. They could be active again, but this is always uncertain in pirate radio. Addr: Blue Ridge Summit. (Max Syko, Gaylord, MI; David Colvin)

WKND- 7465 at 0200. After more than a year of hibernation, Radio Animal has resurrected his well known rock music station. His QSL's and station remarks have traditionally featured dogs. Note this one's address, which differs from prior years. Addr: Blue Ridge Summit. (Hassig)

WVOL- 7385 at 0330. Randy heard a test broadcast from Captain Willie at the "Voice of the Loon," which had been relatively inactive for months. Addr: Wellsville. (Ruger)



MT columnists welcome your input and response to their columns. Please address your letter to the author
c/o Monitoring Times
P.O. Box 98
Brasstown, NC 28902-0098

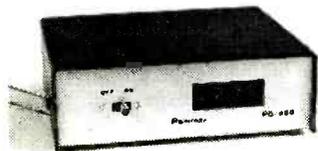
If you request a personal reply, always enclose a self-addressed stamped envelope (SASE).

Old Soldiers Never Die — They Get an LCD

Old receivers, like Hallicrafters, Hammarlund, National, RCA, RME never die. In fact, many of them are still in loving use, pulling in shortwave signals just like they did decades ago. While some still operate these classic radios for their nostalgic value, others recognize certain characteristics missing from today's high-tech marvels.

There is, however, one main drawback to using these Golden Oldies. They have poor dial accuracy.

Palomar Engineers now has a solution to the problem: the PD-600. It adds a frequency readout to 1 kHz on a four digit, bright red display. Most amazingly, no modification of the radio is necessary. All you do is wrap a wire around an oscillator lead.



The PD-600 — which just might be the answer to the most pressing problem in your radio life — is available for \$199.95. For further information, call Palomar at 619-747-3343 or write P.O. Box 462222, Escondido, CA 92029. Tell them that *MT's* Larry Miller sent you.

Undercover Radio

The *Covert Catalog* isn't so much a catalog as it is a book. It claims to be the master list of bullet proof vests, fax interceptors, information suppliers, specialized newsletters, OEM lock picks, thru wall listeners,

and your general, run-of-the-mill spy stuff.

Author Lee Lapin claims that his "private list of suppliers" will save you hundreds, even thousands of dollars. Whether or not Mr. Lapin's private list would actually save us anything (it will cost you \$39.95 postpaid to get your hands on a copy) is unknown. But it can serve to entertain. There's some really neat stuff in here, from tiny video cameras that can be mounted on model airplanes to electrified briefcases. I only wish the author had provided more detail. The descriptions sort of leave you wanting a little more.

There's a lot of bad, space-filling artwork here and far too much white space in the *Covert Catalog*. That's become de rigueur in self-publishing. Worse, though, Mr. Lapin is participating in another new trend — using the forward of the book to apologize in advance for doing a bad job. For example, he says that he did not include phone numbers because of "various laws, restrictions and *my poor typing*." (Italics mine.)

Heck, if poor typing was a legitimate excuse for producing sloppy work, I'd receive a Pulitzer this year. Still, if you're familiar with Lapin's other work, it does have a certain charm...

The *Covert Catalog* is available from Intelligence Incorporated, 2228 S. El Camino Real, San Mateo, California 94403. The phone number is 800-805-5544.

A McCormick Home Run

Anita Louise McCormick has produced her second shortwave book, *The Shortwave Listener's Q and A Book*. As with her previous book, this one



is admirable in its simplicity and clarity. The questions are grouped into several chapters under headings like "What is a shortwave radio?" and "Selecting the right listening equipment." There are plenty of pictures to illustrate the answers including one of Bob Grove.

McCormick is becoming shortwave's unofficial liaison with the common man. Her ability to write cleanly, accurately and without gimmicks will no doubt do much to bring new recruits into the world of radio.

We give *The Shortwave Listener's Q and A Book* our recommendation. You can get your copy from your favorite radio book seller or from Tab Books (Blue Ridge Summit, PA 17294-0854; 1-800-822-8138). The price is \$12.95.

Antennas and RF Circuits

Joe Carr produces good technical books like rabbits produce, well, more rabbits. This guy not only knows his stuff but can put it into readable text. Now come two new Carr efforts you should check out.

First is a new, second edition of his excellent *Practical Antenna Handbook*, a top-notch work designed to help hobbyists of all types to design, build, modify and install their own antennas. There are, I think, more practical projects here than in any other book of its kind, from high frequency

dipole to hidden and limited space VHF/UHF transmitting and receiving antennas — and that's just scratching the surface. This one gets the coveted, unrestricted, "go buy it" from "What's New."

The book is \$26.95. Be sure you get the new second edition when you buy — it has some new BASIC

computer programs for antenna design, impedance matching, propagation theory and more.

Completely new is Carr's *Mastering Radio Frequency Circuits through Projects and Experiments*. Students, beginning- and intermediate-level hobbyists will learn how to design and build their own RF amplifiers, simple wire antennas, microwave integrated circuits, and receiver preselectors. There are also projects on spectrum analyzers and component repair.

You can get your copy of *Mastering Radio Frequency Circuits* for \$19.95. Both books are available from Tab at 1-800-822-8158.

Official New England Scanner Guide



The "Official" series of scanner guides are widely recognized as among the best. The data comes from actual monitoring and from sources within the public safety sector.

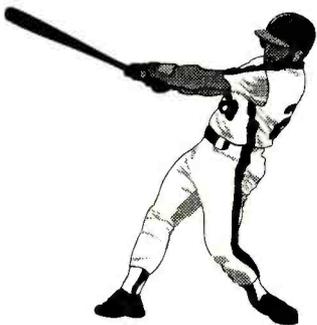
The level of accuracy is sometimes eerie. These people clearly have an "inside" contact.

Now comes a new book, *The Official New England Scanner Guide*. This is a 544 page comprehensive frequency directory listing public safety licenses for Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. In all, 17,700 of the hottest frequencies have been included, most of which are even more up-to-date than the individual state "Official" guides.

In addition to frequencies, the book contains over 140 pages of descriptive information on state and national systems, including maps, frequency allocation charts and 10-codes.

The *Official New England Scanner Guide* is in a handy 6 X 9 inch format, perfect for travel. The price is \$24.95 plus \$3.05 shipping from Official Scanner Guide, P.O. Box 712, Londonderry, New Hampshire 03053 or call 1-800-351-7226.

Sports Frequency Guide



If you're looking for a good sports and entertainment frequency guide to take along on vacation this year but don't want to shell out the money for *Monitor America*, consider Richie Barnett's *Sportcat Frequency Guide*. The pocket-sized 150+ page book lists interesting scanning targets by state, plus an additional 30 pages of racing frequencies. It's like *Monitor America* without

public service frequencies and with a few extra goodies tossed in! Perfect for the sports-minded individual with a scanner.

The book, with a list price of \$14.95, comes free of charge with a new Uniden SportCat scanner. We've also been told that it is available separately from Uniden as a special order (part number UBUD55238ZZ).

Scanner Frequency Series



One new series of frequency directories is called by the cumbersome name of *Frequency Almanac, Scanner Frequency Callbook, [state name] Master Edition*. Editor of the books is the publisher of a long-defunct scanner magazine, writing under a pseudonym.

Although the first book in the series, California, was a disaster due to a computer programming error — Los Angeles and other cities were accidentally deleted — other books began making their appearance to generally positive reviews. Still, the start up was not without continuing controversy.

We received several calls reporting that, despite full page advertisements indicating that all 50 states were available, such was not the case. Gehri claims that the ads he placed were run prematurely by the magazines' publishers.

In any case, this problem

may now be rectified; purchasers of the California edition reportedly received a supplement that includes Los Angeles. We received a very good Pennsylvania edition, Les Mattson of NESN was impressed with his New Jersey edition, and Bob Grove found the North Carolina edition to be "neatly organized and highly useful."

The books range from the 800 page California directory (\$24.95 plus \$5.95 shipping) to Rhode Island, which rings in at \$9.95 (page count unknown) plus \$5.95 shipping.

For more information, contact US Scanner Publications, P.O. Box 14923, Portland, Oregon 97214-4923; 800-890-6999.

Quebec Scanner Guide

Bart Veerman's *Haruteq Scanner Books* have been around for years and they keep

getting better. The new Quebec edition (including Atlantic Canada), is jam-packed with frequencies. There's everything from aircraft to amateur radio, and, of course, police, fire and emergency medical. Frequencies are presented in both by-frequency and alphabetical order.

The book is over 200 pages and retails for \$23.95 (CAN) from Haruteq, P.O. Box 61508, Hamilton, ON L8T 5A1. Tell 'em *MT* sent you.

Amateur Radio Resource Directory

The prospect of trying to find an obscure product or publication can sometimes be daunting, especially if the pursuer doesn't have access to the myriad amateur radio publications peppered with ads. David L. Thompson comes to the rescue with his *Amateur Radio Mail Order Catalog and Resource Directory*, a

GUIDE TO FAX RADIO STATIONS

14th edition • 400 pages • \$ 35 or DM 50

The reception of weatherfax radiostations and meteorological satellites has become a mere child's play. Inexpensive FAX hard- and software connects a radio receiver directly to a laser or ink jet printer. Advanced digital technology puts real-time satellite images on your PC video monitor, with fascinating colour and zoom features. This manual is the basic reference book for everybody interested in FAX via radio.

The new edition of our FAX GUIDE contains the latest equipment information, frequency lists and precise transmission schedules - to the minute! - of 62 FAX radio stations and meteorological satellites, including those of all US Coast Guard and US Navy stations worldwide. The most comprehensive international survey of the "products" of weather satellites and FAX stations from all over the world is included: 353 sample charts and pictures were recorded in 1993 and 1994! Here are that special charts for aeronautical and maritime navigation, the agriculture and the military, barographic soundings, climatological analyses, and long-term forecasts, which are available nowhere else. Additional chapters cover abbreviations, call signs, description of geostationary and polar-orbiting meteorological satellites, regulations, stations, technique, and test charts.

Further publications available are our unique *Modulation Type CDs, Guide to Utility Radio Stations*, and *RTTY Code Manual* (12th ed.), and *Air and Meteo Code Manual* (14th ed.). We have published our international radio books for 25 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, SW listeners and telecom companies worldwide. Please ask for our free catalogue, including recommendations from all over the world. For recent book reviews see *MT* 2/94 page 90 and 10/93 page 92. All books are published in the handy 17 x 24 cm format, and are of course written in English.

Do you want to get the *total information* immediately? For the special price of \$ 180 / DM 270 (you save \$ 37 / DM 55!) you will receive all our manuals and supplements (altogether more than 1800 pages!) plus our *Cassette Tape Recording of Modulation Types*.

Our prices include surface mail postage worldwide (for airmail please add \$ 7 or DM 10). Payment can be by \$ or DM check or cash. We accept American Express, Eurocard, Mastercard and Visa credit cards. Dealer inquiries welcome - discount rates on request. Please fax or mail your order to ©

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sourcebook of amateur-radio-related publications and products. Software, hardware, BBSs, kits, books, clubs, repairs, parts, magazines, manuals; they're here by the hundreds.

The 262-page catalog is a pot pourri of listings which include antique restoration, radio museums, glossary of radio terms, abbreviated list of Q signals, specialty organizations, antenna hints, and other assorted pieces of knowledge.

The *Amateur Radio Mail Order Catalog and Resource Directory* by David L. Thompson, K4JRB, is \$16 plus



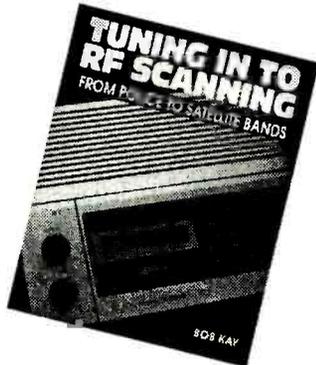
\$3 shipping from publisher Resource Solutions, 6050 Peachtree Parkway, Suite 340-228, Norcross, GA 30092, 1-800-825-8684, or from your local radio store.

Bits, Pieces and Freebies

C. Crane Co. is a California-based retailer of AM, FM, shortwave and scanner radios. They put out a neat, 71 page catalog that contains lots of helpful information. There are also a number of products that you just don't see anywhere else. We highly recommend C. Crane Co.. Over the years, we've heard nothing but good things about them. Their number is 707-725-5940. Their address is 558 - 10th Street, Fortuna, California 95540.

BEX Electronics is a small, mostly family-run business that does TV and VCR repair in Killen, Alabama. They've produced a two-page antenna

length chart that they're selling for \$5.00 postpaid. Included are most of the VHF/UHF scanner bands. To get yours, write to Gary Beck at BEX Electronics, P.O. Box 1054, Killen, Alabama 35645.



Bob Kay has produced a nice, 143-page book called *Tuning In To RF Scanning*. It's a book for anyone who is thinking about buying a scanner and covers all the basics from operating the squelch knob to choosing a comfortable chair. If you like Bob Kay's column in *Monitoring Times*, you'll love this little book. It's available from Tab for \$14.95.

David Williams is offering a **beginner's guide to shortwave** for sale. His booklet, an 18 page effort, covers everything you need to know to get started with shortwave DXing, including a little one-page frequency list and a one page catalog of other items Mr. Williams is selling, like log sheets. The price is \$3.00 and payment is accepted only by money order or cashier's check to P.O. Box 1176, Pinson, Alabama 35126. It's an interesting first effort with a lot of promise.



For folks in Canada who are interested in taking a **course in shortwave listening**, two are being offered by Steve Canney, VA3ID: at Sheridan College-Oakville, Sept. 15-Nov 17 (Call 905-842-8800, course code EXT-3078), or Centennial College-Scarborough, Sept. 20-Nov. 22 (416-698-8200, course code CESI-806).

DX Radio Supply is giving away free copies of their **pocket frequency guide**. The pocket frequency guide is the same size as a credit card, is laminated for durability and lists all of the popular scanner bands by service. DX Radio Supply requests 25 cents to cover the cost of postage. Their address is Box 360, Wagontown, PA 19376.

Fisher Research Laboratory

wants you to have a copy of their newsletter and they're willing to give it to you for free.

Fisher is the oldest manufacturer of **metal detectors** in the country. You can get your copy by writing them at 200 W. Willmott Rd., Los Banos, CA 93635. Tell 'em *MT* sent you.

You can get a copy of the 22nd edition of the **Tropical Bands Survey** from the Danish Shortwave Clubs International. It's 32 pages and will cost you 10 IRCs. Their clandestine station list is 8 IRCs. The address is DSWCI, c/o Bent Nielsen, Egekrogen 14, DK-3500 Vaerloese, Denmark.

125 years after one of its founders, Hiram Percy Maxim, was born (see item in "Communications") **QST magazine** can be bought again on the newsstand. For the past 37 years the 200-page, 80-year-old amateur radio magazine has been available only to ARRL members and subscribers.

We've been told that Paul Lanneur, formerly the New York City representative for

Japan Radio, has left the company and bought Gilfer Shortwave. The company has been renamed, "**Listening In.**" Gilfer founders Jeanne Ferrell and her late husband, Oliver Ferrell, were towering figures in the shortwave industry for decades. We wish Jeanne all the best in her new endeavors. Best wishes also to Paul Lanneur with Listening In.

Antenna Booster/Preselector

Darcy Jabs writes to say that he's building and selling a new, amplified, tunable, shortwave antenna booster/preselector. The unit comes with several plug-in coils to cover 150 kHz to 30 MHz. Specifically made

for end-fed wire antennas, it also works with short indoor antennas, too. The manufacturer claims that it has a good

noise figure and gives up to 40 dB gain.

Says Darcy, "Other boosters have lots of fancy knobs to play with, but the ones that are as good as this one cost around \$100 US. Mine is not as fancy looking, but it performs as good or better than the others, is easier to use and costs only \$59.95." To order or to get more information, contact Darcy Jabs, RR#2, Burns Lake B.C. VOJ-1EO Canada.

VHF/UHF Frequency Flood

Technology sometimes has some interesting, unintended side effects. For example, when PerCon Corporation released the FCC database on CD ROM, it unleashed a flood of new scanner frequency directories.

Now, all you need to become a publisher is \$99.00



for the CD and a CD ROM reader. Push a button and out comes an instant frequency directory for virtually any place in the country.

If you play your cards right and run a few well placed ads for the yet-to-be published book, you can use the "pre-publication sales" to finance the printing. We aren't pointing fingers here — this is an all-too-common practice in many markets — and we certainly don't encourage anyone to try it. Advertising books that you don't actually have in hand is illegal.

These "instant" frequency directories have their pros and cons. First, they are official. That is, they contain all of the information on file with the FCC. The flip side is that, increasingly, public service agencies are not bothering to

license everything, sometimes intentionally, in order to keep their communications whereabouts from being known.

The good side is that these FCC frequency dumps often contain business listings — something left out of the traditional police directory. The bad side is that many businesses rent time on someone else's transmitter and thus their listing doesn't show up anyhow. And so it goes.

The point to all of this: use caution in choosing from the myriad offerings now available to the scanner listener. All of these books have some benefit. There are those of us who will willingly pay \$24.95 for a single extra frequency of value. And sometimes these little, local red books contain more hot info than any of the more widely circulated books.

No-Shows

The Southern Patuxent Amateur Radio Club (SPARC), which has published *The Maryland, DC and Northern Virginia Frequency List* for the past four years, has not been filling orders for their book, according to at least one firm.

RadioCom 94, planned for late August by SCADS (Southern California Area DXers), has been cancelled, according to an announcement by Don Putnick on Internet. Apparently they received insufficient backing by both the radio industry and hobbyists. He said they may try again in another two years!

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NOTE: As of 4/26/94 it became unlawful to market cellular-capable receivers in the U.S. Atlantic Ham Radio assures us it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by U.S. Customs.

Equipment Review

by Bob Grove

Everhardt Shortwave Listening Antenna

It is difficult to design a wideband antenna, especially for general coverage receiver where frequency excursions from 1-30 MHz represent a 30:1 (3000%) ratio. Impedance swings and pattern changes are wild over that much spectrum.

Several classical approaches have been used to tame such antennas—traps, tuners, baluns, and dipole clusters come to mind; the Everhardt is an example of the latter.

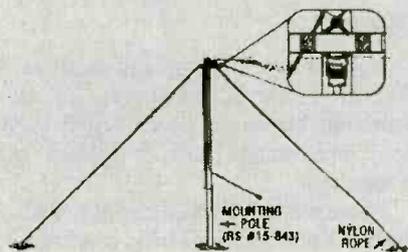
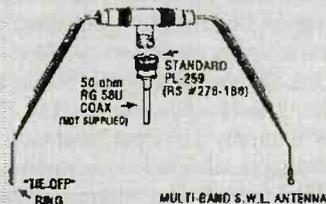
Since a given center-fed dipole is resonant only at a particular frequency (and its odd multiples), the dipole cluster simply bundles several different-length dipoles; each is resonant, then, on its own

set of frequencies, thus covering the spectrum.

Everhardt recommends their SWL antenna to be used for shortwave listening only (not for transmitting) on the 60 through 11 meter international broadcasting bands (4.75-26.1 MHz).

The dipole cluster is made from 65 feet of four-conductor rotator cable, combined at the center with PL-259 connectors attached to a tee for interfacing with a coaxial feedline. It is intended for use as an inverted V configuration. A spade lug is soldered to each end of the longest element for suspension.

The Everhardt SWL antenna is \$38.99 plus shipping from the Marvel Communications Company, 6000-D Old Hemphill Rd., Ft. Worth, TX 76134; ph. 817-568-0177.



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DSP: The Wave of the Future?

Until a few years ago, analog electronics dominated technology. The term "analog" simply means that we create an electrical replica of some function. For instance, as a signal gets louder, the intensity of the electrical waveform becomes greater; as the frequency of a sound increases, the frequency of the electrical waveform increases proportionately.

With the arrival of the computer, digital technology emerged full bore. Now, analog signals are sampled tens of thousands of times per second and transformed into "bits," encoded streams of brief voltage spikes which substitute for the original analog information.

Digital signal processing (DSP) has one strong advantage: We can manipulate the bits so as to remove information we don't want and preserve what we do. This means that it is possible to achieve spectral purity in a received signal not previously available in analog.

But DSP costs rise rapidly with frequency. For consumers, radio frequency (RF) DSP is prohibitive; that's why we see it used only at lower frequencies, a few hundred kilohertz at most.

Recently, several DSP audio filters have been released to the hobby radio market. Hams and SWLs alike are benefitting from the competition and performance. In May we reviewed a new analog audio processor, the Grove SP-200 Sound Enhancer; this month we will take a look at a couple of affordable DSP audio processors.

Radio Shack DSP

Just released, Radio Shack's 21-543 DSP Communication Noise Reduction System is compact, simple to operate, and inexpensive. About the size of a teensy mobile CB radio (4-1/2"W x 2"H x 7"D), it contains an internal speaker—a rare commodity in the audio processing market.

Published specifications boast 6 watts audio output at 10% THD (total harmonic distortion), 55 dB signal-to-noise ratio, 1% total harmonic distortion (of the processing circuitry), 40 dB tone rejection, and 20 dB noise reduction.

It is powered by the vehicle's 12 volt DC system, requiring 1 amp maximum current. Modes are SSB, CW, and NR (noise reduction). Nine different audio bandwidths may



be selected from 300-3000 Hz wide (no filtering) to 597-903 Hz narrow CW.

Since the DSP accessory does not determine reception mode (that is determined by the host receiver), only audio bandwidth characteristics, the SSB position simply means voice bandwidth; it works the same for AM, FM or SSB. CW is simply a sharper bandwidth.

An external speaker jack and earphone jack are provided as well as a volume control. A mobile mounting bracket is included. The illustrated instruction manual is short, to the point, and easy to follow.

Our Test

The Radio Shack DSP accessory was very easy to operate with plenty of reserve audio from its internal speaker, although that speaker's sound was a little thin.

In the DSP mode it recognizes music, yet instantly filters out interference tones of constant pitch. We found all filters steep-sloped, but the sharp CW filter did add some distortion to the audio note.

The noise reduction circuitry worked on electrical pulse noise, making it useful in a mobile environment, but not on atmospheric static.

The DSP Communication Noise Reduction System is \$79.95 from Radio Shack outlets.

JPS Communications NTR-1

At twice the price of the Radio Shack unit, does the JPS work twice as well? Similar in size (1.7"H x 6.5"W x 5.1"D), the NTR-1 offers only two bandwidths: 160-6600 Hz (wide) and 100-3400 Hz (narrow). Response time to attenuate up to four simultaneous interfering tones by 50 dB is less than 5 milliseconds.

Background noise attenuation is up to 20 dB; output power is 2 watts at 10% THD. There is no internal speaker, but there is an external speaker jack and an earphone jack. Power required is 12 volts DC (nominal) at 0.8 amps.

Even simpler to operate than the Radio Shack unit, the JPS has four pushbuttons to select power, notch, noise, and bandwidth. A spiral-bound manual provides excellent support, including a full schematic diagram.

Our test

Housed in a heavy-gauge metal cabinet, the NTR-1 is intended for permanent desktop operation, but no AC power supply (\$16 option), interconnect cable, or internal speaker is supplied.

Noise reduction was superior to that of the Radio Shack, muting background noise and pulses, but, similar to a noise blanker, it



dropped some desired audio as well. Remaining audio was undistorted.

Bandwidth shaping sounds more like a simple treble cut and doesn't have the number of selections that the Radio Shack did. The bandwidth function often took several seconds to stabilize.

The NTR-1 digital signal processor is \$169.95, including shipping, from the manufacturer: JPS Communications, BOX 97757,

Raleigh, NC 27624-7757; ph. 919-790-1456; also available from JPS dealers.

The bottom line

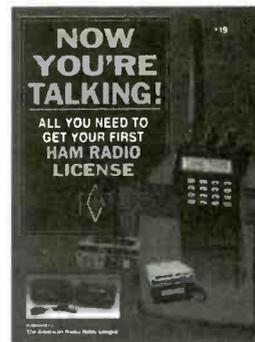
We found both units represented fair values; each had its strong and weak points. The Radio Shack had more flexibility, a built-in speaker, and the lowest cost on the market; the JPS had lower distortion and better noise reduction.

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Drake SW8 Portatop Receiver

In recent years, we've been seeing more portatop receivers on the market. No wonder. These look and operate like tabletops, yet they're completely self-contained and can be carried around like a large portable. Important as those two advantages are, another that's just as important is that these radios aren't as pricey as tabletop models.

Earlier this year, the R.L. Drake Company came out with an interesting portatop model, the SW8, which we've been testing for a new Radio Database International White Paper.

Big, but Portable

The SW8 is about the size of a typical tabletop model. That makes it larger than virtually any portable around. But it's not all that heavy, so it's easy to carry around the house or yard, or on car trips. Airplane trips, too—but only if you're really dedicated, and don't mind having to do a lot of explaining to suspicious security folk. (Be sure to take along batteries to prove that it works, or else the radio may be denied entry on the plane.)

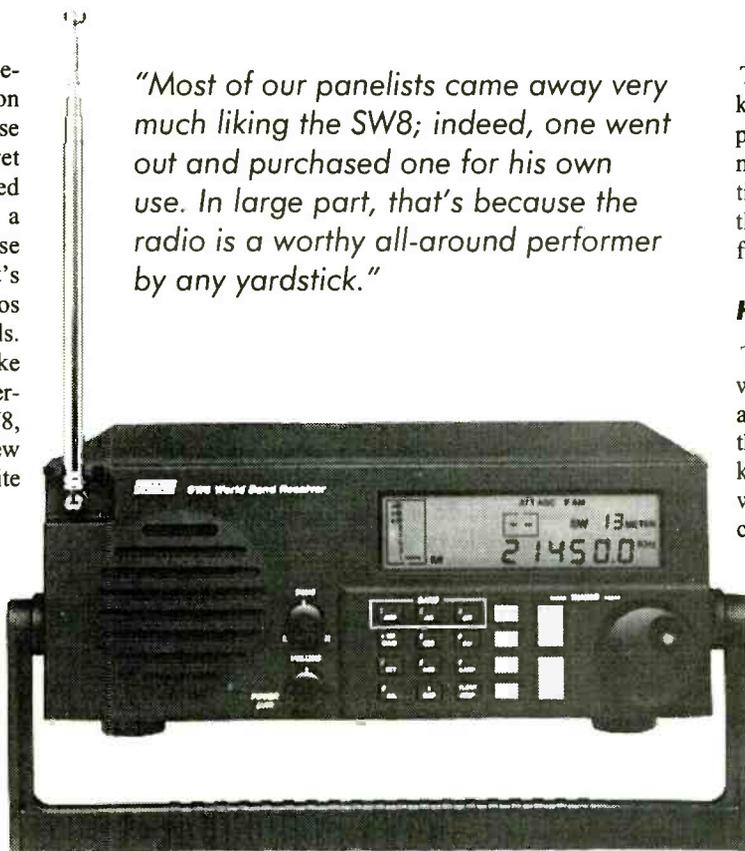
It is powered by six internal "D" batteries, plus there's a UL-approved 120 volt AC adaptor that comes standard. On a DXpedition, we used ordinary Radio Shack NiCd cells, which lasted roughly eight hours between charges.

Drake, itself, doesn't offer a 220 volt adaptor. So in countries that don't use 120 volts, either the distributor in that country provides a suitable adaptor, or you have to go out and buy one locally.

Different from the Drake R8

The first thing that springs to hopeful minds is that the SW8 could be pretty much the same critter as Drake's R8 tabletop model—but cheaper and with portability. What we actually found is that while the two models have a number of things in common, the SW8 is anything but "another R8."

"Most of our panelists came away very much liking the SW8; indeed, one went out and purchased one for his own use. In large part, that's because the radio is a worthy all-around performer by any yardstick."



For example, although SW8 comes with a number of useful features, it lacks some of the signal-enhancing features of the R8. For example, there's no passband offset or notch filter.

While both models have synchronous detection, the one on the R8 works superbly, while that on the SW8 is—politely put—mediocre.

What the SW8 does have, though, is quite impressive, considering that it sells for under \$600. That's less than two-thirds the cost of an R8.

How and Where It Tunes

It tunes the shortwave and AM bands, and also the VHF aeronautical and FM bands. FM usually isn't found except in ordinary plastic portables, but having it means you don't have to lug around a second radio if you also want to hear FM. In fact, the SW8's FM is in stereo when you're listening through stereo headphones.

There are all sorts of ways to tune: keypad, tuning knob, 70 memory presets, band selection, slewing and memory scan. There are also two timers and two 24-hour clocks, although you can't see the time and frequency at the same time.

How Well It Performs

The SW8 has three voice bandwidths, which are nominally 6, 4 and 2.3 kHz. Actually, we found them to be wider: 7.8, 5.2 and 2.6 kHz. By and large, though, they work very well in keeping adjacent-channel interference at bay under a wide variety of reception conditions.

Dynamic range on the SW8 measures 92 dB at 20 kHz separation points, and 67 dB at the more challenging 5 kHz points. The third-order intercept points at those separations points are +11 dBm and -26 dBm, respectively.

Dynamic range is especially important if you plan to listen to weak stations. A radio with poor dynamic range will tend to "overload" if there are powerful stations on nearby channels. Whether you listen using the SW8's built-in telescopic antenna, or connect it to an outdoor antenna, such as the Eavesdropper, overloading is not likely to be much of a problem.

Another plus of the SW8 is that whether a station is weak or strong, it will tend to sound better than it would on nearly any ordinary portable—and even some expensive tabletop models. However, the SW8's synchronous detector—which, in principle, should make the radio sound better, yet—is a major disappointment.

To begin with, that detector has trouble staying locked onto the station's carrier during fades. It also lacks selectable sideband, which is one of the main benefits of synchronous detection. A glance at the schematic shows why: cost-cutting. If you want the genuine Drake synchronous detection, and not a shadow of it, you'll have to spring for its

pricier R8 tabletop sibling, an outstanding piece of gear.

Much less disappointing is image rejection. At 64 dB, it's adequate, and passed our hands-on tests well. But it's not equal to that of most tabletop models.

Another area where the SW8 doesn't shine is ergonomics. There aren't enough controls to handle all the sophisticated functions, and the keys are rubbery and vague. Occasionally, when pressed on the corners, they can even stick.

There's also a three-second data-entry time limit that can be frustrating. The way it's set up, if you're entering a frequency and let three seconds pass between button-pushes, you not only have to start over the entry process again, you may wind up changing the way the receiver is operating. For example, you might not press the keys fast enough, and find that not only has the frequency not changed, but the radio has shifted from the AM mode to, say, upper sideband.

We've tested two units in the United States, and found that there is a very slight hum with Drake's AC adaptor when we listened with the volume low and earphones on. However, the Chinese-made adaptor that came with our third unit—which we tested in Australia—had no hum.

These points notwithstanding, most of our panelists came away very much liking the SW8; indeed, one went out and purchased one for his own use. In large part, that's because the radio is a worthy all-around performer by any yardstick.

For example, skirt selectivity is first-rate

with all bandwidth filters. Ditto IF rejection, at 80 dB. Sensitivity varies between 0.32-0.35 μ V, with the noise floor between -126 and -127 dBm. Audio distortion is consistently below 2%. Stability after ten-second warmup is within less than 20 Hz. Those are tabletop-caliber numbers, not figures you would expect to find with a plastic portable.

The Bottom Line

Even though there are some tabletop models that are better, overall, the Drake SW8 is a hard set to beat because it performs well for much less money than a tabletop.

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.

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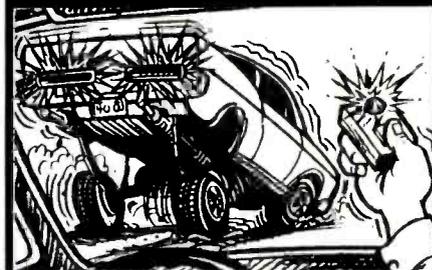
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BUSing Mice, PAKing Ratts and COPYing CATS ...

Wild Kingdom in the 90s

I'm sure some of you remember the TV program *Wild Kingdom*, with Dr. Marlin Perkins. (Those who don't, ask your parents!) In the series the viewers could tag along with ole Marlin as he went in to the darkest jungles in search of wild animals. Well, as you'll recall, we've had our own struggles recently trying to get a wild rodent (mouse) domesticated enough to use with monitoring programs!

To recap, we needed two serial ports for controlling/displaying data for our receiver and the TNC or digital decoder. That was all well and good, since most PCs have two serial ports. When running Windows programs, a serial port switch allowed a mouse to be used in place of the receiver. That was a good solution for about a year until monitoring programs began to use the Windows environment; then we were stuck.

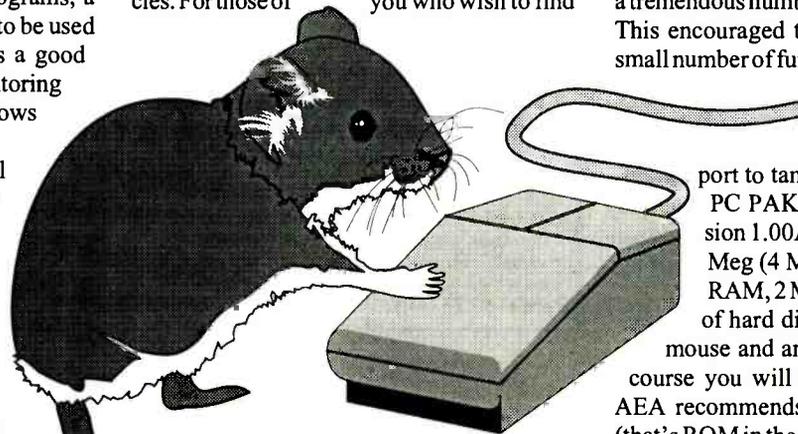
Since PCs support four serial ports, another dual serial card was installed, but the results were mixed, at best. We found that many programs only support control and data from serial ports 1 & 2. And to make matters worse, Windows didn't exactly love the idea of using a mouse on ports 3 & 4. But have no fear, people! We have prevailed and triumphed, thanks to the Bus Mouse.

Unlike the common serial mouse, the Bus mouse does not use a serial card input. Instead it comes with its own plug-in card and sends its data directly to the data bus of the system; hence the name. (Sorry, nothing to do with public transport, except that, at a cost of \$60 and \$100, you may have to sell your car to buy one!) When you consider that serial mice can be purchased for under twenty dollars, the price of a bus mouse came as a shock. The blow was eased a bit by purchasing the Microsoft bus mouse bundled with Microsoft software at a Computer show for \$60.

Installation is as easy as opening the computer case, inserting the bus card in an empty slot and buttoning the case back up. Software installation is even easier. In TEN MINUTES it was installed and operating flawlessly in

both Windows and DOS. If you're serious about using your computer in the monitoring hobby, "byte" the bullet and get a bus mouse. I have been using it for over a month without a single problem. The dreaded monitoring mouse has been tamed.

But, like Marlin, this month we have a few more animal encounters. We looked at two AEA programs last month, AEA FAX II and LOG WINDOWS. Next up is AEA's PC PAKRATT for Windows (thank goodness for the bus mouse). It derives its name from packet—the digital mode used by Hams and, with variations, by some government agencies. For those of you who wish to find



The Bus Mouse comes with its own plug-in card and sends its data directly to the data bus of the system, eliminating the need for an extra serial port for the mouse (i.e., the one on the right).

out more about this popular, and still expanding mode, the ARRL *Handbook for Radio Amateurs* is a good start.

The popular AEA packet decoder, which brought the cost of digital modes down to the amateur level, is actually named Pakratt 232: Hence the name of this program which controls the PK-232. It can also control most other AEA controllers, including PK-88, PK-900, DSP-1232 and DSP-2232. It must be remembered that although listeners just use these decoders for monitoring, they are also capable of transmission in each decoding mode—the reason they sell so well to the Ham population.

I bought my first PK-232 many years ago and am always amazed at the difficulty of controlling the varied and numerous functions and features it contains. The manual is little help as a quick (or even slow) reference. The one that came with my latest model MBX, is a compilation of all the other versions thrown together. Unless you read every page to the end you cannot tell if the instruction or function you are interested in has been changed, or exists at all any longer. The manual is terrible; the decoder is great.

Until recently if you wanted performance you had to suffer through the manual, learning a tremendous number of awkward keystrokes. This encouraged the owner to only use the small number of functions which he/she could

easily remember. But now TWO programs are on the market which purport to tame the wild packet rodent.

PC PAKRATT for Windows, version 1.00A, requires a minimum of 2 Meg (4 Meg recommended) of free RAM, 2 Meg (3Meg recommended) of hard disk space, Windows 3.1, a mouse and an IBM AT compatible. Of course you will also need a PK-232; but AEA recommends that it contain firmware (that's ROM in the decoder which contains its operational instruction set) not older than 1991. Well, I confess I'm using firmware dated 19 July 1990. So if we get any system problems we'll have to call AEA.

Trying to Run with the Pack

PC PAKRATT for Windows easily installed in the Windows environment, from the File Manager, in about two minutes. The 183 page instruction book which comes with the program is very well written. But, as with the PK-232 manual, it lacks a subject index, having just an outline style table of contents. In my opinion this is a major flaw for users who read the manual and then just want to refresh their memory on a given subject. Or, users who want to pick and choose the topics for themselves, without having to read the entire manual.

When you start the program a pretty nifty screen appears which shows drawings of the

three AEA controllers in great detail; almost like digitized pictures. The configuration menu which appears the first time you run the program is straightforward and easily tailors the program for your system and serial settings.

WELL, after trying every possible combination of boot conditions, memory configurations, port settings and Windows parameters, PC PAKRATT will not recognize any serial port, or my PK-232! We'll call AEA in a few minutes and get some technical help. So for now let's look at another program that claims to be a decoder tamer: COPYCAT.

No Cat and Mouse Game

COPYCAT is from the people who brought you the receiver control, logging and decoder communications program called SCANCAT.

"Wait," I hear you say. "But if SCANCAT already has a decoder communications package as part of its program, is COPYCAT any different?" Good question, and one that struck me the first time I heard about the program. Let's see if we can answer that question.

COPYCAT, like SCANCAT, does not require Windows or a mouse to run and was designed in a DOS environment. It installed quickly (less than one minute) and easily (one file name loads everything). The beta copy of the program that I received did not have a hard copy instruction manual. However, there are help files that automatically load with the program and are accessible from the main screen.

Development of the program was stimulated by the complex and varied control commands of Universal's TNCs such as the M-7000 and M-8000. However, it can also control the MFJ-1278 and AEA's PK-232, the one we will use in our review.

The layout of COPYCAT's main screen is the now common top line command bar, which is accessed either via a mouse or by the ALT key and the first letter of the command. Either of these actions produces a pull down menu from which your choice is made. For example, one of the nine commands is DEVICES, which drops down a menu with six other choices. One of these is TNC selection. From here one of the four TNC types listed above is chosen (the PK-232).

Click on MODES, and a pull down menu appears with the following choices: Morse, Rtty/Baudot, Navtex, TDM, Sitor/Amtor, FEC, Ascii, Packet, Packtor and FAX. Changing modes is that simple.

The majority of the screen is text space for incoming messages. At the bottom of the screen are two large lines of fourteen "boxed" displays/commands, the most important of which displays the amount of memory used for storing incoming messages. Also, printer

control is made from these lines.

Returning to the main command line and selecting FILES, the HELP lines can be accessed. This is also possible by pressing the F1 key. The three help files can then be read as text. Not bad, but not exactly a help file as presented in most Windows programs, with topic search capabilities. In at least one case the help file description was not consistent with what the program actually displayed. Perhaps this was due to the fact that this help is a general file covering all the different TNCs. If this is the case, then there should really be four different help files, one for each TNC.

Is more of a good thing good?



Cat-clusion for Use with the PK-232

The easy accessibility of changing modes from a pull down menu without having to memorize the ten commands is valuable. So are the shift and baud selections. But there are many factors against COPYCAT, the most significant being that it is a stand alone program — you cannot run it while running SCANCAT. So you're back on your own, manually tuning your receiver and logging station info. A real step backwards in my opinion.

A second consideration is SCANCAT itself. For use with the PK-232, which has signal analysis built-in, SCANCAT provides ten user programmable keys for decoder control. I use them for mode, baud, and signal sense selection; also for commonly used modes such as signal analysis. True, the user must look them up in that godawful PK-232 manual. But only once. Then SCANCAT will remember the code and the user can call it up with a single keystroke.

Although COPYCAT works well, for my money, COPYCAT is easily eclipsed by SCANCAT for monitoring and decoding using the PK-232. At \$49.95, plus \$5.00 shipping in the USA, COPYCAT costs the same as SCANCAT, while not providing the nearly total monitoring environment and powerful features of SCANCAT. I suggest the very smart "CAT" guys modify COPYCAT to run inside SCANCAT and bring it out as an upgrade of SCANCAT. This makes far more sense from the user's perspective. COPYCAT (and SCANCAT) is available from Computer Aided Technologies, P.O. Box 18292, Shreveport, LA 71138, Tel. (318) 636-1234.

PAKING It Up for this Month

By next column we'll have an answer on the PC PAKRATT for Windows situation. I'm sure it's something at my end that is the problem. Meanwhile, I received information on the new version of AMSOFT's World of Ham Radio, on CD-ROM. We looked at the last version in great detail a few months ago, and really liked what we saw. This May 94 version includes an updated ham call sign database and a few new programs. Its price is still a bargain at \$40 (plus \$3 shipping in the US) from AmSoft, PO Box 666, New Cumberland, PA 17070 Tel. (717) 938-8249.

And finally, I spoke with the people at SoftWave, who have just brought out a digital receiver for Windows (see ad in MT) covering 0.5 to 30 MHz and 108 to 174 MHz. The unit consists of an external "box" and a controller card which installs inside your PC. This new product claims to be a total monitoring environment since it includes hardware and software.

This approach — building a computer controlled receiver up from the computer out — is a method which should allow the software designer (and of course the user) to take full advantage of all the power of the computer. No longer would we be limited by just the features that the receiver manufacture had chosen to make accessible to software. SoftWave's concept could change the whole thinking about monitoring equipment. It's really exciting. But then so are the RFI (radio frequency interference) problems that this approach may bring along with it. I'm sure Softwave has a firm handle on the problems.

Good luck to SoftWave's manufacturer, ComFocus, in their innovative approach to computers and radio. What a hobby! A mixture of the traditional radio technology going back to the 1930s is now being coupled with the fast paced consumer computer industry, and all being led by the ever insanely driven semiconductor industry. Whoever said this was a "retirement" hobby?!

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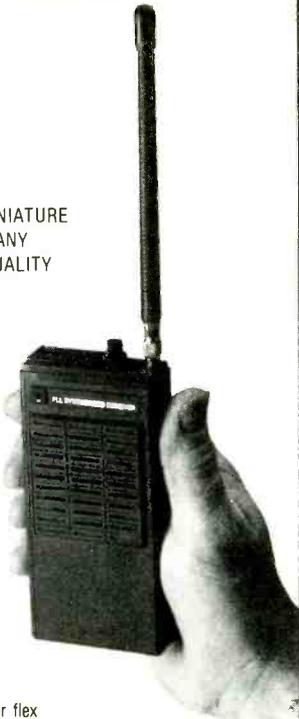
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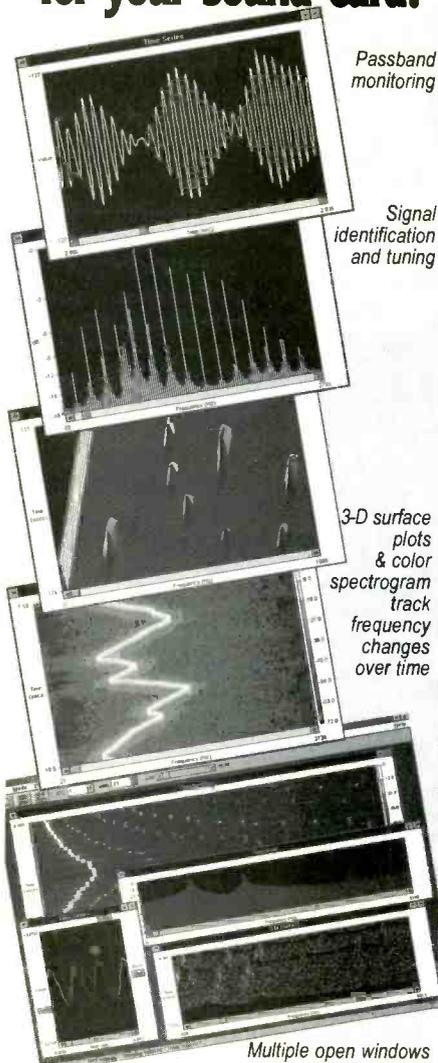
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The Fine Art of Soldering

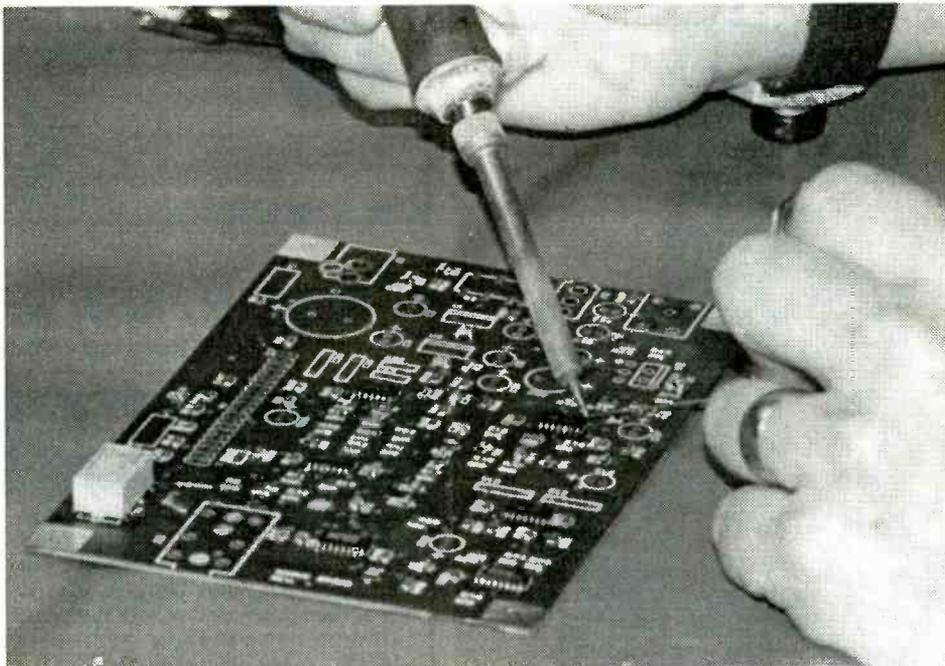
It may seem that nothing in the electronics hobby could be more mundane than creating a solder joint. Not so, because most newcomers to the art have not learned the fine points of developing a neat solder joint that is reliable. Certainly, experience with a soldering iron is helpful, but circuit failures can be avoided if the hobbyist starts with some simple guidelines. Quality soldering is the focal point of this article.

Choosing the Right Iron

I have observed experimenters trying to work with a 100- or 250-W soldering gun while they were mounting components on a PC board. Almost without exception this practice will lead to disaster because (1) there is too much heat and (2) because the tip on a soldering gun is far too large for the fine work that is required for circuit-board assembly. Excessive heat will often cause a PC-board foil to lift from the phenolic or glass-epoxy board material. Also, the large tip on the iron can cause solder to flow across the circuit-board copper elements, thereby creating an unwanted bridge between unrelated conductors.

Soldering guns have their place in the workshop. Most antenna work, for example, requires a substantial amount of soldering-iron heat in order to ensure a strong, reliable joint. A gun is often useful when the builder wants to form an equipment enclosure from sheet metal or PC-board material. Generally speaking, the larger the metal area to be soldered, the greater the heat required to cause the solder to flow smoothly and to adhere to the surfaces.

Most soldering today is done by means of soldering pencils, as they are called. These irons are rated from 25 to 40 watts. They are easy to use because they do not have the mass of a soldering gun, and they are lightweight devices. Various styles of screw-in tips are available for soldering pencils. I prefer the smallest tip that is available. My tips are conical rather than the chisel-blade type. Conical tips taper to a fine point at the end which makes contact with the items to be joined with solder. The fine tip can transfer sufficient heat to ensure a proper joint for nearly every component on the board. It is small enough to make it easy to solder ICs to the tiny PC-board pads that accommodate the



ICs. I have used 25- and 40-watt pencil irons with equal success, but I lean toward the 40-watt irons for all-around work.

Owing to UL standards today, some pencil irons have such massive ac cords that they become the "tail that wagged the dog." This feature makes it awkward to move the iron from point to point on the circuit board. I confess that I cheat by snipping off the cord about two inches below the soldering iron handle. I then splice a smaller, more flexible ac cord to the stub of the original cord. This is acceptable for personal use, but would be considered illegal if the modified iron were used by some employee in a place of business.

The tips for pencil irons come in two styles. Some are iron plated (gray color) and some are made from unplated copper. The plated tips last a long time and do not require cleaning as often as do the copper ones. Tips are available for some irons with maximum temperature ratings (600, 700 and 800 degrees F). I prefer a 700-degree tip for general use.

The Weller Marksman pencil irons are inexpensive and seem to last a long time. They are available in 25- and 40-W sizes. Cordless Pyropen irons are also made by Weller Co. and are handy for many outdoor jobs, but they are costly. I use a pencil size

butane torch for most of my antenna work in the field. Portasol Co. sells such a unit. I paid \$7 for the one I use. It is an imported model that was made in the Orient and purchased from a mail-order tool vendor. The Weller irons are available from Hosfelt Electronics, Inc.¹

Which Solder Is Best?

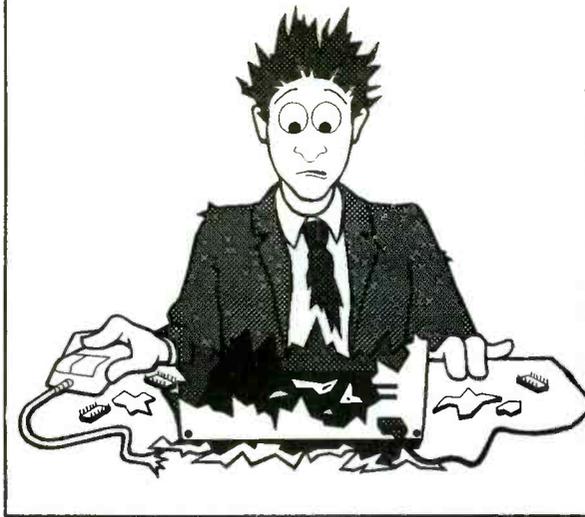
Rule no. 1 tells us to avoid using any form of acid core solder. It is corrosive and too large in diameter for most electronics work. Use only rosin core solder in your electronics equipment. Purchase 60/40 (60% tin/40% lead) solder. Kester and Alpha make quality solder. Ersin Multicore solder is considered by some as the Cadillac of the solders, but it costs more than the other brands. It is imported from Great Britain.

The diameter of your solder is important also. Stay with the smaller diameters for most PC-board work. I prefer 25 gauge (0.020 inch OD). Solder is available in sizes up to 16 gauge.

The Art of Soldering

The surfaces of the items to be joined by solder must be free of film or oxidation resi-

YOW! MORE BAD SOLDER JOINTS?



due in order for the solder to flow freely and provide a secure joint. It is sometimes necessary to clean the surfaces with fine-grade sandpaper or steel wool before using the soldering iron. Some imported parts contain plating that makes soldering difficult. It may be necessary to remove the plating at the point where the solder is applied.

The soldering-iron tip should be held firmly against the surfaces to be soldered in order to properly preheat those areas. Once the parts are warm you can apply only enough solder to form a small joint. Remove the iron from that area and allow the joint to cool before stressing it.

The completed joint should stand slightly higher than the plane of the circuit board, and its finish should be bright and shiny. If the joint is dull gray and granular in appearance you will have what is called a "cold solder joint." Apply more heat and add a tad of fresh solder to correct this condition.

What About Soldering Paste?

Kester Co. produces rosin paste soldering flux that is often helpful when soldering certain kinds of metal. It is a highly active, non-corrosive compound. It should be used only when dealing with difficult metals, such as those with plating that resists solder. If you use soldering paste — and you will need to from time to time — be sure to apply only a thin layer to the surfaces that you intend to solder. Avoid smearing the paste elsewhere.

Removing Solder

It is often necessary to "unsolder" some joints, especially when replacing components or stripping reusable components from a sur-

plus PC board. Various desoldering options are available, such as a rubber suction bulb, a plunger type of solder sucker or solder wick.

I keep all three of these items in my workshop, since each has its special application. I use the bulb or sucker gadgets for removing large blobs of solder. The solder wick is best for cleaning up presoldered points on a PC board, or for removing solder when replacing ICs, transistors and small components. Chemtronics Chem-Wick is my choice, since it absorbs solder better than some other brands I have used.

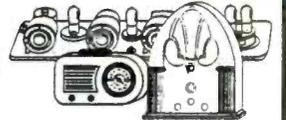
Chem-Wick and the other devices mentioned above are also available from Hosfelt Electronics, Inc. (see note 1). I have made my own solder wick by using the shield braid from mini RG-174 coax and rubbing a light coating of soldering paste on the braid before using it.

In Closing

The success or failure of a project depends in large measure on the integrity of the solder joints. What may appear to be a good solder joint can, at times, be faulty beneath the surface, which can prevent an electrical union between the related components. Too much solder can spread to other areas of a circuit board and cause a short circuit. Final inspection of the soldering job can best be done with the aid of a magnifying glass and a desk lamp. Be sure to watch for fine whiskers of solder that may be short circuiting unrelated foils on your PC board.

Note 1: Hosfelt Electronics, Inc., 2700 Sunset Blvd., Steubenville, OH 43952-1158. Catalog orders via 800-524-6464

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Things to Come — and How to Get Ready!

I am frequently asked about the future and what it holds in store for us radioists. I shy away because I can't predict when I'm going to bed tonight. Predictionist, I am not; at least not one on whom you'd be wise to put any money.

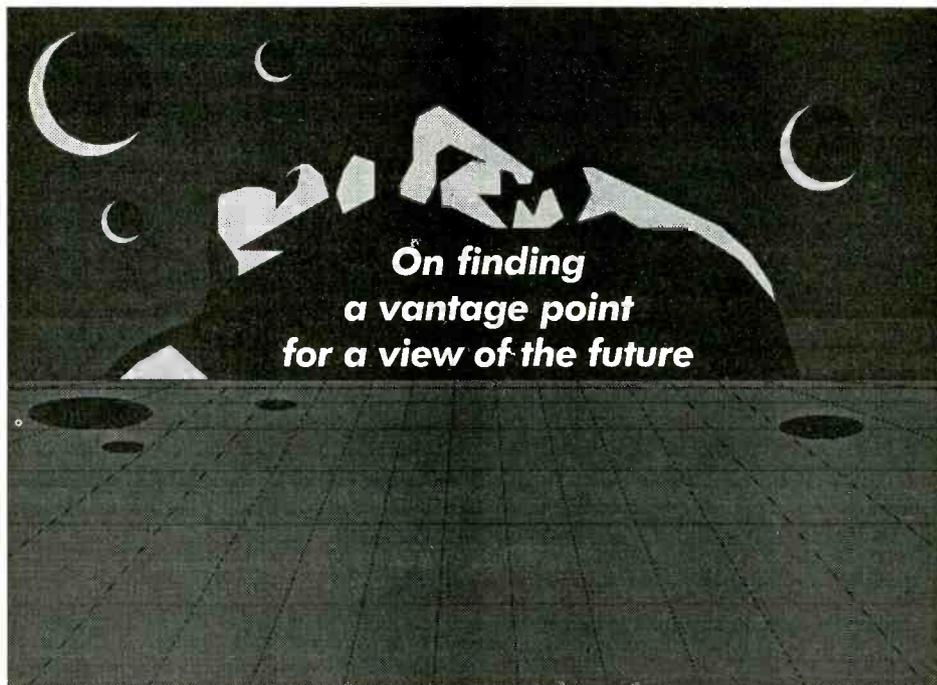
On the other hand, I can speak a little of the trail, the wilderness, the birds, the bees and the signs of nature and the times. I suppose this is the Native American side of me (I am of the Cherokee). I am also from Missouri you have to "show me." So let's take a little walk down a nature trail to a view point for electronics and radio. The view is relatively clear; we need only look at it and discard the crystal ball

I am from the old school where my teeth were cut on vacuum tubes, paper capacitors, magnetrons, amplidyne, "Knight Kits" from Allied Radio, parts from Burstein-Applebee; and real home-made apple pie. I studied transistors in engineering school but had no use for them. Nor did I make very good grades on exams when transistors were the subject. Gimme a design test with a 12AT7 dual triode or a 4CX1000A "gallon fruit jar" and I led the class! Integrated circuits (chips) were developed after my formal education was behind me..

This is relevant because others from the "old school" often confront me with, "*Dang, Doc, I wish you'd get off them dern computers and back onto radio.....*"

But I never got away from radio! There just is no going back. The times are not going back; they never do, you know. Radio and computers have become inseparable. The **Information Age** barrels down upon us. The **Information Highway** may not be a 16-lane freeway yet, but it's not a back alley; call it a boulevard.

Incidentally, the Information Highway is NOT the *InterNet* as some refer to it. The *InterNet* is a part of the Information Highway, but only a bit part. The Information Highway encompasses all imaginable media, forums, and avenues of communications: our concrete highways and byways, railroads, telephone, telegraph, and teletype, wirelines and fiberoptics, the US Mail, United Parcel Service, Federal Express, the airlines, Cable TV, broadcast radio and television, amateur, citizens band, SWL and scanning. The list goes on and on....



500 years from now the Information Highway as we know it will likely be seen the way we view the shipping lanes that developed shortly after Columbus landed in the Americas. Let us NOT define it, for the definition will change even as the words form in our mouths. Instead, in order to perceive it without words, become a part of the experience!

Who among us would not give an arm and a leg to have sailed with Columbus, Magellan, and Vasco Da Gama? Or to have ridden with Lewis and Clark, Kit Carson, Marco Polo, or Alexander the Great? Or to have thundered into the sky aboard chariots of fire with John Glenn, Wally Schirra, and Neil Armstrong? Pity, we can only read about these guys and their lofty adventures.

Yet, the greatest adventure of the Human Experience looms. Amazingly, the tickets are free and anyone can go! You just have to get to the road on your own, but the cost is well within reach. **Get a computer and get one now!** Don't let the sun set on your radio desk until it has a computer.....any kind will do for starters. Let's hop on our computers, Clyde, and ride!

A computer is one of the best ways to get to the Information Highway and it may be the **ONLY** way to experience it to the fullest

possible extent. This is not a time for excuses. It's not a question of "*Can you afford a computer?*"; more like, "*Can you afford not to have one?*"

Never think you're too old or not smart enough. Look at me, fer Pete's sake! Remember that fellow I wrote about in Vol-2 of my *Scanner Modification Handbook*, who 'fessed that he had less than an 8th grade education but was able to perform the modifications to his PRO-2004 scanner? That very same fellow helped ME learn things about my computer!

Some of you might be afraid of computers: I was.... But fear is overcome by familiarity. Are you afraid of your radio, telephone, or car? Four-score and ten years ago, many people feared THOSE new-fangled contraptions. The Information Age is on a roll; we can't stop it, so let's make it work for us.

Digital: A Subtle Difference

Paul Williams, in his 1973 *Das Energi*, wrote, "*We are on the verge of the new age; a whole new world. Mankind's consciousness, our mutual awareness, is going to make a quantum leap. Everything will change. You will never be the same. All this will happen just as soon as you're ready.*"

Now **there's** a predictionist for you! But look around; isn't it happening? Folks, we are going to become legends in our own time if we don't move with the changes. We're dealing now with a whole new technology that's matured since Paul Williams wrote those prophetic words. Analog technology, as we know it, is being replaced on all fronts by a digital technology.

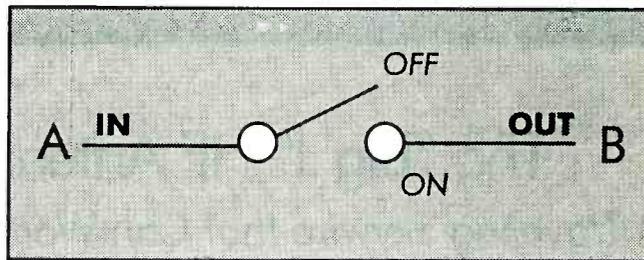
My old-school thinking held resolute for years that digital could never be more accurate or pertinent than analog. I was wrong. It's true that digital is not exact in the purest sense of the word. But you know something? Neither is analog! Consider the second hand of a clock as it sweeps past "12": at which point do you feel confident of the exactness of the minute? If you put that tick mark under a microscope, you'd see a mile-wide lane, so which point is exact? Then put that point under a more powerful microscope and decide which is exact....etc, ad nauseum. Digital technology is a realistic reconciliation with the inexactness of analog. Digital offers a perceptual representation of cut-and-dried cases of it IS or it AIN'T, and nothing in between. And yet, when you stack layers of IS and AIN'T, almost magically appears an "in between." How?

Imagine a contest like 20 Questions in which questions are asked but the answers are only YES or NO. Suppose the objective is to name a major city in someone's mind. *Is it south of the equator?* No. *Is it south of 45° N. Latitude?* Yes. *Is it in the Eastern Hemisphere?* No. *Is it in the United States?* Yes. *Is it west of the Mississippi River?* No. *Is it north of the Tennessee River?* Yes. *Is it in a state?* No. *Is it Washington, DC?* Yes.

Elementary, but the point is that logical exactness and a range of in-betweens are both possible with digital technology serving as assistant to the human mind. The mind can never be digital as far as I know, but it sure can apply digital tools. Thanks to the digital computer, my personal library and access to others afford me a level of power far greater than all the libraries of the world of a generation ago — no joke!

The simplest of all things digital (as well as the most complex) can be represented as a Single Pole, Single Throw (SPST) toggle switch as shown above.

A switch like this represents Yes/No, On/Off, True/False states of existence. There are only two possibilities here: On (=1), Off (=0). You can even call this switch a "gate" where it is either open or closed. This is the basis for digital technology. And that is the foundation for the future of radio and electronics. It's a very small shift, with some very large implications.



Alas, the simplest digital expression is also the most complex!

Radio — Second-Class Status?

If you will reflect on what radio was always about, you can't miss the inescapable conclusion that radio facilitates conveyance of information from Point A to Point B. Now consider how, aside from hobby aspects of radio, the evolution of radio has always been a matter of business and economics. As more efficient and less costly means of conveying information are developed, radio is simply going to retire into a second-class, backup status. Indeed, it already has in many ways. Cable TV is deeply encroaching on the turf of the broadcast industry. Cable offers commercial-free stereo music, and in some markets, it conveys information services! Those places where cable does not yet intrude, are exploited by satellite links.

You might think that long-haul shortwave broadcasting is relatively safe, but think again! It may not be in wide use yet, but satellite links and relays have the capacity to carry hundreds of times more programming than all the present shortwave stations put together! Commercial land-mobile two-way radio is threatened by the more effective and less costly cellular mobile telephone phenomena! Yes, I know: cellular service is still radio. However, the pressure of law and industry have effectively removed this 50 MHz of spectrum from our ears, so in a sense, CMT is not "radio as we know it."

And that, my friends, is the sign of the times. C and Ku Band satellite television is on the march to encryption and effective removal from the hobbyist's grasp. Police and government agencies have begun a massive exodus from transmissions in the clear to encrypted voice or data or both. Encryption and digital modulation technology are reaching the point of cost-effectiveness such that it won't be long before the Industrial and Business Radio Services go completely out of reach.

In fact, the momentum of the times is so clear that I'll break my own rule and speculate that in another 20 years, there will be very little of interest in the detectable radio spectrum other than a few die-hard hams and CB'ers. In fact, I look for ham and CB radio to make the full circle and perhaps merge or join forces in the not too distant future. It might be these two arch-rivals will be joined by the shortwave

listening and scanner communities as well, for "*in union, there is strength.*" We'll need it.

The way I see it, the ONLY possible salvation for hobby radio, as we know it, is to bow to the times and computerize our shacks. This is not to put radio on the back burner; it might very well be that you'll soon have to use a computer WITH your radio to detect anything of interest. At the same time, that computer will be good for other things and perhaps faithfully carry you onto the Information Highway like Trigger carried Roy Rogers into the movies.

But Meanwhile ...

Future Experimenter's Workshop columns will steer you into digital electronics more than ever. Next month, we'll begin with some cheap, interesting, simple and useful digital circuits, the long term results of which will assist your entry into the Information Age.

As always, your suggestions are invited. I am now on CompuServe, at 74107,1176, if you'd like to provide timely feedback. You can also reach me at my BBS, the Hertzian Intercept, (619) 578-9247 (after 5:30pm & before 1:30pm, PDT, weekdays, 24 hrs weekends). No idea or suggestion is too dumb unless it's not communicated.

If you want some homework for the next couple of columns, read up on the basic digital circuits called AND, OR, NAND, and NOR as well as CMOS switches, buffers and inverters. We'll find some fun applications for them!

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The "Big J" HF Antenna: A Traveling Skywire that Can Work at Home

In 1990, in honor of the first annual *Monitoring Times* Convention, I presented a couple of portable antennas specifically for folks planning to attend: 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 me a business-size stamped, self-addressed envelope in care of *Monitoring Times* if you'd like those plans.

Last month, in honor of this year's 5th annual *Monitoring Times* Convention, I featured a highly portable VHF/UHF beam. This month we wrap up with an HF antenna that, as it needs no ground, is a natural for conventions and traveling: The "Big-J" (see fig. 1).

The HF "Big-J" Antenna

This skywire was derived from the halfwave, end-fed zepp antenna, and has the same gain as the halfwave dipole. Mounted vertically, it gives non-directional, mostly medium and low-angle radiation; mounted horizontally, it gives a slightly-directional pattern with more high angle and less low angle radiation, similar to the traditional centered halfwave dipole.

The fact that the J doesn't need a ground makes it ideal for operation where it's hard to get a good ground: hotel rooms, apartments, areas with dry or rocky earth, or where you just can't sink a ground rod. At 14 MHz and above it is about 33 ft. or less long, and can thus be easily strung around your hotel room horizontally, being bent to make an "L" shape if necessary. The matching section can be bent also to fit in any convenient space. The J can even be tossed out a window to hang vertically where that is practical and permitted.

The J is a two-band antenna, performing best at its design frequency, and also performing reasonably well at the third harmonic of that frequency (i.e., the 7 MHz version works also at 21 MHz).

As with many other antennas, the J can also function as an "all-band," random-length antenna by connecting the inner and outer conductors of the coax at the receiver and treating it as a single wire antenna. When used

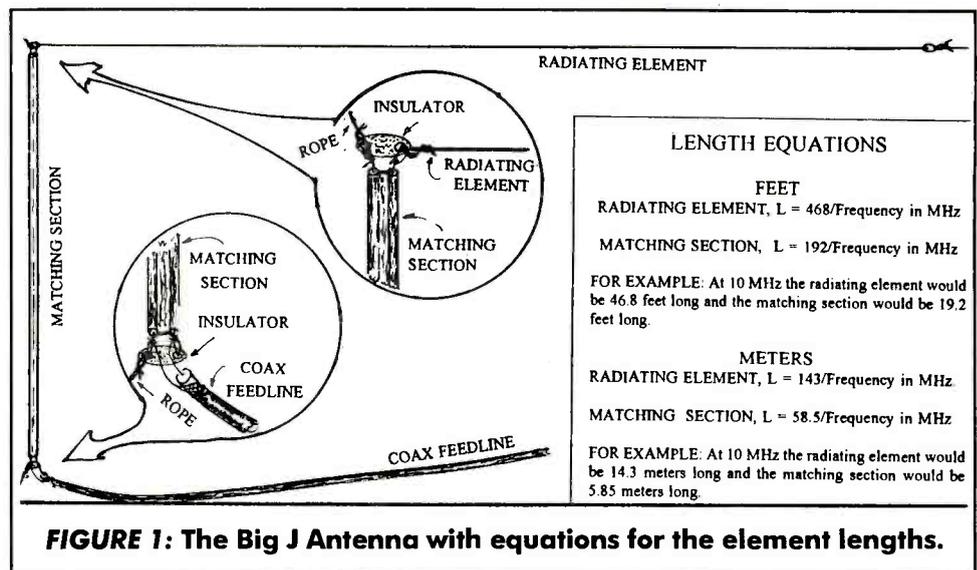


FIGURE 1: The Big J Antenna with equations for the element lengths.

in this fashion for transmitting, it requires an antenna tuner and either a ground connection or one or more quarter wavelength long radials at the "ground" connection of the tuner.

Let's Make the Big J!

NOTE: If you use this antenna inside for receive-only applications you may omit the use of insulators. If you use the antenna to transmit inside a building, keep the antenna—especially the ends of the radiating element—well away from anything that might suffer from electrical discharge; make sure no one gets near the antenna, and use only very low power.

1. Determine the length of the radiating element from the equation given in fig. 1. Add four inches to this length to allow for attaching the insulators if they are used. You may use just about any wire that is strong enough to stand up in use. For portable operation a multistrand, plastic insulated wire is best; one conductor of ordinary speaker cable will work fine. For permanent installations, #12 to #14 stranded-copper antenna wire or copperweld is excellent.
2. Cut the length of wire determined in step 1.

Remove any insulation for about 2 inches at one end and scrape the wire bright. Loop the wire through an end-insulator and solder the wire to itself as in fig. 1. Remove two inches of insulation at the other end of the radiating element and scrape the wire bright and add an insulator.

3. From the data in fig. 1, determine the length of 300-ohm twinlead required for the matching section. Add 2 inches to this length to allow for attaching it to the radiating element and to the coax feedline.
4. Scrape the conductors at one end of the matching section bright for about an inch. Then loop one conductor through an insulator and solder it to the radiating element; simply loop the other twinlead conductor through the other end of the same insulator and solder in place (see fig. 1).
5. Determine which conductor of the matching section you have connected to the radiating element. Then attach and solder that conductor to the center conductor of your 50-ohm coax feedline.
6. Connect and solder the outer conductor (braid) of the coax to the other matching section conductor (see fig. 1). If you are

likely to use the antenna outside in wet weather, seal the coax end with coax sealant.

7. If you use this antenna outside don't forget lightning-induced damage protection. The minimum here is to never use the antenna during weather likely to produce lightning, and always disconnect and ground the antenna when it is not in use.
8. Mount the antenna in place and you're ready to get "on the air!"

An Excellent Reference Text:

Amateur Radio Encyclopedia, Stan Gibbilisco, W1GV, Editor in Chief. Tab Books, Division of McGraw-Hill Inc., Blue Ridge Summit, PA 17249-8050.

This book is an excellent reference source. Its 593 pages are filled with satisfying definitions of a very large number of terms relevant to radio-communications in general, not just to amateur radio. The newcomer and old-timer alike will find it useful. Newcomers will value it for help with the many new and confusing terms they will encounter as they become acquainted with the field of radio communications; old-timers will use it for looking up terms they come across occasionally which are of interest yet are out of their area of knowledge.

A good reference text such as this also can also be used as a useful tool for learning. For instance, just reading and thinking about all the headings under "antenna" and related topics such as "test range," "resonant frequency," "radial," "radiation resistance" "directional antenna," "dipole antenna," etc., gives a good review of antenna technology.

To "bone up" on a topic that interests you, just check out the book's index; for example, there are nearly 100 antenna-relevant entries listed here. I am impressed with the accuracy, completeness and breadth of coverage which I find in this well-written reference book.

RADIO RIDDLES

Last Month

Last month's radio riddle was: "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?"

Well, antennas not only receive energy, they also have some resistance which turns some of the signal into heat, just as in a common resistor. Antennas transmit signals, too, and received energy which is not accepted by the transmission line which leads to the receiver's input is either dissipated as heat in the ohmic resistance of the receiving antenna or re-radiated back into space!

Indeed, the success of parasitic beams like the Yagi-Uda depends on their director and reflector elements receiving and re-radiating signals in such a way that the antenna's driven element helps form the desired directional pattern for the antenna.

This Month

So, now you know that a receiving antenna can transmit, but can a transmitting antenna receive?

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. Till then, Peace, DX, and 73.



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Q. My scanner only displays three decimal places (i.e., 165.235), yet many frequencies have four (i.e., 165.2375). How important is this last digit to reception? (Michael Herman, New York, NY)

A. Not at all. The "window" of selectivity in a scanner is typically 15 kilohertz wide; since

the fourth decimal place represents only a fraction of a kilohertz, such a minor mistuning won't even be noticed.

Q. After letting my Realistic PRO-32 scanner sit idle for about three years, I decided to power it up. Much to my surprise, I discovered

its memory channels were loaded with frequencies, many of which were mighty strange. What gives? (Henry Poh, E. Northport, NY)

A. Manufacturers try to offset the cost of development by using standard sets of parts for a variety of products; often this means using one microprocessor for several models and for several regions of the world which don't share common bandplans.

My guess is that the long period of unpowered sitting let the microprocessor drop back to its factory default condition, showing a variety of frequencies used for alignment and test purposes.

Q. I notice that my Phillips DC-777 mobile shortwave radio experiences a great deal of interference when the engine is running, but reception clears up when the engine is shut off. The noise, however, does not change pitch when I rev the engine. What is the probable cause? (LeRoy Long, Edmond, OK)

A. If you don't hear the familiar "pop-pop" of ignition noise, or alternator whine which changes in pitch with engine speed, the noise is almost certainly being generated by one of the microprocessor-operated accessories. It could be a clock, ignition controller, or other computer-based circuit.

Q. What frequencies are being monitored in the SETI program? (Robert Brock, Andrews, NC)

A. The Search for Extraterrestrial Intelligence (SETI) employs two techniques: a targeted search (1-3 GHz) of close stars which may have planetary systems; and an all-sky survey (1-10 GHz) for suspicious signals.

But don't expect to hear these signals on your home satellite dish; their distance is so great that it takes giant dish antennas and cryogenically cooled amplifiers to detect their weak emissions.

For more information you may wish to read Carl Sagan's book, *Cosmos*.

Bob's Tip of the Month

Memory Backup Mods for the Realistic® Pro-2026

Early models of the Realistic PRO-2026 were designed for mobile use only, with a third (orange) power lead that had to be connected to an unswitched +12-volt source to prevent loss of memory when the radio was shut off by the ignition key.

MT's intrepid scanner modifier, Larry Wiland, has come up with a step-by-step procedure for adapting that early model PRO-2026 for home (desktop) use.

(NOTE: *Monitoring Times* assumes no liability for damage or injury resulting from attempting these modifications)

Modification 1: AC Operation

REQUIRED: DC power supply capable of providing 12 VDC at 760 milliamps minimum (similar to Radio Shack 273-1653, \$21.99); mating DC connector for back of radio (Radio Shack 274-1565); ordinary workshop tools; small-tip soldering iron and rosin-core solder.

PROCEDURE:

(1) With power disconnected, remove the four outer cabinet screws; turn the radio over to access the radio's power connector (red, orange, black wires). Slip the connector out of its slot.

(2) Snip the wires from, and as close to as possible, the connector; trim back about 1/8"-1/4" of insulation preparatory to soldering. Solder both the orange and red wires to the center terminal of the new connector; solder the black wire to the outer lug of the connector.

(3) Using a small file, widen the slot slightly so the new connector slides snugly into place. Inspect all work, then test the radio and AC adaptor combination before reassembly.

(4) After the radio works, reassemble the cabinet. This completes the conversion.

NOTE: The AC adaptor will permanently back up the memory, but even if it should become disconnected, memorized frequencies will remain stored for at least two days.

Modification 2: Alternative Memory Backup

Several users of the PRO-2026 have suggested simply attaching the orange memory power wire to a nine-volt battery, greatly extending the memory channel backup during extended power disconnects.

The battery can be mounted inside the case, out of the way of the circuitry, by affixing it with double-sided sponge tape (Radio Shack 64-2362), Velcro (64-2363), or even a commercial battery bracket (Radio Shack 270-326) mounted on a flange and held in place by a speaker screw.

With the case removed, snip the orange wire from the board, soldering in its place the red (+positive) lead of a nine-volt snap terminal (Radio Shack 270-325). Solder the black (-negative) lead to the black power wire solder pad.

Reassemble and test. This completes the memory backup modification.

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. Is there any advantage to running several close-spaced antennas in parallel to increase reception on shortwave? (Henry Johnson, McLean, VA)

A. No. For any gain, the elements would have to be separated a half wavelength or so. Close-spaced, the only advantage would be wider bandwidth for the feedpoint impedance, but that is of little concern for receiving purposes.

Q. What frequency is used by the Arizona state prisons? (Robert Brock, Phoenix, AZ)

A. 154.920 MHz.

Q. My handheld scanner constantly receives digital pager noises while I'm monitoring my local police channels. I can eliminate them by using a shorter antenna, but then my police signals are too weak. What can I do? (John Shimkunas, Philadelphia, PA)

A. You are experiencing intermodulation, a common complaint among scanner users in metropolitan areas. Intermod is a design deficiency which results from two strong signals mixing in the radio and producing other spurious signal frequencies which pop up as interference in unwelcome places.

There are several possible solutions: Get a new radio with data mute or better dynamic range; move; install an antenna filter for the offending frequency; set up a second antenna positioned to phase out (null) the signal; tolerate the interference.

Q. I recently bought a \$70 battery recharger for ordinary (non-rechargeable) batteries; it doesn't

seem to work. How come? Is it a ripoff? (Paul Simes, Fairfax, CA)

A. Only batteries specifically called "rechargeable," like nickel-metal hydride, nickel-cadmium, lead-acid, and rechargeable alkaline, can be fully and repeatedly recharged.

The chemistry in conventional zinc-carbon and alkaline batteries is destructive and irreversible; that is why such batteries are commonly called "throw-away." Once they're dead, they're dead.

It is possible to condition the gradual discharge of a fresh conventional battery with a recharger, but this simply redistributes the chemicals and offers a life extension of a mere few percent, hardly worth the effort or the expense of a charger.

Is it a ripoff? Yes. An industry source says that a number of these units have been taken off the market.

Q. How much would it cost new to replace the Hammarlund HQ-170 or National NC-155 or NC-270 receivers? (D.J. Morton, N. Huntingdon, PA)

A. Three decades ago these receivers sold in the \$200-\$300 range; they were good, but not excellent, receivers. Nowadays, the popular Drake, ICOM, Kenwood, AOR and similar products in the \$600-\$1000 range considerably outperform those tube-type classics, and in modern dollars, are a much better value.



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John bases some of his receiver choices on their power drain, since six months out of the year he is using his sets on a sailboat and is dependent upon 12 VDC. He also has a 100 watt mini-hydro plant and solar power system. The other half of the year he lives in a remote area in which he is still dependent upon a hydroplant, which often wipes out all but the strongest signals below 15,000 kHz.

"Which is where the PRO-2006 comes in. Sadly, it is not unusual for aircraft and boats to go missing in this area. It is not unusual for the Rescue Center in Victoria to radiophone with requests for help or information. The 2006 scans all the marine VHF channels, the locally-used VHF air channels, plus distant police channels. Air Distress 121.500 is on Priority. A separate VHF marine transceiver is set to Ch16 Marine Distress."

Somewhat surprisingly, John says his favorite listening is the "Tok Pidgin" stations from Papua New Guinea and the Solomon Islands. "I am especially amused by the pidgin expression 'bugger-up.' An earthquake is a 'bugger-up,' a warranty for a Yamaha outboard is a 'suppose-he-bugger-up.' Even the crucifixion, as heard in a PNG sermon, is a 'bugger-up'! Pidgin has its own crazy logic, and the programs have a delightful sincerity."

For twelve years John has also been listening to Radio Tahiti on 15167.6 (or thereabouts; "they move around trying to escape the heterodynes"), for their great Polynesian "escape music."

Caller ID

Bob Grove reports that a number of readers have inquired as to the availability—and the status—of calling number ID, the technology that displays the telephone number of the person currently calling you.

Several lawsuits have plagued the successful distribution of these useful and inexpensive devices, pending court rulings on their constitutionality.

One of the problems cited was that, while they would help curb prank calls and sales pitches, in situations such as victims of abuse calling home, these may unintentionally revealing the victim's whereabouts.

Have any of our readers good information on the status of calling number ID? Is it in wide use? Have the courts disposed? Please let us know.

The flip side of the question is the current

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David Gilden, author of May's feature on Radio Gambia, plays the kora and has several tapes to sell. For information or concert bookings call 617-522-2513.

status of solutions to block Caller ID. *Full Disclosure Magazine* (\$29.95/yr. from P.O. Box 903, Libertyville, IL 60048) mentioned two ways. (1) Set up a second phone line for out-going calls only (available from some phone companies). That way, when the party tries to call you back, they get a recorded message that such-and-such a number "is not in service for incoming calls."

(2) Preface your exchange and number with 10288. This displays your number as "out of area" (possibly incurring a long distance charge?).

The author of the article found it ironic that phone companies tout the benefits of Caller ID, but AT&T provides a way to defeat it!

Short Subjects

"The piece, 'Ham Left Hanging?' in April's 'Communications' ended with: 'Sheriff Roache is up for re-election, however, so anything is possible!'

"Roache attracted less than 24% of the vote in this non-partisan primary election. Now we just have to hold out for November when Roache will definitely be history!

"Chris Boyer's outrageous treatment under Roache's reign really didn't rise to any significant public awareness in San Diego County, except among the ham and scanner community, and it would be wrong to suggest it had any direct influence on Roache's bum's rush. But Boyer's treatment is just another symptom among many. Kolender [who won the primary election] is a genuine professional, and I imagine he'll quietly return Boyer's transceiver. At least I hope so."

Edson Hendricks, San Diego, CA

"Things change! Since I wrote the item on Worldwide Radio Friends [pen friends] which appeared in June on p.114, the request is now for a \$2 contribution in order to be on the list."

Leslie Edwards, Doylestown, PA

"Kudos for your computer BBS article [Closing Comments] in the June issue. It is but another symptom of a sick society ... and there are other indications, across a broad front: A lack of respect for (1) established mores, (2) any authority, (3) personal property of others, (4) laws in general.

"I have stopped saying, 'I couldn't believe my ears,' about things like the filth on CB, and even more incredible, on the ham bands. Now you say it is surfacing on the information superhighway!"

A.W. Edwards, Corpus Christi, TX

"I can't express what a valuable resource your magazine is. Thanks for presenting information in a way that doesn't 'talk down' to the new (40 yrs old) kid.

"I'm wondering what you think of the 'OJ' episode. Obviously Al and OJ were unaware of the secret life of cellular phones, and I was fascinated that the news media DID indicate that the telephone company located OJ by triangulating on his cellular phone calls.

"At one point I thought one reporter was going to make a big mistake and reveal what he (obviously) had heard by listening in ... but he caught himself at the last moment.

"The constant references to scanners by the media as well as being able to hear them in the background was pretty exciting to a newcomer such as myself." *Anonymous*

From the Editor

Thanks for your good letters; we never have space to print them all or to give more than excerpts. Even more of you may never write a feature, or even a letter, but share newspaper and magazine clippings that keep us up-to-date with the world of radio. We thank you for sharing your knowledge and your experiences; after all, your monitoring times become everyone's

Monitoring Times
Rachel Baughn, Editor

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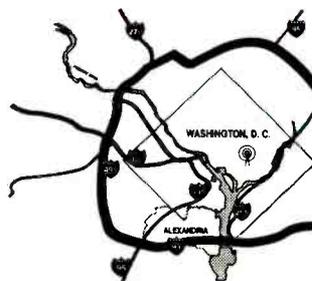
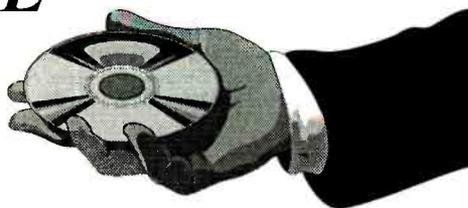
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Memphis Area Shortwave Hobbyists (MASH): P.O. Box 3888, Memphis, TN 38173, Jim Pogue (901)873-4291 or Brandon Jordan 373-8046. Memphis area; SW, MW, FM, TV, utilities, pirates, etc.

Metro Radio System: Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. M.R.S. Newsletter.

Michigan Area Radio Enthusiasts: Bob Walker, P.O. Box 81621, Rochester, MI 48308. E-mail via Internet MARE/Ken Zichi ab415@leo.nmc.edu. Great Lakes Region. All bands. Great Lakes Monitor. \$9.50 annual US & Canada. \$1 sample.

Minnesota DX Club: Greg Renner, P.O. Box 10703, White Bear Lake, MN 55110, 612-822-1186 for meeting info. Minnesota. All bands. MDXC Newsletter. \$10 annual.

Monitoring the Long Island Sounds: Ed, 2134 Decker Ave, North Merrick, NY 11566. Primarily scanner, some SWL. 50 mi. radius of LI. Net Tues 8pm 146.805. Monitoring the Long Island Sounds.

MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 Third St., West Chester, OH 45069-2212, (513)777-2909. Cincinnati/Dayton area; Full spectrum SW and scanning.

Mountain NewsNet: James Richardson, P.O. Box 621124, Littleton, CO 80162-1124, (303) 933-2195. Colorado statewide. Public Safety notification group. Mile High Pages.

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711, (913)266-5707. Worldwide; AM/FM. DX News 30 times yearly,

sample for a 29 cent stamp. Annual Labor Day convention.

National Radio Club - DX Audio Service: Ken Chatterton, P.O. Box 164, Mannsville, NY 13661-0164, (315) 387-3583. Worldwide. North American Broadcasters. DX-Audio Service (90-min.tape). Sample \$3.

NYC Radio Fre(ak)Qs: Joe Alverson, 199 Barnard Ave., Staten Island, NY 10307, 718-317-5556. NY boros & LI; VHF/UHF/HF utilities. NYC Radio FRE(ak)Qs. No dues.

North American SW Assoc.: Bob Brown, 45 Wildflower Lane, Levittown, PA 19057, (215) 945-0543. Worldwide; Shortwave broadcast only. The NASWA Journal. Regional meetings.

North Central Texas SWL Club: Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. North Central TX area; All bands.

Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities. Meet 3rd Tuesdays.

Northeast Scanner Club: Les Mattson, P.O. Box 62, Gibbstown, NJ 08027, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. Northeast Scanning News (NESN). \$29 annual.

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (905) 853-3169 voice & fax, (416) 444-3526 DX-Change information svce; (905) 841-6490 BBS. Predominantly Province of Ontario; All bands. DX Ontario. Meet 3rd Wednesdays, Toronto; bi-monthly, Ottawa.

Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. Pacific NW and BC Canada. DXing all bands. PNBCDX Newsletter. Irregular meetings.

Pitt Co SW/Scanner Listeners Club: L. Neal Sumrell, Rt. 1 Box 276, Sumrell Rd., Ayden, NC 28513-9715. Eastern NC; All bands. The DX Listener. Irregular meetings.

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749, (808) 982-9444; Puna, HI; SW and MW. Meet 1st Tuesdays. No dues.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland, (410) 239-7366; VHF/UHF/HF utilities. Radio Monitors Newsletter of MD. Meet irregularly.

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. RCMA Journal.

Regional Communications Network (RCN): Jay Delgado or Public Information Unit, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group. #10 SASE for info.

Rocky Mountain Radio Listeners: Mike Curta, P.O. Box 470776, Aurora, CO 80047-0776. Metro Denver, Colorado. All bands. Meets monthly 2nd or 3rd Sundays 1-4pm, Aurora Central Library.

Scanning Wisconsin: Ken Bitter, Dept. MT, S. 67 W. 17912 Pearl Dr., Muskego, WI 53150-9608, (414) 679-9442. Wisconsin. VHF/UHF. Scanning Wisconsin (\$2 for sample)

Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.

SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing): Bob Thunberg, Business Mgr., P.O. Box 196, DuBois, PA 15801-0196. Worldwide; SWBC, utilities. Shortwave Radio Today. \$23 annual in US. Sample \$2 or 6 IRCs. \$2 for award program info open to non-members.

Susquehanna Co Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801-0023. PA area; Scanning. Meets irregularly.

Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur. Meets 3rd Tuesdays 7pm Holland Big Boy.

Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.

Wasatch Scanner Club: Jon Van Allen, 2872 West 7140 South, West Jordan, UT 84084. State of Utah. VHF/UHF. Newsletter/directory.

World DX Club: Arthur Ward, 17 Motspur Drive, Northampton, England NN2 6LY (in USA-Richard D'Angelo, 2216 Burkley Drive, Wyomissing, PA 19610). Worldwide. All bands with emphasis on SW. Contact. \$20 overseas airmail. Meets every 6 weeks in Reading, UK.

Worldwide TV/FM DXers Association (WTFDA): P.O. Box 514, Buffalo, NY 14205-0514. Worldwide membership; TV DX, FM BC, VHF utilities. VHF-UHF Digest. Annual convention. \$20 annual in U.S. \$2 for sample.

Monitoring Clubs Outside North America

British DX Club: Colin Wright, 54 Birkhall Road, Cuffod, London, SE6 1TE, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine. Communication. L10 UK, L12 Eur, L16 ww. Sample 3 IRCs or \$2 US cash. Meets monthl in Twickenham (London).

DX Australia: P.O. Box 422, Moonee Ponds, Victoria 3039, Australia. MW, SW. DXers Calling.

DX Club of India: Navin Patel, 1-Dutt Niwas, 809 - M.G. Road, Mulund, Bombay-400 080, India. India; MW/SW/Ham. DX World (quarterly) Rs 50/-, 30 IRCs outside India. 3 IRCs sample.

DX Club Paulista: Marcelo Toniolo Dos Anjos, C. Postal 592, Sao Carlos - SP (Brasil), 13560-970. South America. Shortwave, including utilities. Actividade DX (in Portuguese).

Finnish DX Association: Mr. Arto Mujunen, Suomen DX-Liitto, P.O. Box 454, FIN-00101 Helsinki, Finland; +358-0-8512410 fax. Finland and worldwide. SW and CCB. Radiomaailma.

Friendship DXers Club: Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. Venezuela and Caribbean. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 kHz. Venezuelan membership free.

International Listeners Organization: Mohsin Abbas, St. Nisar Ali Shah Ahamed Pura, Sheikhpura, Pakistan, 1-(50359) 2-(50561). South Asia. Broadcasting. Listener Times.

International Radio Youth Club: G.M. Mostafa Kamal, Amla Wopda Colony-1, Kushtio-7032, Bangladesh

New Zealand Radio DX League: P.O. Box

3011, Auckland, New Zealand. MW, SW, FM, TV. New Zealand DX Times.

New Zealand DX Radio Association: Mr. R. Dickson, 88 Cockerell St., Brookville, Dunedin, New Zealand. MW, SW, amateur and utilities. Tune-In.

Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhpura, 39350 Pakistan; Pakistan; SWBC.

QSL Club de France: Patrick Frigerio, 40 Rue de Hagenau, 67700 Saverne, France. SWBC, pirates, CB-DX, hams, etc. Courrier (in French). 6 bulletins, 72 FF, EEC=16 IRCs, elsewhere 20 IRCs.

Shortwave Radio Communications Club: Atiqur Rehman, Dawood Street, Khalid Road, Sheikhpura, P.C. 39350 Pakistan. South Asia; MW/SW. The Amateur (Urdu language). Meets 1st Fri on SW Complex, S.K.P.

Southern Cross DX Club Inc.: Stephen Newlyn, G.P.O. Box 1487, Adelaide, SA 5001, Australia. Worldwide and Pacific. All bands. DX Post. \$25 annual in Australia. Meets last Fridays, 8pm, Thebarton.

Umbrella Organizations

Association of North American Radio Clubs (ANARC): Richard d'Angelo, 2216, Burkley Drive, Wyomissing, PA 19610. 18 member clubs across North America.

European DX Council (EDXC): Michael Murray, P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE, England. 16 member clubs across Europe.

South Pacific Association of Radio Clubs (SPARC): Arthur Cushen, 212 Earn Street, Invercargill, New Zealand.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Aug 6-7	Jacksonville, FL	Gtr Jacksonville Amateur Radio & Computer Show/ARRL N.Florida Convention, 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 Raffaelli (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 19-21	Bloomington, IN	ARRL National Digital Conference /TwinsLANARC, Paul Ramey, 16266 Finland Ave., Rosemount, MN 55068; NDCC Info Line (612) 432-1149, or Carl Estey at estey@skyler.mavd.honeywell.com. Presentation of papers, forums, all modes of digital communications. Location: Thunderbird Hotel near Int'l Airport, Registration \$45.
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 21 & Sep 18	Cambridge, MA	MIT Radio Society and Harvard Wireless Club Flea Market 9am-2pm, Albany and Main St., \$2 admission, Free off-street parking
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 north of Rt 14 on Rt 47. 6:30am. Talk-in 146.52 simplex.
Aug 31- Sept 3	Irvine, CA	RadioComm '94 / So Cal Area DXers (SCADS), CANCELLED!
Sept 11	Joliet, IL	Hamfest / Bolingbrook ARS, Ed Weinstein WD9AYR, P.O. Box 1009, Bolingbrook, IL 60440, BARS hotline (708) 759-7005. Location: Inwood Recreation Center, 3000 W. Jefferson St (Rt 52), 8am, \$5 at gate. Talk-in: 147.33, 224.54, 146.82
Sept 11	Du Quoin, IL	Hamfest & Computer Swap Meet / Shawnee ARA, Joey Helleny, KB9HNO, 600 South 16th St., Herrin, IL 62948, (618) 457-8114 Location: DuQuoin State Fairground, 8am-2pm. Talk-in 147.09/69 MHz.
Sept 11	Suffern, NY	Hudson Division ARRL Conv / Hudson ARC, Tom Raffaelli, WB2NHC, 544 Manhattan Ave., Thornwood, NY 10594, (914) 769-1486. Location: Rockland Community College Field House near I-87/287, 9am. Talk-in 147.165/765 MHz.
Sept 17-18	Peoria, IL	Peoria Superfest / Peoria Area ARC, P.O. Box 3508, Peoria, IL 61612-3508, (309) 685-6698. Location: Exposition Gardens, Northmoor University, 6am. Talk-in: 146.76/16. \$5 per day at gate. Scanner Forum Sunday by John Coker N9FAM.
Sept 18	Newtown, CT	Western CT Hamfest / Candlewood ARA, Box 3441, Danbury, CT 06813, (203) 743-9181. Location: Edmond Town Hall, Newtown, CT, 8am-1pm, \$4 admission, \$10 table, \$6 tailgating. Talk-in 147.12+ Radio Expo / Chicago FM Club, P.O. Box 1532, Evanston, IL 60204. Location: Lake Co. IL Fairgrounds, Rts 45 & 120, 6am-6pm. Talk-in 146.16/76. \$6 general admission.
Sept 24-25	Grayslake, IL	

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MT Convention '94: A Five-Year Milestone

With the fifth annual *Monitoring Times* Convention only a few weeks away (October 21-23), it is hard to believe the changes we are seeing. It's entirely possible that this will be the last "MT" convention!

Is the convention being abandoned? Hardly! With the launch of our exciting new magazine, *Satellite Times*, the convention will continue to expand, offering even more for our attendees. Formerly locked on terrestrial communications, we now reach into the boundless limits of space to usher in a new era: satellite communications.

Every aspect of our daily lives is impacted by satellites: radio and television broadcasting, telecommunications, law enforcement, personal communications, news gathering and distribution, navigation, defense, banking, scientific studies, space exploration, business and industrial negotiations, long distance correspondence and more.

Dozens of shortwave broadcasters have already hitched their wagons to the stars. Deutsche Welle, the BBC, VOA, Radio Moscow, Radio Netherlands, Radio Korea, Radio Australia, Israel Radio, Radio Sweden, Radio France, and many others are now offering continuous, high-fidelity, audio programming without the fatigue of fading and interference all too familiar to shortwave listeners.

This year's convention will recognize for the first time the growing emphasis on satellite communications. A live telecommunications terminal will be specially

installed at convention headquarters, allowing attendees to see firsthand some of the new horizons we will be exploring.

Monitoring Times will never drop its traditional topics of coverage, however. As our writers have often pointed out, when one user abandons a spot of spectrum, a new user generally moves in. Shortwave and the scanner bands will always provide entertainment and intrigue.

It is appropriate that this fifth anniversary convention commemorates where we have been and where we are going. This is a watershed year in which we focus on the "meat and potatoes" (scanning and shortwave broadcasting) that have given *Monitoring Times* its life, while acknowledging *Satellite Times*, our new offspring.

Somewhat symbolically, our opening forum is dedicated to the international broadcasters who are facing a similar watershed: how to move forward with one foot in shortwave and the other in the new world of satellites.

Convention reservations are at an all-time high, with exhibitor booth space rapidly selling out. If you haven't sent in your reservation, don't wait; do it now! Don't miss this fifth anniversary special *MT* Convention with over \$10,000 in prizes to be given away—ICOM radios, luxury accessories, and much more.

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