Vol. 15, No. 9 September 1996

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Printed in the United States

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- *How to Survive a Computer Virus*
- *MT Reviews Sangean ATS-909*

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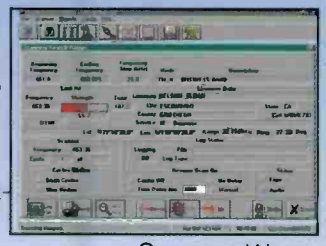

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Software support by ScannerWear for Windows (shown), Scan Star (not shown), ScanCat Gold (shown), Probe (not shown), and Wave for Mac (shown) and Visual Wavelinks by PER CON (shown).

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Monitoring Times™

Vol. 15, No. 9 September 1996

Cover Story

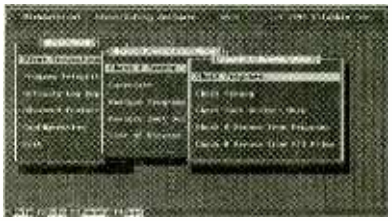
Shuttle Mission Monitoring

By Bob Grove

In Vol. 1 No. 1 of *Monitoring Times*, Bob Grove presented the most comprehensive list of NASA frequencies ever published in the hobby press. That list has changed very little over the years, but NASA's spectrum usage has. Last spring, Bob threw out the old list and went to the Cape armed with spectrum analyzer, directional antenna, and an open mind.

He wasn't disappointed, and you won't be, either. Two packed pages of frequencies should satisfy the next generation of shuttle monitors for years to come. See page 8 for the story.

In our cover photo, courtesy of NASA, Astronauts David Griggs, right, and Jeffrey Hoffman fasten snag-devices on the end of *Discovery's* remote manipulator system arm. If you'd like to have dinner with an astronaut, you can find out how on page 16!



DEPARTMENTS

Reviews:

In his third scoop in as many months, Larry Magne reviews the new Sangean ATS 909 portable shortwave receiver. The '909 follows in the footsteps of Sangean's finer offerings, such as the '803A, and at a very competitive price.

In Computers & Radio, John Catalano takes the first of two looks at WiNRadio, a representative of the new genre of "radio on your PC." Part one covers hard- and software installment. Next month we'll see how it works.

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LETTERS

Vive la Diference!

I'm sure you've noticed a couple of changes about your *Monitoring Times* this month, especially those of you who have a subscription to the magazine. The change that will hit you first is the fact that your issue was not mailed in a plastic polybag—a service we had to discontinue due to substantial increases in printing and production costs.

The other difference won't be obvious until two issues before your subscription expires. (See your label for the date of your final issue.) At that time, your renewal notice will appear as a wrapper attached to the magazine. If you tear out the perforated card on your first notice and mail it in with your payment, your subscription will continue uninterrupted. If you wait to renew until your last issue, you will probably miss a month.

Single-stapled into the center of the magazine you will find the Grove Buyer's Guide. Grove has purchased this easily-removed section as a monthly advertising supplement. If you would like to request information on other products sold by Grove, call their order line at 1-800-438-8155.

See MT for Quality and Diversity

"I just want to let you know that I appreciate the quality and diversity of your periodical. I read with keen interest the June 'Workbench' column and was inspired to create my latest DXing tool for AM. It is a long wire with an inductor located in my shack. By placing my AM broadcast band radio near the inductor, I turn my 6-transistor, 27-year-old Westinghouse into a pocket rocket. Works great on 160 meters with my S-120 Hallicrafter, too.

"I also read the July 'Below 500 kHz' column and finally identified the CW signal I heard last year while out in my back yard with my pocket AM radio. I was chasing some RFI from my neighbor's electrified fence, when I heard TVX in CW at the bottom of the dial.

"Wow, what a great hobby, and what a great staff you have. I read *MT* from cover to cover and then pass it along to others who are interested in the hobby."

—*Tim Woods* via email

REACTing to Our Cover Story

Some folks just have no appreciation for art! *Bob Leef* of Crest REACT Unit 1 in Mission Viejo, California, writes, "Curious cover on July *MT*! Manhattan skyline is recognizable, but what country is represented with the highway scene? A close look shows right-hand drive cars on the 'other' side of the road ..."

"We in REACT appreciate the feature article. Here in Southern California we have a toll-free information number (800) 99REACT. We're always looking for new members."

Don Aspinall says, "As well as spending a lot of time DXing on SW and MW I am a member of REACT here in the Williamsburg area of Virginia. As well as monitoring 27.065, I cover Coast Guard, GMRS, and national freqs on my scanner. In June I logged some 280 hours. I don't mind the hours I spend, as it may well save a life or even help a mother give birth, not to mention helping people simply needing road info.

"How can we stop all those inconsiderate #@! from using 27.065? To me it is a *major* complaint, especially since I'm volunteering my time for a community purpose.

"As I am writing this email I can hear several other states coming through loud and clear especially south of the border and a LOUDmouth in Louisiana who is reading 8's on my meter. At times I feel like just turning it off and leaving, but there could be someone who really needs the help *now*!"

How about it, readers? Can you recommend any tactics that have worked?

Correction

Author *A.W. Edwards* corrected a couple of typos in his article, "SWLing in the Early Forties," found on page 106 of the August issue. It should have read 75- and 160-meter radiotelephone instead of 70 and 260-meter, neither of which is amateur band.

So Far, the Nays Have It

In his July "Closing Comments" Bob Grove said, "CBers have REACT; hams have ARES and RACES; all SWLs and scannists have are radios. But what if we banded together, forming a cadre of trained, civic minded volunteers who could assist law enforcement agencies track down disruptive frequency abusers, assist other licensees in resolving interference problems, help homeowners and utilities companies cleanse the airwaves of electrical noise, and so on?" Reactions to the idea are mixed, but strong!

"I think it's a fantastic idea. In fact, I think such an organization can also be of assistance to ARES, RACES, and even Skywarn," says *Ryan McCarthy* of North Babylon via email. McCarthy says he listens to 2 meters and CB channel 9 in case someone calls for help.

He adds, "I think I have come up with a name: ALARM, which stands for American League of Assistant Radio Monitors. I think the name is perfect because radio monitoring is exactly what we would be doing."

"I do not approve of a national corps of 'scanner vigilantes.' There is entirely too much vigilantism already, whether the militias, self-appointed public library censors, etc. We simply do not need more people turned in to the police for bragging about smoking marijuana on their cordless phones! You need to get out of Podunk before you think up any more ideas that will complicate American's lives even more!"

—*Bob Morris,* Alexandria, VA

"NO scanner vigilantes!"

—*Darryl Porter,* Wash. DC

"I understand what you are trying to do: stimulate civic thought. I applaud you for that; goodness knows we need more constructive civic action in the radio hobby." However, *John Wagner* of Pickerington, Ohio, suggests we start with ill relatives or friends in our civic mindedness.

"The enemy of the very ill is not pain, it is time. Time drags. But, when they pick up a strange radio and hear foreign languages and long distance programs, their interest piques. So, in order to promote the hobby and to perform a civic duty, try loaning a simple portable SW receiver to an ill person."

Come see us at the Grove Communications Expo in Atlanta October 18-20! And turn this month and every month to *Monitoring Times*, your personal source for communications information.

—*Rachel Baughn,* mteditor@grove.net

An Advanced World Receiver for a Very Affordable Price

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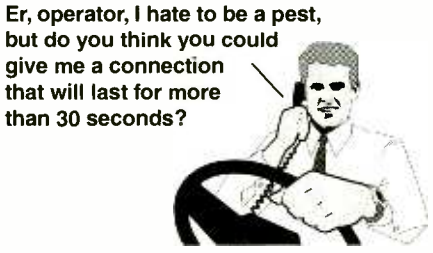
Unhappy Cell Phone Customers

How many cellular phone calls get cut off every day? According to industry sources cited by the *Wall Street Journal*, one million. According to users, that number appears to be an understatement. One sign of the discontent with the quality of cellular service is that 30 percent of the nation's 36 million cellular customers cancel their service or switch carriers each year.

That's not all. The 12 year old industry, though thriving, is beset with problems. Thieves have stolen Deborah Lawler's number three times; Jonathan Feinsod's four times. Now he has to punch in 20 numbers, including a four digit activation code and a four digit PIN plus the area code and number, all the while driving his car one-handed or with his elbows.



After all that, the call doesn't always go through. "I'm not a mechanical genius," says Feinsod. "Am I doing something wrong?" Even cell phone executives are not exempt. Michael Small, Chief Financial Officer for Sprint Corp's cellular spin off, brought along his cell phone on a trip back East. It was useless. His carrier, Ameritech, had "browned out" several cities to foil bandits. "My cell phone," says Small, "stayed in the briefcase."

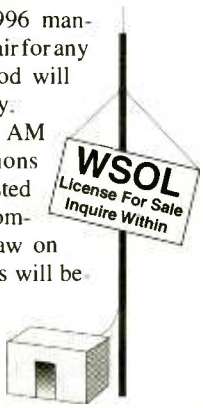
Bill Kalway, engineer with the satellite uplink truck from WXIA, Atlanta, was following the Olympic torch on its run into northern Georgia. He told *MT* he carries two cellular phones for contact with headquarters. Almost in the shadow of a cellular phone tower—a recent addition to these remote counties—he still has to resort to the expensive satellite phone. Why? It's the wrong system.

"I hate my phone," says Robin Fisher, a reporter for the Newark *Star Ledger*. "It's expensive, it doesn't work half the time, and the customer service people are so rude."

If only they had been told: They're not using a phone. They're using a radio. But we know that, don't we?

Bargain Broadcast Stations?

Radio stations that have "gone dark" had better get back on the air or lose their license forever. According to *Radio World*, the Telecommunications Act of 1996 mandates that any station off the air for any consecutive 12-month period will lose its license automatically.



Currently, there are 175 AM stations and 81 FM stations around the country that are listed as "silent." Since the Telecommunications Act became law on February 8, the first licenses will begin to expire on February 9, 1997. These could go cheap.

Could there be a radio station in your future? If you're looking for a broadcast personality, I have resumé and references available upon request.

A Faraday Cage for Hawaii?

The state of Hawaii has the cable and support structures, all $1.9 million worth. Now officials aren't so sure they want to go through with the project.

According to reports, radio waves from the nearby Coast Guard Omega Navigation station in Haiku Valley are electrifying a one-mile section of the H-3 Freeway. So 27 miles of cable were ordered and plans drawn up for a one-mile web of wires called a Faraday Cage to be erected over the highway.

The problem first came to light when construction workers on H-3 began getting shocked. The state, fearing lawsuits, then became alarmed that passing motorists and people with pacemakers might also get zapped. Now comes word that the Coast Guard wants to shut down the system in September of 1997. But people who track weather balloons say they need the Omega station, so it can't be shut down.

Says Marilyn Kalim, spokeswoman for the Hawaii Department of Transportation, "We're damned if we do and we're damned if we don't. We doing our best to find our way out of it, though."

Abandon all radios, ye who enter here...

Yes, it's Kentucky. The state that hates radios has been at it again.

Greg Godsey is, by all reports, a serious, articulate 17-year old. Licensed as ham radio operator KF4BDY, he serves as Christian County's emergency services coordinator, a position that requires him to carry a radio. He works part-time at a service station to earn money for his hobby and hopes someday to become a priest. All of that got turned on its head when Godsey was arrested on charges of possessing a police scanner.

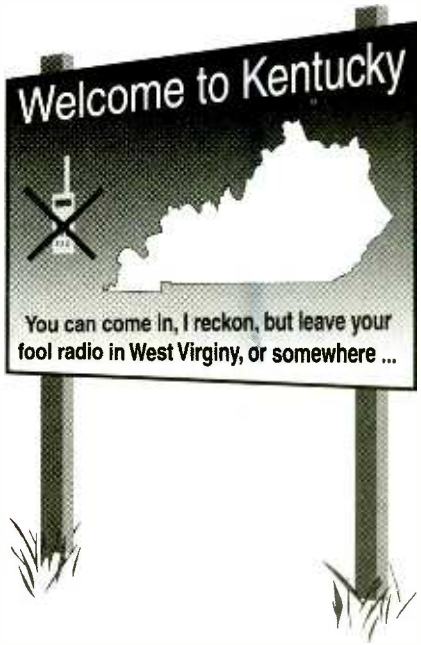
According to the *Kentucky New Era*, Godsey was riding his bike in Hopkinsville, talking on the "scanner" (actually a Radio Shack HTX-202 2-meter transceiver), when he was stopped by some children who said that their father wanted to speak with him. The father told Godsey that he had called the police.

When the arresting officer, Ernest Tibbetts, arrived at the scene, Godsey was talking on his radio "capable of receiving police frequencies" and "the neighborhood children were very upset." Officer Tibbetts says that Godsey told the kids that he was a special investigator and had tried to interrogate someone. Godsey denies this and says he hasn't had any disputes with any of the neighborhood children and doesn't know why someone reported him to police. The 2-meter rig was confiscated by police.

According to neighbors, Godsey has never been in trouble before. "I can't imagine him impersonating a police officer," says Matt Snorton, a local coordinator for the Disaster Emergency Service. "He's a fine young fellow."

At his court hearing on June 4, the judge dismissed the scanner charge, and Godsey's H-T was returned to him, after it was documented that the radio could not operate outside Amateur Radio frequencies. The other charges were continued until June 27, but that court appearance subsequently was postponed because the arresting officer was out of town.

If you're like us, you've cancelled your plans to vacation in Hopkinsville this year. However, an American Radio Relay League (ARRL) bulletin says that Godsey claims his arrest has had at least one positive impact—local ARES (Amateur Radio Emergency Service) membership has been growing since the incident.



800 MHz Scanning News

• The city of Edmonton's 16 channel 800 MHz system went "out to lunch" last month, leaving police, firefighters, and ambulance workers without communications. One senior firefighter said that he was told to find a pay phone if assistance was needed during an emergency call. The outages were brief but scary. "This is a very, very, serious matter," said a senior firefighter who was on a medical aid call and then a fire call when the incidents happened.

• Police in Los Angeles are complaining that the batteries on their $1,900 handhelds go dead just a few hours into their shifts. Los Angeles spent more than $13 million on some 7,000 Motorola Astro radios. Communications Division spokesman Linda Bunker told the police commission that the technology for batteries has not kept up with the technology of the computer-driven 200-channel radios.

• Columbus, Ohio, is going to 800 MHz. Pending funding from city council, the police department will replace their VHF system with an all-new system that will make scanning "impossible."

• Livonia, Michigan, is going to digital 800 MHz. According to Police Lt. Tom Yates, all scanner monitoring stops this month. Privacy wasn't the issue, says Yates. "We have had an aging system for some time for our police, fire, and public works communications," he said. "The new digital system will greatly improve quality and range." Livonia is a large suburb located just west of Detroit.

• Five of 18 State Police posts in Indiana have switched to an 800 MHz system. Don Kottlowski, commander of the communications division of the Indiana State Police, remarked that he'd like to see the entire state go 800 MHz. Officials claim that privacy is not the reason for the switch.

• Atlanta switched over to a Motorola system for the Olympics, and it is assumed they won't be going back to the 460 MHz channels. Where have they gone? Stay tuned—*MT* is digging (but not "down") for the answers.

What They'll be Missing

• When a 12-year-old Fresno, California, youth allegedly ran away to Canada with her 35-year old karate instructor, it was a scanner listener who brought the adventure to an end. A citizen in British Columbia who had heard the missing persons report on his scanner noticed the suspect's car in traffic and called Vancouver police. Without the alert scanner listener, says Vancouver PD's Gary Weishaar, "it was a needle in a haystack." Rick Couch, the karate instructor, had already been convicted of having sexual intercourse with a 13-year-old Fresno girl in 1990.

• An Irish Setter has been awarded a trip to Disneyland after it reportedly dialed 911 and saved her owner's life. According to *Dispatch Monthly*, the dog, Lyric, had been taught to hit the speed-dial, which was programmed for 911. Rescuers arrived to find the owner having a major asthma attack.

• Police in Morro Bay say that they were able to capture a man accused of robbing a motel at gunpoint with the help of a scanner listener. When the motel was robbed, the clerk was able to get the license number and make of the suspect's car. That information was broadcast over the scanner and an alert citizen called police when she noticed the vehicle. Police say that the robber may be the same man wanted in four other local armed robberies.

• David Geary and Louise Armstrong were working on a business project when they heard on the scanner that a house down the street was on fire. Geary stepped outside the house, saw black smoke pouring from the building, and started running. Inside, he could hear—but not see because of thick smoke—77 year-old Ruth Waters, moaning.

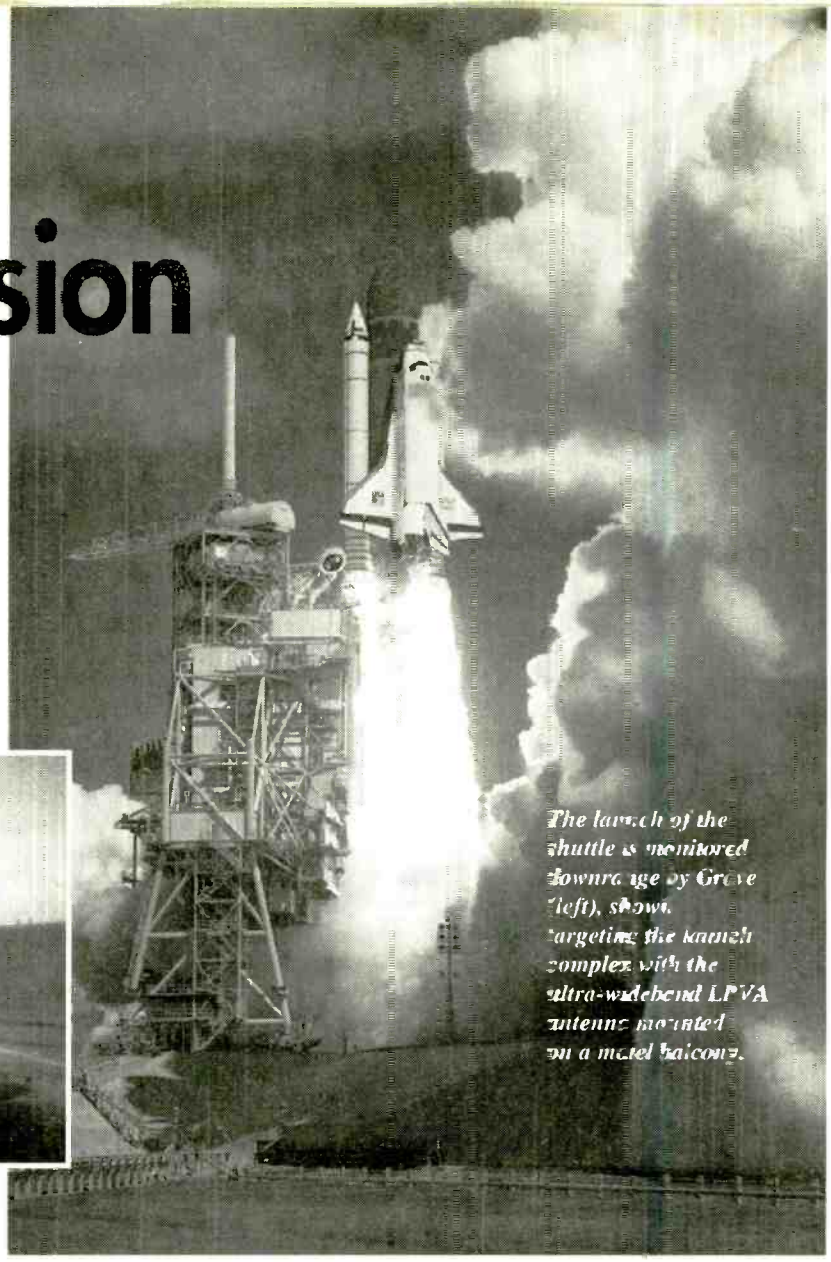
Geary entered the building three times, wrapping his shirt around his face to ward off the smoke and flames. He found the elderly woman, disoriented, and clutching her walker. Geary was able to coax the woman out the door where the police whisked her off to safety. Geary was awarded the Carnegie Hero Fund Medal for his efforts.

Communications is written by Larry Miller with help from Rachel Baughn and the following members of the *Monitoring Times* Communications Media Monitoring Team. Thanks to all of the "old hands" as well as the newcomers this month: Harry Baughn, Brasstown, NC; Warner Chapman, Lloyd Davenport, Southern Pines, NC; Bob Fraser, Cohasset, MA; John Mackey, Beaverton, OR; Paul McDonough, Somerville, MA; Lewis Miller, Reading, PA; Ira Paul, Royal Oaks, MI; Jim Pelham, Hopkinsville, KY; Doug Robertson, Oxnard, CA; Harry Shute, Edmonton, AB; Richard Sklar, Seattle, WA; Joe Thome, Los Banos, CA; Gary Timm, Milwaukee, Susan Wilden, Columbus, IN; WI, and Phil Yasson, Vancouver, WA. We also consulted the following publications and we list their names in appreciation: *ARRL Bulletin*, *Dispatch Monthly*, *Kentucky New Era*, *National Scanning*, *Radio World*, *WorldRadio* and *W5YI Report*

Shuttle Mission Monitoring

For the Next Generation

By Bob Grove



The launch of the shuttle is monitored downrange by Grove (left), shown targeting the launch complex with the ultra-wideband LPVA antenna mounted on a motel balcony.

March 21, 1996, was a crisp spring day on Florida's Gold Coast. The sun shone brilliantly from a blue sky, a beacon illuminating the sleek spacecraft waiting impatiently within an ungainly hardware assembly on Launch Complex 39, site of the historical Apollo lunar program, now home to the space shuttle.

It had been some 14 years since I published the first comprehensive table of active National Aeronautics and Space Administration (NASA) frequencies in the inaugural issue of *Monitoring Times* — a list which still comprises the backbone for listening by hobbyists around the globe. It was definitely time for an update!

My monitoring position in a Cocoa Beach motel, a few miles downrange, was fully outfitted. Signals would be captured by two experimental, portable antennas; the first was a frequency-agile ground plane, and the second a four-element, 30-2000 MHz, log periodic V antenna (LPVA), targeted on Kennedy Space Center (KSC) and Cape Canaveral Air Force Station (CCAFS).

Early in the morning, as the nation slept, a stalwart conclave of scientists, technicians, space buffs, and journalists watched with awe as thunder erupted once again from Launch Pad 39B. A sleek spire of space-age technology rose majestically on a brilliant tongue of flame which turned night into daylight, saluting Man's dream of adventure, and honoring the heroes who went before.

Ready to receive the signals were an ICOM R7100 receiver — upgraded with a Grove SDU-100 spectrum display unit, and a Radio Shack PRO-2006 — fully loaded with 400 previously-reported discrete frequencies. I wasn't disappointed. Upon connecting the antennas, the receivers came alive and, within minutes, I had verified dozens of active frequencies throughout the space complex. The antennas definitely worked!

After several hours of monitoring and logging, I headed for the Cape, a Radio Shack PRO-43 handheld scanner on my belt, to begin my tour of the space complex with fellow journalists of the press corps.

Signs of the Times

The halcyon years of America's Man in Space Program are past. As I arrived in the

Public Affairs Office (PAO), a press conference was being conducted by NASA Administrator Daniel Golden; his outlook wasn't encouraging.

Funds have been cut dramatically from the space program; much of the once-glistening facility is in need of repair. A takeover of the launch operations by commercial interests seems almost certain. Even the PAO is augmented by a legion of some 100 volunteers, retirees of the legend called NASA. Though the vision may be blurred, the deep feelings shared by these proud veterans are still very much alive.

As I climbed into the van, my mind drifted back nearly three decades — the date of my first visit to the Cape. I was invited to a special VIP tour of Launch Complex 39 and the Vertical (now "Vehicle") Assembly Building (VAB), then occupied by a giant Apollo spacecraft which was being readied for its history-making moon mission. Armstrong, Aldrin, and Collins were being suited up nearby, adrenalin rushing, as they anticipated the epoch adventure awaiting them.

Memory then called to mind the harsh image of the *Challenger* disaster, a shattered dream in which seven of our finest lost their lives. It was a setback from which the U.S. space program never fully recovered.

My daydreaming was interrupted by the scanner on my belt alerting me to activity on the launch pad. As my van approached the fixed service structure (FSS), the giant assembly shone in the morning sun. Soon the rotating service structure (RSS) which cradles the shuttle began its laborious, plodding rollaway, revealing within the gleaming white spaceship — *Atlantis*.

An overall view from the rear shows activity in the new Mission Control Center in Houston.

Listening In, 1996

Mornings are ideal times for monitoring. Radio maintenance checks keep the airwaves busy, revealing active frequencies and nets. Most communications are in the simplex modes; repeaters are rare at the Cape. The majority of communications are short range, most often between a base station and associated mobiles and handie-talkies throughout the complex. There is some administrative scrambling (Motorola DVP), but most contacts are in the clear.

The vast majority of communications are high band (142-174 MHz, narrowband FM mode), with some UHF (406-420 MHz), but virtually no low band (30-50 MHz) or 800 MHz activity was noted. Air-to-ground communications were busy in the usual 118-137 MHz civilian and 225-400 MHz military aeronautical bands (AM mode).

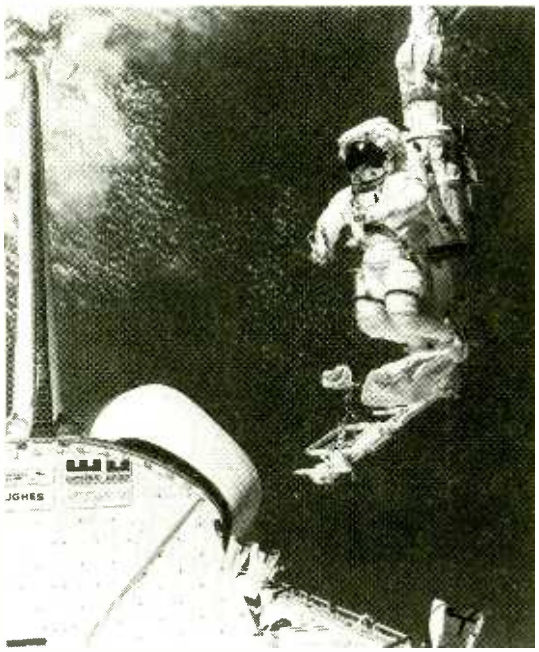
Communications at the Cape are somewhat informal, casual but brief. Protocol is observed, but it isn't stuffy. Status reports are frequent, such as updates of "phase 1" and "phase 2" lightning alerts during a passing thunderstorm prior to final launch preparations.

According to one retired Spectrum Manager, the vast majority of communications — and this would presumably include nearly all data transmissions — are now conducted by fiber optics. Still, data and telemetry bursts were readily detected on a wide variety of frequencies from 72-2000 MHz by the ICOM/Grove SDU package connected to the experimental rapid-deployment antennas.

Radio at the Kennedy Space Center continues to play a vital role in routine daily communications, as well as in launch preparation and support operations. A scanner doesn't remain quiet for very long. During the mission itself, many local listeners lock in on 146.940 MHz, an amateur radio repeater maintained at Cape Canaveral which rebroadcasts NASA Select audio. Nationwide, NASA Select audio can be heard over WA3NAN, the amateur radio club station at the Goddard Space Flight Center in Maryland. Tune them in on or near 3860, 7185, 14295, 21395, or 28650 kHz single sideband.

Thirty years have not dimmed our fascination with space travel, as symbolized by the space shuttle. The frequencies on the following pages represent the most accurate and up-to-date list currently in publication. They offer you an amazing variety of ways to monitor shuttle activities, whether on launch, in flight, or at touchdown.

This article and frequency list first appeared in the May/June issue of Satellite Times.



Some of the more interesting monitoring challenges are the occasional EVAs (extravehicular activities) aboard the shuttle.

Space Shuttle Mission Frequency Guide

NOTE: Frequencies marked with an asterisk were heard in use preparatory to, or during the STS-76 Shuttle mission on March 21, 1996. Reader comments are welcomed. All frequencies are in megahertz and FM mode unless otherwise indicated.

Antigua

5060 5436 6810 6919 7313 7332 7605 7765 7860 7919 9115 9138 9170 10310 10327 10475 10949 11407 11414 12160 13495 13943.5 14497 14585 14819 14891 14914 15528 15575 16216 17554 18237 18700 19143 19961 20272 22990 23413 23603 23940 24530 24760 26515 (All kHz, various modes are used)

Contingency — search & rescue:	11440 kHz (USB)
Fire/security police:	163.4875
Space shuttle range support:	264.8/284.1 (AM)

Ascension Island

2622 4500 4992 5775 5822 7313 7354 7605 7765 7804 7910 9043 10230 10780 10850 10880 10949 11407 11634 12107 13468 13878 14432 14497 14585 14615 14896 14914 14921.4 14967 16246 17554 18331 18434 18700 19126 19198 19371 20195 20390 20475 23035 23485 23603 23661 23840 24240 25245 25299 26356 23389 26684.5 27720 27870 27925 (All kHz, various modes are used)

Fire:	173.575
Space shuttle range support:	264.8/284.1/291.8 (AM)

Cape Canaveral Air Force Station, Florida

Air/ground control:	*284.0
Air rescue:	138.450 (AM)
Base commanders net:	149.535/148.065 170.575
Cape communications:	*165.1125
Cape tower:	*118.625/393.0 *118.625 *120.950 125.900 *126.650 128.150 *133.800 134.275 135.375 135.825 (AM)
Data links:	*403.000 (Pulsed tones) *1030 (Pulse every 14 sec.) *1680 (Pulse every 4, 10 sec.) *1749.5 *1750.5 *1757.2 *1758.2 *1820 (Pulse every 1-4 sec.)
Disaster operations (weather alerts, etc):	*163.5125 (ETR Net B)
Disaster preparedness net:	*148.650 (Data bursts)
Department of Energy explosive ordinance disposal operations:	409.475/412.700
Eastern Test Range command destruct:	406.5 *416.5 (Voice) 421.0 425.0 428.0 (Data)
Eastern Test Range FTS command alert:	*168.000 (tones)
Eastern Test Range instrumentation net:	*148.485
Eastern Test Range launch op. support:	*163.4375 165.0625 407.450
Eastern Test Range paging channel:	*165.0125 (ETR Net S)
Eastern Test Range — test range safety:	46.65 141.300 *142.125
Eastern Test Range — test range support:	229.0 253.6 270.0 (AM)
FCA net:	*163.5875
Federal Highway Admin. construction net:	*169.550
Fire:	*163.5625 (ETR Net F)
Flight support:	138.150 139.050 139.250 140.400 141.300 149.250 (All AM)
Helicopter control:	284.000 (AM)
Maintenance:	149.500 *150.150 (ETR Net N) 165.0625
Operations:	413.200/407.250
Operations security:	419.650
Ordnance Control/Missile loading net:	419.150
Public service agencies mutual aid channels:	154.160 (Fire NASA Net 316) 155.370 (Police NASA Net 303)
Radiation monitoring:	*164.500 (ETR Net Y)
Search and Rescue:	282.8 (AM)
Security:	*163.000 (ETR Net Z) *163.4625 (ETR Net D) *164.200 (channel 2) *165.0875 (Repeater DVP/clear voice) *170.125 *171.975
Seek Skyhook (Aerostat uplink):	440.0 445.0
Solid rocket booster recovery beacons:	240.0 242.0 (Data)
Space shuttle range support:	264.8 291.8 *294.6 341.6 349.6 *350.6 (AM)
Special projects:	413.450
Support services:	*165.0375
Titan III operations:	*148.515 *149.150
Transportation/Admin:	*407.225 413.075
TV audio:	*1799.75 (Computer lesson; spurious emission from another service?)
TV op. net for Eastern Test Range launches:	*148.035
U.S. Air Force miscellaneous frequencies:	74.75
U.S. Air Force Off. of Special Invest. (OSI):	*138.075/139.675 138.175 141.525
U.S. Army explosive ordinance disp.l (EOD):	49.70 49.80 148.700/143.025
U.S. Army research and develop. support:	36.70 40.90
U.S. Coast Guard maritime frequencies:	*156.600 *156.800 157.050 157.075 *157.100 157.175
U.S. Navy Aegis project support:	30.29
U.S. Navy FACSFAC Jacksonville warning area coordination net:	*267.5 *284.5 *349.9 369.9 385.1 (AM)
Utilities:	*150.195 (ETR Net C) *150.250 (ETR Net E)
Unknown use:	*400.050
Weather Balloons (Rawinsonde):	*403.0 (Data; pulse tones)

Edwards AFB, California

Air crew alert:	413.450
Air rescue:	138.450 (AM)
Air traffic control:	136.175 136.425 (AM)
Approach/departure control:	126.1/290.3 133.15/269.2 124.550 132.750/272.0 133.650/348.7 134.050 (AM)
Automatic Terminal Information Service:	116.4/269.9 (AM)
Civil engineers maintenance:	149.275
Command post (call sign-Conform):	304.0 311.0 (AM)
Control tower:	120.7/236.6/318.1 (AM)
Corps of Engineers:	163.4125 163.4375
Emergency 911 radios:	170.350
Explosive ordinance disposal:	148.200
Fire net:	173.4375
Fire/Crash net:	173.4125 173.5875
Flight support:	149.175 149.250 149.300 234.8 237.0 256.15 267.8 268.1 275.2 276.6 283.725 288.7 292.3 298.3 300.675 301.7 327.65 347.1 354.4 361.4 381.175 (AM)
Flight test A/G:	123.125 123.150 123.175 123.200 123.225 123.250 123.275 123.325 123.350 123.375 (also shuttle training aircraft) 123.400 123.425 123.450 123.475 123.525 123.550 123.575 136.225 (AM)
Flight test HF comm support:	5736.5 kHz
Ground control:	121.8/390.1 (AM)
Guards net:	171.150/166.225
Local control:	257.0 (AM)
Maintenance:	141.725/139.825 148.075 148.100 163.4625 163.5375 284.1 (AM)
Medical net:	173.4875
NASA air-to-ground:	371.1 382.6 395.1 (AM)
NASA facility support:	409.350/415.925
NASA flight test:	135.825 237.0 347.1 373.15 (AM)
NASA management:	409.900/417.250 412.050/417.450
NASA mission audio:	169.400
NASA paging net:	416.350/410.300
NASA shuttle training aircraft-op. control:	134.250 (AM)
NASA traffic control:	413.525
Paging:	413.500
Pilot to dispatch (PTD):	372.2 (AM)
Range communications:	170.400/171.000
Security:	148.225 149.9225/148.675 148.875
Shuttle support:	162.6125 164.100 165.6125 168.000 169.075 171.2625 173.6875/169.600
SRB operations:	407.225
Supply:	163.5875
Test range control:	3376 4455 4732 6750 6770 7330 8993 13204 18005 (All kHz and USB) 229.175 260.7 262.5 264.6 266.3 267.9 275.9 276.65 279.9 280.1 286.25 286.4 286.8 287.2 287.425 291.8 294.6 303.325 308.7 311.2 314.4 314.6 315.9 319.6 322.7 325.9 349.3 349.6 351.4 358.4 359.2 378.1 379.7 382.6 383.0 384.8 385.9 389.025 389.1 (All AM) 417.750/412.875
Trunking network:	406.350/415.950 406.750/416.150 407.150/416.750 407.950/416.950 409.350/417.550
U.S.A.F. Military Affi. Radio Sys. (MARS):	143.775/142.275
U.S. Air Force Office of Special Investigations:	138.075 138.175 141.525
U.S. Army:	229.6 367.3 367.6 (AM)

Kennedy Space Center, Florida

Administration (loan pool):	*173.5375 (NASA Net 111)
Base communications net:	*170.150 (NASA Net 107) *173.6375
Camera control:	407.575 412,850 *932.00625 941.00625
Civil Air Patrol:	*148.150 (Repeater output and simplex)
Cape Canaveral National Seashore:	*164.625 *163.150 (Department of the Interior)
Civil Defense:	158.940 (Transmit) 155.715 (Receive) (NASA Net 208)
Civil engineers/maintenance net:	*171.000 (NASA Net 101)
Crane operations:	*407.100 *409.525 409.775
Crane telecommand:	408.49375 408.96875
Crawler transport moves:	*916.0 (Pulses every 3, 3, 8 sec.) 929.0 *932.0 (Pulse every 3.8 sec.) 939.0 *1030 (Pulse every 14 sec.) *1104 (Pulse every 14 sec.)
Data link:	*409.925
Department of Energy communications:	167.850 *168.450 (Tone)
Fire/rescue:	*173.5625 (NASA Net 116/channel 1) *173.7875 (NASA Net 216-tactical channel 2)
Ground Control:	121.750 (AM)
Flight Service Station:	*123.600 (AM)
General maintenance net:	*171.150 (NASA Net 201)
Industrial Area Cranes:	412.825 (UHF-1) 412.950 (UHF-2) 413.025 (UHF-3) 413.150 (UHF-4) *413.250 (UHF-5) 413.375 (UHF-6) 413.525 (UHF-7) 413.550 (UHF-8)
Launch support operations:	*162.6125 (NASA Net 104)
Launch complex 39 convoy command:	407.325 (UHF-1)
Launch complex 39 VAB crane operations.:	*407.475 (UHF-2) 408.175 (UHF-4) 409.050 (UHF-6)
Launch complex 39 convoy purge:	408.150 (UHF-3)
Launch complex 39 operations pool:	408.800 (UHF-5) 409.125 (UHF-7)
Launch complex 39 convoy cooling:	409.175 (UHF-8)
Local Control:	126.650 (AM) Shuttle Training Aircraft (STA) weather conditions prior launch.

Space Shuttle Mission Frequency Guide

Marine operations:	162.0125 (NASA Net 306)
Measurements/safety:	*165.1875 (NASA Net 102)
Medical net:	*173.4375 (NASA Net 117) also UHF MED 1-10 channel pairs (463.000/468.000-463.975/468.975)
MSBLS/telemetry:	*165.6125 (NASA Net 202)
Orbiter operations:	*165.4125 (NASA Net 110)
Paging (voice):	*170.350 (NASA Net 308) *171.000
Public Affairs/Hurricane operations:	*163.5375 (NASA Net 108)
Public Affairs TV coordination:	*171.2625 (NASA Net 408)
Railroad operations:	*170.175 (NASA Net 206) *413.125 413.325
Safety:	*173.4625 (NASA Net 205) *173.6625 (NASA Net 105)
Security:	*173.175 (NASA Net 203/Tactical 2) *173.6875 (NASA Net 103) 173.8625
Shuttle landing facility:	
Emergency-civilian	121.5
Emergency-military	243.0
Ground operations	121.750
Air to ground control	126.3
Orbiter to ground	259.7
Orbiter to ground	296.8
Air to ground control	284.0
	*128.550/284.0 (AM)
Shuttle TV coordination net:	*171.2625 (NASA Net 408)
Supply (digital paging):	*150.325 (Repeater output/173.4875 repeater input) *170.400 (NASA Net 106)
TACAN:	1104.0 1146.0
Telemetry:	*409.925 *410.8625 *413.050 *1250.0 (erratic pulses) *1441.5 (Pulses every 14 sec.) *1780.0 (Erratic pulses)
Traveler Information Sservice (TIS):	1320 kHz (AM)
Transportation:	162.0125 (NASA Net 306)
U.S. Customs Service:	*165.2375 *166.4375 166.4875
Utilities:	*171.000 (NASA Net 101)
VAB to crawler transport duplex channels:	407.600 408.025 412.975 413.825
VAB crane operation:	410.1375 *410.8625 (Data)
Weather telemetry:	*409.925 *413.050
Wind telemetry:	418.075
Wireless mikes:	169.505 170.245 171.045 171.905

Malabar, Florida

FAA net:	172.850 (repeater output/169.250 repeater input) 166.175 172.175
Harbor common:	2716 kHz (USB)
Range clearance function:	2638 kHz (USB)
Space shuttle support:	5187 kHz (USB)
Solid rocket boosters recovery vessels:	2356 2622 2639 (Intership ops) 2716 2764 2800 2820 2837 3187 3365 5810 (All kHz) (plus various VHF marine channels)
Test range comm. to Ascension/Antigua:	6937 7833 9043 9132 10310 11104 11407 11414 11548 11622 13878.0 13986.1 14559.5 14896 14937 15610 17490 17668 18196 18237 18355 18769 19304 20189 20195 23413 23581 24240 24760 27720 27870 (All kHz)
U.S. Air Force Eastern Test Range control:	2622 5810 7765 10780 11615.5 13878 20195 20390 (All kHz)
U.S. Air Force emergency hurricane net:	3365 4900 5350 7412 10305 (All kHz)
U.S. Navy to Atlantic aircraft:	3120 4704 5718 6693 6708 6723 9006 11205 11252 13227 13237 15021 15051 15057 15067 18009 (All kHz and USB)
U.S. Navy to Atlantic ships:	2357.5 2764 2800 3187 4521 4766 4856.5 5180 5190 5246 6897 7461 7676 (All kHz and USB)
U.S. Navy Atlantic ships/aircraft:	2836.5 kHz (USB)
U.S. Navy surface radar:	*1250 MHz

Melbourne, Florida (Miscellaneous)

Data:	*908.000 (Pulse every 1, 3, 5 sec.)
FAA:	*269.300 *348.700 *379.250 *998.000 (Pulse every 14 sec.)
FAA DME:	998.0
FBI:	*167.7875 (Repeater output)
National Weather Service broadcasts:	162.550
U.S. Air Force:	*141.850 (Unmodulated carrier)

Merritt Island, Florida

Solid rocket booster maintenance net:	407.225

Patrick AFB, Florida

Administrative (U.S. Navy):	138.375
Air defense:	148.125 (AM)
Air Force Reserve training:	138.275 138.475 (AM)
Air National Guard administration:	408.000 408.050
Air National Guard maintenance:	141.625
Approach control:	121.050 *125.450 *127.850 (AM)
Approach/departure control:	*132.65/340.9 *134.95/358.3 (AM)
Approach radar:	*1265.0 *1345.0
ARIA aircraft radar:	1441.5
Automatic Terminal Information Sservice:	*119.175/273.5 (AM)
Civil engineers:	*171.3875 173.4125 173.5125
Clearance delivery:	*118.400/289.400 (AM)
Command channel:	407.525 413.225 413.400
Commanders net:	*149.535 148.065
Command post:	311.0 321.0 (AM)
Communications/navaid repair:	413.000
Consolidated comm. post (call sign Mayaap):	138.3/383.0 (AM)
Contingency (Eastern Test Range):	141.725
Control tower:	*133.750/348.400 (AM)
ETR test range control:	46.850 49.850 324.7 (AM) 340.8 (AM) 407.300 413.100
FAA flight check:	135.850 (AM)
FAA telemetry:	*1265.0 *1345.0 (Wideband swept pulse)
Fire:	172.300 (Tactical 2-Simplex) *173.5875 (Tactical 1-Dispatch/Explosive Ordinance Disposal)
Fire alarm:	138.925 (data)
Fuel Farm:	*165.1625
Geodetic survey detachment 4:	141.475/143.075 142.475
Ground control:	*124.350/335.800 (AM)
ILS glide slope:	330.8 (Rwy 20) 331.4 (Rwy 2)
Instructional TV audio link:	1799.75
Launch operations (ETR):	266.2 308.95 320.050 (AM) 413.500
Local control:	126.650 128.150 133.800 (AM)
Marine channels:	156.300 156.575 156.800
Medical:	173.4375
Motor pool/taxi:	*165.1375
Mutual Aid-Fire:	154.130
Mutual Aid-Medical:	154.160 155.160 155.340
Mutual Aid-Police:	155.370
Navaid maintenance:	407.375
Paging:	142.675 931.8375 (digital, leased)
Pilot to Dispatcher (PTD):	*122.850/372.200 (AM)
Possible security channels:	407.400 407.425 413.350 413.475
Radar (IFF):	1030.0
Ramp control/Base operations:	*173.125
Regional approach control:	*290.8 297.2 369.2 372.8 378.8 (AM)
Search and rescue:	236.0 251.9 252.8 (AM)
Security:	*163.4875 (Tactical channel 2) *173.025 (Tactical channel 1)
Security (AFTAC):	*413.275
Seek Skyhook surveillance balloon telemetry:	1749.5 1750.5 1757.2 1758.2 1820.0
Special operations:	282.4 (AM)
Supply and transportation:	*149.265
TACCS training:	*412.875
Training:	138.400 139.650 139.700 141.600 142.300 143.800 148.050
Training Operations:	225.350 316.275 351.2 *363.9 383.2 385.7 395.1 (All AM)
U.S.A.F. Military Affiliate Radio Sys. (MARS):	142.150 *143.450 (Repeater output)
U.S. Air Force Office of Special Investigations:	138.075 (Repeater output) 138.175 141.525 (Repeater input)
Weather (Metro):	344.6
Weather balloon telemetry:	1680.0
Wireless mike:	170.305
71st rescue squadron maintenance:	148.095 148.175
301st rescue squadron maintenance:	148.100 *149.300 163.5875 164.175
71st/301st rescue squadrons:	413.300
Unknown use:	*142.400

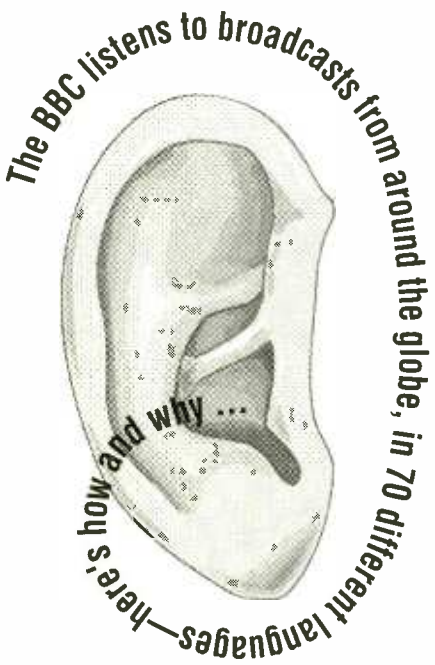
NASA General Frequencies

NASA HF air-to-ground:	3089.5 6743.5 9003.5 11192.5 15062.5 (All kHz and USB)
NASA emergency net:	3385 3395 4604.5 6982.5 14455 (All kHz and USB)
NASA shuttle emergency landing site net:	408.150 408.800
NASA NCS HF net:	2360 3379 3388 5403.5 5821 5961 6106 6108 6809 9462 11801 12129 12219 13633 13744 13780 14836 14989 14908 15464 16201 16430 18744 20063 22983 23390 (All kHz and USB)
NASA nationwide assignments:	162.1125 162.9875 163.100 166.525 166.8375 167.0125 167.350 167.400 167.775 168.350 168.4125 168.9375 169.2125 171.5125 171.6375 172.0375 172.3375 172.9625 173.425 173.900
Search and rescue operations:	282.8 (AM)
Solid rocket booster recovery beacons:	240.0 242.0 (Data)
Shuttle to ground:	
FM voice to Mir	139.300
FM voice to Mir	143.600
Amateur SAREX downlink	145.840 AM
Emergency only	243.0 259.7 (primary UHF) AM
EVA channel	279.0 296.8 (secondary UHF) AM
EVA	410.0-420.0
S-band tracking	2106.4
Orbiter OI transmitter: PM TT&C	2217.5
Orbiter DFI transm.r: voice, data, video	2250.0
PM primary	2287.5
Ku-band telemetry	15003.4 GHz

The "Ears" of Britain

You see a reference to "BBCMS" wherever broadcast information is found. Just what is the BBC Monitoring Service?

By Colin Miller



Have you ever wished that you could have a job related to our hobby? I am sure that most of us would jump for joy at such an idea! Unfortunately, this is rarely possible, but during the early eighties, I was one of those lucky ones. While living in South Africa, I was fortunate to work at the South Africa Broadcasting Company's (SABC) Panorama Receiving Station near Johannesburg, where my duties included assisting with frequency planning for the (then) Radio South Africa (RSA), as well as being in charge of their Monitoring Panel.

On a very small scale, I was performing the same task as the impressive monitoring station located near London and operated by the BBC. If you're a regular reader of *Monitoring Times* and you've followed DX shows and club magazines, you've seen many references to the BBC Monitoring Service and may have wondered what and where it is. Well, read on for a behind the scenes tour.

Upon the outbreak of the Second World War in 1939, the impact of radio propaganda was becoming evident. Hitler and Mussolini had made growing use of the new medium for a number of years. The need for a full-scale professional watch on foreign broadcasts became imperative. Therefore the Monitoring Service was set up in September of that year, at which time it was based in makeshift huts at Wood Norton Hall, near Evesham in Worcestershire. It rapidly expanded, and within the first year was employing 62 monitors working around the clock. The Monitoring Service moved to its present home at

Caversham in 1942.

The heart of the operation is located at Caversham Park, a large mid-nineteenth-century mansion set amid 90 acres of green fields and woodland in what used to be rural south Oxfordshire, but is now the outskirts of the growing town of Reading. This industrial town, 40 miles west of London, stands on the River Kennet near its junction with the Thames. It is noted for its university as well as its baking industry. Henry I lies buried here in the remains of a Norman abbey. Irish-born author Oscar Wilde wrote his famous "De Profundis" and "Ballad of Reading Gaol" during his imprisonment in Reading.

The previous building on the present Caversham site was built in the 18th century by Lord Cadogan, Chief of Staff to the first Duke of Marlborough. In fact Thomas Jefferson, then US Minister in Paris, visited Caversham Park in 1786.

There are currently two main departments at BBC Monitoring: the Editorial, which listens to the broadcasts, edits, and publishes them; and Resources, responsible for the technical facilities. The Editorial Department incorporates the former Reception and News and Publications Departments.

Resources Department

The technical facilities include the operation of a separate receiving station at Crowsley Park, about four miles to the north, where broadcasts are received and fed to the monitors at Caversham. About $4 million has been spent during the last three years on upgrading facilities, and digital technology has been employed to improve links with the receiving station.

The road to Crowsley is a typically English country road bordered by leafy hedgerows, and very narrow—hardly wide enough for two cars to pass. In contrast to the manicured lawns and gardens at Caversham Park, the setting at Crowsley is more informal and rural. In fact, the land on which the antennas are situated is hired out to farmers as grazing for cattle and sheep. Bird-life is also profuse.

Ninety new Watkins Johnson receivers have been installed in the old radio room at Crowsley, replacing Racal and Plessey equipment. These can be connected to any one of 32 antennas. Each of the receivers is remotely tuned from the Listening Room at Caversham via digital connections. The antennas are set at 20 degree intervals around the compass. Before the upgrading, individual receivers could be connected to only one of six antennas.

There are various types of antennas in use at Crowsley. A curtain array points in a westerly direction. Before satellite feeds became commonplace it was used to pick up VOA transmissions from the US, which were then fed by landline to the Woofferton relay station in Shropshire. There are also a number of beverage antennas, which are approximately 3,300 feet, i.e. about 3/4 of a mile, in length. A number of rhombics complete the antenna farm. These are about 30 feet high, and each side of the diamond is 90 feet long.

In the Listening Room at Caversham, operators digitally tune the receivers at Crowsley Park to the required transmissions for the news monitors. The operator has a schedule of the transmissions required, which lists the best frequencies on which the required transmissions can be heard. The best receiving antenna is also selected. These transmissions are fed through to the news monitors.

Formerly only the HF broadcasts were monitored; today satellite transmissions are monitored as well, and broadcasts in approximately 70 languages are observed. The information gathered goes not only to the BBC's newsrooms, but also to commercial subscribers, British government departments, the press, and other bodies concerned with international affairs.

Television is also important as a news source, and the operation relies on satellite signals from 16 dish antennas to receive pictures from the Commonwealth of Independent States, Europe, the Middle East, and Africa. As with the shortwave operation, there has been a large investment in satellite receiving equipment. Satellites operating on any of the three frequency ranges used for satellite TV can be received from 69 degrees West to 68.5 degrees East. Radio is also on satellite, and 32 radio stations are picked up in high-quality audio from satellites.

Remote Receiving

Of course, not all broadcasts can be heard in England. There are currently three staffed overseas stations, located at Nairobi, Tashkent, and Moscow. Increasing use is also made of unstaffed remote receiving sites, which feed signals back to Caversham for monitoring. In the past, BBC Monitoring had no option but to locate staff "on the spot" for monitoring some parts of the world. However, sending people overseas to work is expensive and it is now often much more cost-effective to pay the line charges to feed the signals back to the UK.

For many years BBC Monitoring has kept close ties with the Foreign Broadcast Information Service (FBIS), their parallel entity in Washington. They operate a full exchange agreement on all the information they monitor between them.

Editorial Department

The Editorial Department listens to the broadcasts and writes down what it hears. Voice broadcasts are listened to either live, in order to provide speedy reporting of important news-breaking events, or recorded, so that the broadcast can be played back for the greatest accuracy in translation.

The news monitors are rigorously tested and are expected to be capable of producing

A mid-19th century mansion at Caversham Park is home to "the Ears" of Britain.

copy that is of a publishable standard. Many of the monitors are multiskilled and work as editors producing the final publications as well as translating the news.

The monitors often have the monotonous task of listening to the same broadcasts each day. They can therefore detect any departure from the normal program pattern, which often indicates that something unusual is about to happen—for example, a coup. If trouble is brewing almost anywhere in the world, the local radio station is monitored hour by hour as long as manpower permits.

BBC Monitoring has provided many scoops for the BBC World Service News Department and the domestic TV and radio newsrooms. Full coverage has, for instance, been given to broadcasts from the countries involved in all aspects of Middle Eastern politics.

Monitoring staff were under great pressure in the late seventies and early eighties with great strain being put on their limited resources by the crises in Iran and Afghanistan. Developments in Africa and Asia have also required much attention. One of the major commitments during the Cold War was the reporting of events, official statements, commentary, and propaganda from the former Soviet Union and other communist countries.

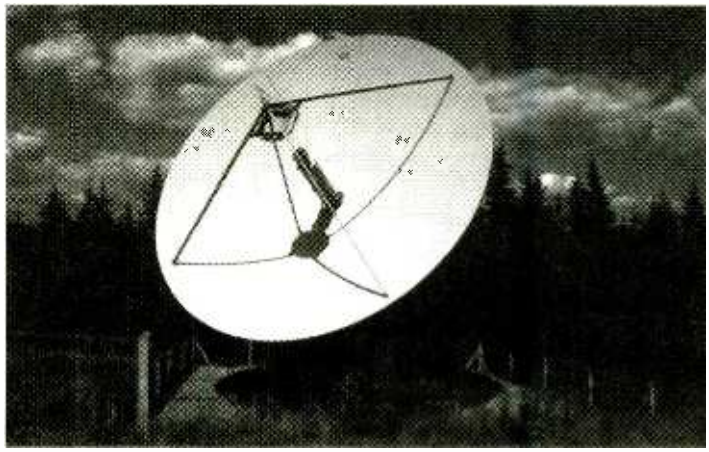
The news monitors and editors are all housed in an enormous hall just off Reception, partitioned into areas for different language groups.

■ Technical Operations

Upstairs is where the technical monitoring is carried out. This department produces all the information on spectrum occupancy which is required by the Frequency Planning Unit at Bush House in London. In addition to producing seasonal spectrum occupancy reports, the following tasks are carried out:

- At the beginning of each broadcasting season, all BBC transmissions are checked to confirm they are actually on the air; co-channels are noted. Adjacent channels are not checked because there are so many BBC broadcasts that this would take too long!
- All transmissions of the High Frequency Coordinating Conference (HFCC) broadcasters are checked to ascertain that they are actually using the frequencies notified. The HFCC is a group of major international broadcasters who get together twice a year to coordinate frequency usage. Among the members are BBC, Deutsche Welle, VOA, France, Russia, Switzerland, Norway, Sweden, and several religious organizations, including Trans World Radio.
- On request, reception reports are provided for other HFCC member broadcasters, advising signal strengths and co-channel or other interference.

The technical monitoring was originally done at the old Tatsfield Receiving Station on the North Downs, just south of London. It was set up in 1929 as a technical monitoring station rather than for program monitoring. One of its main jobs was to check that BBC and foreign stations were operating on their correct frequencies.



Satellite broadcasts are also monitored by the BBCMS, in addition to medium and short wave broadcasts.

It also served as the pick-up point for the above-mentioned VOA relay station at Woofferton. The shortwave broadcasts were received at Tatsfield and the audio then fed to Woofferton for rebroadcast. In 1974, Tatsfield closed down, and its staff and duties were transferred to Crowsley. Thus, Crowsley Park is doing several different jobs—the technical monitoring, acting as the VOA's relay, and picking up the signals for BBC Monitoring.

■ Publications

BBC Monitoring is able to receive and supply to its customers material from stations, principally in the Far East and Latin America, which are inaudible in Britain. BBC Monitoring produces a number of publications giving news and information regarding current events and broadcasting throughout the world.

The *Summary of World Broadcasts* is a distinctive publication providing accurate and comprehensive coverage of international political and economic affairs. Summaries of broadcasts and news bulletins are published together with verbatim extracts, or in the case of important speeches and events, the complete text. Reports contain no additional comment or interpretation and the original source of each item is credited, so you can be sure the information is reliable and impartial.

The *SWB* covers five geographical regions: Former USSR, Central Europe and the Balkans, Asia-Pacific, Middle East, and Africa, Latin America and the Caribbean.

■ Foreign Media Unit

Of particular interest to the DXer, however, is *World Media*, published by the Foreign Media Unit and available in two parts: *Broadcasting News* (also called World Broadcasting Information), and *Broadcasting Schedules*.

World Media tells you what broadcasters around the world are doing, what they are saying about their competitors, and the broadcasting scene in their country. *World Media* covers cable, satellite, and terrestrial television and radio, new and emerging stations, changes in broadcasting regulations, statistics, program policies, and clandestine, unofficial, and religious broadcasters. News is reported with relevant background information and editorial analysis, so you can build a clear picture of emerging trends.

The *Broadcasting Schedules* are an invaluable service, providing schedules and frequencies for international, domestic, clandestine, and religious radio and TV stations worldwide. *Broadcasting Schedules* covers an overview of the station's setup and affiliations, times of news and current affairs programs, languages and hours of broadcast, and, of course, frequencies.

All publications are available not only in hard copy, but also by electronic mail. The Worldwide Web Homepage is: **http://www.monitor.bbc.co.uk** and their regular mailing address is BBC Monitoring, Caversham Park, Reading, RG4 8TZ, United Kingdom.

As you can see, then, a lot of work goes on at BBC Monitoring, which can certainly be considered to be a DXer's paradise! For me personally, Caversham is a far cry from Panorama, and a place I still dream about visiting.

I'd like to acknowledge Chris Greenway and Stephen Innes of BBC Monitoring, and Kathy Otto of Sentech, South Africa, who visited Caversham in 1995, for their help in preparing this article.

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A Feast for Ears and Palate

By Larry Van Horn
Expo '96 Publicity Chairman

Each year, the highlight of the Grove Communications Expo has been the Saturday night banquet and convention speaker. Such luminaries as Richard Carlson (Director VOA), Larry Magne, Dick Tauber (CNN), Carole Perry, Ian McFarland, and Joe Adamov (Radio Moscow) have keynoted the Expo banquets in past years.

This year's keynote speaker is special for a variety of reasons. He has flown twice into orbit on NASA's space shuttles. He was only the second astronaut in history to operate an amateur radio station from a shuttle in orbit. He is an astronomer and accomplished scientist. He is NASA Astronaut, Dr. Ron Parise, WA4SIR.

Ron was born May 24, 1951, in Warren, Ohio. He is the son of Mr. and Mrs. Henry Parise of Warren, Ohio. After some prodding, Ron enrolled in a novice amateur radio class with a friend. By age eleven, he had passed the test and earned a license. "I had a Hallicrafters SX-100 that I used to listen to shortwave," Ron told *Monitoring Times* in a 1990 interview. "I was quite a radio buff."

But Ron also had stars on his mind, and his education in later years reflected this interest. He received a bachelor of science degree in physics, with minors in mathematics, astronomy, and geology from Youngstown State University, Ohio, in 1973. In 1977 and 1979, Ron received his master of science degree and a doctor of philosophy in astronomy from the University of Florida in Gainesville.

Over the years, Ron has held many amateur radio callsigns. He was the first ham radio operator in his family. "My dad later became interested in ham radio and got his ticket," Ron said. "We have regular schedules on 40 meters to keep in touch."

What areas of amateur radio interest Ron the most? "I enjoy 40 meter ragchewing," Ron said. "I also like experimental forms of communication." Ron has even communicated through several of the OSCAR (Orbiting Satellites Carrying Amateur Radio) satellites from his home station in Maryland. Ron is a member of the Goddard Amateur Radio Club, WA3NAN.

Amateur radio is not Ron's only hobby. He also enjoys scuba diving, sailing, hiking, and camping. His professional prowess in astronomy extends worldwide, as he is a member of several organizations including the American Astronomical Society, the Astronomical Society of the Pacific, the Association of Space Explorers, International Astronomical Union (IAU), Sigma Xi, and Phi Kappa Phi.

Astronaut Ron Parise, Expo keynote speaker, is shown at AMSAT terminal aboard the Space Shuttle.

Dr. Parise is a senior scientist in the Science Programs Department, Computer Sciences Corporation, in Silver Springs, Maryland. He is a member of the research team for the Ultraviolet Imaging Telescope (UIT)—one of the instruments that flew on STS-35 and STS-67 as part of the Astro 1/2 payloads. Besides working on UIT, Ron has performed ultraviolet astronomy using NASA's International Ultraviolet Explorer (IUE). He has studied the circumstellar material in binary star systems and is currently studying the evolutionary status of stars in globular clusters.

Ron has logged over 615 hours in space as a member of the crew of space shuttle *Columbia* for STS-35, and the space shuttle *Endeavor* for the STS-67 mission. He is currently assigned to the Goddard Space Flight Center Laboratory for Astronomy and Solar Physics in Greenbelt, Maryland. He is a member of the research team analyzing ultraviolet images returned from the STS-67/Astro-2 space shuttle flight.

Tickets for the Saturday night's banquet are $25.95 and seating is limited. You should make your banquet reservations as soon as possible to ensure a confirmed reservation.

Folks You'll Want to See

Exhibitors have been signing up for the Expo at a steady clip. Exhibitors that will be at the Expo as of presstime include: AMSAT, Atlanta Astronomy Club, Bay Area Scanner Club, Bearcat Radio Club, Cellular Security Group, Christian Science Monitor, Computer Aided Technology, Dallas Remote Imaging Group (DRIG), Drake, Electronic Distributors (EDCO), Grove Enterprises, ICOM, Image the Earth, *Monitoring Times*, Optoelectronics, Radio Astronomy Supplies, Radio Progressive, *Satellite Times*, Scan Master, Signal Intelligence, ScanStar, Society of Amateur Radio Astronomers (SARA), Sony, Swagur Enterprises, Transel Technologies, and Woodhouse Communications. A few booths are left, and companies, clubs, and broadcasters can get more information by contacting one of the following:

Debbie Davis	*Satellite Times* Advertising Manager (704) 837-6412 or via email: debbie@grove.net
Beth Leinbach	*Monitoring Times* Advertising Manager (704) 389-4007 or via email: beth@grove.net

Complete details on the Expo 96 are available at the Grove Internet home page. Point your web browser to URL address: **http://www.grove.net/hmpgexpo.html** for the latest information and Expo updates. You can also register for the Expo by sending email to the following address: expo96@grove.net. An automatic Expo information service is available by sending email to expo96-info@grove.net.

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The more than 50 forums, equipment demonstrations, tours, new products, and special events are only part of the Grove Communications Expo 96 at the Atlanta Airport Hilton October 18-20, 1996. The best part may not be on the schedule—meeting and monitoring with other radio enthusiasts. Do yourself a favor: Don't miss the radio event of the year.

GROVE COMMUNICATIONS EXPO

Mark Your Calendars: October 18-20, 1996!

If you are interested in **electronic communications**, the **Grove Communications Expo** is your event of the year! Expo '96 in Atlanta, to be held **Oct. 18-20**, unites you with hundreds of like-minded communications enthusiasts who assemble to **exchange information, introduce new products, and offer technical help.** This is an outstanding opportunity for you to move into the information age! This year's expanded program includes over **50 seminars, forums, demonstrations and events** in the following areas:

- **Computers and the Internet**
- **Shortwave and scanner monitoring**
- **Satellite communications**
- **Radio astronomy**

As in recent years, the Expo will feature exhibits by top-name vendors, a hands-on listening post, club booths and prizes. Tours will be conducted to the **Delta Communications Center, Atlanta Fire Communi-cations, Atlanta/Fulton County Communications Center** and more.

Keynote speaker at this year's banquet will be **Ron Parise, NASA astronaut** and astronomer. Parise, WA4SIR, has made two trips into space aboard the shuttle and operated the shuttle's amateur radio experiments (**SAREX**). Several special workshops, forums and exhibits will be sponsored this year by the Society of Radio Astronomers (**SARA**), which will be conducting their fall conference in conjunction with the Expo!

This year's scheduled exhibitors include **AMSAT, Bearcat Radio Club, Cellular Security Group, Computer Aided Technology, Dallas Remote Imaging Group, Drake, Electronic Distributors (EDCO), Grove Enterprises, ICOM, Image the Earth, OptoElectronics, Radio Astronomy Supplies, Radio Progressive, Scan Master, ScanStar, Signal Intelligence, Sony, Swagur Enterprises, Transel Technologies and Woodhouse Communications.**

Atlanta Airport Hilton
October 18-20, 1996

Registration $55 per person (take $10 off if you bring a first-time registrant). Banquet $25.95. Rooms at the Airport Hilton available at the convention rate of $76 per night, single or double occupancy. Call 1-800-Hiltons.

For more information and schedules, set your web browser to **http://www.grove.net/hmpgexpo.html**, e-mail us at **expo96-info@grove.net**, phone us at **1-800-438-8155**, or fax us at **1-704-837-2216**.

Inside the Hallowed Halls of

Harry Wong and Steve James from 104 FM Select in Hong Kong did their show from the convention floor.

NAB 96

A Hobbyist's View of the National Association of Broadcasters Convention in Las Vegas

Story and Photos by Bob Rusk

With exhibits taking up more space than 14 football fields, letting a true lover of radio into the National Association of Broadcasters Convention is like letting a kid loose in a candy store. NAB '96 was so huge that the April event—billed as the largest gathering of radio and television professionals in the world—filled both the Las Vegas Convention Center and the nearby Sands Expo Center. More than 1,000 companies displayed their newest wares.

I worked in radio as a disc jockey, news director, and producer for 15 years, but I never had the pleasure of attending an NAB convention during all that time. This was my first opportunity. Now, as a professional writer who covers the industry, I had access to all of the booths as well as the movers and shakers who spoke at the sessions.

The changes the broadcasting industry is undergoing are mind-boggling. Everything from the Internet and unmanned stations to new ways to sell advertising and the latest FCC changes were discussed. There was much to interest the DXer.

"1-888-FCC-TALK"

It was announced at one of the sessions that the FCC would be installing this new toll-free phone line (which, if you're using numbers, is 1-888-322-8255) in order to be more accessible to the public. If you have questions or complaints, this number connects you to the FCC's national call center in Gettysburg, Pennsylvania. However, it was also announced that the FCC would no longer be acting on complaints such as noise interference.

Legendary medium wave DXer Patrick Martin (who was profiled in the December 1990 issue of *Monitoring Times*) attended the session and later told me he was disappointed by this switch in policy.

"It was so helpful when the FCC used to act on complaints," Martin said. "An inspector would come out with direction-finding equipment and track down the cause of the problem. But now they want the private sector to handle disputes."

I called the national center and found out this is, indeed, the way it works. A recorded message told me, "If you're calling about a problem involving interference to home entertainment equipment, please press 1."

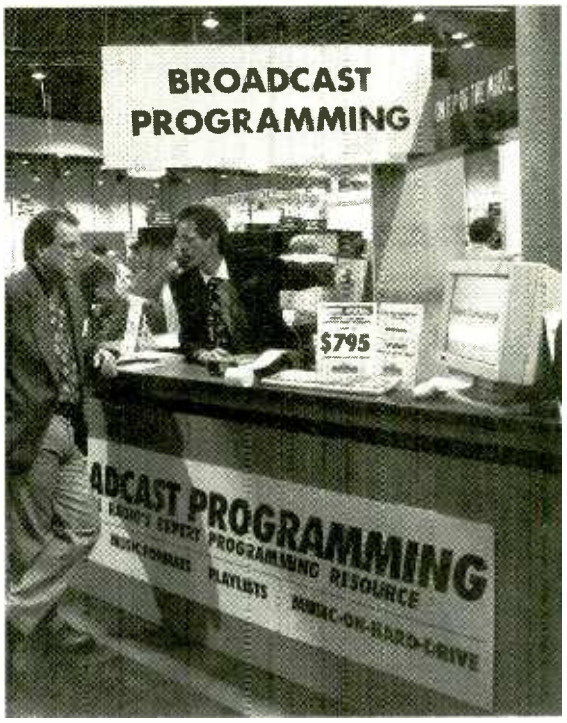
I pressed 1 and the same voice intoned, "Interference problems with televisions, stereos, and telephones are not handled by the FCC. These calls should be directed to the manufacturer of the effected equipment."

But nothing was said about radios. What do you do if electric fence noise is making it difficult to even listen to your local stations?

I pressed 1 again and was connected with an operator who told me, "It's basically the person who's having the interference problem." I didn't quite catch that, so asked her to explain further.

"If you're receiving interference on the radio," she said, "it's because the radio itself is not filtered properly—so you would have to go back to the manufacturer of the radio itself."

Yeah, right.



A booth on the exhibit floor.

As if that's not enough, it was announced at the same session that the FCC would be closing more than half of its field offices, keeping just 16 of 35 open. That change is already being implemented. In my part of the country, for example, the public must now call Seattle, rather than Portland, Oregon, (where I took the test for my Third Class Radio Operator Permit as an eager 15-year-old).

Spinning the Web

If it was discouraging listening to what the FCC had to say, some exciting news came out of the "Radio and The Internet" session. When you're DXing but aren't quite sure which station you've just pulled in, it can be frustrating—especially if you think it's one of your most wanted catches. But modern technology may be able to help you identify it.

All you have to do is log onto the World Wide Web. At the "Radio and The Internet" session, it was stated that more than 1,200 stations now have Web sites.

So, while what you hear on your radio may be scratchy and difficult to ID, if the station has a Web site you can log on and find out if what they are programming is what you're hearing. It was pointed out that many sponsors are running advertisements on the Web. If you hear a commercial while DXing but can't quite make it out, you may be able to verify details by looking on the Web.

Through real time audio, the Web is also a fun way to tune in stations that you have no chance of picking up on your radio. KLIF-

ABC Radio International booth. The NAB convention also caters to a large international clientele.

AM (**http://www.klif.com**) in Dallas, for example, bills itself as "the first radio station to cybercast live on the Internet 24 hours a day." KING-FM (**http://www.king.org**) in Seattle is promoted as the first classical music station in the world to be heard 24 hours a day on the Net.

My list shows there are just five states without at least one station on the Web: Idaho, Maine, North Dakota, South Dakota, and Wyoming. But that will no doubt change as more and more broadcasters log on.

Engineering Excellence

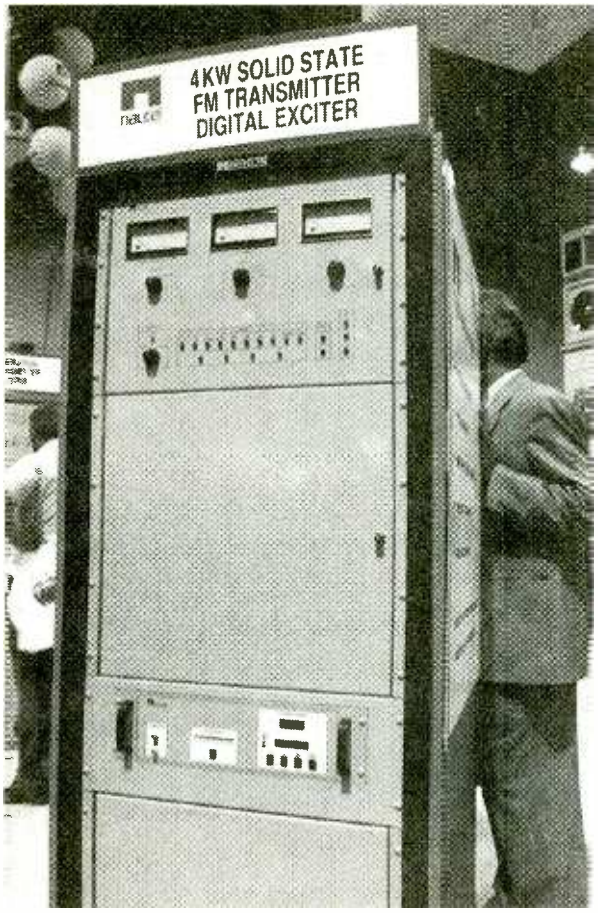
One of the highlights of the convention was attending the engineering awards luncheon. Engineers rarely receive enough credit for their important contributions to broadcasting, so this was a nice tribute.

Each year the NAB presents an engineering achievement award to one radio and one television engineer. The radio achievement award was given to Ogden Prestholdt, who began his career in the 1930s and later joined the CBS network, serving as director of engineering from 1961-1969. Prestholdt retired in 1984 from his position as a partner with a Washington, DC-based engineering firm. Even at the age of 79, this engineering pioneer told me that if a project came along that piqued his interest he would take it on.

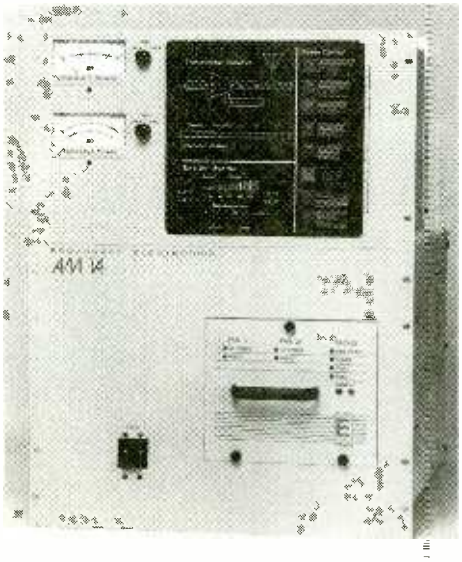
The television achievement award went to Charles W. Rhodes, who was chief scientist of the Advanced Television Test Center (ATTC) from its inception in 1988 until recently. Rhodes holds U.S. and foreign patents on TV signal measurement and control method and techniques.

In addition, a special achievement award was presented to Gerald R. Robinson, who served as vice president/director of engineering for Hearst Broadcasting until his retirement last year. Robinson managed the technical operations of the Hearst TV and radio group, as well as starting the Hearst Washington News Bureau and Hearst Broadcasting Productions.

This year's convention also marked the 50th annual Broadcast Engineering Conference. To put the conference into historical perspective: one of the issues facing the industry fifty years ago included the controversy surrounding the duplication of AM programming on FM stations—which were just becoming established. RCA was advertising a large screen TV back then—it measured a whopping 15" x 20" and had a suggested retail price of a budget-busting $1,195!



The Nautel 4 kW Solid State FM Transmitter



Broadcast Electronics' new 1 kW transmitter, designed to fit into a 19-inch rack. (Photo Courtesy: Broadcast Electronics)

New Equipment

One of the biggest draws each year at the NAB convention is the new equipment. Station engineers come not only to look, but also to buy. Many manufacturers offer reduced prices so they won't have to pay the freight to send their samples back home.

Of the four days I was at the convention, I spent about half of my time wandering the exhibition floors. The item I found most interesting was **Radio In A Box**, a 19-inch rack mount product that is billed as "the world's first plug and play radio station." It plugs into the transmitter audio chain and serves as an ultracompact air studio, which means all of the station's production and programming can be done from the box.

"The music, commercials, promotional announcements, and disc jockeys are inside a single computer," explained Tom Zarecki, director of marketing services for Radio Computing Services, which was scheduled to begin selling the box this summer.

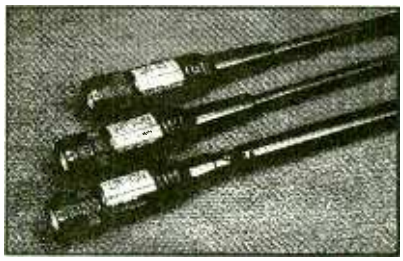
On another aisle Broadcast Electronics unveiled a 1 kW transmitter that is designed to slip into a 19-inch rack—almost unbelievable for those of us who grew up with transmitters twice the size of refrigerators. Called the **PowerMiser**, it even includes AM C-Quam Stereo and helps stations meet nighttime power requirements without the added expense of splitters or a separate low-power transmitter.

The cockpit of the $1.2-million Helicopters, Inc. chopper

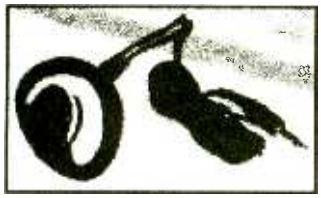
A New Range of Low-Cost Antennas & Accessories

Δ Scanning Aerials: To improve your reception

Watson Scanning Aerials have been designed to bring you the very best reception possible. High quality engineering and ergonomic design ensure that Watson Scanning Aerials are the natural replacement for those seeking to extend their receiver's range. All models cover 25MHz-1900MHz and are fitted with BNC connectors.



WATSON



Δ WEP300 Earclip Microphone

Clips easily over the ear taking the fatigue out of long term monitoring. Superb fidelity makes this a worth while investment. Don't confuse this with the normal earpiece, this is a quality item that will out perform anything you have ever tried before. Includes 4.9 ft cable w/ 3.5m plug.

Δ WSC1

It can be changed from handheld holster to a waist-belt holster or an adjustable sized body holster, to fit any handheld, portable telephone or even tools.

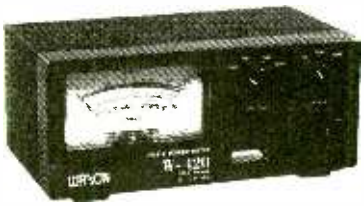
WATSON

Δ SWR & POWER METERS

Highly accurate RF meter for measuring Forward Power, Reflected Power, and VSWR.

- Large meter display for ease of reading
- Forward RF power readings, switchable to indicate either average or Peak Envelop Power (PEP)
- Reflected RF power readings
- VSWR ratios
- Illuminated meter
- Convenient control layout for easy operation.

W - 420



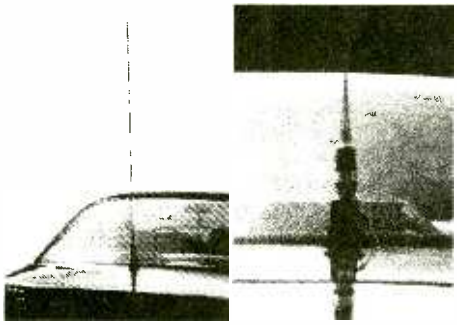
- **W-220** - 1.7 - 200MHz, 5/20/200W, SO239 connectors, Light
- **W-420** - 118 - 530MHz, 5/20/200W, SO239 connectors, Light
- **W-620** - 1.7 - 520MHz, 5/20/200W, SO239 connectors, Light

Δ ANTENNAS

- **W-30** - 2M/70 cm Base antenna, fibre glass, 3/6dB, 150W
- **W-50** - 2M/70 cm Base antenna, fibre glass, 4.5/7.3dB, 200W
- **W-50** - 2M/70 cm Base antenna, fibre glass, 6.5/9dB, 200W

W - 30

W3HM



- **W3HM** Universal mobile mount for hatch-backs. Adapts to any angle, thumbwheel rachet adjustment. Low profile design.
- **W3CK** Mobile Aerial Cable Kit.

For use with W3HM. Comes with 16 feet of cable and has SO239 & PL259 connectors.

WATSON

Contact your Favorite Dealer Today!

Electronic Distributors
325 Mill Street
Vienna, VA. 22180

Ph: 703.938.8105
Fax: 703.938.4525

EDCO

They came from afar to show their stuff. This new van is destined for Channel 2 in Anchorage.

If I could have bought just one item it would have been the helicopter that St. Louis-based Helicopters, Inc., had on display. They have sold whirlybirds to TV stations all over the country, including WDAF in Kansas City, and they operated the helicopters used by NBC Sports during this summer's Olympic Games in Atlanta.

It was fascinating peering into the cockpit and taking a close look at this fully-equipped vehicle. I wasn't prepared for the sticker price, though: $1.2-million. Now you know why there are so many commercials during the evening news!

In addition, there were several rows of four-wheel drive vehicles outside the convention center. A van with "sold to ABC Washington News Bureau" posted on it was parked in one spot.

Across the lot were shiny new vans with channel 5/Cleveland and channel 2/Anchorage logos. Painted bright as the Arizona sun, a huge satellite truck from KPHO, the CBS affiliate in Phoenix, was ready for anything with its dish on top. If a major news story had broken at the convention, there would have been no shortage of coverage.

■ Celebrity Sightings

As I made my way from truck to truck, I couldn't help but think what an honor it was to be at NAB '96 among industry leaders from all corners of the world. Of the 92,333 people registered, more than 20,000 were from foreign countries.

There were times when it was difficult to maneuver through the crowds, especially during lunch hour. I anticipated the lines, so I had packed a peanut butter sandwich (forgetting the jelly in the confusion). Finding a place to sit was the major challenge: I took a cue from hundreds of others and sat on the floor, using the wall for a backrest.

After the noontime break, I got back on my feet (registrants are advised to bring comfortable shoes) and visited more booths and chatted with more exhibitors. Then I stopped and watched Harry Wong and Steve James do their morning show for 104 FM Select in Hong Kong from the convention floor. With the time difference, they began broadcasting from Las Vegas in the mid-afternoon.

Legendary radio star Don Imus, who was this year's inductee into the NAB Hall of Fame, did his show live from the Mirage Hotel on Monday and Tuesday. WFAN-AM in New York is his flagship station; Imus is also syndicated by the Westwood One Network. For Imus the time change meant he had to start his show in the middle of the night—2:30 a.m.

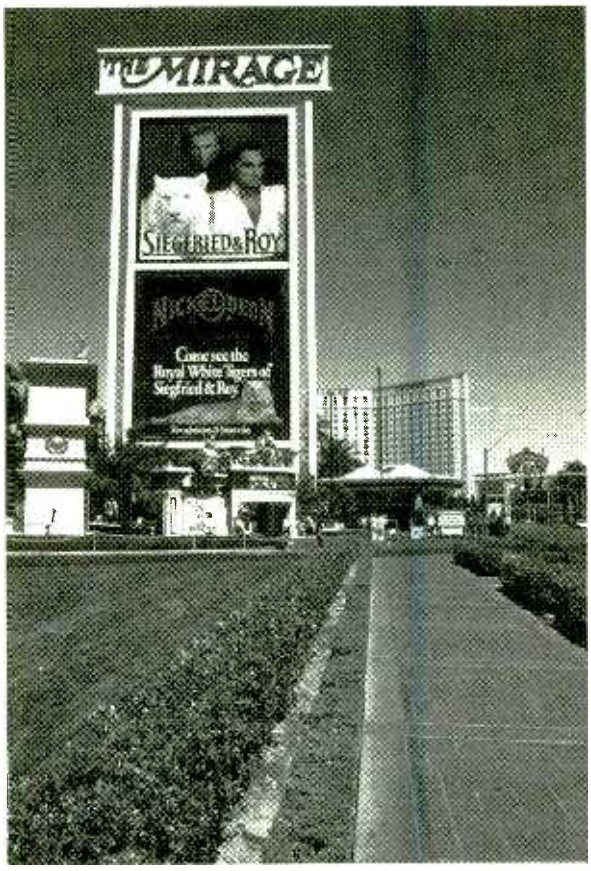
Other notables in attendance at the convention were CBS newsmen Charles Osgood (a speaker at the convention) and Charles Kuralt (recipient of the distinguished service award). Vice President Al Gore spoke at the Television Bureau of Advertising's 42nd Annual Marketing Conference.

All in all it was an exciting experience—a close-up look at the new technology and people who shape the broadcasting industry. Perhaps it was NBC President and CEO Bob Wright who did the best job of putting broadcasting into perspective.

"The current wave of technological change is greater than we've ever faced before," he said in a keynote address. "The way our industry has adapted to new technologies has always been influenced by economics and by public policy, which has either delayed or encouraged innovation. We must as an industry continue to invest and develop technology that offers more and better free broadcast service, and policy makers need to encourage or require this expansion and improvement.

"If this happens," Wright concluded, "I am confident that this country will carry forward well into the next millennium with the best broadcasting system in the world."

Bob Rusk is an Oregon-based freelance writer who reports on radio. He is a frequent contributor to Radio World.



The Mirage ... home of Siegfried & Roy.

How to Survive a Computer Virus Without Really Crying

Whimpering is nevertheless allowed. Then, you must exorcize the beast!

By John Catalano

My family knows that I only read non-fiction, or at least what people think is non-fiction. So in keeping with this, one of the many books I received from my wife at Christmas was *Approaching Zero*.

This curiously titled book, by Paul Mungo and Bryan Clough, details the history of computer hacking, phone phreaking, and virus makers from the late 1960's to 1992. It takes its name from the effect of some viruses on computer hard drives. When a system is infected by some of these creations of misguided programmers, the data stored on the hard drive can be systematically destroyed until the amount of information begins to "approach zero" bytes.

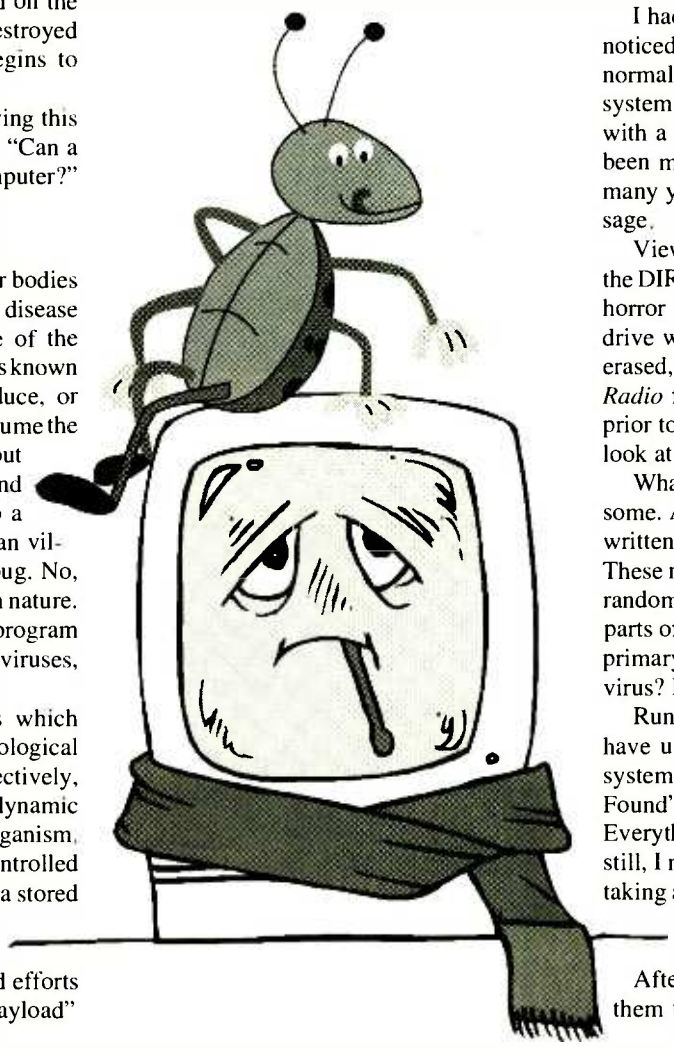
What happened to me after receiving this gift almost prompted me to wonder: "Can a book on computer viruses infect a computer?"

Technology Mimics Biology

When biological viruses attack our bodies the result can be anything from a fatal disease to the common cold. They are one of the smallest, yet complex, living organisms known to man. They can replicate, reproduce, or grow at such a high rate, they can consume the host body in a matter of days. Check out the non-fiction book *Hot Zone* to find out what the E-Boli virus can do to a human in a few hours. Whole African villages have been wiped out by this bug. No, computer viruses are not biological in nature. Although their manner of acting and program size are similar to that of biological viruses, the similarities end there.

Computer viruses are programs which simulate the wildfire growth of biological viruses and their tiny structure. Objectively, the concept is very interesting: the dynamic computer simulation of a living organism. However, during their high and uncontrolled growth they can destroy valuable data stored in random access memory (RAM), and on floppies and hard drives.

Worse yet, through the misguided efforts of the authors, they can include a "payload" program that instructs the virus program to destroy specific structures at specific times. Pretty mean stuff. Imagine all your work, games, programs, and files destroyed unexpectedly by just turning on your computer.



Happy !#%* New Year

As usual, life was hectic around the holidays, but I did manage to check out my new CD-ROM software gifts, write a column for my *MT* readers, and do some technical work. Everything was going fine until January 2. Then, computer hell hit!

I had just turned on my computer when I noticed that it was taking a longer time than normal to boot up. Finally, when it did get the system up, I ran Lotus 123, only to be greeted with a red flag indicating 123.EXE file had been modified. I have been using Lotus for many years, but have never gotten this message.

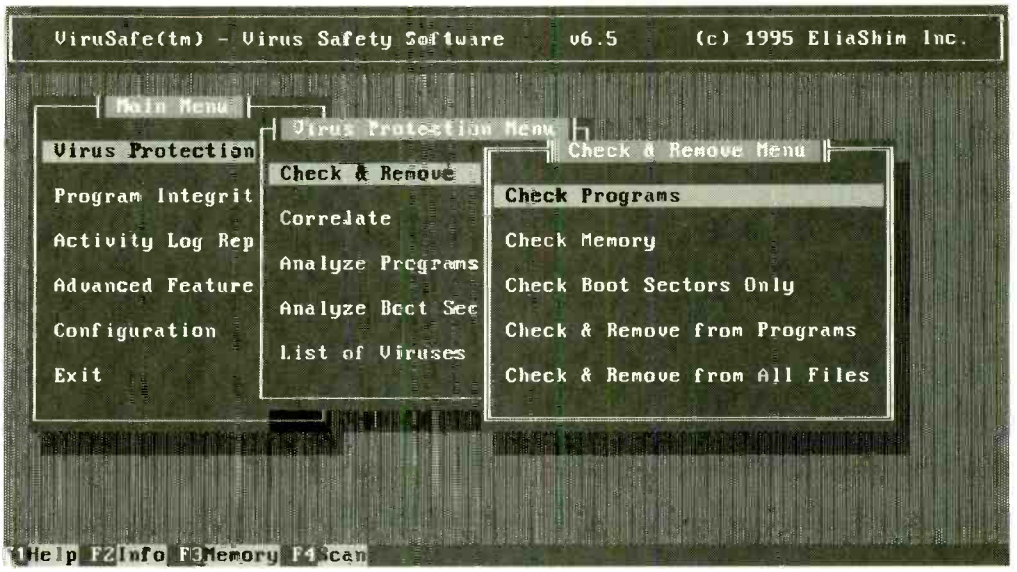
Viewing the hard drive file structure with the DIR (directory) command, I discovered in horror that 80% of all my data on the hard drive was destroyed, damaged, or just plain erased, including all my *MT Computers & Radio* files. With tears in my eyes, and just prior to putting a razor to my wrists, I took a look at my second hard drive.

What I found was amazing and very troublesome. A large number of new files had been written to the second drive; and *not* by me. These new files had names which were either random groups of letters and symbols or had parts of program names originating from my primary hard drive. Was this the work of a virus? I wondered nervously.

Running a virus checker program, which I have used for almost three years, gave my system a clean bill of health. "No Virus Found"—or so it said. I didn't believe it. Everything I found pointed to a virus. Worse still, I now noticed my second computer was taking a long time to boot up when I turned it on. I quickly turned the second computer off in dread. "Now what?"

After I called the *MT* offices and warned them that the disk I sent to them with my

column might be infected, I drove to a branch of a nationwide computer store. There I purchased McAfee's VirusScan version 2.4, one of the latest anti-virus programs available. Since I am an eternal optimist, I also purchased a disk rescue program. I had read with skepticism the claims made by rescue programs such as Norton Utilities. As I drove home, in a surrealistic calm after losing all my data, I hoped for a miracle cure.



Typical anti-virus program functions (Virusafe V6.5)

The Diagnosis

Running the new virus program indicated the presence of at least two different viruses. *Absolute Zero* said that by 1992 hundreds of new viruses were being produced each month in Europe alone. That should be all I need to say about the importance of having the latest virus protection software release.

The VirusScan program, like many good virus programs, provides three distinct functions: finding and identifying a virus on your hard drive, floppy, or memory; destroying the virus; and protecting your system from future virus attacks (VirusShield). It found twenty-five occurrences of one virus on my system. Figure 1 shows what the display looks like when a virus has been detected using ViruSafe software. These bugs were then destroyed by the virus program.

Upon rescanning my system, it found seven occurrences of a different type of virus. These were also dispatched within a few seconds. With the sun coming up I went to bed with the knowledge that I had stopped and killed the enemy. Tomorrow I would investigate the possibility of data repair.

Suffering Delusions

After three hours sleep I turned on my computer with smug confidence, only to find many more viruses throughout my system. I was almost back where I started the day before! So, with much cursing of technology and little sleep, I started the whole procedure again. After a few hours of analyzing and cleaning, the program indicated no active viruses on any of my drives. "I deserve lunch for my efforts," I thought as I turned off my computer.

After lunch I turned on the computer to whole colonies of virus-infected files. "Am I crazy?!" I thought out loud—to the quick affirmation from my family.

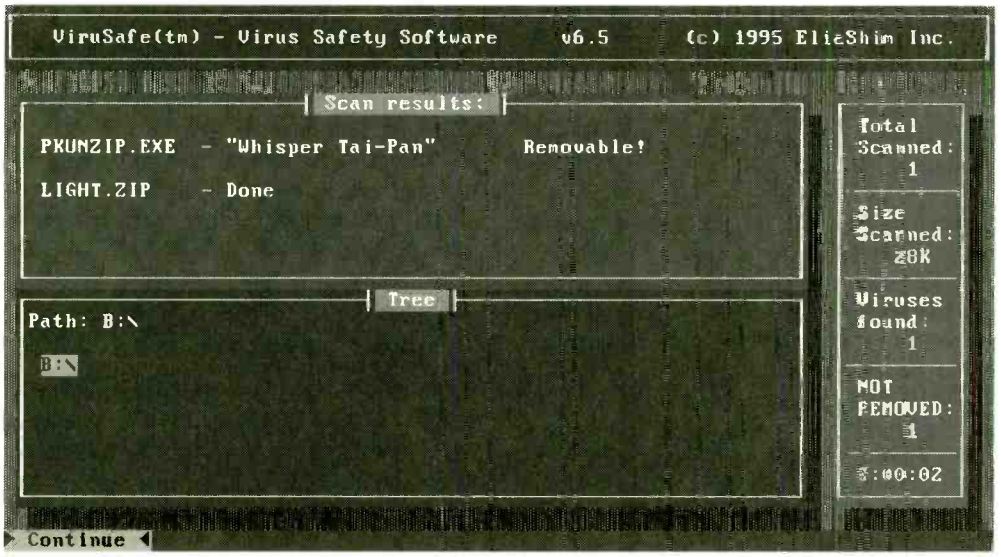
Clearly, there was a virus which was "hiding" in a file and was being activated whenever the computer was turned on.

Rooting Out the Source

After many hours of analysis using VirusScan, I tracked the offender to a file inside a Zip file. (Zip is a compression method that allows files to occupy a smaller number of bytes.) However, to use files that have been zipped, they must be unzipped. I had a command line in my autoexec batch file (autoexec.bat runs programs automatically when you boot your computer) that instructed a file called Display.Zip to be unzipped. When I manually unzipped Display.Zip my anti-virus program went crazy indicating the presence of a virus. After a number of hours scanning all files and instances of the virus, the system was pronounced clean... yeah we've heard this before. The file was neutralized of the virus and then deleted by the anti-virus program.

As at the end of the first *Terminator* or *Alien* movies, I half-expected a piece of this monster to reassemble itself and attack once more as I turned the computer off and then back on. The anti-virus program indicated it was still free of viruses.

After almost three days and little sleep, the computer virus battle had been won.



Anti-virus program detects a virus.

Return of FDR (Full Data Recovery)

The virus was dead and gone, but the damage had been done. My primary hard drive would not boot up. When booted from a floppy the directory of the

What You Can Do to Protect Yourself

"MAYBE IT DOESN'T WORK BECAUSE IT CAUGHT A VIRUS WHILE YOU WERE BUILDING IT."

1. Use a recent anti-virus program such as McAfee's VirusScan, Parson's ViruCide, or ViruSafe to determine if you already have a virus lurking on your system.

2. Use the analyze feature to scan all new programs and files that you might access via floppy disks or modem connection (yes, including the internet).

3. Virus scan *all* new floppy disks—this includes shareware, commercialware or software from a friend.

4. Use your disk recovery software *now*! Make an emergency rescue floppy with your important system information. For example, the Norton product saves your CMOS parameters, images of all your hard drives' file allocation tables, other hard drive operational parameters, device drivers, and memory allocations. Store this floppy in a safe, but easily remembered location.

5. Once you are sure your system is virus free, make a clean, write-protected boot floppy with your **autoexec.bat** and **config.sys** files.

6. Install the terminate, stay ready (TSR) program into your autoexec.bat file. This is your "always on guard" protection part of your anti-virus program.
   Note: Some programs seem to have trouble running with some virus protection programs, especially Windows and memory-hungry programs. If a program does not run correctly, *first* scan *all* the program files with your anti-virus program. Once your system is proven virus-free, unload the TSR protection program. Check your manual for the unload command—usually a /U added to the program command line. Your program should work fine. If it doesn't, then it may have been damaged by the virus. See page 27.

7. Mark the floppy disks that have been given a clean bill of health. Use the write protect tabs to insure that no new "friends" can infect the disk. Virus check all new software, from all sources. Don't use a floppy from your own collection until it has been tested.

primary hard drive was full of garbage. I suspected that the file allocation table (FAT)—which tells the disk operating system (DOS) which programs are on the disk and in what sectors—was damaged.

Running the drive rescue program, Norton Utilities Disk Doctor, as seen on page 27, confirmed my fears concerning FAT damage: it asked if I wished to "attempt" repairs. Without any other alternatives I held my breath and hit "Y" for yes. It also determined that the type and structure of the hard drive as indicated on a section of the boot information, did not agree with the information in the BIOS (Basic Input/Output System) CMOS (Complementary Metal-Oxide Semiconductor). This information, accessed when you first turn on the computer, indicates your exact hardware (hard drive, monitor type, and memory amount), to the computer's operating system.

After a disclaimer that indicated that this was only an "attempt" at repair, the disk began to spin. After a few minutes the program informed me that it had done all it could do and I should attempt to boot from the hard drive. Removing the floppy boot disk and hitting the reset button I watched as the hard drive once again brought the computer to life. The boot was successful. Running VirusScan indicated no viruses were present on the system. We were 80 percent home.

■ Coming back stronger and wiser

The DOS command CHKDSK (check disk) evaluates the file structure of your disk. Running CHKDSK indicated lots of crosslinked files. These are files which do not have unique locations on the hard disk. When you have crosslinked files the disk directory indicates that two different programs are resident at the same physical location on the disk—clearly not possible, and indicative of a problem. The damage caused by the virus to the FAT caused this crosslinking to occur.

CHKDSK fixed the problem by only allowing one file per location. The other file is stored in a special FILE0000.CHK file, but it is no longer in an executable form. Some data can be manually recovered using the DOS edit program. Therefore, it's not a total loss, but close to it. In any case, it's a time-consuming and painful process.

In the final analysis, two important Lotus 123 files were destroyed beyond recovery. However, since I had used the "backup" function whenever I saved a file, I was able to fully recover the file. After four lost days of work, no data was lost, and my system(s) were virus free. The good guys won this time. But one nagging question remains to be answered,

What to Do if You Are Attacked by a Computer Virus

1. *Do not* attempt to erase, move, or copy the infected program. If the system will not boot from the hard drive *do not* attempt multiple resets or turning the computer on and off a number of times. These actions may just spread the virus, causing more damage.

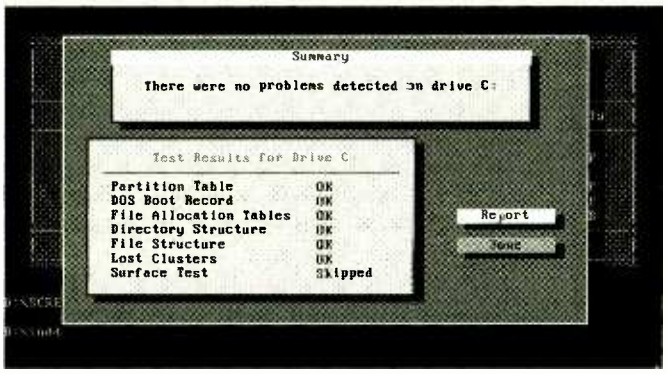
2. Booting from your virus-free floppy, run the anti-virus program in the locate, identify, and remove virus mode. Make a note of which files have been infected and cleaned (see Figure 1). They should be tested for possible damage.

3. Run the anti-virus program on all hard drives in your system.

4. Re-run until you are 100 percent certain that you are virus free. Make sure your protection software opens zipped or compressed files when testing for a virus. It takes a bit longer, but is a real necessity.

5. If the boot sector of your hard drive has been damaged, boot up from a clean boot floppy. Run a rescue program such as Norton Utilities Disk Doctor or Emergency Recovery and follow instructions, very carefully (see screen capture above right).

   These programs perform many functions. They will analyze, compare, and attempt to correct the setup data stored on the drive to that stored in the system's CMOS setup. They will check the disk for crosslinked files, bad sectors, and other format and physical problems. If all else fails, they will use your previously-made rescue disk to totally re-write your hard drive boot sector and FAT data.



6. If there are no booting problems, use DOS CHKDSK /F to check and fix crosslinking disk problems. For more severe cases use Norton Disk Doctor or similar program.

7. Ensure that all programs on the disk operate. If they do not, use the DOS edit command and read through all the FILE0000.CHK files for lost data.

   As we said above, some programs do not work well with the TSR protection program. Unload this and try your program again.

   If all fails, check the original program floppies with your virus checker. When you are certain that it is virus free, reinstall the program.

8. Run the DOS command CHKDSK, Norton Disk Doctor, or a similar disk analysis program regularly to determine the "health" of your hard drives (see screen capture at left).

"What was the source of the virus?"

With VirusShield's protection program, which is now always on guard on my system, an attempted virus attack will result in a red flag notice and instructions on how to stop the attack. My December 29 *MT* column disk tested free of viruses when checked by the Brasstown staff, so what triggered the virus? Perhaps the calendar reading 01/01 on New Year's Day. We may never know the answers.

All of the virus protection programs mentioned in this article are available at software stores such as Software Etc, EggHead, Babbages, and CompUSA. Prices range from $40 to $140. Shareware programs are available to perform similar tasks. The Norton product is pricey at over $120, but it is the one that worked for me. *Approaching Zero* is published by Random House and retails for $22 in the US.

It is unfortunate that people must channel their creative efforts to such destructive and unproductive virus program creation. Ultimately, and as usual, it will be human limitations that limit the usefulness of technology.

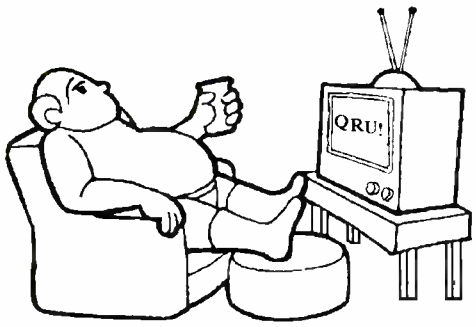
By the way, just as a precaution, if you do read any books on computer viruses, wash your hands well with soap before you turn on your computer.

Just kidding ... I *think*!

Skip Arey, WB2GHA
tjarey@mosquito.com

Radio Ain't Television, Bunkey!

Being a certifiable radio hobby curmudgeon, I occasionally mount my soapbox to let folks know what is bugging me. Two current attitudes, to which beginners are also susceptible, gripe me. First: modern digital, keyboard-controlled radio receivers have tended to move folks away from the most basic radio skill of "spinning the dial" to see what is around. This is coupled directly to my second gripe: Raw data about radio frequencies is available from so many sources today (books, magazines, CDROMs, the Internet, etc.) that many folks simply decide what they want to hear, look up the frequency in some data resource, and then punch in the buttons to make it happen.



Too many people have gotten in the habit of using their receiver and resources in a "TV mode."

People who choose this route to the radio hobby tend to find their interest level falling off rather quickly because they have turned radio monitoring into the same basic process as watching television.

A very common letter or E-mail message that comes my way reads something like this: "Hey Uncle Skip, I wanted to listen to the BBC last night, but when I tuned in the frequency I saw listed on my local Computer Bulletin Board I couldn't hear it."

This is one of the most basic beginning questions and it demonstrates the skewed reasoning that bugs me about the above attitudes. Radio monitoring simply is *NOT* like watching TV. If the person who wrote that letter had access to me in "real time," I would probably say, "Well, propagation is a little weird right now; have you tuned around to see where else you can hear the BBC?"

In the world of radio monitoring, from DC to Daylight, conditions and frequencies change so often that even the best data resources can get out of sync with reality in a very short time. Also, the competition among all of these data resources has confused many hobbyists, making folks begin to wonder if they are really in the "data acquisition and management" business instead of the radio hobby.

The real problem is that too many people have gotten in the habit of using their receiver and resources in a "TV mode" . . . Look up the frequency and punch it into the receiver. Radio monitoring is about tuning around the bands, seeing what you can hear and *then* using the many resources available to help you figure out what you have discovered. Radio monitoring is more akin to making a journey to unknown places and finding out new things about the world around you. It is an adventure you participate in actively, whereas television is merely a series of passive observations of other people's adventures.

As a beginner, you will want to develop the kind of operating habits today that will keep the hobby exciting throughout your lifetime. Most people who complain that the radio hobby is dying really mean that a small number of things they have gotten used to tuning in are changing. There's an enormous spectrum out there, my friends, and there will always be thousands of things to listen to—especially if you break the "TV mode" habit early in your radio monitoring career.

"Primitive" Listening

Okay, let's start out with a little experiment. This can be applied to any aspect of the radio hobby: medium wave, shortwave, VHF/UHF, whatever. Basically, what I want you to do is some good old fashioned "dial spinning." The next time you sit down to play radio, forget about anything you have preprogrammed into your receiver's memories. Forget about your personal list of "favorite" frequencies. We're going exploring. The only "tools" you will need beyond your receiver will be a pencil and paper.

Also—very important to the success of this study—put away every radio frequency resource you may have. Books, magazines, lists: stick them all in a drawer so you won't be tempted by their presence. Absolutely, positively, ***turn off your computer!***

As for the receiver itself, disable or disconnect any "bells and whistles" that you can. I want as little between you and the incoming signals as possible. Even better, if you happen to have a "classic" receiver from before the days of the "digital" revolution, dust it off and trot it out. That old analog rig you were keeping under the bench as a backup is just the ticket for this kind of listening.

Exploring Medium Waves

If you're a medium wave monitor, tune your receiver down to 530 kHz and slowly start to work your way up the band. Make a few notes about each signal you discover. Sure, some of the stuff you hear will be local and all too familiar. Still, keep your ears open and keep track of what is going on. Most of what you hear will occur at even 10 kHz intervals, but don't forget that

some broadcasts originating from outside the United States maintain a 9 kHz spacing. It may be possible to hear signals between the North American standard 10 kHz signals.

Stop at each discovered signal and listen long enough to try to figure out who and what you are hearing. *Stay away from those books!* Use your own listening skills and not somebody else's for now. Make notes about the program content, the callsign, the station's location. Is the signal strong or does it fade? Is there interference from other stations on frequency or from strong stations on adjacent channels? Can you tune the interference out by slightly adjusting the receiver's controls or by changing the orientation of the receiver's antenna? Often on medium wave you can log information about more than one station on the same frequency.

Take good notes on all of this information. Also, because of the nature of signal propagation and station's operating practices, try this "end to end" bandscan at local sunrise, full daylight, local sunset, and after midnight if it fits into your monitoring schedule.

No matter what your personal skill level going in to this experiment, I am positive you will come away with a much better understanding of just what is going on in the medium wave band. In addition, you will no doubt have logged a few new signals to add to your log book. Most importantly, you will have discovered the adventure that comes from searching the band on your own terms and not based upon some predetermined list of what someone else heard at some point in the past. Practice this bandscanning technique on a regular basis and you will soon know things that even some experts can't tell you.

The Shortwave Challenge

Now, if you are a shortwave monitor you've got a bigger chunk of the radio frequency spectrum to cover than our medium wave brothers and sisters. This means you will probably want to break your examination of the shortwave bands down into a number of bite-sized chunks. To some degree, this will be determined by the length of your listening sessions, but a good goal to shoot for is between 1 and 5 MHz at each session.

Successful shortwave monitoring is also more of a function of propagation, so you will need to keep some basic parameters in mind. Begin your study by concentrating on the frequencies between 5 and 25 MHz. Also lean toward frequencies above 13 MHz during daylight hours. You can bring the outer band edges into the study after you have a good handle on how the bands are working, based upon current season, sunspots, and other vagaries of propagation.

Now I'm sure that some propagation pundits out there are screaming for my head right now. Oh, well, it won't be the first time. You see, if you followed the strict school solutions as to *when* to listen *where*, you may miss out on a good bit of listening that can be found on allegedly "dead" band segments. Remember the words of Robert A. Heinlein's character Lazarus Long, "Always listen to experts. They'll tell you what can't be done, and why. Then do it."

With the above adjustments in place, follow the same course as our medium wave brothers and sisters. Slowly examine each band segment. Stop at each discerned signal and give it a bit of your time. Listen carefully and note what you hear. Broadcast stations will give up information fairly easily. Programs tend to be long enough to include several opportunities for both formal (station ID) and informal (program content based) identification.

On the other hand, non-broadcast or "utility" signals will take a bit more work to figure out. These transmissions tend to be short and often full of abbreviations and intentional coding. With utility signals, stick around on a frequency for a while and see what else pops up. The answer to some of the questions that arise out of the initial signal may be made clear in a few more transmissions.

Don't let a lack of knowledge about the world's languages convince you to skip over a signal just because you think you don't understand what is being said. Stick around for a bit. If you listen closely, you may pick up a few things. Many modern words, especially those that apply to technology and science are used universally regardless of the native tongue. Things such as music and station identifications can further help you figure out a signal.

Also, don't forget that many shortwave broadcasters operate in several languages. To better understand a station, all you may need to do is wait out the current broadcast until the top or bottom of the hour. This may bring about broadcasting in a more recognizable language, possibly even English.

Another thing that often confuses beginners is the system of shortwave broadcast band designations. A few sessions of basic "dial twisting" will show you that more than a few shortwave broadcasters operate outside these established frequency ranges—yet another reason to ignore the guidebooks on occasion.

Again, take notes of what you hear and what you think it means. Make small segment shortwave broadcasting a regular practice and you will soon know the bands as well as any expert.

Scanning = Searching

VHF/UHF scanning was at the forefront of the digital receiver revolution. It is also the bastion of "TV mode" tuning. Most people who own scanners get a list of their local police, fire, and EMS frequencies, plug them in, and never listen to anything else. But remember, radio monitors are not "most people." We are explorers of the radio frequency spectrum. To get the most out of monitoring the world above 30 MHz requires a good reading of your scanning receiver's manual. You need to learn how to go beyond just entering frequencies into memory. You must discover and use your scanner's search modes. These usually involve setting upper and lower frequency limits for your receiver to scan through.

Higher end scanners may also feature a "store" function that enters whatever is found during a search into the scanner's memories. Mastering these capabilities as they apply to your particular scanner will allow you to perform the same sort of band scanning as medium wave and shortwave folks.

Remember, *stay away from those frequency lists*. Try to see what you can discover yourself. For example, if you pick up an unfamiliar public safety frequency, listen in to see if you can determine whose it is. Listen for information such as town or street names, the names of landmarks or places such as hospitals. If they are using a "10-code," try to figure it out by listening to the conversations associated with its use.

Also, don't forget that there are thousands of non-public service related signals to catch in the VHF/UHF bands, many of which do not appear on any frequency list. Take time to discover the wider world beyond police and fire calls to maximize your monitoring adventures.

Finally, after you have a handle on things in your area of interest, use your various books, magazines, and computer resources to fill in the gaps in your information. Hit the books *after* your monitoring session instead of before and no one will ever be able to accuse you of being a "TV mode" monitor. You will also discover the full depth of fun and adventure that radio really offers us. Have fun!

Richard Barnett
ScanMaster@aol.com, Compuserve at 102354,3643

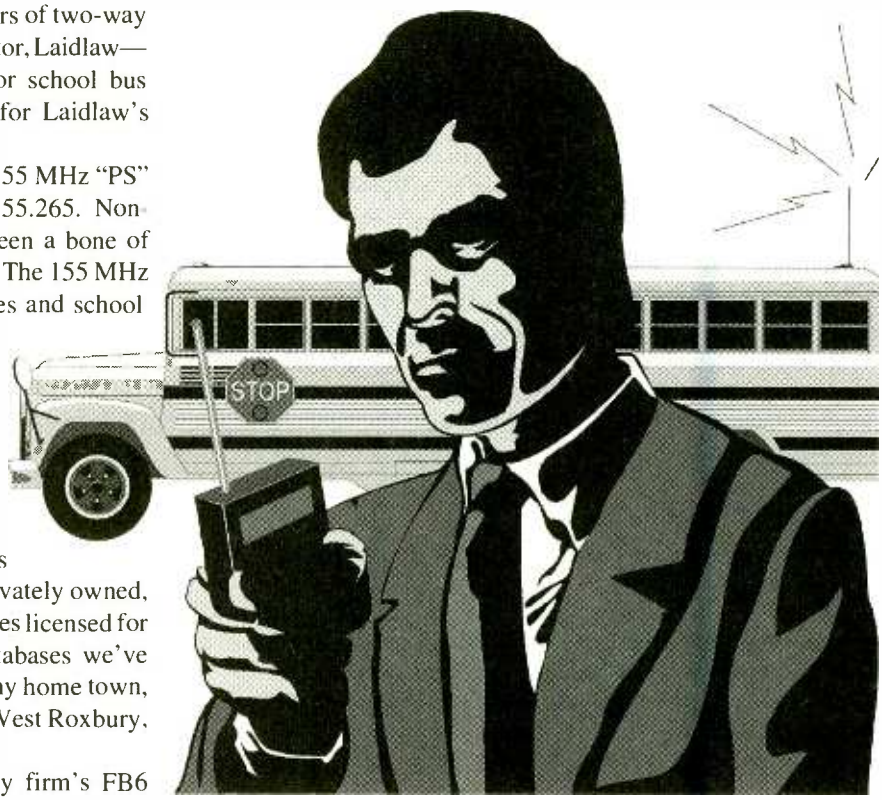
Tales Out of School

or A Funny Thing Happened on the Search for the School Bus Frequency

School buses are among the most prevalent users of two-way radios in my home town. Our city uses a contractor, Laidlaw—a large, national transportation provider—for school bus services. Recently, I began an intensive search for Laidlaw's unlicensed radio channel.

School bus frequencies are often found on the 155 MHz "PS" channels: for example, 155.160, 155.220, and 155.265. Non-public safety use of these channels has always been a bone of contention among those in the ambulance industry. The 155 MHz channels are actually not only used by ambulances and school buses, they're also used by urban and inter-urban bus companies. 155 MHz "PS" frequencies are truly jammed with all kinds of incompatible operators. That's why so many of the users have abandoned these VHF channels for other bands.

Our local school buses appear to use a 460-465 MHz community repeater. The buses are equipped with what look like UHF quarter-wave antennas (four to five-inch sticks). Because the buses are privately owned, there are no public safety or even business frequencies licensed for bus use in my community. In the books and databases we've reviewed, there are also no listings for Laidlaw in my home town, nor in the town where the bus terminal is located (West Roxbury, a Boston neighborhood). What's going on here?



Author enlists several scanners and a frequency counter to perform some "cloak and dagger" surveillance.

Laidlaw is apparently operating on a two-way firm's FB6 license. FB6 is an FCC designation which indicates that the holder of the license is, generally, a two-way radio dealer who is responsible for all the users (companies) that are active on his repeater. Years ago, all users on a community repeater system were required to hold their own licenses, and even hold separate licenses for mobile and other types of operation.

Two-way dealers, we understand, were not very happy with this arrangement. Although maintaining licenses for each customer could be a headache, it could also provide a separate revenue stream. What really irked the dealers and equipment manufacturers, however, was that competing radio shops would essentially have easy access to everyone's customer list. If you saw that Joe's Towing had just been licensed for operation on 463.450, for example, you could easily match up that frequency with your competitor's community repeater. Then you could go out and try to convince Joe that your repeater would provide far superior coverage for his tow trucks.

Not all dealers operated in this manner, but enough did, as we understand it, to cause certain factions in the industry to lobby the FCC for the FB6 designation. Users of 800 MHz trunked systems are similarly not licensed—although, we believe, for different reasons.

What does all this mean for scanner enthusiasts who enjoy listening to business communications? There are still hundreds of thousands of businesses which continue to license the old-fashioned way. Either their two-way provider has not bothered with the FB6 designation, or the business operates its own radio system. Yet, there are thousands of businesses which legally hold no license. It makes it very difficult to figure out, therefore, where particular businesses are operating. With the proper equipment and knowledge, you can still narrow the list of possibilities down to a few distinct frequencies.

At any rate, I wanted to nab that bus frequency. It wasn't that I would be interested in monitoring it, once I had it. It's the chase that's fun in these cases. In a couple of years, when my son is of school age, I may want to pay closer attention to the communications on the channel. For now, though, it was enough to see the bus

drive down the street every day and know that there went a frequency I did not have! That irked me, and it continues to irk me to this day.

My quest to find that frequency began at the end of the school year. The buses were only going to roll another few days when I dug out my Optoelectronics Scout and began to actively search for the channel. After chasing buses for about an hour one morning, I realized that my first hit on the Scout might be a transmission from a driver asking for the police to check out a possible stalker. At least I would have the frequency, right? But, instead, those drivers never seemed to use their radios.

I immediately put Plan B into effect. I decided to follow the buses back to their terminal in hopes of nabbing someone using his radio on the way back to the yard. Buses poured onto a single highway as we neared the terminal. Yet no one, according to the Scout as well as my visual scan of the drivers, ever used the radio. I was beginning to wonder if these folks actually had two-way equipment in their buses!

All this time my Bearcat 760, BearTracker BCT-7, and a Radio Shack PRO-43 swept the UHF input and output frequencies from 461.0000 through 469.975, as well as the 470 through 486 MHz ranges that are commonly used for business repeaters in the Boston area (excluding the numerous public safety channels in this "T-Band" range).

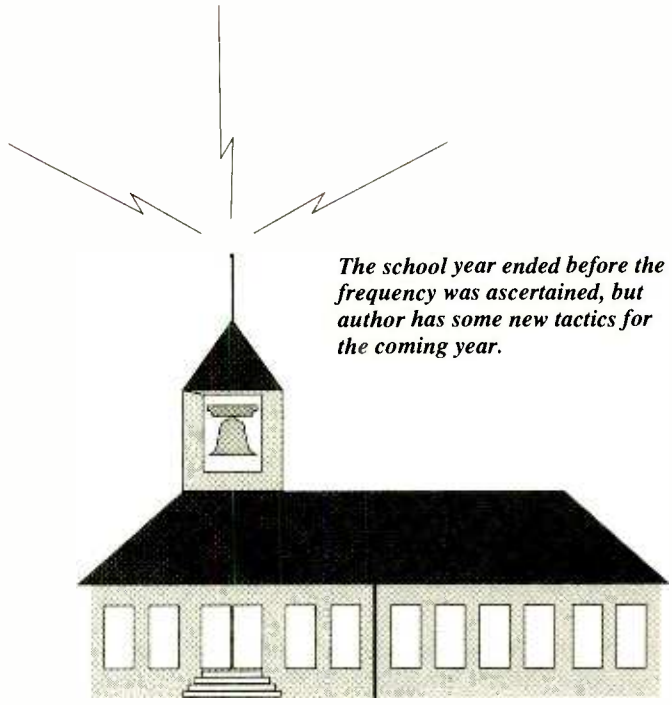
Some of the transmissions I monitored on certain frequencies could possibly have been the Laidlaw buses, based upon the conversation and the signal strength, but it was never clear cut. You must wait for someone to mention a school or a recognizable street name in your town; or better yet, a conversation such as, "You need to make sure to stop at Jimmy Smith's house on Psonby Britt Road and get him over to the Angier School." Wow, would a transmission like that have brought closure to this caper! But ... nothing even came close.

I kept a running list of the possible channels, but still waited for the big break as I drove closer to the bus yard. With no hits on the Scout as I approached the yard, I was feeling kind of down. That is, until I looked up at the roof of the terminal office and saw a UHF yagi pointed off in the direction of Boston. Eureka! All I had to do now was sit outside the terminal fence, in line with the direction of the beam, and I was sure to have my channel.

The frequency I expected to receive was, of course, the input to the repeater. The bus dispatcher would be broadcasting over a mobile, but in this case a fixed-input frequency into the repeater. The transmission would be re-broadcast on the output side of the pair and heard by everyone within range of the repeater.

Then, just at the moment of triumph when I heard the first beep of a hit on my Scout, "down" turned to despondency. I glanced down to see the frequency on that terrific little near-field receiver, convinced I would be seeing some 468 or 469 MHz input. Yet, to my dismay, 454.300 appeared on the screen. And then there was another hit, and another, and even another. All within seconds of one another. It was fully expected, though. 454.300 is a pager frequency. The industrial park where the terminal is located is also neighbor to a paging transmission tower!

Luck, and my time, had run out. Although you can buy filters



The school year ended before the frequency was ascertained, but author has some new tactics for the coming year.

to eliminate certain frequencies or frequency ranges from being received by the Scout (or by any receiver), I couldn't buy an extension to the school year for love nor money.

But, now that it's September I have a couple of new tactics I plan to employ as the kids start back to school. Knowing where that yagi is pointed, I should be able to also pinpoint the possible FB6 community repeaters located in that general direction. Using one of the high-end CD-ROM databases of FCC information, it is possible to look up FB6 licensees and even map their transmitter coordinates. This will help narrow down the frequency options that I'll need to program into a scanner.

I may not have nailed that frequency, but at least I can put my tactics, and my resources, to the test once again now that school's back in session.

Give it a try, sometime. Whether it is a school bus company, a mall security force, or any business in your home town, see if you can figure out their frequency by using a little legwork, a little Scout-work, and a lot of enjoyable scanner-work.

Scanners on Cable TV

We have had a lot of very interesting and positive response to our recent article (May '96) on police radio transmissions being rebroadcast over the Winston-Salem Cable TV public access channels. Here's some of the mail:

> "I'm writing from a cyber cafe in Berlin, Connecticut. Your article on the Winston-Salem cable system reminded me of my days at a tiny newspaper in Stuttgart, Arkansas, in the late 1970s. The cable system there had a rather unusual way of providing audio for its Reuters Sports Wire channel — it would simulcast CB channel 19! Keep in mind that this was during the CB boom, so there were plenty of signals...and plenty of "colorful" language! I wish cable systems were this inventive today; I've had enough of Lite FM on the access channel."
>
> Howard Glazer
> Meriden, CT

David Levine sent us e-mail with the following news:

> "I was in Wilmington, North Carolina, visiting in-laws and flipped to channel 8 on their Time Warner cable system and heard police broadcasts. Like Winston-Salem in your May *Monitoring Times* article, Wilmington, North Carolina, enjoys the same benefit. When the station is broadcasting local government shows, they show local information with the broadcasts in the background. There are times when the broadcasts are few and far between, but on the weekends, the activity picks up. I enjoy your column and your posts to the mailing lists and newsgroups."

We also heard from one of our readers that the Salem, Massachusetts, cable system also provides a similar service. It's nice to hear that other police departments and cable television companies have teamed up to provide a valuable community service. This demonstrates that these PD's, at least, appreciate worthiness of an informed public.

Is it the End for the RCMA?

As this article is going to press, the RCMA (Radio Communications Monitoring Association) is still in its last throes, although some have already reported its demise. The RCMA has been one of the most venerable radio publications and clubs in history. Founded some 20 years ago by hobbyists in southern California, the RCMA was instrumental in growing the hobby and spawning local monitoring organizations around the nation, such as CARMA, the Chicago Area Radio Monitoring Association.

The end of RCMA and its publication, the *Scanner Journal*, would be a terrible blow to scanning. Because all avenues to save the club have not been exhausted at the time of this writing, we do not want to play taps for the RCMA just yet. Should blowing that last bugle be necessary, we will take a look back at the RCMA, its newsletter, and the volunteers who made it all possible, in a future issue. When you read this article, the fate of the club will likely have been decided. For now, though, this editor will keep his fingers crossed.

New Hampshire Rumor

It has been reported that, after years of testing, the New Hampshire State Police will *not* switch to a digital high-band radio system. This is pure speculation at this time. We will keep you apprised of any further details.

This move would be significant, as the State Police in the Granite state have been making a very serious effort to try out the equipment. In talking with local southeastern New Hampshire officers who could no longer monitor the transmissions of their state colleagues, it was quite evident that they weren't the happiest of campers. Local police officers, county sheriffs, and others use scanners in their patrol cars to monitor the New Hampshire State Police and to monitor neighboring departments.

While digital communications may prevent a few "low-lifes" from listening, it also prevents hundreds of fellow officers and thousands of concerned citizens from keeping tabs as they should. What is the response time to calls for assistance from state officers when the local officers had no idea that an emergency situation might develop? Sure, state dispatchers can relay emergency traffic on local channels, but nothing helps clue officers in to potentially dangerous circumstances better than having the ability to monitor an entire event, rather than simply a snippet of that event. That's why so many state, county, and even local police cars use scanners — to keep an ear out for their brethren in neighboring towns or on adjacent streets. At least that's how it seems to this editor.

Scanners in Movies III

In the new Tom Cruise film, *Mission Impossible*, a Bearcat 220/230 is used in one of the scenes. Interestingly, the prop folks used a custom indiglo display to scroll through frequencies. Perhaps the standard Uniden display does not stand out enough on film.

No one got our earlier movie question we posed some months ago. We asked which was the first known film to have ever requested a scanner for a prop in a major motion picture? It was a bit of an unfair question, in that you would have had to have worked for the manufacturer when the requisition for a scanner was submitted.

The answer is *Don't Drink the Water*—the Woody Allen play which was made into a movie back in the late 60's or early 70's. This hysterical movie starred Jackie Gleason and Estelle Parsons. No one we know has ever seen the scanner in the film (the movie is usually cut up when it's broadcast on TV), but it is assumed that it was used in the office of the evil commandant Krojack, played by Michael Constantine of *Room 222* fame.

We received this interesting bit of trivia from the family of the founder of the Electra Bearcat Company. We will have more on these wonderful people, along with information on the history of scanners, in a later article.

Readers: If we are boring you with our scanners in film discussion, please write and let us know. We get a kick out of this trivia, because we like to see how scanners are woven into the fabric of American life. If our readers are not interested, though, we will cut back on the Siskel and Ebert.

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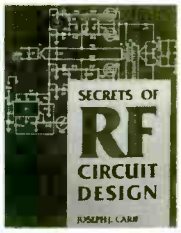

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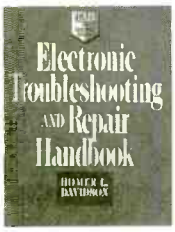

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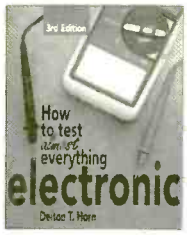

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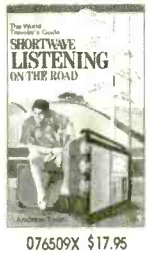

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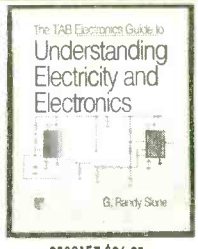

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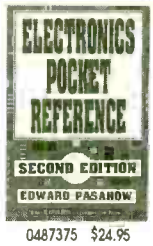

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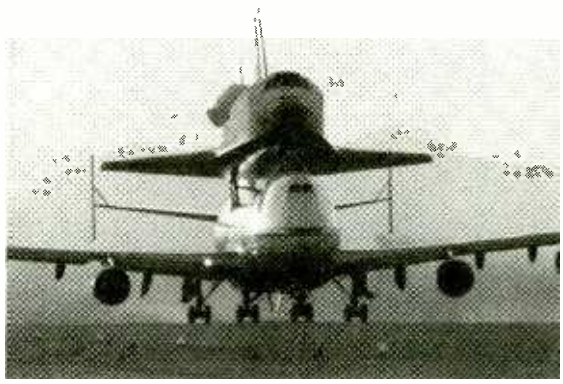
Spotlight on NASA Aircraft

One of the larger fleets of government-owned aircraft belongs to the National Aeronautics and Space Administration (NASA) and, if my mail is any indication, quite a few of them are being heard on HF these days. Several correspondents have asked me if a complete list of NASA callsigns is available.

The best place to look for NASA aircraft on shortwave is on the Global HF System (GHFS) network. Be sure to keep the following frequencies in your receiver memories as they are the most active HF military frequencies in the spectrum: 4724 6712 6739 8968 8992 11175 11244 13200 15016 17976



The shuttle rides piggyback atop Boeing 747.

Other areas in the HF spectrum worth investigating for NASA callsigns are listed in this month's cover story by Bob Grove on page 8.

After many hours of searching the internet, Table One represents the first *Ute World* list of NASA aircraft/callsigns. This list is by no means complete. I know we are missing some of the NASA loaner aircraft and possibly a few others. If you have any additions to this list we want to hear from you at: steditor@grove.net or via snail mail: P.O. Box 98, Brasstown, NC 28902.

NASA B-52 carries Pegasus rocket under its ample wing.

■ *Esteem Highly Alpha* and *White Pinnacle* IDed

Over the last several issues, I have posted several queries regarding two military terms that have been monitored on GHFS in recent months—Exercise Esteem Highly Alpha and White Pinnacle.

The most commonly heard of the two terms is Exercise Esteem Highly Alpha. One source indicates that this is a communications connectivity check through the GHFS network for U.S. Navy assets assigned to the Commander, Submarine Atlantic Command. This is probably a correct assessment since these apparent communication exercises initially appeared on the GHFS network about the time that the Navy did away with the old HICOM (High Command) network.

The second term has not been heard as often. In fact, your editor has only heard it once on GHFS in recent months. Here is the summary of that intercept:

Syllabus with a Flash White Pinnacle message sent to National Military Command Center (NMCC) at 1301. 06/96 (L.Van Horn-NC)

According to one source who works in this area of communications, "a White Pinnacle message is a test of the NMCC to respond to flash traffic from field units." This is an interesting role reversal, as it is usually NMCC issuing the flash traffic to which others must respond. An Emergency Action Message (EAM) is the most customary high priority flash traffic heard on HF that originates from NMCC.

Thanks to all who responded to our queries. Now if we can nail down what a Foxtrot message is (*Skyking, Skyking, do not answer...*), I will sleep a lot better at night.

■ Fire Season Frequencies

This time of year we see reports that the Santa Anna winds are blowing out in the western states and the television networks are usually covering major forest fire stories due to the dry conditions. While most of the action takes place on VHF/UHF Forest Service frequencies, some of the activity can be followed on HF if you know where to look. Depending on where the fire scene is, check out the following frequencies the next time a major blaze rambles across the western states. All communications are in USB.

Forest Service Region 1 Northern-Region Office Missoula, MT:
3247 3250 3261 3285 5901 5904

Forest Service Region 2 Rocky Mountain-Regional Office Lakewood, CO:
3325 3354 3357 4942.5 5901 5904

Forest Service Region 4 Intermountain-Regional Office Ogden, UT, and Forest Service Region 5 Pacific Southwest-Regional Office San Francisco, CA:
3325 3354 3357 4941 4942.5 5901 5902.5 7813 9270 11494 14955

Forest Service Region 10 Alaska-Regional Office Juneau, AK:
3201 3238 3354 4620 (forestry dispatch) 5134.5 5164.5 5167.5 5207.5 7393 8070 (Note: All frequencies in Region 10 are part of the Alaska Fixed Service unless otherwise indicated)

That's a wrap for this month. Hope to see all of you in October at the Grove Comm Expo. Remember to share the experience and bring a friend. This year's Expo promises to be the best yet; if you miss it, you'll be missing a lot.

TABLE 1: NASA AIRCRAFT

Callsign	Type Aircraft (Serial No)	Registration Number	Aircraft Owner
NASA 1	Gulfstream III G-1159A	N1NA	NASA Headquarters
NASA 2	Grumman I G-159	N2NA	Johnson (JSC)
NASA 3	Grumman I G-159	N3NA	Marshall
NASA 4	Grumman I G-159	N4NA	Kennedy (KSC)
NASA 5	Grumman I G-159	N5NA	Lewis
NASA 7	Beech B200	N7NA	NASA Headquarters
NASA 8	Beech B200	N8NA	Wallops Island
NASA 9	Beech B200	N9NA	NASA Headquarters Dryden
NASA 008	Boeing B-52B		
NASA 415	Bell UH-1H (65-10085)	N415NA	Wallops Island
NASA 417	Bell UH-1H (64-13628)	N417NA	Kennedy (KSC)
NASA 418	Bell UH-1H (65-12876)	N418NA	Kennedy (KSC)
NASA 419	Bell UH-1H (65-09708)	N419NA	Kennedy (KSC)
NASA 420	Bell UH-1H (65-10104)	N420NA	Kennedy (KSC)
NASA 425	North American T-39E (158380)	N425NA	Wallops Island
NASA 426	Lockheed P-3B (152735)	N426NA	Wallops Island
NASA 427	Lockheed EC-130Q (161495)	N427NA	Wallops Island
NASA 429	Lockheed 188C (1103)	N429NA	Wallops Island (Retired February 1995)
NASA 432	Fairchild Fokker F27F (35)	N432NA	Wallops Island
NASA 501	Boeing 757	N501EA	Langley
NASA 502	Schweizer SGS 1-36 (1)	N502NA	Langley (Experimental/ R&D)
NASA 503	Cessna 402B (402B0313)	N503NA	Langley
NASA 506	Beech B-80 (LD-507)	N506NA	Langley
NASA 510	Beech T-34C (GL-108)	N510NA	Langley
NASA 511	Northrup T-38A (65-10329)	N511NA	Langley
NASA 514	Aero Commander 680W (83-24126)	N514NA	Langley
NASA 515	Boeing 737-130 (19437)	N515NA	Langley
NASA 516	General Dynamics F-16A (82-0976)	N516NA	Langley
NASA 524	North American OV-10A (67-14687)	N524NA	Langley
NASA 535	Bell UH-1H (65-09992)	N535NA	Langley
NASA 557	Boeing 757-225 (22191)	N557NA	Langley (Experimental/ R&D)
NASA 566	Lear Jet 25 (064)	N566NA	Langley (Expermental/R&D)
NASA 607	Dehavilland DHC-6 Twin Otter (4)	N607NA	Lewis
NASA 614	Beech T-34B (144022)	N614NA	Lewis
NASA 615	Rockwell OV-10D (155436)	N615NA	Lewis
NASA 616	Learjet 25 (035)	N616NA	Lewis
NASA 617	Rockwell OV-10D (155406)	N627NA	Lewis
NASA 701	Beech B200 (BB-1164)	N701NA	Ames
NASA 703	Bell Helicopter Textron 301 (0002)	N703NA	Ames (Experimental/R&D)
NASA 705	Learjet 24A (102)	N705NA	Ames
NASA 706	Lockheed ER-2 (80-1063)	N706NA	Ames
NASA 707	Lockheed NC-130B (58-0712)	N707NA	Ames
NASA 708	Lockheed ER-2 (80-1097)	N708NA	Ames
NASA 710	Convair 30 (30-29)	N710NA	Ames
NASA 714	Lockheed 300-50A-1 (6110)	N714NA	Ames
NASA 715	Dehavilland C-8A Buffalo (6313687)	N715NA	Ames
NASA 717	Douglas DC-8-72 (46082)	N717NA	Ames
NASA 718	Lockheed YO-3A (69-18010)	N718NA	Ames
NASA 722	Northrup T-38A (65-10357)	N722NA	Ames
NASA 803	Molino OY PIK-20E (20219)	N803NA	Dryden (Experimental: Racing)
NASA 808	Piper PA-30 (30-1498)	N808NA	Dryden
NASA 821	Northrup T-38A (65-10353)	N821NA	Dryden
NASA 824	Lockheed TF-104G (583D-5735)	N824NA	Dryden
NASA 825	Lockheed TF-104G (583D-5939)	N825NA	Dryden
NASA 826	Lockheed F-104G (683-8213)	N826NA	Dryden
NASA 831	Lockheed SR-71B (64-17956)	N831NA	Dryden
NASA 832	Lockheed SR-71A (64-17971)	N832NA	Returned to USAF for operational reactivation in 1995
NASA 840	McDonnell Aircraft F/A-18		Dryden (On loan from the US Navy)
NASA 844	Lockheed SR-71A (64-17980)	N844NA	Dryden
NASA 901	Northrup T-38A (66-8381)	N901NA	Johnson (JSC)
NASA 902	Northrup T-38A (63-8193)	N902NA	Johnson (JSC)
NASA 903	Northrup T-38A (63-8200)	N903NA	Johnson (JSC)
NASA 904	Northrup T-38A (63-8204)	N904NA	Johnson (JSC)
NASA 905	Boeing B-747-123 (20107)	N905NA	Johnson (JSC) [Shuttle Carrier Aircraft]
NASA 906	Northrup T-38A (65-10326)	N906NA	Johnson (JSC)
NASA 907	Northrup T-38A (61-0912)	N907NA	Johnson (JSC)
NASA 908	Northrup T-38A (65-10328)	N908NA	Johnson (JSC)
NASA 909	Northrup T-38A (65-10351)	N909NA	Johnson (JSC)
NASA 910	Northrup T-38A (65-10352)	N910NA	Johnson (JSC)
NASA 911	Boeing B-747-SR-46 (20781)	N911NA	Johnson (JSC) [Shuttle Carrier Aircraft]
NASA 912	Northrup T-38A (65-10354)	N912NA	Johnson (JSC)
NASA 913	Northrup T-38A (65-10355)	N913NA	Johnson (JSC)
NASA 914	Northrup T-38A (65-10356)	N914NA	Johnson (JSC)
NASA 915	Northrup T-38A (60-0585)	N915NA	Johnson (JSC)
NASA 916	Northrup T-38A (60-8382)	N916NA	Johnson (JSC)
NASA 917	Northrup T-38A (66-8383)	N917NA	Johnson (JSC)
NASA 918	Northrup T-38A (66-8384)	N918NA	Johnson (JSC)
NASA 919	Northrup T-38A (66-8385)	N919NA	Johnson (JSC)
NASA 920	Northrup T-38A (66-8386)	N920NA	Johnson (JSC)
NASA 921	Northrup T-38A (66-8387)	N921NA	Johnson (JSC)
NASA 923	Northrup T-38A (66-8355)	N923NA	Johnson (JSC)
NASA 924	Northrup T-38A (67-14825)	N924NA	Johnson (JSC)
NASA 928	WB-57F Canberra		Johnson (JSC)
NASA 933	Lear Jet 23 (23-049)	N932NA	NSTL Station, MS
NASA 940	Boeing 377SG (15938)	N940NS	Johnson (JSC)
NASA 944	Grumman Gulfstream III G-1159 (144)	N944NA	Johnson (JSC) [Shuttle Training Aircraft]
NASA 945	Grumman Gulfstream III G-1159 (145)	N945NA	Johnson (JSC)
NASA 946	Grumman Gulfstream III G-1159 (146)	N946NA	Johnson (JSC)
NASA 947	Grumman Gulfstream III G-1159 (147)	N947NA	Johnson (JSC)
NASA 948	Grumman Gulfstream III G-1159 (222)	N948NA	Johnson (JSC)
NASA 955	Northrup T-38A (69-7082)	N955NA	Johnson (JSC)
NASA 956	Northrup T-38A (69-7084)	N956NA	Johnson (JSC)
NASA 959	Northrup T-38A (70-1550)	N959NA	Johnson (JSC)
NASA 960	Northrup T-38A (70-1552)	N960NA	Johnson (JSC)
NASA 961	Northrup T-38A (70-1555)	N961NA	Johnson (JSC)
NASA 962	Northrup T-38A (70-1556)	N962NA	Johnson (JSC)
NASA 963	Northrup T-38A (59-1603)	N963NA	Johnson (JSC)
NASA 966	Northrup T-38A	N966NA	N number change in process N722NA
NASA 967	Northrup T-38A	N967NA	Ames (N821NA changing to this number)
NASA ???	Schweizer SGS 2-32 (70)	N7794S	Univ of Texas, Austin, TX (Experimental/ R&D)

Aircraft Registration Numbers Reserved by NASA

N10NA	West Trenton, NJ
N18NA	Dryden Flight Rsearch Center, CA
N416NA	Kennedy Space Center, FL
N423NA	Langley Research Center, VA
N433NA	Wallops Flight Facility, VA
N434NA	Wallops Flight Facility, VA
N711NA	Ames Research Center, CA
N712NA	Ames Research Center, CA
N719NA	Ames Research Center, CA
N819NA	NASA HQ Washington, DC
N828NA	Dryden Flight Research Center, CA
N829NA	Dryden Flight Research Center, CA
N830NA	Dryden Flight Research Center, CA
N925NA	NASA HQ Washington, DC
N949NA	JSC-Houston, TX
N951NA	JSC-Houston, TX
N952NA	JSC-Houston, TX
N953NA	JSC-Houston, TX
N954NA	JSC-Houston, TX
N958NA	JSC-Houston, TX

Utility Loggings

Larry Van Horn

UTILITY WORLD

Abbreviations used in this column

AF1	Air Force 1
AF2	Air Force 2
AFB	Air Force Base
ANDVT	Advanced Narrowband Digital Voice Terminal
ARQ-E3	Single-channel ARQ teleprinter system
CAP	Civil Air Patrol
CFL	*Confidential Frequency List*
CW	Continuous Wave (Morse code)
DEA	Drug Enforcement Administration
DGPS	Differential GPS
EAM	Emergency Action Message
ETA	Estimated Time of Arrival
FEMA	Federal Emergency Management Agency
FF	French Forces
GHFS	Global HF System
GNA	Gulf News Agency
GPS	Global Positioning System
HF	High Frequency
ID	Identification
IRNA	Islamic Republic News Agency
KCNA	Korean Central News Agency
LDOC	Long Distance Operational Control
MARS	Military Affiliate Radio System
MSK	Multi Frequency Shift Keying
m/v	Motor Vessel
NAVTEX	Navigation Text
NCS	National Communications System/ Net Control Station
NDB	Non Directional Beacon
NECN	National Emergency Coordination Net
NTCN	National Telecommunications Coordinating Network
NTMS	National Telecommunications Management Structure
NW	Nightwatch
OET	Office of Emergency Transportation
Ops	Operations
RTTY	Radioteletype
SAM	Special Air Mission
SATCOM	Satellite Communications
Selcal	Selective Calling
SITOR-A	Simplex teleprinting over radio system, mode A
SITOR-B	Simplex teleprinting over radio system, mode B
Tanjug	Telegrafska Agencija Nove Jugoslavija
Unid	Unidentified
USAF	US Air Force
USCG	US Coast Guard
USCGC	US Coast Guard Cutter
USN	US Navy
USS	United States Ship (USN vessel)

All times are in UTC, all frequencies in kHz, and all transmissions are in USB unless otherwise indicated

288.5 YM-IJmuiden front lt, Holland, at 0845 with CW ID. (Ary Boender-Netherlands)

296.0 GR-NDB Goeree lt, Holland, with CW ID at 2220. (Boender-Neth)

296.5 BH-NDB Blavands Huk lt, Denmark, at 1647 with CW ID. (Boender-Neth)

301.0 ER-NDB Eierland lt, Holland, with CW ID at 1649. (Boender-Neth)

303.5 VL-NDB Vlieland lt, Holland, at 1651 with CW ID. (Boender-Neth)

305.5 AL-NDB Pointe d'Ailly lt, France, with CW ID at 2153. (Boender-Neth)

311.0 LMA-NDB Lima, Germany, at 1715 with CW ID. (Boender-Neth)

311.5 Oostende lt, Belgium, with DGPS transmissions using 100 baud MSK at 2137. (Boender-Neth)

312.0 OE-Oostende lt, Belgium, at 2137 with CW ID. (Boender-Neth)

313.5 CM-Cromer lt, Germany, with CW ID at 0847. (Boender-Neth)

316.0 PH-Locator Eindhoven, Holland, at 0740 using CW. (Boender-Neth)

316.5 STK-Aero NDB Stadskanaal, Holland, with CW ID at 0748. (Boender-Neth)

317.0 VS-Locator Valenciennes/Denain, France, at 0746 with CW ID. (Boender-Neth)

319.0 LEC-NDB Stavanger, Norway, at 1200 with CW ID. (Boender-Neth)

326.0 LLS-Aero NDB Lelystad, Holland, with CW ID at 1400. (Boender-Neth)

327.0 MVC-Locator Merville, France, at 2150 with CW ID. (Boender-Neth)

336.5 NIK-NDB Nicky, Belgium, at 1920 with CW ID. (Boender-Neth)

342.0 GG-Locator Eelde, Holland, with CW ID at 0656. (Boender-Neth)

348.5 LG-NDB-Luik, Belgium, at 1723 with CW ID. (Boender-Neth)

350.0 ROT-Aero NDB Rotterdam, Holland, with CW ID at 2135. (Boender-Neth)

352.5 DD-Locator Oostende, Belgium, at 0735 with CW ID. (Boender-Neth)

357.0 VZ-Locator Groningen/Eelde, Holland, with CW ID at 0802. (Boender-Neth)

360.5 MAK-Aero NDB Mackel, Belgium, at 0733 with CW ID. (Boender-Neth)

369.0 PS-Locator Rotterdam, Holland, with CW ID at 2138. (Boender-Neth)

375.0 OO-Locator Oostende, Belgium, at 0731 with CW ID. (Boender-Neth)

376.0 WP-Locator Amsterdam, Holland, with CW ID at 1212. (Boender-Neth)

382.0 PM-NDB Peronne, France, at 0630 with CW ID. (Boender-Neth)

386.0 STD-Aero NDB Stad aan het Haringvliet, Holland, with CW ID at 2142. (Boender-Neth)

387.5 ING-Aero NDB St. Inglevert, France, at 0853 with CW ID. (Boender-Neth)

388.5 CH-Locator Amsterdam, Holland, with CW ID at 2139. (Boender-Neth)

393.0 DEN-Aero NDB Dender, Belgium, at 0854 with CW ID. (Boender-Neth)

395.0 OA-Locator Schiphol/Amsterdam, Holland, with CW ID at 0730. (Boender-Neth)

397.0 EHN-Aero NDB Eindhoven, Holland, at 2146 with CW ID. (Boender-Neth)

398.0 ONO-Aero NDB Oostende, Belgium, with CW ID at 2146. (Boender-Neth)

401.5 BET-NDB Rhein/Bentlange (German Army), Germany, at 0725 with CW ID. (Boender-Neth)

404.0 MRV-Locator Merville, France, with CW ID at 2158. (Boender-Neth)

404.5 RR-Aero NDB Rotterdam, Holland, at 2158 with CW ID. (Boender-Neth)

406.5 BOT-NDB Botttrop, Germany, with CW ID at 0933. (Boender-Neth)

418.0 MK-Aero NDB Calais/Dunkerque, France, with CW ID at 0638. (Boender-Neth)

421.0 BUR-Aero NDB Bernham, UK, at 0640 with CW ID. (Boender-Neth)

429.0 CLN-Aero NDB Clacton-on-Sea, Germany, with CW ID at 0642. (Boender-Neth)

431.0 ONT-Aero NDB Kleine-Brogel (Belgian Air Force), Belgium, at 0645 with CW ID. (Boender-Neth)

434.0 THN-NDB Thorn, Holland, with CW ID at 1202. (Boender-Neth)

447.5 LGQ-Rogaland Radio, Norway, with CW traffic list at 1000. (Boender-Neth)

449.0 OXZ-Lyngby Radio, Denmark, with CW weather broadcast at 0925. (Boender-Neth)

518.0 LGQ-Rogaland Radio, Norway, with 100 baud SITOR-B NAVTEX broadcast at 0948. (Boender-Neth)

4724.0 Dactyl 15 calling Andrews at 0517 with nothing heard. (Jeff Haverlah-Houston, TX)

4466.0 Keystone 17 at 2115, NCS Pennsylvania CAP net. (Rick Baker-Austintown, OH)

4472.0 Motorist working NW01 on Zulu 130 at 0648. (Jeff Jones-CA)

4495.0 Baked Pie calling NW01 for signal check on Zulu 125 at 0530. (Jones-CA)

4734.9 FT7F working G9F, Norfolk, and Hershey at various times. (Bob Wilczynski-Springfield, MA)

4745.0 NW01 working MacDill GHFS at 0416. (Haverlah-TX)

5081.5 Group 27 working 271 at 0042. Moved back to 7800. (Fowler-MA)

5437.0 Female operator with phonetic message at 0136 and it sounded pre-recorded. (Fowler-MA)

5649.0 KLM602 working Shanwick Air Radio for selcal check (CG-LR) at 0720. (Robin Hood-UK)

5731.0 YRR4-Bucharest Meteo, Romania, with 50 baud RTTY coded weather reports at 0224. (Baker-OH)

5732.0 Omaha 2 (US Customs aircraft) tracking an unknown aircraft on the border near Yuma at 0425. (Mike Ryan-Buena Park, CA)

5766.3 Egyptian Embassy in unid location at 0214 with 5-letter group SITOR-A traffic. (Baker-OH)

5841.0 34 Charlie at 0312 calling Panther on DEA Bravo channel. (Baker-OH)

6263.6 YLAR-m/v *Inzenieris Suhorukovs* working YLQ-Riga Radio in SITOR-A at 0711. (Hood-UK)

6292.5 LYID-m/v *Akmena* working LYL-Klaipeda Fisheries Radio in CW at 0704. Vessel is the ex-UIDN Seliger. (Hood-UK)

6302.0 ICYZ-m/v *Aquarius* with ETA for Dunkirk in SITOR-A at 0737. (Hood-UK)

6637.0 Connie Ops LDOC, Miami, FL, at 0206 working unid flight 312. (Baker-OH)

6691.0 Voice and data comms heard between two unid stations at 1737. (Haverlah-TX)

6715.0 NW01 attempting to work Elmendorf GHFS at 0645. (Haverlah-TX)

6730.0 Andrews working SAM 403 (60403) at 1219. (Haverlah-TX)

6739.0 Andrews GHFS at 0938 with 20 character EAM 'For Tacamo Cent Primary" at common H+38 timestamp. Next day Andrews back up at 1138 with 20 character EAM "For Tacamo Cent Secondary." (Haverlah-TX)

6745.0 CANFORCE Volmet Trenton military, ON, Canada, with aviation weather at 0133/0521. (George Knight-Garfield, NJ)

6757.0 NW01 worked Pawnshop at 1211 and moved to Zulu 185 (9809). At 1213, Quincher worked NW01 and then moved to Zulu 170 (7831). (Haverlah-TX) NW passing an EAM for Labor Day at 1419. Noted new Zulu designator Zulu 165 being used. (J.L. Metcalfe-KY)

6765.0 A very weak KNY callsign passing NTMS/NTCN exercise traffic at 1632. (Metcalfe-KY)

6820.0 Aria Control and Abnormal 10 heard between 0414-0513 working Aria 1 for tracking support toward Pegusas/TOMS launch. I found them by putting your Pacific Missile Range frequencies listed in your old *Communications Satellites* book, and boom, they popped up on 6820. So your old book is still very useful today. (Keith Stein-Woodbridge, VA)

6835.0 Seabreeze-FACSFAC Pensacola, FL, calling W60 at 0307. (Metcalfe-KY)

7309.6 RFHJ-FF Papeete, Tahiti, at 1315 with ARQ-E3 100 baud Cortrole de Voie. (Takashi Yamaguchi-Nagasaki, Japan)

7500.0 Group 27 calling Sweathog at 0022. Moved to 8100. (Fowler-MA)

7606.7 RFHI-FF Noumea, New Caledonia, at 1055 with ARQ-E3 100 baud idler. (Yamaguchi-Japan)

7753.5 100 baud encrypted RTTY at 2243. RYRY sent at the very beginning of each transmission. (Metcalfe-KY) *I have seen the USCG logged using RTTY in this area before, might be them-Larry.*

7765.0 USCGC *Confidence* working USS Taylor at 1120. (James Lumen-Tiffin, OH)

7800.0 Group 27 working 271 at 0029. Moved to alternate frequency 5081.5. (Fowler-MA)

7831.0 NW net with Kiwibird (the only other net member) at 0300 moving around various frequencies including: 7831 (Zulu 170), 6757 (Zulu 165), 5705 (Zulu 145), and 6715 (Zulu 160). (Haverlah-TX)

7861.0 3SP-Unid station at 1005 repeating "V CQ DE 3SP ZCC" in CW. (Yamaguchi-Japan)

7873.0 Teal 03 working Andrews at various times with weather related traffic. (Fowler-MA)

8025.5 Zero Zulu called Darkstar Tango. Other 2-element callsigns also active. By 0559, Fox Tango active with single letters calls, trigraphs, and two letter calls including November Six. Very active alligator playground coordination net. (Haverlah-TX)

8042.0 Teal 03 working Andrews for weather related traffic at 0043. (Fowler-MA)

8056.0 NW or Skywatch requesting next position at 0011. (Fowler-MA)

8100.0 271 working Group 27 at 0027. Moved to 7800. (Fowler-MA)

8308.0 USN units setting up data transfer for tracking net. (Fowler-MA)

8380.5 9HWL2-m/v *Puppy P* with message via Bern Radio using SITOR-A with selcal 31922 at 1752. (Hood-UK)

8495.0 F/K/C-Single letter HF CW marker at 1459. (Yamaguchi-Japan)

8754.0 Pyongyang ACC, North Korea, contact Russian aircraft at 0201 in very distorted USB. (Yamaguchi-Japan)

8849.0 Beijing Volmet, China, with weather report at 0152 in distorted USB. (Yamaguchi-Japan)

8861.0 Irkutsk Volmet, Russia, with weather report in Russian at 1228. (Yamaguchi-Japan)

8965.5 1YH working 1YY in non-US English. Position given at sea around Virgin Islands at 0455. (Haverlah-TX)

8967.0 India working Sierra in a very informal, back channel type chit chat net. Presumed USN and they are here often. (Haverlah-TX)

8968.0 McClellan with numerous 20 character EAMs "For Double Bar" and "For Stub." McClellan at 1350 with 26 character EAM taken from earlier 20/20/26 character EAM set, at McClellan's H+50 repeat EAM transmission window. (Haverlah-TX)

9016.0 NW net active on this frequency at 0500 with Jonathon, Mongoose, and NW01. Jonathon popped up at 0501 for his regular top of the hour check, but nothing heard from NW01. Jonathon advises in blind that he was moving to Zulu 160. Immediately tuning to suspected 6715 within seconds finds Jonathon calling NW01. Zulu 160=6715 (strong tentative). Hickam working Andersen at 1202. At 1202 Anttrail working NW01 dropping in on the Andersen/Hickam comms. A frustrated Anttrail described the co-channel interference here (and on 9809) using a burst of GI barracks slang, and requested a frequency change. (Haverlah-TX) *Looks like the operator on Anttrail needs some lessons in manners, net discipline, and propagation of radio signals-Larry.*

9017.0 Andrews working AF2 at 0556. (Haverlah-TX) SAM 28000 and AF1 working Andy at various times. (Wilczynski-MA)

9018.0 Gaser 93 working Gaser 92 about Plantation Ops being off SATCOM at 0157. (Haverlah-TX)

9025.0 Parkhill scrambled communications noted here at 0622 by unid units. (Haverlah-TX)

9057.0 NW01 working ? Bug who request secondary frequency at 1505. They first move to Zulu 190 (10204) then Zulu 170 (7831). These were all too weak for comms, then all move to Zulu 185. A jump to 9809 finds a NW net player testing on the frequency. Zulu 185=9809 (strong tentative). (Haverlah-TX)

9809.0 Anttrail working NW01 on Zulu 185 at 1141. (Haverlah-TX)

10204.0 WAR46 working NW01 at 0519. (Haverlah-TX)

10229.0 USN/Royal Navy exercise communications noted over 24 hours period. Have not seen this one in your column or in the CFL. What is this? (Kris Wolf-Dixon, IL) *It is just another of those little used US Navy voice exercise frequencies in the HF spectrum that pop up from time to time and exercise to exercise-Larry*

10493.0 KNY90-NCS Arlington, VA, calling WGY904-FEMA Thomasville, GA, during NTMS/NTCN exercise at 1600. Frequencies in use include 4458, 5211, 6765, and 10493. KWB406-OET Ames, IA, checking into FEMA's NECN exercise at 0007. Lots of MARS stations noted during this exercise. (Metcalfe-KY)

10780.0 Cape radio at 1120 conducting a radio check. (Lumen-OH)

10864.0 Unid station 4XML repeating "V 6FR7 DE 4XML" at 1040 in CW. (Yamaguchi-Japan)

10872.0 C/S-Single letter HF CW markers at 1520. (Yamaguchi-Japan)

11056.0 SAM 201 working Andrews at 1950. (Haverlah-TX)

11175.0 Derby 51 (ex-Galveston) enroute to Howard AFB working MacDill GHFS at 1450. (Haverlah-TX) Rockaway requesting working frequencies for Area 91. Was given Zulu 190/175. (Rick Roop-Sacramento, CA) *Area 91-Larry?* 20 character EAM 67RNZ4 from McClellan GHFS at 1939. (Anonymous) Spirit 25 (USAF B-2) with a phone patch to Andrews AFB show control. Patch was for coordinating a fly-by for the air show at 1303. (Metcalfe-KY)

11181.0 Teal 03 moved here from 8968, worked Andrews at 2258. (Haverlah-TX) Spacecard calling NW01 on Zulu 200 at 1213. (John Cawby-Mountlake Terrace, WA)

11187.0 Brownrat calling Topkick at 1733. (Haverlah-TX)

11214.0 Chalice Bravo working Edmonton military with phone patches to Bigfoot and Deerhunter at 1708. (Haverlah-TX)

11220.0 SAM 60201 working Andrews at 0230. (Wilczynski-MA)

11229.0 NW01 working Urgent and several others here on Zulu 210 at 1545 after setting up communications on 11175. (L. Van Horn-Brasstown, NC)

11244.0 Offutt with 20 character EAM "for Absently" at 1335 and 1343. Andrews with 26 character EAM string followed by 20 character EAM string "for Tacamo Pac Primary," at common 1938 transmission time. McClellan with 20 character EAM "for Tacamo Lant Secondary" at 0438. (Haverlah-TX)

11258.0 Brownrat and Topkick in mostly ANDVT. Also on frequency: periodic one-second ticking with the top of the minute timehacks possible given using ANDVT. (Haverlah-TX)

11494.0 NW01 working Deadball here on Zulu 205 at 1616. Moved net to Zulu 225. Within seconds found Deadball and NW01 working each other on 13907. Zulu 225=13907. (Haverlah-TX)

12525.5 UYJD-TKH *Rostov Na Donu* with ETA for Casablanca to Mariupol Radio in SITOR-A at 0656. (Hood-UK)

12557.0 TCMC-m/v *Pazar* with ETA for Bari from Malaga. SITOR-A with selcal 65724 at 0758. (Hood-UK)

12561.0 4JDS-TKH *Gazanfar Musabekov* working UON Baku Radio in CW at 0720. (Hood-UK)

13200.0 Overslide working Thule at 1522 getting working frequencies for NW01. (Haverlah-TX)

13242.0 NW01, Mercator, Chinaware, and WAR46 noted here from 10204. At 1744, NW01 moved Mercator to Zulu 230 (not found after checking some 14 aand low 15 MHz frequencies). (Haverlah-TX) Neon Sign calling NW01 on Zulu 215 at 2031. (Cawby-WA)

13320.0 Russian military station copied in Cryllic CW at 1910. This was one end of a two frequency net. 5-letter and 3-digit groups noted with periodic BT symbols to separate parts of encoded text. This may be a Russian Air Force transmitter. Has anyone copied such traffic on 13320 kHz? Any information or comments are appreciated. (Vladimir)

13440.0 YZI235-Tanjug Belgrade, Serbia, at 0714 with 50 baud RTTY English news. (Yamaguchi-Japan)

14763.0 A9M70-GNA Manama, Bahrain, at 1517 with 75 baud RTTY English news. 14764 is listed in CFL. (Yamaguchi-Japan)

14784.0 Unid station at 1320 with 100 baud POL-ARQ idling. Not listed in CFL/Klingenfuss guides. (Yamaguchi-Japan) *Must be new, Takashi. I have nothing in any of my intercept lists-Larry.*

15016.0 Offutt with 20/20/26 character EAM set over an eight minute period at 1817. (Haverlah-TX) 20 character 677IIM EAM from Lajes GHFS for "Tacamo Lant Primary" at 1140. VLB2-Israeli Mossad number station in AM at 1144-1150. (Anonymous)

15016.5 MacDill GHFS (off frequency) with a 20 character EAM "for Tacamo Pac Primary" at 1426. (Haverlah-TX)

15046.0 Topkick working NW01 on 15046 and self IDed the frequency as Zulu 230 at 2118. (Jones-CA)

15707.0 SAM 974 returning home from Manila working Andrews on F-300 at 0130. (Jones-CA)

16113.0 HBD22S-Berne, Switzerland, at 1144 with SITOR-A German message. Not listed in CFL/Klingenfuss. (Yamaguchi-Japan) *I have seen numerous intercepts for the Swiss embassies and Berne between 16105-16111.1, but nothing this high-Larry.*

16788.5 USDA-TKH *Agostino Neto* working UUI-Odessa Radio in 50 baud RTTY at 1000. (Hood-UK)

16826.0 ESA Tallinn Radio with news in Estonian using SITOR-B at 1125. (Hood-UK)

17181.0 YLQ-Riga Radio with traffic list in CW at 1302. (Hood-UK)

17976.0 S5E calling Andrews Global for radio check. At 1927, Andrews up with a 67 character EAM: UP6EEK preamble. (Haverlah-TX)

18580.0 HMF36-KCNA Pyongyang, North Korea, with 50 baud RTTY French news. (Yamaguchi-Japan)

19631.0 VRQ-Unid station at 0832 with CQ marker and 5-letter groups using hand sent CW. (Yamaguchi-Japan)

19980.0 9BC33-IRNA Teheran, Iran, at 1215 with 50 baud RTTY Arabic news. (Yamaguchi-Japan)

20600.0 MKK-Royal Air Force, London, UK, at 1200 with a 50 baud RTTY test tape. (Yamaguchi-Japan)

Glenn Hauser, P.O. Box 1684-MT, Enid, OK 73702
fax: (405) 233-2948, or (704) 837-2216 ATT: Hauser

Your Support is Solicited

Floral designs with "BBC WS R.I.P." keep appearing outside the BBC's Bush House, in response to the move by BBC management to restructure the BBC World Service into the domestic service, reports Rachel Meyerwood in Radio Four Watch UK, via *DWC*. News stories passed on by Arthur Ward in the World DX Club publication *Contact*, say that the all-party Public Accounts Select Committee concluded that bosses of the BBCWS have been guilty of massive overspending; overambition, and a lack of commercial expertise, producing a 2.3 megapound loss on English lessons. In the report, World Service bosses were rebuked for using 'improper procedures' when they spent more than a megapound on new computer equipment. Some language depts are over-staffed. They have been told to eliminate waste and curb excessive spending to help make 8 megapound cut by next year.

http://www.longitude0.co.uk/save-ws/

Sam Younger, BBC World Service managing director, says via *Write On* the World Service will still be the commissioner and specifier of what it wants: even though the news will be part of a single department with domestic, it will still be WS-focused. The WS will not be destroyed by this managerial reorganisation.

If you wish to state your view of this planned restructuring, you may write to: Sir Christopher Bland, Chairman of the BBC Board of Governors, BBC Broadcasting House, London W1A 1AA, UK. A joint working group is to report on the proposed changes in October. For a more thorough discussion of the issues and more addresses to which to write or E-mail, check the web page for *Save the World Service Campaign* at **http://www.longitude0.co.uk/save-ws/** or write them at Room 512 NE, Bush House, Strand, London WC2B 4PH, UK.

South Africa's Channel Africa obtained a temporary reprieve from its financial cut-off, but solicits support from listeners. The Cabinet has ordered a feasibility study, and input from listeners is needed. This committee is also to make its report in October. For more, see the web page **http://sabc.co.za/saveca.htm**. Write to "Channel Africa: Feasibility Study," P.O. Box 91313, Auckland Park 2006, Rep of South Africa. Fax: (+27 11) 714 2546; E-mail: lacuevae@sabc.co.za. Please state your country and postal address in your message.

R. Oranje, one of South Africa Broadcasting Company's domestic services, has already been sold by SABC to private interests. Its shortwave future is unknown, according to a press report via Ulis Fleming of *Cumbre DX* via HCJB *DXPL*.

Shortwave broadcast program listeners may also want to write to WEWN if they agree/disagree with Martin Gallas of Illinois. Martin stated, in effect: R. Australia has been on 9580 for many years, and now you park yourselves right on top of them, somewhat as you did on 6000 where you interfere with 5995. You are not making any friends for yourselves on SW this way. Tell your frequency managers to listen to SW channels and not just look at charts and skeds before they choose a channel for WEWN.

EWTN GLOBAL CATHOLIC NETWORK WEWN

To which Stanley Leinwoll of WEWN replied in essence: You don't have a clue about the social, cultural, religious and political aspects of ISWBC... There is no mention in the Regulations of the use of SW as a toy, for collecting QSLs and scribbling in little log books. The primary purpose of SW radio is to inform, educate, and enlighten, not to play games. Radio Australia 9580 is beamed 30 degrees toward Asia.

Martin's desire was to listen to Radio Australia, not DX it. But WEWN's rude behavior may turn it into a difficult-to-hear DX catch. Along with super-transmitting-power comes the super-responsibility to behave as a good neighbor, in this editor's opinion. (WEWN, Eternal Word Radio Network, Catholic Radio Service, P.O. Box 100234, Birmingham, AL 35210).

ALBANIA R. Tirana first program on 6100 at *0300-2200*; musical 2nd progam on 6145 at *0900-1400*; freqs vary up to 5 kHz; one hour later after Oct. 27 (BBC Monitoring) Unwanted sideband products of 6100v on 6053, 6147 (Rumen Pankov & Ivo Ivanov, Bulgaria, *BC-DX* via George Thurman as are all such items)

ANGOLA Another BBCM version of the VORGAN schedule here last month shows daytime freq as 9765, not 9775; which is it? (gh) Em. Prov. da Cabinda reactivated on 4971 at 0410-0415 (Søren Dippel, Denmark, DSWCI *SW News*) Cabinda is detached from rest of Angola, might be considered separate radio country (gh)

ANTARCTICA LRA36, R. Nacional Arcángel San Gabriel, 15476, transmitter test, then regular M-F until 1950*v, only audible after Gabon 15475 1900* (Tony Jones, Paraguay, *NU* via *DXW*)

ARGENTINA R. Armonía, Buenos Aires on 3200.35 = 2 x 1600, very good with minute of news, ID and music at 0100 (Jarmo Havukunnas, Finland, DSWCI *DX Window* via Thurman as are all such items) Also reported from N Am (gh)

AUSTRALIA Australian Defence Forces Radio, 13525-USB, at 0430-0633* with country, pop music, DJ chatter, phone talk, news; very weak (Brian Alexander, PA) Surprising we get as much signal as we do since it's aimed at a ship in the Persian Gulf! Better here, informal broadcast with news at 0605-0613 (gh, OK) For *HMAS Melbourne* from 40 kW Canberra; fax +61-2-266-6565 (BBCM) See also TASMANIA

BENIN At first unID, 7210.2 at 2100-2300* is ORTB, since 4870 then reactivated and closed with same anthem (Bob Hill, MA, HCJB *DX Partyline*)

BOSNIA-HERCEGOVINA R. B-H, 7105, faxed QSL for faxed report to 387-71-455-104, one week after follow-up, on letterhead signed by Nermin Podzi , program coordinator (Dan Henderson, MD, *NU* via HCJB *The Latest Catch*)

BRAZIL RadioBrás missing from 15445 in mid-July, 1200 English, 1330 Spanish. No spurs found. At least it cleared 15445 for V. of Tibet, *q.v.*, before 1200 (gh, OK) Portuguese 1900-2030 on 17750 wandered 17746-17753 (Pankov and Ivanov, Bulgaria, *BC-DX*) 1800-1920 En-

All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; Z-96 = Summer season

glish on 17758.06v//15265 (Nikolay Pashkevich, Russia, *ibid.*) R. Marumby on new 11724.9v until covered by Turkey, *q.v.*, at *2100v, additional to 9665 (Finn Krone, Denmark, *BC-DX*)

CANADA RCI has been pre-empting regular programming one weekend a month for a "live" broadcast from Rideau Falls Park in Ottawa, *Canada and the World*, for greater public exposure to Ottawans, found Sun July 21 in the 2000 hour on 11690, 15325; Mon 0100 on 13670, 9755, 6010. *Double Exposure* has been getting additional airing thanks to *As It Happens* ceding last half hour on Fridays, 2329 on 5960, 9755, 13670. *The Chumps* was summer comedy series via CBC North Québec, 9625, Sats 1505-1533.

CHINA CRI's facilities urgently need updating. High-powered SW and MW transmitters will be introduced to improve reception in US, Europe, Africa (CRI *Messenger* via Gigi Lytle, Bob Thomas) [non] CRI Mali relay including English 0000 irregularly on 11695 hetting VOA, ex-11760 which clashed with Cuba, ex-11715; also bothers Nederland at 0127 (gh, Alexander, Thurman)

COLOMBIA CARACOL heard on 1920.05 kHz at 0100-0715+, fading in and out, maybe 2 x 960 where CARACOL Caribe is listed, no //s found on MW or 60m (Brian Alexander, PA, *W.O.R.*)

COSTA RICA Expect special programming for RFPI's 9th anniversary Sept 16-17 on 15050-USB, 7385, 6205-USB (gh)

DENMARK [non] R. ABC/Denmark, 7570 via Kaliningrad, Sun 0800-1200, well heard in Europe, but not outside; if previous E-mail doesn't work, try **hartvig@cybernet.dk** (Stig Hartvig Nielsen, DSWCI *DX Window*) Fax +45-86-405522 (BBCM) No longer relayed by Kaliningrad, since name of that city has changed to Korolyov! (Karel Honzík, Czech Rep., *DX Window*) Programs done a couple days before, then by courier to site; disadvantage as would prefer to broadcast directly (Nielsen via Søndergaard, *hard-core dx* via *DXW*)

GABON Africa Number One reported it had agreed to relay the Gabonese national radio from Moyabi so it could cover the entire country; has 5 x 500 kW (BBCM) So does RTG 4777 sound like 500 kW now? (gh)

GEORGIA George Jacobs & Associates now represents the SW facility here, airtime available, especially suitable for Mideast coverage (via George Thurman)

GUYANA Reactivated GBC, 3290, verified with freq-only form letter from CE Shiroxley Goodman; now's the time to QSL them.Using very simple dipole to minimize skywave and cover Guyana's interior, but had received no reports from there, just abroad (David Sharp, FL, DSWCI *DX Window*) Fax OK: 592-2-587-56 (Sharp, *DWC*) IDed as Voice of Guyana at 2330, 0934, time check at UT-4 (Robert Wilkner, FL, *Fine Tuning*) Upon occasion 0220-0300+ Namibia heard on 3289.91 instead //3270.05; be careful (Alexander)

HONDURAS R. Copán International testing again on 15674.85 in mid-July, music, and announcements even in French (Ed Rausch, NJ, *W.O.R.*) Peaked here around 2330, but still weak with poor modulation (gh, OK)

HUNGARY To finance satellite service via WRN R. Budapest had to give up two of its four SW freqs for English to NAm (R. Budapest DX program)

INDONESIA Kangguru 2 [see July] Tues 1230 on RRI 9680, announced July 23 was its final broadcast of English-learning, but might return if private funding could be found (gh)

INTERNATIONAL WATERS [non?] Ship *Electra* for Lightwave Mission Broadcasting is smaller than previous ones; hired independent monitoring lab to keep FCC honest. Construction site secret to prevent curiosity-seekers, but when ready will visit four or five different ports and broadcast via land-based station. Plans 3 SW, 1 MW, perhaps TV and FM too; one of the SW = 50 kW. Bill Bragg's *Yesterday USA Network* will use one of the SW 24 hours for old-time radio. (Scott Becker, LMB, on R. Netherlands *Media Network*) Is ocean-going tug, 400' long, renovated; plans to start in mid-autumn (Becker via Chris Lobdell, *DWC*) Not a pirate, but in compliance with all laws, 5-50 kW, not near US due to FCC. Gyro-stabilized satellite receiver and backup equipment aboard, tough, and seaworthy (Allan Weiner, LMB via *ibid.*) Will not fly American flag; plans interactive www site (Becker via Alan Haber, *Radio World*)

KIRIBATI R. Kiribati, 9825-USB, 0700-0825+ local island music; mixing with BBC until 0714, then clear but weak (Brian Alexander, PA, *Mundo Radial*)

LAOS Xieng Khouang on new 5398.7v around 1145-1400 (Roland Schulze, Philippines, *BC-DX*)

LAO NATIONAL RADIO

LIBERIA New on exactly 5000 July 10 was Liberia Communication Network testing with music, and at 2300-2315 English news, good until WWV overtook at 0055 (Lee Silvi, OH, *World of Radio*) By far strongest signal on 60m, 2325-0027* but not heard the next day (Brian Alexander, PA, *W.O.R.*.) 5000 heard as early as 1830, as late as 0540 by many European Dxers; guess 10-50 kW (*DX Window* via Thurman) Location given as Totota in central Liberia; hilife and reggae music, news and editorials in English, French, but no partisan content to the broadcasts I've heard. Asks for reports to the 89.9 FM in Monrovia, which per *WRTH* 95 was ELRL, licensed to National Patriotic Reconstruction Assembly, *i.e.* Charles Taylor. Announced phone in Monrovia of 22-69-63. Shortly moved to 5100 at 1800-0300, 6100 at 0500-1800 per announcements; P.O. Box 1103, Monrovia, but my local PO confirms mail to Liberia suspended (Ed Rausch, NJ) Suspect this is a 10 kW transmitter looted from ELWA (Colin Miller, Canada, *DXW*)

MEXICO We have tried to contact all inactive Mexican SW stns; these have some hope of returning: 6045, 6105, 6115, 9600 (Julian Santiago, *Encuentro DX*)

MOLDOVA [non] R. Moldova Int'l, 7520 via Romania, English poor at 2200, 2300 with transmitter noise or jammer; 0330 fair, 0430 weak under Denmark (Brian Alexander, PA)

NETHERLANDS 1330-1625 via Madagascar moved to 9895, 15585 (RN *MN* via *BC-DX* via *Australian DX News*) At 1530 on 12090 ex-15585 (RN *MN* via RVI *Radio World* via Steven Cline, Diane Mauer)

NIGERIA [non] R. Democrat International, clandestine via South Africa, moved July 14 from 7195 to 6205, still at 2100-2200 but asked listeners to suggest better time between 1800 and 2100 (Ed Rausch, NJ, *World of Radio*) During feed losses, announcements heard on SW from World Radio Network, so WRN must be feeding it from London via line to South Africa (BBCM)

Radio Democrat International Nigeria

QSL – Verification of Reception

Nigerian government was wasting money trying to unravel the mystery of our station. It is not clandestine; all info about it is in the public domain with the London address (RDIN announcement heard by Roger Tidy, UK) But they're not admitting it's via S. Africa (gh) RDIN E-mailed me pages of info. Needs contributions to cover up to $1M annual broadcast costs, cheques made out to Nalicon Trust Fund, endorsed on the back "Radio," sent to NALICON USA, P.O. Box 175, Boston, MA 02131; fax 617-364-7362; E-mail **nalicon@nalicon.com** (via Larry Shewchuk, Man.) Programming ranges from non-political to simulated torture sounds (Hans Johnson, *DWC*)

OMAN BBC is spending $48M on new relay here on mainland to replace Masirah Island by end of century, to improve reception in South Asia, along with new Thailand relay, *q.v.* (Robert Wilson, BBC WS, UPI via David Alpert)

PHILIPPINES PBS added more Filipino/English via VOA Poro, 0330-0400 on 15330 at 34°, 13770 232°, and to WNAm 17730 45° (Dan Ferguson, IBB

via *Electronic DX Press* via Thurman)

RUSSIA VOR went silent on 7240 which had been one of best English freqs to us at 2030-0300; still 7175 and 7250 until 0100, but hard to hear after that (Kevin Hecht, PA, *W.O.R.*)

SÃO TOMÉ Another VOA xmtr on line: 0300-0400 UT on 7290 kHz, 0400-0500 7180, 1600-1700 11880, 1700-1800 11890, 1800-2230v 11975 (VOA *CW* via Rausch) Music tests with 100 kW on 4750 or 4950 authorized, mainly 0700-1300 (Bill Matthews, RKI *SW Feedback*)

SERBIA [non] R. Yugoslavia still announcing but unheard on 9580 at 0000 English, just on 11870 clashing with Hungary; also 0430? (Daryl Rocker, NY and Bob Thomas, CT, *W.O.R.*)

SINGAPORE RSI, English at 1100-1400 on 6015, 6155, includes a mailbag program, *Friends of the Airwaves,* Sun 1305-1345 (Arthur Cushen, RNZI *Mailbox*; via Gigi Lytle)

SOMALIA Four SW stations active in Mogadishu, all in 6500-7000 range: 6545v or 6655v, Holy Koran Radio, supporting *Ahlu Sunnah Waljama*; 6711, R. Mogadishu, V. of Somali Pacification/Peace Processing, supports Osman Ato; 6800v, R. Mogadishu, V. of the Somali Republic, supports Ali Mahdi Muhammad; 6990-7000v, R. Mogadishu, V. of the Masses of the Somali Republic, supports Gen. Muhammad Farah Aydid. All fqs vary (Chris Greenway, BBCM via *DXW*) That IDs the 6999 station heard at 0310 and better early eves (Finn Krone, *ibid.*)

SWAZILAND Dr Gene Scott claims to be on SCR 6155 at 0400, but it isn't even on the air at this time (Hans Johnson, *Cumbre DX* via *DX Ontario*)

SYRIA R. Damascus on new 13610 at 2105-2205 English //12085 (Nikolay Pashkevich, Russia, *BC-DX*) 13610 also in Arabic at 0630, 1930 (Wolfgang Büschel, *ibid.*) Audio quality appalling on 13610 (Noel Green, UK, *BC-DX*)

TASMANIA R. Techno-Net is a regular pirate at 0930-1230 on 4795 or 11700v, playing techno-pop music; P.O. Box 797, Sandy Bay, Tas. 7006, Australia (Chris Lobdell, *NU* via HCJB *TLC*) 4795 at 1130 as Radio TSW, Box 7976 (Paul Bailey, ARDXC via *EDXP*)

THAILAND R. Thailand added three more English half-hours via VOA Udorn July 15: 0530 Eu 15115, 1230 9885, 1400 9830 both to As/Pac (Dan Ferguson, IBB via *DXW*) Worth checking for the last two in NAm, tho beamed SE from Thailand; I could hear 9885 poorly (gh) New BBC relay here will cost $56M; only 23 percent of S. Asian population curently receives acceptable BBC signal; see OMAN (UPI via Alpert)

TIBET [non] Beijing station Easy FM in English is used to jam V. of Tibet 15445 1145-1200 via Seychelles, completely obliterating VOT, went off at 1200 (BBCM) Switched to 15480 escaping jamming (Victor Goontilleke, Sri Lanka) VOT URL is: **http://www.twics.com/~tsgjp/tibrad.html**(Kuhl, Keeney, *Cumbre* via *DXW*)

TINIAN Asia Pacific Network plans to broadcast from here in two years (Richard Richter, APN on VOA *CW*) If mothballed RFE/RL Maxoqueira, Portugal, site is permanently closed, the 6 x 50 kW SW transmitters could go to Philippines or the proposed, if not shelved site on Tinian Island, north of Saipan (Robert Jones, *Australian DX News*) We have unconfirmed reports that SW transmitters are already built here, source of funding secret (gh)

TURKEY TRT on mixing product 9265 at 1530-1600 from 9655 Arabic and 9460 Turkish (Pankov & Ivanov, Bulgaria, *BC-DX*) Have noticed TRT missing from 9445 (gh) Heard at 0300 in Turkish on 8445 (Chuck Rippel, VA, *DXW*) Punch-up error? Still heard two weeks later, mixing with KFS V-marker. Also, 11725 has some great Turkish music, such as Sun 2105-2200 (gh, OK)

UKOGBANI R. Japan and RCI assume that all their UK relays are via Skelton, but both have used Woofferton regularly for a few years, and it makes you wonder if the stations themselves know this! (Tony Rogers, BDXC *Communication* via *BC-DX*)

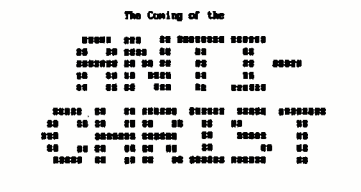
UKRAINE RUI has new weekly DX show with clips of unusual stations, UT Fri 0045 on 7150, 9550 (Ben McNimley, *Dxing with Cumbre*) Started a bit earlier, and over in time for *Media Network* at 0053; heavy accent including SW station news we've already heard elsewhere; should also be at Thu 2140, Fri 0340 (gh)

URUGUAY IBRA sked last month was outdated, mixed up. Formerly used R. Fénix on 6170, not 6370; no longer on SW (Horacio Nigro, Uruguay, DSWCI *DX Window*) Emisora Ciudad de Montevideo, testing 9650 irregularly between 1100 and 0300; building 19mb transmitter to be tested on 15230 with 5 kW, hoping to have yagi for 125 kW ERP toward NAm (Nigro, *ibid.*, via *Fine Tuning*)

U S A Former bureau chief of VOA Moscow was dismissed from his post for refusing to employ Russian workers with ties to the KGB. Peter Collins has filed complaints seeking Whistleblower protection. Collins said, "What we're dealing with is as much a case of bureaucratic arrogance as a security lapse." (John Pulley, *Federal Times*) Voice of America added Ethiopian languages to Amharic 1800-1830 daily: M-F 1830-1845 Tigrigna, 1845-1900 Oromiffa (USIA via Kevin Hecht, Aaron Pilchick) No freqs given, but Z-96 sked showed Amharic on 7170 & 11740 Kavala, 7330 Botswana (Pilchick) Also added Kinyarwanda and Kirundi 0400-0430 M-F on 6145, 7415, 7290 (VOA *CW*) No accident 6145 is next to Burundi's own 6140!—too close for comfort? (gh) VOA started new *European Edition* at 1906-1930, bumping *Dateline Bosnia* to 1930-2000 (VOA *Communications World*) Archive shows of late Willis Conover's *Music USA—Jazz* reduced to Sat only at 2010 on 9760, 9770, 10454-LSB, etc; weekdays hour occupied by news and variety of music (David Boddington, VOA via *DWC*) New sked from late July includes *American Gold* with Ray Freeman, Mon 1110-1200 to As/Pac, shorter versions at 1530, 2200, 2430 (VOA *CW*)

Asia-Pacific Network is pressuring Philippines, Thailand, to carry this new service over existing VOA transmitters, even though not covered in existing agreements; they would rather not, since APN could cause bilateral problems with target countries, interfering in their internal affairs. After cosmetic name-change from R. Free Asia, APN actually applied to Vietnam to set up a bureau in Hanoi. See also TINIAN (*W.O.R.*)

On WWCR, *The Coming of the Anti-Christ* purports to support and be in contact with this individual, in obviously scripted "interviews" with disciples, Sun 2100 on 9475, UT Mon 0000 on 5065. Promotes His website => **http://www.antichrist.com**or P.O. Box 8055, Des Moines, IA 50301-8055; voicemail 24h 1-800-693-8717 (gh) A blast to listen to—a put-on? (Gigi Lytle, TX) WWCR is making tentative frequency plans for a fifth transmitter, 17/9/7 MHz bands (gh) Now has two computer programs back-to-back on 9475: Sun 1700 *Cybernet News,* 1800 *Net Connection.* Part of WWCR-1 schedule changed to: 3215 until 0405 (Sun/Mon 0400), then 3210 (Adam Lock, WWCR)



WORLD OF RADIO on WWCR as of late July: Thu 2030 15685, Fri 2115 15685, Fri 2215 9475, Sat 1130 9475, Sun 0800 3210, Sun 0900 5065, Sun 1900 12160, Sun 2130 9475, Mon 2030 15685, Tue 1230 15685, Wed 1130 15685 (gh)

KVOH alternate 5085 reinstated on Jacobs' schedule, available 0000-1400; check if they've started using it now during part of that span (via George Thurman)

WGTG note to *MT* states, "We are testing #2 transmitter on 5065, 7380, 3210, 2390 kHz day and night. QSL card for reception report." (David Frantz, WGTG) Hmm, WWCR's nite-time freqs (gh) "Meltdown tests," David Frantz called them, daytime only in July (Ulis Fleming, *DWC*)

UZBEKISTAN R. Vatandosh at 0230-0330 with jamming or interference on 9715, 9540, 9530, best on 7190, language uncertain; called MinCom and secretary didn't know about it but said name means Compatriot, so may be a division of R. Tashkent for Uzbeks abroad, something like the former Radiostantsiya Rodina from Moscow (Vladimir Titarev, Russia, *DX Window*)

VATICAN From Sept 1, VR English at 0250-0310 plans 6095 ex-9605 //7305 (VR sked)

VENEZUELA YVTO timesignals on 5000 put spurs on 4900, 5100-USB at 0210; new transmitter? (Rich McVicar, Quito, HCJB *The Latest Catch*)

ZAMBIA ZNBC Radio 1 at 0245-0530 on 4910, 0500-1430 7220, 1430-2205 4910. Radio 2, 0250-2210 on 6165 (BBCM)

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

Broadcast Loggings

SHORTWAVE BROADCASTING

Gayle Van Horn

0000 UTC on 7325
IRELAND: Midwest Radio. Dublin greetings from call-in listeners. Excellent propagation for this one hour transmission. (Edouard S. Provencher, Biddeford, ME)

0023 UTC on 5050.42
PERU: Radio Municipal. Spanish. Talk by male/female duo with many time checks. Low modulation with possible ID to music pause. Signal covered at 0037. (Giovanni Serra, Rome, Italy) Peru's **Radio Cora** heard on 4914.4 at 0450 with regional music to "Cora" ID at 0500. (Jerry Witham, Keaau, HI)

0045 UTC on 9540
SPAIN: Radio Exterior de Espana. *Entertainment in Spain* at tune-in featuring spanish performers and Spanish language lessons. (Jim Moats, Ravenna, OH) Station noted on 9540 at 0519. (Serra, Italy)

0100 UTC on 7300
SLOVAKIA: Radio Slovakia International. Station ID, frequency quote and program preview into news bulletin. Noted on // 5930, 9440. Fair quality. (Moats, OH)

0117 UTC on 5620.91
PERU: Radio Ilucan (tent) Spanish. Andean music tunes and announcer's talk to 0124. Peru's **Radio Satelite** noted in Spanish on 6725.52 at 0301. ID as "RRRRRadio Satelite...". Time checks and "por el segundo domingo de mayo...por el dia de la madre...," abrupt end of program and 0452*. (Serra, Italy)

0130 UTC on 9655
AUSTRIA: Discussion on child labor laws, and the increase of drug use and violence. (Elmer W. Wallesen, La Grange Park, IL) Station heard at 0230 on 9655//9870 with IDs, news bulletins, and current affairs update. (Moats, OH)

0140 UTC on 7540
GREECE: Voice of Greece. News at tune-in with items on Israel and United States. Musical interlude at 0145 to "this is Athens." SINPO=34533. (George Knight, Garfield, NJ)

0201 UTC on 4824.4
PERU: La Voz de la Selva. Spanish. Fine "lite" music to female's ID. Continued music program, audible only in LSB to avoid signal splash. (Serra, Italy)

0220 UTC on 6203
PERU: Radio Cusco. Spanish. Chatter from DJ to regional music. Time check and local ads. More talk, phone calls, and public service announcement. Station sign-off at 0300. (Tom Banks, Dallas, TX)

0310 UTC on 4895
COLOMBIA: La Voz del Rio Arauca. Spanish. Station ID/promo and national news briefs. Two Colombians noted as: **Radio Nacional** heard on 4955.8 at 0330. (Witham, HI) **Ecos de Orinico** heard on 4905.3 at 0355 with "Ecos Ecos" echo ID. (Witham, HI)

0630 UTC on 7280
KAZAKHSTAN: Radio Almaty. Russian. Talk to lady announcer's newscast. (Witham, HI)

0850 UTC on 21725
AUSTRALIA: Radio Australia. Music pause to interval signal. ID and preview for upcoming newscast. ID/time pips to world and national news with correspondents reports. (Serra, Italy)

1035 UTC on 11715
CANADA: Radio Korea International relay. Poor signal for English *Mailbag* program. (Bob Fraser, Cohasset, MA)

1130 UTC on 5965
CANADA: BBC WS relay. *One Foot in the Grave* comedy series. (Fraser, MA)

1145 UTC on 6120
CANADA: Radio Japan relay. News item on wild monkey park to close—they got too tame and people lost interest! (Fraser, MA)

1215 UTC on 13625
FRENCH GUIANA: Radio France relay. Interview on the Berlin meeting on the future of NATO, heard on // 15530. (Fraser, MA)

1315 UTC on 15430
NORWAY: Radio Norway International. Feature on 4-nation *Sea Launch*, Norway to convert oil rig into rocket platform in South Pacific. (Fraser, MA)

1450 UTC on 15520.27
BANGLADESH: Radio Bangladesh. Bengali. Local chants alternating with male talk. Time pips at 1500 to station ID and news. (Serra, Italy; Witham, HI)

1458 UTC on 15120
NIGERIA: (Clandestine) Radio Democrat International. Drum music interval signal, ID and program information to regional music. (Larry Shewchuk, Seven Sisters Falls, BC, Canada/via email)

1525 UTC on 11580
GUAM: Trans World Radio-KTWR. Religious programming to station ID, address and Christian vocals. (Frank Hillton, Charleston, SC)

1623 UTC on 7345
SLOVAKIA: Radio Slovakia International. Male frequency quote to brief interval signal. Programming preview to *Slovakia Today* and mailbag program. Pop song to talk about pop music in the Czech Republic and Slovakia with interviews. Station ID/address and interval signal. Heard / / 6055, 5915. (Serra, Italy)

1655 UTC on 6140
SEYCHELLES: FEBA Radio. Children's choir with religious music sung in unid language. Mentions of Madagascar and FEBA IDs at 1700*. Programming in presumed Farsi at 1840 on 9455. Text to interval signal and 1850*. (Jerry Witham, Keaau, HI)

1705 UTC on 4880
INDIA: All India Radio. Half-hour of sitar music to station ID and national newscast. (Witham, HI)

1715 UTC on 17840
NETHERLANDS ANTILLES: BBC WS via Antigua. *Composer of the Month* featuring the music of Anton Dvorak. (Fraser, MA)

1730 UTC on 7255
NIGERIA: Voice of Nigeria. Arabic. Mineral price quotes to children's choir and ethnic instrumental music to 1800*. (Witham, HI)

1740 UTC on 6150
JAPAN: Radio Japan. *Media Roundup* hosted by Ian McFarland featuring Larry Magne's receiver review. (Witham, HI) Japan's Sackville, Canada, relay heard on 5960 at 0101. (Sue Wilden, IN/via email)

1832 UTC on 7270
ALBANIA: Radio Tirana. News to 1835, music pause and commentary about political situation in Kossovo to 1838. ID/music pauses to talk about Albanian University including interview with Minister of Department of Education. (Serra, Italy)

1850 UTC on 17605
NETHERLANDS ANTILLES: Radio Netherlands-Bonaire. *Siren Song* program of Yehudi Menuhin's music for peace. (Fraser, MA)

1900 UTC on 9440
CHINA: China Radio International. World news to station ID. Regional news and special program commemorating the Chinese Lunar New Year as the *Year of the Rat*. (Witham, HI)

1900 UTC on 15540
ECUADOR: HCJB. *Studio 9* program on colonial schools. (Fraser, MA)

1924 UTC on 15009
VIETNAM: Voice of Vietnam. Fair signal quality for national political text to ID beak. Regional instrumental program and travelogue feature on remote villages. (Loyd Van Horn, Brasstown, NC)

1925 UTC on 11603
ISRAEL: Kol Israel. Report on economic aims of the new government. (Fraser, MA; Banks, TX; Hillton, SC)

1935 UTC on 9670
ITALY: RAI. Italy celebrates the 50th anniversary of the republic. (Fraser, MA; Sam Wright, Biloxi, MS)

2000 UTC on 12160
USA: Radio Telefis Eireann via WWCR Nashville, TN. News of Irish interest and sports results. (Provencher, ME) RTE can also be heard via satellite on World Radio Network 1, C-band satellite service-domestic satellite Galaxy 5/transponder 6, audio subcarrier 6.80 MHz at 2100-2130 UTC with excellent programming! -ed.

2015 UTC on 12080
AUSTRALIA: Radio Australia. *To the Editor* program featuring selected letters to the editor from many of Australia's newspapers. (Witham, HI) *Asia Focus* heard on 9580 at 0105. (Fraser, MA)

2015 UTC on 11750
ASCENSION ISLAND: BBC WS relay. *Seeing Stars* featuring Norman Locklear Observatory and their work. (Fraser, MA)

2025 UTC on 13785
NORTH KOREA: Radio Pyongyang. Spanish. Female announcer running the usual blend of nationalistic music and comments. Station ID at 2030. Arabic programming noted on 11905 at 1840. (Witham, HI)

2145 UTC on 17750
BRAZIL: Radio Nacional. Portuguese. Bombastic announcer with a sporting event wrap-up. ID at 2152 to phone interview, all the time pumping the echo machine at full tilt. (Witham, HI) Brazil's **Radio Nacional do Brazil** heard on 15445 at 1235. Report on animal breeding to Brazilian music bridges. (Fraser, MA)

2133 UTC on 5003.71
EQUATORIAL GUINEA: Radio Nacional. Spanish. Poor modulation for news from female/male with music pauses. Frequency quote, ID at 2142 and political text from male. (Serra, Italy)

2145 UTC on 7240
RUSSIA: Voice of Russia. *This is Russia*-featuring the ancient city of Suzdel. (Fraser, MA; Wilden, IN; Hillton, SC; Wright, MS)

2235 UTC on 5047
TOGO: Rome Lome. French. Regional updates to music program. Phone-in from listeners with ID break at 2245. (Wright, MS)

2236 UTC on 17750
USA: Voice of Free China via Okeechobee, FL. Interesting story on bungee jumping. (Wilden, IN)

Thanks to our contributors — Have you sent in YOUR logs?
Send to ***Gayle Van Horn,*** *c/o Monitoring Times (or e-mail gayle@grove.net)*
English broadcast unless otherwise noted.

Gayle Van Horn, gayle@grove.net

It's WUN...derful!

Besides the radio newsgroups and personal homepages of hobbyists on the Internet, there is a terrific electronic club for utility enthusiasts who chase signals on frequencies under 30 MHz.

WUN, the Worldwide Utility News Club, was organized for sharing news and information about utility (nonbroadcast) transmissions on the HF radio spectrum.

There are no dues or fees for joining WUN, and you are welcome and encouraged to join in on the conversation. Monthly newsletters consist of the following columns; *International Civil Aero, Nautical News, Surfing the Longwaves, Digital Review, Loggings Column, New Products/Reviews, Utility Roundup, Ask WUN, The WUN Military Column,* and *The QSL Report.*

For more information and a copy of the club's FAQs (Frequently Asked Questions) on this WUN...derful utility club, use your favorite web browser and access the URL: **http://www.leonardo.net/berri/wun**. This will put you in the WUN home page. Besides the current and back issues, the WUN World Wide Web site contains many other useful links to utility information files, special topics, and other WWW sites. Send email relating to this site to the webmaster at: **berri@aero.org**.

To subscribe to the WUN list, send an email message to: **majordomo@grove.net** with only "subscribe wun" in the body of the message.

Those without computer/Internet access are also welcome. However, they must pay the cost of printing and mailing of the newsletter. For information on paper subscriptions contact; Tim Braun, Worldwide UTE News (WUN) HQ, P.O. Box 16533, Washington, DC 20041-6533, USA.

BELGIUM

Radio Vlaanderen International, 13670 kHz. Full data color *Kanaal Gent-Temeuzen* card unsigned. Received in 119 days for a cassette of programming and an English reception report. Station address: P.O. Box 26, B-1000 Brussels, Belgium. (George Knight, Garfied, NJ)

BRAZIL

Radio Bandeirantes, 6090 kHz. Confirmation letter signed by Joao Jorge Saas, plus souvenir station T-shirt and stickers. Received in 33 days for a Portuguese report and one IRC. Station address: Rua Radiantes, 13-Sao Paulo, SP 05699-900. (Jose Moura, Washington, DC)

Radio Difusorado Amazonas, 4805 kHz. Partial data verification on a "3-D" postcard, signed by Joaquim Marinho. Received in 136 days for a Portuguese report and one U.S. dollar. Verification signer says he collects topical stamps of cinema, music and cartoons. Station address: Caixa Postal 311, 69011-970, Manaus, AM Brazil. (Darren R. White, Hattiesburg, MS)

CHILE

Radio Esperanza, 6090 kHz. Full data *Certificado de Sintonia* QSL card signed by Eleazar H. Jara, and stamped with station seal. Received in 60 days for a Spanish report and two IRCs. Station address: Casilla 830, Temuco, Chile. (White, MS)

CUBA

CLA-Habana Radio, 8496.0 kHz USB. Full data prepared QSL card signed and stamped with station seal. Received in 151 days for an English report and one U.S. dollar. Station address: Boca De Jaruco, La Habana, Cuba. (Dr. Selsyn)

IRELAND

Radio Telefis Eireann via WWCR-Nashville, TN, 12160 kHz. Full data *Dublin City Ireland* color postcard verified with illegible signature. Received for an English report. Station address: Donnybrook, Dublin 4, Ireland. (Patrick Barry, Mission Viejo, CA)

Midwest Radio, 7325 kHz. Partial data QSL card signed by Michael Commins-Program Producer, plus two verification letters, stickers, postcards and station newsletter. Received in 101 days for an English report, three IRCs and two souvenir postcards. Station address: Abbey St., Ballyhaunis, County Mayo, Ireland. (Steven Cline, Indianapolis, IN, via e-mail; White, MS)

JAPAN

JFM-Muroto Fisheries Radio, 8508 kHz USB. Full data prepared QSL card signed and stamped with station seal. Received in 38 days for a utility report of CW traffic. Station address: 2318 Furushiro Murotsu Muroto-City, Kochi-Prefecture, Japan. (Steve Mc Donald, Port Coquitlam, BC, Canada)

JFG-Shizuokaken Fisheries Radio, 12811.5 kHz USB. Full data prepared QSL card signed and stamped with station seal, plus color photo of station. Received in 20 days for an English utility report of CW traffic. Station address: Shizuokaken Musen (Gyokyo), 1991-1 Tajiri, Yaizu-shi, Shizuokaken-ken, 425, Japan, (McDonald, CAN)

MEDIUMWAVE

WVBS, 1470 AM kHz. Full data prepared QSL card signed by Pastor Carl Gibbs. Received in 207 days total, four days after second follow-up report. Verification signer requested future correspondence be directed to: Bible Baptist Church, P.O. Box 914, Burgaw, NC 28425. (Mike Hardester, Jacksonville, NC)

KBGO, 1140 AM kHz (ex 840 kHz). Personal letter on *Casino Radio* letterhead, signed by Rick Pitts-Account Executive. No data verification letter signed by Lance Alexander. Station address: 1130 E. Desert Inn Rd., Las Vegas, NV 89109-2812. (Paul Gager, Deutschkreutz, Austria)

WPEN, 950 AM kHz. Full data verification on station letterhead, signed by Larry Paulausky-Chief Engineer. Received in 16 days for a cassette of programming and an English AM report. Station address: One Bala Plaza, Bala Cynwyd, PA 19004. Phone 215-667-8500, FAX 215-664-9610. (Knight, NJ)

NETHERLANDS ANTILLES

PJC-Curacao Radio, 8694 kHz USB. Full data color glossy QSL card signed by R. Sprock, stamped with station seal. Received in 33 days for an English utility report and one U.S. dollar. Station address: Postbus 103, Willemstad, Curacao, Netherlands Antilles. (Bill X)

NIGERIA

FRCN-Kaduna, 4770 kHz. Full data verification letter signed by Ahmed U. Abdullahi. Received in 78 days for an English report. Station address: P.O.Box 250, Kaduna. Nigeria. (Don Aspinall, VA via email)

SHIP TRAFFIC

KXCH-*SS Jeremiah O'Brien*, 8384.5 Sitor-A.(WWII Liberty ship). One of two remaining WWII Liberty ships. Full data prepared QSL verified, plus full data commemorative QSL card for 1994/50 year memorial cruise to the beaches of Normandy, France. Received in 683 days for an English utility report and an SASE. Ship's location noted as Cherbourg Harbor, France, at time of log. Ship address: Building A, Fort Mason Center, San Francisco, CA 94123. (Rich Baker, OH, via email)

KHJL-John W. Brown, 500 kHz. (WWII Liberty ship). Full data QSL card verified, plus folder on vessel. Received in 16 days for a test transmission. Between 1941-1945 over 2700 Liberty ships were built, and only the *John W. Brown* survives on the east coast. Ship address; Project Liberty Ship, P.O. Box 25846, Highlandtown Station, Baltimore, MD 21224-0846. (Hank Holbrook, Dunkirk, MD) *Thanks, Rich and Hank — great QSLs-Gayle.*

VENEZUELA

YVTO-Time/Frequency Station., 6100 kHz. Full data QSL card verified, plus station form letter and folder. Received in 45 days for an English report. Station address: Observatorio Cagigal, Apt. 6745, Armada 84-Dhn, Caracas 103, Venezuela. (R.W. Parker, Amherst, NY)

YUGOSLAVIA

Radio Yugoslavia, 9580 kHz. Full data QSL card depicting 17th century Belgrade, unsigned. Frequency schedule and sticker enclosed. Received in 15 days for an English follow-up report and one U.S. dollar. Station address: Hilandarska 2, P.O. Box 200, 11000 Beograd, Serbia, Federal Republic of Yugoslavia. (Randy Stewart, Springfield, MO)

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 Time) 4,5,6, or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC Sunday will be heard on Saturday evening in America (8:30 pm Eastern, 5:30 pm Pacific).

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

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

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

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

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

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

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

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

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

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

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

Hot News

Programming Tips by Jim Frimmel

Voice of America Update

Inner/Outer Space: VOA has introduced a new program in special English called *Exploration* in its Wednesday broadcasts. Hosted by Steve Ember and Shirley Griffith, early editions of the 15-minute program focused on space news. The first broadcast at 0045 (am/as) is repeated at 0345 (af), 1115 (as), 1345 (as), 1615 (af), 1645 (as/me), and 1845 (me). *Exploration* replaces the program *Space and Man*. The new name will permit VOA to venture back to Earth to examine other avenues of exploration.

VOA Teaches English: The VOA has inaugurated an English-teaching program called *All About English* (M-F) at 1310 (as), 1610 (as/me), and 1810 (me). The new program is an expanded (20-minute) version of the previously discontinued *Tuning in the USA*. *All About English* replaces *Spotlight on Business and Finance* (Mon), *Inside USA* (Tue), *International Focus* (Wed), *Reporter's Notebook* (Thu), and *Perspectives* (Fri).

Europe Edition: The VOA has slipped the starting time of *Dateline Bosnia* from 1906 to 1930 (M-F), in order to make way for *Europe Edition*, a new background current affairs offering. Program content is not limited to European news, as one might expect, but appears to be tailored to provide information of interest to European listeners.

The New *BBC On Air*

BBC On Air magazine is the replacement for *BBC Worldwide*, expected to resemble the old *London Calling*. My archived copy of *London Calling*, last printed in October 1992, was 28 pages (and £1 per issue) compared to the 48 pages of *BBC On Air* (and £2 per issue). It was immediately obvious that six of those extra pages are occupied by the listings of the BBC's international TV channels. That service did not exist in 1992. Nor was the beeb sending out its programs into five "streams" back in 1992.

The three pages of frequency listings in chart form that had been carried over from *London Calling* to *BBC Worldwide* are changed dramatically in the new *BBC On Air*. Instead of full page tables to the five "streams," the charts are compressed into 18 separate bar charts, each describing frequencies in use to different target areas. Two new features are:

1. Each frequency's "bar" is labeled with a letter code to describe the transmitter's country location.
2. Local times in one of the cities in the region of the intended target audience is now displayed at the top of each chart. UTC times remain at the bottom of the charts.

The most dramatic change is the way that programs are listed by day-of-the-week. *BBC Worldwide* listed them first by "stream" and then by day, making program comparison a tedious task. The listings are now organized by weekday with the programs for each stream listed in five vertical columns across a two-page spread for each day. It's now a breeze to compare what's on the separate streams by scanning across the columns for any particular time.

Guide to Programmes is virtually the same, and is indispensable to the reader/listener, being a description of all programs plus the days, times, and streams where all the repeat programs may be found. *BBC On Air* still devotes space to columns and short features. Vicky Payne, *BBC On Air*'s new editor, has done a great job in the remaking of a publication that is so essential to the avid BBC World Service listener.

The subscription rate of $30 (US) (£18) per year makes this publication an attractive offer and BBC should increase its subscriber base accordingly. To subscribe, write to BBC On Air, PO Box 76S, Bush House, Strand, London WC2B 4PH. You should also be able to find it on the magazine racks of America's larger bookstores such as Barnes and Noble.

Frequencies

0000-0030	Australia, Radio	11855as	13605pa	13745as	17750as
0000-0100 vl	Australia, VL8A Alice Spg	2310do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100	Canada, CBC N Quebec Svc	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, China Radio Intl	9710na	11655na	11715na	
0000-0100	Costa Rica, Adv World R	7375am	9725am	13750am	15460am
0000-0027	Czech Rep, Radio Prague	5930na	7345na		
0000-0030	Egypt, Radio Cairo	9900na			
0000-0015 vl	Ghana, Ghana Broadc Corp	3366do	4915do		
0000-0045	India, All India Radio	7155as	9705as	9950as	11620as
		11660as			
0000-0030	Kazakhstan, R Alma Ata	6230eu			
0000-0100	Lebanon, Voice of Hope	6280eu	9960eu		
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM Kuching	7160do			
0000-0100	Netherlands, Radio	6020na	6165na	9845na	
0000-0100	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0100	Palau, KHBN/Voice of Hope	9965as			
0000-0100 vl	Papua New Guinea, NBC	9675do			
0000-0100	Philippines, FEBC/R Intl	15450as			
0000-0100	Russia,Voice of Russia WS	7070na	7125na	7240na	7250na
		9620na	9665na		
0000-0030 mtwhfa	Serbia, Radio Yugoslavia	9580na	11870na		
0000-0100	Spain, R Exterior Espana	9540na			
0000-0030	Thailand, Radio	9690as			
0000-0100	Ukraine, R Ukraine Intl	7150na	9550na	9560na	
0000-0100	United Kingdom, BBC WS	5965as	5970sa	5975va	6175na
		6195as	7265as	7325va	9410as
		9590va	9915sa	11750sa	11955as
0000-0030	United Kingdom, BBC WS	7110as	9580as	11945as	15280as
0000-0100	USA, KAIJ Dallas TX	5810am			
0000-0100	USA, KTBN Salt Lk City UT	15590am			
0000-0100	USA, KWHR Naalehu HI	17510au			
0000-0100	USA, Monitor Radio Intl	7535am	9430ca		
0000-0100	USA, Voice of America	5995am	6130am	7215va	7405am
		9455am	9770va	9775am	11695am
		13740am	17735va	17820va	
0000-0030	USA, Voice of America	6873va			
0000-0100	USA, WEWN Birmingham AL	5825eu	7425na	15375sa	
0000-0100	USA, WGTG McCaysville GA	9400am			
0000-0100	USA, WHRI Noblesville IN	5745am			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WWCR Nashville TN	3215am	5065am	7435am	9475am
		13845am			
0000-0045	USA, WYFR Okeechobee FL	6085na	11855ca		
0003-0010	Croatia, Croatian Radio	5895eu	7165eu		
0030-0100	Australia, Radio	13605as	13755pa	15240pa	15365pa
		15510as	17795pa	17860pa	
0030-0100	Ecuador, HCJB	9745am			
0030-0100	Iran, VOIRI	6050na	9022na	9685na	
0030-0056	Lithuania, Radio Vilnius	9560na			
0030-0100	Sri Lanka, Sri Lanka BC	15425as			
0030-0100	Sweden, Radio	6065am			
0030-0100	Thailand, Radio	15370na			
0035-0040	India, All India Radio	7110do	11830do	11870do	
0038-0055 1&3rd m	Denmark, R Denmark Intl	7275na	7465ca	9560sa	
0050-0100	Italy, RAI Intl	6005na	9675na	11800na	

Selected Programs

Sundays

0000 India, All India Radio: Press Review. Review of the Indian press.
0000 New Zealand, R NZ Intl: RNZ News. News from New Zealand's National Radio.
0000 UK, BBC London (am/as pac): Newsdesk. World news and dispatches from overseas and UK correspondents.
0000 UK, BBC London (south as): World News. Broadcast on the hour of 5, 10, or 15 minutes in length.
0000 USA, WRMI/R Miami Intl, FL: Church of Christ. Religious program.
0010 New Zealand, R NZ Intl: Focus on Politics. Developments on the New Zealand political scene.
0015 USA, WRMI/R Miami Intl, FL: Truth for the World. Churches of Christ spokesman Jim Dearman examines Scripture.
0025 New Zealand, R NZ Intl: NZ Long Range Weather Forecast. Five-day weather forecast with warnings for mariners.
0030 India, All India Radio: News and Commentary. International news and background reports.
0030 New Zealand, R NZ Intl: Insight '96. New Zealand's relationships with other countries of the Asia/Pacific region (Nat'l Radio).
0030 USA, WRMI/R Miami Intl, FL: Wavescan. Adventist World Radio's DX/Media program with Jeff White of WRMI.
0045 UK, BBC London (am/as pac/south as): Britain Today. News about Britain.

Mondays

0000 India, All India Radio: Press Review. See S 0000.
0000 New Zealand, R NZ Intl: RNZ News. See S 0000.
0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0000 USA, WRMI/R Miami Intl, FL: Herald of Truth. Bible-based solutions to personal and national problems.
0008 New Zealand, R NZ Intl: Midday Report. See S 2300.
0012 Serbia, R. Yugoslavia: Political Review. A commentary on current political activities in the region.
0016 Serbia, R. Yugoslavia: Weekly Concert. A classical music program featuring Yugoslav composers and musicians.
0030 India, All India Radio: News and Commentary. See S 0030.
0031 New Zealand, R NZ Intl: RNZ News. See S 0000.
0037 New Zealand, R NZ Intl: NZ Long Range Weather Forecast. See S 0025.
0041 New Zealand, R NZ Intl: Rural Report. See S 2340.
0055 New Zealand, R NZ Intl: International Business News. See S 2355.

Tuesdays

0000 India, All India Radio: Press Review. See S 0000.
0000 New Zealand, R NZ Intl: RNZ News. See S 0000.
0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0008 New Zealand, R NZ Intl: Midday Report. See S 2300.
0012 Serbia, R. Yugoslavia: Press Review. Summary of news items in the Yugoslav press.
0015 Serbia, R. Yugoslavia: Economic Review. Internal Yugoslav financial matters and EEC relations.
0020 Serbia, R. Yugoslavia: Sports Roundup. A summary of domestic sports results and Yugoslavia's participation in international events.
0025 Serbia, R. Yugoslavia: Music. The pop music of Yugoslaia.
0030 India, All India Radio: News and Commentary. See S 0030.
0031 New Zealand, R NZ Intl: RNZ News. See S 0000.
0037 New Zealand, R NZ Intl: NZ Long Range Weather Forecast. See S 0025.
0041 New Zealand, R NZ Intl: Rural Report. See S 2340.
0055 New Zealand, R NZ Intl: International Business News. See S 2355.

Wednesdays

0000 India, All India Radio: Press Review. See S 0000.
0000 New Zealand, R NZ Intl: RNZ News. See S 0000.
0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0008 New Zealand, R NZ Intl: Midday Report. See S 2300.
0030 India, All India Radio: News and Commentary. See S 0030.
0031 New Zealand, R NZ Intl: RNZ News. See S 0000.
0037 New Zealand, R NZ Intl: NZ Long Range Weather Forecast. See S 0025.
0041 New Zealand, R NZ Intl: Rural Report. See S 2340.
0055 New Zealand, R NZ Intl: International Business News. See S 2355.

Thursdays

0000 India, All India Radio: Press Review. See S 0000.
0000 New Zealand, R NZ Intl: RNZ News. See S 0000.
0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0008 New Zealand, R NZ Intl: Midday Report. See S 2300.
0019 Serbia, R. Yugoslavia: People and Events. Background to current affairs.
0030 India, All India Radio: News and Commentary. See S 0030.
0031 New Zealand, R NZ Intl: RNZ News. See S 0000.
0037 New Zealand, R NZ Intl: NZ Long Range Weather Forecast. See S 0025.
0041 New Zealand, R NZ Intl: Rural Report. See S 2340.
0054 Radio Netherlands: Documentary. From Before the Cradle (12th). See A 2354.
0054 Radio Netherlands: Documentary. I want to play for Ajax, dad! (19th). See F 1454.
0054 Radio Netherlands: Documentary. Peter The Great (Part 1) (26th). See F 2354.
0054 Radio Netherlands: Documentary. Stichting Noord-Ierland (5th). See W 1154.
0055 New Zealand, R NZ Intl: International Business News. See S 2355.

Fridays

0000 India, All India Radio: Press Review. See S 0000.
0000 New Zealand, R NZ Intl: RNZ News. See S 0000.
0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0008 New Zealand, R NZ Intl: Midday Report. See S 2300.
0030 India, All India Radio: News and Commentary. See S 0030.
0031 New Zealand, R NZ Intl: RNZ News. See S 0000.
0037 New Zealand, R NZ Intl: NZ Long Range Weather Forecast. See S 0025.
0041 New Zealand, R NZ Intl: Rural Report. See S 2340.
0055 New Zealand, R NZ Intl: International Business News. See S 2355.

Saturdays

0000 India, All India Radio: Press Review. See S 0000.
0000 New Zealand, R NZ Intl: RNZ News. See S 0000.
0000 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0007 New Zealand, R NZ Intl: Saturday Afternoon Variety or Sport. See S 0107.
0030 India, All India Radio: News and Commentary. See S 0030.

Frequencies

0100-0200	Australia, Radio	13605pa	13755pa	15365pa	15415as
		15510as	17795pa		
0100-0200 vl	Australia, VL8A Alice Spg	2310do			
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200 vl	Canada, CBC N Quebec Svc	9625do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0159	Canada, R Canada Intl	6120am	9535am	9755am	11715am
		13670am			
0100-0200	Costa Rica,RF Peace Intl	6205am	7385am		
0100-0200	Cuba, Radio Havana	6000na	9820na	9830na	
0100-0127	Czech Rep, Radio Prague	6200na	7345na		
0100-0200	Ecuador, HCJB	9745am	21455va		
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9640na
		11740na			
0100-0115	Ghana, Ghana Broadc Corp	3366do	4915do		
0100-0130	Hungary, Radio Budapest	9840na	11870na		
0100-0200	Indonesia, Voice of	9525na			
0100-0128	Iran, VOIRI	6050na	9022na		
0100-0110	Italy, RAI Intl	6005na	9675na	11800na	
0100-0200	Japan, NHK/Radio	5960na	11790as	11840as	11860as
		11885as	11890as	11910as	17810as
0100-0200	Lebanon, Voice of Hope	9960eu			
0100-0200 smtwh	Malaysia, Radio	7295do			
0100-0125	Netherlands, Radio	6020na	6165na	9845na	
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0130 m	Norway, Radio Norway Intl	9560na			
0100-0200 vl	Papua New Guinea, NBC	9675do			
0100-0200	Philippines, FEBC/R Intl	15450as			
0100-0200	Russia,Voice of Russia WS	7070na	7240na	9620na	12010na
		12050na	13665na	15180na	15580na
0100-0130	Slovakia, R Slovakia Intl	5930na	7300na	9440na	
0100-0200	Spain, R Exterior Espana	9540na			
0100-0200	Sri Lanka, Sri Lanka BC	15425as			
0100-0130	Switzerland, Swiss R Intl	6135na	9885na	9905ca	
0100-0200	United Kingdom, BBC WS	5970sa	5975va	6175va	6195as
		7265as	7325va	9410as	9560va
		9590va	9915va	11750sa	11955as
		15360as			
0100-0200	USA, KAIJ Dallas TX	5810am	9815am		
0100-0200	USA, KTBN Salt Lk City UT	7510am			
0100-0200 twhfas	USA, KVOH Los Angeles CA	9975am			
0100-0200	USA, KWHR Naalehu HI	17510au			
0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	USA, Voice of America	5995am	6130am	7115as	7205as
		7405am	9455am	9635as	9775am
		11705as	11725as	13740am	15170as
		15205as	17740as	17820as	
0100-0200	USA, WEWN Birmingham AL	5825eu	7425na		
0100-0200	USA, WGTG McCaysville GA	9400am			
0100-0200	USA, WHRI Noblesville IN	5745am			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0130	USA, WRMI/R Miami Intl	9955am			
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200 mtwhf	USA, WVHA Greenbush ME	5850eu			
0100-0200	USA, WWCR Nashville TN	3215am	5065am	5935am	7435am
		13845am			
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na		
0100-0130	Uzbekistan, R Tashkent	7190as	9715as		
0100-0200	Vietnam, Voice of	5940na	7250na		
0103-0110	Croatia, Croatian Radio	5895eu	7165eu		
0115-0130 f	Greece, Voice of	7448na	9420na	9935na	
0130-0155	Austria, R Austria Intl	9655na			
0130-0150	Greece, Voice of	7448na	9420na	9935na	
0130-0200	Netherlands, Radio	5905as	7305as	9860as	11655as
0130-0200	Sweden, Radio	7290am	9435am		
0138-0155 1&3rd m	Denmark, R Denmark Intl	7465am	9560am		
0140-0200	Vatican State, Vatican R	5980as	7335as		
0145-0200	Albania, R Tirana Intl	6140na	7160na		

Selected Programs

Sundays

0100 Japan, NHK/Radio: NHK News. Fifteen minutes of world news.
0100 New Zealand, R NZ Intl: RNZ News. See S 0000.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0107 New Zealand, R NZ Intl: Future Indicative or Sport. National Radio.
0110 Japan, NHK/Radio: Asia Weekly. A magazine of news from other Asian broadcasters, entertainment update and music.
0111 Japan, NHK/Radio: Asian News Summary. This ten-minute wrap-up of regional events is heard as a segment of the program Asia Weekly.
0121 Japan, NHK/Radio: Business Report. A summary of regional financial news heard as part of the program Asia Weekly.
0125 Japan, NHK/Radio: Entertaining in Asia. NEW! A segment of "Asian Report" which focuses on an aspect of entertainment in the region.
0130 Austria, R Austria Intl: Report from Austria. A magazine program covering all aspects of Austrian life and events in the news and opening with the latest news bulletin.
0130 UK, BBC London (as pac/south as): World News. See S 0000.
0137 Austria, R Austria Intl: Postbox. Radio Austria's mailbag program.
0146 Japan, NHK/Radio: Asia Kaleidoscope. NEW! A segment of the program "Asian Report" devoted to life in Japan and the region.
0155 Japan, NHK/Radio: Tokyo Pop-In. A sample of the Japanese music scene.

Mondays

0100 Japan, NHK/Radio: NHK News. See S 0100.
0100 New Zealand, R NZ Intl: RNZ News. See S 0000.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0100 UK, BBC London (south as): Newsdesk. See S 0000.
0100 USA, WRMI/R Miami Intl, FL: Scriptures for America. Peter J. Peters exposes the world's evils.
0108 New Zealand, R NZ Intl: Correspondence School. Listeners learn by way of interviews with experts and interesting presentations about a variety of subjects.
0110 Japan, NHK/Radio: Let's Learn Japanese. See S 0510.
0125 Japan, NHK/Radio: Media Roundup. See S 0525.
0130 Austria, R Austria Intl: Report from Austria. See S 0130.
0130 New Zealand, R NZ Intl: Cadenza. National Radio's classical music program.
0130 UK, BBC London (as pac/south as): World News. See S 0000.
0150 Japan, NHK/Radio: Viewpoint. See S 0550.
0155 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Tuesdays

0100 Japan, NHK/Radio: NHK News. See S 0100.
0100 New Zealand, R NZ Intl: RNZ News. See S 0000.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0100 USA, WRMI/R Miami Intl, FL: Scriptures for America. See M 0100.
0108 New Zealand, R NZ Intl: Correspondence School. See M 0108.
0115 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
0125 Japan, NHK/Radio: Profile. See M 1525.
0130 Austria, R Austria Intl: Report from Austria. See S 0130.
0130 New Zealand, R NZ Intl: Cadenza. See M 0130.
0130 UK, BBC London (as pac/south as): World News. See S 0000.
0155 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Wednesdays

0100 Japan, NHK/Radio: NHK News. See S 0100.
0100 New Zealand, R NZ Intl: RNZ News. See S 0000.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0100 USA, WRMI/R Miami Intl, FL: Scriptures for America. See M 0100.
0108 New Zealand, R NZ Intl: Correspondence School. See M 0108.
0115 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
0125 Japan, NHK/Radio: Enjoy Japanese. See T 1525.
0130 Austria, R Austria Intl: Report from Austria. See S 0130.
0130 New Zealand, R NZ Intl: Cadenza. See M 0130.
0130 UK, BBC London (as pac/south as): World News. See S 0000.
0133 Germany, Deutsche Welle (am): Come to Germany. The Green Roofs of Europe (25th). See T 2035.
0155 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Thursdays

0100 Japan, NHK/Radio: NHK News. See S 0100.
0100 New Zealand, R NZ Intl: RNZ News. See S 0000.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0100 USA, WRMI/R Miami Intl, FL: Scriptures for America. See M 0100.
0108 New Zealand, R NZ Intl: Correspondence School. See M 0108.
0115 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
0125 Japan, NHK/Radio: History and Classics. See W 1525.
0130 Austria, R Austria Intl: Report from Austria. See S 0130.
0130 New Zealand, R NZ Intl: Cadenza. See M 0130.
0130 UK, BBC London (as pac/south as): World News. See S 0000.
0155 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Fridays

0100 Japan, NHK/Radio: NHK News. See S 0100.
0100 New Zealand, R NZ Intl: RNZ News. See S 0000.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0100 USA, WRMI/R Miami Intl, FL: Scriptures for America. See M 0100.
0108 New Zealand, R NZ Intl: Correspondence School. See M 0108.
0115 Japan, NHK/Radio: Current Views. A Radio Japan editorial.
0120 Japan, NHK/Radio: Enjoy Japanese. See T 1525.
0130 Austria, R Austria Intl: Report from Austria. See S 0130.
0130 New Zealand, R NZ Intl: Cadenza. See M 0130.
0130 UK, BBC London (as pac/south as): World News. See S 0000.
0133 Germany, Deutsche Welle (am): Arts on the Air. The Bayreuth Festival (Aug 30th). The 120th year of this Wagnerian opera festival from Bavaria.
0155 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Saturdays

0100 Japan, NHK/Radio: NHK News. See S 0100.
0100 New Zealand, R NZ Intl: RNZ News. See S 0000.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0107 New Zealand, R NZ Intl: Saturday Afternoon Variety or Sport. See S 0107.
0115 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
0125 Japan, NHK/Radio: Music and Book Beat. See F 1525.
0130 Austria, R Austria Intl: Report from Austria. See S 0130.
0130 UK, BBC London (as pac/south as): World News. See S 0000.
0154 Radio Netherlands: Documentary. From Before the Cradle (14th). Mindy Ran examines Holland's National Health Care system's spiraling costs.
0154 Radio Netherlands: Documentary. I want to play for Ajax, dad! (21st). See F 1454.
0154 Radio Netherlands: Documentary. Peter The Great (Part 1) (28th). See F 2354.
0154 Radio Netherlands: Documentary. Stichting Noord-Ierland (7th). See W 1154.
0155 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

0200 UTC SHORTWAVE GUIDE 10:00 PM EDT 7:00 PM PDT

Frequencies

0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, Radio	13755pa	15240pa	15365pa	17715as
		17750as	17795pa		
0200-0300 vl	Australia, VL8A Alice Spg	2310do			
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0300	Canada, CBC N Quebec Svc	9625do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0259	Canada, R Canada Intl	6120ca	9535ca	9755na	11715am
		13670am			
0200-0300	Costa Rica,RF Peace Intl	6205am	7385am		
0200-0300	Cuba, Radio Havana	6000na	9820na	9830na	
0200-0300	Ecuador, HCJB	9745am	21455va		
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	7285as	9640as	9690as ,	11545as
		11945as	11965as	12045as	
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0200-0300 smtwh	Malaysia, Radio	7295do			
0200-0300	Netherlands, Radio	5905as	7305as		
0200-0225	Netherlands, Radio	9860na	11655na		
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0300 vl	Papua New Guinea, NBC	9675do			
0200-0300	Romania, R Romania Intl	5990na	6155na	7105na	9510na
		9570na	11940na		
0200-0300	Russia,Voice of Russia WS	7070na	7240na	9620na	12010na
		12050na	13645na	13665na	15180na
		15580na			
0200-0300	Slovakia, Adv World Radio	11610as			
0200-0300	South Korea, R Korea Intl	7275am	11725am	11810am	15575am
0200-0300	Sri Lanka, Sri Lanka BC	15425as			
0200-0300	Taiwan, VO Free China	5950na	7130as	9680na	11740ca
		11825as	15345as		
0200-0300	United Kingdom, BBC WS	5970sa	5975va	6175va	7235va
		9410na	9560na	9590na	9605as
		9915sa	15360as		
0200-0300	USA, KAIJ Dallas TX	5810am	9815am		
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0300	USA, KVOH Los Angeles CA	9975am			
0200-0300	USA, KWHR Naalehu HI	17510au			
0200-0300	USA, Monitor Radio Intl	5850na	9430am		
0200-0300	USA, Voice of America	7115as	7205as	7651as	9635as
		11705as	11725as	15170as	15250as
		17740as	17820as		
0200-0300	USA, WEWN Birmingham AL	5825eu	7425na	11775na	
0200-0300	USA, WGTG McCaysville GA	9400am			
0200-0300	USA, WHRI Noblesville IN	5745am	7315am		
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300	USA, WWCR Nashville TN	2390am	3215am	5065am	5935am
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200-0300	Vietnam, Voice of	5940na	7250as		
0203-0210	Croatia, Croatian Radio	5895eu	7165eu		
0215-0225	Nepal, Radio	7165do			
0230-0300	Albania, R Tirana Intl	6140na	7160na		
0230-0259	Austria, R Austria Intl	9655na	9870ca	13730sa	
0230-0300	Hungary, Radio Budapest	9840na	11870na		
0230-0255	Moldova, R Moldova Intl	7520na			
0230-0245	Pakistan, Radio	7290as	15120as	15485as	17705as
		17725as	21730as		
0230-0300 vl	Philippines, R Pilipinas	17760me	17865me	21580me	
0230-0300	Sweden, Radio	6090na			
0238-0255 1&3rd m	Denmark, R Denmark Intl	7465am	9560am		
0245-0300	India, All India Radio	3945do	6045do	7110do	11830do
		15135do			
0250-0300	Vatican State, Vatican R	6095na	7305na	9605na	
0250-0300	Zambia, ZNBC Radio 2	6165do			

Selected Programs

Sundays

0200 New Zealand, R NZ Intl: National Radio or Sport. Regular programming is preempted for sports events.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. Opening three minutes of each transmission.
0200 UK, BBC London (all streams): Newsday. Coverage of the breaking stories and a background briefing on the main news issues of the day.
0203 Taiwan, V of Free China: News. Twelve minutes of world news.
0215 Taiwan, V of Free China: The Adventures of Taiwan. A young couple's escapades in Taiwan.
0230 Austria, R Austria Intl: Report from Austria. See S 0130.
0235 Taiwan, V of Free China: Mailbag Time. Letters from listeners and music requests.
0237 Austria, R Austria Intl: Postbox. See S 0137. .
0247 Taiwan, V of Free China: Let's Learn Chinese. Chinese lessons with commentary and translation in English.

Mondays

0200 New Zealand, R NZ Intl: RNZ News. See S 0000.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0200 UK, BBC London (all streams): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0206 New Zealand, R NZ Intl: Cadenza. See M 0130.
0215 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. Chinese folk and temple music.
0230 Austria, R Austria Intl: Report from Austria. See S 0130.
0249 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Tuesdays

0200 New Zealand, R NZ Intl: RNZ News. See S 0000.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0200 UK, BBC London (all streams): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0206 New Zealand, R NZ Intl: Cadenza. See M 0130.
0215 Taiwan, V of Free China: Kaleidoscope. Spotlight on life in Taiwan.
0230 Austria, R Austria Intl: Report from Austria. See S 0130.
0236 Taiwan, V of Free China: Main Roads and Byways. Hop a tour bus to a Taiwan attraction.

Wednesdays

0200 New Zealand, R NZ Intl: RNZ News. See S 0000.
0200 Taiwan, V of Free China: Frequency Announcements/ Anthem. See S 0200.
0200 UK, BBC London (all streams): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0206 New Zealand, R NZ Intl: Cadenza. See M 0130.
0215 Taiwan, V of Free China: Music Box. Some of the popular music of Taiwan.
0230 Austria, R Austria Intl: Report from Austria. See S 0130.
0251 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Thursdays

0200 New Zealand, R NZ Intl: RNZ News. See S 0000.
0200 Taiwan, V of Free China: Frequency Announcements/ Anthem. See S 0200.
0200 UK, BBC London (all streams): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0206 New Zealand, R NZ Intl: Cadenza. See M 0130.
0215 Taiwan, V of Free China: Perspectives. Issues facing the lives and conversations of Taiwanese people.
0230 Austria, R Austria Intl: Report from Austria. See S 0130.
0232 Taiwan, V of Free China: Journey into Chinese Culture. Conversation about a particular cultural activity in Taiwan.
0252 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.
0254 Radio Netherlands: Documentary. From Before the Cradle (12th). See A 2354.
0254 Radio Netherlands: Documentary. I want to play for Ajax, dad! (19th). See F 1454.
0254 Radio Netherlands: Documentary. Peter The Great (Part 1) (26th). See F 2354.
0254 Radio Netherlands: Documentary. Stichting Noord-Ierland (5th). See W 1154.

Fridays

0200 New Zealand, R NZ Intl: RNZ News. See S 0000.
0200 Taiwan, V of Free China: Frequency Announcements/ Anthem. See S 0200.
0200 UK, BBC London (all streams): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0206 New Zealand, R NZ Intl: Cadenza. See M 0130.
0215 Taiwan, V of Free China: Confrontation. Two points of view on a controversial topic.
0230 Austria, R Austria Intl: Report from Austria. See S 0130.
0232 Taiwan, V of Free China: New Record Time. The latest releases of the popular music of Taiwan.
0247 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Saturdays

0200 New Zealand, R NZ Intl: RNZ News. See S 0000.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0200 UK, BBC London (all streams): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0205 New Zealand, R NZ Intl: Saturday Afternoon Variety or Sport. See S 0107.
0215 Taiwan, V of Free China: Reflections. See S 0315.
0230 Austria, R Austria Intl: Report from Austria. See S 0130.
0249 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

FREQUENCIES

0300-0400	Australia, Radio	13605pa	13755pa	15240pa	15365pa
		15415as	15510as	17750pa	17795pa
0300-0400 vl	Australia, VL8A Alice Spg	2310do			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400 vl	Canada, CBC N Quebec Svc	9625do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9710na	11760na	
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0400	Costa Rica,RF Peace Intl	6205am	7385am		
0300-0400	Cuba, Radio Havana	6000na	9820na	9830na	
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB	9745am	21455va		
0300-0330	Egypt, Radio Cairo	9475na			
0300-0350	Germany, Deutsche Welle	6085na	6185na	9535na	9615na
		9640na			
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Japan, NHK/Radio	11790na	11840as	15230na	17810as
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0300-0330	Mexico, Radio Mexico Intl	9705na			
0300-0325	Netherlands, Radio	5905as	7305as	9860as	11655as
0300-0400	New Zealand, R NZ Intl	15115pa			
0300-0400 vl	Papua New Guinea, NBC	9675do			
0300-0330 vl	Philippines, R Pilipinas	17760me	17865me	21580me	
0300-0400	Russia,Voice of Russia WS	7230na	9620na	12010na	12050na
		13645na	13665na	15180na	15580na
0300-0400	S Africa, Channel Africa	3220af	5955af		
0300-0400	Sri Lanka, Sri Lanka BC	15425as			
0300-0400	Taiwan, VO Free China	5950na	9680na	11745as	11825as
		15345as			
0300-0330	Thailand, Radio	15370na			
0300-0350	Turkey, Voice of	9655na	9685eu		
0300-0315 mtwhf	Uganda, Radio	3340do			
0300-0400	Ukraine, R Ukraine Intl	7150na	9550na		
0300-0330	United Kingdom, BBC WS	5970sa	6135af	7235va	7325sa
		15360as			
0300-0400	United Kingdom, BBC WS	3255af	3955eu	5975va	6005af
		6175va	6190af	6195eu	9410na
		9600af	9605as	9895va	12095af
		15310as			
0300-0400	USA, KAIJ Dallas TX	5810am	9815am		
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	USA, KWHR Naalehu HI	17510au			
0300-0400	USA, Monitor Radio Intl	5850na	7535af		
0300-0400	USA, Voice of America	6035af	6080af	6115af	7105af
		7280af	7340af	7405af	7415af
		9575af	9885af		
0300-0400	USA, WEWN Birmingham AL	5825eu	7425na		
0300-0400	USA, WGTG McCaysville GA	9400am			
0300-0400	USA, WHRI Noblesville IN	5745am	7315am		
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WMLK Bethel PA	9465eu			
0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400	USA, WWCR Nashville TN	2390am	3215am	5065am	5935am
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0315	Vatican State, Vatican R	6095na	7305na	9605na	
0300-0400 mtwhfa	Zambia, ZNBC Radio 2	6165do			
0300-0400 vl	Zimbabwe, Zimbabwe BC	3396do			
0303-0310	Croatia, Croatian Radio	5895eu	7165eu		
0315-0330 s	Greece, Voice of	7448na	9420na	9935na	
0320-0350	Vatican State, Vatican R	7360af	9660af		
0330-0357	Czech Rep, Radio Prague	9480as			
0330-0355 mtwhf	Moldova, R Moldova Intl	7520na			
0330-0400 vl	Philippines, R Pilipinas	13770as	15330na	17730as	
0330-0400 twhf	Portugal, R Portugal Intl	6095am	9570am		
0330-0400	Slovakia, Adv World Radio	9465af			
0330-0400	Sweden, Radio	7115na			
0330-0353	UAE, Radio Dubai	13675na	15395eu	21605na	
0330-0400	United Kingdom, BBC WS	9610af	11730af	11955as	15280as
0335-0355 vl	India, All India Radio	7110do	11830do	15135do	
0338-0355 1&3rd m	Denmark, R Denmark Intl	7165am	7465am	9565am	
0340-0350	Greece, Voice of	7448na	9420na	9935na	
0345-0400 irreg	Burundi, Radio Nationale	6140do			
0345-0400 as	Uganda, Radio	3340do			

SELECTED PROGRAMS

Sundays

0300 Japan, NHK/Radio: NHK News. See S 0100.
0300 New Zealand, R NZ Intl: National Radio or Sport. See S 0200.
0300 UK, BBC London (all streams): World News. See S 0000.
0303 Taiwan, V of Free China: News. See S 0203.
0310 Japan, NHK/Radio: Hello from Tokyo. The weekend magazine program.
0315 Taiwan, V of Free China: Reflections. The best of Chinese literature.
0330 UK, BBC London (af): African News. News bulletins with the latest reports from across the continent.
0355 Japan, NHK/Radio: News Summary. A five-minute news wrap-up.

Mondays

0300 Japan, NHK/Radio: NHK News. See S 0100.
0300 New Zealand, R NZ Intl: RNZ News. See S 0000.
0300 UK, BBC London (all streams): World News. See S 0000.
0303 Taiwan, V of Free China: News. See S 0203.
0306 New Zealand, R NZ Intl: In Touch with New Zealand. See M 0230.
0315 Japan, NHK/Radio: Radio Japan Magazine Hour. The weekday magazine program.
0315 Taiwan, V of Free China: The Adventures of Taiwan. See S 0215.
0316 Japan, NHK/Radio: Sports Spotlight. Focus on a current sporting event in the region.
0325 Japan, NHK/Radio: Japan Diary. Life in Japan as seen through the eyes of a foreign resident in Japan.
0330 Japan, NHK/Radio: Close Up. Featuring a Japanese person of note.
0335 Taiwan, V of Free China: Mailbag Time. See S 0235.
0347 Japan, NHK/Radio: News Commentary. An editorial opinion on the current news.

Tuesdays

0300 Japan, NHK/Radio: NHK News. See S 0100.
0300 New Zealand, R NZ Intl: RNZ News. See S 0000.
0300 UK, BBC London (all streams): World News. See S 0000.
0303 Taiwan, V of Free China: News. See S 0203.
0306 New Zealand, R NZ Intl: In Touch with New Zealand. See M 0230.
0315 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0315 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. See M 0215.
0320 Japan, NHK/Radio: Close Up. See M 0330.
0330 Japan, NHK/Radio: Japanese Culture Today. Comparing modern-day Japan with the customs of old.
0330 Portugal: News. See Day M 1430.
0345 Japan, NHK/Radio: Japan Diary. See M 0325.
0348 Portugal: Visitors' Notebook. See Day M 1446.
0350 Japan, NHK/Radio: News Commentary. See M 0347.

Wednesdays

0300 Japan, NHK/Radio: NHK News. See S 0100.
0300 New Zealand, R NZ Intl: RNZ News. See S 0000.
0300 UK, BBC London (all streams): World News. See S 0000.
0303 Taiwan, V of Free China: News. See S 0203.
0306 New Zealand, R NZ Intl: In Touch with New Zealand. See M 0230.
0315 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0315 Taiwan, V of Free China: Kaleidoscope. See T 0215.
0320 Japan, NHK/Radio: Asian Report. NEW! Current events in the Asia-Pacific region.
0330 Japan, NHK/Radio: Close Up. See M 0330.
0330 Portugal: News. See Day M 1430.
0336 Taiwan, V of Free China: Main Roads and Byways. See T 0236.
0341 Japan, NHK/Radio: Japan Diary. See M 0325.
0345 Portugal: Musical Kaleidoscope. See Day T 1445.
0347 Japan, NHK/Radio: News Commentary. See M 0347.

Thursdays

0300 Japan, NHK/Radio: NHK News. See S 0100.
0300 New Zealand, R NZ Intl: RNZ News. See S 0000.
0300 UK, BBC London (all streams): World News. See S 0000.
0303 Taiwan, V of Free China: News. See S 0203.
0306 New Zealand, R NZ Intl: In Touch with New Zealand. See M 0230.
0315 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0315 Taiwan, V of Free China: Music Box. See W 0215.
0330 Japan, NHK/Radio: Crosscurrents. Radio Japan's mailbag program.
0330 Portugal: News. See Day M 1430.
0342 Japan, NHK/Radio: Japan Diary. See M 0325.
0344 Portugal: Challenge of the '90s. See Day W 1449.
0348 Japan, NHK/Radio: News Commentary. See M 0347.

Fridays

0300 Japan, NHK/Radio: NHK News. See S 0100.
0300 New Zealand, R NZ Intl: RNZ News. See S 0000.
0300 UK, BBC London (all streams): World News. See S 0000.
0303 Taiwan, V of Free China: News. See S 0203.
0306 New Zealand, R NZ Intl: In Touch with New Zealand. See M 0230.
0315 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0315 Taiwan, V of Free China: Perspectives. See H 0215.
0316 Japan, NHK/Radio: Japan Diary. See M 0325.
0321 Japan, NHK/Radio: Close Up. See M 0330.
0330 Japan, NHK/Radio: Business Focus. A segment of the Magazine Hour which spotlights an aspect of business in Japan.
0330 Portugal: News. See Day M 1430.
0332 Taiwan, V of Free China: Journey into Chinese Culture. See H 0232.
0345 Japan, NHK/Radio: News Commentary. See M 0347.
0346 Portugal: Spotlight on Portugal. See Day H 1446.

Saturdays

0300 Japan, NHK/Radio: NHK News. See S 0100.
0300 New Zealand, R NZ Intl: RNZ News. See S 0000.
0300 UK, BBC London (af/am/as pac/south as): World News. See S 0000.
0300 USA, WRMI/R Miami Intl, FL: Viva Miami (1). See M 1330.
0303 Taiwan, V of Free China: News. See S 0203.
0310 Japan, NHK/Radio: This Week. A weekly variety show.
0315 Taiwan, V of Free China: Confrontation. See F 0215.
0330 Portugal: News. See Day M 1430.
0330 UK, BBC London (af): African News. See S 0330.
0330 UK, BBC London (eu): World News. See S 0000.
0332 Taiwan, V of Free China: New Record Time. See F 0232.
0346 Portugal: Collector's Corner (triweekly). See Day F 1446.
0346 Portugal: Listeners Mailbag (triweekly). See Day F 1446.
0346 Portugal: Radio Portugal DX (triweekly). See Day F 1446.

0400 UTC SHORTWAVE GUIDE 12:00 M EDT 9:00 PM PDT

Frequencies

0400-0500	Australia, Radio	11880pa	13605as	15240pa	15365pa
		15415pa	17750as	17795pa	
0400-0500 vl	Australia, VL8A Alice Spg	2310do			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500	Bulgaria, Radio	9700na	11720na		
0400-0500 vl	Canada, CBC N Quebec Svc	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, R Canada Intl	11835me	11905me	15275me	
0400-0500	China, China Radio Intl	9560na	9730na		
0400-0500	Costa Rica,RF Peace Intl	6205am	7385am		
0400-0500	Cuba, Radio Havana	6000na	6180na	9820na	9830na
0400-0500	Ecuador, HCJB	9745am	21455va		
0400-0450	Germany, Deutsche Welle	5990af	6015af	6185af	7150af
		7225af	9565af	11765af	
0400-0500 twhfa	Guatemala, Radio Cultural	3300do			
0400-0415	Israel, Kol Israel	7465na	9435na	17545au	
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0400-0500	Lebanon, Voice of Hope	9960eu			
0400-0430 vl/m-a	Mexico, Radio Mexico Intl	9705na			
0400-0458	New Zealand, R NZ Intl	15115pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0430 m	Norway, Radio Norway Intl	7520na			
0400-0500 vl	Papua New Guinea, NBC	9675do			
0400-0430	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0400-0500	Russia,Voice of Russia WS	7230na	9620na	12010na	12050na
		13645na	13665na	15180na	15580na
0400-0455	S Africa, Channel Africa	3220af	5955af		
0400-0427	S Africa, Trans World R	7165af			
0400-0430	Slovakia, Adv World Radio	11600af			
0400-0430	Sri Lanka, Sri Lanka BC	15425as			
0400-0430	Switzerland, Swiss R Intl	6135na	9885na	9905na	
0400-0430	Tanzania, Radio	5050af			
0400-0415	Uganda, Radio	5026do			
0400-0500	United Kingdom, BBC WS	3255af	3955eu	5975af	6005af
		6175va	6180eu	6195eu	7160af
		9410af	9600af	11760va	12095af
		15280as			
0400-0500	USA, KAIJ Dallas TX	5810am	9815am		
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	USA, KWHR Naalehu HI	17780as			
0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	USA, Voice of America	6080af	7170va	7265af	7280af
		7405af	9575af	11965va	
0400-0430	USA, Voice of America	6145af	7340af		
0400-0500	USA, WEWN Birmingham AL	5825eu	7425na		
0400-0500	USA, WHRI Noblesville IN	5760am	7315am		
0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	USA, WWCR Nashville TN	2390am	3215am	5065am	5935am
0400-0500	USA, WYFR Okeechobee FL	9985af			
0400-0445	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0500	Zambia, Christian Voice	3330af			
0400-0410	Zambia, ZNBC Radio 2	6165do			
0400-0500 vl	Zimbabwe, Zimbabwe BC	3396do			
0403-0410	Croatia, Croatian Radio	5895eu	7165eu		
0425-0440	Italy, RAI Intl	5975eu	7275eu		
0425-0500	Nigeria, FRCN/Radio	3326do	4990do		
0430-0500	Australia, Radio	15510pa			
0430-0500	Australia,DefenseForces R	13525as			
0430-0500	Netherlands, Radio	6165na	9590na		
0430-0500	Serbia, Radio Yugoslavia	9580na	11870na		
0430-0500	Swaziland, Trans World R	3200af	4775af	6070af	
0430-0500	Switzerland, Swiss R Intl	9905na			
0430-0500	United Kingdom, BBC WS	7150eu	15420af		
0430-0500	USA, Voice of America	5970af			
0438-0455 1&3rd s	Denmark, R Denmark Intl	7520na	9565na	13805na	
0459-0500 mtwhf	New Zealand, R NZ Intl	9570pa			

Selected Programs

Sundays

0400 Guatemala: Moody Presents. Christian messages from the Moody Bible Institute.
0400 New Zealand, R NZ Intl: National Radio or Sport. See S 0200.
0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0430 UK, BBC London (af): African News. See S 0330.
0430 Serbia, R. Yugoslavia: News. World and Yugoslav news.
0437 Serbia, R. Yugoslavia: Current Affairs. An in-depth look at the latest news.
0444 Serbia, R. Yugoslavia: Cultural Panorama. A summary of activities dealing with the arts.

Mondays

0400 New Zealand, R NZ Intl: Pacific Regional News. News about the Pacific Islands.
0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0400 USA, Monitor Radio Intl: Sunday from the Mother Church. See S 2300.
0405 New Zealand, R NZ Intl: Calling Cook Islands. Birthday Calls, dedications, and requests for Cook Islands listeners.
0430 New Zealand, R NZ Intl: Mailbox (biweekly). Transmission developments, letters from listeners, and DX news from Arthur Cushen.
0430 New Zealand, R NZ Intl: Travel Pacific (biweekly). A comprehensive look at tourism in the South Pacific from Air New Zealand and RNZI.
0430 Serbia, R. Yugoslavia: News. See S 0430.
0439 Serbia, R. Yugoslavia: Current Affairs. See S 0437.
0442 Serbia, R. Yugoslavia: Domestic Chronicle. Current affairs in the Yugoslav republics.
0446 Serbia, R. Yugoslavia: Weekly Concert. See M 0016.

Tuesdays

0400 Guatemala: Insight for Living. Chuck Swindoll applies the Bible to life today.
0400 New Zealand, R NZ Intl: Pacific Regional News. See M 0400.
0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0400 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0405 New Zealand, R NZ Intl: Calling Tonga. Regional news and topical programming for Tonga.
0406 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0430 Serbia, R. Yugoslavia: News. See S 0430.
0431 New Zealand, R NZ Intl: The World in Sport. A review of the week's sports developments.
0442 Serbia, R. Yugoslavia: Press Review. See T 0012.
0445 Serbia, R. Yugoslavia: Economic Review. See T 0015.
0449 USA, Monitor Radio Intl: Letterbox. See M 1149.
0450 Serbia, R. Yugoslavia: Sports Roundup. See T 0020.
0452 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Wednesdays

0400 Guatemala: Insight for Living. See Day T 0400.
0400 New Zealand, R NZ Intl: Pacific Regional News. See M 0400.
0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0400 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0406 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0430 Serbia, R. Yugoslavia: News. See S 0430.
0442 Serbia, R. Yugoslavia: Press Review. See T 0012.
0449 USA, Monitor Radio Intl: Letterbox. See M 1149.
0452 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Thursdays

0400 Guatemala: Insight for Living. See Day T 0400.
0400 New Zealand, R NZ Intl: Pacific Regional News. See M 0400.
0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0400 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0405 New Zealand, R NZ Intl: Calling the Solomon Islands (biweekly). A program for the Solomon Islands.
0405 New Zealand, R NZ Intl: Spectrum (biweekly). Focus on an aspect of life in New Zealand with the sounds of on-location interviews.
0406 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0430 Serbia, R. Yugoslavia: News. See S 0430.
0442 Serbia, R. Yugoslavia: Press Review. See T 0012.
0449 USA, Monitor Radio Intl: Letterbox. See M 1149.
0449 Serbia, R. Yugoslavia: People and Events. See H 0019.
0452 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.
0454 Radio Netherlands: Documentary. (19th) From Before the Cradle (12th). See A 2354. (19th) I want to play for Ajax, dad! . See F 1454. (26th). Peter The Great (Part 1) See F 2354. (5th) Stichting Noord-Ierland . See W 1154.

Fridays

0400 Guatemala: Insight for Living. See Day T 0400.
0400 New Zealand, R NZ Intl: Pacific Regional News. See M 0400.
0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0400 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0405 New Zealand, R NZ Intl: Calling Nuie. Regional news and topical programming for Nuie.
0406 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0430 New Zealand, R NZ Intl: Around the World with Rudi Hill (in rotation). International broadcaster Rudi Hill provides topical comment and a Pacific viewpoint.
0430 New Zealand, R NZ Intl: Calling Pitcairn and Norfolk (in rotation). A program for Pitcairn and Norfolk Islands listeners.
0430 New Zealand, R NZ Intl: Calling Tokelau (in rotation). A program for Tokelau listeners.
0430 New Zealand, R NZ Intl: Feature (in rotation). Variable feature program.
0430 Serbia, R. Yugoslavia: News. See S 0430.
0439 Serbia, R. Yugoslavia: Press Review. See T 0012.
0444 Serbia, R. Yugoslavia: Political Commentaries. The official position of the Yugoslav Government on matters of current affairs.
0449 USA, Monitor Radio Intl: Letterbox. See M 1149.
0452 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Saturdays

0400 Guatemala: Insight for Living. See Day T 0400.
0400 New Zealand, R NZ Intl: RNZ News. See S 0000.
0400 UK, BBC London (af/am/as pac/south as): Newsdesk. See S 0000.
0400 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0400 USA, WRMI/R Miami Intl, FL: Radio Porkopolis (1). No information available.
0406 New Zealand, R NZ Intl: Tagata Atu Motu. No details avaiable.
0430 New Zealand, R NZ Intl: Change of Pace. A light mixture of jazz, polka, and other musical forms.
0430 UK, BBC London (af): African News. See S 0330.
0430 UK, BBC London (eu): Newsdesk. See S 0000.
0430 Serbia, R. Yugoslavia: News. See S 0430.
0440 Serbia, R. Yugoslavia: Commentary. Official state opinions about current events.
0444 Serbia, R. Yugoslavia: Press Review. See T 0012.
0450 Serbia, R. Yugoslavia: Current Affairs. See S 0437.

Frequencies

0500-0600	Australia, Radio	11880pa	13605as	15240pa	15365pa
		17715pa	17795pa		
0500-0600 vl	Australia, VL8A Alice Spg	2310do			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Australia,DefenseForces R	13525as			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0529 mtwhfa	Canada, R Canada Intl	6050eu	7295va	15430af	17840va
0500-0600	China, China Radio Intl	9560na			
0500-0600	Costa Rica, Adv World R	5030ca	6150ca	9725ca	
0500-0600	Costa Rica,RF Peace Intl	6205am	7385am		
0500-0600	Cuba, Radio Havana	9820na	9830na		
0500-0600	Ecuador, HCJB	9745am	21455va		
0500-0550	Germany, Deutsche Welle	5960na	6045na	6185na	9515na
0500-0600 vl	Italy, IRRS	3985va			
0500-0600	Japan, NHK/Radio	6110na	7230eu	11725as	11740as
		11920na	17810as		
0500-0530	Japan, NHK/Radio	11885na	11895na	15230na	
0500-0600 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0500-0600	Lebanon, Voice of Hope	9960eu			
0500-0510 mtwhf	Malawi, MBC	3380do			
0500-0525	Netherlands, Radio	6165na	9590na		
0500-0600	New Zealand, R NZ Intl	9570pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4990do		
0500-0600 vl	Papua New Guinea, NBC	9675do			
0500-0600	Russia,Voice of Russia WS	12010na	12040na	12050na	13645na
		13665na	15580na		
0500-0555	S Africa, Channel Africa	5955af	9590af		
0500-0600	Slovakia, Adv World Radio	7215eu			
0500-0556	Spain, R Exterior Espana	9540na			
0500-0600	Swaziland, Trans World R	6070af			
0500-0515	Uganda, Radio	3340do			
0500-0600	United Kingdom, BBC WS	3255af	3955eu	5975va	6005af
		6175va	6195eu	7160af	9410va
		9600af	9640va	9740as	11760va
		11955as	15280as	15360va	15420af
		15575va	17640af	17885af	
0500-0600	USA, KAIJ Dallas TX	5810am	9815am		
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9975am			
0500-0600	USA, KWHR Naalehu HI	17780as			
0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600	USA, Voice of America	5970af	6035af	6080af	7170va
		7195af	7295af	9775af	9885af
		11675af	11965va	15205va	
0500-0600	USA, WEWN Birmingham AL	5825na	7425na		
0500-0600	USA, WHRI Noblesville IN	5760am	7315am		
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, WWCR Nashville TN	2390am	3215am	5065am	5935am
0500-0600	USA, WYFR Okeechobee FL	5985na	7355eu	9985eu	11580af
0500-0530	Vatican State, Vatican R	9660af	11625af	15570af	
0500-0520	Vatican State, Vatican R	5880eu	7250eu		
0500-0600	Zambia, Christian Voice	3330af			
0500-0510	Zambia, ZNBC Radio 1	7220do			
0500-0510	Zambia, ZNBC Radio 2	6165do			
0500-0530 vl	Zimbabwe, Zimbabwe BC	3396do			
0503-0510	Croatia, Croatian Radio	5895eu	7165eu		
0505-0600	Swaziland, Trans World R	3200af	5055af	9500af	
0515-0530	Switzerland, Swiss R Intl	6165eu	9535eu		
0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0530-0559	Austria, R Austria Intl	6015na			
0530-0600	Kazakhstan, R Alma Ata	11705eu			
0530-0556	Romania, R Romania Intl	11810af	11940af	15270af	15340af
		17790af			
0530-0600	Slovakia, Adv World Radio	11600eu			
0530-0600 vl	Zimbabwe, Zimbabwe BC	5975do			
0538-0555 1&3rd s	Denmark, R Denmark Intl	7465va	13805va		
0555-0600	Malaysia, Voice of	6175as	9750as	15295au	

Selected Programs

Sundays

0500 Japan, NHK/Radio: NHK News. See S 0100.
0500 New Zealand, R NZ Intl: RNZ News. See S 0000.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0510 Japan, NHK/Radio: Let's Learn Japanese. A course in the Japanese language.
0525 Japan, NHK/Radio: Media Roundup. Reception reports, DX/media news, and equipment reviews.
0530 Austria, R Austria Intl: Report from Austria. See S 0130.
0530 New Zealand, R NZ Intl: Te Reo o Te Pipiwharauroa. A program for Maori listeners.
0530 UK, BBC London (af): African News. See S 0330.
0537 Austria, R Austria Intl: Postbox. See S 0137.
0550 Japan, NHK/Radio: Viewpoint. Opinions of a guest personality.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Mondays

0500 Japan, NHK/Radio: NHK News. See S 0100.
0500 New Zealand, R NZ Intl: RNZ News. See S 0000.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0507 New Zealand, R NZ Intl: Checkpoint. Ninety minutes of NZ current affairs, sports news, business news, news about Australia, and English language Maori news from National Radio.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0516 Japan, NHK/Radio: Sports Spotlight. See M 0316.
0525 Japan, NHK/Radio: Japan Diary. See M 0325.
0530 Austria, R Austria Intl: Report from Austria. See S 0130.
0530 Japan, NHK/Radio: Close Up. See M 0330.
0547 Japan, NHK/Radio: News Commentary. See M 0347.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Tuesdays

0500 Japan, NHK/Radio: NHK News. See S 0100.
0500 New Zealand, R NZ Intl: RNZ News. See S 0000.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0507 New Zealand, R NZ Intl: Checkpoint. See M 0507.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0520 Japan, NHK/Radio: Close Up. See M 0330.
0530 Austria, R Austria Intl: Report from Austria. See S 0130.
0530 Japan, NHK/Radio: Japanese Culture Today. See T 0330.
0545 Japan, NHK/Radio: Japan Diary. See M 0325.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Wednesdays

0500 Japan, NHK/Radio: NHK News. See S 0100.
0500 New Zealand, R NZ Intl: RNZ News. See S 0000.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0507 New Zealand, R NZ Intl: Checkpoint. See M 0507.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0520 Japan, NHK/Radio: Asian Report. See W 0320.
0520 Japan, NHK/Radio: Close Up. See M 0330.
0530 Austria, R Austria Intl: Report from Austria. See S 0130.
0539 Germany, Deutsche Welle (am): Come to Germany. The Green Roofs of Europe (25th). See T 2035.
0541 Japan, NHK/Radio: Japan Diary. See M 0325.
0547 Japan, NHK/Radio: News Commentary. See M 0347.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Thursdays

0500 Japan, NHK/Radio: NHK News. See S 0100.
0500 New Zealand, R NZ Intl: RNZ News. See S 0000.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0507 New Zealand, R NZ Intl: Checkpoint. See M 0507.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0530 Austria, R Austria Intl: Report from Austria. See S 0130.
0530 Japan, NHK/Radio: Crosscurrents. See H 0330.
0542 Japan, NHK/Radio: Japan Diary. See M 0325.
0548 Japan, NHK/Radio: News Commentary. See M 0347.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Fridays

0500 Japan, NHK/Radio: NHK News. See S 0100.
0500 New Zealand, R NZ Intl: RNZ News. See S 0000.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0507 New Zealand, R NZ Intl: Checkpoint. See M 0507.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0516 Japan, NHK/Radio: Japan Diary. See M 0325.
0521 Japan, NHK/Radio: Close Up. See M 0330.
0530 Austria, R Austria Intl: Report from Austria. See S 0130.
0533 Germany, Deutsche Welle (am): Arts on the Air. The Bayreuth Festival (Aug 30th). See F 0133.
0542 Japan, NHK/Radio: Japan Diary. See M 0325.
0548 Japan, NHK/Radio: News Commentary. See M 0347.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Saturdays

0500 Japan, NHK/Radio: NHK News. See S 0100.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0510 Japan, NHK/Radio: This Week. See A 0310.
0512 New Zealand, R NZ Intl: Pacific Requests. Music request and dedications.
0530 Austria, R Austria Intl: Report from Austria. See S 0130.
0530 UK, BBC London (af): African News. See S 0330.
0545 New Zealand, R NZ Intl: Story Time. See S 0645.
0555 Japan, NHK/Radio: News Summary. See S 0355.

Hauser's Highlights

SW Radio Switzerland relays legal European free radio programmes via IRRS Italy:

Sun	1500-1700	3985
Fri	2000	3955 (repeat)

Also on WRMI:

Sun	2000-2100	9955

More info for return post to P.O. Box 510, CH-4010 Basel, Switzerland (DJ Stevie, Int'l Relations)
Notes:
Only *Viva Miami* was heard at 2035 check, not this (gh) Try Mon at 0000 (SWRS via R. Japan *Media Roundup*) Is that UT Mon?

0600 UTC SHORTWAVE GUIDE 2:00 AM EDT 11:00 PM PDT

FREQUENCIES

0600-0700	Australia, Radio	9860pa	11880pa	12080pa	13605as
		15240pa	15365pa	15415as	15510as
		15530as	17715as	17880as	
0600-0700 vl	Australia, VL8A ALice Spg	2310do			
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0630	Australia,DefenseForces R	13525as			
0600-0700 vl	Canada, CBC N Quebec Svc	9625do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
0600-0700	Cuba, Radio Havana	9820na	9830na		
0600-0700	Ecuador, HCJB	9745am	21455am		
0600-0650	Germany, Deutsche Welle	11915af	13790af	15185af	15225af
		17875af			
0600-0615	Ghana, Ghana Broadc Corp	3366do	4915do		
0600-0700 vl	Italy, IRRS	3985va			
0600-0700	Japan, NHK/Radio	11725as	11850au	17810as	
0600-0700 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0600-0700 vl	Kiribati, Radio	9825do			
0600-0700	Lebanon, Voice of Hope	9960eu			
0600-0700	Malaysia, Voice of	6175as	9750as	15295au	
0600-0700	New Zealand, R NZ Intl	9570pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4990do		
0600-0700	North Korea, R Pyongyang	15180as	15230as		
0600-0630 s	Norway, Radio Norway Intl	7180au	7295af	9590au	
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0640 vl	Romania, R Romania Intl	9550eu	9665eu	11815eu	
0600-0700	Russia,Voice of Russia WS	12010na	12040na	12050na	13645na
		13665na	15470as	15560na	15580na
		17665na			
0600-0700	S Africa, Trans World R	11730af			
0600-0610	Sierra Leone, SLBS	3316do			
0600-0630	Slovakia, Adv World Radio	13715af			
0600-0700	Slovakia, Adv World Radio	5905am			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	Swaziland, Trans World R	11730af			
0600-0630	Switzerland, Swiss R Intl	9885af	11860af	13635af	
0600-0700	United Kingdom, BBC WS	3955eu	5975va	6175eu	6195eu
		7145pa	7160af	9410eu	9600af
		9640af	9740as	11760eu	11955as
		12095as	15280as	15310as	15360va
		15420af	15575va	17640af	17790as
0600-0700	USA, KAIJ Dallas TX	5810am	9815am		
0600-0700	USA, KTBN Salt Lk City UT	7510am			
0600-0700	USA, KVOH Los Angeles CA	9975am			
0600-0700	USA, KWHR Naalehu HI	17780as			
0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	USA, Voice of America	5970af	6035af	6140af	7195af
		9630af	11805af	11950af	11965af
		12080af	15205af		
0600-0630	USA, Voice of America	6080af	9435af		
0600-0700	USA, WEWN Birmingham AL	5825eu	7425na		
0600-0700	USA, WHRI Noblesville IN	5760am	7315am		
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WRNO New Orleans LA	7395na			
0600-0700	USA, WWCR Nashville TN	2390am	3215am	5065am	5935am
0600-0700	USA, WYFR Okeechobee FL	5985eu	7355eu	9985af	
0600-0645 vl/m-f	Vatican State, Vatican R	4005eu	5880eu	7250eu	9645eu
		15215me			
0600-0700	Yemen, Yemeni Rep Radio	9780do			
0600-0700	Zambia, Christian Voice	3330af			
0600-0605 mtwhfa	Zambia, ZNBC Radio 1	7220do			
0600-0630	Zambia, ZNBC Radio 2	6165do			
0600-0700 vl	Zimbabwe, Zimbabwe BC	5975do			
0603-0610	Croatia, Croatian Radio	5920eu	7165eu	9830eu	13830eu
0605-0700	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0615-0630	Switzerland, Swiss R Intl	6165eu	9535eu		
0630-0655	Austria, R Austria Intl	6015na			
0630-0700	Belgium, R Vlaanderen Int	5985eu	9925au		
0630-0700 as	USA, Voice of America	6080af			
0630-0700	Vatican State, Vatican R	11625af	13765af	15570af	
0638-0655 1&3rd s	Denmark, R Denmark Intl	7180va	7295va	9590va	13805va
0645-0655 as	Monaco, Trans World Radio	7115eu			
0645-0700	Romania, R Romania Intl	11740pa	11840pa	15250pa	15270pa
		17720pa			
0655-0700 mtwhf	Monaco, Trans World Radio	7115eu			

SELECTED PROGRAMS

Sundays

0600 Japan, NHK/Radio: NHK News. See S 0100.
0600 New Zealand, R NZ Intl: National Radio. Programming from New Zealand's domestic radio.
0600 UK, BBC London (af/as pac/eu/south as): World News. See S 0000.
0610 Japan, NHK/Radio: Hello from Tokyo. See S 0310.
0630 Austria, R Austria Intl: Report from Austria. See S 0130.
0630 New Zealand, R NZ Intl: Pacifika Style. Interview program in Maori.
0630 UK, BBC London (af): African News. See S 0330.
0640 Austria, R Austria Intl: Postbox. See S 0137.
0645 New Zealand, R NZ Intl: Story Time. Stories from around the world for children.
0655 Japan, NHK/Radio: News Summary. See S 0355.

Mondays

0600 Japan, NHK/Radio: NHK News. See S 0100.
0600 New Zealand, R NZ Intl: RNZ News. See S 0000.
0600 UK, BBC London (all streams): World News. See S 0000.
0607 New Zealand, R NZ Intl: Checkpoint. See M 0507.
0615 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0616 Japan, NHK/Radio: Sports Spotlight. See M 0316.
0625 Japan, NHK/Radio: Japan Diary. See M 0325.
0630 Austria, R Austria Intl: Report from Austria. See S 0130.
0630 Japan, NHK/Radio: Close Up. See M 0330.
0630 New Zealand, R NZ Intl: Ears. Children's stories.
0647 Japan, NHK/Radio: News Commentary. See M 0347.
0655 Japan, NHK/Radio: News Summary. See S 0355.

Tuesdays

0600 Japan, NHK/Radio: NHK News. See S 0100.
0600 New Zealand, R NZ Intl: RNZ News. See S 0000.
0600 UK, BBC London (all streams): World News. See S 0000.
0607 New Zealand, R NZ Intl: Checkpoint. See M 0507.
0615 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0620 Japan, NHK/Radio: Close Up. See M 0330.
0630 Austria, R Austria Intl: Report from Austria. See S 0130.
0630 Japan, NHK/Radio: Japanese Culture Today. See T 0330.
0630 New Zealand, R NZ Intl: Ears. See M 0630.
0645 Japan, NHK/Radio: Japan Diary. See M 0325.
0650 Japan, NHK/Radio: News Commentary. See M 0347.

Wednesdays

0600 Japan, NHK/Radio: NHK News. See S 0100.
0600 New Zealand, R NZ Intl: RNZ News. See S 0000.
0600 UK, BBC London (all streams): World News. See S 0000.
0607 New Zealand, R NZ Intl: Checkpoint. See M 0507.
0615 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0620 Japan, NHK/Radio: Asian Report. See W 0320.
0630 Austria, R Austria Intl: Report from Austria. See S 0130.
0630 Japan, NHK/Radio: Close Up. See M 0330.
0630 New Zealand, R NZ Intl: Ears. See M 0630.
0641 Japan, NHK/Radio: Japan Diary. See M 0325.
0647 Japan, NHK/Radio: News Commentary. See M 0347.
0655 Japan, NHK/Radio: News Summary. See S 0355.

Thursdays

0600 Japan, NHK/Radio: NHK News. See S 0100.
0600 New Zealand, R NZ Intl: RNZ News. See S 0000.
0600 UK, BBC London (all streams): World News. See S 0000.
0607 New Zealand, R NZ Intl: Checkpoint. See M 0507.
0615 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0630 Austria, R Austria Intl: Report from Austria. See S 0130.
0630 Japan, NHK/Radio: Crosscurrents. See H 0330.
0630 New Zealand, R NZ Intl: Ears. See M 0630.
0642 Japan, NHK/Radio: Japan Diary. See M 0325.
0648 Japan, NHK/Radio: News Commentary. See M 0347.
0655 Japan, NHK/Radio: News Summary. See S 0355.

Fridays

0600 Japan, NHK/Radio: NHK News. See S 0100.
0600 New Zealand, R NZ Intl: RNZ News. See S 0000.
0600 UK, BBC London (all streams): World News. See S 0000.
0607 New Zealand, R NZ Intl: Checkpoint. See M 0507.
0615 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
0630 Austria, R Austria Intl: Report from Austria. See S 0130.
0630 Japan, NHK/Radio: Close Up. See M 0330.
0630 New Zealand, R NZ Intl: Ears. See M 0630.
0642 Japan, NHK/Radio: Japan Diary. See M 0325.
0648 Japan, NHK/Radio: News Commentary. See M 0347.
0655 Japan, NHK/Radio: News Summary. See S 0355.

Saturdays

0600 Japan, NHK/Radio: NHK News. See S 0100.
0600 New Zealand, R NZ Intl: RNZ News. See S 0000.
0600 UK, BBC London (all streams): World News. See S 0000.
0602 New Zealand, R NZ Intl: Saturday Night. Either Veronica Alum or Peter Siedmere hosts this four-hour variety program.
0610 Japan, NHK/Radio: This Week. See A 0310.
0630 Austria, R Austria Intl: Report from Austria. See S 0130.
0630 UK, BBC London (af): African News. See S 0330.
0655 Japan, NHK/Radio: News Summary. See S 0355.

FREQUENCIES

0700-0800	Australia, Radio	9860pa	12080pa	15240pa	15365pa
		15415as	15510as	15530as	17715pa
		17880as			
0700-0730	Australia, Radio	11880as	13605as	15245as	
0700-0800 vl	Australia, VL8A Alice Spg	2310do			
0700-0800 vl	Australia, VL8K KAtherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
0700-0727	Czech Rep, Radio Prague	7345eu	9530eu		
0700-0800	Ecuador, HCJB	9445pa	11615eu	21455au	
0700-0800 as	Eqt Guinea, R East Africa	15186af			
0700-0800 mtwhf	Eqt Guinea, Radio Africa	15186af			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0730 vl	Italy, IRRS	3985va			
0700-0800	Japan, NHK/Radio	7230eu	11725as	11740as	11850pa
		11920as	15165me	17810va	17815af
		21610as			
0700-0800 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800	Lebanon, Voice of Hope	9960eu			
0700-0800 asmtwh	Malaysia, Radio	7295do			
0700-0800	Malaysia, Voice of	9750as	15295au		
0700-0710	Malaysia, Voice of	6175as			
0700-0800	Monaco, Trans World Radio	7115eu			
0700-0715 mtwhf	New Zealand, R NZ Intl	9570pa			
0700-0758 as	New Zealand, R NZ Intl	9570pa			
0700-0750	North Korea, R Pyongyang	15340af	17765me		
0700-0800 vl	Palau, KHBN/Voice of Hope	9965as			
0700-0745	Romania, R Romania Intl	11740pa	11840pa	15250pa	15270pa
		17720pa			
0700-0800	Russia,Voice of Russia WS	15470as	15560va	17570va	17665as
0700-0710	Sierra Leone, SLBS	3316do			
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800	United Kingdom, BBC WS	3955eu	6175eu	6190af	6195eu
		7145va	7325eu	9410eu	9600af
		9640va	9740as	11760as	11940af
		11955as	12095va	15070va	15280as
		15310as	15360va	15400va	15575me
	17640va	17790as	17830af	17885af	
0700-0730	United Kingdom, BBC WS	6180eu	11780eu		
0700-0715	United Kingdom, BBC WS	6005af	7160af		
0700-0800	USA, KAIJ Dallas TX	5810am	9815am		
0700-0800	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KVOH Los Angeles CA	9975am			
0700-0800	USA, KWHR Naalehu HI	9930as			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	USA, WEWN Birmingham AL	5825eu	7425na		
0700-0800	USA, WHRI Noblesville IN	5760am	7315am		
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	2390am	5065am	5935am	7435am
0700-0745	USA, WYFR Okeechobee FL	7355eu	9985eu		
0700-0800	USA, WYFR Okeechobee FL	13695af			
0700-0800 vl	Vanuatu, Radio	3945do	7260do		
0700-0800	Zambia, Christian Voice	6065af			
0700-0800	Zambia, ZNBC Radio 2	6165do			
0700-0800 vl	Zimbabwe, Zimbabwe BC	5975do			
0703-0710 mtwhf	Croatia, Croatian Radio	5920eu	7165eu	9830eu	13830eu
0705-0800	Swaziland, Trans World R	5055af	9500af	9650af	
0710-0800 vl	Papua New Guinea, NBC	4890do			
0716-0800 mtwhf	New Zealand, R NZ Intl	6100pa			
0730-0800	Australia, Radio	9580pa	9710pa		
0730-0755	Austria, R Austria Intl	6155eu	13730eu	15410me	17870me
0730-0745 s	Greece, Voice of	7450eu	9425eu	11645au	
0730-0735	India, All India Radio	15185do	15260do		
0730-0800 vl	Italy, IRRS	7125va			
0730-0800	Netherlands, Radio	9700pa	9720au	11895pa	
0738-0755 1&3rd s	Denmark, R Denmark Intl	7180va	7295va	9590va	13805va
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		
0745-0755	Greece, Voice of	7450eu	9425eu	11645au	
0755-0800	Guam, AWR/KTWR	15200as			
0758-0800 as	New Zealand, R NZ Intl	6100pa			

0800 UTC

0800-0900	Australia, Radio	6020pa	6080pa	9580pa	9710pa
		9860pa	15530as	17715pa	
0800-0900 vl	Australia, VL8A Alice Spg	2310do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0900 vl	Australia, VL8T Tent Crk	4910do			
0800-0900 vl	Canada, CBC N Quebec Svc	9625do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0830	Chile, Radio Esperanza	6090sa			
0800-0900	Costa Rica,RF Peace Intl	6205am	7385am		
0800-0900 s	Denmark, Radio ABC	7570eu			
0800-0830	Ecuador, HCJB	11615eu			
0800-0900	Ecuador, HCJB	9445pa	21455au		
0800-0900 as	Eqt Guinea, R East Africa	15186af			
0800-0900 mtwhf	Eqt Guinea, Radio Africa	15186af			
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, TWR/KTWR	15200as			
0800-0900	Indonesia, Voice of	9525as			
0800-0900 vl	Italy, IRRS	7125va			
0800-0900 mtwhf	Italy, IRRS	3985va			
0800-0900 vl	Kiribati, Radio	9825do			
0800-0900	Lebanon, Voice of Hope	6280eu	9960me		
0800-0900	Malaysia, Radio	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295au	
0800-0820 mtwhf	Monaco, Trans World Radio	7115eu			
0800-0805 a	Monaco, Trans World Radio	7115eu			
0800-0825	Netherlands, Radio	9700pa	9720au	11895pa	
0800-0900	New Zealand, R NZ Intl	6100pa			
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0830 s	Norway, Radio Norway Intl	17860au			
0800-0850	Pakistan, Radio	15470eu	17900eu		
0800-0900 vl	Palau, KHBN/Voice of Hope	9730as	9955as	9965as	15140as
0800-0900 vl	Papua New Guinea, NBC	4890do			
0800-0900	Russia,Voice of Russia WS	5940va	9835va	11800pa	12025as
		15470as	15560pa	15580as	
0800-0810	Sierra Leone, SLBS	3316do			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	7550eu	13670eu		
0800-0900	United Kingdom, BBC WS	6190af	6195va	9410eu	9600af
		9740as	9805va	11760as	11940af
		11955as	15070af	15280as	15310as
		15400va	15575me	17640va	17790as
		17830af	17885af		
0800-0815	United Kingdom, BBC WS	3955eu	7145va	12095eu	
0800-0900	USA, KAIJ Dallas TX	5810am	9815am		
0800-0900	USA, KNLS Anchor Point AK	9615as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	7535eu	9845pa	15665eu	
0800-0900	USA, WEWN Birmingham AL	5825eu	7425na		
0800-0900	USA, WHRI Noblesville IN	5760am	7315am		
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	2390am	5065am	5935am	7435am
0800-0830 vl	Vanuatu, Radio	3945do	7260do		
0800-0900	Zambia, Christian Voice	6065af			
0800-0805 mtwhfa	Zambia, ZNBC Radio 2	6165do			
0800-0900 vl	Zimbabwe, Zimbabwe BC	5975do			
0803-0810 as	Croatia, Croatian Radio	5920eu	7165eu	9830eu	13830eu
0805-0835 mtwhf	Swaziland, Trans World R	4775af	9500af	9650af	
0815-0900 mtwtf	Nigeria, FRCN/Radio	3326do	4990do		
0830-0900 s	Armenia, Voice of	15270eu			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900	Georgia, Radio	11910me			
0830-0840	India, All India Radio	7250do	15185do	15260do	
0830-0900	Lithuania, Radio Vilnius	9710eu			
0830-0900	Netherlands, Radio	9720au	13700pa		
0830-0900	Slovakia, R Slovakia Intl	11990au	15460au	17550au	
0838-0855 1&3rd s	Denmark, R Denmark Intl	15220va	17855va		
0855-0900	Guam, TWR/KTWR	11830pa			

Your Name in Lights!

... or at least in ink within the *Monitoring Times* Shortwave Guide. Please send us your "best catches" on the worldwide shortwave bands — QSLs, that is — and we will try to use them in future issues of *MT*. Your QSLs will be returned.

FREQUENCIES

0900-1000	Australia, Radio	5995as	7240as	9510as	9580pa
		9860pa	13605as	21725as	
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	4910do			
0900-0930 mtwhfa	Belgium, R Vlaanderen Int	6035eu	15545af	17595af	
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa	17690au	
0900-1000	Costa Rica,RF Peace Intl	6205am	7385am		
0900-0930	Czech Rep, Radio Prague	15640me	17485af		
0900-1000 s	Denmark, Radio ABC	7570eu			
0900-1000	Ecuador, HCJB	9445pa	21455au		
0900-1000 as	Eqt Guinea, R East Africa	15186af			
0900-1000 mtwhf	Eqt Guinea, Radio Africa	15186af			
0900-0950	Germany, Deutsche Welle	6160as	9565af	12055as	15225af
		15410af	17800af	21600af	21680as
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-0915	Guam, TWR/KTWR	15200as			
0900-1000	Guam, TWR/KTWR	11830pa			
0900-1000 vl/as	Italy, IRRS	7125va			
0900-0930 mtwhf	Italy, IRRS	3985va			
0900-1000	Japan, NHK/Radio	9610as	11850au	15190as	
0900-0930 vl	Kiribati, Radio	9825do			
0900-1000	Lebanon, Voice of Hope	6280eu	9960me		
0900-1000	Malaysia, Radio	7295do			
0900-0925	Netherlands, Radio	9720au	13700pa		
0900-1000	New Zealand, R NZ Intl	6100pa			
0900-1000 vl	Papua New Guinea, NBC	4890do			
0900-1000	Russia,Voice of Russia WS	7150va	9835pa	11800as	12025as
		15580as			
0900-0930	Switzerland, Swiss R Intl	9885pa	13685pa	17515pa	
0900-1000	United Kingdom, BBC WS	6190af	6195va	9410eu	9740as
		11750as	11940af	12095eu	15070va
		15190sa	15280va	15400va	15575va
		17640va	17705eu	17830va	17885af
0900-0915	United Kingdom, BBC WS	6065as	7180as	9580as	11760as
		11955as	15310as	15360as	17790as
0900-1000	USA, KAIJ Dallas TX	5810am	9815am		
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu	9430as	13615au
0900-1000	USA, WEWN Birmingham AL	5825eu	7425na		
0900-1000	USA, WHRI Noblesville IN	5760am	7315am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000 as	USA, WVHA Greenbush ME	13825eu			
0900-1000	USA, WWCR Nashville TN	2390am	5065am	5935am	7435am
0900-1000	Zambia, Christian Voice	6065af			
0900-1000 vl	Zimbabwe, Zimbabwe BC	5975do			
0903-0910 mtwhf	Croatia, Croatian Radio	5920eu	7165eu	9830eu	
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0930-0955 mtwhfa	Austria, R Austria Intl	6155eu	13730eu	15450as	17870au
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Mongolia, R Ulan Bator	11850as	12085as		
0930-1000	Netherlands, Radio	9720au	12065pa	13705pa	
0930-1000	Philippines, FEBC/R Intl	11635as			
0938-0955 1&3rd s	Denmark, R Denmark Intl	13800va	17855va		

1000 UTC

1000-1100	Australia, Radio	5995as	7240as	9510as	9580pa
		9860pa	13605as	15170as	21725as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	4910do			
1000-1100 vl	Canada, CBC N Quebec Svc	9625do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa	17690au	
1000-1100	Costa Rica,RF Peace Intl	6205am	7385am		
1000-1100 s	Denmark, Radio ABC	7570eu			
1000-1100	Ecuador, HCJB	9445pa	21455au		
1000-1100 as	Eqt Guinea, R East Africa	15186af			
1000-1100 mtwhf	Eqt Guinea, Radio Africa	15186af			
1000-1100	Guam, AWR/KSDA	9370as			
1000-1100	India, All India Radio	13700as	15050as	17387au	17890as
1000-1100	Iraq, Radio Iraq Intl	13680eu			
1000-1100 vl/as	Italy, IRRS	7125va			
1000-1100	Lebanon, Voice of Hope	6280eu			
1000-1100	Malaysia, Radio	7295do			
1000-1100 vl	Malaysia, RTM Kuching	7160do			
1000-1100 vl	Malaysia,RTM KotaKinabalu	5980do			
1000-1025	Netherlands, Radio	9720pa	11895au	13700pa	
1000-1100	New Zealand, R NZ Intl	6100pa			
1000-1100 vl	Papua New Guinea, NBC	4890do			
1000-1100	Philippines, FEBC/R Intl	11635as			
1000-1100	Russia,Voice of Russia WS	7150va	9835oa	11655as	11800pa
		12025as	15520as	17560as	17775as
		17870pa			
1000-1100	Singapore, SBC Radio One	6155do			
1000-1030	Switzerland, Swiss R Intl	6165eu	9535eu		
1000-1100	United Kingdom, BBC WS	5965na	6190af	6195va	9410eu
		9740as	11750as	11760as	11940af
		12095eu	13745va	15070va	15190sa
		15280va	15310as	15400af	15575va
		17640va	17705va	17790as	17830va
		17885af			
1000-1100	USA, KAIJ Dallas TX	5810am	9815am		
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	9930as			
1000-1100	USA, Monitor Radio Intl	6095ca	7395sa	9430as	13840as
1000-1100	USA, Voice of America	5985va	6165am	7405am	9590am
		11720va	15425va		
1000-1100	USA, WEWN Birmingham AL	7425na	15665eu		
1000-1100	USA, WGTG McCaysville GA	9400am			
1000-1100	USA, WHRI Noblesville IN	6040am	6185am		
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100 as	USA, WVHA Greenbush ME	13825va			
1000-1100	USA, WWCR Nashville TN	5065am	5935am	9475am	15685am
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1100 vl/m-f	Vatican State, Vatican R	5880eu	11740af	15210af	17550af
1000-1030	Vietnam, Voice of	9580as	15010as		
1000-1100	Zambia, Christian Voice	6065af			
1000-1005 mtwhfa	Zambia, ZNBC Radio 2	6165do			
1030-1055	Austria, R Austria Intl	15450as	17870au		
1030-1057	Czech Rep, Radio Prague	7345eu	9505eu		
1030-1100	Finland, YLE/R Finland	13645as	15235au		
1030-1100	Guam, AWR/KSDA	9530as			
1030-1100	Netherlands, Radio	6045as	9650as	12065as	13705as
1030-1100	South Korea, R Korea Intl	11715am			
1030-1055	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me
1038-1055 1&3rd s	Denmark, R Denmark Intl	9480eu	15220na		

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THANK YOU...

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FREQUENCIES

1100-1200	Australia, Radio	5995as	7240as	9510pa	9580pa
		9615as	9860pa	13605as	15170as
		15530as	15565as		
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	4910do			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, Adv World R	7375am	9725am	13750am	
1100-1200	Costa Rica,RF Peace Intl	6205am	7385am		
1100-1200 s	Denmark, Radio ABC	7570eu			
1100-1130	Ecuador, HCJB	9445pa	12005am		
1100-1200 as	Eqt Guinea, R East Africa	15186af			
1100-1200	Eqt Guinea, Radio Africa	9530as			
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17800af
		17860af	21600af		
1100-1200	Iraq, Radio Iraq Intl	13680eu			
1100-1200 vl/as	Italy, IRRS	7125va			
1100-1200	Japan, NHK/Radio	6120na	9610as	15350as	
1100-1200	Jordan, Radio	11970eu			
1100-1200	Malaysia, Radio	7295do			
1100-1200 vl	Malaysia, RTM Kuching	7160do			
1100-1200 vl	Malaysia,RTM KotaKinabalu	5980do			
1100-1125	Netherlands, Radio	6045as	9650as	12065as	13705as
1100-1200	New Zealand, R NZ Intl	6100pa			
1100-1150	North Korea, R Pyongyang	6575na	9975na	11335na	
1100-1200 vl	Palau, KHBN/Voice of Hope	9730as	9985as	15140as	
1100-1200 vl	Papua New Guinea, NBC	4890do			
1100-1200	Russia,Voice of Russia WS	4740as	11655as	15460as	15520as
		15560as	16560as	17755as	17775as
		17870as			
1100-1200	Singapore, SBC Radio One	6155do			
1100-1200	Singapore,R Singapore Int	6015as	6155as		
1100-1130	Switzerland, Swiss R Intl	13635as	15415as	17515as	
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200	United Kingdom, BBC WS	5965na	6190af	6195va	7180as
		9410eu	9580as	9740va	11750as
		11760as	11940af	11955as	12095eu
		15070va	15220va	15310as	15575va
		17640va	17705va	17830af	17885af
		21660af			
1100-1130	United Kingdom, BBC WS	9700au	15190sa	15400eu	17790va
1100-1200	USA, KAIJ Dallas TX	5810am	9815am		
1100-1200	USA, KTBN Salt Lk City UT	7510am			
1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	USA, Monitor Radio Intl	6095na	7395ca	9355as	9430au
1100-1200	USA, Voice of America	5985va	6110va	6165am	7405am
		9590am	9645va	9760va	11720va
		15160va	15425va		
1100-1200	USA, WEWN Birmingham AL	7425na	15665eu		
1100-1200	USA, WGTG McCaysville GA	9400am			
1100-1200	USA, WHRI Noblesville IN	6040am	6185am		
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200 as	USA, WVHA Greenbush ME	13825am			
1100-1200	USA, WWCR Nashville TN	5935am	7435am	9475am	15685am
1100-1200	USA, WYFR Okeechobee FL	5950na	11830na		
1100-1200	Zambia, Christian Voice	6065af			
1105-1120	Pakistan, Radio	15470as	17900eu		
1115-1127	Zambia, ZNBC Radio 1	7220do			
1115-1200	Zambia, ZNBC Radio 2	6165do			
1130-1155	Austria, R Austria Intl	13730na			
1130-1200	Bulgaria, Radio	13790as			
1130-1200 vl	China, China Radio Intl	8660as	11445as	11700as	
1130-1200	Ecuador, HCJB	15115na	21455am		
1130-1200	Finland, YLE/R Finland	11900na	15400na		
1130-1200	Iran, VOIRI	11875me	11930me	15260af	
1130-1200 a	Monaco, Trans World Radio	7115eu			
1130-1155 s	Monaco, Trans World Radio	7115eu			
1130-1200	Myanmar, Voice of	5990do			
1130-1200	Netherlands, Radio	6045eu	7190eu		
1130-1200	Sweden, Radio	11650na	15240na		
1130-1200 f	Vatican State, Vatican R	15210as	15570as	17550au	
1135-1140	India, All India Radio	9595do	11620do	11710do	15185do
1138-1155 1&3rd s	Denmark, R Denmark Intl	7295eu	17740af		

SELECTED PROGRAMS

Sundays

1100 Japan, NHK/Radio: NHK News. See S 0100.
1100 New Zealand, R NZ Intl: Newsdesk. Rebroadcast of the BBC World Service's quality news program.
1100 Singapore, R Singapore Intl: News. Singapore, regional and international news.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1105 Singapore, R Singapore Intl: The Week Ahead. A diary of major events in Singapore in the coming week.
1109 Germany, Deutsche Welle (af): Arts on the Air. The Bayreuth Festival (1st). See F 0133.
1110 Japan, NHK/Radio: Hello from Tokyo. See S 0310.
1110 Singapore, R Singapore Intl: Asean Notes. A montage of cultural and social events in the Asean region.
1120 Singapore, R Singapore Intl: Profile. A personality profile of prominent Singaporeans and foreigners who have made their mark in their chosen fields.
1130 Singapore, R Singapore Intl: News. See S 1100.
1135 Singapore, R Singapore Intl: Regional Press Review. A review of the major issues discussed in the editorials of the regional papers during the week.
1140 Singapore, R Singapore Intl: Business World. The latest business and financial trends in Singapore and Asia, or Specials. An in depth look at a topical issue concerning Singapore, the region and the world.

Mondays

1100 Japan, NHK/Radio: Radio Japan News Round. Thirty minutes of world, regional, and Japanese news.
1100 New Zealand, R NZ Intl: Newsdesk. See S 1100.
1100 Singapore, R Singapore Intl: News. See S 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1109 Singapore, R Singapore Intl: Business and Market Report. A roundup of financial and business news.
1115 Singapore, R Singapore Intl: Frontiers. See S 1215.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1130 New Zealand, R NZ Intl: Faith and Works. News about the Church and religion.
1130 Singapore, R Singapore Intl: News. See S 1100.
1131 Japan, NHK/Radio: Sports Spotlight. See M 0316.
1135 Singapore, R Singapore Intl: The Front Page. Headlines from the front pages of Singaporean and regional dailies.
1138 Singapore, R Singapore Intl: Take Five. See S 1255.
1144 Japan, NHK/Radio: Japan Diary. See M 0325.
1145 Singapore, R Singapore Intl: Newsline. An analysis of the news making headlines in Singapore, the region, and the world.

Tuesdays

1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1100 New Zealand, R NZ Intl: Newsdesk. See S 1100.
1100 Singapore, R Singapore Intl: News. See S 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1105 Singapore, R Singapore Intl: Business and Market Report. See M 1109.
1115 Singapore, R Singapore Intl: Kaleidoscope. See S 1240.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1130 New Zealand, R NZ Intl: On the March. Recordings of march music from New Zealand and the world.
1130 Singapore, R Singapore Intl: News. See S 1100.
1131 Japan, NHK/Radio: Japanese Culture Today. See T 0330.
1135 Singapore, R Singapore Intl: The Front Page. See M 1135.
1141 Japan, NHK/Radio: Japan Diary. See M 0325.
1145 Singapore, R Singapore Intl: Newsline. See M 1145.

Wednesdays

1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1100 New Zealand, R NZ Intl: Newsdesk. See S 1100.
1100 Singapore, R Singapore Intl: News. See S 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1109 Singapore, R Singapore Intl: Business and Market Report. See M 1109.
1115 Singapore, R Singapore Intl: Star Trax. A showcase of events on the pop, movie, and entertainment beats.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1130 New Zealand, R NZ Intl: Orient Express. Live music request program for Chinese listeners. Recommended.
1130 Singapore, R Singapore Intl: News. See S 1100.
1138 Singapore, R Singapore Intl: The Front Page. See M 1135.
1141 Japan, NHK/Radio: Japan Diary. See M 0325.
1145 Singapore, R Singapore Intl: Newsline. See M 1145.
1154 Radio Netherlands: Documentary. From Before the Cradle (11th). See A 2354.
1154 Radio Netherlands: Documentary. I want to play for Ajax, dad! (18th). See F 1454.
1154 Radio Netherlands: Documentary. Peter The Great (Part 1) (25th). See F 2354.
1154 Radio Netherlands: Documentary. Stichting Noord-Ierland (4th). Maggie Ayre looks into the work of the exchange program that brings Irish children to Holland.

Thursdays

1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1100 New Zealand, R NZ Intl: Newsdesk. See S 1100.
1100 Singapore, R Singapore Intl: News. See S 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1105 Singapore, R Singapore Intl: Business and Market Report. See M 1109.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1130 New Zealand, R NZ Intl: Trading Post. Report on NZ's overseas trade with up-to-date comment on trends, issues, and products.
1130 Singapore, R Singapore Intl: News. See S 1100.
1131 Japan, NHK/Radio: Crosscurrents. See H 0330.
1138 Singapore, R Singapore Intl: The Front Page. See M 1135.
1144 Japan, NHK/Radio: Japan Diary. See M 0325.
1145 Singapore, R Singapore Intl: Newsline. See M 1145.

Fridays

1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1100 New Zealand, R NZ Intl: Newsdesk. See S 1100.
1100 Singapore, R Singapore Intl: News. See S 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1109 Singapore, R Singapore Intl: Business and Market Report. See M 1109.
1115 Singapore, R Singapore Intl: The Written Word. See M 1240.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1130 New Zealand, R NZ Intl: Dateline Pacific. Background current affairs in the Pacific region.
1130 Singapore, R Singapore Intl: News. See S 1100.
1131 Japan, NHK/Radio: Business Focus. See F 0330.
1135 Singapore, R Singapore Intl: The Front Page. See M 1135.
1144 Japan, NHK/Radio: Japan Diary. See M 0325.
1145 Singapore, R Singapore Intl: Newsline. See M 1145.

Saturdays

1100 Japan, NHK/Radio: NHK News. See S 0100.
1100 New Zealand, R NZ Intl: Newsdesk. See S 1100.
1100 Singapore, R Singapore Intl: News. See S 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1110 Japan, NHK/Radio: This Week. See A 0310.
1110 Singapore, R Singapore Intl: Catch of the Week. See H 1240.
1115 Singapore, R Singapore Intl: Star Trax. See W 1115.
1130 Singapore, R Singapore Intl: News. See S 1100.
1135 Singapore, R Singapore Intl: Regional Press Review. See S 1135.
1150 Singapore, R Singapore Intl: Business World, or Specials. See S 1140.

Frequencies

1200-1300	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9560as	9580pa	9615as	9710as
		11800pa	15565as		
1200-1300 mtwhf	Belgium, R Vlaanderen Int	13610na			
1200-1300	Brazil, Radio Bras	15445na			
1200-1230	Bulgaria, Radio	13790as			
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300 vl	Canada, CBC N Quebec Svc	9625do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1259	Canada, R Canada Intl	9640am	11855am	13650am	
1200-1300	China, China Radio Intl	7385na	7410as	9565as	9715as
		11660as	11795pa	15440au	
1200-1230 vl	China, China Radio Intl	8660as	11445as	11700as	12110as
1200-1300	Costa Rica, Adv World R	5030am	6150am	9725am	13750am
1200-1300	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
1200-1300	Ecuador, HCJB	12005am	15115am	21455am	
1200-1300 as	Eqt Guinea, R East Africa	15186af			
1200-1300	Eqt Guinea, Radio Africa	9530as			
1200-1300	France, Radio France Intl	9805eu	11600as	11670as	13625am
		15155eu	15195eu	15325af	15530ca
1200-1230	Iran, VOIRI	11875me	11930me	15260af	
1200-1300	Iraq, Radio Iraq Intl	13680eu			
1200-1300 vl/as	Italy, IRRS	7125va			
1200-1300	Malaysia, Radio	7295do			
1200-1300 vl	Malaysia,RTM KotaKinabalu	5980do			
1200-1250	Myanmar, Voice of	5990do			
1200-1300	Netherlands, Radio	6045eu	7190eu		
1200-1206	New Zealand, R NZ Intl	6100pa			
1200-1230 s	Norway, Radio Norway Intl	9590eu	13800eu	15305eu	
1200-1300 vl	Palau, KHBN/Voice of Hope	9730as	9955as	9965as	9985as
		15140as			
1200-1255	Poland, Polish R Warsaw	6095eu	7145eu	7270eu	9525eu
		11815eu			
1200-1300	Russia,Voice of Russia WS	4740as	4975as	11655as	11785as
		15110as	15230as	15435as	15510as
		15520as	17755as	17775as	17870as
1200-1300	Singapore, SBC Radio One	6155do			
1200-1300	Singapore,R Singapore Int	6015as	6155as		
1200-1300	South Korea, R Korea Intl	7285va			
1200-1300	Switzerland, Swiss R Intl	6165eu	9535eu		
1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300	United Kingdom, BBC WS	5965na	6190af	6195va	7180as
		9410eu	9580as	9740va	11750as
		11760as	11940af	11955as	12095eu
		15070va	15220va	15310as	15575va
		17640va	17705va	17830af	17885af
	21660af				
1200-1300	USA, KAIJ Dallas TX	5810am	9815am		
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	6095na	9355as	9430au	9455sa
1200-1300	USA, Voice of America	6110va	9645va	9760va	11715va
		15160va	15425va		
1200-1300	USA, WEWN Birmingham AL	7425na	15665eu		
1200-1300	USA, WGTG McCaysville GA	9400am			
1200-1300	USA, WGTG McCaysville GA	9400am			
1200-1300	USA, WHRI Noblesville IN	6040am	6185am		
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300 s	USA, WRMI/R Miami Intl	9955am			
1200-1300 as	USA, WVHA Greenbush ME	13825va			
1200-1300	USA, WWCR Nashville TN	5935am	7435am	9475am	15685am
1200-1300	USA, WYFR Okeechobee FL	5950na	6015na	11830na	17750na
1200-1230	Uzbekistan, R Tashkent	7285as	9715as	15295as	
1200-1300	Zambia, Christian Voice	6065af			
1200-1300 mtwhf	Zambia, ZNBC Radio 2	6165do			
1206-1300 occsnal	New Zealand, R NZ Intl	6100pa			
1215-1300	Egypt, Radio Cairo	17595as			
1230-1300	Bangladesh, Radio	7185as	9548as		
1230-1255 s	Belgium, R Vlaanderen Int	13610na	15540as		
1230-1300	Bulgaria, Radio	15620as			
1230-1259	Canada, R Canada Intl	6150as	15195as		
1230-1300 mtwhf	Finland, YLE/R Finland	11900na	15400na		
1230-1235	India, All India Radio	4860do	6185do	17865do	
1230-1300 w	Indonesia, RRI Sorong	4875do			
1230-1300	Mongolia, R Ulan Bator	9745as	12085as		
1230-1300	South Korea, R Korea Intl	9570as	9640as	13670as	
1230-1300 mtwhf	Sri Lanka, Sri Lanka BC	15425as			
1230-1300	Sweden, Radio	13740as	15240pa		
1230-1300	Turkey, Voice of	9445na	9630na		
1230-1300	Vietnam, Voice of	9840as	12010as		
1238-1255 1&3rd s	Denmark, R Denmark Intl	9590va	13800va	15305va	15480va
1240-1250	Greece, Voice of	11645af			

Selected Programs

Sundays

1200 New Zealand, R NZ Intl: RNZ News. See S 0000.
1200 Singapore, R Singapore Intl: News. See S 1100.
1200 UK, BBC London (am/eu/south as): World News. See S 0000.
1200 USA, WRMI/R Miami Intl, FL: Abundant Life Broadcast. Tony Abrams evangelizes from Alabama.
1203 Taiwan, V of Free China: News. See S 0203.
1205 Singapore. R Singapore Intl: E-Z Beat. Adult contemporary music program.
1215 Singapore, R Singapore Intl: Frontiers. ü magazine program featuring developments in the fields of health, science, information technology, education and the environment.
1215 Taiwan, V of Free China: The Adventures of Taiwan. See S 0215.
1215 UK, BBC London (eu): Britain Today. See S 0045.
1215 USA, WRMI/R Miami Intl, FL: Faith and Truth. Ken Megilligan.
1230 Singapore, R Singapore Intl: News. See S 1100.
1230 USA, WRMI/R Miami Intl, FL: The Scripture Hour. Evangelist Paul Fleming spreads the gospel from South Carolina.
1235 Taiwan, V of Free China: Mailbag Time. See S 0235.
1240 Singapore, R Singapore Intl: Kaleidoscope. A lifestyle magazine that looks at leisure, food, culture, heritage, fashion, travel, and consumer trends.
1245 USA, WRMI/R Miami Intl, FL: Deliverance Ministries. See S 0000.
1255 Singapore, R Singapore Intl: Take Five. Pop music program.

Mondays

1200 New Zealand, R NZ Intl: RNZ News. See S 0000.
1200 Singapore, R Singapore Intl: News. See S 1100.
1200 UK, BBC London (all streams): World News. See S 0000.
1203 Taiwan, V of Free China: News. See S 0203.
1205 Singapore, R Singapore Intl: E-Z Beat. See S 1205.
1215 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. See M 0215.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1220 Singapore, R Singapore Intl: Business and Market Report. See M 1109.
1230 Singapore, R Singapore Intl: News. See S 1100.
1240 Singapore, R Singapore Intl: The Written Word. Interviews, reviews, comments and analysis from the world of print.
1255 Singapore, R Singapore Intl: Take Five. See S 1255.

Tuesdays

1200 New Zealand, R NZ Intl: RNZ News. See S 0000.
1200 Singapore, R Singapore Intl: News. See S 1100.
1200 UK, BBC London (all streams): World News. See S 0000.
1203 Taiwan, V of Free China: News. See S 0203.
1205 Singapore, R Singapore Intl: E-Z Beat. See S 1205.
1215 Taiwan, V of Free China: Kaleidoscope. See T 0215.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1220 Singapore, R Singapore Intl: Business and Market Report. See M 1109.
1230 Singapore, R Singapore Intl: News. See S 1100.
1236 Taiwan, V of Free China: Main Roads and Byways. See T 0236.
1240 Singapore, R Singapore Intl: Reflections. See S 1345.
1255 Singapore, R Singapore Intl: Take Five. See S 1255.

Wednesdays

1200 Singapore, R Singapore Intl: News. See S 1100.
1200 UK, BBC London (all streams): World News. See S 0000.
1203 Taiwan, V of Free China: News. See S 0203.
1205 Singapore, R Singapore Intl: E-Z Beat. See S 1205.
1215 Taiwan, V of Free China: Music Box. See W 0215.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1220 Singapore, R Singapore Intl: Business and Market Report. See M 1109.
1230 Singapore, R Singapore Intl: News. See S 1100.
1240 Singapore, R Singapore Intl: Frontiers. See S 1215.
1255 Singapore, R Singapore Intl: Take Five. See S 1255.

Thursdays

1200 New Zealand, R NZ Intl: RNZ News. See S 0000.
1200 Singapore, R Singapore Intl: News. See S 1100.
1200 UK, BBC London (all streams): World News. See S 0000.
1203 Taiwan, V of Free China: News. See S 0203.
1205 Singapore, R Singapore Intl: E-Z Beat. See S 1205.
1215 Taiwan, V of Free China: Perspectives. See H 0215.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1220 Singapore, R Singapore Intl: Business and Market Report. See M 1109.
1230 Singapore, R Singapore Intl: News. See S 1100.
1232 Taiwan, V of Free China: Journey into Chinese Culture. See H 0232.
1240 Singapore, R Singapore Intl: Catch of the Week. A look at interesting thoughts and exchanges for internet surfers.
1245 Singapore, R Singapore Intl: Classic Gold. A golden-oldies music program.

Fridays

1200 New Zealand, R NZ Intl: RNZ News. See S 0000.
1200 Singapore, R Singapore Intl: News. See S 1100.
1200 UK, BBC London (all streams): World News. See S 0000.
1203 Taiwan, V of Free China: News. See S 0203.
1205 Singapore, R Singapore Intl: E-Z Beat. See S 1205.
1215 Taiwan, V of Free China: Confrontation. See F 0215.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1220 Singapore, R Singapore Intl: Business and Market Report. See M 1109.
1230 Singapore, R Singapore Intl: News. See S 1100.
1232 Taiwan, V of Free China: New Record Time. See F 0232.
1240 Singapore, R Singapore Intl: Profile. See S 1120.
1254 Radio Netherlands: Documentary. From Before the Cradle (13th). See A 2354.
1254 Radio Netherlands: Documentary. I want to play for Ajax, dad! (20th). See F 1454.
1254 Radio Netherlands: Documentary. Peter The Great (Part 1) (27th). See F 2354.
1254 Radio Netherlands: Documentary. Stichting Noord-Ierland (6th). See W 1154.
1255 Singapore, R Singapore Intl: Take Five. See S 1255.

Saturdays

1200 New Zealand, R NZ Intl: RNZ News. See S 0000.
1200 Singapore, R Singapore Intl: News. See S 1100.
1200 UK, BBC London (all streams): World News. See S 0000.
1203 Taiwan, V of Free China: News. See S 0203.
1205 Singapore, R Singapore Intl: E-Z Beat. See S 1205.
1205 Singapore, R Singapore Intl: The Last Radio Show. An imaginary journey into the year 2020 and what Singaporean personalities would like to hear in the final radio broadcast.
1215 Taiwan, V of Free China: Reflections. See S 0315.
1215 UK, BBC London (af/eu/south as): Britain Today. See S 0045.
1225 Singapore, R Singapore Intl: Asean Notes. See S 1110.
1230 Singapore, R Singapore Intl: News. See S 1100.
1240 Singapore, R Singapore Intl: Asean Notes. See S 1110.
1245 Singapore, R Singapore Intl: Arts Arena. A program devoted to the visual and performing arts.

FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240as	9560pa	9580pa
		9610as	11800pa		
1300-1330	Australia, Radio	6060pa	6080as	9510pa	
1300-1355 mtwhfa	Belgium, R Vlaanderen Int	13610na	15540as		
1300-1320	Brazil, Radio Bras	15445na			
1300-1330	Bulgaria, Radio	15620as			
1300-1400 vl	Canada, CBC N Quebec Svc	9625do			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1359 mtwhfa	Canada, R Canada Intl	9640am	11855am	13650am	
1300-1400	China, China Radio Intl	7385na	9715as	11660pa	
1300-1330	China, China Radio Intl	7410as			
1300-1400	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
1300-1330	Czech Rep, Radio Prague	11660eu	17845af		
1300-1400	Ecuador, HCJB	12005am	15115am	21455am	
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Eqt Guinea, R East Africa	15186af			
1300-1400	Eqt Guinea, Radio Africa	9530as			
1300-1400	Iraq, Radio Iraq Intl	13680as			
1300-1330 vl/as	Italy, IRRS	7125va			
1300-1400	Malaysia, Radio	7295do			
1300-1400 vl	Malaysia, RTM Kuching	7160do			
1300-1400 vl	Malaysia,RTM KotaKinabalu	5980do			
1300-1325	Netherlands, Radio	6045eu	7190eu		
1300-1400 occsnal	New Zealand, R NZ Intl	6100pa			
1300-1350	North Korea, R Pyongyang	9345as	9640eu	11740as	15230as
		15430as			
1300-1330 s	Norway, Radio Norway Intl	13800as	15340na		
1300-1400 vl	Palau, KHBN/Voice of Hope	9730as	9955as	9965as	9985as
		15140as			
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1356	Romania, R Romania Intl	9690eu	11940eu	15365eu	17720eu
1300-1400	Russia,Voice of Russia WS	15340as	15460as	15560as	17755as
1300-1400	Singapore, SBC Radio One	6155do			
1300-1400	Singapore,R Singapore Int	6015as	6155as		
1300-1400 mtwhf	Sri Lanka, Sri Lanka BC	15425as			
1300-1330	Switzerland, Swiss R Intl	7230as	7480as	13635as	15240as

1300-1400	United Kingdom, BBC WS	5965na	5990as	6190af	6195va
		9410eu	9515va	9590va	9740as
		11750as	11760as	11940af	12095eu
		15070va	15220am	15310as	15420af
		15575va	17640va	17705va	17830af
	17885af	21470af	21660af		
1300-1400	USA, KAIJ Dallas TX	5810am	15725am		
1300-1400	USA, KJES Mesquite NM	11715na			
1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, Monitor Radio Intl	6095na	9355as	9455na	13840as
1300-1400	USA, Voice of America	6110va	9645va	9760va	15160va
		15425va			
1300-1330	USA, Voice of America	11715va			
1300-1400	USA, WEWN Birmingham AL	9580na	11875na	15665eu	
1300-1400	USA, WGTG McCaysville GA	9400am			
1300-1400	USA, WHRI Noblesville IN	6040am	15105am		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400 s	USA, WRMI/R Miami Intl	9955am			
1300-1400	USA, WRNO New Orleans LA	15420am			
1300-1400 as	USA, WVHA Greenbush ME	15745eu			
1300-1400	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1300-1400	USA, WYFR Okeechobee FL	5950na	11830na	13695na	17750na
1300-1400	Zambia, Christian Voice	6065af			
1300-1330 mtwhf	Zambia, ZNBC Radio 2	6165do			
1303-1310	Croatia, Croatian Radio	5920eu	7165eu	13830am	
1330-1355	Austria, R Austria Intl	6155eu	13730eu		
1330-1359 s	Canada, R Canada Intl	11855am	11935eu	15325va	21455va
1330-1359 mtwhfa	Canada, R Canada Intl	17820va			
1330-1359	Canada, R Canada Intl	9535as	11795as		
1330-1400	Guam, AWR/KSDA	9650as			
1330-1400	India, All India Radio	11620as	13750as		
1330-1400 vl	Italy, IRRS	3985va			
1330-1400	Netherlands, Radio	9895as	13700as	15150as	
1330-1400	Sweden, Radio	6090na	9835as	13740na	15240na
1330-1355	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me
1330-1400	Uzbekistan, R Tashkent	7285as	9715as	15295as	
1330-1400	Vietnam, Voice of	9840as	12010as		
1335-1345	Greece, Voice of	15180na	15630na		
1338-1355 1&3rd s	Denmark, R Denmark Intl	9590va	13800va	15305va	15340va
1345-1400	Vatican State, Vatican R	9500as	11625as	13765au	

SELECTED PROGRAMS

Sundays

1300 Singapore, R Singapore Intl: News. See S 1100.
1300 UK, BBC London (all streams): Newshour. A comprehensive look at the major topics of the day, plus up-to-the-minute international and British news.
1300 USA, WRMI/R Miami Intl, FL: Search for Truth. Greg Neely evangelizes from Ontario, Canada.
1305 Singapore, R Singapore Intl: Friends of the Airwaves. Conversations with studio guests and listeners, letter reading and regional lifesytle (simulcast from Singapore's One FM).
1315 USA, WRMI/R Miami Intl, FL: Prophecy Talk. See S 0000.
1330 Austria, R Austria Intl: Report from Austria. See S 0130.
1330 India, All India Radio: News and Commentary. See S 0030.
1330 USA, WRMI/R Miami Intl, FL: Battle Cry Sounding. Deborah Green evangelizes.
1345 India, All India Radio: Program Preview. A look at today's program lineup.
1345 Singapore, R Singapore Intl: Reflections. Vignettes of life in Singapore and the region.
1346 India, All India Radio: Musical Interlude. A musical filler program.
1355 Singapore, R Singapore Intl: News. See S 1100.

Mondays

1300 Singapore, R Singapore Intl: News. See S 1100.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, WRMI/R Miami Intl, FL: Church of Christ. See S 0000.
1305 Singapore, R Singapore Intl: Singa-Pop. A showcase of homegrown Singaporean talents and local songs.
1315 USA, WRMI/R Miami Intl, FL: Christ Gospel Broadcast. BR Hicks with a bible lesson.
1330 Austria, R Austria Intl: Report from Austria. See S 0130.
1330 India, All India Radio: News and Commentary. See S 0030.
1330 Singapore, R Singapore Intl: Newsline. See M 1145.
1330 USA, WRMI/R Miami Intl, FL: Viva Miami!. A magazine program hosted by Jeff White from and about Miami and Florida, that includes DX and international travel features and seasonal tropical weather updates.
1345 India, All India Radio: Program Preview. See S 1345.
1355 Singapore, R Singapore Intl: News. See S 1100.

Tuesdays

1300 Singapore, R Singapore Intl: News. See S 1100.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, WRMI/R Miami Intl, FL: Prophecy Talk. See S 0000.
1305 Singapore, R Singapore Intl: To Each His Own. A weekly program featuring listeners' dedications and song requests.
1315 USA, WRMI/R Miami Intl, FL: Deliverance Ministries. See S 0000.
1330 Austria, R Austria Intl: Report from Austria. See S 0130.
1330 India, All India Radio: News and Commentary. See S 0030.
1330 Singapore, R Singapore Intl: News. See S 1100.
1330 USA, WRMI/R Miami Intl, FL: Viva Miami!. See M 1330.
1340 Singapore, R Singapore Intl: Newsline. See M 1145.
1345 India, All India Radio: Program Preview. See S 1345.
1355 Singapore, R Singapore Intl: News. See S 1100.

Wednesdays

1300 Singapore, R Singapore Intl: News. See S 1100.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, WRMI/R Miami Intl, FL: Word of Truth. See S 0000.
1305 Singapore, R Singapore Intl: Hot Trax. Information about new music releases in Singapore.
1315 USA, WRMI/R Miami Intl, FL: Faith and Truth. See S 1215.
1330 Austria, R Austria Intl: Report from Austria. See S 0130.
1330 India, All India Radio: News and Commentary. See S 0030.
1330 Singapore, R Singapore Intl: News. See S 1100.
1330 USA, WRMI/R Miami Intl, FL: Viva Miami!. See M 1330.
1340 Singapore, R Singapore Intl: Newsline. See M 1145.
1345 India, All India Radio: Program Preview. See S 1345.
1346 India, All India Radio: Indian Music. Traditional indian music played with original instruments.
1354 Radio Netherlands: Documentary. From Before the Cradle. See A 2354.(11th)I want to play for Ajax, dad! See F 1454.(18th) Peter The Great (Part 1) See F 2354.(25th). Stichting Noord-Ierland. See W 1154 (4th)
1355 Singapore, R Singapore Intl: News. See S 1100.

Thursdays

1300 Singapore, R Singapore Intl: News. See S 1100.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, WRMI/R Miami Intl, FL: Word for the World. See S 0000.
1305 Singapore, R Singapore Intl: Singa-Pop. See M 1305.
1315 USA, WRMI/R Miami Intl, FL: Wavescan. See S 0030.
1330 Austria, R Austria Intl: Report from Austria. See S 0130.
1330 India, All India Radio: News and Commentary. See S 0030.
1330 Singapore, R Singapore Intl: News. See S 1100.
1330 USA, WRMI/R Miami Intl, FL: Viva Miami!. See M 1330.
1340 Singapore, R Singapore Intl: Newsline. See M 1145.
1345 India, All India Radio: Program Preview. See S 1345.
1346 India, All India Radio: Listeners' Choice. Indian music requests from listeners.
1355 Singapore, R Singapore Intl: News. See S 1100.

Fridays

1300 Singapore, R Singapore Intl: News. See S 1100.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, WRMI/R Miami Intl, FL: Voice of Deliverance and Power. See S 0000.
1305 Singapore, R Singapore Intl: Hot Trax. See W 1305.
1315 USA, WRMI/R Miami Intl, FL: Wavescan. See S 0030.
1330 Austria, R Austria Intl: Report from Austria. See S 0130.
1330 India, All India Radio: News and Commentary. See S 0030.
1330 Singapore, R Singapore Intl: News. See S 1100.
1330 USA, WRMI/R Miami Intl, FL: Viva Miami!. See M 1330.
1340 Singapore, R Singapore Intl: Newsline. See M 1145.
1345 India, All India Radio: Program Preview. See S 1345.
1346 India, All India Radio: Indian Music. See W 1346.
1355 Singapore, R Singapore Intl: News. See S 1100.

Saturdays

1300 Singapore, R Singapore Intl: News. See S 1100.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1305 Singapore, R Singapore Intl: Chartbeat. A countdown of chart-toppers on Singapore's Perfect 10, Rediffusion and Big O magazines.
1330 Austria, R Austria Intl: Report from Austria. See S 0130.
1330 India, All India Radio: News and Commentary. See S 0030.
1330 Singapore, R Singapore Intl: News. See S 1100.
1340 Singapore, R Singapore Intl: Regional Press Review. See S 1135.
1345 India, All India Radio: Program Preview. See S 1345.
1346 India, All India Radio: UN News Magazine. The United Nations daily news program.
1355 Singapore, R Singapore Intl: News. See S 1100.

FREQUENCIES

1400-1430	Australia, Radio	7240as	9560as	9610pa	11695pa
1400-1500	Australia, Radio	5995pa	9580pa	9615as	11800pa
1400-1500 vl	Canada, CBC N Quebec Svc	9625do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1459	Canada, R Canada Intl	11855au	13650am		
1400-1500	China, China Radio Intl	7405na	9530as	9785as	11815as
1400-1500	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
1400-1500	Ecuador, HCJB	21455am			
1400-1430	Ecuador, HCJB	12005am	15115am		
1400-1500 as	Eqt Guinea, R East Africa	15186af			
1400-1500	France, Radio France Intl	7110as	15405as	17560me	
1400-1500	India, All India Radio	11620as	13750as		
1400-1430	Israel, Kol Israel	12077va	15615na		
1400-1500 vl	Italy, IRRS	3985va			
1400-1500	Japan, NHK/Radio	9535na	11705na	11895as	11915as
1400-1500	Jordan, Radio	11970eu			
1400-1500	Malaysia, Radio	7295do			
1400-1500 vl	Malaysia, RTM Kuching	7160do			
1400-1500 vl	Malaysia,RTM KotaKinabalu	5980do			
1400-1430 vl	Mexico, Radio Mexico Intl	9705na			
1400-1500	Netherlands, Radio	9895as	13700as	15150as	
1400-1500 occsnal	New Zealand, R NZ Intl	6100pa			
1400-1500 vl	Palau, KHBN/Voice of Hope	9730as	9955as	9965as	9985as
		15140as			
1400-1500	Philippines, FEBC/R Intl	11995as			
1400-1500	Russia,Voice of Russia WS	4740me	4940me	7225me	9595me
		9705me	11835me	11945me	11985me
		15320me	15350me	15430me	15540me
		15560me			
1400-1500	Singapore, SBC Radio One	6155do			
1400-1500	Sri Lanka, Sri Lanka BC	15425as			
1400-1500	United Kingdom, BBC WS	5990as	6195as	7205as	9410eu
		9515na	9590va	9740as	11750as
		11865am	11940af	12095eu	15070va
		15220am	15260na	15575va	17640va
		17705va	17830af	17840af	21470af
	21660af				
1400-1500	USA, KAIJ Dallas TX	13815am	15725am		
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510am			
1400-1500	USA, Monitor Radio Intl	9355as			
1400-1500	USA, Voice of America	6110va	7125as	7215as	9645as
		9760as	15255va	15395as	15425va
1400-1500	USA, WEWN Birmingham AL	9580na	11875na	15665eu	
1400-1500	USA, WGTG McCaysville GA	9400am			
1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WRMI/R Miami Intl	9955na			
1400-1500	USA, WRNO New Orleans LA	15420am			
1400-1500 as	USA, WVHA Greenbush ME	15745eu			
1400-1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400-1500	USA, WYFR Okeechobee FL	11550as	11830na	17750eu	
1400-1415	Vatican State, Vatican R	9500as	11625as	13765au	
1400-1500	Zambia, Christian Voice	6065af			
1400-1405 mtwhf	Zambia, ZNBC Radio 2	6165do			
1415-1500 mtwhfa	Bhutan, Bhutan BC Service	5030do			
1415-1425	Nepal, Radio	7165do			
1430-1500	Australia, Radio	6060na	6080as	6090me	11660eu
		11695pa	12080pa		
1430-1500 vl	China, China Radio Intl	8660as	9880as	11445as	15135as
1430-1440	India, All India Radio	3945do	6185do	9565do	9685do
1430-1440 mtwhf	Indonesia, RRI Uj Pandang	4753do			
1430-1500 mtwhf	Portugal, R Portugal Intl	21515me			
1430-1500	Romania, R Romania Intl	11775as	15335as		
1430-1500	United Kingdom, BBC WS	15400af			
1438-1455 1&3rd s	Denmark, R Denmark Intl	13800na	15340as		
1440-1500	Myanmar, Voice of	5990do			
1458-1500	Seychelles, FEBA Radio	9810as	11870as		

SELECTED PROGRAMS

Sundays

1400 India, All India Radio: Feature Program. A variable feature produced by AIR.
1400 Japan, NHK/Radio: NHK News. See S 0100.
1400 UK, BBC London (all streams): News Summary. One minute news update.
1410 Japan, NHK/Radio: Let's Learn Japanese. See S 0510.
1420 India, All India Radio: Press Review. See S 0000.
1425 Japan, NHK/Radio: Media Roundup. See S 0525.
1445 India, All India Radio: News. International news and reports.
1450 Japan, NHK/Radio: Viewpoint. See S 0550.
1453 India, All India Radio: Program Preview. See S 1345.
1455 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Mondays

1400 Japan, NHK/Radio: NHK News. See S 0100.
1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1400 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. Brother R. G. Stair preaches about the last days.
1415 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1420 India, All India Radio: Press Review. See S 0000.
1420 Japan, NHK/Radio: Close Up. See M 0330.
1430 Japan, NHK/Radio: Sports Spotlight. See M 0316.
1430 Portugal: News. A quarter-hour of international and national news.
1440 Japan, NHK/Radio: Japan Diary. See M 0325.
1445 India, All India Radio: News. See S 1445.
1446 Japan, NHK/Radio: News Commentary. See M 0347.
1446 Portugal: Visitors' Notebook. Tourist attractions and events in Portugal.
1453 India, All India Radio: Program Preview. See S 1345.
1455 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Tuesdays

1400 Japan, NHK/Radio: NHK News. See S 0100.
1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1400 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. See M 1400.
1415 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1420 India, All India Radio: Press Review. See S 0000.
1420 Japan, NHK/Radio: Close Up. See M 0330.
1430 Japan, NHK/Radio: Japanese Culture Today. See T 0330.
1430 Portugal: News. See Day M 1430.
1445 India, All India Radio: News. See S 1445.
1445 Japan, NHK/Radio: Japan Diary. See M 0325.
1445 Portugal: Musical Kaleidoscope. A variety of music for listening.
1450 Japan, NHK/Radio: News Commentary. See M 0347.
1453 India, All India Radio: Program Preview. See S 1345.
1455 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Wednesdays

1400 Japan, NHK/Radio: NHK News. See S 0100.
1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1400 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. See M 1400.
1415 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1420 India, All India Radio: Press Review. See S 0000.
1420 Japan, NHK/Radio: Asian Report. See W 0320.
1430 Japan, NHK/Radio: Close Up. See M 0330.
1430 Portugal: News. See Day M 1430.
1441 Japan, NHK/Radio: Japan Diary. See M 0325.
1445 India, All India Radio: News. See S 1445.
1447 Japan, NHK/Radio: News Commentary. See M 0347.
1449 Portugal: Challenge of the '90s. The past, present, and future of Portugal.
1453 India, All India Radio: Program Preview. See S 1345.
1455 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Thursdays

1400 Japan, NHK/Radio: NHK News. See S 0100.
1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1400 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. See M 1400.
1415 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1420 India, All India Radio: Press Review. See S 0000.
1430 Japan, NHK/Radio: Crosscurrents. See H 0330.
1430 Portugal: News. See Day M 1430.
1442 Japan, NHK/Radio: Japan Diary. See M 0325.
1445 India, All India Radio: News. See S 1445.
1446 Portugal: Spotlight on Portugal. Focus on the cities, towns, and regions of Portugal.
1448 Japan, NHK/Radio: News Commentary. See M 0347.
1453 India, All India Radio: Program Preview. See S 1345.
1455 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Fridays

1400 Japan, NHK/Radio: NHK News. See S 0100.
1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1400 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. See M 1400.
1415 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0315.
1420 India, All India Radio: Press Review. See S 0000.
1430 Japan, NHK/Radio: Close Up. See M 0330.
1430 Portugal: News. See Day M 1430.
1442 Japan, NHK/Radio: Japan Diary. See M 0325.
1442 Portugal: Visitors' Notebook. See Day M 1446.
1445 India, All India Radio: News. See S 1445.
1446 Portugal: Collector's Corner (triweekly). At look at stamps, coins and other collectibles.
1446 Portugal: Listeners Mailbag (triweekly). Listener letters are read and questions answered.
1446 Portugal: Radio Portugal DX (triweekly). Shortwave radio listening tips.
1448 Japan, NHK/Radio: News Commentary. See M 0347.
1453 India, All India Radio: Program Preview. See S 1345.
1454 Radio Netherlands: Documentary. From Before the Cradle. See A 2354.(13th) I want to play for Ajax, dad! Howard Shannon investigates what makes this one of Europe's most attractive clubs for your players (20th). Peter The Great (Part 1) See F 2354 (27th). Stichting Noord-Ierland. See W 1154 (6th).
1455 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Saturdays

1400 India, All India Radio: Feature. See S 1400.
1400 Japan, NHK/Radio: NHK News. See S 0100.
1400 UK, BBC London (all streams): World News. See S 0000.
1410 Japan, NHK/Radio: This Week. See A 0310.
1420 India, All India Radio: Press Review. See S 0000.
1445 India, All India Radio: News. See S 1445.
1453 India, All India Radio: Program Preview. See S 1345.
1455 Japan, NHK/Radio: News Summary. See S 0355.

Frequencies

1500-1600	Australia, Radio	5995pa	6060pa	6080pa	6090as
		7260as	9580pa	9615as	9710pa
		11660as	11695pa	11800pa	12080pa
1500-1600 vl	Canada, CBC N Quebec Svc	9625do			
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			
1500-1559 s	Canada, R Canada Intl	11855am	13650am		
1500-1600	China, China Radio Intl	7405na	9535na	9785as	11815as
1500-1600	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
1500-1600	Ecuador, HCJB	15115sa	21455va		
1500-1600 as	Eqt Guinea, R East Africa	15186af			
1500-1600	Guam, TWR/KTWR	11580as			
1500-1600	Italy, Adv World Radio	7230eu			
1500-1600 vl	Italy, IRRS	3985va			
1500-1600	Japan, NHK/Radio	9535na	11915as	11930me	15355af
1500-1600	Jordan, Radio	11970eu			
1500-1600	Lebanon, Voice of Hope	6280eu			
1500-1600	Malaysia, Radio	7295do			
1500-1600 vl	Malaysia, RTM Kuching	7160do			
1500-1600 vl	Malaysia,RTM KotaKinabalu	5980do			
1500-1530	Mexico, Radio Mexico Intl	9705na			
1500-1530	Mongolia, R Ulan Bator	9745as	12085as		
1500-1515 s	Myanmar, Voice of	5990do			
1500-1525	Netherlands, Radio	9895as	13700as	15150as	
1500-1600 occsnal	New Zealand, R NZ Intl	6100pa			
1500-1550	North Korea, R Pyongyang	9325eu	9640eu	9975na	13785me
1500-1600 vl	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	15140as
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1526	Romania, R Romania Intl	11775as	15335as		
1500-1600	Russia,Voice of Russia WS	4740va	4940va	4975va	7305me
		9595me	9830va	9955af	9975af
		11775va	11835va	11945va	12025af
		12035va	15320me	15340va	15350va
		15540me	15560af	17750af	
1500-1600	S Africa, Channel Africa	3220af	7155af		
1500-1600	Seychelles, FEBA Radio	9810as	11870as		
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600 mtwhf	Sri Lanka, Sri Lanka BC	9720as	15425as		
1500-1530	Switzerland, Swiss R Intl	12075as	13635as	15530as	
1500-1600	United Kingdom, BBC WS	5990as	6190af	6195va	7205as
		9410eu	9515na	9740va	11750as
		11865am	12095as	15070as	15220am
		15400as	17705va	17830af	17840af
		21660af			
1500-1530	United Kingdom, BBC WS	11860af	11940af	15420af	17880af
		21490af			
1500-1600	USA, KAIJ Dallas TX	13815am	15725am		
1500-1600	USA, KTBN Salt Lk City UT	15590am			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, Voice of America	7125as	7215as	9645as	9700va
		9760as	15205as	15255va	15395as
1500-1600	USA, WEWN Birmingham AL	9580na	11875na	15665eu	
1500-1600	USA, WGTG McCaysville GA	9400am			
1500-1600	USA, WHRI Noblesville IN	13760am	15105am		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WRNO New Orleans LA	15420am			
1500-1600 as	USA, WVHA Greenbush ME	15745eu			
1500-1600	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1500-1600	USA, WYFR Okeechobee FL	11830na	17750na		
1500-1600	Zambia, Christian Voice	6065af			
1520-1530 mtwhf	Estonia, Radio	5925eu			
1530-1555	Austria, R Austria Intl	11780as			
1530-1545	India, All India Radio	3945do	6185do	7140do	7410do
		9530do	9565do	9685do	9910do
		11740do			
1530-1600	Iran, VOIRI	7290as	9635as		
1530-1600	Netherlands, Radio	9890as	15150as		
1530-1600	United Kingdom, BBC WS	7180as	11720as		
1538-1555 1&3rd s	Denmark, R Denmark Intl	11840va	13805va	15230va	
1545-1600 a	Vatican State, Vatican R	9940as	11640as		

Selected Programs

Sundays

1500 Japan, NHK/Radio: NHK News. See S 0100.
1500 UK, BBC London (all streams): World News. See S 0000.
1510 Japan, NHK/Radio: Hello from Tokyo. See S 0310.
1530 Austria, R Austria Intl: Report from Austria. See S 0130.
1530 India, All India Radio: National News. News from around India.
1555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Mondays

1500 Japan, NHK/Radio: NHK News. See S 0100.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. See M 1400.
1515 Japan, NHK/Radio: Today's Top News Asia. The most important stories from other Asian media organizations are summarized in a new 10-minute format.
1525 Japan, NHK/Radio: Profile. An in-depth interview with a Japanese personality.
1530 Austria, R Austria Intl: Report from Austria. See S 0130.
1530 India, All India Radio: National News. See S 1530.
1555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Tuesdays

1500 Japan, NHK/Radio: NHK News. See S 0100.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. See M 1400.
1515 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
1525 Japan, NHK/Radio: Enjoy Japanese. Learn and practice the Japanese language.
1530 Austria, R Austria Intl: Report from Austria. See S 0130.
1530 India, All India Radio: National News. See S 1530.
1555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Wednesdays

1500 Japan, NHK/Radio: NHK News. See S 0100.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. See M 1400.
1515 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
1525 Japan, NHK/Radio: History and Classics. NEW! A look at Japanese historical figures and art forms.
1530 Austria, R Austria Intl: Report from Austria. See S 0130.
1530 India, All India Radio: National News. See S 1530.
1554 Radio Netherlands: Documentary. From Before the Cradle (11th). See A 2354.
1554 Radio Netherlands: Documentary. I want to play for Ajax, dad! (18th). See F 1454.
1554 Radio Netherlands: Documentary. Peter The Great (Part 1) (25th). See F 2354.
1554 Radio Netherlands: Documentary. Stichting Noord-Ierland (4th). See W 1154.
1555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Thursdays

1500 Japan, NHK/Radio: NHK News. See S 0100.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. See M 1400.
1515 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
1525 Japan, NHK/Radio: Enjoy Japanese. See T 1525.
1530 Austria, R Austria Intl: Report from Austria. See S 0130.
1530 India, All India Radio: National News. See S 1530.
1555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Fridays

1500 Japan, NHK/Radio: NHK News. See S 0100.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 USA, WRMI/R Miami Intl, FL: The Overcomer Broadcast. See M 1400.
1515 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
1525 Japan, NHK/Radio: Music and Book Beat. NEW! What people in Japan are listening to and reading.
1530 Austria, R Austria Intl: Report from Austria. See S 0130.
1530 India, All India Radio: National News. See S 1530.
1555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Saturdays

1500 Japan, NHK/Radio: NHK News. See S 0100.
1500 UK, BBC London (all streams): World News. See S 0000.
1510 Japan, NHK/Radio: Asia Weekly. See S 0110.
1511 Japan, NHK/Radio: Asian News Summary. See S 0111.
1521 Japan, NHK/Radio: Business Report. See S 0121.
1525 Japan, NHK/Radio: Entertaining in Asia. See S 0125.
1530 Austria, R Austria Intl: Report from Austria. See S 0130.
1530 India, All India Radio: National News. See S 1530.
1546 Japan, NHK/Radio: Asia Kaleidoscope. See S 0146.
1555 Japan, NHK/Radio: News Summary. See S 0355.

FREQUENCIES

1600-1700	Australia, Radio	5995pa	6060pa	6080pa	6090pa
		7260as	9580pa	9615va	11660pa
		11695pa	11800pa		
1600-1609	Belarus, Radiosta Belarus	4880eu			
1600-1700 vl	Canada, CBC N Quebec Svc	9625do			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, China Radio Intl	4130af	11575as	15110af	15130af
1600-1700	Costa Rica,RF Peace Intl	6205am	15050am		
1600-1627	Czech Rep, Radio Prague	5930eu	17485af		
1600-1630	Ethiopia, Radio	7165af			
1600-1700	France, Radio France Intl	6175eu	11615me	11700af	12015af
		15210af	15460af	15530af	
1600-1650	Germany, Deutsche Welle	7225as	9875as	13690as	
1600-1700	Germany, Deutsche Welle	7185af	9735af	11965af	17800af
1600-1700	Guam, AWR/KSDA	7395as			
1600-1615 mt	Guam, TWR/KTWR	11580as			
1600-1630 whfas	Guam, TWR/KTWR	11580as			
1600-1630	Iran, VOIRI	7290as	9635as		
1600-1700 vl	Italy, IRRS	3985va			
1600-1630	Jordan, Radio	11970eu			
1600-1700	Malaysia, Radio	7295do			
1600-1625	Netherlands, Radio	9895as	13700as	15150as	
1600-1650 occsnal	New Zealand, R NZ Intl	6100am			
1600-1630 s	Norway, Radio Norway Intl	11860eu	13800eu		
1600-1630	Pakistan, Radio	9425af	9515af	11570af	13590af
		15555af			
1600-1700 vl	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	
1600-1700	Russia,Voice of Russia WS	7240eu	7325af	7350eu	7440af
		9480eu	9830va	9880eu	9955eu
		9975eu	11630eu	11675eu	11775me
		11945me	12025af	15350va	15400eu
		17875af			
1600-1655	S Africa, Channel Africa	9530af			
1600-1700	S Africa, Trans World R	9500af			
1600-1700	Singapore, SBC Radio One	6155do			
1600-1700	Slovakia, Adv World Radio	13590as			
1600-1700	South Korea, R Korea Intl	5975eu	9515af	9870af	
1600-1630 mtwhf	Sri Lanka, Sri Lanka BC	9720as	15425as		
1600-1700	Swaziland, Trans World R	9500af			
1600-1640	UAE, Radio Dubai	11795me	13675eu	15395me	17825me
1600-1700	United Kingdom, BBC WS	3915as	6190af	6195va	7135as
		9410va	9515na	9590na	9740va
		11750as	12095as	15070as	15400af
		17830af	17840va	21470af	21505af
1600-1615	United Kingdom, BBC WS	5990as	7180as	7205as	17705af
1600-1700	USA, KAIJ Dallas TX	13815am	15725am		
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	6120as			
1600-1700	USA, Monitor Radio Intl	9385af	15715eu	17510af	
1600-1700	USA, Voice of America	7125as	7215as	9645as	9700va
		11920af	12040af	13710af	15205va
		15225af	15255va	15395as	15410af
		15445af	17895af		
1600-1630 as	USA, Voice of America	6035af			
1600-1700	USA, WEWN Birmingham AL	11875na	13615na	15665eu	
1600-1700	USA, WGTG McCaysville GA	9400am			
1600-1700	USA, WHRI Noblesville IN	13760am	15105am		
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WRNO New Orleans LA	15420am			
1600-1700 as	USA, WVHA Greenbush ME	15745eu			
1600-1700	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1600-1700	USA, WYFR Okeechobee FL	11705na	11830na	15695eu	17750eu
		21525af	21745eu		
1600-1620 a	Vatican State, Vatican R	5880as	7250as		
1600-1700	Zambia, Christian Voice	3330af			
1600-1610 mtwhfa	Zambia, ZNBC Radio 2	6165do			
1615-1630	Albania, R Tirana Intl	7155eu	9740eu		
1615-1700	United Kingdom, BBC WS	9510as	11860af		
1615-1630 a	Vatican State, Vatican R	9645eu	11810eu		
1630-1659	Canada, R Canada Intl	7150as	9550as		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	Slovakia, Adv World Radio	15620af			
1630-1700	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1630-1700	USA, Voice of America	11765af			
1638-1655 1&3rd s	Denmark, R Denmark Intl	11860na	13800na	15540na	
1645-1700 mtwhf	Canada, R Canada Intl	9555va	11935va	15325eu	17820eu
1650-1700	Eqt Guinea, Radio Africa	15186af			
1650-1700 mtwhf	New Zealand, R NZ Intl	6145pa			

SELECTED PROGRAMS

Sundays

1600 Germany, Deutsche Welle: DW World News. Eight minutes of world news from Deutsche Welle.
1600 UK, BBC London (af/am/as pac/south as): World News. See S 0000.
1600 USA, WRNO,: The Overcomer Broadcast. Brother R. G. Stair preaches about the last days.
1609 Germany, Deutsche Welle (as): Arts on the Air. Reports and interviews on major cultural events and developments. The Bayreuth Festival (1st). See F 0133.
1609 Germany, Deutsche Welle: The Week in Germany. A summary of the week's events in Germany by Deutsche Welle's Bonn correspondents.
1619 Germany, Deutsche Welle: Religion and Society. News and developments concerning the world's major religions.
1629 Germany, Deutsche Welle: Through German Eyes. In-depth interviews with prominent German journalists.
1633 Germany, Deutsche Welle: German by Radio. An advanced German language course for English speakers.
1634 Germany, Deutsche Welle: Hits in Germany. The German pop scene for listeners in Africa.
1645 UK, BBC London (am): Britain Today. See S 0045.

Mondays

1600 Germany, Deutsche Welle: DW World News. See S 1600.
1600 UK, BBC London (af/am/as pac/south as): World News. See S 0000.
1600 USA, Monitor Radio News. See M 1100.
1600 USA, WRNO,: USA Radio News. Five minutes of news from the USA Radio Network.
1606 USA,:. See M 1106.
1606 USA, WRNO,: Rush Limbaugh Program. Political talk on the conservative side.
1609 Germany, Deutsche Welle: Newsline Cologne. Worldwide current affairs program with a review of the press.
1633 Germany, Deutsche Welle: African News. News about and for African countries.
1633 Germany, Deutsche Welle: Science and Technology. Magazine program presenting new developments in science and technology.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1649 USA,: Letterbox. See M 1149.

Tuesdays

1600 Germany, Deutsche Welle: DW World News. See S 1600.
1600 UK, BBC London (af/am/as pac/south as): World News. See S 0000.
1600 USA: Monitor Radio News. See M 1100.
1600 USA, WRNO: USA Radio News. See M 1600.
1606 US,:. See M 1106.
1606 US, WRNO: Rush Limbaugh Program. See M 1606.
1609 Germany, Deutsche Welle: Newsline Cologne. See M 1609.
1633 Germany, Deutsche Welle: Man and Environment. Various topics relating to the environment in industrial and developing countries.
1638 Germany, Deutsche Welle: African News. See M 1633.
1644 Germany: Man and Environment. See T 1633.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1649 USA,: Letterbox. See M 1149.

Wednesdays

1600 Germany, Deutsche Welle: DW World News. See S 1600.
1600 UK, BBC London (af/am/as pac/south as): World News. See S 0000.
1600 USA,: Monitor Radio News. See M 1100.
1600 USA, WRNO: USA Radio News. See M 1600.
1606 USA:. See M 1106.
1606 USA, WRNO,: Rush Limbaugh Program. See M 1606.
1609 Germany, Deutsche Welle: Newsline Cologne. See M 1609.
1633 Germany, Deutsche Welle: Insight. A weekly analysis of major developments on the international scene.
1638 Germany, Deutsche Welle: African News. See M 1633.
1643 Germany, Deutsche Welle: Insight. See W 1633.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1649 US,: Letterbox. See M 1149.

Thursdays

1600 Germany, Deutsche Welle: DW World News. See S 1600.
1600 UK, BBC London (af/am/as pac/south as): World News. See S 0000.
1600 USA: Monitor Radio News. See M 1100.
1600 USA, WRNO: USA Radio News. See M 1600.
1606 USA,: See M 1106.
1606 USA, WRNO: Rush Limbaugh Program. See M 1606.
1609 Germany, Deutsche Welle: Newsline Cologne. See M 1609.
1633 Germany, Deutsche Welle: Living in Germany. A weekly look at the social and political issues in the 1990s.
1638 Germany, Deutsche Welle: African News. See M 1633.
1643 Germany, Deutsche Welle: Living in Germany. See H 1633.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1649 USA,: Letterbox. See M 1149.

Fridays

1600 Germany, Deutsche Welle: DW World News. See S 1600.
1600 UK, BBC London (af/am/as pac/south as): World News. See S 0000.
1600 USA: Monitor Radio News. See M 1100.
1600 USA, WRNO: USA Radio News. See M 1600.
1606 USA:. See M 1106.
1606 USA, WRNO: Rush Limbaugh Program. See M 1606.
1609 Germany, Deutsche Welle: Newsline Cologne. See M 1609.
1633 Germany, Deutsche Welle: Spotlight on Sport. Weekly magazine program with background stories and coverage of important events.
1638 Germany, Deutsche Welle: African News. See M 1633.
1643 Germany, Deutsche Welle: Spotlight on Sport. See F 1633.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1649 USA: Letterbox. See M 1149.

Saturdays

1600 Germany, Deutsche Welle: DW World News. See S 1600.
1600 UK, BBC London (all streams): World News. See S 0000.
1600 USA: Monitor Radio News. See M 1100.
1600 USA, WRNO: The Overcomer Broadcast. See S 1600.
1606 USA: Christian Science Sentinel Radio Edition. See S 1129.
1609 Germany, Deutsche Welle: Feature of the Month (1st Sat). A special feature on important developmental issues of our time. Africa in the German Press. What the German newspapers and weeklies have to say about Africa.
1609 Germany, Deutsche Welle: International Talking Point. Journalists discuss major trends and events.
1618 Germany, Deutsche Welle: Focus on Development (biweekly). Reports and interviews on projects and progress in Africa and Asia.
1618 Germany, Deutsche Welle: Women on the Move (biweekly). A magazine promoting intercultural understanding and portraying the role of women in society.
1623 Germany, Deutsche Welle: Development Forum. Reports and interviews on projects and progress in Africa and Asia.
1630 USA, WRNO: American Dissident Voices. The facist point of view is expounded.
1633 Germany, Deutsche Welle: Economic Notebook. The economic scene in Germany and around the world.
1640 Germany, Deutsche Welle: Religion and Society. See S 1619.
1648 Germany, Deutsche Welle: The Jazz Corner. A musical change-of-pace from the world of jazz.

FREQUENCIES

1700-1800	Australia, Radio	6060pa	6080pa	6090pa	7260as
		9580pa	9615as	9860pa	11660pa
		11695pa	11880pa	12080pa	
1700-1800 vl	Canada, CBC N Quebec Svc	9625do			
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	5220af	7150af	7405af	9535as
		11575af	11910af		
1700-1800 as	Costa Rica, Adv World R	13750am			
1700-1800	Costa Rica,RF Peace Intl	6205am	15050am		
1700-1727	Czech Rep, Radio Prague	5835eu	15640af		
1700-1800	Ecuador, HCJB	15540eu	21455eu		
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Eqt Guinea, Radio Africa	15186af			
1700-1730	France, Radio France Intl	6175eu	11615me	11700af	12015af
		15210af	15365af	15460af	15530af
1700-1800 vl	Italy, IRRS	3985va			
1700-1800	Japan, NHK/Radio	6035na	9535na	9580as	11880as
1700-1800	Lebanon, Voice of Hope	6280eu			
1700-1800 mtwhf	New Zealand, R NZ Intl	6145pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9975af	13785me
1700-1750	Pakistan, Radio	9400eu	11570eu		
1700-1800 vl	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	
1700-1755	Poland, Polish R Warsaw	6095eu	7270eu	7285eu	
1700-1800	Russia,Voice of Russia WS	7440af	9480eu	9830va	9880eu
		9955af	9975af	11775va	11960va
		12065me	15400eu	17875af	
1700-1755	S Africa, Channel Africa	3220af	7155af		
1700-1730	Sri Lanka, Sri Lanka BC	15425as			
1700-1800	Swaziland, Trans World R	9500af			
1700-1730	Switzerland, Swiss R Intl	9505eu	9885me	9905eu	12075af
		13635af			
1700-1800	United Kingdom, BBC WS	3955eu	6190af	6195eu	7150eu
		9410va	9710as	9740as	11750as
		11760as	11860af	15070af	15400af
		15420af	17830af	17840af	
1700-1745	United Kingdom, BBC WS	3915as	7135as	9630af	12095va
1700-1715	United Kingdom, BBC WS	9515va	9590na		
1700-1800	USA, KAIJ Dallas TX	13815am	15725am		
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	13625as			
1700-1800	USA, Monitor Radio Intl	9385af	15715eu	17510af	
1700-1800	USA, Voice of America	6035as	7125as	7215as	9645as
		9700va	9760va	11765af	11920af
		12040af	13710af	15255va	15395as
		15410af	15445af	17895af	
1700-1800 mtwhf	USA, Voice of America	5990va	6045va	7125as	7150va
		7170as	9550as	9770va	11870va
1700-1800	USA, WEWN Birmingham AL	11875na	13615na	15665eu	
1700-1800	USA, WGTG McCaysville GA	9400am			
1700-1800	USA, WHRI Noblesville IN	13760am	15105ca		
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	9475am	12160am	13845am	15685am
1700-1800	USA, WYFR Okeechobee FL	15695eu	17555eu		
1700-1800	Zambia, Christian Voice	3330af			
1700-1800 a	Zambia, ZNBC Radio 2	6165do			
1700-1800 vl	Zimbabwe, Zimbabwe BC	4828do			
1715-1800	United Kingdom, BBC WS	7160va			
1730-1755	Austria, R Austria Intl	6155eu	9665me	11780as	13730eu
1730-1800	Guam, AWR/KSDA	9370as			
1730-1800	Netherlands, Radio	6020af	7120af	11655af	
1730-1800 vl	Philippines, R Pilipinas	11815me	11890me	15190me	
1730-1756	Romania, R Romania Intl	9550af	9750af	11830af	11940af
1730-1800	United Kingdom, BBC WS	6180eu			
1730-1800	Vatican State, Vatican R	9660af	11625af	15570af	
1738-1755 1&3rd s	Denmark, R Denmark Intl	7485va	11860va	15220va	
1745-1800 mtwhf	Armenia, Voice of	4810eu	4990eu	7490eu	9965eu
1745-1800	Bangladesh, Radio	7190as	9568as		
1745-1800	India, All India Radio	7410eu	9650eu	9950af	11620af
		11935af	13750as	15075me	
1745-1800 mtwhf	Swaziland, Trans World R	3200af			
1800-1900	Algeria, R Algiers Intl	15160eu	15240eu		
1800-1900	Australia, Radio	6060pa	6080pa	6090pa	7260eu
		9580pa	9860pa	11660as	11695pa
		11880pa	12080pa		
1800-1900	Bangladesh, Radio	7190eu	9568as	15520as	
1800-1825	Belgium, R Vlaanderen Int	5910eu	13645af		
1800-1900	Brazil, Radio Bras	15265eu			
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,RF Peace Intl	6205am	15050am		
1800-1900	Ecuador, HCJB	15550eu			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Eqt Guinea, Radio Africa	15186af			
1800-1900	India, All India Radio	7410eu	9650eu	9950af	11620af
		11935me	13750as	15075as	
1800-1900 vl	Italy, IRRS	3985va			
1800-1900	Kuwait, Radio	11990na			
1800-1830 mtwhfa	Lebanon, Voice of	6550eu			
1800-1900	Lebanon, Voice of Hope	6280eu	9960me		
1800-1900 s	Morocco, RTVM Marocaine	17815af			
1800-1825	Netherlands, Radio	6020af	7120af	11655af	
1800-1900 mtwhf	New Zealand, R NZ Intl	6145pa			
1800-1830 s	Norway, Radio Norway Intl	7485af	9590af	13805af	15220af
1800-1900 vl	Philippines, R Pilipinas	11815me	11890me	15190me	
1800-1900	Russia,Voice of Russia WS	7240eu	7350eu	9480eu	9505va
		9665va	9830va	9880va	9955af
		9975af	11630af	11675eu	11765af
		11945af	11960af		
1800-1900	Sudan, Radio Omdurman	9026af			
1800-1830	Swaziland, Trans World R	9500af			
1800-1900	Swaziland, Trans World R	3200af			
1800-1900	United Kingdom, BBC WS	3255af	3955eu	6180eu	6190af
		6195eu	9410va	12095eu	15070af
		15400af	17830af	17840ca	
1800-1830	United Kingdom, BBC WS	7150eu	7160va	9510as	11750as
1800-1900	USA, KAIJ Dallas TX	13815am	15725am		
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625au			
1800-1900	USA, Monitor Radio Intl	9385af	13770me	15665eu	17510af
1800-1900	USA, Voice of America	6035va	9760va	9770va	11920af
		12040af	13710af	15410af	15580af
1800-1830	USA, Voice of America	11765af			
1800-1900	USA, WEWN Birmingham AL	11875na	13615na	15745eu	
1800-1900	USA, WGTG McCaysville GA	9400am			
1800-1900	USA, WHRI Noblesville IN	9495am	13760eu		
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900 mtwhf	USA, WRMI/R Miami Intl	9955am			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900 mtwhf	USA, WVHA Greenbush ME	9930af			
1800-1900	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1800-1900	USA, WYFR Okeechobee FL	15695eu	17555eu		
1800-1900	Zambia, Christian Voice	3330af			
1800-1810	Zambia, ZNBC Radio 1	7220do			
1800-1857	Zambia, ZNBC Radio 2	6165do			
1800-1900 vl	Zimbabwe, Zimbabwe BC	4828do			
1803-1810	Croatia, Croatian Radio	5920eu	7165eu	9830eu	
1830-1900	Albania, R Tirana Intl	7270eu	9740eu		
1830-1900	Netherlands, Radio	6020af	7120af	9860af	11655af
		13700af	15315af	17605af	
1830-1857	S Africa, Trans World R	9525af			
1830-1900	Serbia, Radio Yugoslavia	6100eu	9720eu		
1830-1900	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1830-1855 irreg	Somalia, Radio Mogadishu	6710af			
1830-1900	South Korea, R Korea Intl	3955eu			
1830-1900	Sweden, Radio	6065eu	9655eu	11615me	
1830-1900	Turkey, Voice of	9445na	9535na		
1830-1900	United Kingdom, BBC WS	6005af	9630af	9740va	
1830-1900	USA, Voice of America	12080af			
1833-1900	Cote D' Ivoire, RDTV	11920do			
1838-1855 1&3rd s	Denmark, R Denmark Intl	7485eu	9590eu	13805va	15220va
1840-1850	Greece, Voice of	11645af	15150af		
1845-1900 t	Belarus, Radiosta Belarus	7180eu	7210eu	9875eu	11960eu
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	

RFPI ANNIVERSARY FIESTA

Join Radio For Peace International (RFPI) for *Fiesta on the Air,* celebrating their 9th anniversary. Tune in UTC 17 September 1996 to 7.385 MHz from 0000 to 0400. Call the numbers announced during the *Fiesta* toll free from the US and Canada or collect from elsewhere in the world. Callers will receive prizes which include handicrafts and T-shirts. The station is non-commercial and basically listener supported. For a contribution of $35 you can receive their quarterly newsletter *VISTA*. For membership and other information write to their US address: PO Box 20728 Portland, OR 97294 USA.

FREQUENCIES

1900-2000 mtwhf	Argentina, RAE	15345eu			
1900-2000	Australia, Radio	6060pa	6080pa	6150as	7240pa
		7260as	9560as	9580pa	9860pa
		11660pa	11695pa	11880pa	12080pa
1900-1930	Azerbaijan, Voice of	4957eu			
1900-1920	Brazil, Radio Bras	15265eu			
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	6955af	9440af	11515me	
1900-2000	Costa Rica, Adv World R	13750am	15460am		
1900-2000	Costa Rica,RF Peace Intl	6205am	15050am		
1900-1930	Cote D' Ivoire, RDTV	11920do			
1900-2000	Ecuador, HCJB	15550eu			
1900-2000	Eqt Guinea, Radio Africa	15186af			
1900-1930 mt	Estonia, Radio	5925eu			
1900-1950	Germany, Deutsche Welle	9735af	11740af	11785af	13690af
		13790af			
1900-2000	Guatemala, Adv World R	5980am			
1900-1930	Hungary, Radio Budapest	3975eu	6140eu	7130eu	9835eu
1900-2000 s	Iceland, R Alpha & Omega	6110eu			
1900-1945	India, All India Radio	7410eu	9650eu	9950me	11620eu
		11935af	13750as	15075as	
1900-1930	Israel, Kol Israel	7465na	9435eu	11605na	15640sa
1900-2000 vl	Italy, IRRS	3985va			
1900-2000	Japan, NHK/Radio	6035as	7140pa	9535na	9580as
1900-2000 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
1900-2000	Kuwait, Radio	11990eu			
1900-1930 as	Latvia, Radio	5935eu			
1900-2000	Lebanon, Voice of Hope	6280eu	9960me		
1900-1930	Mexico, Radio Mexico Intl	9705na			
1900-2000	Netherlands, Radio	6020af	7120af	9860af	9895af
		11655af	13700af	15315af	17605af
1900-1952 mtwhf	New Zealand, R NZ Intl	6145pa			
1900-1930 vl	Philippines, R Pilipinas	11815me	11890me	15190me	
1900-1956	Romania, R Romania Intl	9550eu	9690eu	11810eu	11940eu
1900-2000	Russia,Voice of Russia WS	7440af	9480eu	9665eu	11630af
		11675eu	11765af	11785af	11945af
		17875af			
1900-2000	South Korea, R Korea Intl	5975eu	7275as		
1900-2000	Swaziland, Trans World R	3200af			
1900-1930	Switzerland, Swiss R Intl	6165eu			
1900-2000	Thailand, Radio	7210eu			
1900-1930	Turkey, Voice of	9445na	9535na		
1900-2000	United Kingdom, BBC WS	3255af	3955eu	5975me	6005af
		6180eu	6190af	6195va	9410af
		9630af	9740af	15070af	15400af
		17830af			
1900-2000	USA, KAIJ Dallas TX	13815af	15725am		
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, KWHR Naalehu HI	13625au			
1900-2000	USA, Monitor Radio Intl	9385af	13770me	15665eu	17510af
1900-2000	USA, Voice of America	6035af	7415af	9525va	9760va
		9770va	11870va	11920af	12040af
		12080af	13710af	15180va	15410af
		15445af	15580af		
1900-2000	USA, WEWN Birmingham AL	11875na	13615na	15745eu	
1900-2000	USA, WGTG McCaysville GA	9400am			
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu		
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000 mtwhf	USA, WRMI/R Miami Intl	9955am			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000 smtwhf	USA, WVHA Greenbush ME	9930af			
1900-2000	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1900-2000	USA, WYFR Okeechobee FL	17555eu	21745eu		
1900-2000	Zambia, Christian Voice	3330af			
1900-2000 vl	Zimbabwe, Zimbabwe BC	4828do			
1930-1955	Austria, R Austria Intl	9655me	13730af		
1930-2000	Iran, VOIRI	7260af	9022eu		
1930-2000	Mongolia, R Ulan Bator	9745as	12085as		
1930-2000 vl	Papua New Guinea, NBC	4890do			
1930-2000	Poland, Polish R Warsaw	6035eu	6095eu	7285eu	
1930-2000	Sweden, Radio	6065eu			
1935-1955	Italy, RAI Intl	9670eu	9710eu	11905eu	
1938-1955 1&3rd s	Denmark, R Denmark Intl	7520af	11860af	13805eu	15220au
1950-2000	Vatican State, Vatican R	4005eu	5880eu	7250eu	
1953-2000 smtwh	New Zealand, R NZ Intl	9810pa			

2000 UTC

2000-2100	Algeria, R Algiers Intl	11715me	15160eu		
2000-2100	Angola, Radio Nacional	3355do	9535do		
2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7260as
		9580pa	9860pa	11660pa	11695pa
		11855as	11880pa	12080pa	
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			
2000-2059	Canada, R Canada Intl	5995va	7235va	11690va	13650eu
		13670eu	15150eu	15325eu	17820eu
		17870eu			
2000-2100	China, China Radio Intl	5220eu	6950eu	9440af	9920eu
		11715af	15110af		
2000-2100	Costa Rica,RF Peace Intl	6205am	15050am		
2000-2027	Czech Rep, Radio Prague	5930va	11600va		
2000-2100	Ecuador, HCJB	15550eu			
2000-2100	Eqt Guinea, Radio Africa	15186af			
2000-2050	Germany, Deutsche Welle	7170eu	9615eu		
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
2000-2010	Greece, Voice of	9420eu			
2000-2100	Guatemala, Adv World R	5980am			
2000-2100	Indonesia, Voice of	9525as			
2000-2030	Iran, VOIRI	7260af	9022eu		
2000-2100 vl/fas	Italy, IRRS	3980va			
2000-2100 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2000-2100	Kuwait, Radio	11990eu			
2000-2100	Lebanon, Voice of Hope	9960eu			
2000-2030	Mexico, Radio Mexico Intl	9705na			
2000-2025	Netherlands, Radio	7120af	7205af	7895af	9860af
		11655af	15315af	17605af	
2000-2006 fa	New Zealand, R NZ Intl	9810pa			
2000-2048 smtwh	New Zealand, R NZ Intl	9810pa			
2000-2005	Nigeria, FRCN/Radio	3326do	4990do		
2000-2050	North Korea, R Pyongyang	6575eu	9345as	9640af	9975as
2000-2030 s	Norway, Radio Norway Intl	9590au			
2000-2100 vl	Papua New Guinea, NBC	4890do			
2000-2025	Poland, Polish R Warsaw	6035eu	6095eu	7285eu	
2000-2030 mtwhf	Portugal, R Portugal Intl	6130eu	9780eu	9815eu	15515af
2000-2100	Russia,Voice of Russia WS	7070eu	9480eu	9880eu	11630eu
		11675eu			
2000-2015	Sierra Leone, SLBS	3316do			
2000-2015	Swaziland, Trans World R	3200af			
2000-2030	Switzerland, Swiss R Intl	6165eu	9870af	9885af	9905af
		11640af			
2000-2015	Uganda, Radio	3340do			
2000-2100	United Kingdom, BBC WS	3255af	3955eu	5975me	6005af
		6180eu	6190af	6195eu	7325eu
		9410af	9630af	11750sa	11835va
		11955as	12095eu	15070eu	15400af
		17830af			
2000-2100	USA, KAIJ Dallas TX	13815am	15725na		
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100 s	USA, KVOH Los Angeles CA	17775am			
2000-2100	USA, KWHR Naalehu HI	15405as			
2000-2100	USA, Monitor Radio Intl	9570pa	13770eu	15665eu	
2000-2100	USA, Voice of America	6035af	7415af	9760va	9770va
		12080af	15410af	15580af	17725af
		17755af			
2000-2100	USA, WEWN Birmingham AL	7425na	13615na	13695eu	
2000-2100	USA, WGTG McCaysville GA	9400am			
2000-2100	USA, WHRI Noblesville IN	9495am	13760eu		
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100 mtwhf	USA, WRMI/R Miami Intl	9955am			
2000-2100 as	USA, WVHA Greenbush ME	9930af			
2000-2100	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
2000-2100	USA, WYFR Okeechobee FL	17555eu	17750eu	17845sa	21525af
2000-2030	Vatican State, Vatican R	7365eu	9645eu	11625eu	
2000-2030	Zambia, Christian Voice	3330af			
2000-2005	Zambia, ZNBC Radio 2	6165do			
2000-2100 vl	Zimbabwe, Zimbabwe BC	4828do			
2005-2100	Syria, Radio Damascus	12085na	15095na		
2007-2300 fa	New Zealand, R NZ Intl	11735pa			
2015-2045 as	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Intl	7110af	9710af	11840af	
2030-2100	Armenia, Voice of	9965eu	11615eu	11665eu	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100	Finland, YLE/R Finland	9855af	15440af		
2030-2035 mtwhf	Latvia, Radio	5935eu			
2030-2100 mwh	Moldova, R Dniester Intl	11750na			
2030-2100	Netherlands, Radio	9860af	9895af	11655af	
2030-2100	Russia,Voice of Russia WS	7240eu	9665eu		
2030-2100	Serbia, Radio Yugoslavia	7230au			
2030-2100	Slovakia, Adv World Radio	9455af			
2030-2100 as	Sweden, Radio	6065eu	9430eu	9655af	
2030-2045	Thailand, Radio	9555eu			
2038-2055 1&3rd s	Denmark, R Denmark Intl	7485eu	9590me		
2045-2100	India, All India Radio	7410eu	9910au	9950eu	11620eu
		11715pa	15225pa		
2049-2100 smtwh	New Zealand, R NZ Intl	11735pa			

FREQUENCIES

2100-2200	Australia, Radio	6060pa	6080pa	7240pa	7260as
		9580pa	9660pa	11660pa	11855as
		11880pa	11955pa	13745pa	
2100-2125	Belgium, R Vlaanderen Int	5910na			
2100-2200	Bulgaria, Radio	9700eu	11720eu		
2100-2200 vl	Cameroon, Radio Garoua	5010do			
2100-2200 vl	Canada, CBC N Quebec Svc	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			
2100-2200	Canada, R Canada Intl	7235eu	11690eu	13650eu	13670eu
		15150eu	15325eu	17820eu	
2100-2200	China, China Radio Intl	5220eu	6950eu	9920eu	
2100-2130	China, China Radio Intl	3985eu	11715af	15110af	
2100-2200	Costa Rica,RF Peace Intl	6205am	15050am		
2100-2200	Cuba, Radio Havana	13715eu	13715eu		
2100-2200	Ecuador, HCJB	15540eu	21455eu		
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200	Eqt Guinea, Radio Africa	15186af			
2100-2150	Germany, Deutsche Welle	7115as	9670as	9735af	9765as
		11755af	15135af		
2100-2130	Hungary, Radio Budapest	3975eu	5935eu	7250eu	9835eu
2100-2200	India, All India Radio	7410eu	9910eu	9950eu	11620au
		11715au	15225au		
2100-2200 vl/fas	Italy, IRRS	3980va			
2100-2200	Japan, NHK/Radio	6035as	9535as	9560as	11850pa
2100-2110	Japan, NHK/Radio	9570as	11685as		
2100-2105 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2100-2200	Lebanon, Voice of Hope	6280eu	9960me		
2100-2125	Moldova, R Moldova Intl	7520na			
2100-2125	Netherlands, Radio	9860af	9895af	11655af	
2100-2200 smtwh	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4990do		
2100-2200 vl	Papua New Guinea, NBC	4890do			
2100-2156	Romania, R Romania Intl	5990eu	7105eu	7195eu	9690eu
2100-2200	Russia,Voice of Russia WS	7240eu	7350eu	9480eu	9580eu
		9665eu	9710eu	9880eu	11630eu
		11750eu			
2100-2130	Serbia, Radio Yugoslavia	6100eu	6185eu		
2100-2200	Slovakia, Adv World Radio	6055eu			
2100-2130	Slovakia, Adv World Radio	9455af			
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2157	Spain, R Exterior Espana	6125eu	11775af		
2100-2110	Uganda, Radio	3340do			
2100-2200	Ukraine, R Ukraine Intl	5905eu	6010eu	6020eu	6080eu
		9560eu	9735eu	9875eu	
2100-2200	United Kingdom, BBC WS	3255af	3915as	3955eu	5975va
		6005af	6120as	6180eu	6190af
		6195va	7325eu	9410va	9740au
		11750sa	11835va	11955as	12095eu
		15070eu			
2100-2130	United Kingdom, BBC WS	9630af			
2100-2200	USA, KAIJ Dallas TX	13815am	15725am		
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200	USA, Monitor Radio Intl	13770na	13840au	15665eu	
2100-2200	USA, Voice of America	6035af	7415af	9760na	11870na
		11965va	13710af	15185va	15410af
		15445af	15580af	17725af	
2100-2130	USA, Voice of America	11855af	12080af		
2100-2200	USA, WEWN Birmingham AL	7425na	13615na	13695eu	
2100-2200	USA, WGTG McCaysville GA	9400am			
2100-2200	USA, WHRI Noblesville IN	9495am	13760am		
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRMI/R Miami Intl	9955am			
2100-2200 mtwhf	USA, WVHA Greenbush ME	9930eu			
2100-2200 s	USA, WVHA Greenbush ME	9930af			
2100-2200	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
2100-2200	USA, WYFR Okeechobee FL	17555eu	17845eu	21525af	
2100-2105	Zambia, ZNBC Radio 2	6165do			
2100-2200 vl	Zimbabwe, Zimbabwe BC	4828do			
2103-2110	Croatia, Croatian Radio	5895eu	7165eu		
2105-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130	United Kingdom, BBC WS	15390am	17715am		
2130-2200	Australia, Radio	9610as	9645as	15365pa	17795pa
		17860pa			
2130-2200	Guam, AWR/KSDA	15310as			
2130-2200	Iran, VOIRI	6175au			
2130-2200	Russia,Voice of Russia WS	7250eu			
2130-2200	Sweden, Radio	6065eu	9430na	9655va	
2130-2145	United Kingdom, BBC WS	11680sa			
2138-2155 1&3rd s	Denmark, R Denmark Intl	7205na	9495na	9590au	
2145-2200 a	Greece, Voice of	9425au			
2145-2200	United Kingdom, BBC WS	5990as	7160as	9580as	

2200 UTC

2200-2300	Australia, Radio	9475as	9580pa	9610as	9645as
		9660pa	11660pa	11695pa	11855as
		11880pa	11955pa	13745pa	13755pa
		15365pa	17795pa	17860pa	
2200-2300	Canada, CBC N Quebec Svc	9625do			
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			
2200-2300	Canada, R Canada Intl	5960am	9755va	13650va	13670am
		13740va			
2200-2230	Canada, R Canada Intl	5960am	11705as	15305am	
2200-2300	China, China Radio Intl	7110eu	9880eu		
2200-2300	Costa Rica,RF Peace Intl	6205am	7385am		
2200-2300	Cuba, Radio Havana	6180na			
2200-2230	Ecuador, HCJB	15540eu			
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eqt Guinea, Radio Africa	15186af			
2200-2215	Ghana, Ghana Broadc Corp	4915do			
2200-2230	India, All India Radio	7410eu	9910eu	9950eu	11620au
		11715au	15225au		
2200-2230	Iran, VOIRI	6175au			
2200-2225	Italy, RAI Intl	5975as	9710as	11815as	
2200-2300	Lebanon, Voice of Hope	6280eu	9960me		
2200-2300	Malaysia, Radio	7295do			
2200-2225 mtwhf	Moldova, R Moldova Intl	7520eu			
2200-2300 smtwh	New Zealand, R NZ Intl	11735pa			
2200-2215	Nigeria, FRCN/Radio	3326do	4990do		
2200-2230 s	Norway, Radio Norway Intl	9485au			
2200-2300 vl	Palau, KHBN/Voice of Hope	9985as	11735as	13615as	
2200-2208 vl	Papua New Guinea, NBC	4890do			
2200-2300	Russia,Voice of Russia WS	7070na	7250na	9665na	11750na
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, Adv World Radio	9455af			
2200-2205	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	15600eu	17750eu		
2200-2300	Turkey, Voice of	9560na	9655va		
2200-2300	UAE, Radio Abu Dhabi	9605na	9695na	9770na	
2200-2300	United Kingdom, BBC WS	3955eu	5905as	5975va	6175va
		6195va	9590va	9915va	11750sa
		11835va	11955as	12095eu	
2200-2230	United Kingdom, BBC WS	9410eu			
2200-2300	USA, KAIJ Dallas TX	13815am	15725am		
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	13770eu	13840as	15405as	15665sa
2200-2300	USA, Voice of America	7215va	9705va	9770va	11760va
		15185va	15290va	15305va	17735va
		17820va			
2200-2230 mtwhf	USA, Voice of America	6035af	7415af	12080af	13710af
2200-2300	USA, WEWN Birmingham AL	7425na	11820eu	13615na	
2200-2300	USA, WGTG McCaysville GA	9400am			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 smtwhf	USA, WVHA Greenbush ME	5850eu			
2200-2300	USA, WWCR Nashville TN	7435am	9475am	12160am	13845am
2200-2245	USA, WYFR Okeechobee FL	17845af	21525eu		
2200-2210	Zambia, ZNBC Radio 2	6165do			
2203-2210	Croatia, Croatian Radio	5985eu	7165eu	13830am	
2210-2300 vl	Papua New Guinea, NBC	9675do			
2230-2255	Austria, R Austria Intl	5945eu	6155eu	9880eu	
2230-2257	Czech Rep, Radio Prague	9430na	11600af		
2230-2300	Russia,Voice of Russia WS	7125na			
2230-2300	United Kingdom, BBC WS	7325va			
2238-2255 1&3rd s	Denmark, R Denmark Intl	9495na	11840au		
2240-2250	Greece, Voice of	9425au			
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	7155as	9705as	9950as	11620as
		11660as			
2245-2300	Vatican State, Vatican R	7305as	9600as	11830au	

2300 UTC SHORTWAVE GUIDE 7:00 PM EDT 4:00 PM PDT

Frequencies

2300-0000	Australia, Radio	9610as	9660pa	11645as	11660pa
		11695as	11855as	13745pa	13755as
		15365pa	17795pa	17860pa	
2300-0000	Bulgaria, Radio	7480na	9700na		
2300-0000	Canada, CBC N Quebec Svc	9625do			
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-2359	Canada, R Canada Intl	5960am	9755am	11940am	13670am
		15305am			
2300-0000	Costa Rica, Adv World R	5030am	6150am	7375am	9725am
		13750am	15460am		
2300-0000	Costa Rica,RF Peace Intl	6205am	7385am		
2300-0000	Egypt, Radio Cairo	9900na			
2300-2350	Germany, Deutsche Welle	7235as	9690as	12045as	
2300-0000	Guatemala, Adv World R	11775am			
2300-0000	India, All India Radio	9705as	9950as	11620as	13700as
		15145as			
2300-0000	Japan, NHK/Radio	5965eu	9535eu	9560as	11850pa
2300-0000	Malaysia, Radio	7295do			
2300-2306	New Zealand, R NZ Intl	11735pa			
2300-2315	Nigeria, FRCN/Radio	3326do	4990do		
2300-2350	North Korea, R Pyongyang	11700na	13650na		
2300-0000 vl	Palau, KHBN/Voice of Hope	9985as	11735as	13615as	
2300-0000 vl	Papua New Guinea, NBC	9675do			
2300-2356	Romania, R Romania Intl	7105na	9570na	9625na	11940na
2300-0000	Russia,Voice of Russia WS	7125na	7240na	9665na	11750na
2300-0000	UAE, Radio Abu Dhabi	9605na	9695na	9770na	
2300-0000	United Kingdom, BBC WS	3955eu	5975va	6175va	6195va
		7295as	9580as	9590na	9915va
		11750sa	11945as	11955as	
2300-2330	United Kingdom, BBC WS	3915as			
2300-2315	United Kingdom, BBC WS	11835va			
2300-0000	USA, KAIJ Dallas TX	13740am	13815am		
2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	USA, KWHR Naalehu HI	17510as			
2300-0000	USA, Monitor Radio Intl	13625as	13770af	15405as	15665sa
2300-0000	USA, Voice of America	7215va	9705va	9770va	11760va
		15185va	15290va	15305va	17735va
		17820va			
2300-0000	USA, WEWN Birmingham AL	7425na	11820eu	13615na	
2300-0000	USA, WGTG McCaysville GA	9400am			
2300-0000 vl	USA, WHRI Noblesville IN	5745am	9495am		
2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000 twhfa	USA, WRMI/R Miami Intl	9955am			
2300-0000	USA, WRNO New Orleans LA	7355am			
2300-0000 s	USA, WVHA Greenbush ME	5850eu			
2300-0000	USA, WWCR Nashville TN	5065am	7435am	9475am	13845am
2300-2315	Vatican State, Vatican R	7305as	9600as	11830na	
2303-2310	Croatia, Croatian Radio	5895eu	7165eu		
2307-0000	New Zealand, R NZ Intl	15115pa			
2310-2315	Kyrgystan, Kygyz Radio	4010eu			
2325-2336 mtwhfa	Lebanon, Voice of	6550eu			
2330-0000	Australia, Radio	9645as	9850as	13605as	15240pa
2330-2355	Belgium, R Vlaanderen Int	9925na	11690sa		
2330-2359	Netherlands, Radio	6020na	6165na	9845na	
2330-0000	Vietnam, Voice of	9840eu	12010eu		
2335-2345	Greece, Voice of	9395sa	9425sa	11595sa	
2338-2355 1&3rd s	Denmark, R Denmark Intl	7275va	7490va	9485va	
2355-0000	Japan, NHK/Radio	9570as	11685au		

Selected Programs

Sundays

2300 India, All India Radio: News and Commentary. See S 0030.
2300 Japan, NHK/Radio: NHK News. See S 0100.
2300 UK, BBC London (af/am/as pac): World News. See S 0000.
2310 Japan, NHK/Radio: Let's Learn Japanese. See S 0510.
2325 Japan, NHK/Radio: Media Roundup. See S 0525.
2330 New Zealand, R NZ Intl: RNZ News. See S 0000.
2350 Japan, NHK/Radio: Viewpoint. See S 0550.
2355 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Mondays

2300 India, All India Radio: News and Commentary. See S 0030.
2300 Japan, NHK/Radio: NHK News. See S 0100.
2300 UK, BBC London (af/am/as pac): World News. See S 0000.
2300 USA, WRMI/R Miami Intl, FL: The Intelligence Report. A patriot radio program.
2315 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
2325 Japan, NHK/Radio: Profile. See M 1525.
2330 New Zealand, R NZ Intl: RNZ News. See S 0000.
2355 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Tuesdays

2300 India, All India Radio: News and Commentary. See S 0030.
2300 Japan, NHK/Radio: NHK News. See S 0100.
2300 UK, BBC London (af/am/as pac): World News. See S 0000.
2300 USA, WRMI/R Miami Intl, FL: The Intelligence Report. See M 2300.
2315 Japan. NHK/Radio: Today's Top News Asia. See M 1515.
2325 Japan, NHK/Radio: Enjoy Japanese. See T 1525.
2330 New Zealand, R NZ Intl: RNZ News. See S 0000.
2340 India, All India Radio: DX-ers Corner (2/4). India's bimonthly program for shortwave listeners.
2355 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Wednesdays

2300 India, All India Radio: News and Commentary. See S 0030.
2300 Japan, NHK/Radio: NHK News. See S 0100.
2300 UK, BBC London (af/am/as pac): World News. See S 0000.
2300 USA, WRMI/R Miami Intl, FL: The Intelligence Report. See M 2300.
2315 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
2325 Japan, NHK/Radio: History and Classics. See W 1525.
2330 New Zealand, R NZ Intl: RNZ News. See S 0000.
2355 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Thursdays

2300 India, All India Radio: News and Commentary. See S 0030.
2300 Japan, NHK/Radio: NHK News. See S 0100.
2300 UK, BBC London (af/am/as pac): World News. See S 0000.
2300 USA, WRMI/R Miami Intl, FL: The Intelligence Report. See M 2300.
2315 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
2325 Japan, NHK/Radio: Enjoy Japanese. See T 1525.
2330 New Zealand, R NZ Intl: RNZ News. See S 0000.
2355 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Fridays

2300 India, All India Radio: News and Commentary. See S 0030.
2300 Japan, NHK/Radio: NHK News. See S 0100.
2300 New Zealand, R NZ Intl: RNZ News. See S 0000.
2300 UK, BBC London (af/am/as pac): World News. See S 0000.
2300 USA, WRMI/R Miami Intl, FL: The Intelligence Report. See M 2300.
2315 Japan, NHK/Radio: Today's Top News Asia. See M 1515.
2325 Japan, NHK/Radio: Music and Book Beat. See F 1525.
2354 Radio Netherlands: Documentary. From Before the Cradle. See A 2354. (13th)I want to play for Ajax, dad! See F 1454. (20th). Peter The Great (Part 1) Dheera Sujan in this 3-part series examines how the monarch opened Russia to the world and his fascination with Dutch technology. (27th).
2354 Radio Netherlands: Documentary. Stichting Noord-lerland (6th). See W 1154.
2355 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Saturdays

2300 India, All India Radio: News and Commentary. See S 0030.
2300 Japan, NHK/Radio: NHK News. See S 0100.
2300 New Zealand, R NZ Intl: RNZ News. See S 0000.
2300 UK, BBC London (as pac): World News. See S 0000.
2300 USA, WRMI/R Miami Intl, FL: Radio Modern Rock (1/3). See A 0400.
2300 USA, WRMI/R Miami Intl, FL: The Praise Report (2/4). See S 0000.
2300 USA, WRMI/R Miami Intl, FL: Viva Miami! (5). See M 1330.
2310 Japan, NHK/Radio: Asia Weekly. See S 0110.
2311 Japan, NHK/Radio: Asian News Summary. See S 0111.
2321 Japan, NHK/Radio: Business Report. See S 0121.
2325 Japan, NHK/Radio: Entertaining in Asia. See S 0125.
2330 USA, WRMI/R Miami Intl, FL: A Texas Shootout (1/3). See A 0400.
2330 USA, WRMI/R Miami Intl, FL: I Believe God (2). See S 0000.
2330 USA, WRMI/R Miami Intl, FL: Wavescan (4/5). See S 0030.
2345 USA, WRMI/R Miami Intl, FL: Wavescan. See S 0030.
2346 Japan, NHK/Radio: Asia Kaleidoscope. See S 0146.
2355 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Hauser's Highlights
BANGLADESH: R. Bangladesh

External English:
1230-1300 9548, 7185
1745-1815 V.of Islam
9568 7190
1815-1900 9568 7190
(BBCMS)

Hauser's Highlights
U A E: Dubai

New 17630 kHz
1330-1355 English
(Notes: Only announcing
21605, 17825?, 15395,
13675
Nikolay Pashkevich,
Russia, *BC-DX*)

SPECIAL EVENT CALENDAR

Aug. 31-Sept. 1	Shelby, NC	Shelby ARC / June Melvin, WA4JNJ, 902 Henry St., Kings Mountain, NC 28086, 704-739-2583 (704-480-6928 after Aug 25). Location: Cleveland Co Fairgrounds. Talk-in 146.28/88. $5 gen adm.
Sep 7	Rolling Meadows, IL	N IL DX Assoc / Phil Camera, KB9CRY, 806 Portsmouth Ave., Westchester, IL 60154, 708-343-1696, Fax: 708-343-4394,
Sep 7	Fort Wayne, IN	Ft Wayne RC / Bill (KF2BS); Becky (N2XUW) Stockslager, 4801 Honey Oak Run, Fort Wayne, IN 46845, 219-471-5657
Sep 7	Spencer, IN	Owen Co ARA / Kathryn Smith, KB9INU, Rt. 1, Box 368D, Poland, IN 47868, 812-829-2140
Sep 7	Topeka, KS	NE Kansas ARC / Robert Nall, WV0S, 4316 SE Oakview Ln., Topeka, KS 66609-1638, 913-267-9399
Sep 7	Walker, MN	Cass-Hubbard ARC / Bill Beebe, N0SFJ, HCR 84, Box 1423, Walker, MN 56484, 218-547-3147
Sep 7	Erie, PA	Radio Assoc of Erie / Chris Robson, KB3A, 5560 Bear Creek Rd., Fairview, PA 16415, 814-474-1211
Sep 7	Uniontown, PA	Uniontown ARC / Carl Chuprinko, WA3HQK, Rt. 6, Box 231-CC, Morgantown, WV 26505, 304-594-3779
Sep 7-8	Louisville, KY	KY State Conv / Herbert Rowe, W4WQD, 5612 Highway 160, Charlestown, IN 47111, 812-294-4905
Sep 8	Dubuque, IA	Great River ARC / Jerry Lange, 2191 Graham Circle, Dubuque, IA 52002, 319-556-3050
Sep 8	Joliet, IL	Bolingbrook ARS / Ed Weinstein, WD9AYR, 7511 Walnut Ave., Woodridge, IL 60517, 708-759-7005
Sep 8	So Dartmouth, MA	SE Mass ARA / William Miller, K1IBR, 49 Old Westport Rd., North Dartmouth, MA 02747, 508-996-2969
Sep 8	Gaithersburg, MD	Found for Amateur Radio / Al Brown, WA3FYZ, 8645 Tower Dr., Laurel, MD 20723, 301-490-3188
Sep 8	Brewster, NY	Putnam Emergency ; Rptr League / Shirley Dahlgren, N2SKP, Box 677, 152 Broadway, Verplanck, NY 10596, 914-736-0717
Sep 8	Findlay, OH	Findlay RC / John Stultz, AA8IS, 523 Charles Ave., Findlay, OH 45840-4550, 419-425-2402
Sep 8	Butler, PA	Butler Co ARA / Gerald H. Wetzel, W3DMB, 784 Mercer Rd., Butler, PA 16001, 412-282-6777
Sep 13-15	Peoria, IL	ARRL Nat'l Conv, / Ron Morgan, KB9NW, PO Box 3508, Peoria, IL 61612-3508, 309-694-2649. Location: Peoria Civic Center
Sep 4	Prairieville, LA	Ascension ARC / Shane Dugas, KK5LC, 37150 Swamp Rd., Prairieville, LA 70769, 504-673-8396
Sep 14	Ballston Spa, NY	Saratoga County RACES / Lenny Leger, N2KKP, 518-885-4933
Sep 14-15	Melbourne, FL	Platinum Coast ARS / Allen Hudson, N4PTM, 575 Norwood Ct., Satellite Beach, FL 32937, 407-773-9658
Sep 15	Newtown, CT	Candlewood ARA / John Ahle, N2DVX, Box 3441, Danbury, CT 06813-3441, 203-438-6782. Talk in 147.12/.72. 9am-2pm. Adm $4.
Sep 15	Cambridge, MA	MIT RS; Harvard Wireless Club / Steve Fineberg, W1GSL, PO Box 397082, MIT Branch, Cambridge, MA 02139, Nick Alternburnd, KA1MQX, 617-253-3776
Sep 15	Mt. Clemens, MI	L'Anse Creuse ARC / Ralph Irish, WA8GDT, PO Box 180122, Utica, MI 48318-0122, 810-731-6760
Sep 15	Omaha, NE	AK-SAR-BEN ARC / Dave Kline, WJ0Z, 5055 South 87th St., Omaha, NE 68127, 402-592-4930
Sep 15	Hamilton Twp, NJ	DE Valley RA / Info call 609-882-2240. Location: Tall Cedars of Lebanon picnic grove, Sawmill Rd (I-295 to I-195 Exit 1, S Broad St, bear right at Yardville Bank, past "Barrel" to yield, first right past yield to Sawmill Rd, 1.1 miles on right), Talk-in 146.670-. Adm: $5
Sep 15	Cincinnati, OH	Gtr Cincinnati ARA / Joseph Phillips, K8QOE, 2800 Jupiter Dr., Fairfield, OH 45014, 513-874-0006
Sep 15	Wheeling, WV	Triple States RAC / Ralph McDonough, K8AN, Box 240, RR 1, Adena, OH 43901, 614-546-3930
Sep 20-22	Seattle, WA	Digital Coms Conf / Tucson Amateur Packet Radio, 8987-309 E. Tanque Verde Rd #337, Tucson, AZ 85749-9399, 817-383-0000, internet tapr@tapr.org. Location: Quality Inn Seattle Airport.
Sep 21-22	Anchorage, AK	Anchorage ARC / Lillian Marvin, 1030 Denali, Anchorage, AK 99501, 907-277-6741. Location: Kincaid Park Outdoor Center.
Sep 21	Mt Home, AR	Twin Lakes ARC / Phil Waters, AB5ZU, 711 East 8th St., Mountain Home, AR 72653, 501-425-7406
Sep 21	Sebastopol, CA	Sonoma County RA / Rick Reiner, K6ZWB, 2120 Slater St., Santa Rosa, CA 95404, 707-575-4455
Sep 21	Lexington, NE	Heartland ARA; Mid-Nebraska Antique RC / Randy Gigliotti, WB0SAO, PO Box 231, Area Ct. #9, Overton, NE 68863, 308-987-2312
Sep 21	Altus, OK	Altus Area ARA / Mart Dennis, KC5NAX, PO Box 73, Altus, OK 73521
Sep 21	Seal Beach, CA	SCADS / Gene Hughes guest speaker. Location: Farmers & Mechants Bank, 12535 Seal Beach Blvd. at 1300 hrs. Limited seating, call 714-522-6434
Sep 21	Lincoln, ME	Bagley ARC / Don Benson, N1JNK, 67 State St., Millinocket, ME 04462-1405, 207-723-4205
Sep 21	Hamburg, NY	W New York Conv / Harold Smith, K2HC, 300 White Spruce Blvd., Rochester, NY 14623, 716-424-7184
Sep 21	Randolph Ctr, VT	Central Vermont ARC / Tom Girardi, WA1YNU, PO Box 261, Waterbury, VT 05676, 802-244-7836
Sep 21-22	Grayslake, IL	Chicago FM Club / Phil Amato, N9IPI, 6330 North Oketo Ave., Chicago, IL

Send anouncements of events or club information to: Editor, Monitoring Times, P.O. Box 98, Brasstown, NC 28902-0098. Fax 704-837-2216; e-mail mteditor@grove.net. See MT's homepage on **www.grove.net** for complete listings.

CLUB CIRCUIT

North American Club Listings O-Z

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada: Internet 73737.3453@compuserve.com; (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

Pacific NW/BC DX Club: Bruce Portzer, 6546 19th Ave NE, Seattle, WA 98115. Pacific NW and BC Canada. DXing all bands. $9 US, $10 Canada. *PNBCDXC Newsletter.* Irregular meetings.

Pitt Co SW/Scanner Listeners Club: L. Neal Sumrell, P.O. Box 1818, Winterville, NC 28590-1818. 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.

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.

Sandy River SW Radio DXers Assoc: Duncan or Brenda Steele, R.R. 1, P.O. Box 1560, Norridgewock, ME 04957. Worldwide. *The QSL* - irregular. No dues.

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)

Signal Surfer DX Club: Darcy Jabs, RR2, Burns Lake, BC, Canada, V0J 1E0; (604) 694-3760. Canada and worldwide. MW and SW DXing.

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.

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 Thursdays 7pm Holland Big Boy.

Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.

Vancouver Shortwave Association (previously British Columbia Shortwave Listening Club): Box 500, 2245 Eton St., Vancouver, BC Canada V5L 1C9, (604) 255-8987 fax. Shortwave. *LOGJAM.* Meets 3rd Thurs. 7pm at 920 Davie St.

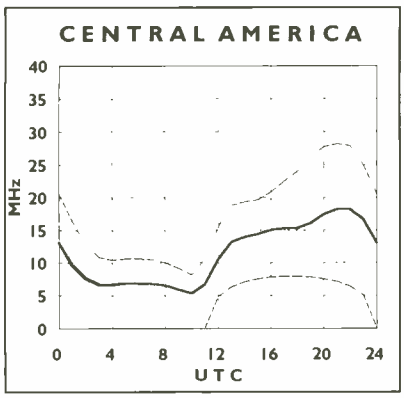
World DX Club: Arthur Ward, 17 Motspur Drive, Northampton, England NN2 6LY (in USA-Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610). Worldwide. All bands with emphasis on SW. *Contact.* $22 overseas airmail. Meets every 6 weeks in Reading, UK.

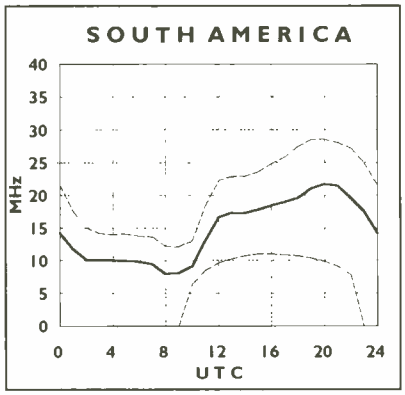
Worldwide TV/FM DXers Association (WTFDA): P.O. Box 514, Buffalo, NY 14205-0514. Worldwide membership; TV DX, FM BC, VHF utilities. *VHF-UHF Digest.* Annual convention. $24 annual in U.S. $2 for sample.

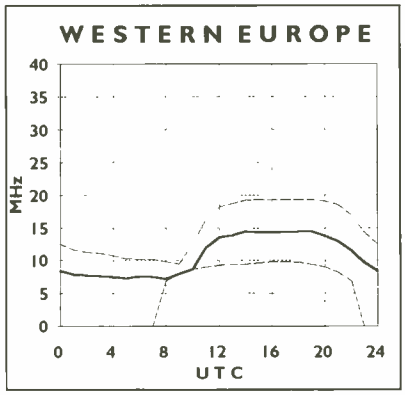
Worldwide Ute News: Rick Baker, ae411@yfn.ysu.edu for info - worldwide membership; non-broadcast under 30 MHz. Free electronic newsletter WUNNEWS, join by sending e-mail to majordomo@grove.net with following in e-mail message: "subscribe wun." Through World Wide Web: http://www.leonardo.net/berri/wun. For paper version: $18/yr to Tim Braun, PO Box 16533, Washington, D.C. 20041-6533. Sample $1.50.

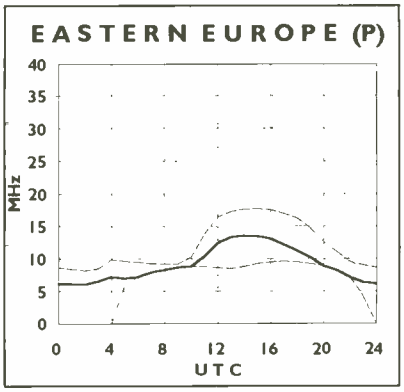
Propagation Conditions: Eastern United States

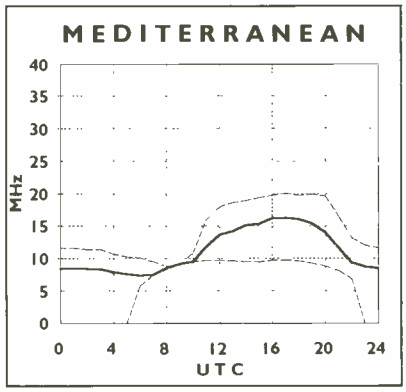
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear. The Sun Spot Number used this month for forecasting purposes is 6.

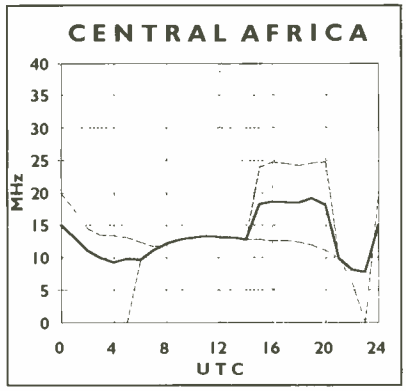


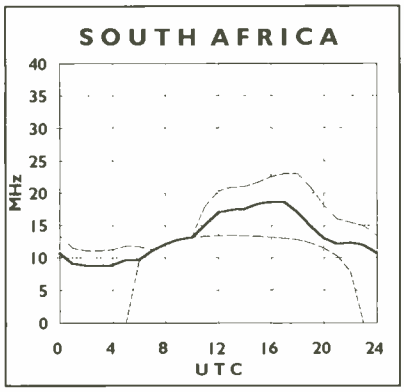


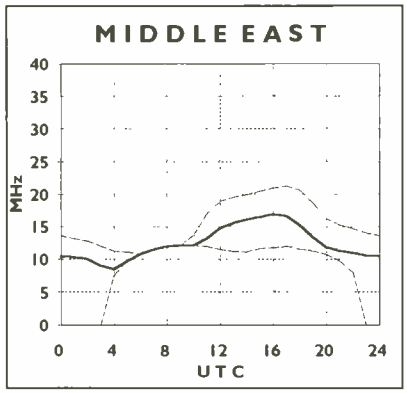


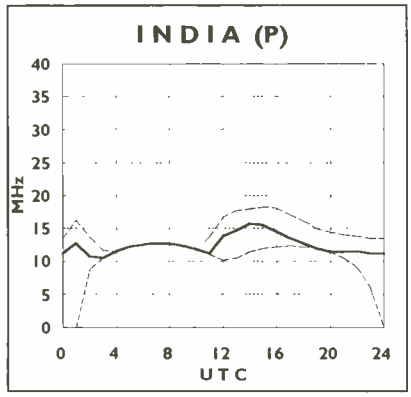


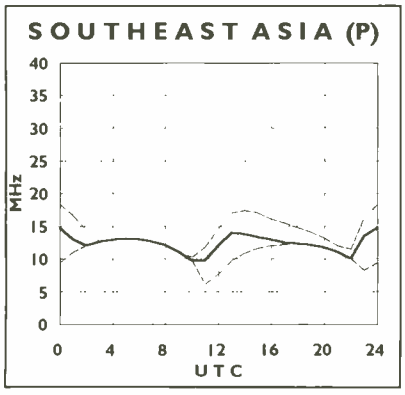


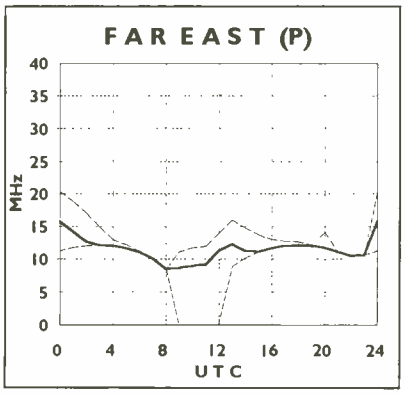


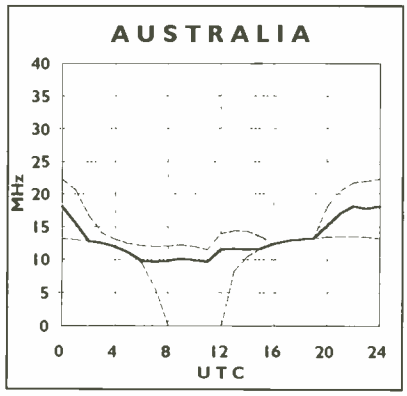






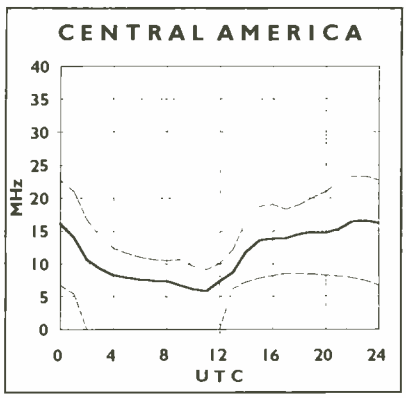


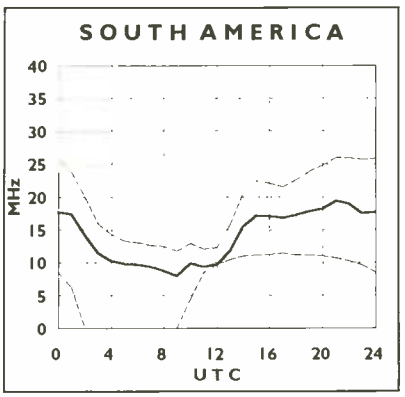


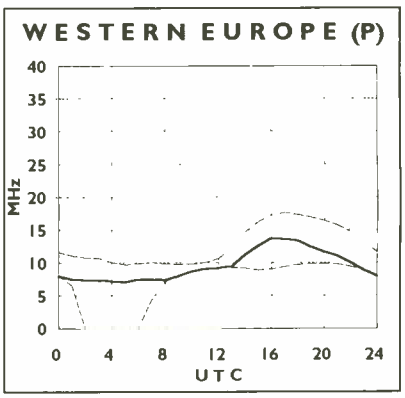


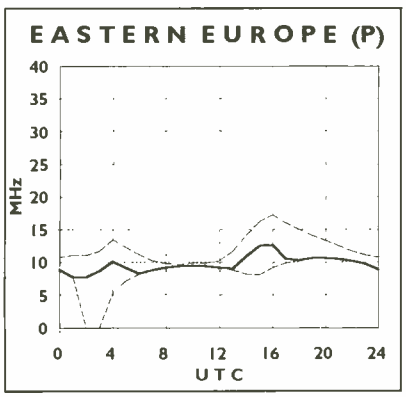
Propagation Conditions: Western United States

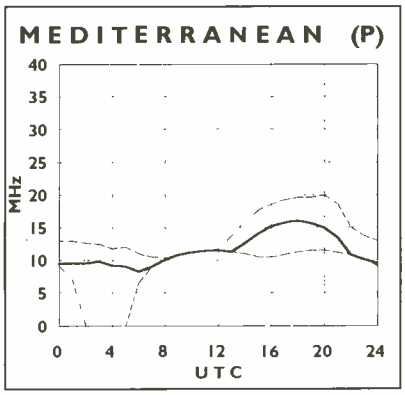
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom 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.

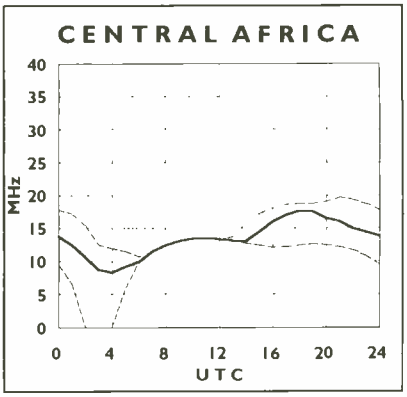


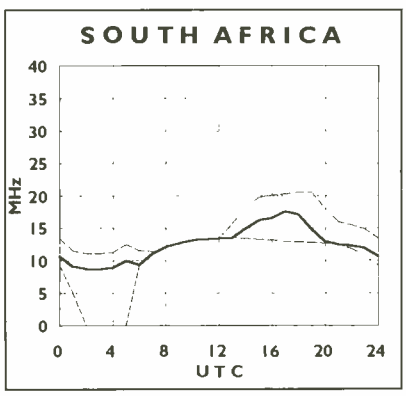


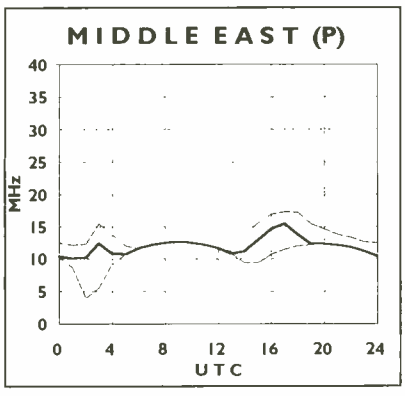


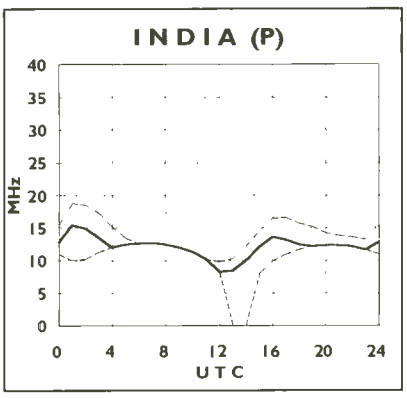


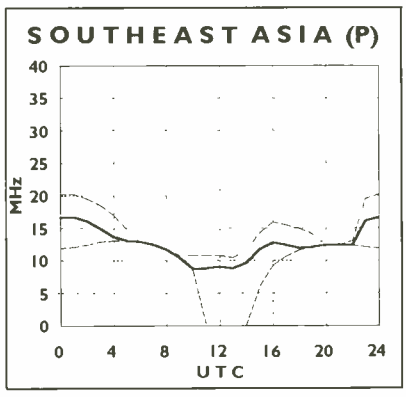


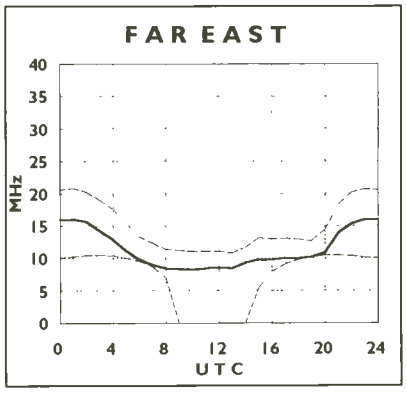


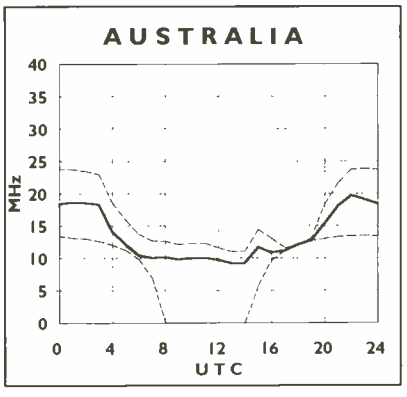










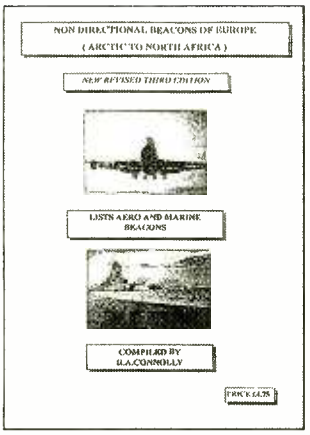


Kevin Carey, WB2QMY
kevinc@mdsroc.com

European Beacon Book

Everyone agrees: for longwave DXing in North America, it's tough to beat the *Aero/Marine Beacon Guide* by Ken Stryker, described many times in this column. In Europe and other parts of the world, however, a comprehensive beacon guide has not always been easy to come by.

For that reason, I was excited to learn of Robert Connolly's publication, *Non Directional Beacons of Europe (Arctic to North Africa)*. After reviewing the text I felt it deserved special mention here—not only for European listeners, but also for those in search of that "super catch" across the pond during the upcoming DX season.



Non Directional Beacons of Europe *is a fine addition to any longwave library.*

The guide starts out with a list of beacon terms and abbreviations, followed by a helpful section explaining how the guide is arranged. Next, just before the start of the beacon listings, there is a technical section on beacon modes and a Morse code chart for the beginner.

The beacon listings are divided into two main sections—*Aero* and *Marine*. In total, there are about 2100 entries, covering the area from Greenland to Arctic Russia in the north, to the Azores and North Africa in the south, the Atlantic coast of Ireland in the west, and the Black Sea in the east.

The back section of the guide contains a reverse listing of stations by frequency. This is very helpful when you want to know what beacons are assigned to a certain frequency, or group of frequencies. The guide concludes with a "Stop Press" section that contains last minute information and corrections.

A comb binding allows the book to lay flat when opened—very handy when you're busy tuning the dial. About the only negative thing I can say (and it really only applies to U.S. readers) has to do with the book's physical dimensions. It's in an "A4" metric size which is somewhat taller than the U.S. standard of 8.5" x 11". For this reason, it may not fit into some bookcases—a small nuisance for such a useful book. Perhaps someday the U.S. will join the rest of the world and adopt the metric standard!

Non Directional Beacons of Europe may be purchased from the author, Robert Connolly, for £ 6 including shipping by airmail for EEC countries, £ 6.50 for non-EEC countries. (Checks must be drawn on a London clearing bank, or local currency notes to an equivalent value plus 10% to cover banking costs.) Also, U.S. listeners can obtain the guide for $12 U.S. dollars sent by registered mail.

The address for orders or inquiries is: 21 Eleastan Park, Kilkeel, Co. Down, N. Ireland, BT34 4DA. The author can also be reached by Internet email at 101477.3577 @compuserve.com.

"Graffiti Beacon" PIC, 339 kHz (Calverton, NY). Submitted by Charles Bernth (NY).

NAVTEX Cutback

The 518 kHz NAVTEX system (SITOR B) has been a huge success since its introduction by the U.S. Coast Guard. While use of the system is expanding worldwide, a recent Coast Guard bulletin announced the cutback and eventual shutdown of one NAVTEX station located in Adak, Alaska. The text of the bulletin follows:

> *As a result of the planned closing of the U.S. Naval Air Station in Adak Alaska, located in the Aleutian Islands, the Coast Guard will be forced to terminate NAVTEX broadcasts from there on approximately 1 December, 1996. The 300 foot antenna used to broadcast NAVTEX will soon be torn down. On 30 May, the Coast Guard began using a new antenna to transmit NAVTEX information using a new inverted "L" antenna. As a result, the Adak NAVTEX service range was reduced by approximately 50%. The Coast Guard Pacific Area command is reviewing options to determine if and when NAVTEX can be broadcast from another site in that area.*

That's it for this month. See you in Atlanta!

LOGGINGS

This month's loggings are courtesy of Bob Hamilton (NY), Al Marote (FL), Joseph Fahrenholtz (OH) and Al Hemmalin (RI). Two of the logs came to me via the Internet. If you are active on the 'net, feel free to use that medium to send in your reports or other comments. My Internet address is: kevinc@mdsroc.com. Whether you use email or conventional mail, I'd enjoy hearing from you!

FREQ	ID	LOCATION	BY
198	DIW	Dixon, NC	J.F. (OH)
206	GLS	Galveston, TX	A.H. (RI)
208	YSK	Sanikilauq, NWT	A.H. (RI)
212	PMX	Palmer, MA	A.H. (RI)
257	PLD	Portland, IN	J.F. (OH)
263	YGK	Kingston, Ont.	A.H. (RI)
270	EZM	Eastman, GA	B.H. (NY)
275	FPR	Fort Pierce, FL	A.M. (FL)
300	UGT	Guantanamo, Cuba	B.H. (NY)
321	UR	Covington, KY	J.F. (OH)
323	BSD	David's Head, Bermuda	A.H. (RI)
326	PKZ	Pensacola, FL	J.F. (OH)
329	CH	Charleston, SC	A.H. (RI)
335	LUK	Cincinnati, OH	J.F. (OH)
335	LEE	Leesburg, FL	A.M. (FL)
344	AVN	Avon, NY	B.H. (NY)
344	JA	Dinns, FL	A.M. (FL)
346	YXL	Sioux Lookout, Ont.	B.H. (NY)
353	FOA	Flora, IL	J.F. (OH)
356	PB	W. Palm Beach, FL	A.M. (FL)
360	LYS	Lyndon, NY	B.H. (NY)
362	LYL	Lima, OH	J.F. (OH)
373	JF	New York City, NY (JFK)	A.H. (RI)
388	AM	Tampa, FL	A.M. (FL)
392	VEP	Vero Beach, FL	A.M. (FL)
392	DDP	San Juan, PR	A.M. (FL)
404	IUB	Baltimore, MD	B.H. (NY)
406	FLR	Fall River, MA	B.H. (NY)
512	HMY	Lexington, OK	J.F. (OH)
526	ZLS	Stella Maris, Bahamas	A.M. (FL)

Note on advertisement below: *As of 4/26/95 it became unlawful to market cellular-capable receivers in the US. Atlantic Ham Radio assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.*

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Getting on the Air

Have you ever had a project totally planned and ready to execute — then found a critical part missing? That happened to this month's column. The original concept was to explain the purpose of the various test patterns used by TV stations. Unfortunately, when I tried to display the computerized images of the patterns, my PC decided it didn't understand the file format.

You may find plan B to be even better, since I now have the opportunity to touch on a variety of short subjects I've been meaning to mention.

In July, I explained the rather difficult process for starting a new radio station. The article also touched on an easier, and legal, way of getting on the air with carrier-current AM. Now, a firm called "Playfone" thinks it's found yet another route.

The FCC offers experimental licenses. These licenses may be issued when the Commission feels the broadcasts would improve scientific understanding. In November of 1993, the call KF2XFB was issued to Playfone. The license allowed broadcasts on any AM, FM, or VHF-TV frequency at powers as high as 40 watts. Such broadcasts were intended to test the feasibility of broadcasting to the audience at sporting events.

By this spring, however, KF2XFB's broadcasts had taken on a rather different tone. A report in *Radio World* notes a station was operating on 88.5 MHz at the Avis Rent-A-Car location at Logan Airport in Boston. DXers in New Jersey report one at the Avis location at Newark Airport, on 105.7 MHz — a very poor choice of frequency, as WHBI-FM, a licensed station in Newark, operates on 105.9 MHz. And an article in the *Oklahoma City Journal-Record* noted the introduction of an Avis radio service, with five-mile coverage, at five major airports.

Donald Pipa of New York sent copies of his DX verifications. RVC-535 in the Turks and Caicos Islands (a British possession near the Bahamas) has been heard throughout eastern North America. Be careful when looking for RVC; their frequency varies between 530 and 535 kHz.

535 AM / RVC INT'L.
SOUTH CAICOS ISLANDS

1330 AM / WWRV
P.O. BOX 2908, PATERSON, N.J. 07509

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Radio Vision Cristiana Int'l. ☒ 535 A.M. / RVC INT'L.
Radio Vision Cristiana ☐ 1330 A.M. WWRV
Acknowledges your Report of Reception of our transmission on:
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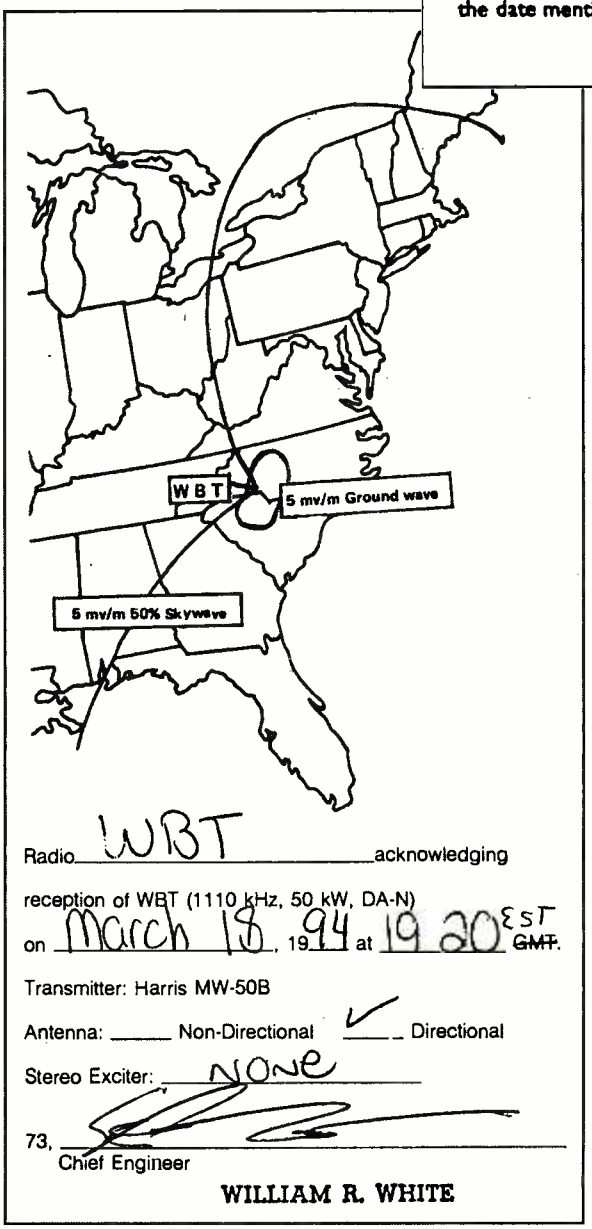
This reception has been confirmed in the Station log for the date mentioned above and is duly verified. Thank you.
WENDELL SEYMOUR
Bob Jarvis, Chief Engineer. KA4NYO



The WBT QSL at left is also Donald Pipa's. This card shows clearly the station's directional antenna pattern, and explains why WBT is much harder to hear here in Tennessee than it is in New York.

This service was certainly not experimental. On February 28, the FCC ordered the shutdown of the stations. Playfone is allowed to continue broadcasts from sporting events until their license expires in July of 1997.

Alan Weiner is well known to DXers as another person who's found ways to work around the licensing requirement. He was one of those involved in the brief (but widely heard) operation of Radio Newyork International, from a ship just outside U.S. territorial waters near New York City.

He's now working on another radio ship. The *Electra* is being outfitted with AM and shortwave transmitters. Most radio ships have been designed to operate only at anchor. It's difficult to sail a ship with a large and fragile radio tower on board. The *Electra*, however, is designed to sail to wherever its owners feel a "free radio voice" is needed. The station's own programs will be largely environmental in nature, but time will also be leased to third parties.

In another part of the *Radio World* article, it is suggested that the FCC is considering licensing temporary low-power broadcast stations at special events. A FCC official told the magazine they receive approximately 50 requests a year for such licenses, most of which must be denied under current rules.

Temporary stations are common in Canada. They generally operate with approximately

10 watts on unused FM frequencies, and are licensed for terms of up to 28 days. Stations have been authorized to commemorate the end of World War 2, to cover Grand Prix auto races, in connection with annual religious rallies, and for local festivals. DXers in the Toronto area should pay special attention to 99.1 MHz, which sees frequent use by temporary broadcasters.

■ Staying on the Air

Some licensed broadcasters may be more "temporary" than they think. The new Telecom Act requires the FCC to revoke the license of any station which remains off the air for more than a year. As the act became law on February 8, it won't affect any of the 200-plus silent stations until February of 1997. But the Commission has been busily revoking the licensees of silent stations for other reasons.

It might seem that the answer for an economically-strapped station is to just broadcast a few hours of programming every few months. But FCC regulation #73.1740 sets minimum schedules for commercial broadcast stations. For most radio stations, the minimum is eight hours between 6 a.m. and 6.p.m., and four hours between 6 p.m. and midnight, every day except Sunday. For AM stations which broadcast only during the day, or with very low power at night, the requirement is for 2/3 of the hours between sunrise and sunset.

The regulation is less strict for TV; stations more than three years old must broadcast at least two hours a day and at least 28 hours a week. Newer stations may broadcast as little as 12 hours a week. Test patterns don't count.

■ Bits and Pieces

• A new version of the *MW Database Viewer* is now available in the DL21 section of Compuserve's Hamnet forum, as AMDB.EXE. This program, a public-domain effort by Neil S. Adams, is a must for the computerized AM DXer with Internet access. This program provides an easy way to search the database and display power, coordinates, etc.. But it also plots the pattern of any directional antenna used, and shows the arrangement of the towers.

• Gary Timm in Milwaukee forwarded an article on the downgrade of WOWO-1190 kHz 50 kW night signal to 9.8 kW. The article, printed in late November of 1995, suggested that the switch would take place in six months, which would be late May of this year. Gary asks, "Has WOWO dropped power yet?" I don't know, but don't think so.

The FCC has issued the construction permit for the power decrease, but I haven't seen an application for a permanent license to cover the change. I would guess WOWO's owners have not yet completed the new 30 kW night facilities for their other station on 1190, WLIB in New York. WOWO's reason for decreasing power is to accommodate WLIB, and I don't think they want to make the change until WLIB is ready to go.

There hasn't been much other FCC activity affecting the AM band. Two stations in the Dallas, Texas, area had applied to swap frequencies and increase power: the applications were returned. Here in Nashville, long-silent WCKD-1430 has returned to the air, but only for brief tests with easy-listening music.

■ Expanded Band Notes

The FCC hasn't been very busy in the expanded AM department, either. As predicted, broadcasters don't seem to like the new expanded-band plan any more than they did the old one. However, I'm not aware of any legal challenges, so the FCC may yet be able to issue more expanded-band licenses before the end of the year.

Jesse Rose of Virginia has joined the list of those receiving KTRK-1670 QSLs. He heard the station IDing as "ABS." Jesse's certificate includes the special endorsement for reception on a car radio.

How's DX? Write me at Box 98, Brasstown NC 28902-0098, or by email at 72777.3143@compuserve.com.

George Zeller
George.Zeller@acclink.com

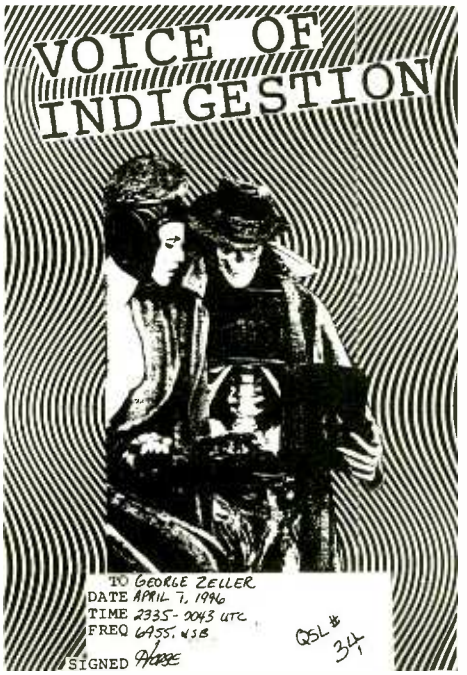
New Nigerian Clandestine Changes Schedule

An English language station (that claims it is *not* a clandestine) is producing good signals for DXers in North America and creating some excitement among DXers this summer. **Radio Democrat International** made its first test broadcast on June 11, and has been heard on an almost daily basis since then. Originally the station transmitted two half hour shows at 0600 UTC on 11900 kHz and at 1500 UTC on 15120 kHz. But, the clandestine moved during July to a schedule of 2100-2200 UTC on 7195 kHz. Most recently it moved to 6205 kHz at the same hour, and said nothing about further changes.

The anti-Nigerian government station is operated by NADECO, the National Democratic Coalition. This political opposition group includes former government officials, ex-military officers, and various professionals. NADECO says that the shortwave service is an extension of **Radio Freedom,** an FM clandestine that has previously operated erratically in the country. Nigerian state radio quickly criticized the clandestine broadcasts.

BBC Monitoring Service (BBCMS) reports that the Nigerian Defence Intelligence Agency was "locating the source of the radio." Radio Democrat International says that all of their information is public, and that they therefore are not a clandestine. However, they do not announce their transmitter site. DXer speculation, so far unconfirmed, suggests that the transmitter is probably located in or near South Africa.

The station is already responding to DX reports, using an address c/o Nalicon UK, PO Box 9663, London SE1 3LZ, United Kingdom. They also have a USA contact point at PO Box 175, Boston, MA 02131. The QSL that we picture here arrived in my mailbox in only 19 days! The station's **nalicon @postlin.demon.co.uk** e-mail address also works.



Watch the wavy lines ... queasy yet?

Costa Rican Clandestine Arrests

On June 10 a new clandestine temporarily replaced two San Jose, Costa Rica, FM stations with "insults against the chief executive (Costa Rican President Jose Maria Figueres)." During a power outage that briefly knocked Radio Sensación and Radio Alajuela off the air, the clandestine threatened to explode a bomb at the President's office building in Zapote. The station also threatened Costa Rican Minister of Public Security, Juan Diego Castro.

Authorities quickly arrested two suspected station operators: Ivan Valverde and Andrés Brenes of San Jose. Valverde is the son of the late Bosco Valverde of the *La Nación* newspaper, and has been actively involved in Costa Rican radio communications for many years. Both Valverde and Brenes have claimed innocence, and were released pending legal proceedings. Thanks go to *MT* reader Ulis Fleming of Glen Burnie, Maryland, for articles on this incident from *La Nación* and *The Tico Times.*

New Tasmanian Pirate?

A press release from **TSW, Techno Shortwave, Radio TechnoNet** says that this new station has begun regular pirate transmissions from Tasmania in Australia. The schedule is between 0930-1230 UTC on 4795 and 11700 kHz. I've seen no logs of them, so it's not yet clear if this one will be able to reach North America. They list an address of PO Box 797, Sandy Bay, Tasmania Island, Australia 7006. We thank *MT* readers Rob Keeney of Kansas and John Cruzan of Missouri for copies of this info.

What We Are Hearing

Your pirate logs are welcome via PO Box 98, Brasstown, NC 28902, or via the e-mail address at the top of the column. All frequencies are in kHz, with times in UTC.

The all-time record 50 pirate stations listed here use the following addresses: PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 28413, Providence, RI 02908; PO Box 146, Stoneham, MA 02180; PO Box 605, Huntsville, Alabama 35804; PO Box 17534, Atlanta, GA 30316; PO Box 88, Moline, MI 49335; 770 Sycamore Avenue #J193, Vista, CA 92083; PO Box 293, Merlin, Ontario N0P 1W0; and Postfach 220342, D-42373 Wuppertal, Germany. For return postage, enclose three 32¢ stamps in the envelope to USA addresses. $2 US or two International Reply Coupons go to foreign maildrops.

6YCAT- 6955 at 2115. Kittycat Marley's new station, the Voice of the Cat, is dominated by feline themes. Both 6Y "Jamaican" pirates say that the new operation has no relationship with the Voice of Smoke. Addr: Providence. (Paul Demsky, South Portland, ME; Bill McClintock, Minneapolis, MN; Mike Prindle, New Suffolk, NY; Rich and Talea Jurrens, Katy, TX; John Mello; Scituate, RI; direct from the stations)

6YVOS- 6955 at 2300. Pigpen Marley at the Voice of Smoke quickly reminded listeners that he has a different station from the new one above. Addr: Wellsville. (Jurrens)

Alternate Pirate Radio Station- 6955 at 0300. This new station plays novelty music, but we don't know much about it. Addr: None. (Jerry Coatsworth, Merlin, Ontario)

Anarchy One- 6956 at 0400. Captain Anarchy has reappeared with reggae music and drug advocacy. His station should not be confused with others using the word "Anarchy" in their identification. Addr: Vista. (Randy Ruger, North Hollywood, CA)

Canine Kitty Radio- 13900 at 2000. Few heard this unusual combination of Radio Animal's dogs and the cats at 6YCAT, but it must have been interesting. This frequency is worth a check during daylight hours. Addr: Wellsville. (Neil Wolfish, Toronto, Ontario)

Cat in the Hat Radio- 6958 at 0000. This new station blends Dr. Seuss Broadway musicals, Calypso music, and pirate songs. Addr: Providence. (Barry Williams, Enterprise, AL; Howard E. Lyon, Oz; Pat Murphy, Chesapeake, VA; Coatsworth; Jurrens; Wolfish;)

CELL, Cell Phone Radio- 6955 at 2345. The ECPA may have made it illegal to listen to 800 MHz cellular phone calls, but it didn't anticipate the recordings of them heard on this pirate. Addr: Wellsville. (Mello; Prindle; Murphy; Coatsworth; Wolfish)

CSHT- 6955 at 2330. Here's another new one with an extremely funny mix of DX parodies and jokes about chickens. A message from Dr. Dumbo Lowblow said that contrary to rumor, they do not yet have a maildrop. Addr: None; may verify logs in

Pirate Pages via Blue Ridge Summit. (John Fisher; Brights Grove, Ontario; Prindle; Wolfish; Jurrens; Williams; Coatsworth; direct from the station)

Free Hope Experience- 6955 at 0400. Major Spook's signal has a nationwide reach. Some broadcasts use AM modulation, while others are in sideband modes. Addr: Blue Ridge Summit. (Jesse Rose, Hampton, VA; Jurrens; Williams; Prindle; Love)

Friday Radio- 6955 at 0015. If it's Friday, you may hear them with a celebration of the weekend. Addr: Providence. (Kenny Love, Columbia, SC; Williams; Lyon; Murphy; Wolfish; Jurrens)

FUCC- 89.1 MHz. This local micropirate is the renamed Monkey Wrench Radio, according to the *Seattle Weekly*. Addr: Unknown. (Mark Redfox, Seattle, WA)

KAOS- 6955 at 0230. Joe Momma reports that he will be sending out QSL's via his new maildrop. Some earlier QSL's, apparently from logs in bulletins, may not have been genuine. Dennis says that his congregation recently bought a Zenith Trans Oceanic G-500 for him; congratulations! Addr: Wellsville. (Dennis Myhand, Mercedes, TX; Fisher; Love; Jurrens; Williams; Wolfish; Demsky; Lyon; direct from the station)

KOLD- 6956 at 0100. They play big band music from the 1940's, with host Aldo Batista. Addr: Stoneham. (William Hassig, Mt. Prospect, IL; Mello; Wolfish; Jurrens; Williams)

Monday Radio- 6955 at 0245. This Friday Radio parody played *Monday, Monday* by the Mamas and the Papas. Guess which day of the week they operate on? Addr: None. (Jurrens)

Montana Audio Relay Service- 6955 at 1330. Despite the capture of the Freemen and the Unabomber, the station is still transmitting. Addr: Merlin. (Dick Pearce, Brattlebaro, VT; Wolfish; Prindle; Fisher; Jesse Rose)

Mystery Radio- 6955 at 0200. This pirate often programs instrumental new age music, although rock such as Pink Floyd makes the playlist. Addr: Stoneham. (Ranier Brandt, Germany (!); Joel Rose, Cleveland, OH; David Chapchuk, Scranton, PA; Jesse Rose; Prindle; Wolfish; Murphy; Jurrens)

Omega Radio- 6955 at 0215. Dick Tator is back with Christian heavy metal rock, including interviews with musicians in the bands that perform on the air. Addr: Moline. (Prindle; Fisher; Jurrens; Wolfish)

One Voice Radio- 6956 at 0000. Joe, their mild mannered announcer, calmly reads newsworthy items from medical journals that have practical applications for improving our health. Blues music has been heard lately between the health tips. Addr: Wellsville. (Williams; Wolfish)

Partial India Radio- 6955 at 0000. My vote for the funniest pirate of the year goes to this parody of All India Radio, the international broadcaster from India. One skit, where CPRV operator Jerry Berg's QSL's were stolen, was resolved when veteran DXer Chuck Rippel threatened to become a hostage. You had to be there. Addr: Stoneham. (Brandt; Murphy; Prindle; Mello; Hassig; Wolfish)

Radio Azteca- 6955 at 2230. Bram Stoker's DX parodies are fast paced, with music from the Rocky and Bullwinkle cartoon between sketches. Addr: Wellsville. (Prindle; Mello; Murphy; Wolfish)

Radio Communication International- 6955 at 0030. This German pirate now programs shows specifically for North American relay in English. Addr: Wuppertal. (Williams; Prindle; Fisher; Wolfish)

Radiodiffusion Television Quebec- 7465 at 2215. Most North American pirates use English, but this French pirate is an exception. Programming includes country music, French ads, and a "Buffalo Gals" interval signal The full station name appears to be ORTQ, with "Office" preceding the ID. Addr: Providence. (Brandt; Jurrens; Fisher; Wolfish)

Radio Dr. Tim- 6955 at 2330. Even with a decent signal via a North American relay transmitter, it's hard to pull out the correct identification on this rock music Europirate because of the announcer's heavy German accent. Addr: Wuppertal. (Wolfish)

Radio Free Euphoria- 6950 at 0200. Like the Voice of the Runaway Maharishi, their format is mainly drug advocacy. Addr: Wellsville. (Lyon)

Radio Free Speech- 6955 at 0000. I played a tape of Bill O. Rights' hilarious parody of Rush Limbaugh during a speech to the Lake Erie Amateur Radio Association in Parma, OH, and the hams seemed to like it. Bill is among the pirates whose signals have made it to Europe on multiple occasions. Addr: Wellsville. (Scott Krauss, Cleveland, OH; Brandt; Fisher; Pearce; Murphy; Prindle; Coatsworth; Wolfish; Lyon; Mello; Love)

Radio Rehoboth- 1705 at 0500. Bob's log reminds us that some pirates still inhabit the medium wave band. This one played Grateful Dead music. Addr: None. (Bob Bailey, Annapolis, MD)

Radio One- 6950 at 0100. This is the original slick rock oldies station with Bobaloo. Addr: Wellsville. (Jesse Rose; Pearce)

Radio Two- 6955 at 0200. Yabba Dabba Do is still playing rock oldies in a light-hearted imitation of the slick Radio One. Addr: Providence. (Cathy Zylka, North Tonawanda, NY; Frank Carson; Joel Rose; Williams; Wolfish; Coatsworth; Prindle; Fisher; Lyon; Murphy; Jurrens)

Radio Three- 6955 at 1830. It was inevitable; after Radio One and Radio Two, we now get Radio Three with rock music from announcer Sal Ammoniac. Addr: None, said would verify logs in *The ACE*. (Murphy; Wolfish; Lyon)

Radio Zebulon- 6950 at 2330. Initial reviews of the amusing DX parody programming on this new one have been excellent. Addr: Atlanta. (Murphy; Williams; Lyon; Prindle; Wolfish; Jesse Rose; Jurrens; Coatsworth)

Razorback Radio- 6955 at 0330. Announced as "comin' to yew" from Arkansas, this one mixes local country music with pig calls by the announcer. Addr: Stoneham. (Jurrens)

RFM- 6955 at 0245. H. V. (as in Victor) Short, the operator at Radio Free Massachusetts, is now a veteran pirate. His station features rock music and some original dry comedy. Addr: Wellsville. (Wolfish)

Tangerine Radio- 6955 at 2330. Raunchy Rick's anarchist station, which was much more active during the 1980's, has returned with some repeats of his old shows. Addr: Wellsville. (Joel Rose; Jurrens)

The Alan Masyga Project- 6955 at 0400. Their format is rock music by the Alan Parsons Project, but they make fun of the penmanship of veteran DXer and *MT* contributor Alan Masyga of Minnesota. Addr: Providence. (Wolfish)

The Fox- 6955 at 0315. Normally this one plays rock music, broadcasts comedy, and discusses pirate affairs, but it coordinates a network of stations such as the **Voice of Helium**. Addr: Blue Ridge Summit. (Wolfish; Lyon; Williams; Coatsworth)

Up Against the Wall Radio- 6957 at 0145. A replay of an old show of 60's and 70's rock music announced their old Wellsville address, but this has changed. Addr: Providence. (Murphy; Jurrens; Wolfish; Lyon; Love; Williams; Pearce; Coatsworth)

Up Your Radio Shortwave- 6955 at 1700. With very high quality production standards, the rock, comedy, and political parody on this station is announced as an alternative to right wing politics on radio nowadays. Addr: None; says will verify logs in *The ACE*. (Coatsworth; Prindle; Murphy; Lyon)

Voice of Idiot Drivel- 6955 at 0130. The announcer on this rock music station says that he's "from beyond your planet." Addr: Merlin. (Prindle; Murphy)

Voice of Indigestion- 6955 at 2330. QSL's from "Horse" at this station have been arriving, noting that the station is located in Gas, Kansas. Addr: None, but as we see here, has verified logs in *The ACE*. (Robert Ross, London, Ontario; Prindle; Williams)

Voice of Juliet- 6955 at 2045. The female announcer on this station has begun to jibe back and forth with the sexist He Man from **He Man Radio**. Addr: Merlin. (Chapchuk; Williams)

Voice of the Runaway Maharishi- 6951 at 0200. The Maharishi promises that his pro-drug programming will include a new character in the future: The Gatekeeper. Addr: Wellsville. (Prindle)

(unidentified)- 1610 at 1800. Terry says that amid the various Tourist Information Stations on Interstate 77 in the Canton, Ohio, area, he hears a pirate playing contemporary Christian music. Has anybody else noticed this? Addr: None. (Terry Provance, Zanesville, OH)

WARR- 6955 at 2330. This new rock station broadcasts from a "little island in the West Indies" using an "Arrgh Radio" slogan. Addr: None. (Fisher; Coatsworth; Jurrens; Williams; Wolfish; Lyon; Jesse Rose)

WCTU- 6955 at 0300. Normally active during the March Winter SWL Festival in Kulpsville, PA, this one made a summer appearance with a parody of the rock oldies on **WSKY.** Addr: Blue Ridge Summit. (Lyon)

WEED- 6955 at 0315. This may be the slickest of the pro-marijuana stations. It always programs a fast paced mix of rock music and drug skits. Addr: Huntsville. (Prindle; Ruger)

WHDA- 6955 at 0430. The "We Hate Dead Air" motto at this pirate means that they go on the air to fill empty frequencies when they find them. Addr: Blue Ridge Summit. (Williams; Lyon)

WPN, World Parody Network- 6955 at 2330. As you would expect, parody and satire dominate their transmissions. Addr: Huntsville. (Lyon; Jurrens; Williams; Coatsworth)

WREC- 6955 at 0115. P. J. Sparx's rock music and comedy is a frequent visitor to the pirate bands. During North American relay show, **Weekend Music Radio** said that the Radio Free East Coast signal has been heard in Scotland. Addr: Wellsville. (Jurrens; Wolfish; Murphy; Jesse Rose; Williams; Joel Rose; Prindle; Jurrens; Hassig; Mello)

WRRN- 6955 at 0000. Senator Watts, realizing that it is an election year, has been sending out QSL's rapidly from the World Republican Radio Network. Addr: Wellsville. (Ruger; Jesse Rose)

WRV- 6955 at 2330. Pete the Pirate at The Radio Virus has been among those stations who sometimes return to 41 meters, particularly in the afternoon before the multi-kilowatt international broadcasters sign on. Addr: Wellsville. (Wolfish)

Radio Democrat International Nigeria

QSL – Verification of Reception

This is to confirm that GEORGE ZELLER received *Radio Democrat International Nigeria* on:

Date: JUNE 22 1996

Time: 14[58] - 15[30] GMT/UTC

Frequency: 15120 kHz Power: — kW

Transmitter location: —

SIGNATURE: R.A.E.NIG OFFICIAL SEAL:

The new Nigerian clandestine is verifying.

Ike Kerschner, N3IK

Low Band Lowdown

Yeah, sunspots are down, and DX on 20 and higher is tough to come by. So what are you gonna do? Sit it out for a few more years until the spots reappear on the face of old Sol, or turn your sights to chasing DX on the low bands instead?

If you have been paying attention to 40 and 80 meters, you are aware that there is plenty of DX to be had there—Oh, it may often be a bit difficult to work, but it is workable.

The comments I get about DXing on the lower frequencies would lead one to believe you need a kilowatt and 300 foot tower with a full size beam on it to work DX on 40, 80, and 160. That's not really so. Plenty of DX is available to the guy with a hundred watts and modest antenna.

As we have mentioned previously, many DX countries are not allowed the entire 40, 80, and 160 bands. That means you must go where they are. An Extra class license will put you into the DX portion of these bands, and the Advanced allows operation on a large part of the DX portion of the phone bands. If you have a General class or lower, the opportunities will be more limited for you to work DX on the lower bands. There is DX in the General bands: just not as much of it.

Equipment

A hundred watts is plenty of power for either phone or CW, if you choose your equipment well and mount it correctly. First, be sure your receiver has the best (i.e., sharpest) possible filter for CW and phone. If at all possible use a vertical antenna. You don't need a full size antenna: a 25 to 40 foot antenna will do fine. Just be sure to tune it properly, and get the best possible ground plane you can.

My own favorite antenna for the low bands is the HF2V by Butternut. My HF2V is mounted 25 feet above ground and has three radials on 80, four on 40, and two on 160. I have worked about 135 countries on 80 with this antenna and 100 watts.

You can work DX with a dipole antenna, but in general the vertical will give you a lower angle of radiation, making it a bit easier to work long distance stations. On the other hand, one drawback of vertical antennas is noise. If you live in a noisy location, the vertical will pick up more noise than a horizontal wire. Many hams solve this problem by using a horizontal antenna for receiving and vertical for transmitting.

Another choice for antenna is the loop, either full size or reduced size. They seem to work very well even if only a foot or so above ground.

Should you choose to go with a vertical, get the best ground possible. Generally speaking, a ground-mounted vertical requires more radials than an antenna mounted some distance above ground. The reason can be a bit difficult to understand, but basically, if you have extremely lossy earth beneath the vertical, the efficiency of the antenna will suffer greatly. By raising the antenna a few feet above ground and also keeping the radials above ground, you provide a degree of isolation and allow the vertical to become more efficient.

Here's a case in point: A friend of mine purchased an HF2V on my recommendation and complained when it did not work as well as mine did. His was mounted at ground level with a half dozen very short radials buried an inch of so under ground. We moved the antenna to his garage roof and used four radials on 40 and two on 80 (1/4 wavelength long). The roof of the garage was only about 12 feet above ground, but the first attempt netted several DX stations on 80. True, some hams report excellent results using a vertical at ground level and only a simple ground rod or two. All I can say is, try it.

Perhaps the greatest problem hams have working DX on the lower bands is local noise. If you live in a noisy location, try one of the specialized receiving antennas such as the snake (coax buried underground), beverage, or tuned loop.

The thing to remember is that you *can* work DX on the low bands, and that it does not require any more gear than the average active HF ham has or can easily acquire. Also bear in mind that the low bands are nighttime bands and best results will be obtained from the hours just before night falls to the hour or two after sunrise.

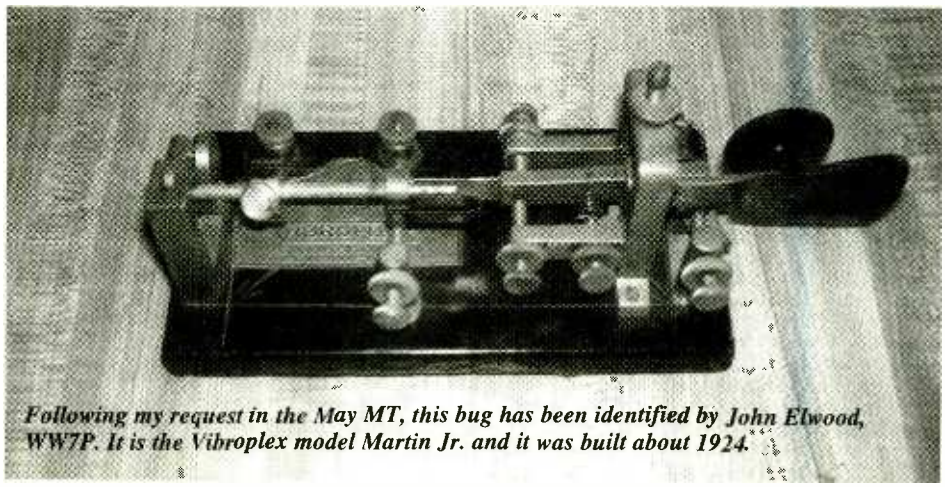
Mystery Solved

In the May issue I featured a photo of one of my Vibroplex bugs and asked if anyone could identify it. I received more letters on this request than I ever expected. The bug has been identified by John Elwood, WW7P. It is the Vibroplex model Martin Jr. and it was built about 1924.

The route used to identify my Vibroplex was very interesting. Ed Von Nordeck, a member of the Morse Telegraph club, forwarded my article to John Elwood and asked him to help. He did indeed help, sending me fairly detailed information about the bug.

The most surprising aspect of all this is all the letters that poured in. Most writers told me where I could obtain information on keys and key collecting, and indicated a lot of enthusiasm for this hobby within a hobby. I am presently gathering information on this fascinating facet of amateur radio and hope to provide more information on where and how you can join with others to build your own key collections.

73 de Ike N3IK



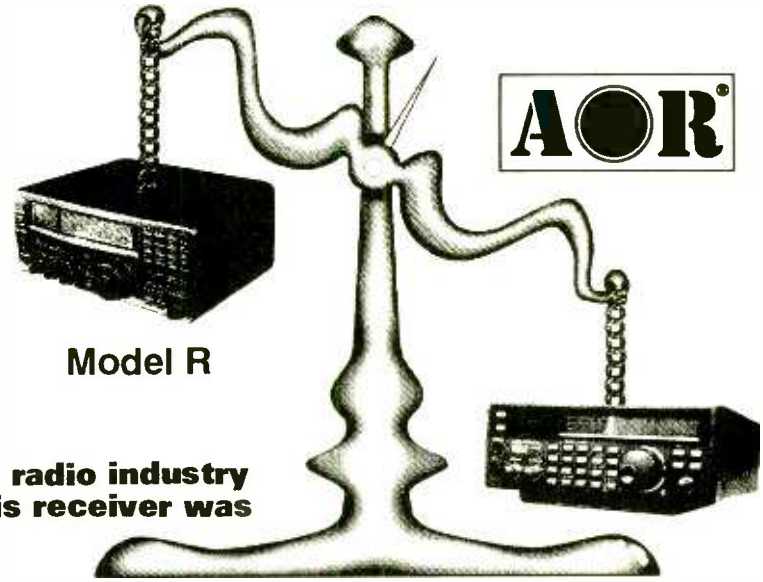
Following my request in the May MT, this bug has been identified by John Elwood, WW7P. It is the Vibroplex model Martin Jr. and it was built about 1924.

Q :

When does a 5.5 pound radio outweigh a 15.4 pound radio?

A :

...when you turn it on



AOR has set new standards in the radio industry with their new AR5000 radio. This receiver was designed using the leading edge technology. This new technology places the AR5000 into its own class. There are many features of the AR5000 that have never before been available.

AR5000 SPECIFICATIONS: **Widest coverage :** 10kHz-2600MHz **Tracking preselector with manual override and memory Tuning steps and display accuracy down to 1Hz • IF filtering:** 7 positions in both 10.7MHz & 455kHz IF **• Antenna:** 2 switchable ports (expandable to 8 ports) **• Built-in decoders:** CTCSS (incl.), DTMF & inversion (opt.) **• Audio controls:** switchable multi HI/LO pass & de-emphasis **• Discriminator output:** FM Wide & Narrow for SCA & Data **• Spectral display output w/pre or post filtering selection**

The industry seems to want to compare the AR5000 to it's closest competitor. Listed are a few features and specifications of interest, some NOT obvious in the sales literature.

1. FREQUENCY COVERAGE
AR5000: 10kHz - 2600MHz; Spec. full range
Model R: 100kHz - 2000MHz; Spec. .1-1000 & 1240 -1300MHz

2. RECEIVER DESIGN: BOTH TRIPLE CONVERSION
AR5000: Tunes entire range: 10kHz - 2600MHz
Model R: Tunes 100kHz - 1025MHz: Block converts to 2GHz

3. TUNING STEPS AND DIGITAL DISPLAY
AR5000: 1Hz - 1MHz any size: 1Hz display
Model R: 10Hz - 1MHz fixed steps: 10Hz display

4. IF FILTERING
AR5000: Total 14 (2 opt.); 7 at 10.7MHz, 7 at 455kHz
Model R: Total 4; 1 at 10.7MHz, 3 at 455kHz

5. SENSITIVITY - FM NARROW µV at 12dB SINAD
AR5000: (0.2 to 0.28) w/6kHz filter 30 - 2600MHz
Model R: (0.5) 28 - 1000 & 1240 - 1300MHz

6. PRESELECT FRONT END TO 1000MHz
AR5000: CPU controlled user override & store in memory
Model R: CPU controlled only, no override or peaking

7. EXTERNAL FREQUENCY STANDARD INPUT
AR5000: 10MHz increased accuracy and more
Model R: Not provided

8. ANTENNA INPUTS
AR5000: (2) type "N"& SO239 switchable local/remote
Model R: (3) <30MHz SO239 & RCA 50 & 500Ω, >30MHz type "N"

9. BUILT-IN DECODERS
AR5000: CTCSS (incl.) DTMF & inversion (opt.)
Model R: Not provided

10. AUDIO CONTROL
AR5000: Hi pass, Lo pass, De-emphasis (4 steps)
Model R: Tone control

11. DISCRIMINATOR OUT FOR DIGITAL & SCA DECODING
AR5000: Front panel ACC1 jack, FMN-FMW
Model R: Not provided

12. TUNING CONTROL KNOB
AR5000: (2) main and sub
Model R: (1) main

13. BFO OFFSET FOR CW & DIGITAL RECEPTION
AR5000: 100Hz steps selectable 400-1100Hz
Model R: Not provided

14. SPECTRAL DISPLAY READY; BOTH 10.7 IF 10MHz WIDE
AR5000: SDU output switchable pre or post filters
Model R: Not switchable, pre filter only

15. AGC CONTROL
AR5000: Fast, med, slow, OFF w/ RF gain control
Model R: Fast, med, slow, no OFF

16. MEMORIES, BANKS, SEARCH BANKS, PASS FREQ.
AR5000: 1000 memory, 10 banks; 2100 pass frequencies
Model R: 800 memory, 20 banks; 100 auto memory; 100 pass

17. SCAN/SEARCH SPEED
AR5000: 25 and 45 channels/sec.
Model R: typical <13 channels/sec.

18. POWER REQUIREMENTS
AR5000: 12-16VDC, 1 amp max, ext. AC supply incl.
Model R: internal AC, ext. DC (added weight & heat)

19. SIZE & WEIGHT
AR5000: 8.6"x3.9"x10.3" WHD 3.1"H w/o spkr baffle (275in³) 5.5lbs
Model R: 11.3"x4.4"x12.2" WHD (607in³) 15.4lbs.

20. COMPUTER CONTROL BOTH RS232
AR5000: All CPU functions are RS232 controllable
Model R: RS232 & CI-V details not available

21. RACK MOUNTING (STANDARD 5.25"X19" RACK)
AR5000: (2) side by side, (1) AR5000 & SDU, or (1) AR5000
Model R: 1 Model R with or without speaker

Above is an excerpt from a detailed flyer on the AR5000. The AR5000 story is too extensive for a single page. Get all the details NOW by phone/FAX/mail.

Contact Your Favorite Dealer

Electronic Distributors
325 Mill St., Vienna, VA. 22180
703-938-8109, FAX: 703-938-4525

Choosing the Right Capacitor

We experimenters must decide which type of fixed-value capacitor is best for new designs or when repairing a piece of radio equipment. The wrong capacitor can spoil circuit performance, or it might not survive in the circuit environment we expose it to. Capacitor selection is far from casual, even if we understand the intrinsic nature of this rather ordinary component. I will explain the characteristics of some common capacitors and offer some advice concerning their use.

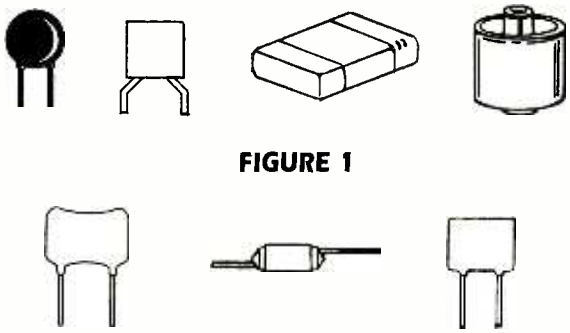


FIGURE 1

Outlines, L to R top row, are for disc ceramic, square ceramic, SMD ceramic and transmitting ceramic. Shown in the bottom row, L to R, are silver-mica, polystyrene and polyester capacitors.

Ceramic Capacitors

Ceramic capacitors come in many shapes and sizes. The most common form is the disc ceramic unit with pigtails. These capacitors are used principally for bypassing and coupling (blocking) from audio through VHF. An important trait they exhibit is low internal inductance. An ideal capacitor, no matter what style it might be, would have no internal inductance (X_L), resistance, or loss. It would present a pure capacitance. However, the manufacture of an ideal capacitor remains to be accomplished.

Excessive inductance spoils the ability of the capacitor to function as a bypass element, especially as the operating frequency is raised. At VHF, for example, it may act more like an RF choke than a capacitor. Fortunately, disc ceramic capacitors have minimal internal inductance. Hence, they are suitable for most RF applications through 60 MHz. Their pigtails introduce unwanted inductance at the higher frequencies. Therefore, those leads must be kept as short as practicable. The disc capacitor illustrated in Figure 1 is available as a general-purpose (Z5U) type that is useful for circuit bypassing and for coupling between circuits. Its actual capacitance may be close to the marked value at +25° C, but it can change ± 20% from -55° C to +85° C. Therefore, the general purpose disc capacitor should not be used in critical circuits such as filters, tuned circuits, oscillators and VFOs.

Special temperature-stable disc ceramic capacitors are available. They are identified as NP0 (NP zero) units. These usually have a black dot on the body. Likewise with the older tubular (dog bone) NP0 ceramic capacitors. They are ideal for use in the aforementioned critical applications. An NP0 capacitor is rated for a ± 5% change over the temperature range listed above for general-purpose capacitors. NP0 capacitors are widely used in oscillator circuits to minimize long-term frequency drift.

General-purpose and temperature-stable ceramic capacitors are available in other formats too. Some are square or rectangular. The CN series devices are ultra stable and are made by Phillips Corp. The "CW" prefix indicates temperature stability on par with NP0 units. General-purpose capacitors of this species are marked "CZ."

Surface-mount (SMD) monolithic ceramic capacitors or "chips" are available also. They are tiny and rectangular in shape. There are no pigtails. These devices have a metal coating at each end so that they can be soldered directly to the PC-board conductors. This virtually eliminates unwanted inductance. These capacitors are widely used at VHF and above. They are also available as NP0 and general-purpose units.

Still another ceramic capacitor style is manufactured for high-power, high-voltage use, such as in transmitters. These have been called "barrel capacitors" for many years. They are rated as high as 15,000 volts. Type 858S has a temperature tolerance of ± 20%, whereas types 850S and 857 have a ± 10% temperature tolerance. Types 8540 and 8550 are NP0 units.

Silver-Mica and Polystyrene Capacitors

In the order of temperature stability and minimum internal inductance are polystyrene and silver-mica capacitors. Generally, polystyrene capacitors closely follow the traits of NP0 ceramic capacitors. They are useful up to approximately 15 MHz. A third choice for temperature stability is the silver-mica, or dipped silver-mica capacitor. These capacitors have very close tolerances respective to their marked values. The D type made by CDE is rated at 0.5 pF of the marked value. Type J is within ± 5% of the marked value. These capacitors have a high resistance to the effects of humidity and moisture. They are excellent for use in RF filters, low- and medium-frequency oscillators and tuned circuits. See Figure 2 for circuit examples. Polystyrene capacitors are similarly tight with respect to their marked values and are resistant to moisture.

Capacitor Q is Important

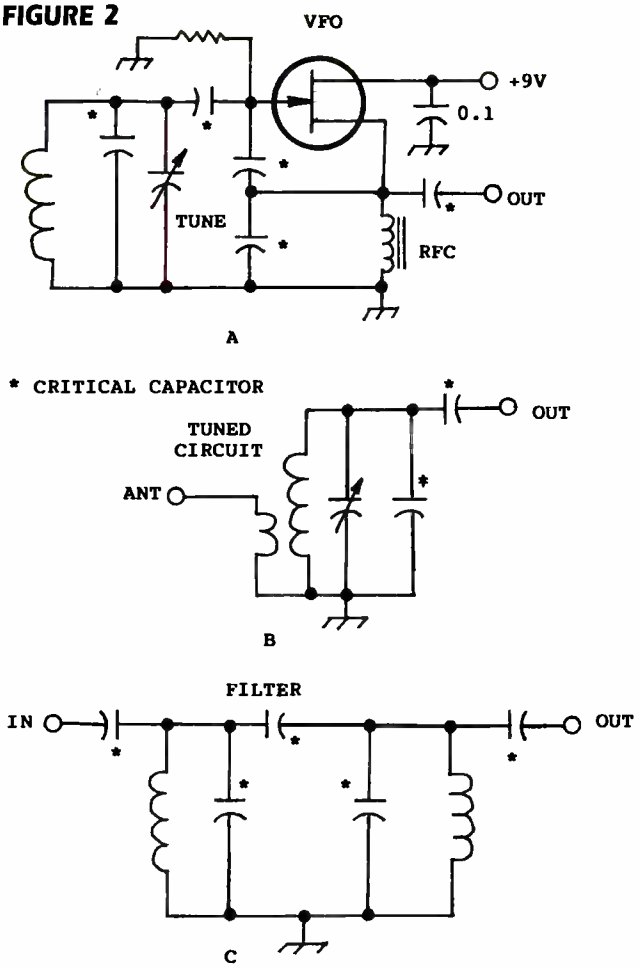
The term "Q" stands for quality factor. It is a measure of how lossy or AC-resistive a capacitor or coil may be. In tuned circuits the selectivity improves with increased loaded Q. A "loaded" circuit is one that is connected to its related circuit components, such as an antenna and an RF-amplifier in a receiver front end. The unloaded Q is always higher than the loaded Q.

The capacitors we choose for critical circuits of this type must have a high Q in order to avoid degrading the overall circuit Q. This is especially important in VFOs, fixed-frequency oscillators, RF filters and tuned circuits. NP0 ceramic, polystyrene and silver-mica capacitors all have high Q factors. A polystyrene capacitor, for example, may have a Q as high as 1000. The Q of tuned circuits in most equipment is seldom greater than 300. However, extremely high Q (1000 or greater) is possible with carefully designed helical resonators and resonant cavities.

Other Capacitor Types

Mylar, polypropylene, polyester, tantalum, and electrolytic capacitors are common-

FIGURE 2



Examples of circuits that require capacitors with close-value tolerances, temperature stability and high Q. A VFO is shown at A. At B is a parallel tuned resonant circuit. The filter at C uses silver-mica or polystyrene capacitors.

place in the equipment we buy. Most of the foregoing varieties are used for audio, VLF, LF, and MF applications. Therefore, I won't dwell on their traits.

Electrolytic capacitors are used primarily in power-supply filter circuits and for bypassing and coupling in audio circuits.

High-capacitance tantalum capacitors have low internal inductance and they are small in size. This makes them useful in RF bypass and coupling circuits below approximately 1 MHz.

Voltage Ratings

Capacitor longevity is dependent upon it having a maximum voltage rating greater than the highest voltage in the circuit where it is used. It is prudent to allow plenty of safety factor. For example, I use 50-volt ceramic capacitors in my 12-VDC circuits. I prefer 35-volt electrolytic and tantalum capacitors for 12-volt circuits, even though 16- or 25-volt capacitors should be okay. I use 0.01-ìF, 1000-volt ceramic capacitors for bypassing the 120-volt AC line inside my equipment cabinets. Capacitors with a 600-volt rating may also be used, but I am a coward: I detest blown fuses and the odor of charred components!

Closing Remarks

Space doesn't permit an in-depth treatment of capacitors and their applications. The tips provided in this article should help you to avoid errors when you select capacitors for that next workbench project. You will save money if you do your shopping in surplus electronics catalogs and at radio flea markets.

Having a digital capacitance meter in your shop is essential when you need to know the values of unmarked capacitors, or those with strange markings. The numbers on silver micas can be misleading. For example, a unit marked "150J" is a 15-pF rather than a 150-pF capacitor. On the other hand, a 201J is a 200-pF capacitor. Confusing, eh?

Jean Baker, KIN9DD

SELCALs for All

Welcome aboard, everyone! I hope you've made your plans to attend the Grove Communications Expo next month. I'm looking forward to seeing you there!

For those of us who are selective calling (SELCAL) collectors, I'm very pleased to announce that the SELCAL directory published in Great Britain, *High in the Sky* (5th edition, by J. Davies, K. Barker, and A. McKenzie), is now available in the United States! For $12.95 plus $4.50 s/h, you get a guidebook with the most complete listing of SELCALs to date, plus aircraft, registrations, etc.

There's a lot of data contained in this book about SELCALS, including facts that I didn't know. For instance, did you know that the second and fourth letters of a SELCAL Code must always be further into the alphabet than the first or third?

Send your checks to Airliners, P.O. Box 521238, Miami, FL 33152-1238, USA. Or call your credit card orders in to 1-800-875-6711 (USA only; other countries use 1-305-477-7163.) Remember, they're also the publishers of a very fine periodical for us aero buffs worldwide—*Airliners Magazine*. Ask for their catalog; they have lots of other great books, videos, and neat stuff.

Frequencies

As promised, here are airport freqs for Cincinnati and Louisville. We'll start with Cincinnati. In case you didn't realize it, Cincinnati's major airport for commercial traffic is in Covington, Kentucky. This airport is sometimes referred to as "Northern Kentucky International":

Cincinnati (Covington, KY)

Approach	119.70	123.875	128.700
Departure	121.100	126.650	128.700
Ground	121.300	121.700	
Clearance Delivery	127.175		
Automatic Terminal Info. Service (ATIS)	135.300		
Tower	118.300	118.975	

Airline Ground Support (Ramp Control):

American Airlines	460.775		
Delta	460.650	460.750	460.825
	460.850		
Northwest	460.700		
United	460.650		
TWA	460.675		

Company Station Frequencies:

American Airlines	129.200		
FedEx	131.825	131.925	
Northwest	129.950		
Delta	129.550	129.500	129.600

(used by Delta's radio network to and from Atlanta)

The closest Flight Service Station is located at Cincinnati Municipal Airport (mostly used by general aviation aircraft): 122.200 122.400 255.00 335.000

Louisville

Louisville's major commercial Airport is Standiford Field; Bowman Field handles general aviation aircraft:

Approach/Departure	123.700	124.500	126.550
Ground	121.700		
Clearance Delivery	126.100		
ATIS	118.150		
Tower	120.300		
Flight Service Station (Bowman Field)	114.800	122.100	122.200
	122.600		

Airline Ground Support:

Delta	460.875
Northwest	460.750
USAir	460.700
United	460.725
TWA	460.850

Company Station Frequencies:

Delta	129.550
Southwest	130.125
Northwest	129.950
USAir	130.100

Say Again?

There's a lot of terminology used in aviation comms that's apt to confuse even those of us who've been monitoring for a long time. In this edition of *Plane Talk*, we'll explain some of the more common ones that readers have asked about.

Heavy - Aircraft capable of take-off weights of 300,000 pounds or more, whether or not they are operating at this weight during a particular phase of flight. Aircraft types we are referring to include 747s, DC-10s, MD-11s and some variants of Airbuses, L-1011s, 777s, 767s, and DC-8 aircraft.

Ground Stop - When a very busy airport, such as O'Hare, becomes saturated and can't take any more arrivals for a while, all flights that are headed for O'Hare are kept on the ground at their airports of origin until the ground stop is lifted. (Sure beats flying around in a holding pattern and using up fuel.)

Flight Level - A level of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Each is stated in three digits that represent hundreds of feet. For example, flight level 250 represents a barometric altimeter indication of 25,000 feet; flight level 255, an indication of 25,500 feet, etc.

Emergency Locator Transmitter (ELT) - A radio transmitter attached to the aircraft structure which operates from its own power source on 121.500 MHz (VHF), and 243 MHz (UHF). It aids in locating downed aircraft by radiating a downward sweeping audio tone, 2 - 4 times per second, and is designed to function without human action after an accident.

Let us know if there are other terms you'd like clarified.

There's Going to be a Short Quiz....

Now let's have some fun! We're going to have a contest in which the entry with all five questions answered correctly and bearing the earliest postmark will win a copy of *DAZZLE*—a really gorgeous screen saver for the computer. If the prize winner doesn't have a computer, I'll substitute a book full of aircraft photos for the prize.

Ready? Here's a hint: The answers to every one of these questions have been included within the column during the past few years:

1. What does MWARA stand for?
2. Where would you find a glide slope?
3. What is the nickname that a lot of pilots have given the T-CAS equipment aboard their aircraft?
4. True or False? ARINC is an integral part of the FAA.
5. Name the three types of facilities that make up the air traffic control system.

I'll be waiting for your postcards or letters with the answers. The winner's name will be announced in the January 1997 issue of *Monitoring Times*.

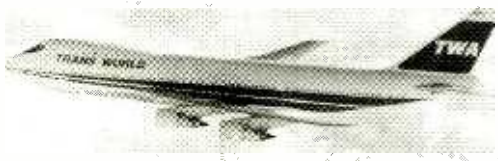
Readers Corner

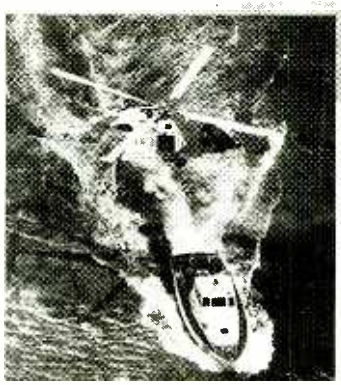
• Bill Battles still has a few copies of his book *World Air Carrier Radio Call Sign Directory* (2nd Edition) available. It's an extremely interesting and very useful book that you'll want on your shelf next to *High in the Sky*. Write to Bill for more information at: P.O. Box 133, East Kingston, NH 03827.

John Fulford, WA4VPY
email: johnf@emi.net

Coast Guard to the Rescue

It just so happened that the very night I decide to try out the new Microsoft/NBC network, MSNBC apparently scooped CNN with the unfolding story of the tragedy of TWA Flight 800. For as much as twenty minutes, I could find no other network, including CNN, carrying the breaking news of this disaster. Questioning whether the story was really valid or not, I went in and turned on my shortwave radio. Coast Guard rescue traffic started appearing on 5696 kHz, and it was immediately apparent that the radio traffic did indeed pertain to the disaster.





Soon other shortwave frequencies came alive, all in the 5, 6, and 8 MHz bands. As the story unfolded, I decided it was a good time for Fed File to review the structure of Coast Guard communications.

The first frequencies to monitor during an emergency involving Coast Guard personnel are the air station frequencies. The air station (to a landlubber like me) is the Coast Guard installation from which search and rescue aircraft are launched. Air stations can be found on the following shortwave frequencies:

2141 2261 3053 3056 3119 3122
5693 5696 5699 8980 8983 11196
11199 11202 15082 15085 15088

Oftentimes the military will become involved in joint military/Coast Guard operations. In this case, Global HF system (GHFS) will be used. They include:

4724 6712 6739 8968 8992 11175
11244 13200 15016 17976

Some of the frequencies that could be used during a rescue setting include:

2182 kHz	Distress and calling
3023 kHz	Search and rescue (SAR)
4125 kHz	Distress and safety calling
5680 kHz	Search and rescue
6215 kHz	Distress and safety
8291 kHz	Distress and safety
8364 kHz	Morse Code international lifeboat, life raft, and survival craft
12290 kHz	Distress and safety
16420 kHz	Distress and safety

When the Coast Guard aircraft are not using shortwave, they can be found communicating on either VHF or UHF channels. The air station groups use the following VHF/UHF frequencies:

Joint military common emergency channel:	40.500 MHz (FM)
VHF-AM aeronautical distress and emergency locator transmitters (ELT) class A and B:	121.500 MHz
National VHF-AM SAR training channel:	122.900 MHz
International VHF-AM SAR freq.y:	123.100 MHz
On-scene SAR VHF-FM:	156.300 MHz
International Digital Selective Calling (DSC):	156.525 MHz (FM)
Emergency locator transmitters, class C:	156.750 MHz (FM)
International distress, safety, and calling (marine channel 16):	156.800 MHz (FM)
SAR datum marker beacons:	156.750 229.325 229.335 240.600 242.650 242.6625 275.100
Aircraft homing and comm.:	237.900 MHz (AM)
International UHF-AM survival craft/military common emergency:	243.000 MHz (AM)
Joint/combined military on-scene SAR/UHF DF:	282.800 MHz (AM)
Nationwide Coast Guard SAR air to ground:	381.700 381.800 383.900 MHz (all are AM)
COSPAS-SARSAT satellite EPIRB frequency:	406.025 MHz (Data burst)

Increasingly, the Coast Guard is assisting the Customs Service and the Drug Enforcement Administration in their hunt for smugglers of both drug and human cargo. During these missions, the Coast Guard will be found on a variety of other government HF frequencies. This is a sampling:

34285571 8912 11288 13312 17952 kHz

The United States is broken down into several Coast Guard Districts. I live in South Florida, so I am in District 7. Starting at the Mexican border and going up the California coast to the Canadian border, you pass through Districts 11 and 13. The following frequencies are designed for specific districts, but since there is a finite number of frequencies, I would monitor them all, not just those for my district.

Coast Guard

Command, Control, and Communications (C3) Radio Systems

Chan	Use	Frequency	
01	C3 Repeater	162.050	control/mobile
		163.175	rptr out
02	C3 Simplex	163.175	simplex
03	Tac1/helo Primary	162.125	simplex
04	Tac2/helo Sec	162.325	simplex
05	Marine 21a	157.050	simplex
06	Marine 23a	157.150	simplex
07	Marine 81a	157.075	simplex
08	Marine 83a	157.175	simplex
09	Marine 16	156.800	distress
10	Marine 13	156.650	simplex
11	Marine 22a	157.100	simplex

Office of Law Enforcement (OLE)

Chan	Use	Frequency	
01	OLE Rptr	167.900	rptr out
		162.325	control/mobile
02	OLE Simplex	167.900	simplex
03	OLE Rptr	163.175	rptr out
		162.050	control/mobile
04	OLE Simplex	163.175	simplex
05	OLE Tac1	162.125	simplex
06	OLE Tac2	162.325	simplex
07	OLE Rptr	165.3125	rptr out
		164.400	control/mobile
08	OLE Simplex	165.3125	simplex

National Marine Environmental Response Group

The Coast Guard operates this group designed for large-scale marine disasters.

Chan	Use	Frequency	
01	Simplex	168.500	
02	Rptr	168.500	rptr out
		165.3125	control/mobile

03	Rptr	168.500 163.5125	rptr out control/ mobile
04	Rptr	168.500 164.9125	rptr out control/ mobile
05	Rptr	165.3125 164.3000	rptr out control/ mobile
06	Simplex	165.3125	
07	Rptr	168.500 164.300	rptr out control/ mobile
08	Rptr	168.500 165.0375	rptr out control/ mobile
09	Rptr	168.500 164.875	rptr out control/ mobile
10	Customs Liaison	165.2375	simplex
11	Rptr	163.175 162.050	rptr out control/ mobile
12	Simplex	163.175	

Coast Guard Auxillary

Chan	Use	Frequency	
01	Rptr	148.825 143.800	rptr out control/ mobile
02	Simplex	148.825	

Coast Guard Security Group

Chan	Frequency
01	415.9250
02	416.8500
03	417.1250
04	419.9250
05	415.6250
06	409.8250
07	419.1250

Down in South Miami is the home of Miami Coast Guard. This is the communications station with the callsign of NMA. The transmitters and receivers are controlled from Portsmouth, Virginia. This is also the location of the Customs/Coast Guard/DEA (and who knows what else?) C3I drug interdiction control center. It is not in the same building as the Coast Guard, but it is on the same property. The security personnel guarding this massive complex use the radio frequencies of 171.2375 and 171.3625 MHz for security.

While going through some old notes from a federal database I started approximately ten years ago, I came across some frequencies that were in use back in the middle 1980's for the Coast Guard. They may still be valid.

Security:	164.3000 165.2125 165.2625 171.2375 171.3625
Air FM:	164.3000
Coast Guard Intelligence:	165.3125 165.3375 171.3125 171.3375 172.3000
Security (Los Angeles):	171.3375//171.3625
Security:	407.9750 409.8250 415.7750 415.9250 416.8500 417.0000 419.1250

Les Butler was also listening to 5696 on July 17th from his location in Michigan. He says, "I was stunned when I heard Coast Guard rescue 6001 telling CAMSLANT he was enroute to an airline explosion off Long Island. I cranked up the volume and put the headphones on.

"The conditions were such in Michigan that night that I could copy the aircraft that no east coast CG station could. San Francisco even covered some east coast stations at times. I then heard all the east coast stations trying to get through to 6001 and 6017. Both aircraft answered them several times, but nobody heard them."

Les told *MT* that, inspired in part by John Seibels' July feature on helping the CG DF an interfering signal, he summoned the courage to call the only CG phone number he had, from a QSL letter from COMSTA Boston.

He says, "The Petty Officer asked if I copied their positions. I told her, no, she kept stepping on them every time they tried. She took my name, number, and callsign and said CAMSLANT may call back. A short time later CAMSLANT copied 6001's position but not 6017's. I called again and told them that 6017 said his position was pretty much the same as 6001."

The phone calls continued to go back and forth, as Les kept hearing what the CG could not. "I was so busy I was getting annoyed at how well my antenna was performing. I had just made another 80 foot dipole and stretched it out in the attic the best I could the night before and along came these outstanding atmospheric conditions. You never know what you'll find on the radio."

A truer word was never spoken. I'll add a word to the wise, though. For monitors who may be tempted to do what Les did, be cautious what you say until you discover whether the agency you call is interested in your information. If not, you may find yourself in trouble where your only intent was to help.

■ Sale on Surveillance

Your local Radio Shack is having a summer sale on electronic surveillance equipment. They are offering wireless microphones in the 170 MHz band at 37% off their regular price. The going price is $49.95. These are three-channel units operating in the new low power business channels, which are as follows:

169.445 169.505 170.240 170.300 171.050
171.110 171.845 171.905

In the "standby mode" the units transmit a carrier only. In the "on mode" audio is transmitted. Battery life is approximately 8 hrs. Power output is limited to 50 milliwatts. The part number is 32-1231RZ. The matching Radio Shack receiver is part number 32-1233 RZ and sells for $79.99.

Incidentally, the McDonald's restaurant chain has also licensed the above frequencies for use in their drive-throughs. Could be some interesting interference on those channels.

That's it for this month. I expect to see you in Atlanta October 18th, scanner in hand and ready to snoop out the hidden "bug"! If you don't know how, we'll be offering some instruction this year on direction finding techniques. Come join the fun!

Ken Reitz, KS4ZR

World Viewing

From its inception satellite technology promised to open wide television's window on the world. Today, satellite television remains the best showcase for viewing any nations' cultural identity, their entertainment, news, sports, and even weather. The chart below shows the programming and locations available. Note that all channels listed are unencrypted. Very few cable companies carry any of these channels, and only a few channels are carried on the new generation of direct broadcast satellites (DBS).

Throughout the course of the broadcast day a number of these channels will feature English programs or offer English subtitles; the value of these channels to students, scholars, immigrants or foreign nationals is obvious. What better way to keep up with news from home or study the language and culture of other countries? However, if you're not a native speaker, the majority of the programming will be of little use. Wouldn't it be nice if there was a way to translate or somehow understand what is being sent? There is.

The International Channel

Launched in July of 1990, the International Channel seeks to bring foreign language programming to new Americans, those engaged in international business, students, educators, and all Americans with ethnic or foreign backgrounds. Transmitting on Galaxy 7 channel 24, the VC2+ encrypted channel offers 24 hour/day programming in 24 languages from Asia, Europe, and the Middle East. And the best part is, some of the programming features English subtitles.

Emirates Dubai TV (EDTV) transmits a variety of programming in Arabic. Radio Maria from Italy transmits on a 5.80 MHz subcarrier.

Egyptian Satellite TV on Telstar T401 channel 17

Arabic Network America billboard on Galaxy 6 channel 10. Arabic Radio is heard on 5.80 MHz subcarrier.

The daily schedule for the International Channel is a broadcast parade of nations. The day starts out with programming from France, the Philippines and Israel, followed by broadcasts from Korea, Arab news from London, the *Asian Market Digest* from Singapore, news from Taiwan, and *Fugisankei News* from Tokyo—and that only takes us to noon. The afternoon starts out with several hours of Indian programming in Hindi, followed by *German News Journal* and *Vremya News* from Moscow. An hour of TV Polonia from Poland is followed by more programming from France, and that wraps up the afternoon. Programming from Korea, Manila, Greece, Rome, and Hong Kong rounds out the prime time schedule.

Most of the programming is not live; it is recorded from satellite transmissions and rebroadcast within the same day in the daily schedule.

Receiving the International Channel

The International Channel is available on cable systems throughout the U.S. In addition, it is available to full-view satellite subscribers from its G7 location. C-band subscription rate is around $33 per year. As of this writing it is not available on any of the DBS satellites.

Currently, the daily schedule, as outlined above, is available on C-band and to cable viewers. However, a much more expanded schedule is planned for the future. International Channel plans call for the creation of single language premium channels. As stated in a recent press release:

"...These single language premium channels will be provided by International Channel's newly refurbished International Production Center in Los Angeles, in conjunction with leading networks from around the world. The global partnership channels will be rolled out with digital compression..."

Look for single language channels in Arabic, Cantonese/Mandarin Chinese, French, German, Polish, Greek, Italian, Korean, Vietnamese, Asian Indian, and Tagalog (Filipino).

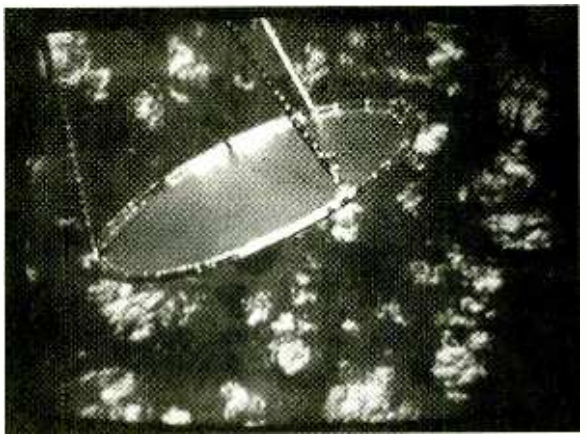
International News Monitoring

If your need for international news requires more than the passing reference usually given on nightly network news shows, or strained through the filter of CNN International, the International Channel is for you. During the recent uncertainties of the Russian general elections this summer, International Channel viewers could see what Russian viewers were watching, and non-Russian speakers

Russian news report during presidential election. Note English translation a bottom of screen.

could follow along with the subtitles provided. Following the activities of another country on a day by day basis brings us closer to an understanding of the special problems others might have and it allows the viewer to appreciate how much alike we all are.

There is always something to be gained by watching the news of another country. Last year satellite viewers all over America were watching CBC-TV during the Quebec referendum. This summer it was the Russian elections. Ten months from now the British Crown Colony of Hong Kong reverts to China. The months leading up to the change-over will be increasingly tense. How will China treat this former province, now a free-wheeling democracy with a robust economy? How will Hong Kong citizens react? Questions such as these will mount as the time draws near and you can have a front row seat with the International Channel. For more information on the International Channel call them at 310-826-4777 or Fax them at 310-447-7906. For schedule updates visit their Website: **http://www.1-channel.com/**.



Experimental inflatable satellite dish set loose by space shuttle crew on recent flight.

Transponder Notes

• Hughes Communications' Galaxy 9 (G9) satellite began distributing programming June 15 from its location at 123 degrees West. G9 replaces Telstar 303 which was moved East to 120 degrees where it continues in limited service. G9 becomes the latest in a "neighborhood" of cable birds which stretch uninterrupted from 123 to 137 degrees and include six satellites transmitting 144 channels. Of these, only 17 are digital transmissions, 26 are in the clear, and the rest are available by subscription. Of special interest are the Computer TV Network and the Sundance Channel (featuring independent films).

• If all goes well later this month, General Electric's GE 1 satellite will make its debut in the Clarke Belt at 103 degrees West. GE 1 is the first of a new breed of hybrid (C- and Ku-band) satellites built by Martin Marietta Astro Space. GE 1 has 24 C-band transponders with variable output between 12 and 18 watts and 24 Ku-band transponders with up to 60 watts each and has a design lifetime of 15 years.

• July 1 was the official launch date of the latest entrant in the DBS sweepstakes. AlphaStar offers its 100 digital channels for reception on its own 24 inch dishes from its location on Telstar 402 Ku. Channel line-up includes the usual cable fare, sports, news, superstations, pay-per-view, and digital music channels. AlphaStar offers programming packages and allows a-la-carte programming purchases. This service hopes to expand to 200 channels next year when it shifts to Telstar 5 which is scheduled for launch in 1997. To find out more about AlphaStar call 800-983-3266.

• According to industry reports there are 5 million subscribing satellite viewers. Of these DSS (DirecTV and USSB) have 1.5 million; Primestar has 1.1 million and there are 2.3 million "full view" subscribers. Expect DISH and Alphastar to start racking up additional numbers for the DBS crowd. C-band sales seem to have leveled off at an average of 10,000 systems per month. There are said to be 95 million television households.

• DirecTV has hit back at what they termed an "...international satellite piracy ring..." by filing a civil suit against 22 defendants, including some authorized DirecTV dealers, for allegedly being involved "...in efforts to compromise the DSS encryption system." Charging violations of state and Federal law, DirecTV means business. Guilty parties can be assessed statutory damages up to $100,000 for each device and still be held liable for criminal penalties under the Racketeer Influenced and Corrupt Organizations Act, known popularly as RICO.

• In other DirecTV related information, I asked a DirecTV spokesperson what the process was for determining what new channels DirecTV would add in the future. I was told that discussion about new channels happens on a daily basis and that they are particularly keen to hear from regular subscribers. Obviously, popularity and channel availability will also determine what gets added. To find out more, you can check out the Websites of the main DBS players:

AlphaStar **http://www.alphastar-tv.com**;
DirecTV **http:// www.directv.com**;
DISH **http://dishnetwork.com**;
USSB **http://www.ussbtv.com**.

• And, finally, satellite enthusiasts watching NASA Select TV enjoyed the sight of the inflatable satellite antenna experiment released by a recent Space Shuttle mission. Like some kind of bizarre party favor, the dish started out as small package and, with the help of onboard gas, slowly expanded to its full glory. The shallow parabolic dish measured 50 feet in diameter when fully inflated and, at the end of the experiment, drifted to a fiery end into the Earth's atmosphere.

TABLE 1: Window on the World

C-band	
Arab Network of America (ANA)	Galaxy 6 channel 10
Portuguese Television Service (RTP)	Galaxy 6 channel 13
Dubai TV	Galaxy 7 channel 10
Italian Television Service (RAI)	Galaxy 3 channel 12
Deutsche Welle German Television Service	Satcom C4 channel 5
Korean Broadcasting (Part Time)	Telstar T 401 channel 18
BBC World/Domestic (Part Time)	Galaxy 4 channels 5, 9, or 11
Canada Domestic Services (French and English)	Anik E2
Mexico Domestic Service (Spanish)	Morelos 2
Ku-band	
Russian-American Network	SBS 5 channel 14
Chinese (Hong Kong) Television Network (CTN)	Galaxy 4 channel 7
Jade Satellite (Hong Kong): Cantonese	Galaxy 4 channel 18
Asian American TV (AATV): variety of Asian programming	Galaxy 4 channel 21
Egyptian Satellite Channel	Telstar T401 channel 17
The Asian Network (TAN) (South Korea)	Galaxy 7 channel 19

Bill Cheek
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Precision Tone Detector-Decoder

Here is an intriguing circuit that is simple, fun, and utilitarian. The Tone Detector-Decoder (I'll call it TDD) is a low cost, single chip, adjustable circuit which detects a tone from most any source and tells you when that tone is present. Increasingly, tones are used to "wake up" equipment (e.g., Emergency Broadcast System) or squelch it until activity appears (Toronto, ON, scannists who use "metro mod" to squelch an "anti-scanner" tone).

About the Circuit

The TDD employs an LM-567 Tone Decoder chip and a handful of parts to detect a single tone of the user's choice, between .01 Hz and 500 kHz. Output is logic high as long as the selected tone is not present. (We'll call this type 1.) The output goes logic-low when the tone is detected. The TDD is sensitive only to the chosen tone. It ignores all other signals. The change of output logic can be used to turn things on and off, as desired. The tone to be detected is selected by adjustment of a potentiometer, VR1, and by choice of timing capacitor, C4. (Figs 1-3)

Opposite logic (type 2)—with a logic-low for no tone and a logic high for when the selected tone is present—is possible. This variety is not discussed in detail, but the slight extra circuitry for it is depicted in Figures 2-3, as R3, R4, Q1, with the associated lighter-shaded traces.

Pin 6 of the LM-567 is the internal VCO output. It can be measured with a frequency counter to determine the exact tone-set point. When the incoming tone matches the VCO frequency, detection occurs! Most any freq counter is ample for this measurement, including Radio Shack's #22-305. Their #22-168 digital multimeter has a built-in frequency counter.

One TDD is good for one essentially pure and steady tone at a time. Used with a radio (audible tones), the frequency range should be roughly 200 Hz-6 kHz, although with a change of components you can set the TDD for anywhere between 0.01 Hz and 500 kHz, according to the LM-567 data sheet. A single design does not yield the entire range of detection.

The TDD may not respond well to warbles, staccato, or data tones like FSK, Fax, and computers. Two TDDs can work together to detect tones like those generated in a dual-tone multi-frequency (DTMF) system. Each TDD output should be connected to an input of a dual AND or NAND gate for the desired resultant output action.

If you want to detect a continous tone controlled squelch system (CTCSS) and other tones with a scanner, it is probably best to use the baseband audio output from the scanner's discriminator. Tone detection from other radios or signal sources should be tapped at a point in the preamplifier stage, perhaps a tape record jack, or even the "high" lug of a volume control. The TDD's input on pin 3 should not exceed 200 millivolts (0.2v) RMS. If you need discriminator pin information for your scanner, contact me by e-mail, or in the public network scanner forums.

The TDD uses +5 V or +8 V logic. Five volt logic is 4.5-5.5 volts while eight volt logic is 7-9 volts. The maximum logic and power supply voltage of the TDD is nine volts. Minimum is 4.5 volts.

Build the TDD

The TDD is easily assembled on perf board about an inch square (11 complete holes wide by 10 complete holes long.) Layout is not critical. Use 22-30 gauge solid wire for the

FIG-1: TDD SCHEMATIC

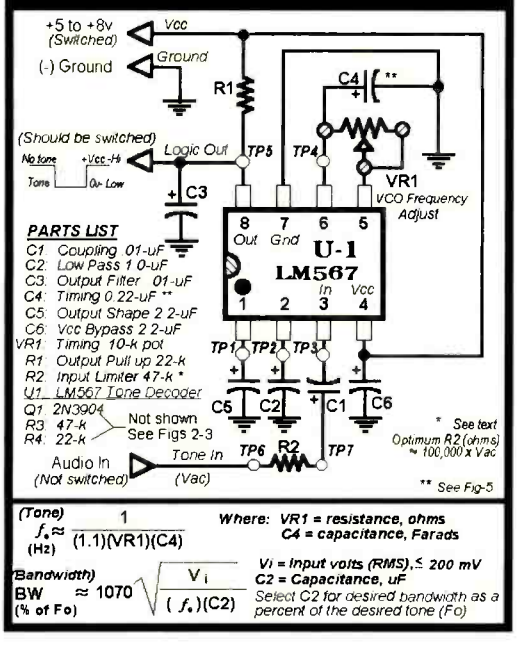


FIG-2: COMPONENT SIDE

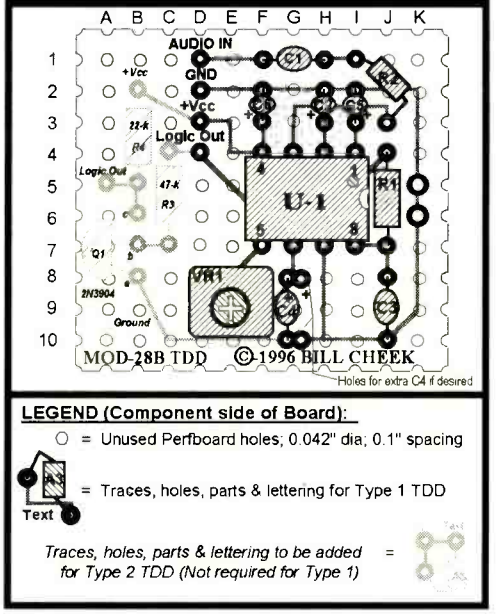
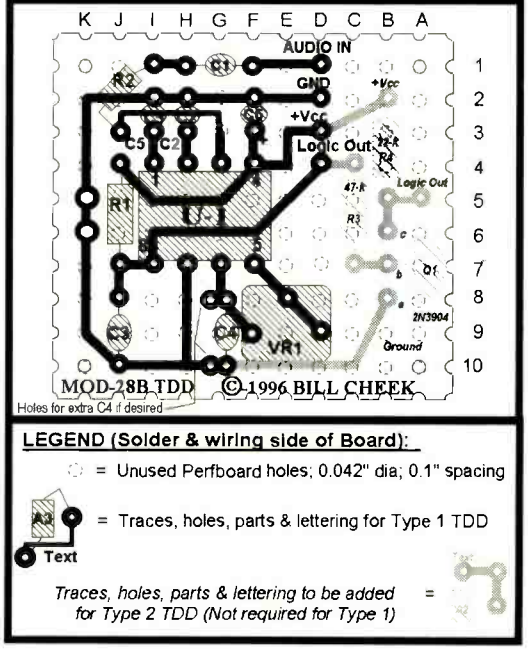


FIG-3: SOLDER & WIRING SIDE

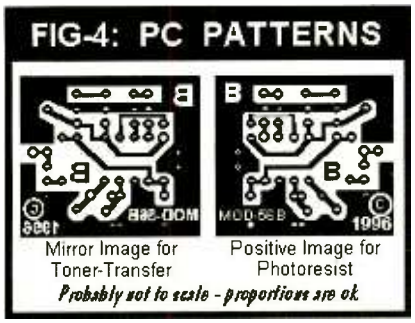


point-to-point wiring on the bottom side of the board. Don't use Q1, R3, and R4 if you don't need a type 2 TDD.

Solder a bare copper wire (#18 gauge) to the ground trace of the board. Loop it through the two ground holes in the perfboard for rigidity. Leave about 1-1/2 inches of this bare wire free to simplify installation in the intended equipment. Solder wires 8-10 inches long to the audio-in, +Vcc, and logic-out points on the board. Clip to ideal length later.

Install the TDD

Install the tone decoder/rejector board in a handy spot in a radio, scanner, audio amplifier, or even in a stand-alone metal box. If you anticipate the need to adjust for different tones, then consider a regular potentiometer with an external shaft for VR-1. Another good idea is to drill a hole in the front panel of the equipment and super-glue a trim pot behind the hole for a convenient but unobtrusive screwdriver adjustment. Otherwise, VR-1 can



be a trimpot on the perf board of the TDD. You should also incorporate a double-pole double-throw (DPDT) switch to simultaneously switch the +Vcc and logic-out lines if the TDD is not to run full time.

The bare ground wire off the TDD can be soldered or bolted to a chassis or to a printed circuit board ground trace, to simplify the mount. Once soldered or bolted, the stiff wire makes the board relatively immobile and stable. You can wrap the board with clear plastic tape if there is a chance of anything shorting to it. Make VR1 and any switch accessible for convenient adjustment.

Connect the TDD

1. Ground: The ground trace of the board must be connected to system ground. This is usually any part of a metal chassis, but can also be a ground trace on a PCB. You may have already made this connection via the stiff bare ground wire.
2 DC Power: The TDD must be powered by a source of DC of the same level as the desired logic-out. If the target equipment doesn't have a +5V or a +8V source, then you'll have to provide external power. Switching is desirable.
3. Baseband Audio: An easy connection to make. It need not be switched. Connect a wire from R2 on the TDD to the baseband audio pin on a scanner's NFM discriminator chip or to another audio source to sample for the presence of a certain tone. A typical scanner connection is shown in Figure 5.
4. Logic-Out Point: Connect a wire from the TDD board, U1 pin 8 (TP4) to whatever needs to be controlled by the TDD. A typical connection to use the TDD as a countermeasure to anti-scanner tones is shown in Figure 5.

TDD (Type 2)

Connections for a type 2 TDD are the same as for type 1. The differences are certain points on the TDD board shown in Figures 2-3. Use the above instructions, but make sure you have the proper input/output points noted on your TDD board. Install Q1, R3, and R4 on your TDD only if you need a type 2 board; otherwise, leave them off for a type 1.

Setup and Adjustment

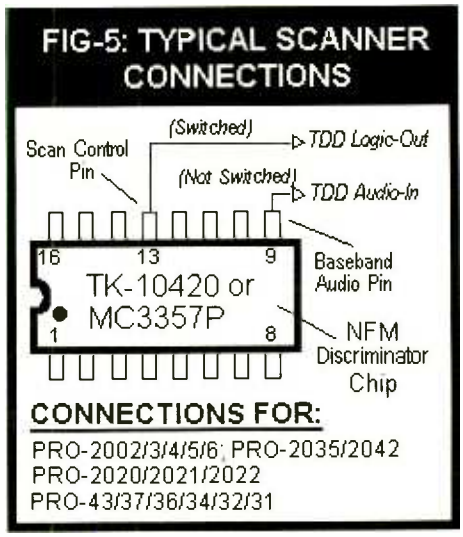
Preset VR-1 to one end of its rotation. Attach a volt meter between ground and the TDD output point. Feed a desired tone to the TDD (via scanner, signal generator, or 49 MHz handi-talkie—press the Call button to hear the tone, typically about 900 Hz.).

The voltage at the type 1 TDD output should be about equal to the supply voltage—5 or 8 volts. For type 2 TDD's, the voltage will be about zero.

With the tone feeding the TDD, slowly adjust VR-1 through its range. At some point, that voltage will suddenly change: For type 1 it will drop to nearly zero volts and for type 2 it will rise to +Vcc. Continue adjusting VR-1 and the voltage should change back to where it was before. The dropout point (type 1) or peak point (type 2) is the tone-detect point of the TDD. Tweak VR-1 back and forth to determine the middle of the dropout (or peak) zone and set it there.

Bandwidth

The detection bandwidth of the TDD is "adjustable" by C2 as a percent of the desired tone, Fo. The wider the bandwidth (BW), the more tones will be detected other than the desired one. The narrower the BW, the more critical the adjustment. C2 in this design yields a 16% bandwidth, or about ±72 Hz at Fo=900 Hz. The formula is shown in Figure-1 if you want to experiment.



Conclusion

There are several other things you need to know about the LM-567 chip and circuit as follows:

1. VR1 should be set to not less than 1-k ohm, nor greater than 20-k ohm. The max value of VR1 is 20-k ohm, but 20-k pots are harder to find than the specified 10-k ohm. If you can find a 20-k ohm pot or trimmer, use it.
2. C4 can be any practical value that results in Fo between 0.01-Hz and 500-kHz, per the formula in Figure-1.
3. Pin 2 of the LM-567 has an undocumented feature where the offset error (Hz) from an incoming tone and its VCO frequency can be measured with a frequency counter. The offset has to be within a few hundred Hz, else there is nothing to measure. If you can measure this offset frequency, it will guide you to precise settings of VR1.
4. The optimum value of R2 may not be 47-k ohm as specified. I chose R2 to fit a wide variety of situations, but you can change it to an ideal value by measuring the AC value of the tone voltage from the audio-in and multiplying that voltage by 100,000 to get the ohms value of the ideal resistor for R2. Suppose you measure 2-volts: the ideal R2 would be 200-k ohms. The TDD functions best when the tone voltage at pin 3 of U1 is between .125 and .200 volts, RMS.
5. The output capacitor C5 should be about twice the value of the bandwidth capacitor, C2 (in case you want to experiment).
6. For an all-purpose, wide range TDD, add a switch to select values of C4.
7. Uses for the TDD and the LM-567 chip may be limited mostly by your imagination. It might offer possibilities for low cost CTCSS tone detection. Choose an Fo to equal a desired CTCSS tone; experiment with C2 to narrow the bandwidth.

John Catalano, PhD
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WiNRADIO: 0.5 to 1300 MHz on your PC!

Gud day, Mate! This month we will take a first look at a futuristic offering from Australia, for which I must thank Internet, which just entered the wilds of this part of rural America a few weeks ago. I was the second person to sign up! Thanks to a small local telephone company, who beat the big boys into the area by providing local dial-up of the World Wide Web, we are isolated no more. The very first night I checked the Grove Web site and then browsed on the topic of radio.

WWW = WOW

I immediately was able to listen in real-time—via the Real Audio player program downloaded from the net at **www.prognet.com/**—to shortwave and medium stations all over the world. A net search revealed dozens of radio-related web sites.

I had recently spoken to the UK radio company, Lowe, concerning a newly announced, very wide range receiver, totally contained on a plug-in card for IBM compatible computers. I told you in past months that this was coming. Well, via the Internet I found out it was *here*.

The Lowe web page give me a link to the manufacturer in Melbourne, Australia, Rosetta Laboratories. Within minutes of being on the web I was downloading their "functional" demo from Australia. The company also has operations in Germany. As I watched the file download from Australia I recalled my Physics professor's sarcastic words when his thick students finally grasped a concept: "Isn't technology wonderful?!"

You can believe I was excited; I left an email for the people at Rosetta requesting price and availability. The next evening I had an email reply from Rosetta with the details I asked for and requesting my telephone number so we could arrange delivery. Pretty good! The Net had reduced what used to take weeks to a matter of hours.

Rosetta's WiNRADIO should not be confused with an FM broadcast radio (88-108 MHz) PC card of the same name. We looked at the FM radio a few years ago and were impressed with its concept, operation, and price. At that time I remember thinking that this was the future of receivers.

The Rosetta product promises to cover 0.5 to 1300 MHz in AM, SSB, FM-N and FM-W mode—a very tall order. So let's open the nicely packaged box, install the WiNRADIO hardware and start up the software.

Hardware choices

Rosetta's product comes on a 3/4 form factor expansion plug-in card that requires a 16 bit expansion socket. In its basic form it can be operated by line (text) commands from the disk operating system (DOS) prompt. For this basic operation it only requires a 80286 processor, 640K randon access memory (RAM), 12K hard disk space, any text display, and DOS 3.0 or later.

This basic text screen display is a possible option, but one I do not recommend. This does not allow the use of any of the very useful graphical interface (GUI) menus, screens or buttons. After all, how can a WiNRADIO really work well without Windows? It can, but the operating differences are dramatic. We'll use Windows operation, which requires a 386 or better processor, 1 meg RAM, 1 meg hard disk space, a VGA monitor, and Windows 3.1. It will work with Windows 95, but then requires a 486, 4 meg RAM and an SVGA monitor. We will look at WiNRADIO installed in a 486 DX2 33 MHz, 8 meg RAM, Windows 3.1 and a VGA monitor.

The only hardware/software installation setting is the I/O (input/output) address. This is first done with a jumper on the board and then set in the installation software. For our system the jumper was left in the factory-set position. The installation process is easy and well documented in the professional 151 page instruction manual. Don't let the number of pages scare you. The total installation (hardware/software) takes less than 15 minutes and two pages of instruction. The rest of the manual gives excellent instructions on the use of all the varied WiNRADIO software functions; this thing does quite a bit.

In fact, the WiNRADIO manual is an excellent introduction to all facets of monitoring. The majority of the manual is devoted to explaining the radio spectrum between 0.5 and 1300 MHz, the tuning range of WiNRADIO. (In the US, disallowed frequencies such as cellular telephone are not accessible.) Covering this wide range, in the manual and in operation, is no small task.

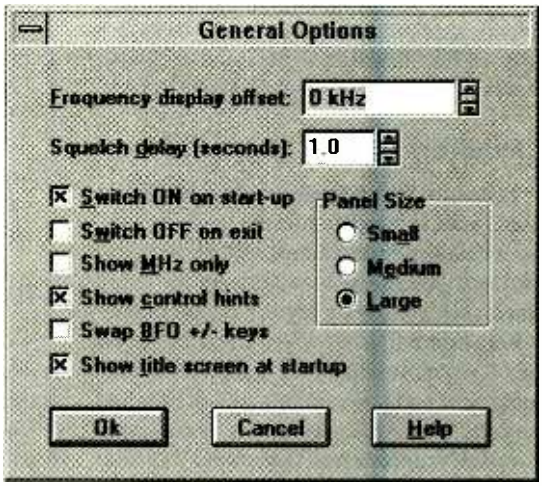


FIGURE 1

Connections to the outside world are only the antenna and a speaker.

A tour of WiNRADIO's software

Using the WiNRADIO in Windows is a commonsense exercise. The software has been made extremely user friendly. The whole software package is on par with the best I have seen for computer control of receivers. Granted, some very advanced functions are not included, but all the monitoring features I commonly use were available.

We should start our tour by pulling down the configuration menu at the top left of the screen and then clicking on "General." The General options box, Figure 1, appears. Frequency offset, squelch delay, and panel size are just the beginning of the many user-controllable options. The nice thing is that Rosetta has already entered default values for all options. So we lazy folks can run WiNRADIO right out of the box without any decisions required.

The basic control screen is shown in Figure 2. Starting at the top left we have the sensitivity controls which are straight forward, as are the mode controls below them.

Moving to the right we come upon the frequency display. We can manually set frequencies in a number of ways. Pressing number keys on the keyboard, followed by K or M, will enter that frequency in either MHz or kHz. To the right of the display are up/down arrow keys which can also set the frequency

when clicked. The step increment is user-set in the box to the right of the arrows labeled, "Fixed Step." This box does lots more which we will get to later.

The big round graphic under the frequency display is a nifty tuning "knob." Placing the cursor over this knob makes a double sided arrowhead arc pop up. Pressing the left mouse button fine tunes the receiver by reducing the most-right digit by one. The right mouse button increases the frequency in the same manner.

FIGURE 2

Now, I'm sure many of you noticed that when we looked quickly at the mode control there was only one single sideband (SSB) mode. What happened to upper and lower sideband? Good question, and one that had me concerned until I learned about the function of the beat frequency oscillator BFO) offset in the top right corner. Here we can monitor both upper and lower sidebands by setting the BFO to + or - frequencies. This is done by either clicking on the BFO display box and then entering the desired offset frequency via the keyboard, or by clicking on the up/down arrows. The volume and squelch controls are operated in the same manner.

If memory serves me correctly ....

Take a look at the box labeled "Memory" in the upper right of Figure 2. Clicking on the "S" for store brings up the menu in Figure 3. If you click "OK" the frequency will be stored in the next available memory channel number. You can also save the mode, along with the station's callsign and your comments, if the box at the bottom is checked.

The menu also gives you the ability to place the memory entry into any one of sixteen groups. For example, group one may be shortwave broadcast stations, while group two may be for VHF/UHF police frequencies.

The help feature, which appears on every menu, is nicely implemented. Operational details and instructions for each section of the menu in question are displayed by pointing and clicking on the section of interest. Very nice, quick, and easy.

Once you have entered a number of frequencies they can be recalled by clicking the "R" button. This provides the user with a typical database search screen. The user enters either the frequency, callsign (name), or comments of a previously stored intercept. Click on "Find," and the receiver recalls the desired entry and tunes it in in the proper mode. Deleting, adding, and editing of stations are also done in this menu. The search operation is quite easy to use and fast.

Open "scanner" box!

Click the Setup button first to set such receiver functions as the level of the signal which stops the scanning, and whether the stop is a pause or a full stop. Clicking the Range button allows the operator to scan a user-entered range of frequencies by user-defined step increments. Any stations found during a scan can be automatically stored via this menu.

Scanning of the memory channels is performed by the Memory button. The channel scan can be customized using memory number range, group, and signal mode.

The button labeled Select is used to access three different operations. We already know that we can enter our desired tuning step from this box. But clicking the Select button gives us two other possibilities: auto-step and memory step. Pulling down the Configure menu at the top of the screen the user can program step frequencies for each frequency range. It's a convenient way to start a search.

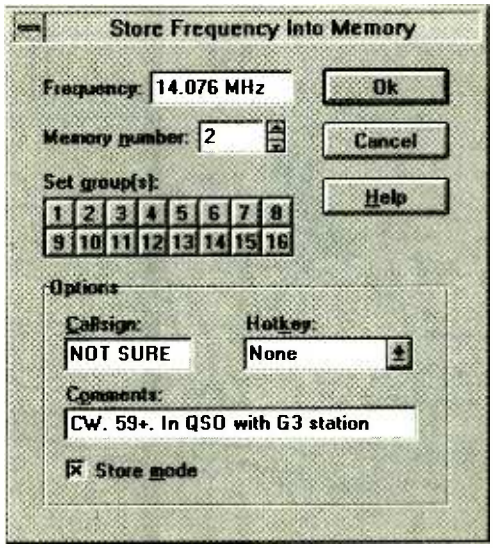


FIGURE 3

Memory step now allows you to step through your memory channels via the up/down arrows at the right side of the frequency display. The tuning "dial" can then be used to tune around the memory frequency—a unique and useful feature. When scanning memory channels, the data saved in the callsign box is displayed above the Select button.

Can you hear anything with it??

Well, I hope you'll give me a break here. I have not had much time to operate WiNRADIO, and the frequency coverage is so wide. All seems to operate as advertised, and my first impressions are good after monitoring VHF aircraft frequencies for a few days. However, both you readers and the manufacturer deserve a better basis for my operational comments. Meanwhile, while you're waiting you can download the software demo from the Internet at **www.kiss.com.au/winradio/**.

Now, where do I start monitoring with 1300 MHz of spectrum... ?!

Wayne Mishler, KG5BI
e-mail: mishler@aol.com

Watch for rising costs of wireless phone services

Grab your wallets and purses. The government has been helping us again. The Federal Communications Commission is still grinning over its recent windfall in auctioning off frequencies for wireless telephones. The *Chicago Tribune* reports that commercial bidders paid $10.2 billion for the right to operate on those frequencies. That's twice what the FCC expected to get from the bidders. You and I might shrug off their extravagance if it were not for one minor detail. The cost ultimately will be passed on to us, pushing the price of a wireless phone call beyond the reach of many non-commercial users. The industry needs this like it needs a ball and chain.

In case you keep track of such things, the amount bid is $3.2 billion more than was bid last year for licenses to operate Personal Communications Services. Not a promising trend.

Many of the smaller companies attempting to bid in the auction complained of being shut out by the bigger companies with deeper pockets. This cuts out competition, which, of course, would have the power to lower prices. The smaller companies who were able to bid can't compete by cutting prices; they have too much invested. They can only compete by offering more services and filling special niches. This may bring us improved services, but at a higher cost.

The high cost of convenience

Not that the prices are all that cheap now. True, you can get a cellular phone free or for a few dollars. But just wait until you use it. There are activation charges and roaming charges and time charges. And have you ever used one of those neat little phones mounted on the seats of airliners? We've talked about them previously in this column. I know of one business man who spent $500 trying to make a call during a flight—and he never even got through! He was charged $20 for every attempt that he made. He complained and the phone company ultimately canceled the charges. But the point remains: most of us won't be using those phones to tell Aunt Maud we're on the way.

At this writing, a three-minute local phone from an airliner call costs about $10. Phone companies say they have to charge high prices because the technology costs so much to provide. No kidding. Maybe they should avoid scratching their ears at auctions.

And what do we get for our money on those in-flight calls? Users complain of getting cut off in a middle of a conversation, getting billed for calls that don't go through, and having their credit cards refused for no apparent reason. Those are the major gripes expressed by consumers.

Consumers will have their say

Don't let me give you the wrong idea. Certainly I'm not belittling the value of wireless phone services, including those on airliners. Wireless is here to stay. It is the wave of the future. One airline removed phones from their aircraft because passengers complained about the service, and then passengers complained even more about having no phone services at all. There's nothing more nerve-stretching than getting an urgent page from a family member or important business client and not being able to answer it for lack of a phone.

While airborne on many airliners these days, you can use the onboard wireless phones to send and receive faxes, get on the Internet and check your email, check on Wall Street, do some last minute shopping, and enjoy a number of other conveniences that are very much in demand.

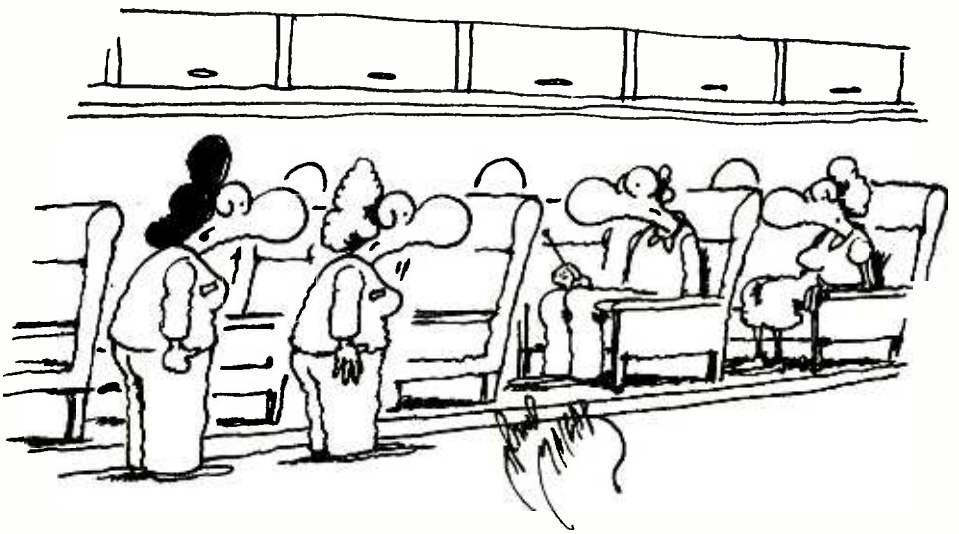
Notwithstanding a few bumps, the wireless industry remains poised for explosive growth. Nothing significant has changed. There's no question that wireless—especially in the field of personal communications—is going to be a leading industry well into the next century. Along the way we can expect some bumps and growing pains. Like bouncing prices, for example.

A matter of supply and demand

The wireless industry is no different from any other business. It is subject to supply and demand. Right now companies are scrambling to get footholds in the market. They cannot operate without access to the airways. If the companies get a bit eager and overspend, well, the cost of business gets passed on to us consumers. But then the demand factor kicks in, and if fewer of us pay those high prices, those prices eventually will have to come down.

In fact the phone companies are telling us that in the next five years we will see prices decrease and technology significantly improve. One company says it will begin offering PCS services in Chicago as early as next year, offering advanced features and simplified pricing to appeal to people who've never used wireless phones.

So, expect to see a short-term price increase in wireless phone service. But then look for wireless phone rates to fall by as much as 50% by the end of the century. And, as competition increases, watch for greater innovations and improved services.



"Keep an eye of passenger 28. He just called the Psychic Hotline with the onboard phone."

It's Here: The Monumental 2000 MHz IC-R8500 Receiver from ICOM!

Now Shipping from ICOM — Call Grove now and reserve your new R8500!

GROVE ENTERPRISES, INC.

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FAX 704-837-2216
7540 Highway 64 West
Brasstown, NC 28902

Please visit our site on the World Wide Web
www.grove.net

Imagine: an affordable, compact, tabletop receiver with continuous 100 kHz-1999.99 MHz frequency coverage (less cellular) in precise 10 Hz steps—longwave, shortwave, VHF/UHF, all services and modes (wide and narrow FM and AM, USB, LSB, CW). Add high sensitivity, IF shift, selectable AGC timing, audio peak filter to automatically enhance modes, built-in RS232C and CI-V for direct computer control, 1000 memory channels in 20 banks, multiple scanning selections with priority function and selectable delay, S-meter settable squelch, noise blanker, and 12 VDC / 120 VAC operation.

This all-new receiver offers features previously found only on the premium R-9000—which sells to the government for $7,508—but the R-8500 will retail for under $2,000. High stability crystal oscillators combine with automatic frequency control circuitry for outstanding stability. Multiple tuning speeds optimize signal hunting. Alphanumeric display aids in identifying memorized frequencies. Automatic memorizing of search-discovered active frequencies, skipping of unwanted channels, three antenna connectors for optimal choices for frequency ranges, even voice scan to ignore noisy channels, and even optional voice synthesizer and remote control--an incredible array of advanced features!

Call today to reserve your premium ICOM R-8500. Check our site on the World Wide Web for updates on specifications and pricing.

WHAT'S NEW?

PRODUCTS AND BOOKS OF INTEREST TO THE RADIO HOBBYIST

by Larry Miller

Guest reviewers: Bob Grove, Rachel Baughn

Digital Cyberscan Revolution #2

We get lots of information on AOR receivers. The odd thing is that we get some good stuff out of the US distributor and then we get other flyers that leave a lot to the imagination.

Take, for instance, the flyer we received on the new AR7000 CyberScan. According to AOR Ltd., this new receiver is "the digital revolution with true IF digital signal processing. The AR7000 is another break-through of the AOR receiver design. It is the first RF DSP receiver for future listeners. Signal demodulation and filtering are performed high speed 16-bit DSP and digital down converter that digitize the signals with 10.7MHz IF."

I'm sure that somewhere there is someone who knows what that means, and what makes it different from the other "scanner of the future," the AR5000 with CyberScan, on which we reported in March (and which is just now scheduled for delivery).

Here's what else I can glean out of the flyer and its low resolution picture. Frequency coverage is 100 kHz to 2 GHz in selectable 10 Hz-1000 kHz steps! Reception is in AM/NFM/WFM/SSB and CW. There is a 1500 channel memory bank set up in 100 fifteen channel banks. The 3.5" color LCD not only reads out pertinent information on the receiver's status but also acts as a Spectrum Display Unit.

How much is the Digital CyberScan Revolution? Don't know. Where can you get one? Don't know. Who wrote the press release? I wish I knew.

Radio Shack HTX242 Transceiver

Radio Shack has been treading further into amateur radio, GMRS, and even their own Family Radio Service. Their newest ham release, the HTX242 two-meter FM rig, is a fine example. Featuring 144-148 MHz, 10 and 45 watt transmitting capability, and frequency steps from 10 to 100 kHz, the HTX242 also offers 136-174 MHz continuous coverage reception.

Only 1-1/2" high, the small footprint is ideal for under-dash mounting, and the multifunction microphone conveniently controls the most important operational commands of the radio, including VFO selection, frequency stepping, memory channels, and DTMF code entry,

This mobile rig is one of the most feature-packed we've seen; space doesn't permit a listing of all the perks on this radio. The sharp selectivity and powerful audio are just two reasons why hams may wish to stop by Radio Shack and see this impressive rig for themselves.

—BG

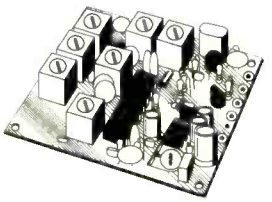
Weather Radio

I have to admit that the announcement for the new Hamtronics Weather Alert Receiver caught my attention. Honestly, I've been thinking of getting a dedicated weather radio—it just seems that the weather is getting weirder all the time. Although the weather service channels are included on my scanners, I could really use a radio with one of those automatic turn-on functions when there's a severe storm warning.

Hamtronics says that their RWX receiver is very sensitive and very selective. The manufacturer claims that you can get reception "even at distances of 70 miles or more with a suitable antenna" but then goes on to claim that "there is no comparison with ordinary consumer radios or scanners."

My curiosity immediately rose to the challenge. My scanner already gets weather radio reception of 100 miles or more with a suitable antenna. Automatic mode on the Hamtronics RWX does keep your radio quiet until an alert tone is broadcast by the weather service. The receiver is then unmuted. There's also an output to trip remote equipment, like an audible alarm device (not included). You can override the automatic mode any time to listen.

The RWX is crystal-controlled and all seven weather channels are provided, including the new split channels. You have to go inside the unit to select the right channel.

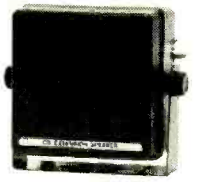


The price is where the Hamtronics RWX Weather Radio lost my attention. Even though ham radio operators who purchase Hamtronics amateur products vouch for their quality, assembled, the RWX costs $139 plus shipping—the cost of some multiband scanners. You can also buy it as a kit (receiver PCB module only, no case or power supply) for $79.00 plus shippping.

To get more information on the Hamtronics RWX Weather Receiver and other Hamtronics products, call 716-392-9430. You can also write to 65-M Moul Rd, Hilton, NY 14468.

Two New Speakers

Grove Enterprises has introduced two new speakers that might well fill an audio void in your mobile radio line-up.

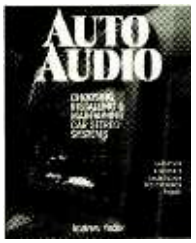


First, if you have one of those mini-portables—the kind with the microscopic speaker—you may want to check out the SPK 6 Noise Cancelling Mobile Speaker. While the SPK 6 would be a welcome addition to any CB or scanner set up, this particular unit has an added bonus—a pushbutton, high-frequency rolloff switch that reduces crackling and pulse noise. Measuring approximately 4 inches square, this compact unit is rated at 10 watts and comes with 10 feet of cable ending in a 1/8 inch (3.5mm) miniplug. A hinged mounting bracket is included. The price is an affordable $16.95 plus $5.50 UPS.

Also new to the Grove speaker

line-up is the new Sun Visor Mobile Speaker (SPK 15). Clever and convenient, it's barely 1-1/4 inches thin. You simply slide this little 3 inch dual speaker onto your vehicle's sun visor for high quality, concentrated sound in your face. The SPK 15 is also $16.95 plus $5.50 UPS. Both speakers are ideal for noisy environments. To get yours, call Grove at 800-438-8155 or visit their catalog on the web at **www.grove.net**.

Auto Audio



Many shortwave enthusiasts, especially pirate radio fans, will recognize the name of Andrew Yoder who, for years, wrote pirate radio articles and books for the hobby magazines. Now Yoder has embarked on a new specialty, autosound, with this publication.

Aptly subtitled *Choosing, Installing & Maintaining Car Stereo Systems*, Yoder's 300+ page book is an illustrated guide to making the appropriate selection of an automotive stereo system and making sure as well that it is operating properly.

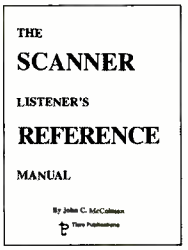
Complete chapters are provided covering such major topics as amplifiers, speakers and enclosures, filters and crossovers, antennas, wiring and connectors, and maintenance and repair. Yoder's inclusion of a troubleshooting chart is a nice touch for quickly nailing down the source of various types of electrical interference. A glossary of terms and a large list of suppliers will also be of assistance to the mobile audiophile.

Auto Audio is $24.95 from McGraw-Hill, Inc., 1221 Avenue of the Americas, NY, NY 10020.

—BG

Scanner Reference Manual

The *Scanner Listener's Reference Manual* is about as lacking in charm as a book can get. Then again, it's not designed to be light reading for a day at the beach. The *Scanner Listener's Reference Manual* is a 98 page book packed with data, including an FCC Allocation Table, service pool, emission symbols, non-federal service category codes, digitally coded squelch, GMRS, VHF marine channels, Civil Air Patrol, paging frequencies, TV audio frequencies, cordless telephones, railroad channels, federal allocations, itinerants, CB, U.S. military, and much more.



This is the closest you're going to get to an encyclopedia for scanning. There's no text to read, just tables. But it's helpful information that every scanner listener should have.

The spiral-bound book is $17.95 plus $3.00 shipping from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. The author is John C. McColman.

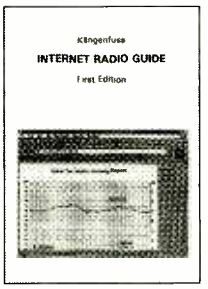
Internet Radio Guide

Joerg Klingenfuss is a German publisher who puts out one of the most impressive utility monitoring guides in the world. His books, some say, are to publishing what Swiss watches once were to precision.

Now, sensing a trend but staying ever close to radio, Klingenfuss has introduced a brand new book: the *Internet Radio Guide*. The book basically consists in its entirety of screen captures of radio-related sites such as amateur, aviation, companies, dealers, DX clubs, equipment, geography, intelligence, manufacturers, marine, meteorology, propagation, publications, satellites, shortwave, weather, and more.

MT editor, Rachel Baughn, in assessing the book, questions whether the directory format, which has served Klingenfuss so well in past endeavors, is appropriate to a field as volatile as the Internet. The printed medium just can't keep up with the changes in the constantly-fluid arena of Internet addresses, whereas several Internet sites maintain more easily managed directories of radio-related web sites. On the positive side, she says, unlike on-screen directories the book can save you some time by giving you a thumbnail view of the site without having to go there. However, directories on the internet are free.

Klingenfuss' books are not only expensive (50 DEM for *IRG*) but currency exchange rates constantly fluctuate. For U.S. customers, we suggest you call Universal Radio at 800-431-3939, which sells the book for $24.95, or contact Mr. Klingenfuss by mail and ask for his free catalog. It's Klingenfuss Publications, Hagenloher Str. 14, D-72070 Tuebingen, Germany. He can be reached by phone at +49 7071 62830 or by e-mail at 101550.514@compuserve.com. There's also a web site at **http://ourworld.compuserve.com/homepages/Klingenfuss**



Radio Manager for Windows

Radio Manager is a radio control program for computer-controlled scanning radios. Ben Saladino, its creator, has introduced a new version for Windows.

The new version features a new and improved user interface, UFDBF file import capability, and the ability to restore full frequency coverage (i.e. cellular) to the AR8000, the OptoScan 456 and the OptoScan535. Radio Manager also has a band plan editor as well as upload/downloading for the AR8000.

There's much more to Radio Manager. Since it's shareware, you can try it before you buy it so... why not try it? To find out more, or to download, visit **http://www.interplaza.com/bensware/** You can also write to Ben at 660 West Oak Street, Hurst, TX 76053-5526.

More Morse Fun

"It's going to be fun."

If I had a dollar for every Morse Code disk, CD, tape, or book that I've reviewed or announced that says it's going to be fun, I'd be able to retire.

Advanced Electronics Applications, Inc. is now offering Morse University II (*Oh, no; college-level Morse?*), the Windows-based CW training software. Morse University—(*here it comes*)—"makes learning Morse code fun!"

Well, AEA is trying to make it fun, anyhow. Morse University II is a multimedia product. You start with lessons to learn the characters, numbers, and punctuation. Then you start practicing real world QSO's using the exercise feature. There's even a Morse-based game included called Pentode. "Once you play Pentode," claims the manufacturer, "you won't be able to stop!" (*Hide and watch me.*)

Let me know if you were able to stop. Call AEA and order the Morse University II. It's just $39 from your favorite radio equipment dealer. For more information, call AEA on their 24-hour automated literature request line: 1-800-432-8872. You can also visit the AEA web page at **http://www.aeainc.com**.

Solar Charging

Jade Products has introduced a new lead/acid gell-cell battery controller. Called the SC06, this 6 amp controller offers fast recovery and is applicable to deep cycle, high-power usage. It is designed to be used in combination with a solar panel of at least 4 volts more than the battery voltage needed.

The SC06 is designed to sense the condition of the battery and control the charging accordingly. It can be left connected indefinitely, prolonging the life of the battery by protecting it from under/overcharge damage.

The SC06 is a kit for which you'll need a screwdriver, pliers, and soldering equipment.

The price for the SC06 Controller is $185 plus $7.25 shipping. You can get more information by callling Jade Products at 603-329-6995 or by writing P.O. Box 368, East Hampstead, NH 03826. Their web site is at **http://www.hampstead.k12.nh.us/~djade/**

Rocky Mountain Hams

Wayne Heinen has been a friend for many years. He's helped out with *Monitoring Times* and later with *National Scanning* as its projects editor. If you're an AM DXer, you're probably familiar with his work with the National Radio Club.

Now Wayne and his wife Joan are striking out on their own with a publication designed for Rocky Mountain ham radio operators. Called *Rocky Mountain VHF+*, it's a professional 12-page newsletter with articles, activity reports, want ads, a mailbag, and contest calendar.

Everything Wayne and Joan are involved in is first class; *Rocky Mountain VHF+* is no exception.

You can get a sample copy of *Rocky Mountain VHF+* from Wayne and Joan Heinen, P.O. Box 473411, Aurora, CO 80047-3411. The cost is $1.00. Tell them that *Monitoring Times* sent you.

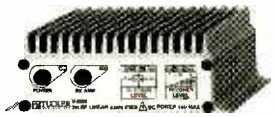
The Return of 2MP-4

The Firestik Antenna company has recently reintroduced their 2-meter (144-148 MHz) mobile antenna. This is the second go-round for the Firestik 2-meter mobile, also dubbed the 2MP-4. It originally went on the market in 1979, but was inexplicably dropped from the line three years later during a product restructuring at the company.

Even though the 2MP-4 went out of production 13 years ago (it continued to appear under other company names), the antenna continued to live on as a kind of legend. Now, it's back. Says a company spokesman simply, "We decided to give it a go again."

The 2MP-4 is made from a 3/8 inch fiberglass core and is 48 inches long. Retail price is $16.99. For more information on price and availability you can call 602-273-7151 or e-mail them at firestik1@aol.com. Mail address: 2614 E. Adams St., Phoenix, AZ 85034.

Two New Tucker Amps



Tucker Electronics has announced a new line of 2 meter VHF amplifiers. The first two are the V-35W and the V-100W. Both amps are designed to be used with 2 meter handheld transceivers and low wattage 2 meter desktop transceivers, such as the ICOM IC-706.

The V-35 will accept a 0.5 to 8 watts of input power and produces up to 35 watts of output. It features a built-in RF power meter and operates on both FM and SSB/CW.

The 100-W also accepts 0.5 to 8 watts of input power and produces up to 100 watts of output. It features a built-in 15dB preamplifier and a built-in RF power meter. Like the V-35, it operates on FM and SSB/CW.

Both amps come with a one year warranty. For more information, call 800-559-7388 or write 1717 Reserve Street, Garland, Texas 75042.

Inductor Introduction

It's probably not going to make the New York *Times* best seller list but wireheads may find it helpful. It's called *The Inductor Handbook*.

Of all passive components, inductors are probably the most difficult to specify because of the many parameters that must be considered. This 170 page reference combines inductor and transformer theory and construction with practical circuit application information.

There are also glossaries, symbol and equation conversion tables, a ferrite material constant chart, ferrite selection guidelines, and a comprehensive index.

The cost for *The Inductor Handbook* is $15.95 plus $4.00 UPS and it's available from CJ Publishing, 2851 West 127th Street, Olathe, KS 66061.

Techni-Tool Catalog

The company's name is pretty self-explanatory. Techni-Tool offers a big, 250 page catalog packed full of tools, tool kits, test instrumentation, ESD, soldering and desoldering products, and more. Need a pair of strippers? Got 'em. How about a big chest to store your tools? Right here, right now. In fact, Techni-Tools seems to have everything from telco butt sets to ESD wrist and heel straps, to electrical tapes, testers, and probes.

Need a catalog? The address is 5 Apollo Rd, P.O. Box 368, Plymouth Meeting, PA 19462. You can call 610-941-2400. Or, you can also visit Techni-Tool's web site at **http://www.techni-tool.com/**

Radio Programming

Pretend that you own a radio station in a medium-sized market like Wilmington, Delaware. Competition is fierce. You must cope with big-signal, big-money stations pounding in from Baltimore and Philadelphia. How do you compete?

Eric Norberg's *Radio Programming: Tactics and Strategy* focuses on how to program a radio station in today's hyper-competitive environment. This is one of the first books to look at underlying principles and assist the programmer in accomplishing specific objectives without mandating specific methods.

Included in the discussion is the basic principles of radio programming, creating a station identity, leading an airstaff, music as a programming weapon, ratings, promotion, the FCC and more.

Radio Programming: Tactic and Strategy is $26.95 from Focal Press, 313 Washington Street, Newton, MA 02158. You can order by calling 800-366-2665.

Business Briefs

Worldradio has reported that it has received a letter from a law firm indicating that Atlas Radio has closed and that it "had no prospects to reactivate." According to the report, the remaining assets of the company were of little value. Company bank accounts have been closed. Only a year ago, *MT* columnist Ike Kerschner lauded the Atlas 400X transceiver as one of ham radio's best buys.

This past summer, Wayne Green, Inc., owned by the self-proclaimed "El Supremo" of *73 Amateur Radio Today* magazine, filed for bankruptcy. According to the *W5YI Report*, *73* magazine had sales of $422,342 in 1994. Current liabilities exceed one million dollars. What impact this will have on the publication of *73*, now technically owned by his wife, is not yet known. It is presumed the publication will continue until court rulings determine if its sale was improper.

Lawrence Magne
Editor-in-Chief, Passport to World Band Radio

Sangean's Latest: The ATS 909

Back around the time of the last Ice Age, I reached deep into my Levis and purchased a spanking-new Plymouth Valiant. *Consumer Reports* and various car magazines had hailed it as a breakthrough in performance and styling, which it was, and one test drive got me hooked.

Alas, what none of this tipped me off to was that it was put together...well, awfully. From day one, things failed—serious things, like the electrical system, transmission, and rear axle. In rainy Florida, where I lived, all it took was passing through one good puddle and the ignition system would die. I finally got rid of the thing, and swore I'd never, ever again lay hands on another Chrysler product.

But, here we are, years later, wheeling around Bucks County in a Chrysler-made Jeep Grand Cherokee—the best vehicle I've ever owned. Whatever Chrysler was back then, it certainly isn't anymore.

Sangean Grew from Original ATS-803

So it is with the receiver we're looking at this month, the Sangean ATS-909. Sangean started getting serious in shortwave when it reportedly obtained rights to the old Sony ICF-2001 design. They cleaned it up, then issued the result as the Sangean ATS-803, which remained virtually an international secret until my wife and I happened to stumble upon it at a small Asian-owned store along the banks of the Seine in Paris. Although it had a couple of significant shortcomings, in many respects it was a very good receiver for its time, and it was also reasonably priced.

I wrote up my findings, and the rest is history. Sangean and some of its prospective dealers, such as EEB and Eska, took note of those findings, then made a number of improvements, eventually culminating in the ATS-803A. Under that name and others, including the Realistic DX-440, it went on to become one of the world's most popular shortwave receivers.

Sangean issued some other worthy models in due course, but a couple of years ago things took a turn for the worse. They not only discontinued the '803A—then still the pride of their fleet—they also began coming out with models that either were mediocre or had serious deficiencies. And unlike in the old days, when they would react to criticism by taking corrective action, Sangean retreated into a defensive posture towards those who were pointing out shortcomings and embraced those whose vision appeared to be more optimistic.

ATS 909 Encouraging Step Forward

Fortunately, there seems to be a new wind blowing through Sangean, as their latest offering, the ATS-909, is the sort of product we would have expected from the "old Sangean." While it's not the best shortwave portable on the market, it's as good an offering as has ever come out of Sangean, and it is competitively priced—under $300, street—for what it does.

The Sangean ATS-909 is a large compact portable using four "AA" batteries. It covers FM, in stereo through earpieces (included), and the full spectrum from longwave 153 kHz through the upper reaches of the shortwave band at 30 MHz. With batteries, it weighs in at just under two pounds, well under a kilogram, and comes with a reel-in external wire antenna.

Many Features, Including Superior AC Adaptor

Even better, it comes with something we've been harping on for years: a 110-230 VAC, 50-60 Hz, power supply that automatically figures out the line voltage. In fact, it even comes with European and North American plugs. While this AC adaptor is beefier than most and has no UL seal of approval, it is a definite plus for globetrotters.

Operation is entirely by keys and knobs—thankfully, no sliders—and the knobs are knurled and have concentric "goose pimples" for an improved grip. The tuning knob, which turns less freely than it could, also has tactile detents to give you a feel of how fast you are tuning. And to make operation more agreeable, there's a well-designed elevation panel and self-extinguishing liquid crystal display (LCD) illumination. For DXers and station monitors, there's a 1-10 digital signal-strength indicator.

For travelers, there's a power lock to keep batteries from running down in transit, plus an indicator to let you know when the batteries are low. There's also a soft carrying pouch, but no carrying handle or strap whatsoever.

A 24-hour clock displays at all times, and there is a feature to display the local time in 42 cities of the world, although there is no means to adjust properly for summer time shifts, which differ from country-to-country. There is also what amounts to a clock-radio function which allows three on-times and frequencies to be specified.

Numerous Tuning Techniques

There's just about every kind of tuning technique you could wish for. There's a tuning knob with two user-selectable speeds that vary according to mode. There's also a keypad in the familiar telephone-like format, up/down slewing buttons, signal-seek scanning, fully 306 presets (some are pre-programmed at the factory) using handy Sony-like "pages," and buttons to select meter-bands. There's also a button to bring up any one favorite channel with a single push. As if that weren't enough, you can program in alphanumeric stations descriptors to allow, say, the BBC on 5975 kHz to be described as "BBC WS."

A surprising characteristic is that the alphanumeric ID can keep displaying even when you subsequently tune in other channels. So, if you punch in for Taiwan on 5950 kHz, then tune to 5955 kHz and beyond, "TAIWAN" remains on the display—freqency after frequency throughout the spectrum.

To get around this, dial to page 29 ("op-

tional"), which defeats the alpha-numeric display. Trouble is, if you punch up a frequency that's stored in a page with an alphanumeric descriptor, page 29 disappears, being replaced by the page where that frequency is stored. The problem thus recurs until you once again reset the rdio to page 29.

After that, of course, it recurs whenever you key in a frequency that's stored on any of the radio's 306 presets. We notified Sangean of the problem, so conceivably a fix is in the offing.

Superior Selectable Sideband Reception

The '909 tunes not only in the AM and FM modes, but also LSB and USB in precise 40 Hz increments. Indeed, sideband (LSB/USB) operation is good enough that the radio works exceptionally well, by portable standards, for manual tuning of a broadcaster's individual sidebands (nonsynchronous selectable sidebands). That's also a plus for utility DXers and hams, who need superior SSB reception. However, there is no synchronous detection, and frequency readout is only to the nearest kilohertz.

Although most portables have only one bandwidth, for pleasant shortwave reception a receiver should have two or more bandwidths. On the '909 there are two voice bandwidths, and they are both well-chosen.

Performance Nearly Tops

With all these features, we expected top-notch shortwave performance, and in many respects that's just what we found. Sensitivity to weak signals is a bit above average, selectivity commendable in both bandwidths, and dynamic range superior by portable standards. To combat any overloading that might be encountered, there's an RF-gain control, such as you might find on a serious tabletop model.

On FM, the audio lacks low-end response, and there's only a three-level tone switch—a far cry from the separate and continuously tunable tone controls found on the now-discontinued Sangean ATS-803A. On shortwave, though, the audio quality is better, even though it doesn't have quite the audio power its size might seem to suggest.

When put against a couple of our best reference portables—Sony's ICF-2010 and the discontinued Philips D2999—the '909 acquits itself well, but only to a point. The relatively hefty D2999, with its excellent audio section, sounds much more pleasant than either alternative, and the Sony and Philips models both do slightly better than the Sangean in making DX signals readable. Yet, the overall result is that the '909, which is smaller and lighter than the other two, comes out only one notch below these "best of the best" portables.

RDS Feature Requires Powerful Signal

The '909's FM performance is good, and includes RDS, where participating FM stations can display their station ID and keep the receiver's clock "spot on." However, the '909's RDS works only with a strong signal.

Lacks Synchronous Selectable Sideband

Deficiencies, all told, amount more to nuisances than problems, with two exceptions.

For a new model going for nearly $300, the lack of synchronous selectable sideband is both surprising and disappointing. Sony has a model, the ICF-SW7600G, with synchronous detection that sells for under $200, and the "El Supremo" Sony ICF-2010 offers it for under $400. Not every listener is enamored with synchronous selectable sideband, if only because it can complicate operation. But it does help reduce adjacent-channel interference in numerous cases, and also pretty much eliminates selective-fading distortion.

Mutes During Bandscanning

Another difficulty with the '909 is in bandscanning. Popular wisdom suggests that nearly all tuning is done direct; that is, people use presets or direct frequency entry to get to desired stations. However, at *Passport to World Band Radio* we have found that even casual listeners like to bandscan to a greater or lesser extent.

Alas, the '909's tuning knob tends to mute out all traces of stations when it is turned at anything but a snail's pace. There have been reports circulating that Sangean plans to issue a revised version of the '909 that corrects this, but the manufacturer's North American office told us it was unaware of any planned changes, although it nonetheless agreed it would look into the question. However, should this muting be a bother, you can contact the C. Crane Company (800/522-8863), which offers a modification to relieve the problem.

Otherwise, the only demerits we unearthed were pretty small potatoes. The scanner stops on relatively few active shortwave signals, and it scans out-of-band for only one pass before restricting continuation of the scan to default (in-band) limits. The clock is set up to display "home" time—not World Time—if you want the international cities feature to work properly. We got around this by setting the "home" time to World Time, and forgetting the "cities" feature and RDS tie-in to set the clock to the exact local time.

Also, there's a two-second lag from when you key in a preset until you can hear the station; the alphanumeric ID always shows on a frequency, regardless of the time of day or how you are tuning; and with various functions there is a tendency for the '909 to return to the default setting at inappropriate times.

Bottom Line: Fine Offering

Overall, the ATS 909 is a big step forward for Sangean, and a welcomed offering for shortwave listeners. Indeed, for hams and utility DXers, as well as broadcast DXers wedded to manual selection of sidebands, the '909 is arguably the best offering among portables in this regard. Although none of our panelists consider it the full equal of the Sony ICF-2010, the Sangean ATS 909 is a travel-friendly runner-up, and usually sells for around $50 to $75 less.

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.

 Bob Parnass, AJ9S

Electra Corporation Lives!

Al Lovell founded Electra Corporation in 1964 and developed the original Bearcat line of scanner radios. The rights were sold to Uniden in the mid 1980s, and we heard nothing about Electra thereafter. Readers will be interested to hear that Al Lovell's son, David, re-incorporated Electra in 1991.

He wrote to us from Indianapolis, "Our main emphasis is in new design/development work. To that end, we are engaged in assisting local engineering concerns... We also are making prototype PC boards with our new mechanical etching mill. I have a fully equipped RF Lab with considerable complement of parts and reference materials, as well as the usual test gear—analyzers, service monitors, etc. "

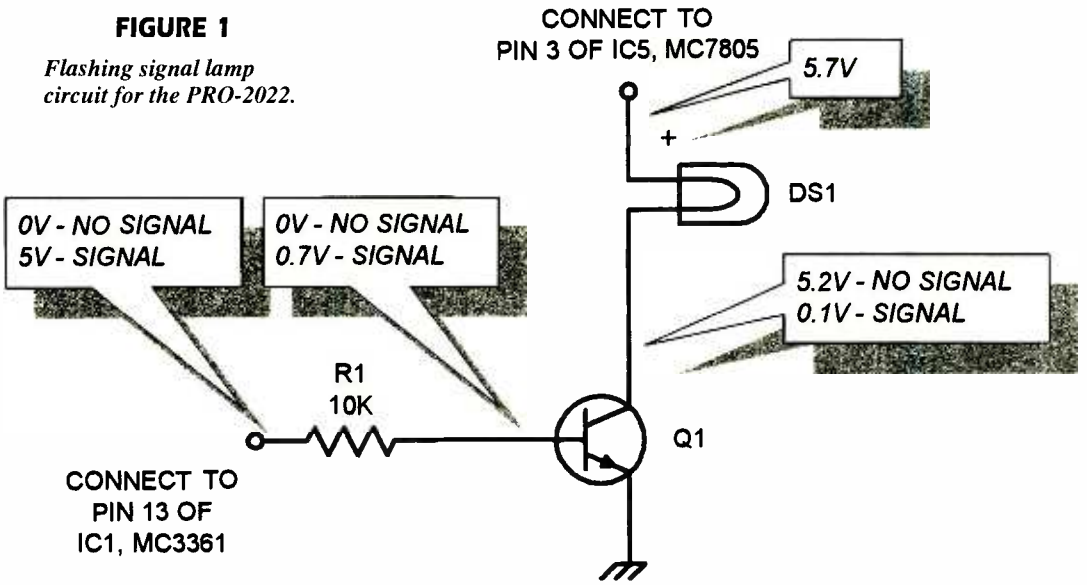
David continued, "Since our re-incorporation in late 1991, we have been able to survive on small projects and service for existing RF product—however, in the future we intend to return to manufacturing as our primary business."

Here's the good news for scanner collectors: In its current configuration, Electra Corporation is able to effect repairs on some older, pre-Uniden Bearcat scanners. Electra sells crystals, antennas, power cords, and owner's manuals. We suggested they consider selling service manuals, as well.

You may contact Electra Corporation by telephone at (317) 326-4419, or at either of two electronic mail addresses: Electra@trader.com or 71722.40@Compuserve.com.

FIGURE 1

Flashing signal lamp circuit for the PRO-2022.



DS1 - GREEN FLASHING LIGHT EMITTING DIODE (RS 276-030)
Q1 - 2N2222 OR SIMILAR GENERAL PURPOSE NPN SILICON TRANSISTOR
R1 - 10,000 OHM, 1/8W or 1/4W RESISTOR (RS 271-1335)

Modify Your PRO-2022

It's been widely reported that removing diode D44 restores full 800 MHz band coverage in the older Radio Shack PRO-2022 in 30 kHz steps. We will describe two other modifications to the PRO-2022 which you can adapt to other models.

• While listening to many scanners at the same time, it's often difficult to tell which scanner is hearing activity. A carrier-activated lamp, which lights when a signal is detected, is useful for drawing your attention to the active scanner. We built a flashing activity lamp into the Shack PRO-2022, and you can, too.

The flasher requires about 40 mA at about 5 VDC. The voltage on pin 13 of IC1 inside the PRO-2022 changes from 0 to 5 VDC when a station is detected. Why not connect the flasher directly to this pin? The 40 mA required might be more than IC1 can furnish. Instead of risking damage to the IC, build a single transistor amplifier (Figure 1).

One side of the flasher is connected to a source of approximately 5 volts. The other side is connected to transistor Q1, which we use as an amplifier (or switch). When the PRO-2022 hears a station, pin 13 of IC1 becomes 5 VDC forcing current to flow through current-limiting resistor R1 into the base of transistor Q1. This causes Q1 to conduct, pulling one side of the lamp near ground, causing it to flash until the station stops transmitting.

Construction is simple. Mount a terminal strip (RS 274-688) inside the PRO-2022 and solder Q1 and R1 to it. Drill a hole in the scanner's front panel, located just below the LCD display and above the "200 CHANNEL" lettering. Glue the green flashing LED lamp (RS 276-030) into the hole.

• The PRO-2022's LCD display is backlit by an EL (electroluminescent) panel, similar to the type found in the PRO-2006. EL lights grow dimmer with age until they become useless. Since our PRO-2022 stays on 24 hours a day, we added a switch to disable the backlight. The simple SPST toggle switch is mounted on a hole drilled through the back metal panel, although it could have been located on the front panel instead. We inserted the switch in series with R145, a 56 ohm 1/8 W carbon resistor.

Baseband Audio Tap for PRO-2042

The June 1996 column showed how to connect a CTCSS reader, which requires baseband audio, to a Uniden/Bearcat BC9000XLT. Johnny Knight, of Monroe, NC, wrote that a tone reader can be connected to the Radio Shack PRO-2042 at pin 9 of IC2, which connects to test point TP2. We no longer have a PRO-2042 to try this, but Johnny's colleague tied a Connect Systems CD-1 to his PRO-2042 at TP2 and it functioned well.

How Hot is Your Transformer?

While troubleshooting his Uniden BC800XLT scanner, Jeff Herman noticed the power transformer was hot and asked if this is cause for alarm.

Overheating can be caused by a defective component drawing too much current or even shorted windings. Another way to overheat the transformer is to power too many current-hungry accessories or circuit add-ons by tapping into your scanner's power supply. The heat generated from an abnormally hot transformer can shorten the life of surrounding components, and the transformer can fail if the condition goes unchecked.

Don't be alarmed—a hot transformer doesn't necessarily mean trouble. The power transformers in many scanners run hot, and without measuring the temperature, it's difficult to know whether your transformer is abnormally hot. After running 24 hours a day, the power transformer in our BC800XLT measured 121 degrees Fahrenheit immediately after we removed the cabinet. The temperature dropped to 108 degrees after operating the BC800XLT without its cabinet for an hour. The 121 degree temperature is uncomfortable to the touch, but doesn't signify trouble. Our BC800XLT has been operating 24 hours a day for the last three years, backed up with a UPS (uninterruptable power source).

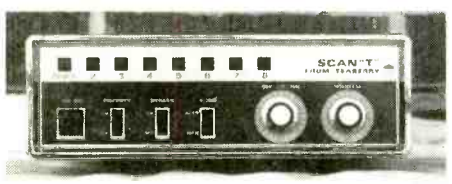
Yaesu FT50R Dual Band Walkie-Talkie

Ham radio operators who are scanner hobbyists appreciate a portable transceiver which can be used as a scanner outside the VHF and UHF ham bands and as a walkie-talkie inside. For that reason, we bought the new Yaesu FT50R dual band walkie-talkie, which is half the height of a Bearcat BC3000XLT scanner and more ruggedly constructed. It has one bank of 100 channels and five search banks. You can program separate transmit and receive frequencies in each of the memories and can monitor a repeater input at the press of one key.

The FT50R comes equipped with a digital squelch encoder and decoder (digital PL for Motorola aficionados), and a CTCSS encoder. An analog CTCSS decoder is available as option FTT-12. The FT50R's tone scan feature cycles through all the different CTCSS or DCS codes until it finds the proper tone which matches the station to which you are listening. No portable scanner has this feature—yet.

We programmed the first 23 channels in our FT50R, with five channels locked out of the scan list. About a third of the remaining 18 channels were programmed with CTCSS or DCS codes. With that mix, our FT50R scans at about 10 channels per second, much slower than a modern scanner.

Frequencies and operating parameters can be bulk downloaded from, or uploaded to, a personal computer using the optional Yaesu ADMS-1C Windows-based software and interface cable. Street price for the basic FT50R is about $330.



Teaberry Scan "T," a VHF high band, crystal-controlled scanner with priority. Photo by Pam Parnass, N9HRZ.

Clem Small, KR6A, CET

Antenna Tuners: HF Help or Hindrance?

We all want to get the best possible performance from our antenna when we are working weak signals. If a source of RF signals, such as the antenna, is connected to a circuit (load) which is to accept those signals, then the source and load should each have about the same impedance value (i.e., be matched to one another). The load can be the antenna's lead-in cable which routes the signals on to the antenna input-circuit of the receiver, or, if there is no lead-in, the load will be the receiver antenna-input circuit itself.

An antenna tuner is a circuit which can improve a poor match between an antenna system and receiver input or lead-in. (Doug DeMaw had an excellent article on building an antenna tuner in the June issue of *Monitoring Times*.) When an antenna tuner improves the match, then signals received by the antenna pass to the receiver at a greater amplitude. This would seem likely to improve reception, but, as is often the case, "it ain't necessarily so." If the signals received by the antenna include significant received noise at the same frequency as the desired signal, then the improved match increases them both to an equal extent.

As you might guess, it's the relative level of the noise accompanying the desired signal as compared to the level of the signal itself, that is a basic determiner of how well you can understand ("copy" or "read") that signal. This comparison of signal to noise is called the "signal-to-noise ratio" or "S/N."

On shortwave (HF) the level of noise received along with the signal is generally much greater than the noise that is generated in the first stages of the receiver. Therefore, received noise generally accounts for the noise factor in the S/N of the received signal. Since the S/N is not improved by increasing the signal level when received noise is similarly increased, this means that an HF antenna tuner is often of little use in improving reception. When received noise is high, then improving antenna-system signal output level has an effect similar to simply turning up the volume control on the receiver—it makes both signals and noise louder, but doesn't improve the quality of reception much.

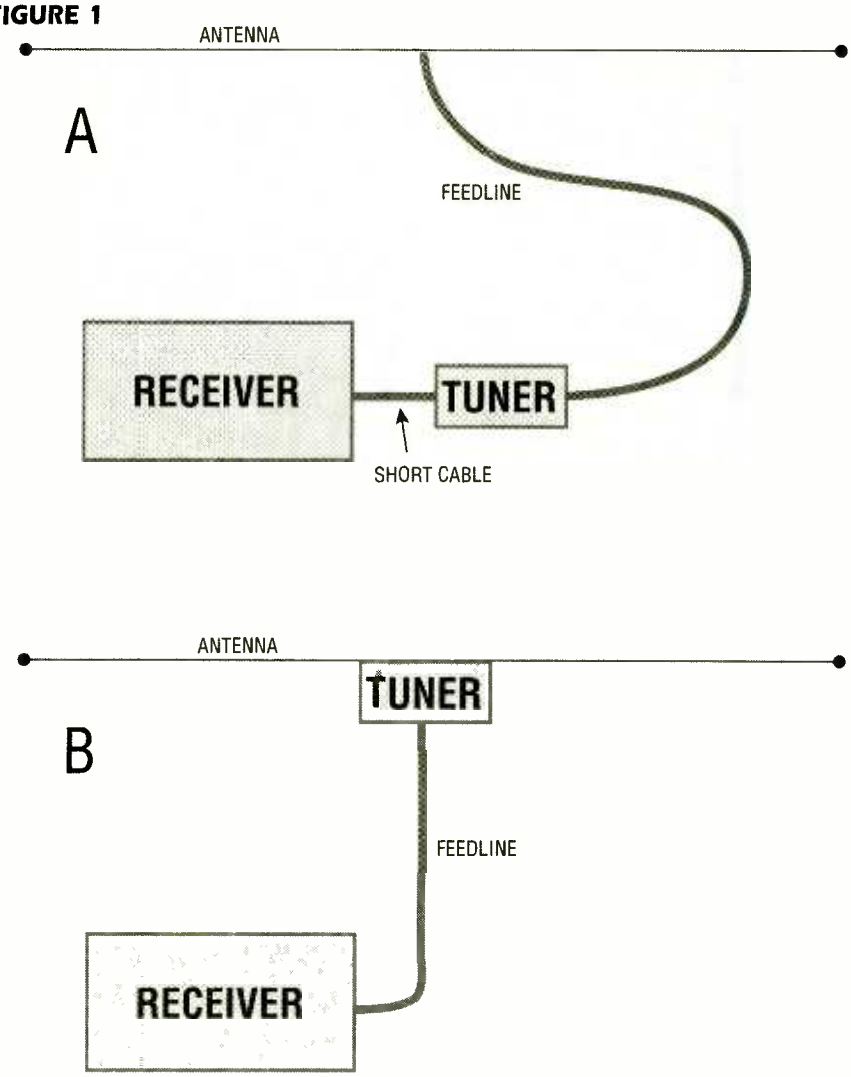
Is an antenna tuner then of no value on HF? Sometimes yes, sometimes no. Let's now discuss what causes this ambivalence.

Noise and HF Reception:

Controversy sometimes arises between operators as to the value of using an antenna tuner for HF reception. Some operators feel that tuners help, and some say they give no benefit. As just explained, the received-noise level on the HF band is generally greater than the noise generated in the receiver itself. When this is true then the use of an antenna tuner is not usually of value.

One exception to this could be if the antenna is not outputing enough signal for the receiver to detect any signals at all. In this case improved output level may sometimes be gained by use of an antenna tuner, or by lengthening the antenna if it is a simple random-length wire, or by changing the antenna

FIGURE 1



The most common method of connecting an antenna tuner to a receiving-antenna system (A), and a much less common method (B).

such that it is closer to being resonant at the frequency of operation.

How do you know if amplification would be of benefit? As a test of HF antenna output-level you can briefly connect your receiving antenna lead-in to the receiver's antenna input terminal, and then remove it. If you hear an increase in noise in the receiver's audio output when the antenna is connected then you will probably have enough signal output from the antenna to receive any signals that are copyable above the received noise. (If your noise level is *really* high you still may not hear any signals!) If you hear no increase in noise in this test your antenna may not have sufficient output for your receiver's sensitivity level.

On the other hand, when you hear no noise it can mean that the received-noise level is quite low. Received noise tends to be lower in remote or rural areas, at latitudes far from the equator, and in the winter. It can also vary with the frequency being utilized.

At frequencies above HF, received noise levels usually decrease as frequency increases. For this reason matching an antenna to its feedline, and matching the feedline to the receiver's antenna input circuit at these frequencies can be very important in the reception of weak signals.

Coming down in frequency from the VHF band we find that the lowest frequency at which received noise is no longer a serious problem for weak-signal work is variable with both time and location. At times this frequency can be well down into the HF band; at other times it is up into the lower end of the VHF band. If the antenna is located near a noise source, such as house electrical wiring, noise will be high.

This means that whether or not an antenna tuner will help your HF reception may change from time to time and with different locations of your antenna. Whenever you notice that the HF frequency on which you are listening is quiet in terms of received noise, then you might try a tuner to check whether it will help your weak signal work on that frequency at that particular time and location. When conditions are such that a tuner doesn't help, then it is a waste of time, effort, and money to include one in your receiving system. On the HF band this latter case is very common.

■ Connecting an Antenna Tuner to your System:

Antenna tuners are usually connected between the receiver's antenna-input circuit and the antenna feedline (fig. 1). Occasionally, an antenna tuner will be located between the antenna and the feedline (fig. 2). Matching at this latter location is particularly valuable for receiving antennas, because a significant portion of received signal energy not entering the feedline from the antenna is re-radiated and lost.

Unfortunately it is a problem to support a device as large and heavy as even a simple antenna tuner at this location, and even more difficult to adjust it. It is much more common to use non-tunable (fixed tuned) matching devices such as stubs and baluns in this location. Whatever the case, for maximum transfer of signal to receiver there should be good matching at both tuner locations shown in fig. 1.

■ Kite Antenna Note:

MT readers interested in my June article on kite antennas may be also interested that the June 96 issue of *Practical Wireless* gives the following internet address: **http://www.kitesantenna.com**, and an E-mail address of kites@antenna.thegap.com. Also Sky High Kites, 39 Dalton Crescent, Comber, N. Ireland BT23 5HE, tel/fax (01247) 874224 sells kites for such purposes.

RADIO RIDDLES

■ Last month:

I said: "The six-meter antenna system discussed above gives 16 dBd gain sending a signal to the moon, and 16 dBd receiving a returning signal. This gives 32 dBd gain." The riddle was then: "How then can we successfully use this antenna in EME work where we must overcome a path loss of over 250 dB?"

Well, in addition to increasing antenna gain, transmitter power can be increased to overcome path losses. And, as explained above, the use of a low-noise receiver front end also helps in high path-loss work when received noise is very low.

■ This Month:

Electric currents flow in or on conductors, right? Well, what causes radio waves to leave an antenna, and fly off into space?

You'll find an answer to this month's riddle, and much more, in next month's issue of Monitoring Times. 'Til then Peace, DX, and 73.

Rich Arland, K7YHA
P.O. Box 1782, Shavertown, PA 18708; email address: k7yha@epix.net

Mobile Installations

Be prepared—when you first get the desire to pack the family automobile full of radio gear, you may encounter some unexpected resistance from your spouse, kids, and, yes, even the local authorities. The local/state authorities can present quite an intimidating hurdle. Many municipalities, along with some state legislatures, seem to feel that placing certain types of radio equipment inside a vehicle is ominous enough to justify making it a violation of the law. These ordinances are primarily focused on scanner receivers, but any radio that can be made to receive police/EMS/public service frequencies (like many of the newer 2 meter and dual band VHF/UHF ham rigs) can possibly land you in hot water with the authorities.

Now you see it ... now you don't: The cupholder completely covers the PRO-2026 while the ICOM IC-24AT HT is safe in the glove box.

Therefore, I begin with this word of caution: *research the laws in your state before installing ANY type of equipment that will receive law enforcement/EMS or public service frequencies in your vehicle.*

Surmountable Installations

One of the first problems you will have to contend with is the total lack of suitable mounting space for radio equipment in vehicles manufactured over the last five years. Today's crop of new cars feature plastic, padded dashboards, sloping surfaces with graceful arcs—none of which are suited to mounting equipment. One item that is quite useful is the extra strong velcro™ strip sold by Radio Shack. Any relatively flat surface can be made to support radio gear using these strips.

Add to the physical obstacles the presence of multiple on-board computer systems in the newer cars (my Subaru has four computers), and the possibility of Radio Frequency Interference (RFI) or Electro Magnetic Interference (EMI) becoming a factor are quite high. Most automobile manufacturers will not warranty any computer modules if RF transmitting devices are installed in their vehicles.

RFI/EMI are very real problems that have to be addressed when installing any type of radio equipment in a vehicle. First, get the 800 number of your vehicle manufacturer's customer service center. Call them and explain your situation. Ask them up front if the vehicle's warranty is voided by installing radio gear. Then inquire if they have any recommendations or service data available that will help you with the installation.

Connect the DC power for the radio equipment *directly* to the vehicle battery. *DO NOT*, under any circumstances, use a cigarette lighter plug or fuse box adaptor to power the radio gear. RF can easily find its way onto DC wiring connected in this fashion and get into other systems inside the vehicle. Run the DC power cable directly to the vehicle battery, fuse both the negative and positive leads at the battery terminals, and you will have a head start on eliminating RFI/EMI, including annoying alternator whine. Should you encounter a stubborn case of alternator whine, Radio Shack sells several sizes and styles of hash filters that can be placed in series with the DC power cables to eliminate the problem.

Locate the antenna(s) as physically close as possible to the associated radio gear. Avoid long coaxial runs inside a vehicle. Find out where the various computer modules are physically located in your vehicle and do not route the coax anywhere near these areas. Line isolators (available from The Radio Works[1]) can be inserted at the output of the rig and at the base of the antenna to reduce any unwanted RF radiation by the coaxial cable.

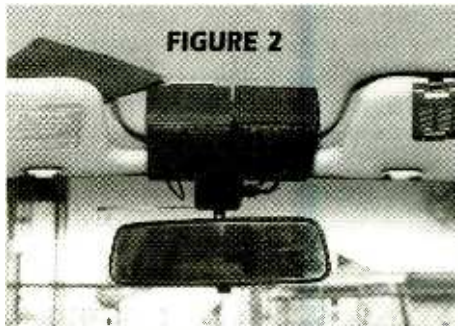
Ground is hard to find on newer car bodies. The trend toward lexan™ and polycarbonate body panels in today's vehicles create some interesting grounding and bonding problems. Check continuity from the car frame to negative battery terminal with an ohm meter. There should be *zero* ohms resistance.

In order to get a good electrical connection, you will probably have to scrape away some of the undercoating (an outstanding insulator, by the way) on the frame. You may have to resort to using some small coaxial braid straps to bond the hood, trunk, doors, etc. to the frame to insure that a good ground develops throughout the vehicle. This will also reduce much of the noise associated with mobile installations, where doors, hoods, and trunks vibrate, causing irritating static.

One trick I use when mounting more than one radio in a vehicle is to build up a power buss using multiple power connectors. This allows only one set of *heavy* wires to connect to the battery, but offers multiple distribution of DC power inside the vehicle. I'm currently using the Radio Shack 276-222 Molex™ connectors. By paralleling several of the connectors on one power cable, I can connect multiple radios to one power source with less hassle while reducing the normal rat's nest of wires.

Antenna Answers

We could spend a couple of columns on this subject alone! Generally, all antennas should be mounted on a large metal surface like the rear deck or roof of the vehicle. This provides a decent RF groundplane and increases the radiation efficiency of the antenna(s). However, times change. In order of descending priority, plan your antennas



Two small Radio Shack speakers on the ceiling fed with RG-174 subminiature coax provide full sound for the scanner and CB rigs.

around the lowest profile, most efficient, and highest gain. Why do I list low profile antennas at the top of the list? The less attention you attract with your mobile set-up the longer you will keep your gear. If a thief spots your antennas it is a sure bet he will case your vehicle for a future heist.

"But Rich, I have an anti-theft alarm system in my vehicle," you say. Yeah, so? How many times have we heard the "WHOOP, HONK, BEEP!" of car alarms in parking lots, only to witness people walking all around, not giving a second look to the vehicle making all the noise? In short, car alarms are 99.99% hype and .01% effective in deterring theft. Any knowledgeable thief can disable your car alarm within seconds. It's better to lower the profile of your mobile installation.

Low profile antennas are admittedly a trade-off : they are not necessarily efficient nor do they provide maximum gain. That's the price of going mobile today. I have used several of the Lakeview Company's[2] antennas over the last several years. They offer quality antenna products at reasonable prices, and I am very impressed with the overall performance.

The Lakeview HF Hamsticks™ are second to none for mobile HF. I currently use a 40 and 20 meter Hamstick with my NorCal Sierra CW transceiver and manage to have lots of fun running HF from the car. I also use Lakeview's on-glass VHF/UHF dual band cellular look-alike antenna on my Subaru. While not the most efficient, this low profile black antenna works quite well. My mobile VHF/UHF ham station consists of an ICOM IC-24AT dual band handheld in a cellular mount on the passenger's side of the console (see Fig #1a).

The Lakeview Company dual band antenna serves double duty since I also use it for my Radio Shack PRO-2026 100 channel scanner. A miniature A/B switch (also available at Radio Shack) is used to switch the on-glass antenna between the ICOM HT and the scanner. Since I cannot transmit on the handheld while the scanner is running (near field RF will incinerate the scanner front end device), the A-B switch is a necessary evil. It also lowers my antenna count, since I can use one antenna for two separate radio systems.

An additional Lakeview on-glass CB antenna sits on my left rear side window. This antenna offers a low profile design (short whip, black in color) and will not attract undue attention. This antenna provides me with what I believe a CB should be used for on the road ... listening. Outside of an emergency, I am not very interested in talking to anyone on 11 meters. I am, however, intensely interested in the location of speed traps, who has spotted Smokey rolling down the road, and where any traffic tie-ups might be.

Occasionally I like to run HF mobile equipment in the car. Unfortunately, Butch Shira, N4WHB, at Lakeview has yet to design and market a stealth version of his Hamstick HF antennas. So, a rear antenna mount (a steel bracket that is level with the top of the rear bumper) accommodates a single band Hamstick.

I have used the massive tri-magnet mount that Lakeview sells for mounting their HF Hamsticks on the roof or rear deck of a vehicle. While this is an ideal mounting method, yielding an extremely good ground plane and increasing HF antenna efficiency dramatically, my spouse has drawn the line, so I'm relegated to mounting the HF antenna(s) on the homebrew mount on the rear of the car. While this keeps the HF antenna quite low to the ground, it still allows HF operation. When I have no HF gear in the Subaru, there is no antenna mounted to this point, thereby reducing the overall visual profile of the car.

For the finale: I'll give you a tour of the cockpit of my Subaru Impreza wagon. Starting at the left of the steering wheel, mounted against the lower portion of the padded dashboard with velcro strips is a Cobra CB. This rig is mounted so it is difficult to see from the outside. In the center console, just below the pull out coffee cup holder, is the Radio Shack PRO-2026 scanner. This is an almost perfect fit into the hole meant for the cassette player. With the cup holder in the extended position, the face of the scanner is completely covered (see Fig #1b).

To the right, and down, is the cellular phone mount which holds my ICOM IC-24AT dual band handheld. I remove the HT and lock it in the glove box when out of the car. The coaxial cable with connector drapes over the mount giving an impression that the radio has been removed.

In the "normal" operating mode, the exterior of the Subaru has only two antennas (not counting the AM/FM radio antenna) and both of those are low profile, on-glass antennas, black in color. The Lakeview Hamstick is only added when operating HF mobile. From a short distance, it is difficult to tell that the vehicle has any extra radio gear installed.

I hope some of my mobile installation tips will help you design your own mobile radio shack. Until next time, have fun and **Keep It Simple**.

FOOTNOTES

[1] The Radio Works, P.O. Box 6159, Portsmouth, VA 23703 TEL: (804) 484-0140

[2] Lakeview Company, 3620-9A Whitehall Road, Anderson, SC 29624 TEL: (864) 226-6990 FAX: (803) 225-4565

ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ
bob@grove.net

Our Readers Answer:

Last month I posed several questions to our readers for their assistance; I wasn't disappointed. Special thanks to Doug Smith, Radcliffe Cutshaw, Grant Porter, Karl Zuk, and Robert Smathers for their knowledgeable replies, edited for space below.

Is a preamplifier transistor more likely to burn out from overload when the radio is on or off? Probably when it's on, but by an insignificant margin. When on, there is already some current flowing which heats the microscopic semiconductor material, giving it a head start toward burnout when additional current flows. But signal overload conditions that would burn out a transistor are so great that the on-or-off argument is immaterial.

Is there a universal code for entertainment center remote controllers? No. The chip sets in the remote controllers have the manufacturers' mutually incompatible codes preprogrammed, requiring the user to select which manufacturer he is using. Worse, there are many formats which differ by their encoding scheme: space, pulse, shift, and even frequency modulation, which could be 40 or 50 MHz. These options require a very flexible universal remote!

Is there a way to automatically detect and mute a TV commercial? Probably not, at least not dependably. There is no electronic cue, only "timing sheets" sent by the producers, allowing the control room personnel to follow the format of a program log to manually cut to a local spot. While the video will "dip to black" before and after a commercial, and a given commercial break may be the same length of time for a given program week after week, there is no sure-fire way to automatically detect the commercial break itself.

There are many other data cues, however, which ride along on the vertical interval signal which can be seen just above the picture. If you slightly misadjust your vertical hold control so the picture rolls slowly, you will see white dashes which correspond to closed captioning, data, network-to-affiliate text, and even some encrypted closed circuit audio—but no commercial cues!

With radio, it's much easier. Ever since the early days of network radio, there have been analog, and now digital, cues for logging and commercial breaks.

All this brings us to the question for this month: *Is there a simple, low voltage, solid state equivalent to the old high voltage Geiger counter tube that can be used for an inexpensive, pocket radiation detector?*

Q. I often listen to air-to-air refueling operations. Why does the radio become quiet when the refueling starts? I hear them again afterward. (James Ashe, Weymouth, MA)

A. After the boom operator connects, the crew uses a hard-wired intercom system to avoid any possibility of explosion from a spark from a radio transmission igniting the volatile fuel vapors. After the refueling, the snorkel is removed and radio ops are resumed.

Q. What are the satellite signals I hear on 150 MHz? (Louis Johnson, Doraville, GA)

A. You are hearing the Russian Cosmos series navigational satellites. They are in a polar orbit, so they come and go several times a day, receivable for a few minutes each pass. The Cosmos satellites have been in orbit for several decades now, and used by both military and civilian ground and maritime interests. The data transmission is in a simple RTTY style, but non-standard, so there is no readily available program to let you use it.

Bob's Tip of the Month

Helpful Hints for a Balky Sony 2010

Norris Howard of New Lebanon, New York, discovered a fix for a common problem experienced by owners of the popular Sony ICF-2010 portable shortwave receiver which he would like to share with fellow *MT* readers.

When the radio is jostled or twisted, its batteries may briefly break contact with their compartment, causing loss of preset frequencies and even clock settings, as well as interrupting reception. Years ago, Norris suggested to our readers that a quarter coin slid between the D cells improved the intermittent reception problem, but not the clock or memory presets which are supported by two separate AA cells.

Norris removed the radio's back cover panel and observed two things: a crack in the thin, positive end of the AA cell compartment, and a sharp burr on the D cell contact spring which was rubbing on a solder spot on the circuit board where it connects.

Norris jammed some soft gum rubber between the cracked end of the AA holder and a nearby molding fillet; that shored up the memory cells. He then burnished the burr with some emery cloth. Reassembling the radio, he found the intermittent problems gone for good.

Q. *What is the National Weather Service alarm tone which activates suitably equipped weather alert receivers? (Rob Martens, Cinnaminson, NJ)*

A. 1000 Hz.

Q. *How can I slow down the recording speed of a tape recorder? I've tried a resistor, but that didn't work. (Jerome Kaye, Far Rockaway, NY)*

A. You can't lower the voltage and still retain the stability of the motor. Professional slow speed recorders use a different size pulley for changing the gear ratio while maintaining the torque.

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*, or e-mail to **bob@grove.net**. (Please include your name and address.) The current "Ask Bob" is now online at our WWW site: **www.grove.net**

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Ads for **Stock Exchange** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.
Ad copy must be typed for legibility.

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word — *Subscribers only!*
All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue if camera-ready copy or, $85 if copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads, contact Beth Leinbach, 704-389-4007.

FM MICRO BROADCASTING: Transmit many miles. 88-108 MHz. PLL. Kit or assembled. Mono/stereo, 1-100 watts. Call (604) 642-2859. R. Scott Communications.

HOME AUTOMATION. Become a dealer in this fast-growing field. Call (800) 838-4051.

GE SUPERADIO III, custom designed with up to four noise-free SCA channels. Performance guaranteed. Credit Card orders accepted. (800) 944-0630.

SOUP UP YOUR RADIO with extra-narrow AM and FM filters, internal antenna booster, alignment, modifications, all done in our lab! Send $.32 stamp for details. Worldcom, Box 3364, Ft. Pierce, FL 34948. (407) 466-4640.

TEST EQUIPMENT BONANZA! Free Shipping! Bird 4411W wattmeter, like new; elements for 2-30, 144-520, 400-1000 MHz, leather case. Orig. cost $1383 (order TIN75 $699.95). HP 333A distortion analyzer, good (UTST3 $99.95). Wavetek/CT Systems 3000S service monitor, like new, cost $5000 (UTST4 $2399). Tenma 72-730 dual trace, 35 MHz oscilloscope, like new, cost $600 (UTST5 $299). HP 680D signal generator, 10-420 MHz (UTST6 $199). Grove Enterprises, P.O. Box 98, Brasstown, N.C. 28902. 1-800-438-8155.

BRIGHTEN UP YOUR SHACK! Eleven page Compendium filled with ideas, tips, and instructions for building Illuminated Maps. Send $6.00 (TX res. add $.050 tax) to Pineapple Paradise Radio Co., P.O. Box 370692, El Paso, TX 79937-0692.

FOR SALE: ICOM R9000, ICOM R7000, ICOM R1, JRC 525 w/spk., Kenwood 5000. Call Billy (330) 533-2478, (330) 782-2086.

UNIDEN 2500 HANDHELD SCANNER, full 800 restored, $200. Uniden 120, no 800, priced at $100. 1-704-746-8792.

FOR SALE: ICOM R7100 Receiver, full coverage (800 MHz) and UT36 Voice Synthesizer, like new, $1,195.00. Call Bob at (607) 785-3420 after 4 PM.

QUITTING HOBBY! Lots of new and used scanners, radios, and accessories for sale. Good prices ... great stuff! SASE brings GIGANTIC listing. Larry Wiland, 292 South Turner Rd., Youngstown, Ohio 44515.

McINTOSH MR-78, considered "simply the best" FM tuner ever made (*MT*, July '93 p. 48), MINT $1050. McIntosh MR-80, upgraded version of MR-78, $1150. (412) 243-1569.

FOR SALE: AOR AR-1000 scanner. Like new condition. $250.00. I ship. Call Don, 610-683-7373.

JPS ANC-4, like new, $135.00. MFJ 1020A, like new, $40.00. WB9YCJ/6, 714-564-9010.

FOR SALE: Magnavox 2999, $200.00. Panasonic 2200, $100.00. Grundig YB 400, $125.00. All excellent, with manuals. Prices firm, including UPS. Call Pete, (205) 773-5505; FAX (205) 773-1456.

SELL OR TRADE FOR SCANNER with cellular, Hallicrafters Model S-38C, good working condition, but not mint. (613) 729-0861 evenings.

AR-1500, 500 kHz-1300 MHz handheld; mint condition with Grove FCC database on CD-ROM, $325.00. Also Regency HX-1500 Handheld with drop-in charger; mint in original box, $100.00. Call Bob, (810) 887-3786.

YUPITERU MVT 7100. New in box including all accessories. Call Fred (312) 467-9810 daytime, or (708) 352-0808 evenings.

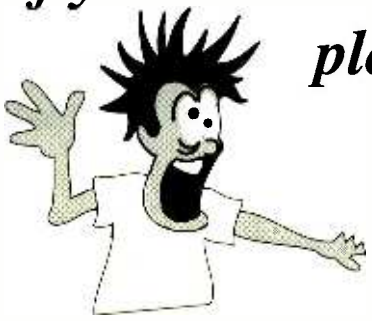
OPTOELECTRONICS SCOUT MODEL 40 and R-10 Interceptor. Mint condition in original boxes. $500 takes both units. (701) 282-0448.

RS PRO-2030 BASE SCANNER—80 channels, plus 10 monitor. 800 MHz, instant weather, $125.00 plus shipping takes it. SPECIAL OFFER: Give me some local cities, and I'll program the freqs for free. Call Jay Mattes (201) 391-1285 or e-mail Jaeburd@gnn.com.

RADIO SHACK PRO-2006, like new in box. Bill Cheek modification with computer interface and software for control and downloading frequencies. Cellular restored. $475.00. Call Ken at (803) 651-2988.

PRO-46 HANDHELD scanner, 100 channel, 29-956 MHz, cellular restored. New in the box. $325.00. Call or fax Thomas at (513) 661-1234.

If your MT *is just a little late— please don't panic...*



If you haven't received your *Monitoring Times* by the beginning of the month, please remember that postal delays do occur, and we must wait until the 10th of the month before sending replacements for lost issues. If you don't have your *MT* by the 10th, call us at 1-800-438-8155 and we will be happy to send a replacement.

CLOSING COMMENTS

By Bob Grove, Publisher

What the Heck is PCS?

Several months ago in our sister magazine, *Satellite Times*, I presented an editorial in which I challenged readers to list as many devices as they could which would legitimately belong to the emerging PCS industry. Not only did I not receive any accommodating lists, I didn't receive a single reply! With thousands of *ST* readers exposed to the challenge, the lack of reponse was startling.

There are several reasons that I found the lack of replies disturbing. First, most of the proposed systems use satellites, so *ST* was a logical platform to pose the question; secondly, untold billions of dollars are being expended by the aerospace and telecommunications industries to satisfy a market that apparently doesn't even know it exists; and thirdly, traditional radio systems have been losing enormous chunks of spectrum to an immature, speculative technology.

Even the abbreviation "PCS" is only vaguely understood, interpreted differently among different interests. Personal Communication(s) System(s)? Personal Communication(s) Satellite(s)? Personal Communication(s) Service(s)? Let's at least get *that* right: It's Personal Communications Services, as originally defined by the Federal Communications Commission (FCC). The Commission continues to define PCS as "radio communications that encompass mobile and ancillary fixed communication that provide services to individuals and businesses with a variety of competing networks."

But don't we already have personal communications? How about CB, ham radio, GMRS, low power walkie-talkies, and the new Family Radio Service? Certainly, but these are more incidental, discretionary forms of communications. PCS is nearly exclusively digital, handles massive amounts of data exchange, operates at microwave frequencies (typically 900 and 1900 MHz), is relayed by satellites, time-shares frequencies with multiple users, may be networked, and is a primary facility, not a hobby.

With range-extending satellites, PCS will allow worldwide telephone access, Internet by wireless terminal, two-way paging and messaging services (SkyTel and Motorola are already up and running), business telecommuting, small office/home office (SOHO) interconect, and tiny wireless handsets at lower cost than cellular services.

But the satellites are only starting to be placed; the imposing Iridium program intends ultimately to have a constellation of several dozen low-earth-orbiting (LEO) satellites enabling personal communications worldwide.

With PCS, you will be able to sit on a sunny beach and use your voice/keyboard unit to talk to the office, answer correspondence, access files, cruise the Internet, check your phone messages at home or at the office, even check on household security and temperature, or start dinner. And how about calling up your shortwave receiver to catch that elusive DX, or accessing your scanner from some distant location to pick up local emergency activity—or even controlling your home ham rig while you're out of town?

Tiny pocket pagers will allow you to reply to callers, and recover several minutes worth of stored voice messages at the touch of a button. Medical patients and supervised felons alike wearing radio devices may be monitored continuously, regardless where they go—the same technology providing solutions in radically different situations.

Utility and convenience are the watchwords for PCS; I'm sure that you can think of many more applications we haven't touched on here, and many more will become evident as we watch this amazing era emerge. In coming months, *MT* will continue to bring you up to date on this exciting new technology and how it will affect your life.

THE ALL NEW Xplorer

HEAR IT, SEE IT, DECODE IT, MAP IT*, RECORD IT...

The all new **Xplorer**, everything you ever asked for in a handheld instrument.

The Xplorer offers All Mode Communications Decoding.

CTCSS Mode

DCS Mode

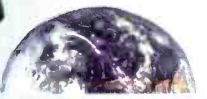
DTMF Mode

Additional Display Modes:
- Latitude/Longitude Mode
- Signal Strength Mode
- Deviation Mode
- LTR-Trunking Mode

FEATURES

- High Speed FM Communications Nearfield Receiver sweeps range of 30MHz to 2GHz in less than one second
- Two line character LCD displays Frequency and either All Mode Decoding (CTCSS, DCS, DTMF), LTR-Trunking, Relative Signal Strength, Latitude and Longitude, or FM Deviation with automatic backlight
- NMEA-0183 GPS Interface provides tagging data with location for mapping applications*
- CI-V compliant Serial Data Interface with both TTL and RS232C levels
- Frequency Recording Memory Register logs 500 frequencies with Time, Date, Latitude, and Longitude information
- Real-Time Clock/Calander with battery back-up
- Frequency Lock Out, Manual Skip, and Auto or Manual Hold capability
- Tape Control Output with Tape Recorder Pause control relay and DTMF Encoder for audio data recording
- Rotary Encoder for easy selection of menus for setup
- Internal Speaker, Audio earphone/headphone jack
- Miniature 8-pin DIN Serial Interface port for PC connection
- Relative ten segment Signal Strength Bargraph Mode
- Numerical Deviation Mode with 1-10kHz and 10-100kHz ranges
- Includes Built-in Rapid Charge NiCad Batteries with 8 hour discharge time and a Universal Power Supply

**Software for mapping applications is planned by third party Software Design Companies. Inquire about the availability and specific Companies to contact.*



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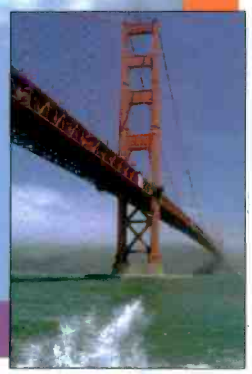

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