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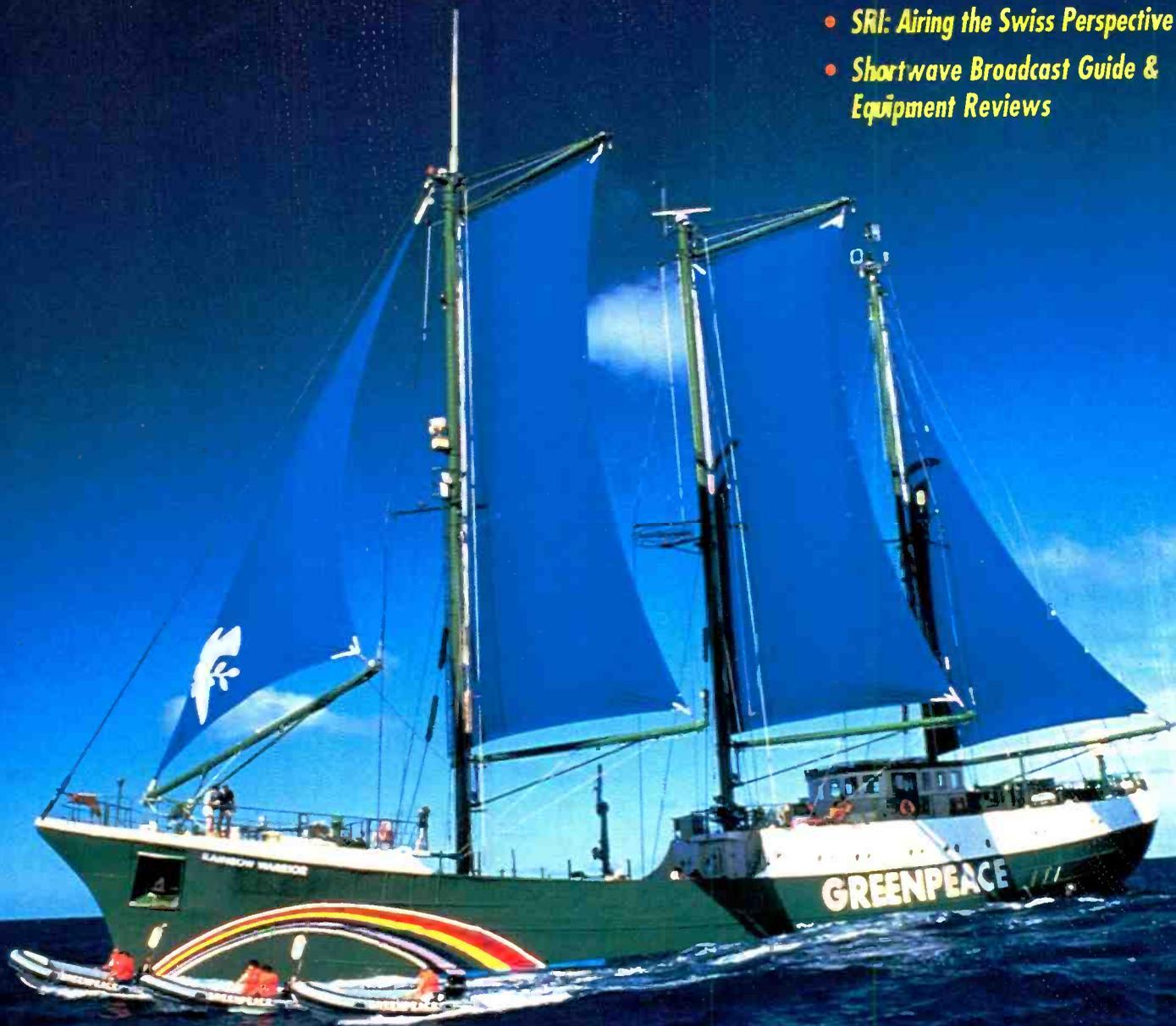


# Monitoring Times<sup>®</sup>

The Full-Spectrum Radio Magazine

A Publication of Grove Enterprises, Inc.

- *England's WWII Code Crackers*
- *SRI: Airing the Swiss Perspective*
- *Shortwave Broadcast Guide & Equipment Reviews*



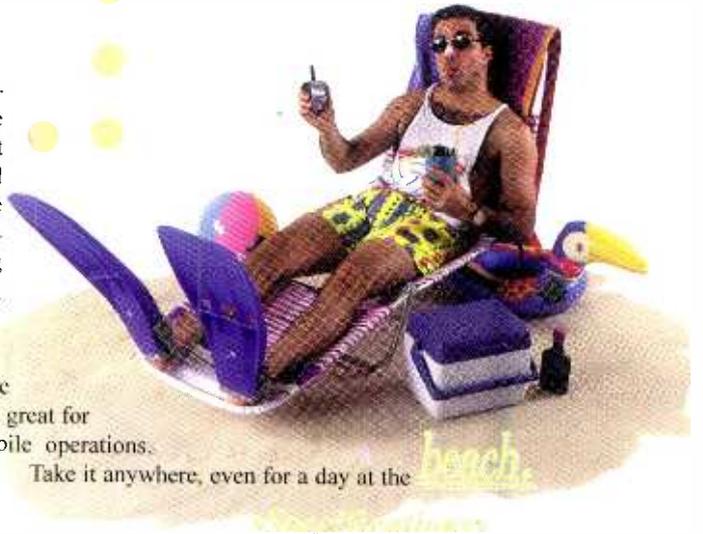
*Monitoring the High Seas Drama of*

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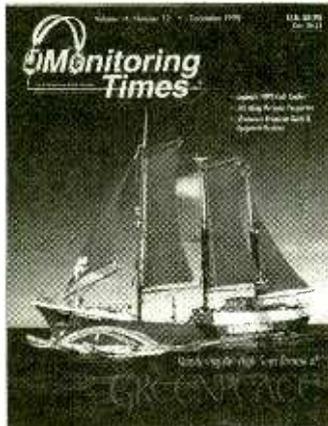
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Cover Story

### **Monitoring the High Seas Drama of Greenpeace**

**By Jim Pogue**

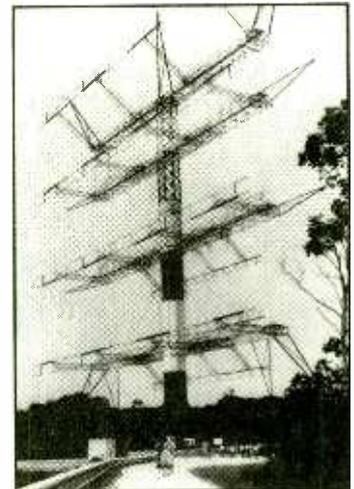
France's determination to conduct a series of nuclear tests between September 1995 and April 1996 has incited a head-on conflict once again with the conservation activists of Greenpeace. Radio monitors from the South Pacific and North America have reported hearing Greenpeace communications on maritime and amateur radio channels.

Although the first blockade ships have been impounded, look for more boats to be recruited as the action continues. See page 9 for the story. Cover photo copyright Greenpeace/Grace.

### **Swiss Radio International .....14**

**By Dean Mahin**

At first glance, SRI's broadcasting mandate seems very insularæby the Swiss for the Swiss. Remember, however, that to be Swiss generally means to possess a heightened global consciousness, so you may find SRI's programming has a global appeal.



### **Bletchley Park: The Golden Goose Cackles .....20**

**By J. Wandres**

Preserved from destruction in the nick of time, England's Bletchley Park opened in the summer of 1994 as a museum to the work of the Allied code breakers of World War II. As many as 7,000 British, Canadian, American, and European specialists worked here, engaged in activities so clandestine they are scarcely spoken of even today.

### **The Wisdom of Informed Scanning.....24**

**By Otto Muller**

You've heard the saying, "You can't tell the players without a program." Actually, knowing the program may change the game entirely. Get informed about the agencies and the voices on your scanner, and it will change the way you listen.



### **Grove Expo, Volume VI.....28**

**By Bob Grove**

A pictorial look at the 1995 Grove Communications Expo.

## DEPARTMENTS

### Equipment and Reviews:

Are you confused about what to buy or whether to buy when it comes to shortwave radios? Larry Magne looks into his crystal ball and offers some sage advice (p. 102). Bob Parnass isn't using a crystal ball; he's turned the magnifying glass on Radio Shack's new PRO-2040, with mixed results (p. 100).

The Kiwa medium-wave loop gets top marks from *MT* staffer Larry Van Horn (p.97), while Antenna Topics' author Clem Small takes an over-all look at loop antennas and what they can do for you (p.110). You'll find book reviews, new software, computer tips, and more in this and every issue of *Monitoring Times*!



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# MT

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# Scanners/CB/Weather Stations

## New Scanner Products Available

Now it's easy to purchase communications, emergency management supplies, weather forecasting equipment and more directly from Communications Electronics Inc. Your free fax-on-demand catalog including unadvertised specials is instantly available by calling 313-663-8888 from your fax machine.

## Bearcat Scanners

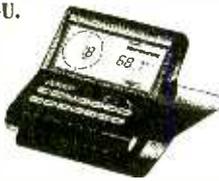
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Bearcat 80XLT-U handheld with 800 MHz .....	\$144.95
Bearcat BCT7-U information mobile .....	\$168.95

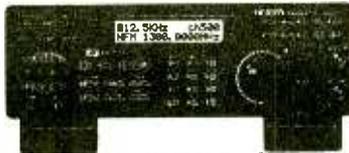
## Weather Stations

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If it weren't for the Christmas catalogs appearing in my mailbox, I would find it hard to realize that you will be reading this during the height of the winter holiday season. Frankly, my mind is still taken up with images of the Grove Communications Expo, just completed a few weeks past. For the first time in six years, I prevailed upon Bob Grove to write the wrap-up report, which you'll find in this issue. His closing words struck me as very apropos: "The Grove Communications Expo is a pilgrimage."

I began to think about it: the Grove Expo has become somewhat of a pilgrimage, but who are the pilgrims? The hams have the Dayton Hamvention—it's often said every ham has to go at least once (and I no doubt will); the shortwave DXers have the Winter SWL Festival in Kulpville, Pennsylvania; and I understand the National Scanning Convention last summer in Lancaster, Pennsylvania, may have the makings of an annual scanner pilgrimage.

The Grove Expo is unique among these. It is a love affair with radio which has produced many children—each one of them different. Like proud parents, we try not to play favorites, for each one has its place and its role to play. One child, now coming into maturity and taking its full place in the family is, of course, satellite monitoring.

You might say that *Monitoring Times* and the Grove Expo represent a kind of "renaissance" approach to the hobby. Probably few folks epitomize the well-rounded, well-versed, and ever-curious hobbyist better than one staff writer, who began as an *MT* subscriber with issue no. 1. Larry Van Horn, who got his first "real radio" thirty years ago this Christmas, loves radio in all its forms, but especially mediumwave DXing, amateur radio, shortwave utilities, and satellite listening. (He's also married to a shortwave broadcast DXer, and is father to a budding mediumwave buff!)

Being well-versed in more than one aspect of the hobby isn't a prerequisite to finding a niche at the Grove Expo. However, there is something to be said in this era of racial, national, and political divisions for a magazine and an event that encourages rubbing elbows with folks with a different passion from one's own. Yes, there are other places for hobbyists with a single-minded focus. But anyone who loves radio in any form owes it to himself to make a pilgrimage, at least once, to the Grove Expo.

### An MT Honor Student

It's very gratifying to receive letters such as this one from Sharon Cenna of Westlake, Ohio; we must not be falling too far short of the mark.

"Thank you for the wide range of radio topics that you cover in your monthly publication. About two years ago I decided that the children were growing up and I needed a hobby. Radio has more than filled the bill! I now have a Novice ticket, and Tech plus; have a scanner, CB, 2M/440 radio, and SWL equipment. I've even participated in a demonstration in my 6th grader's science class last year. None of this would be possible (or at least as easy), without carefully learning from *MT*. I consider it a classroom in 120 pages!"

### Cite the Site

Tad Cook from Seattle, Washington, noticed, "on page 7 of the November issue you have a news item titled 'Radio Saves Man Buried Alive,' which it says happened in Montgomery County, Washington. The state of Washington does not have a Montgomery County. About half of the other states have one, but not Washington."

It may not apply in this case, but Tad's



*John Babbis (left), monitor for the Voice of Greece and frequent contributor to the MT Shortwave Guide section, was honored with a visit to his radio shack in Silver Spring, MD, by Demetri H. Vafeas, Chief Engineer of VOG in Athens. (Photo by Despina Vafeas)*

note gives me the excuse to make a point. Do you realize how often there is absolutely no clue on either side of an entire newspaper page as to its geographic region? When you send in news clippings, be sure to note the city and state if it's not obvious by the name of the newspaper. In this case, I can only make an educated guess that, with the words "Montgomery" and "Washington" occurring together, the incident likely occurred in Washington, DC, or just outside it in Montgomery County, Maryland. We apologize for not getting it right—wherever it was.

### Top of the List

Tom Osenkowsky responded via Internet to the November feature on *15 Mistakes to Avoid in Buying a Scanner*. He feels the article "omitted the first and foremost priority when buying a scanner. That is, 'Never buy a scanner or receiver that does not feature up-conversion.'

He says, "I know this bounces out a lot of equipment, but nothing beats up conversion (at least three stages). For example, if a signal is there on an R-7000 or R-7100, you can believe it's there and not an image. Although some of the Radio Shack models are up conversion schemes, their plastic cases and lack of shielding make them less than ideal for the serious listener.

"In any event, this is 1995, not 1945. Up conversion should be a de facto prerequisite for the purchase of any receiver."

*(Continued on Page 114)*





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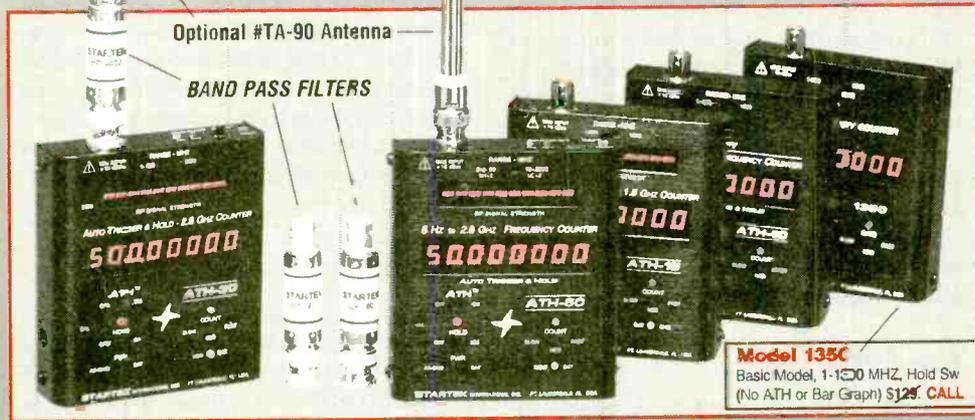
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#RD-450	450 MHz Rubber Duck Antenna .....	16
#RD-800	Cellular phone band RD Antenna .....	16
#P-110	200 MHz 1X-1CX Probe .....	39
#LP-22	Low Pass, Auto Probe .....	25
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## The Ultimate Crank Call

Donna Graybeal of Massachusetts noticed a pattern immediately. Her phone would ring every 90 minutes, day and night, like clockwork. And it did it 2,688 times. Something was wrong. She would answer, only to hear what sounded like a rush of air, a click, then a dial tone.

2688 times?



"It drives you absolutely out of your mind," Graybeal told reporters. "I thought, talk dirty to me. Do something. This silence is driving me crazy." Finally she called police, who traced the calls to the Potomac, Maryland, home of Theodore and Elisabeth James. But, the James' weren't making the calls— an oil tank in their basement was doing the dialing. Old and unused, the tank had been sitting in the basement, equipped with a device that automatically dials the oil company wherever the fuel runs low.

"Poor Donna had been harassed for months by our oil tank," said Elisabeth James.

Bell Atlantic officials called it strange and unprecedented. Steuart Petroleum said the redialer was a short-lived test eight years ago, which was discontinued. The tank was dialing an 800 number that the company had dropped. Graybeal had obtained the 800 number for her food service equipment repair company. She also obtained a mechanical prank caller.

Nobody knows what brought the autodialer to life. Sounds like a case for the *X-Files*.

## Chatty Burglars

Three teenagers who broke into a landscaping company's offices and stole three portable radios were caught shortly after when police heard the radio calls and recognized the thieves' voices.

"They weren't exactly rocket scientists," a police official said.

The three teens in Ephrata, Pennsylvania, stole the radios from Martin's Landscaping, ran into a cornfield and then headed home, chatting on the radios all the way. When police and business owners checked the business to see what was missing, they heard the youths using the two-way radios.

Police recognized the boy's voices and went to their homes, where they found them still talking on the radios. The youths were arrested on charges of burglary, theft, and criminal trespass.

## Lookie-Loo Gets Clipped

A Jacksonville, Florida, man who repeatedly showed up at the scene of police calls was arrested and charged with illegally monitoring police radio traffic. 41-year-old David Randall Boyd, a self-employed window washer, violated a city ordinance that prohibits monitoring police from a motor vehicle or business. Monitoring from a home is still permitted.

Police responding to a burglar alarm spotted Boyd's scanner mounted in his car. They also saw a 5-inch TV screen mounted on the dash, which is a traffic violation. Boyd was released upon posting bail.

## Federal Aero Monitoring

This could provide some interesting monitoring. The Bureau of Alcohol, Tobacco, and Firearms (ATF) — perhaps the most controversial agency in the US government — has begun to assemble its own air force. According to reports in the *Washington Times*, the ATF is now operating 22 North American OV-10D Broncos. Broncos were designed in the early 1960s as a light attack aircraft suited to anti-guerrilla operations.

The Bronco is capable of carrying 4,000 pounds of ordnance at speeds of up to 350 knots. ATF spokesman Susan McCarron insists that their Broncos will not be used for bombing. "They will be used for surveillance and photography purposes."

## Fire Radio Static

Firefighters in Kansas City, Missouri, are criticizing the city's new emergency radio system, saying that flaws could endanger the lives of firefighters and police officers. The \$18 million 800 MHz radio system has had recent problems, ranging from repeated failures of handheld radios and blocked signals within buildings, to failure of alarms to sound at area fire stations.

"It is a constant day-to-day problem and it's going to get one of us killed," said firefighter Chris Gussman. "We've got to be able to communicate." City officials said that they are working with Ericsson, Inc. to solve the problems, which have so far run up a repair tab of nearly \$1 million.

Same story. Only the city changes.

## General Wireless Communications Service

The FCC has created a new General Wireless Communications Service that will operate in the 4660-4685 MHz band. This band has been used by the military for some time for such things as point to point links and video/data links, but it was determined that a small portion could be taken for other use with no detriment to military communications.

## Refarming Rules Change

The FCC, attempting to make more efficient use of the radio spectrum below 800 MHz, recently established a narrowband channel plan based on current channel centers. Channels will be listed every 7.5 kHz within the 150-174 MHz band and every 6.25 kHz within the 421-430 MHz, 450-470 MHz, and 470-512 MHz bands.

The transition plan for equipment has been helped along with the adoption of a plan in which users will not be required to replace their existing systems. Only narrowband equipment will be type-accepted over the next ten years.

By August 1, 1996, new equipment must be type-accepted for 12.5 kHz or less channels, or on 25 kHz channels for narrowband efficiency. By January, 2005, new type-accepted equipment must be designed to operate on channels of 6.25 kHz or less or on channels up to 25 kHz for narrowband efficiency.

## Cellular Satellite Rescue

The Ford Motor Company recently announced the Lincoln Remote Emergency Satellite Cellular Unit, conveniently called Lincoln RESCU. The system uses GPS to compute the location of cellular callers who are in need of help on the roadways. A driver simply activates a two-button device in the vehicle's overhead console, which takes control of the cellular phone and automatically dials the Westinghouse Emergency Response Center in Irving, Texas.

Information transmitted includes type of assistance needed (emergency or roadside), VIN number, location, and call back phone number. The operator confirms the request and the location of the call, contacts the local PSAP (Public Safety Answering Point) and directs them to the call. Lincoln RESCU will be manufactured for Ford by Motorola and will ship in late 1995. The system will be an option on 1996 Lincoln Continentals.

### But I've Got the Transmitter!

Eastern Bohemia's most popular radio station is off the air due to a dispute between the owners. Martin Cerny, the station's license holder, said that the studio was completely cleaned out and not even the fax machine was left behind. Technicians discovered a group of strangers wandering through the building, removing equipment. There have been arguments among the owners, and partner Cerny recently moved the broadcasting equipment. His partners moved it back, but they can't broadcast without a transmitter, of which Cerny is in possession.

### No Cell Towers in My Backyard

The Warren County, Michigan, Planning Commission stunned cellular providers recently when they voted unanimously to reject proposals to build a cellular tower next to a senior citizens apartment complex. Residents and city staff were strongly against the proposal, which would have erected a Cellular One tower next to the Joseph Stillwell Senior Apartments and nearby single family homes. The decision to turn down the new tower was said to be based on the lack of conclusive evidence that cellular transmissions won't harm human beings.

### Hams Work During Hurricane Marilyn

When Hurricane Marilyn swept through the US Virgin Islands, it was two guys in a old Spanish fort that kept local and federal officials informed of what was happening.

"When everything went down, ham radios were still working," contends Steve Siddons who, with Carlos Rodriguez, bunkered in the Puerto Rico Civil Defense Headquarters. The two relayed faint radio signals from the islands - signals that told of the hurricane's destruction.

Siddons said, "We lost the signal from St. Croix at one point, but we knew well before



it went down that the US Virgin Islands were in big trouble." Siddons and Rodriguez belong to the UN Radio Readiness Network which goes to full alert during natural disasters.

(Service agencies such as the American Red Cross have greatly depleted their funds while responding to the natural disasters of 1995. This aid is provided free of charge by volunteers. You can help restore their Disaster Relief Fund by calling 1-800-HELPNOW.)

### RF Safety Guidelines

The US Environmental Protection Agency, citing inadequate funding levels, has failed to issue RF radiation exposure guidelines, leaving citizens to wonder if their health is in danger. Cellular phones and cell site towers are the latest concern, but the EPA can't say whether



there are any adverse health effects from these transmissions. Non-ionizing radiation is not as well known as ionizing radiation, though it is known that radio waves can heat living tissue. There is also growing evidence that radio transmissions cause adverse effects on humans.

The FCC, failing to get any guidance from EPA, has decided to use non-government standards for RF safety. The standards will regulate RF exposures around amateur radio stations for the first time. The guidelines also have restrictions on RF fields below 100 MHz, including low-power handhelds and cellular phones. Two-meter, 1.25 cm, 70cm, and 23 cm handhelds whose antennas are close to the body would be affected.

The guidelines mostly follow common sense, such as using the minimum power necessary, minimizing transmission time, and mounting antennas as high as possible. EPA claims that these measures would not be restrictive enough, but it is unclear whether or not they will finally issue their own set of standards.

### Olympic Frenzy

Local television stations in Atlanta, Georgia, are brainstorming ways to beat the influx

of satellite trucks and radio transmissions that will hit the city during the '96 Olympics. Out of town stations are expected to cause traffic and airwave jams as they jockey for parking areas and microwave frequencies to transmit on. Several local stations are pooling resources and plan to run fiber optic feeds.

"Communications" is written by Larry Miller with help from Laura Quarantiello, Rachel Baughn and the following readers who are members of the Communications Media Monitoring Team: George Beard, Kansas City, Kansas; Louis "Sammy the Scanner" Campagna, Philadelphia, Pennsylvania; Oliver Cooney, Jenkintown, Pennsylvania; Charles D. Gossett, Nashville, Tennessee; Tom Hodge, Jacksonville, Florida; Maryanne Kehoe, Atlanta, Georgia; David McBeth, Amesbury, Massachusetts; Jack McCartan, Newark, Delaware; Denny Murr, Mountville, Pennsylvania and Pete Romeika, Rosemont, Pennsylvania. We also consulted the following publications and we list their names in appreciation; *Atlantic Flyer*, *BBC Broadcast Information*, *National Scanning*, *Radio World* and *W5YI Report*.

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With the Scout's Memory Tune feature™, the AR-8000 can be tuned later to a frequency logged into memory on the Opto.

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# Monitoring the High Seas Drama of

The S.V. Rainbow Warrior was sunk by the French secret service in 1985. A crew member was killed in the explosion.

# G R E E N P E A C E

© Greenpeace/Robin Culley

By Jim Pogue

The S/V *Rainbow Warrior II* and M/V *Greenpeace* sailed just inside a 12-mile military exclusion zone around Mururoa Atoll, 750 miles southeast of Tahiti. Keeping the Greenpeace ships company, several small yachts and other private vessels with names like *Pickety Witch*, *Sudden Laughter*, and *Aquila D'Oro* skittered across the crystal blue Pacific waters. Steaming near the rag-tag fleet to keep a close eye on things was the Royal New Zealand Navy oceanographic research vessel *HMNZS Tui*. The *Tui* carried two members of the New Zealand Parliament. French warships, ever threatening, closely watched their every move.

Friday, Sept. 1, marked the beginning of an extended period during which the French government planned to conduct seven or eight nuclear detonations at the Mururoa site. Nuclear warheads for France's new *Triomphant*-class submarines and a new air-to-surface missile are among the systems being tested. The Greenpeace vessels' purpose was to prevent the tests from taking place. Just after 5:30 a.m., a team of

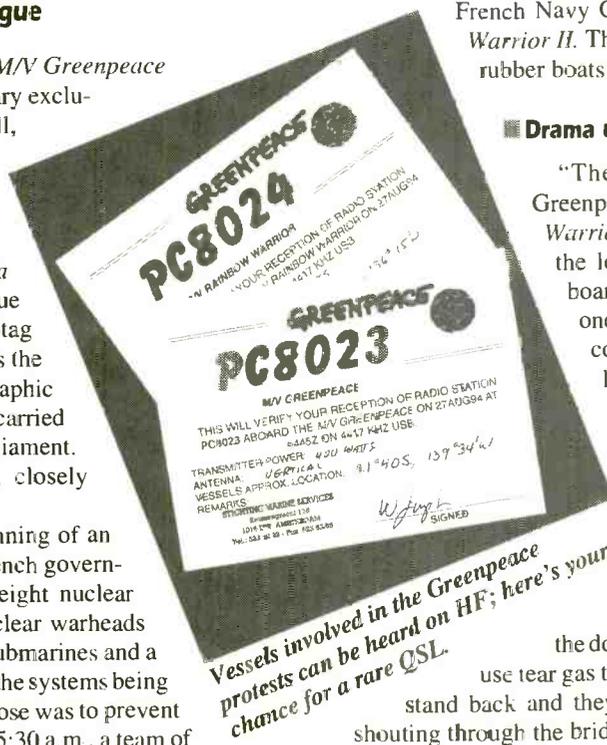
French Navy Commandos stormed aboard the *Rainbow Warrior II*. They climbed up the sides of the vessel from rubber boats and descended on ropes from helicopters.

## ■ Drama unfolds as French seize vessels

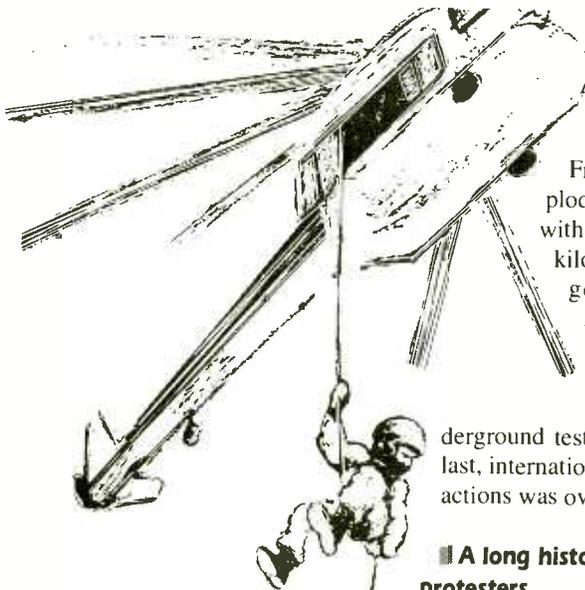
"They have just come alongside," said Greenpeace's Stephanie Mills aboard the *Rainbow Warrior II*. "They've put this grappling hook on the lower deck. There is one commando now boarding. They are dressed in black...there is one coming on board. They've boarded," she continued over an INMARSAT telephone link.

The urgency in her voice mounted as she continued, "There's now about six or eight on board. One is now on the bridge and he's ordering people around. He's just ordering everybody to stop, to sit down...They are coming to the bridge now."

As Greenpeace activists blocked the door to the bridge, the commandos prepared to use tear gas to gain entry. "They are telling everybody to stand back and they've got canisters of some sort. They are shouting through the bridge window."



*French Navy Commandos storm the Rainbow Warrior II. (Drawing by Emily Short)*



Mills, speaking from the vessel's radio room below decks, said, "...they have pushed our cameraman (on the bridge) over. We can't see anything except the sea and somebody's feet at the moment." After a brief pause she continued, "...I can see the bridge now...our first mate is on the bridge...I can see them tapping on the windows through the outside..." And then the connection was broken.

It was later learned that 19 commandos smashed communications and satellite equipment with sledge hammers, cut radio room cables, and ultimately took everyone aboard captive. A few hours later, a similar raid took place aboard the *M/V Greenpeace*, when a Greenpeace helicopter allegedly flew over the test site, filmed military facilities, then landed on the vessel. Both vessels were towed to Tahiti, and French authorities placed ev-

eryone aboard in detention.

Four days later, on Sept. 5, French authorities exploded a nuclear device with a yield of over 20 kilotons under the lagoon at Mururoa Atoll. Although French President Jacques Chirac has said the underground tests will be France's last, international outrage at their actions was overwhelming.

■ **A long history of power vs. protesters**

Greenpeace and the French government have a long history of disagreements and ensuing altercations. France conducted its first nuclear tests in Algeria in 1960. Testing was moved to the Pacific in 1966, with scores of atmospheric and underground tests at Mururoa and nearby Fangataufa Atolls.

In 1972, the Greenpeace yacht *Vega* sailed into the French test site at Mururoa.

It was rammed by French warships and towed to Mururoa. The next year another Greenpeace vessel, the *Fri*, was boarded and its crew detained. Later the *Vega* returned to the test site and its skipper, David McTaggard,

was severely beaten by French commandos. Perhaps the most dramatic and tragic in-

cident between Greenpeace protesters and the French took place in 1985. While Greenpeace was preparing to sail the vessel *Rainbow Warrior* to Mururoa, it was blown up in Auckland Harbour, New Zealand, by French secret service agents. A crew member, photographer Fernando Pereira, was killed in the explosion.

The *Rainbow Warrior* was later raised from Auckland Harbour, towed further up north on the New Zealand coast, and sunk in a bay there as a memorial to photographer Pereira.

Through the 1980s, Greenpeace stayed involved in nuclear protest activities in the Pacific. A new *Rainbow Warrior* was launched in 1989, and it first visited Mururoa to conduct water sampling in 1990. In 1992, French President Francois Mitterrand announced a 12-month moratorium on French testing, to be extended if other countries followed suit. The world breathed a guarded sigh of relief.

■ **Tensions mount again as French announce more nuke tests**

In early 1995, things began to heat up again when France announced it would resume limited nuclear testing in the Pacific. Greenpeace immediately picked up the pace of its activities with a variety of protests. The dispute between Greenpeace and the French government continued to escalate until the attack on the two vessels Sept. 1.

For a month or so prior to the capture of the two vessels, radio listeners from Australia to Virginia had the unique opportunity to tune in a variety of communications from and related to the Greenpeace vessels. Using reasonably simple equipment, a variety of civilian and voice communications over HF radio frequencies gave listeners a firsthand look



*The New Zealand naval vessel HMNZS Tui, with two parliament members on board, kept a watch on the French actions against Greenpeace protest ships.*

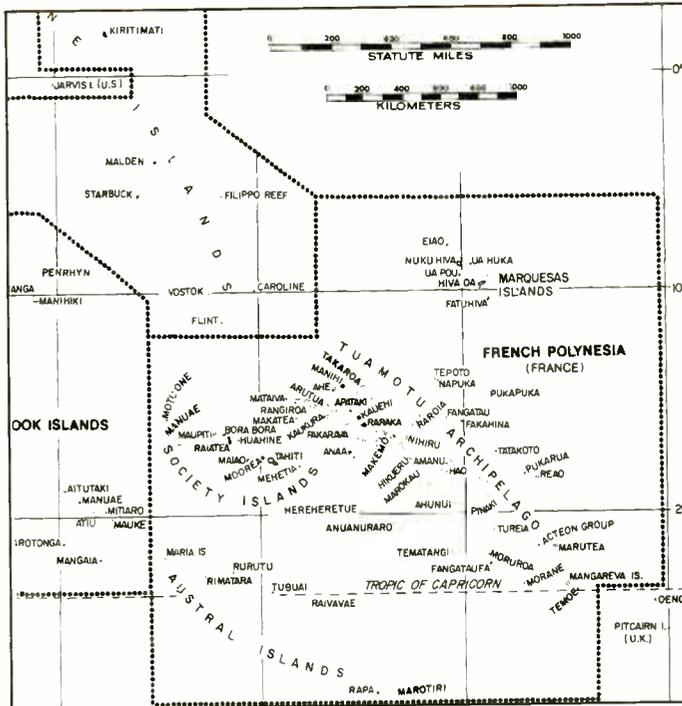
into an exciting global news event.

**■ South Pacific DXers first to pick up protest fleet**

Listeners from "down under" were the first to tip off North American DXers that there was much to hear. One New Zealand listener even mentioned he had a personal friend embarked aboard one of the protest yachts. Word quickly spread throughout the utility DX community, primarily through postings on the WUN (Worldwide Ute News - see page 78 in the July 1995 issue of *Monitoring Times* for more on this electronic club).

Amateur radio was pressed into service, and resulted in some of the first signals heard. Twenty meters was the place to be, with

14,315 kHz USB a good place to catch the ships checking with the folks back in New Zealand and Australia.



*750 miles from Tahiti marks the site of a political storm, as the French continue their nuclear testing.*

Several commercial and government marine radio stations also pitched in to help ensure the safety of the ad hoc fleet. Weather reports were broadcast from KeriKeri Radio on the northern tip of New Zealand, Raoul Island northeast of New Zealand in the Kermadec group, and Taupo Marine Radio in New Zealand. Nikao Radio, believed to be in the Cook Islands, also kept the fleet in touch.

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**TABLE 1: Greenpeace Communication Schedules**

Time (UTC)	Station(s)	Freq	Comments
0400	ZK1DB, ships	14318.5+/-	
0400	Intership comms	4417	
0445	Nikao Radio, ships	8815	
0500	Nikao Radio, ships	4540	
0710	Kerikeri Radio, ships	4445	Weather & position rpts
0805	Nikao Radio, ships	8818	
1830	Nikao Radio, ships	4540	
1900	Fleet net	8297	Sec. 4164 kHz

**Additional notes:**

- Listen for Greenpeace ships on 8294 & 8791 kHz USB.
- Intership communications may also be heard at various times on 4125 kHz USB.
- Phone calls may be placed through Australian High Seas Operators on following ITU channels:  
Sydney Radio (VIS) on 405, 607, 802, 1203 & 1602.  
Townsville Radio (VIT) on 404, 412, 427, 607, 822 & 1203.  
Also check AT&T High Seas Operator, Inverness, CA (KMI) on ITU channels 804, 809, 822, 1201, 1202, 1203, 1229, 1602, 1603 & 1624 for ship to shore calls.
- Taupo (New Zealand) Marine Radio (ZLM) working frequencies are: 2207, 4146, 6224, 8297, 12356, 16531
- A station identifying as "Navy Auckland" was heard calling HMNZS Tui at 0900 UTC on 3192 kHz USB.
- Amateur radio stations to listen for:  
N6VS - Dick Dillman, Greenpeace, San Francisco  
PA3CQA - Aboard *M/V Greenpeace*  
ZK1DB - New Zealand

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**TABLE 2: Addresses**

**Greenpeace vessels:**

Including *S/V Rainbow Warrior II* (PC8024), *M/V Greenpeace* (PC8023) and *S/V Vega* (VG9983).

Greenpeace International  
Marine Services

Attn: Mr. Walt Simpson  
Keizersgracht 176  
1016 DW Amsterdam  
Netherlands

**HMNZS Tui (ZMSQ):**

Commanding Officer  
HMNZS Tui (A05)  
Overseas Branch  
CPO Auckland, New Zealand

**Kerikeri Marine Radio (ZMH98):**

Kerikeri Marine Radio  
Attn: Mrs. Maureen Cullen  
Box 131  
Keri Keri, New Zealand

**Nikao Marine Radio:**

Uncertain - but probably a  
private station in the  
Cook Islands

**Raoul Island Radio (ZME):**

Raoul Island Weather Station  
Communications Manager  
c/o Overseas Mail Section  
Wellington, New Zealand

**Taupo Marine Radio (ZLM):**

Taupo Marine Radio  
c/o BCL  
Box 98  
Wellington, New Zealand

The *Rainbow Warrior II* also rebroadcast weather information for the ships in company with them, and talked for lengthy periods with the *M/V Greenpeace*. All this took place on HF radio frequencies that were heard across the Pacific and North America. *HMNZS Tui* was heard communicating with Keri Keri Radio, and both Australian and New Zealand Naval Communication Stations.

**■ Vessels still in French hands**

As of mid-September, both the *Rainbow Warrior II* and *Greenpeace* remained in the hands of French authorities, with no indication of when — if ever — they would be released. According to Greenpeace officials, rumor has it the French commandos were especially destructive this time, particularly in the radio rooms.

Not to be put out of action, however, the venerable 36' *S/V Vega* (the original boat that penetrated the French testing zone in 1972) is in the area once again. Joining it is the 120' *S/V Manutea*, a vessel chartered by Greenpeace

out of San Francisco.

An official at Greenpeace's San Francisco office said his group shifted most of its communications to INMARSAT in 1984. However, the number of non-Greenpeace vessels involved in the protest effort make HF radio the best common denominator for communications. "It makes me pine for the old days when all the comms came through our HF station here in San Francisco," he said.

Indeed, Greenpeace no longer has an HF radio station on the U.S. West Coast. Although they are authorized and licensed for operation on all the marine simplex channels and several SITOR channels with 1 kW of power, officials haven't been able to find a home for an HF station.

"We have all the equipment including a log periodic antenna, but no place to install the station," a spokesman said. "Perhaps (there is) a transmitter site somewhere in Northern California ... just crying out for a nice crop of



*The M.V. Greenpeace*

© Greenpeace

telephone poles," he hinted..

Since the French have announced tests may go on for as long as nine months, interested listeners should keep listening for Greenpeace related communications. Even though their people have been beaten and blown-up, their property smashed, and a ship sunk, Greenpeace authorities vow to keep up the pressure. And HF radio communications can be counted on to play an important role in this dramatic showdown on the high seas.

**TABLE 3: Vessels in the Mururoa Flotilla as of September 12, 1995**

<u>Vessel name</u>	<u>Location</u>
Aquila D'Oro	On location at Mururoa
Photina	On location at Mururoa
Tucker Thompson	On location at Mururoa
Anna	Proceeding to Mururoa
Pickety Witch	Proceeding to Mururoa
Tara	On location at Mururoa
Sudden Laughter	36°20'S 160°18'W
Chimera	On location at Mururoa
S/V Rainbow Warrior II	Being towed toward Hao Atoll
S/V Vega	On location at Mururoa
S/V Manutea	On location at Mururoa
M/V Greenpeace	Being towed towards Hao Atoll
HMNZS Tui	On location at Mururoa
Gemini Galaxsea	Proceeding to Mururoa
Joie	On location at Mururoa
Kela	On location at Mururoa
NZ Maid	On location at Mururoa
Possualana	On location at Mururoa
Machias	Enroute Papeete, Tahiti
Moriah	On location at Mururoa
Aveia	On location at Mururoa
Te Kaitoa	Enroute Mururoa
Guinevere	36°20'S 160°18'W
Matagi Princess	On location at Mururoa
Babinka	On location at Mururoa

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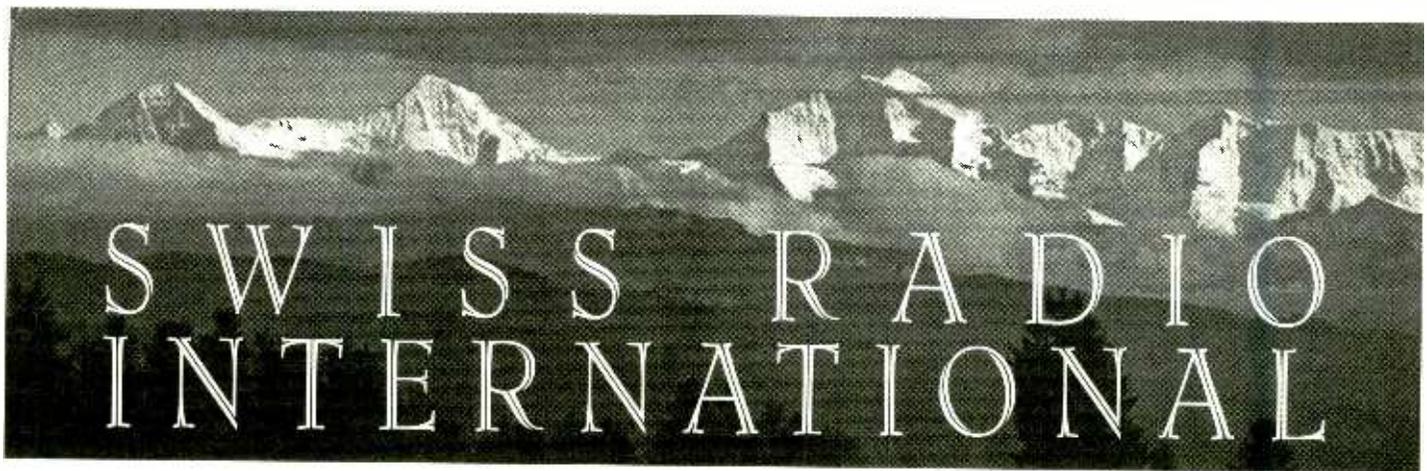
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*Three directional antennas at Schwarzenburg, south of this Alpine view from Bern, carry many of SRI's intercontinental broadcasts.*



## *Purveyors of the Swiss Perspective*

By Dean B. Mahin

Swiss Radio International's broadcasts by shortwave and satellite provide a uniquely Swiss programming mix emphasizing developments in areas of crisis, commentary from Switzerland on international problems, activities of international organizations based in Switzerland, and news of special interest to Swiss living and traveling abroad.

SRI's emphasis on areas of crisis began with the first shortwave broadcasts from Switzerland in the 1930s, when Switzerland was becoming an island of freedom in a Europe dominated by totalitarian governments. Regularly scheduled shortwave broadcasts from Switzerland in German, French, and Italian began in the fall of 1935, using the League of Nations transmitter near Geneva. In 1939 the first Swiss shortwave transmitter, with an output of only 25 kW, began broadcasts in German, French, and Italian from a transmitter at Schwarzenburg near Bern. Broadcasts in English, Spanish, and Portuguese were added in 1941. During World War II these weak broadcasts were a very important source of information from central Europe.

After the war, transmitter power was increased to 100 kW. In 1954 a Swiss government charter defined the double task of the Shortwave Service: "to strengthen the ties linking Swiss residing abroad with their homeland" and "to promote Switzerland's image abroad." These remain the paramount objectives of Swiss Radio International today. The current Radio and Television Act adds a third objective—"contributing to the process of communication and mutual understanding between peoples."



### ■ The Global-Minded Swiss

Today SRI broadcasts in seven major languages. Until 1994 the world news was received from wire services and SRI correspondents in English, edited in English, and then translated by the other language services. The remainder of each program was (and is) prepared by the individual language service, emphasizing news and features of special interest to its audi-

ence. Now each language service reviews all the world news available in its language and prepares a world news segment tailored for its listeners.

At present no international broadcaster beams a program to North America that is specially prepared for the North American audience. Although some international broadcasters carry special regional programs for English-speaking audiences in Africa and Asia, SRI's budget does not permit such programs. It sends the same English-language programs to every region. Ronald Gruenig, head of SRI's English service, says his staff tries to include news and features of interest to the various parts of the very diverse English-speaking audience in Europe, North America, Africa, and Asia. A typical 30-minute broadcast in English includes a bulletin of world news, background reports on several major international news stories (usually commentary by Swiss correspondents and an interview with a Swiss expert or official of an international organization based in Switzerland), a bulletin of Swiss news, and one or two features on events or developments in Switzerland.

SRI's programs in the three major Swiss languages—French,

German, and Italian—are also broadcast to all regions of the world. They give priority to subjects of interest to half a million Swiss living abroad and over a million Swiss who travel abroad each year. These broadcasts are one way the Swiss government encourages them to retain their ties with their home country. Since 1992, Swiss living abroad can even participate through absentee ballots in Federal elections and national referenda.

Each of these language services must not only accommodate the interests of the Swiss living abroad, but also those of the non-Swiss audience speaking its language. For example, although French is spoken by only 19% of the Swiss, there are large French-speaking audiences in France, Africa, and Canada. Programs in German (spoken by 63% of the Swiss) and in Italian are primarily for audiences in Germany and Italy, for emigrants from those countries, and for Swiss living abroad. SRI's programs in Arabic, Spanish, and Portuguese are broadcast only to regional audiences in the Middle East, Iberia, and Central and South America.

In 1995 SRI's budget was 28 million Swiss francs (\$24 million). In addition, Swiss Telecom spends about 18 million Swiss francs (\$15.5 million) annually for the transmission of SRI programs. SRI has about 140 full-time employees, about 25% of whom are of non-Swiss origin, and about 100 free-lance correspondents around the world. But Walter Fankhauser, Head of Communication and Marketing Services, says SRI emphasizes the "Swiss-ness" of its coverage of international affairs. Swiss correspondents are used for nearly all on-air reports and commentary, with only rare exceptions, such as when a major news story (the bombing in Oklahoma City, for example) breaks in a city in which no Swiss correspondent is available.

SRI gives priority to international news originating in Switzerland and to commentary by Swiss experts and/or officials of international organizations based there. The location in Switzerland of several major international orga-



*This cartoon reflects SRI efforts to reach Swiss residents and travelers in all parts of the world.*

nizations concerned with acute international problems—notably the European headquarters of the United Nations, the Office of the UN High Commissioner for Refugees, the World Health Organization, the World Trade Organization, and the International Committee of the Red Cross—gives SRI a unique advantage in the coverage of “areas of crisis.”

SRI often interviews officials of these international organizations on developments in areas with severe health, food, and/or refugee problems. The extensive coverage of areas of crisis and human problems also reflects the traditional Swiss concern for such problems. Many Swiss participate in relief and humanitarian programs in problem areas, and one of SRI's objectives is to provide crucial information not available from other sources to populations and relief workers in those areas of crisis.

Much of the Swiss news carried by SRI even has an international dimension. Since Austria joined the European Union recently, Switzerland is completely surrounded by EU countries. Much of the trade between Italy and other EU countries must pass through Switzerland. Although in December 1992 a majority of Swiss voters rejected membership in the European Economic Area (which would have increased Swiss access to the EU's internal market), the question of relationships with the EU remains a very important and controversial issue in Switzerland. SRI's policy is to provide balanced coverage of all major Swiss viewpoints on these and other crucial issues.



*Each SRI language service selects world news, Swiss news, and features of special interest to its audience.*



*Some non-Swiss employees prepare news and features in non-Swiss languages, but nearly all direct reports and commentary are by Swiss correspondents.*

#### ■ SRI Via Shortwave

SRI broadcasts from three mountain locations in Switzerland. For its broadcasts to other European countries, SRI uses two 250 kW omnidirectional transmitters at Lenk in the Bernese Alps. Intercontinental transmissions are broadcast by three 250 kW and two 100 kW transmitters with directional antennas at Schwarzenberg near Bern and by a 500 kW transmitter with a rotating antenna at Sottens near Laussane.

SRI's intercontinental broadcasts are relayed by two 120 kW transmitters at Beijing in China and—since April 1994—by a 500 kW transmitter at Montsinery in French Guyana. The powerful new relay gives North American listeners a choice between direct and relayed broadcasts. Those in eastern North America can find SRI's English program in the evening at 0100 UTC on 5885 or 6135 from Switzerland, and on 9905 from Guyana; transmissions beamed to Africa at 2000 UTC on 11640 are usually audible in the Southeastern US. The English program is repeated at 0400 UTC on 6135, 9885, and 9905, primarily for listeners in Central and Western North America.

#### ■ SRI Via Satellite

In the spring of 1994 SRI's governing body approved a stra-

tegic realignment of SRI programming. A central plank of this new strategy was to build a strong position in the rapidly developing market in Europe served by broadcasting via satellite, while maintaining its use of shortwave broadcasting to reach priority audiences in other areas.

Broadcasts to Europe via the Astra 1A satellite began in April 1992. Europeans find

SRI at 19.2° East, transponder 9H, TV channel Kabel 1, frequency 11.332 GHz. SRI now broadcasts two programs in Astra 1A: "Astra English" is broadcast in English 24 hours a day on audio channel 7.56 MHz. A second program, "Astra Mix," is heard in Europe via Astra 1A on audio channel 7.38 MHz. It includes short news and documentary programs in various languages.

In 1995 SRI began broadcasting a 24-hour program in French to Europe and North Africa on the Eutelsat II-F1 satellite (13° E, transponder 6 vertical, TV channel TV5, frequency 11.325 GHz, audio subcarrier 7.74 MHz). It carries news and commentary from the Swiss French-language radio, Radio Suisse Romande, plus weekend features.

The rapid increase in satellite receivers in Europe contributed to a recent decision to terminate in 1997 the transmission of SRI programs within Switzerland by cable and telephone lines. This service has been widely used by officials of international organizations, foreign businessmen, and foreign tourists in many Swiss hotels. SRI programs will be available at larger hotels with satellite receivers, but may be missing at smaller hotels.

In March 1993 SRI began broadcasting to the Americas via the Intelsat-K satellite. At present Intelsat-K is used primarily to transmit programs to be rebroadcast by "partner



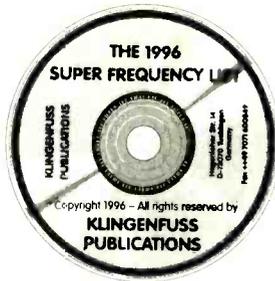
*SRI's studios are in the Bern headquarters of the Swiss Radio and Television Company.*

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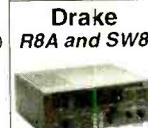


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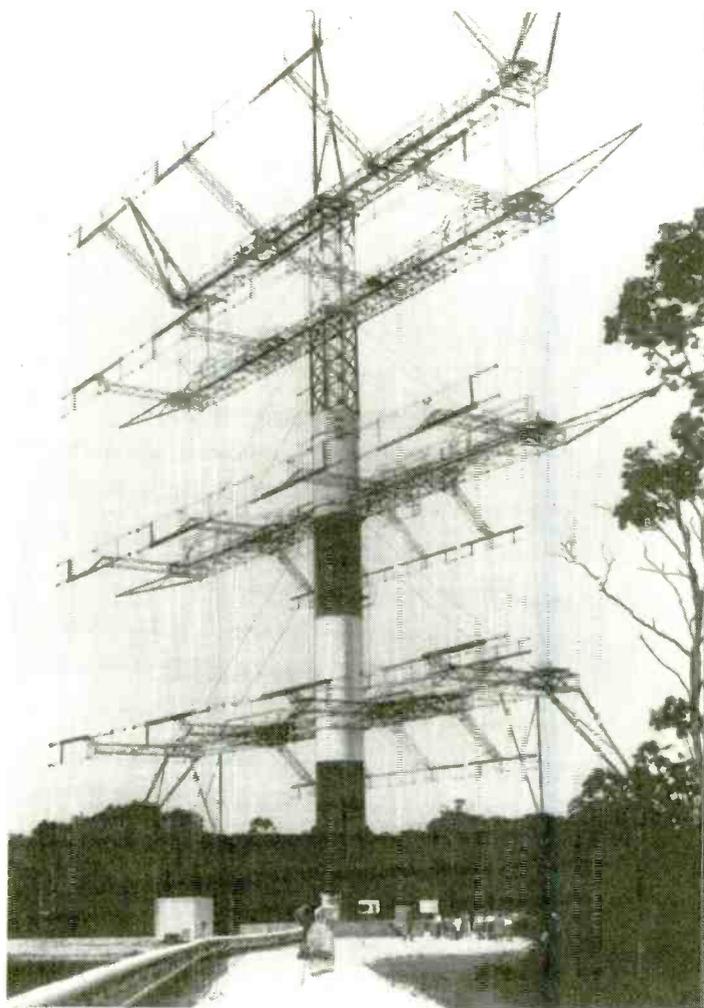


stations" in the Americas and to carry SRI broadcasts to the shortwave relay in French Guyana. The multi-lingual mix includes nine half-hour broadcasts in English. Those with satellite receivers in Eastern and Central US and Canada (and in the Andes and extreme Southern South America) can find SRI at 338.5° East, transponder 7, TV channel DW, frequency 11.605 GHz, audio subcarrier 8.1 MHz.

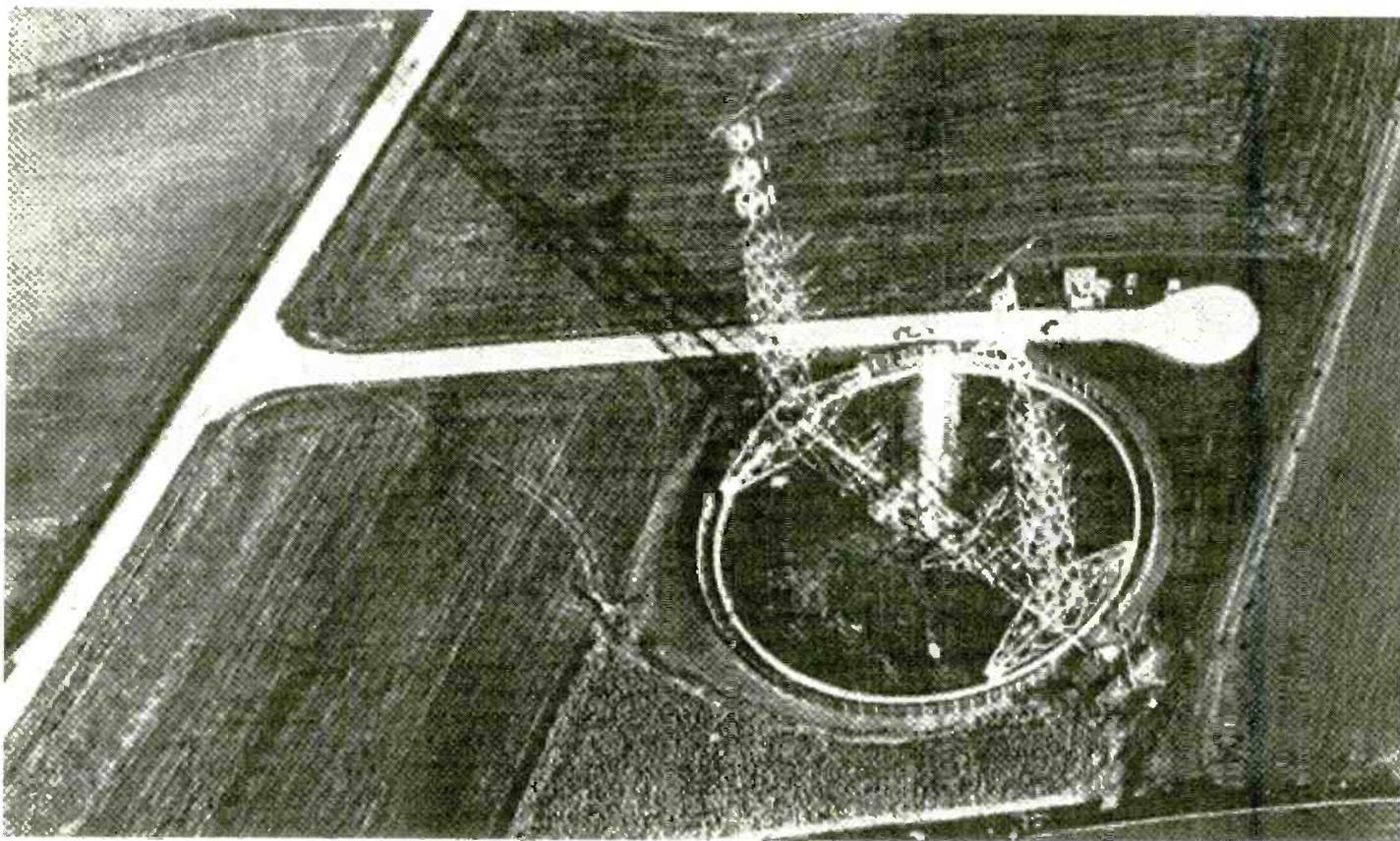
#### ■ A Swiss Mix

SRI programs reflect some of the most important characteristics and objectives of contemporary Switzerland. They are very international in scope, but retain a distinctively Swiss quality. The programs demonstrate the national determination to maintain the Swiss identity and culture in a rapidly integrating continent. They emphasize Swiss-based international programs including traditional Swiss humanitarian and relief roles in crisis areas and the activities of international organizations located in Switzerland. The recent strategic realignment of SRI operations reflects Swiss determination to maintain a strong position in rapidly evolving European markets and to utilize fully advanced technologies to achieve Swiss objectives.

*The 500 kW rotating antenna at Soetens near Laussane (right) carries SRI programs to the Americas, Africa, and Asia.*



*SRI's new 500 kW relay station at Montsinery in French Guyana (below) gives listeners in North America a choice between direct and relayed broadcasts.*



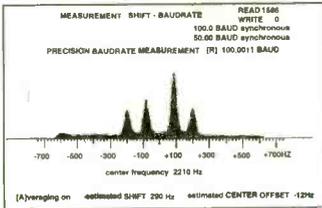
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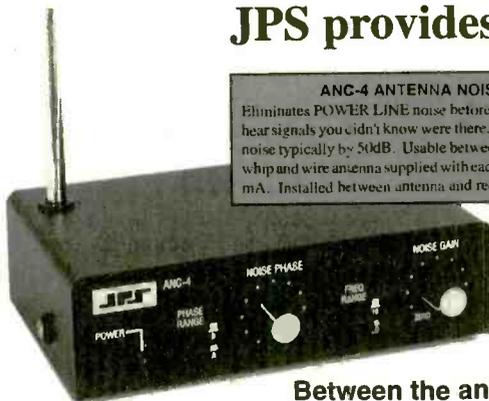
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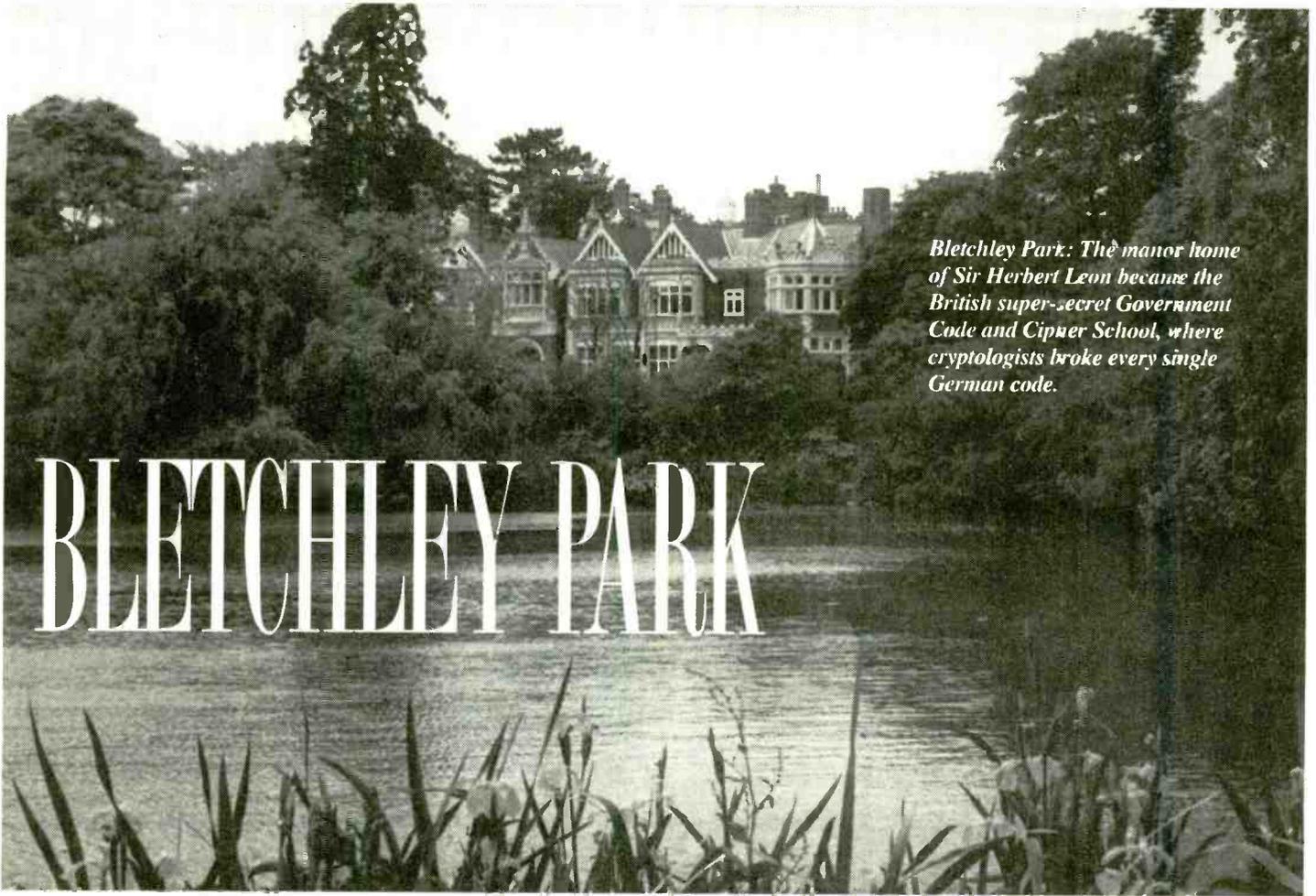
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*Bletchley Park: The manor home of Sir Herbert Leon became the British super-secret Government Code and Cipher School, where cryptologists broke every single German code.*

# The Golden Goose Finally Cackles

By J. Wandres

**T**he express train from London rocketed toward the town of Bletchley, 60 miles north in Buckinghamshire, in under an hour. Acting on instructions given over the phone, I got off the train, crossed a carpark filled with commuters' cars, then located the wooden gate. As directed, I then followed a pathway between several back yard gardens and a high brick wall. At the top end of the alley I looked behind me. Of course there was no one following: all the commuters had departed for their jobs in London! I turned right, then proceeded along a lane until I reached a closed iron gate.

An elderly security guard in uniform came out of a weathered brick guard house. I showed my identity card. "I'm here to see a Mr. Bristow."

The guard put on his bifocals, studied the I.D. card, then spoke into his two-way radio. "Front, to Bungalow: Ruth, tell Roger that The American is here."

## ■ Propaganda, white and black

Bletchley Park had been my own personal enigma for years, ever since I began researching U.S. Naval Intelligence during World War II and its relationship to radio propaganda. Eventually, my research culminated in my book about a secret propaganda project the U.S. Navy's Office Of Naval Intelligence ran during the war.

The so-called "Norden Broadcasts," produced by the highly secretive, OP-16-W, "Special Warfare" branch of ONI, were heard by U-boat crews at sea, the German Naval High Command, and civilians and all over Europe via numerous medium- and short-



*The author stands on the same rock used by Prime Minister Winston Churchill to tell the codebreakers that Bletchley Park was his "golden goose that never cackles."*

wave frequencies several times a week for two and a half years, until V-E Day, May, 1945.

The American propaganda effort was modeled on a British project run by section I7-Z of NID, the Naval Intelligence Division of the Admiralty. Much of section "Seventeen Zed's" intelligence originated with decrypts of German naval radio traffic, as well as expert infiltration and interrogation of German naval personnel in British POW camps. NID's "black" (clandestine) propaganda radio programs, such as "Atlantik Sender" and "Gustave Siegfried Eins," were produced by the super-secret Government Code and Cipher School within the 55-acre Bletchley Park.

#### ■ A visitor from America

An assignment in June 1994 had taken me to England in connection with the 50<sup>th</sup> anniversary commemoration of the D-Day invasion of Normandy. A couple days before

I had to return home, I started to wonder what ever happened to the vaunted Government Code & Cipher School after the war. Was it still a secret facility? Had it fallen into ruin; or worse, been developed as a shopping mall?

I got the phone number for the "Bletchley Park Trust," and called. Would it be possible to visit, I asked. Yes, said the woman who answered. She explained, however, that the museum was not yet open to the public, but because I had come such a distance...perhaps the Manager, Roger Bristow could spare a couple of hours the next day. I said I would be there.

The Roger Bristow I imagined would be a gentlemen well advanced in years; tall and ramrod stiff. Proper. Old School and all that: one who had been with "Winnie" and "Monty" at "B.P." during the Dark Days of The War. The Roger Bristow who greeted me was in his forties, energetic: a walking-talking encyclopedia about the Bletchley Park of World War II.

As Bristow and I walked up the drive toward the manor house, he explained that the grounds had been the country home of Sir Herbert Leon. Sir Herbert died in 1926, and, in 1937 following his widow's death, the 55-acre estate was sold to a local housing developer. Before any residential construction could begin, however, title to the estate was "mysteriously transferred" to His Majesty's Government, to become the Code and Cipher School under the leadership of Commander Alistair Denniston.

The manor house, with walnut-paneled

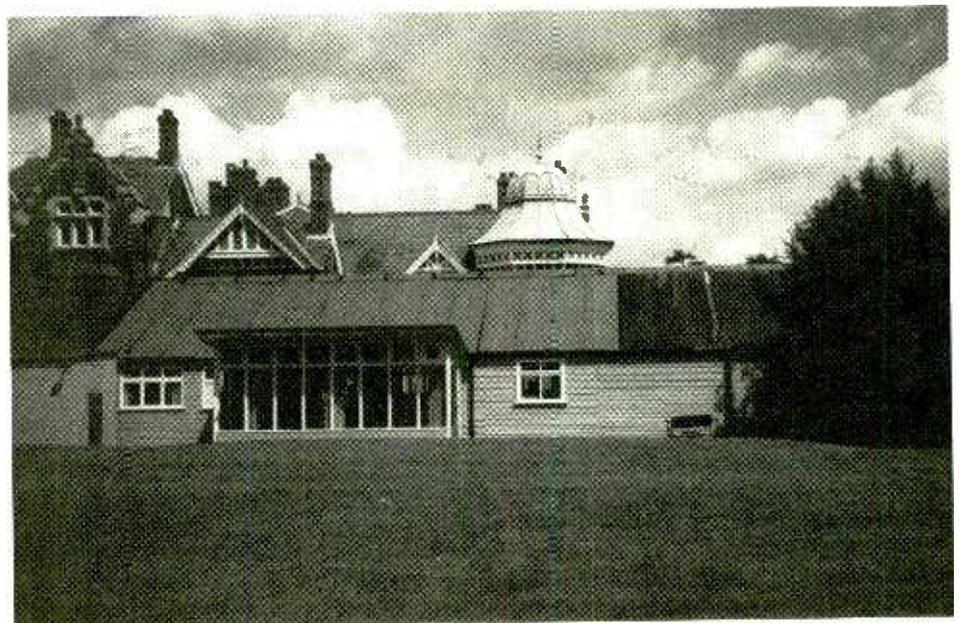
rooms, decorated plaster ceilings and leaded windows, was converted into planning rooms, offices, dining and sleeping quarters for the senior staff. The thousands of the junior personnel who staffed B.P. were "billeted" in private homes all over Buckinghamshire. They commuted to their shift via special trains, buses, and even by bicycle. It is testimony to the local British citizenry's "stiff upper lip" that no civilian ever asked or spoke about the mission of this regiment of highly-trained specialists.

The initial 1938 cadre of 200 radio "eavesdroppers" and code breakers swelled to more than 7,000 British, Canadian, American, and European military and civilian specialists and staff by 1944. They worked 'round the clock to break, translate, analyze, and disseminate intelligence from every single code the Germans put together, and some Japanese codes, too.

The front of the ornate Victorian mansion looks out across a lawn and pond which a brace of geese call their home. To one side of the house is a decrepit, olive-drab, pre-fabricated structure with tarpaper roof.

"That's Hut Four, you know," Bristow explained. "That's where Denniston, the young 'Leftenant' Harry Hinsley, Alan Turing and others broke German naval codes including 'Shark' and 'Triton.'" The building now serves as a social club for Trust members.

Enemy signals, intercepted by outlying listening posts of the British "Y" Service, came to B.P. by teleprinter or were delivered



*Hut Four: In the foreground, one of the original prefabricated structures now serves as a social club. During World War II, German naval codes were broken in this building.*

by motorcycle dispatch. Outgoing intelligence to Allied commanders was sent by scrambler teletype, or hand-carried by special couriers whose unchallengeable orders were to place the documents in the hands of military leaders including General Eisenhower, Viscount Montgomery, and Admiral Pound, all of whom were planning Operation Overlord, the D-Day invasion.

### ■ **Bombes in bomb-proof buildings**

Throughout World War II, the German military believed that their ciphers, encoded by Enigma, Lorenz and “Geheime-sreiber” (secret writer) machines, were foolproof. The Enigma system had been in use by the Nazi regime since 1934, but they did not know that Polish mathematicians had figured out how the machine worked, and smuggled one to British intelligence just before the German invasion of Poland in September 1939. An Enigma code book, recovered from a sunken U-boat, gave Allied codebreakers a crucial advantage early on.

Between 1939 and late 1943, the German codes were broken by mechanical machines called “Bombes,” devised by Polish engineers. And, while the mechanical decoding went on, scientists and electrical engineers at B.P. were devising and assembling the world’s first electronic, programmable computer—a room-sized device with more than 1500 “valves” (vacuum tubes), known as “Colossus.” The first machine went on line in



*D-Block: One of the later buildings which took the overflow of decoders from Huts Three, Four, and Six.*

December 1943 and greatly speeded up decoding German messages. By the war’s end, ten 2500-valve Colossus computers were in use.

In addition to its cryptologic work and intelligence collection and analysis, “B.P.” served as a center for the production of numerous radio propaganda programs. However, Bletchley Park itself did not transmitting for fear its signal would be pinpointed by German direction finders, and the place bombed. Instead, radio signals were broadcast from different transmitters located throughout England.

Early huts were pre-fabricated. The later, bomb-proof structures were also called huts.

“You have to understand,” Roger Bristow explained, “that, although German naval ciphers were decoded in the building known as Hut Four, in fact, wherever those code-breakers did their work was also also called ‘hut four.’”

In Hut Six, made famous by Gordon Welchman’s *The Hut Six Story*, Wehrmacht and Luftwaffe codes were broken and read. Hut Six specialists decoded plans for the Luftwaffe Battle of Britain bombardment. This foreknowledge allowed the desperately few British Spitfire planes to appear as if by magic exactly where the German aircraft were heading, and attack them.

Hut Six was connected to the adjacent Hut Three via a small, duct-like passageway. The Hut Six decoders would bang on the duct, and a specialist in Hut Three would pull the papers through on a metal tray attached to a rope.

Hut Three was the Priority Building—the nerve center of Bletchley Park, Bristow explained.

“Here, information was put into priority order for dissemination to the Allied commanders.” Once B.P. perfected a delivery system for intelligence, it was possible to get English translations of top secret messages to Allied field commanders even before German officers got the messages. One joke of the day was that it might have been easier if the Germans simply called Bletchley for their intelligence.

### ■ **The word from the rock**

Prime Minister Churchill made one official visit to Bletchley Park during the war, in 1940. How many times he secretly visited the facility is still shrouded in Britain’s Official Secrets Act. However, many years after the



*A and B Blocks: Within its reinforced, gas-proof rooms, work went on to figure out the complicated Lorenz code machine. The buildings now house part of the Bletchley Park Trust Museum. Enigma and Lorenz machines are on display, and a Colossus computer is being reassembled.*

war, researchers analyzing the operating logs of trains which pulled Churchill's private rail car during World War II noted several instances of the train pulling into a siding at Bletchley late at night, then departing a few hours later. There are remains today of an underground tunnel connecting the train station directly with the grounds.



*Hut Three - the Priority Hut: Bletchley Park Trust Manager Roger Bristow believes that Prime Minister Winston Churchill made several secret visits to B.P. to get his intelligence from the source.*

"We believe that the P-M made several private visits to

Hut Three to get his intelligence from the source—fresh, and not filtered through his war command," Bristow told me.

At one point in the tour, we stopped in front of a two-story building with an exhaust pipe curving out of its roof.

"That was our powerhouse," Bristow explained. "The only place in England during the war to generate 220 volt and 110 volt power—to operate both British and American cryptographic equipment."

Bristow had me step atop a lichen-covered boulder by the kerb (as the English spell curb) near the powerhouse. Taking a snapshot of me atop this boulder, Bristow proclaimed, "On that rock in 1940, Prime Minister Winston Churchill told a gathering of code-breakers that Bletchley Park was his 'golden goose that never cackles.'" The P-M also paid a special tribute to the hundreds of British girls serving in the WRNS (Women's Royal Naval Service: "Wrens"), calling them his "hens that laid eggs without cracking."

#### ■ Secrets then, secrets now

The United States Army's and Navy's contributions to code-breaking at Bletchley Park have never been publically documented. A couple of years ago, I was given the address of a retired Naval officer who, I was told, had served at Bletchley. I wrote, asking if he would share his experiences at B.P. His refusal was cordial. "I took an oath of secrecy about my wartime activities. To this day I have not been informed that the oath has been rescinded."

The very fact of Bletchley Park's secrecy almost spelled its demise—literally. In the

mid-1980s, the local Borough Council and a development corporation, unaware of (or ignoring) the site's historic significance, announced plans to transform the park and its buildings into a high-tech "special study area" and build a few hundred houses.

It wasn't until 1991 that a group including veterans of the Government Code & Cipher School began a push to save and recognize the site for its historic value. It was not that the facility had sat vacant for decades. British Telecom had used some buildings to train radar operators and air traffic controllers, and Her Majesty's government had also used B.P. as a training site. Negotiations between the newly formed Bletchley Park Trust and the government were difficult, but by February 1994 the Trust was able to go ahead with plans to develop a museum to the dark science of Cryptography.

In July 1994, Bletchley Park threw open its gate for an official opening, attended by Prince Phillip and many of the World War II code-breaking pioneers. Churchill's Golden Goose could finally cackle.

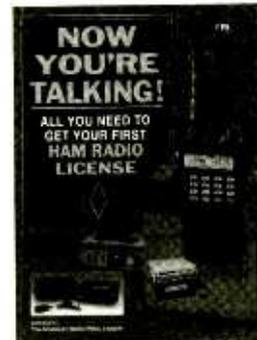
For more information about Bletchley Park:  
Bletchley Park Trust, Ltd  
The Bungalow, Stable Yard  
Bletchley Park,  
Milton Keynes, MK3 6EF, Bucks.  
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J. Wandres is the author of *THE NORDEN BROADCASTS: America's Ace in the Hole*. To be published in 1996.

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# The Secret Wisdom of Well-Informed Scanning



By Otto H. Muller  
Photos by Ed Reuter

You must first  
familiarize yourself  
with the who, what,  
when, where, and how  
before you can truly  
hope to attain the  
wherewithal.

I find baseball so boring that I have great difficulty sitting through an entire game. Still, millions of fans find the game interesting, even exciting, so I have always wondered what they appreciated that I missed. Many discussions have led me to conclude that to enjoy baseball, one needs to have considerable familiarity with lots of those statistics and data which fill the backs of baseball cards.

Apparently it *does* matter whether a batter is right-handed or left-handed, but more so with some pitchers than with others. Managers (baseball's name for coaches) consider all sorts of strange things when determining the lineup for a particular game. The adjustments made in the outfield as a different batter comes up to bat reflect that batter's strengths and weaknesses, the skill and speed of each of the runners on base, the pitcher, the catcher, the score, and who knows what else?

To an uninformed observer such as myself, the outfielders are just shifting around out there, probably because they are as bored as I am. To a true fan, however, the adjustments are just what are expected, or else are a fascinating indicator that something is amiss.

In this respect, scanning is a lot like baseball. Listeners can appreciate the action on

many different levels, but those who appreciate it most are likely to be those who are best informed about the agencies they are listening to. An uninformed listener might be overwhelmed by a stream of identifying numbers coming in over the radio. A better informed listener can make sense out of these numbers by knowing which units come from which locality. A very well informed listener knows the capabilities of each unit, and can then appreciate the strategies and tactics being employed in the incident.

Knowing the frequencies for the agencies you wish to monitor in your area is essential, just as knowing that there are three outs in an inning. There are a lot of ways to determine those frequencies, but they are not the subject of this article. Instead, we will consider some of the other information of interest: the location, equipment, and personnel of the various units in those agencies.

Depending on your situation the scale and detail of your information will vary. To someone scanning in an urban area there are probably certain neighborhoods or business districts where much of the action is concentrated. A detailed map of such areas could be useful, and knowledge of how units are deployed in their vicinity and what their capabilities are might also be worth developing. But urban areas have so many streets and highways connecting places, and so many different agencies using the airways that acquiring enough information to permit effective second-guessing of tactics and strategy is likely to be extremely difficult.

In rural areas, where units are spread out and travel times are significant, we stand a better chance of having sufficient information to make reasonable judgments. I will concentrate on rural situations in this article, but much can be adapted to urban settings quite easily.

### ■ Map

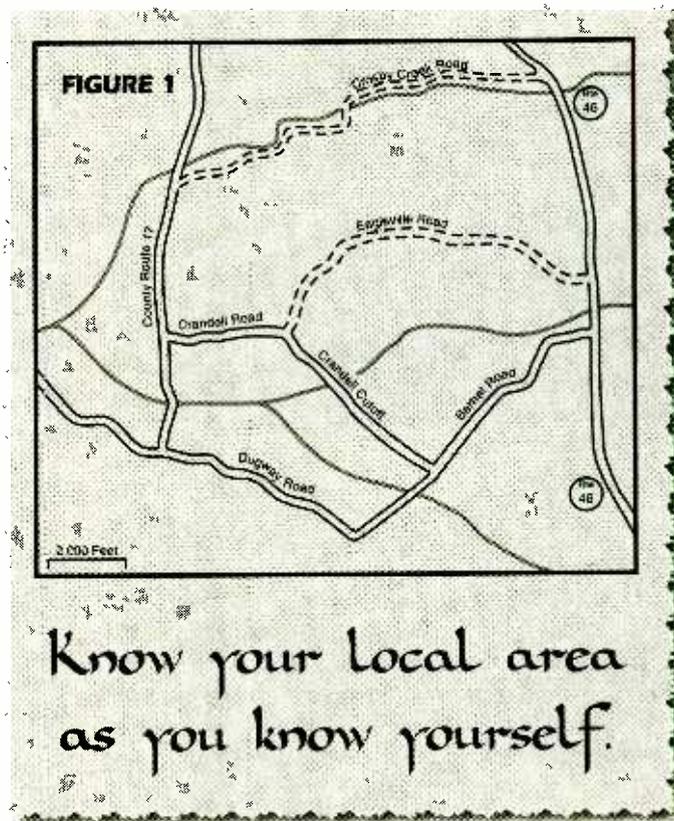
A map is essential to understanding what you hear on your scanner. On your map you should locate the transmitting antennas and unit locations for the agencies that interest you. Note that the antennas may be far from the units. By knowing where the various antennas and repeaters are you can see why officers at some incidents have difficulty com-

municating with control centers while those at others do not. By knowing where the various units are housed, you can predict travel times, routes, mutual aid and backup arrangements.

A map of the area you can hear on your scanner is unlikely to comprise a single political entity such as a town or a county. The FM radio waves reaching your scanner are not affected by political boundaries, but will usually propagate to the horizon, or a bit further. They are affected by topography, interference, etc., so the area you can monitor is not likely to be circular, either.

The allocation of frequencies, on the other hand, is based on political entities, and so are many agencies. Sheriff Departments in New York State, for example, are county agencies, and village police departments share a common county-wide frequency. Depending on your situation you may need to have several adjoining county maps. County maps have the advantages of giving most road names, being at a useful scale for scanning, and having political boundaries clearly indicated.

As an alternative, you might consider USGS topographic maps. It takes several of the common "quadrangle" maps, at a scale of 1:24 000 to cover the area you can easily monitor, however, so unless you have a large wall in need of some decoration, you might



do better with the 1:250 000 scale maps. Since these cover 1° of latitude and 2° of longitude, they are often called "One by two degree sheets." Although many roads will not be named on these USGS maps, the topography they show can be useful.

Other maps are available in hard copy or on CD-ROM. You may find that printing your own customized map gives the best results. To be most useful your map should include roads with their names, rivers, and streams, and the informal names of places as used by the people in the area. If you know your area well, you may already know these names. But if your memory isn't terrific you might find it useful to put these on whatever maps you use. "The Rocks," "Dead-Man's Curve," "Smith's Corners" may be commonly used, but may not exist on any published map, anywhere. As you listen to your scanner, write down any informal names such as these. Later, when

you know exactly where the incident was, you can annotate your map accordingly.

The locations of the fire departments, police stations, village garages, etc. should be indicated, of course. Remember to put on some of the less obvious locations used by agencies in your area. Meet-up sites, where blood, donor organs, prisoners, etc. are exchanged between counties are worth noting. So are those places where helicopters routinely land to take on patients. It's also convenient to know where there are "fill sites," where water can be pumped easily from streams or ponds for rural fire fighting. Sometimes it takes patience to figure out where these places are, but if you listen carefully you should be able to locate many of them. Your map represents a "work in progress" and should improve as time goes on.

### ■ Equipment

It is useful to know what equipment is available, where it is housed, and what sorts of incidents it is likely to respond to. Try to develop an equipment inventory for all of the agencies you monitor. (This is more important with fire departments and ambulance corps than with police agencies.) Agencies which rely on public support either for volunteers or for taxes are usually more than willing to give you information on their equip-



Know (but do not  
covet) your public  
agency's equipment.

ment and its capabilities. It is also very nice to actually see the apparatus that you listen to. Visitors are usually welcome at most fire stations and ambulance corps when things aren't too busy. In many places a weekend morning is a good time to drop in.

Be sure to get the identifier used on the air for each piece of equipment. This is usually a number, but may be a name, or a combination of a name and a number. Often the numbering system is designed so that you can tell what type of apparatus it is, and where it is from, just from the number. In some areas, though, the numbers may be consecutive, based on when each piece was purchased. In that case, getting the number for each vehicle is very important if you are to understand what is going on out in the field.

For fire apparatus, learn the pumping capacity (usually given in gallons per minute) and the amount of water carried aboard each pumper and tanker, the height of any aerial ladders, and what kinds of major extrication equipment (hydraulic jaws, etc.) are carried. For ambulances, the principal difference in many regions is whether or not a rig is equipped to provide Advanced Life Support (ALS). Such rigs carry heart monitors, cardiac drugs, defibrillators, etc. Certain ambulance calls require ALS rigs, and such rigs must be staffed by personnel with more training than the BLS (Basic Life Support) rigs.

When you have developed your equipment inventories, keep them up to date. In

most departments, acquisition of new apparatus is a well publicized event. As new equipment comes on line, older equipment will be retired, so find out which pieces are being replaced. When maintenance is required, equipment will be taken out of service temporarily. This may be hours, or weeks, depending

on what is needed. It is common for control centers to broadcast equipment updates at the same time every day, listing what units are out of service. You may wish to tune in on these and adjust your inventories.

There are many ways of keeping track of units. An easy, intuitive, method might be to make little cut-outs of all the various

units, with their identifiers and capacities written on them. Put them on a board with hooks representing each of the fire departments and ambulance corps in your area, and have another hook for those that are out of service. If your map and cut-outs are of a compatible scale, you can move them to the scene during an incident, too. If your interest is only in a few agencies, with a limited number of rigs, you'll probably be able to keep track of things in your head.

#### ■ Personnel

Data on who is available, when, and how often they respond is somewhat more sensitive than what equipment is out there. Many volunteer outfits are understandably reluctant to admit to smaller numbers than they'd like. The issue of who actually responds and when can be even more sensitive. Your best source for this information may be your scanner.

Often there is a small group of volunteers who tend to show up for many of the minor calls, particularly

during normal working hours. For major incidents others, working locally, may be able to get off work and respond. But in today's society, many volunteers will be unavailable for calls during significant portions of the week, because they work out of town, have other commitments, etc. There are indicators of such staffing problems: Units may establish automatic mutual aid agreements during certain hours, or you might hear a call where you would expect all equipment to respond, but some is either left in the garage or else is very slow to respond. Knowing such things can add a great deal to your enjoyment of your hobby.

#### ■ A Test Run

After you have made up your map and inventories and have some idea of what personnel are likely to respond to a call at a particular time, you should be able to guess what will take place before it happens. A house fire at ten in the morning on a Wednesday might result in mutual aid requests to three adjacent towns. A motor vehicle accident on a Sunday afternoon might be easily handled by local personnel and equipment.

There is considerable satisfaction to be gained from sitting back in your easy chair and predicting events before they occur. Less satisfaction, perhaps, but still a sense of involvement comes from detecting errors as they develop.

Perhaps a hypothetical example (using

Know which neighbors  
are most likely to  
heed the call.



the map on page 25) can illustrate how all this information may enhance the pleasure and excitement experienced by scanning a developing incident. Imagine it is early afternoon on a Wednesday, and that a call is received at Fire Control that a house is on fire at the corner of Crandell and Eagleville Roads. The caller lives across the street, and can see smoke coming out from under the eaves. You know that this house is in the Fire District of a village two miles to the southeast. They have one pumper and a tanker, and half a dozen firefighters who work right in the village. You know that they'll be called first, and will respond very quickly to the scene. But you also know that they will need help.

You guess that they'll request mutual aid from a community seven miles to the north, where you know there are three pumpers and two good sized tankers. Personnel there are in short supply weekdays during business hours, so you won't be at all surprised if it takes them a while to get under way, and if they request additional help from adjacent communities to cover their area. A glance at your map suggests that a tanker relay will be required, and you speculate that a fill site on County Route 17, half way between Crandell Road and Dugway Road might be most appropriate.

The first units get on the scene, ascertain that there is no one inside the building, and begin to fight the fire. The Chief decides to establish a fill site on Crandell Cutoff. Certain that the little stream there won't provide enough water, you start yelling at your scanner. The Chief on the scene requests additional mutual aid, from several of the surrounding towns and villages. You make some hasty projections of how long it will take each unit to respond and to travel to the scene. Things don't look good.

Reception from the scene is sketchy, but occasionally you hear the pump operator on the truck radio talking to an officer who is using a portable, which you never hear. Apparently they are continuing to fight the fire. You know that their tanker holds 1500 gallons, and there are another 600 gallons on board the pumper, but they've been fighting

*Test your system best,  
when an emergency  
occurs, your own sanity  
is tested...*



the fire now for over ten minutes... All that water should have disappeared some time ago. What gives?

Shortly, as mutual aid tankers show up from the north, you find out when you hear their drivers instructed to dump their loads in the pool. Ah, you hadn't figured on that! Now things look more hopeful. Transmissions from the scene confirm this, as you hear bits and pieces suggesting that the fire has been knocked down, and overhaul is beginning. OK, this one goes in the "Win" column. The excitement subsides; nothing left now except to see if your guesses about arrival times of the more distant mutual aid companies have any merit.

Enjoyment of scanning, as with most spectator sports, is enhanced by knowing what is going on. I know that I'm not likely to learn all that is necessary to appreciate baseball, and so my interest in it is practically nonexistent. On the other hand, I am constantly learning more about all of the emergency services I listen to on the scanner. The more I listen, the more I learn. And the more I know, the better I listen.

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# Grove Convention, Volume VI: Upward and Onward!

*A Short Look Back at the  
1995 Grove Communications Expo,  
Atlanta Airport Hilton, October 13-15*

**By Bob Grove**  
**Photos by Harry Baughn**

It really is hard to believe that six years have gone by since our inaugural Monitoring Times Convention in Knoxville, Tennessee. Now, with hundreds of attendees—the majority of whom are repeats from previous years—we have grown in size and scope. Formerly confined to shortwave and scanner monitoring only, the present Grove Communications Expo explores space as well, with satellite imaging of weather systems, and voice communications from INMARSAT, and more

The three-day experience has earned a reputation as “the event,” with several companies now using this opportunity for new product premiers. EDCO revealed their imminent AR5000 full-spectrum (10 kHz-2600 MHz!) general coverage receiver, demonstrating it in the Grove listening booth; Cascade Technology unveiled their FM<sup>2</sup> and SCPC receivers, advanced products with great promise for broadcast re-



ception; and Kiwa debuted their impressive, new shortwave tropical band loop antenna system, an open-frame beauty that collapses into a compact, transportable package.

There were more, and there will be yet more next year. The exhibit hall was completely sold out well before the convention opened. But we'll make room; vendors who took advantage of the invitation to demonstrate their products were delighted with the sales which followed. We all learned a valuable lesson: The 1996 Grove Communications Expo will offer more hands-on demonstrations of equipment, accessories and software, with manufacturers given more time on the sound stage.

Two forums, chaired by leaders in the field of radio, satisfied the myriad questions fired at them by information seekers. Shortwave, scanners, satellites, computers, antennas, utility and broadcast monitoring, interference—you name it and it was discussed!

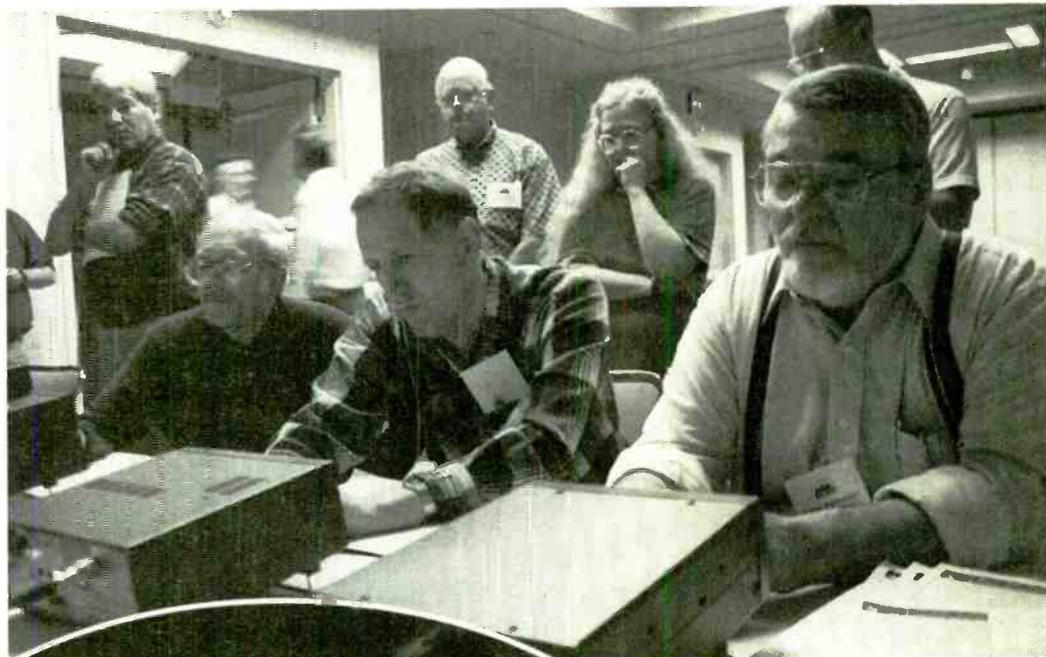
As always, the bug hunts (left) were a hit. Each year, more and more enthusiastic scanner listeners line up with their portables and unique antennas, trying to find a hidden transmitter or two. It has been in potted plants (no longer, per the hotel's request!), in



bathroom fixtures, installed in electric outlets, carried by hotel personnel, hidden under vehicles—just about anywhere you can imagine. Great fun, and great prizes to boot—frequency counters from Optoelectronics!

This is the second year we have hosted the popular international broadcasters' forum which follows a professional symposium, spearheaded by Ian McFarland. A dozen luminaries from around the world whose voices are recognized by millions of listeners answered questions posed by an enthusiastic crowd. Joe Adamov, the vibrant host of *Moscow Mailbag*, was an instant hit at the Saturday evening banquet as he delivered scathing commentary on the former Soviet political system, answered questions directly and bluntly about Russia's internal problems—then spent an additional hour after the banquet answering a barrage of questions from an admiring crowd.

It is now exactly one week since my return from the Atlanta convention site. I'm happily exhausted; I suspect that many of our exhibitors and conventioners are feeling the



same way! But it was well worth it, an occasion to meet people whose names you have shared for years, the opportunity to ask questions of recognized experts in the field of monitoring, and a chance to compare and purchase the best equipment at promotional prices.

The Grove Communications Expo is a pilgrimage; quite an experience.

*Top: The Listening Post served double duty as an antenna connections were provided for equipment demonstrations, and also for after-hours, informal monitoring. Glenn Hauser and others gave the equipment a try.*

*Middie: "The Eagle and the Bear make a formidable pair." A standing ovation rewarded these closing words from this year's banquet speaker, Joe Adamov, host of Moscow Mailbag (left, shown with MT editor Rachel Baughn). We will always be grateful to Kathy Lawson—a shortwave listener who decided the Voice of Russia should be represented at the Grove Expo, and was determined to make it happen.*

*Left: Bob Grove tantalizes participants already looking forward to Grove Expo '96, Oct. 18, 19 and 20. Mark your calendar!*



## Exhibitors at Grove Communications Expo '95

These fine exhibitors presented a lively cross-section of equipment and services for the hobby from mediumwave to satellites; from listener clubs to shortwave broadcasters; from hardware accessories to top receivers.

AMSAT  
 B.A.S.E. Club  
 Bearcat Radio Club  
 Cellular Security Group  
 Computer Aided Technologies  
 Dallas Remote Imaging Group  
 Dextra Software PW Publishing  
 Electronic Distributors  
 European DX Council  
 Grove Enterprises  
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 Radio Progressive  
 Ramsey Electronics  
 RCMA Club  
 R.L. Drake Company  
 Transel Technologies  
 Universal Radio  
 Vlaanderen Int'l  
 Voice of America  
 Worldcom Technology  
 World Radio Network



*Over half of Monitoring Times readers are devout shortwave broadcast listeners, and the presence of personalities and decision-makers in the world of SW broadcasting added a definite flair to the Grove Expo. Pictured are (back row, L to R): Larry Magne, Passport to World Band Radio; Jeff White, Radio Miami Int'l; Dr. Walter Scragg, Adventist World Radio; Tony Kobatake, WSHB; Ed Evans, WSHB; Sandor Laczko, Radio Budapest; Ian McFarland, Marbian Productions; Adam Stegg, audiovisual attache for Radio France International; Michael Murray, European DX Council. Front row: Thais White, Radio Miami Int'l; Ishmael Hozour, Grundig; Anna Maria Palcu, Radio Romania, Int'l; Betty Thompson, Voice of America; Eniko Zsuffa, Radio Budapest; Frans Vossen, Radio Vlaanderen Int'l; Joe Adamov, Voice of Russia. Present at some events, but not pictured were Chae Hong-pyo, Radio Korea Int'l, and George McClintock, WWCR.*

### Prize Donors

We are grateful to those listed at right for their support of the Grove Communications Expo through their generous prize donations:

AMSAT  
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 Christian Science Monitor  
 Computer Aided Technologies  
 Dallas Remote Imaging Group  
 R.L. Drake Company  
 DX Computing

Electronic Distributors  
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 ICOM America  
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Signal Intelligence  
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 Worldcom Technology  
 Mark Zealor



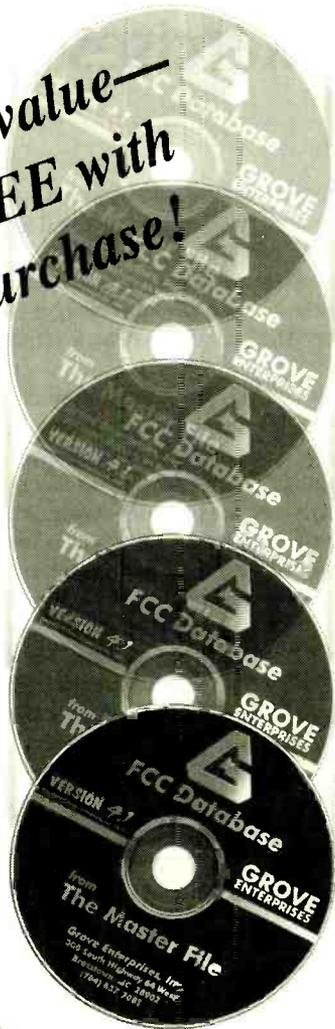
*The banquet featured a lively talk by Joe Adamov, Radio Moscow, delicious food from the Hilton, and 180 attendees.*



*Seminars were lively and educational. Thanks to the efforts of Michael and Debbie Love, they are also available on tape. See page 97 for details.*

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## US Government HF Exercises

**U**te World regular Jack Metcalfe recently shared some information regarding three major US Federal government exercises that are routinely heard on government frequencies. One exercise I knew about; the other two are new to me. Here is a look at these exercises with details on when and where to hear them.

Three separate, but similar, exercises are heard on HF involving the military, industry, and government agencies. All of these exercises are conducted to prepare for possible emergencies or what the government likes to call "contingencies."

A big concern of government planners is the potential loss of the telephone system in times of emergency. Much of the traffic monitored during these exercises seems to be using HF as a voice coordination network to pass interagency messages, or to use it as a backup to coordinate the restoration of telephone service (local and long distance).

### ■ SHARES

**SHARED RESOURCES:** Presidential Executive Order 12472 established national policy guidance in support of National Security and Emergency Preparedness (NS/EP) objectives. This guidance mandated that action be taken to "...ensure that a national telecommunications infrastructure is developed..."

To comply with the Executive Order, functionally similar government telecommunications networks were designed to interchange traffic in support of national leadership requirements. The National Communications System (NCS) was responsible for the implementation of the Executive Order. Part of their plan addressed sharing federally-controlled HF radio resources in order to establish a strong national emergency HF communications infrastructure. This evolved into the SHARES HF radio program.

There are five objectives to the SHARES program:

- Provide participating agencies with extended high frequency coverage and enhanced emergency HF radio communications at no added cost.
- Provide an enduring backup to vulnerable leased telecommunications.
- Provide the flagword SHARES to expedite identification and processing of emergency Federal government traffic.
- Standardize message preparation and procedures to simplify inter-agency handing of NS/EP traffic.

**TABLE 1**

Dates on Which Government Exercises Were Monitored:

SHARES:	August 31, 1993 August 2-3, 1994 September 27-28, 1995	October 26, 1993 December 6, 1994
NECN:	June 1, 1994 September 1, 1995	March 1, 1995
NTMS/NTCN:	May 15, 1993 March 16, 1994	September 22, 1993 August 30, 1995

- Provide possible work-around to jamming by permitting interagency operation on allocated frequencies identified for SHARES use.

The last objective mentioned above is the key to the SHARES puzzle. There are no SHARES frequencies per se. Each agency submits frequencies to the SHARES pool on which SHARES operations may be conducted.

You can recognize if a particular government HF frequency is being used for SHARES by the system flagword—SHARES. If you hear SHARES mentioned, then you are dealing with a SHARES exercise or operation rather than the normal day-to-day communications of the government agency you are used to hearing on that frequency..

Based on over-the-air intercepts, it now appears that three SHARES readiness exercises are conducted during each calendar year. These have traditionally occurred in May, August, and December. However, Ute World has been told that future SHARES exercises will be conducted in January, May, and September of each year. These exercises will stretch over a two-day period and will run continuously during the exercise period. Past exercises were only conducted during normal government working hours.

The following is a list of the member agencies for the SHARES communications system:

AT&T, Bellcore, Civil Air Patrol, Drug Enforcement Administration, Defense Logistics Agency, Defense Mapping Agency, Department of Energy, Department of Interior, Department of Justice, Director of Military Support, Environmental Protection Agency, Federal Aviation Administration, Federal Bureau of Investigation, Federal Communications Commission, Federal Emergency Management Agency, various state emergency operations centers (EOC), American Red Cross, Federal Highway Administration, Immigration and Naturalization Service, Maritime Administration, MITRE Corp, US Marine Corps/Mountain Warfare Training Center, National Aeronautics and Space Administration, various Army National Guard units, National Coordinating Center for Telecom, National Communications System, National Telecommunications and Information Administration, Office of Emergency Transportation, US Air Force MARS, Air Force Reserve, US Army—WAR46 (1111th Signal Battalion)/ 2nd US Army (GA/SC), US Army Material Command, US Coast Guard, Customs Service, US Department of Agriculture, US Navy, US Navy MARS, US Transportation Command, Veterans Administration, 44th Med Brigade, Department of Health and Human Services, and the General Services Administration..

### ■ NECN

**National Emergency Coordination Net:** This exercise has similar participants to the SHARES exercises, but these exercises have only been monitored on FEMA's primary frequencies of 5211 and 10493 kHz using USB/LSB. Message traffic consists of relays of callsign, agency name, and local zip code.

Not much more is known about the NECN and any information that readers may wish to share is welcomed.

■ **NTMS/NTCN**

**National Telecommunications Management Structure (NTMS)/ National Telecommunications Coordinating Network (NTCN):** Two acronyms that ute listeners may not have seen before are NTMS and NTCN. The first of these new acronyms describes an organization within the government and industry that is responsible for the country's telecommunications resources. The NTMS team provides a comprehensive, survivable, and enduring management capability for initiating, coordinating and restoring.

The National Telecommunications Coordinating Network (NTCN) supports the operations and functions of the NTMS by providing communications connectivity for the exchange of minimum essential telecommunications management information between NTMS elements. The NTCN relies on existing multimedia telecommunications systems and capabilities that can be readily accessed. HF radios deployed by the NTMS program office serve in a contingency as a means of communications if other systems are disrupted or inaccessible.

Participants in the NTMS/NTCN system include six Federal regional centers and 49 industry operating centers scattered throughout the US. Forty-two HF radio frequencies have been dedicated to the NTCN and an automatic link establishment (ALE) system is used by the NTCN using the Harris RF-3200E radio system.

FEMA, FCC, and NCS (KNY callsigns) have been the only participants noted during NTCN exercises to date. Frequencies monitored during NTCN exercises include 5211.0, 10493.0, and frequencies noted below with the NC designators.

Major participants known to be part of the NTCN system include: ALASCOM, Ameritech, AT&T, Bell Atlantic, Bellcore, GE, GTE, Hughes, McCaw, MCI, NYNEX, PacBell, PTI, Sprint, BellSouth, Southwestern Bell, US West, GSA, FCC, and FEMA.

Possible NTCN activity has been monitored on the following HF frequencies:

- 2283 2302 2353 2382 4458 4522 4538
- 4618 4623 6765 6781 6845 7320 9051
- 9054 9064 9067 9070 9276 11428 11432
- 11448 11474 13800 13804 13854 15613
- 15642 15989 18938 18946 22864 22867
- 25344 25347 27550

Known designators (NC)/frequencies for the NTCN include:

- NC02 ..... 4458.0
- NC04 ..... Unknown
- NC10 or NC12 .. 9052.0
- NC11 ..... Unknown
- NC? ..... 9065.5

All of these government systems should provide the utility listener with interesting listening during times of national disaster and emergencies. Keep your frequency list handy during the next natural disaster and let the Utility World know what you hear.

■ **FAA HF Radio Network**

A major upgrade to the FAA's national radio communications HF radio system (NARACS) is underway. The NARACS upgrade—a high priority in the FAA's radio communication program—will add ALE (see above), make the system more user friendly, replace outdated

computers, and improve equipment standardization. Officials say that the upgrade addresses the deficiencies of the current NARACS system, and will result in a system which is significantly easier to operate.

This list of FAA frequencies and their designators is courtesy of Jack Metcalfe.

Chan	Freq	Chan	Freq
5	6870.0	12	11637.0
6	7475.0	13	13312.0
7	7611.0	14	13457.0
8	8125.0	16	13630.0
11	9914.0	17	15851.0

Obviously, there are some holes in this frequency list. If anyone has any updates, please send them along to the Ute World column.

■ **Global Network on 28 Channels**

Ships at sea now have more choices than ever to easily send and receive their RadioTelex and E-Mail traffic. Global Wireless™ has commenced operation from SAB-Gothenburg Radio in Sweden, another node in the company's growing network of public coast stations. The Global network now covers Europe, both coasts of the United States, the Atlantic and Pacific Oceans, the Panama Canal, the Caribbean Sea, and the Gulf of Mexico. The company's existing stations include: KEJ-Hawaii, KFS-California, WNU-Louisiana, and VCT in Newfoundland, Canada.

In addition to traditional SITOR communications, the station also supports high-speed data communication. Using the company's recently introduced GlobeEmail™ system, ships at sea easily communicate with all shore-based electronic mail networks.

The new facility at Gothenburg is being provided, and operated, by Telia Mobitel AB under a partnership arrangement with Global Wireless. The transmitters and receivers are located at an historical radio site initially constructed by RCA for point-to-point service between Sweden and New York.

The Global Radio Network™ was started two years ago when remote control equipment and data lines were installed between WNU in Slidell and a centralized traffic facility in Half Moon Bay, California (KFS). This connection—and now a similar one to Sweden—allows ships at sea to contact the most convenient stations for messages, all of which are stored in a sophisticated computer system at KFS.

Traffic lists sent by the five network stations are identical and include every message on hand. Radio operators can determine if they have traffic waiting by listening to just one such broadcast.

Table 2 is a complete list of all twenty-eight ITU NBDP (SITOR) channels being used by the Global Radio Network of marine stations.

Now it is time to see what you have been hearing in the world of utility listening. I hope each of you has a safe and happy holiday season.

**TABLE 2 - Global Radio Network**

ITU Channel	Call Sign	Shore Transmit	Ship Transmit
401	WNU	4210.5	4172.5
403	KFS	4211.5	4173.5
409	KEJ	4214.5	4176.5
416	VCT	4217.5	4180.0
418	SAB	4218.5	4181.0
603	KFS	6315.5	6264.0
625	KEJ	6326.0	6275.0
626	SAB	6326.5	6275.5
627	WNU	6327.0	6276.0
632	VCT	6329.5	6283.5
803	KFS	8417.5	8377.5
819	WNU	8425.5	8385.5
830	KEJ	8431.0	8391.0
837	SAB	8434.5	8394.5
838	VCT	8435.0	8395.0
1203	KFS	12580.5	12478.0
1219	WNU	12588.5	12486.0
1257	WNU	12607.5	12505.0
1263	VCT	12610.5	12508.0
1265	KEJ	12611.5	12509.0
1291	SAB	12624.0	12522.0
1347	SAB	12652.0	12555.0
1647	KFS	16829.5	16706.5
1657	WNU	16384.5	16711.5
1673	KEJ	16842.5	16719.5
1691	SAB	16851.5	16728.5
1676	VCT	16844.0	16721.0
2203	KFS	22377.5	22285.5

Note: KEJ has moved from 407 to 409 and VCT has moved onto two channels.

## Abbreviations used in this column

AM	Amplitude Modulation	MARS	Military Affiliate Radio System
ARQ	Synchronous transmission and automatic repetition teleprinter system	Meteo	Meteorology
ARQ-E	Single-channel ARQ teleprinter system	MFA	Ministry of Foreign Affairs
ARQ-E3	Single-channel ARQ teleprinter system	M/T	Motor Tanker
ARQ-M2	Multiplex ARQ teleprinter system with two data channels	M/V	Motor Vessel
Canforce	Canadian Forces	NASA	National Aeronautics and Space Administration
CG	Coast Guard	NW	Nightwatch
COE	Corps of Engineers	Packet	Teleprinter system commonly used by amateur radio operators
Comms	Communications	PAP	Polska Agencja Prasowa
CW	Continuous Wave (Morse code)	PIAB	Presse- und Informationsamt dieser unserer Lugengerierung
Diplo	Diplomatic	POL-ARQ	Polish diplomatic ARQ teleprinter system
EAM	Emergency Action Message	RAF	Royal Air Force
FAX	Facsimile	RTTY	Radioteletype
FEC	Forward Error Correction	RUM-FEC	Romanian diplomatic version of the FEC teleprinter system (ROU-FEC)
FEC-A	One-way FEC teleprinter system	SAM	Special Airlift Mission
FEMA	Federal Emergency Management Agency	SELSCAN	Selected Scan
FF	French Forces	SITOR-A	Simplex teleprinting over radio system, mode A
F/V	Fishing Vessel	SITOR-B	Simplex teleprinting over radio system, mode B
GHFS	Global HF System	SK	Morse code abbreviation for 'end'
HF	High Frequency	Unid	Unidentified
ID	Identification	U.S.	United States
KHz	Kilohertz	USAF	U.S. Air Force
LDQC	Long Distance Operational Control	USB	Upper sideband
LSB	Lower sideband	USCG	U.S. Coast Guard
		USN	U.S. Coast Guard

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

- 409.0 BA-Non directional beacon (NDB) in modulated CW at 0406. Where is it? (Sue Wilden-Columbus, IN) *That's an NDB at Columbus Muni, IN, on 410 kHz-Larry.*
- 1923.7 GKR2-Wick Radio, England, with CW marker at 0106. (Ary Boender-Neth)
- 1925.0 GKZ-Humber Radio, England, with phone patch traffic at 1010. (Boender-Neth)
- 2460.0 UDH-Riga Radio, Latvia, with CW marker at 0002. (Boender-Neth)
- 2461.5 99-Irish Naval station with routine messages in SITOR-A at 2354. (Boender-Neth)
- 2582.0 ZMB-Bermuda Harbor Radio, Bermuda, with high seas and local Notices to Mariners at 0434. (Rausch-NJ)
- 2670.0 USCG Group Southwest Harbor, ME, with weather update at 0218. (Rausch-NJ)
- 2696.7 GLD3-Land's End Radio, England, with CW marker at 0052. (Boender-Neth)
- 2840.0 DLVF-German customs launch *Glueckstadt* working Cuxhaven CG using SITOR-A at 1932. (Boender-Neth)
- 2841.0 EBA-Spanish Naval Radio Madrid, Spain, with CQ CW marker at 0045. (Boender-Neth)
- 2892.5 MTO-Royal Navy Rosyth, England, with 75 baud RTTY availability messages at 0024. (Boender-Neth)
- 3023.0 Edinburgh Rescue working Rescue MU at 0405, here from 5680. (Boender-Neth)
- 3195.0 R-Russian Navy channel marker in CW at 0039. (Boender-Neth)
- 3753.3 FUF-FF Fort de France, Martinique (IAR), with ARQ-E3 message to RFLID-Pointe a Pitre (ARI) at 1000. (Fred Hetherington-Ormond Beach, FL)
- 3839.0 Russian Air Defense station in CW at 2350 parallel to 6635. (Boender-Neth)
- 4190.0 SZTJ-M/V *Golden Eagle* with CW traffic to WLO at 0342. (Jim Navy-Colonial Heights, VA)
- 4199.0 YJYF2-M/V *Gulf Trident* working WNU in CW at 0155, moved to 8350. (Navy-VA)
- 4201.0 C4JU-M/V *Luckyman* working WCC in CW at 0230. (Navy-VA)
- 4245.8 Unid station with 100 baud RTTY at 0430. Encryption broken by occasional RY. (J.L. Metcalfe-KY) *This is a GYA/MTO-Royal Navy frequency-Larry.*
- 4330.0 Spanish female number station in AM at 1210. (R.L. Smith-Satellite Beach, FL)
- 4331.0 WCC-Chatham Radio, MA, with CW CQ marker at 0643. (Wilden-IN)
- 4524.0 Fox Tango net (USN Link-11 voice coordination net) at 0518 working Golf Tango and others. (Baker-OH)
- 4602.0 NJDK-Unid military station in CW with 5-letter groups at 2323. (Boender-Neth)
- 4745.0 NW 01 working McClellan GHFS. Moved here from 8968 at 0713. (Jeff Haverlah-Houston, TX)
- 5155.0 Witch or Wish 12 calling X2X at 0410, no response. Next day caught Gizmo 14, X2X, T8A and 737 at various times. Very active frequency. Sounds like a USN frequency. (Metcalfe-KY) *This is a reported naval gunfire and amphibious support frequency. The USCG has also been reported here-Larry.*
- 5462.9 RF??-FF Tahiti, with ARQ-E relay of message from RFFAAK to RFHHHC-Air Hao at 1000. (Hetherington-FL)
- 5643.0 Auckland and New Zealand Aeradios working various aircraft at 0929. (Navy-VA)
- 5667.0 Honolulu Aeradio, HI, working Northwest 6 at 1236. (Gordon Levine-Anaheim, CA)
- 5673.0 Aviation weather, English female with Asian accent, hard to understand due to atmospheric at 1246. Mentioned Shanghai. The only info I have is Stockholm for this frequency, any ideas? (Levine-CA) *Per the Grove Shortwave Directory, 8th edition, that is Beijing, China, VOLMET-Larry.*
- 5680.0 Stavanger Rescue, Norway, calling Swedish Air Rescue at 0718. Swedish Air Force Lulea working Rescue U93 at 0740. (Boender-Neth)
- 5700.0 NW 01 working WAR46 with phone patch to Seven Figures at 271-5926 at 0518. (Haverlah-TX)
- 5714.0 Architect-RAF Strike Command with Celebrity message at 0430. (Boender-Neth)
- 6227.0 Container ships *Tropic Night*, *Tropic Palm*, and *Tropic Sun* working KMB with position reports at 1040. (Rausch-NJ)
- 6261.6 USCG using 300 baud packet at 0412. Appears to be navigational info from CG cutters or units, in this case the cutters *Dauntless* and *Challenger*. (Metcalfe-KY)
- 6446.0 WLO-Mobile Radio, AL, with CQ CW marker at 0710. (Wilden-IN)
- 6497.0 CFH-Canforce Halifax, NS, Canada, with 75 baud RTTY weather at 2330. (Boender-Neth)
- 6635.0 CIO2-Israeli Mossad number station in AM here at 2346. New frequency. Also Russian Air Defense station noted here in CW at 0006, not parallel to 3839. (Boender-Neth)
- 6683.0 SAM 125 calling Andrews (Mystic Star) at 0201. (Timothy D. Ward-Portage, IN)
- 6712.0 Andrews GHFS (now using North American sites on this frequency) with EAM broadcast at various times. (Haverlah-TX)
- 6717.0 FAR 65 carrying diplomats to Split, Croatia, with phone patches via Andrews at 1315. (Eric Langhendries-Winenne, Belgium) *Welcome aboard, Eric; think that call was SPAR, not FAR-Larry.*
- 6745.0 Rescue 332 at 0039 working Trenton military with phone patch to Winnipeg base operations. (Baker-OH)
- 6767.8 In CW noted 5-letter groups ending with SK SK at 0415. (Metcalfe-KY)
- 6873.5 ICS-Italian Navy La Spezia working replenishment vessels in Adriatic at 0738, probably replenishment vessels for Sharp Guard vessels. (Boender-Neth)
- 6989.5 AAMOHT-U.S. Army MARS station discussing packet meteor burst equipment in LSB at 0255. Metcalfe-KY)
- 7503.0 Bravo Whiskey working in a tracking net over several days. Also heard Delta, India, Mike and November. More USN? (Metcalfe-KY) *Yes indeed-Larry.* Papa Whiskey Link-11 voice coordination net at 0003. (Baker-OH)
- 7507.0 Unid stations with lots of scrambling at various times. (Robert C. Thompson-Kilgore, TX) *This is a USN hurricane net frequency; interesting that you heard scrambling here-Larry.*
- 7765.0 U.S. military stations Sierra 4, 5 and 6 at 0047. Went to 12270.0 kHz around 0100. Shut down while waiting for Sierra 6 to reach their relay site. (Metcalfe-KY) *These are probably NASA/USAF Eastern Test Range stations-Larry.*
- 8136.0 Spanish female 5-digit number station in AM at 0300. (Rausch-NJ)
- 8136.7 RFQP-FF Djibouti (DJV), sending ARQ-E3 message to "V" at 0100. (Hetherington-FL)
- 8342.0 UGOV-M/V *Novomoskovsk* with CW message for CINAVE Buenos Aires at 1318. (Navy-VA)
- 8377.0 EMIATH *Kazakhstan*, a Pass/RoRo cargo ferry, at 0328 in SITOR-A. (Baker-OH)
- 8379.5 LXAM-Container ship M/V *Antwerpen* at 0352 in SITOR-A. (Baker-OH)
- 8381.0 YLBM-M/V *Tavala* calling Riga Radio using SITOR-A at 1803. (Boender-Neth)
- 8384.0 VRGH-M/V *Mineral Europe* at 0318 in SITOR-A with telex that Inmarsat-C satellite system was down. (Baker-OH)
- 8390.0 3FLI3-M/V *Forest Swan* at 0227 in SITOR-A. (Baker-OH)
- 8397.5 DQFX-M/V *DSR Asia* at 1640 using SITOR-B with relay of DSR Rostok news in German. (Baker-OH)
- 8399.0 C6BP9-M/V *Forest Hills* with SITOR-A message to CTGM Lausanne at 1834. (Boender-Neth)
- 8406.0 SQPP-M/V *Batanchlopsi* at 2335 in SITOR-A. (Baker-OH)
- 8407.5 UXGQ-SRTM (Medium Fishing Trawler, Freezer) *1500 Let Kieva* at 2326 using 50 baud RTTY to UIW-Kaliningrad Radio. (Baker-OH)
- 8410.0 LYCG-Lithuanian bulk carrier TH *Kapitonas Mestserjakov* at 0251 in CW with two telex messages for LYL, ex-UZXF callsign. (Baker-OH)

8413.0	URAE-TH <i>O'ga Ul'yanova</i> at 0158 in SITOR-A with admin message via St. Petersburg Radio. (Baker-OH)	12480.5	LAI12-M/V <i>Adriatic</i> with SITOR-A telex traffic to SMT Cyprus at 1550. (Navary-VA)
8423.0	SVT4-Athens Radio, Greece, with SITOR-B news in Greek at 2103. (Hetherington-FL)	12484.0	3ELE9-Container ship <i>M/V Aquilhas</i> at 2201 in SITOR-A. (Baker-OH)
8429.5	WNU-Slidell Radio, LA, with SITOR-A service selcalling 24 hours a day. (Hetherington-FL)	12503.5	UIWF-TH <i>Pervomaysk</i> at 1929 in SITOR-A (Baker-OH)
8448.5	WK0-Mobile Radio, AL, with CW traffic list at 0323. (Wilden-IN)	12552.0	SZPZ-M/V <i>Captain Sarantis</i> at 2333 in CW calling unid coastal station. (Baker-OH)
8473.5	A7D-Doha Radio, Qatar, with CW traffic list at 0011. (Roger Parmenter-Hyannis, MA)	12560.0	P3LD5-M/V <i>United V</i> working WCC in CW with message traffic at 2233. (Navary-VA)
8475.5	FUX-French Navy Le Port, Reunion Island, with 75 baud RTTY at 000. (Hetherington-FL)	12992.0	WLO-Mobile Radio, AL, with SITOR-B traffic list and high seas forecast at 1939. (Wilden-IN)
8598.0	OXZ4-Lyngby Radio, Denmark, with CW traffic list at 1459. (Boender-Neth)	13095.0	PZN-Paramaribo Radio, Suriname, with traffic list at 2140. (Rausch-NJ)
8646.5	FUJ-French Navy, Noumea, New Caledonia, at 1205 using 75 baud RTTY. (Baker-OH)	13211.0	Austerity working NW 01 here and on 9017 at 0120. (Haverlah-TX)
8650.0	ESA-Tallinn Radio, Estonia, with CW marker at 1500. (Boender-Neth)	13242.0	McGuire Radio Maintenance calling Andrews at 2200, no response. (Haverlah-TX)
8825.0	VIASA 740 working New York Aeradio at 0017. (Navary-VA)	13306.0	New York Aeradio working Air Maroc 204 and Baton 01 at 1436. (Navary-VA)
8906.0	AF1995-Air France Concorde on around the world flight working Gander Aeradio at 1706. (Paul Miller-Andover, ME)	13505.7	AAA6USA-U.S. Army MARS, Ft. Sam Houston, TX, using 300 baud packet regarding hurricane emergency procedures. (Metcalfe-KY)
8933.0	United 991 at 0305 calling Cedar Rapids LDOC. (Baker-OH)	14487.2	RFFP-FF Paris, France, with ARQ-E3 message to Sarajevo at 0022. Formerly ARQ-M2. (Hetherington-FL)
8968.0	Razor or Ranger 33 with phone patch via Offutt to 965-3066 with ETA information at 1447. (Les Butler via Grove BBS)	14513.7	Japanese Embassy in Haiti sending 5-letter code groups using SITOR-A at 1910. (Hetherington-FL)
8971.0	Cardfile 711 (probably USN P-3C) at 1653 calling GOC and Blue Star. (Baker-OH)	14663.5	German Embassy in Brasilia, Brazil, with ARQ-E message to Bonn at 1300. (Hetherington-FL)
8992.0	Razor 01 working MacDill GHFS with phone patch to Raymond 24 at 0201. (Ward-IN)	14688.0	V5G-Bucharest, Romania, with RUM-FEC transmission then CW sign-off at 1300. (Hetherington-FL)
9007.0	Unid station at 0112 in USB calling Lima Tango and what sounded like Russian language communications. (Baker-OH)	14692.5	JMJ4-Tokyo Meteo, Japan, with a beautiful FAX meteo chart at 1315.
9014.0	Jam Up 1 (ground unit) working Jam Up 2 (aircraft) with mentions of Raymond 2 at 0200. Who is Raymond 2/Jam Up 1/2? (Gary M. Beck-Florence, AL) <i>Raymond 2 is Tinker AFB. OK. I do not have a listing for Jam Up 1/2-Larry.</i>	14707.0	JPA35-Interpol Tokyo, Japan, with SITOR-A pulses. Good strength, but won't print as SITOR-A. (Hetherington-FL)
9018.0	Sparerib working Thule looking for NW working frequencies at 0243. (Haverlah-TX)	14908.0	A brief transmission heard here at 2347. Listed as FEMA F-46, but might have been U.S. military. (Metcalfe-KY) <i>Concur on the FEMA F46-Larry.</i>
9031.0	Architect-RAF Strike Command at 0000 with weather. (Baker-OH) <i>New frequency-Larry.</i>	14912.5	SPW-PAP Warsaw, Poland, with SITOR-B news in Polish ending at 1854. (Hetherington-FL)
10314.0	Polish Embassy Belgrade, Serbia, working MFA Warsaw in POL-ARQ at 1135.	15016.0	Goatpen and Porkpie broadcasting EAMs at 0620, also on 8968. (Haverlah-TX)
10320.0	Unid Russian stations with short messages using both USB and LSB. Russian Air Force? (Boender-Neth)	15041.0	NW calling Pleasure at 1905 on S-314. (Jeff Jones via Grove BBS) <i>Thanks for the new designator, Jeff-Larry.</i>
11150.0	Tech 32 and 33 working each other on 11175, moved here to avoid interference at 1058. Interesting choice of frequency. (Larry Van Horn-Brasstown, NC)	15750.0	GVA/MTO-Royal Navy London, England, with 75 baud RTTY encrypted then RYs at 2130. (Hetherington-FL)
11175.0	Aegis 26 (C-130 tail number 41673) working Offutt with phone patch to Nellis at 0253. (Haverlah-TX)	15992.4	DGP92H3-PIAB Bonn, Germany, with FEC-A news in German 1130 to 1353 parallel DES70L3-18697.6. (Hetherington-FL)
11181.0	Bandsaw India Art working Hickam GHFS at 0340. (Navary-VA)	16228.2	Unid station sending 5-letter groups using 75 baud RTTY at 1406. (Metcalfe-KY)
11217.0	Shark 85 working Albrook GHFS with phone patch at 2127. (Navary-VA)	16238.5	CLP1-MFA Havana, Cuba, with 50 baud RTTY messages to CLP55-Embacuba Georgetown, Guyana. (Hetherington-FL)
11229.0	Lord Jim, One Punch, NW 01, and Memorial working each other at 1620. (Haverlah-TX)	16305.7	FDZ-FF Paris, France (FDZ), with ARQ-E3 transmission to N'Djamena at 1430. Formerly ARQ-M2. (Hetherington-FL)
11243.0	Sandy with a rare 'HFUSB181630' type message at 1630. These messages are rare on the NW nets and they usually seem to come from callsigns that are people's names. (Haverlah-TX)	16326.0	U.S. Army COE directed net operations including the following stations: WUA-Boston, MA; WUG-Vicksburg, MS; WUE4-Huntington, WV; and WUB3 mobile, Philadelphia, PA, among others on channel 13 (previously 16382.0). COE recently shifted channels 11, 13, 14 and 15. Designators I currently have are: ch 3-6020; ch 4-6785; ch 8-9122.5; ch 9-11693.5; ch 10-12070; ch 11-12122; ch 12-16077; ch 13-16326; ch 14-unknown; and ch 15-unknown. (Metcalfe-KY) <i>Thanks for the update, Jack-Larry.</i>
11244.0	Croughton GHFS with a Foxtrot message at 0531. (Haverlah-TX)	16693.5	P3N04-MSC <i>Jade</i> , DUJW-M/V <i>Sapphire</i> , P3GF4-M/V <i>Sea Concert</i> , C6H16-M/V <i>Clipper Unity</i> , EOIQ-M/V <i>Aram Khachaturyan</i> , EMSE-M/V <i>Petr Tomasevich</i> and 5LHW-M/V <i>Callian S</i> on this frequency at various times with SITOR-A traffic. (Navary-VA)
11288.0	Jeddah-Saudi LDOC calling Saudi 006 at 2130. (Navary-VA)	16698.5	C6DJ3- <i>Bongo Danielsen</i> , VRGH- <i>Mineral Europe</i> , OUKI6-M/V <i>Helle Stevns</i> , and OWWA2-M/V <i>Jaguar</i> noted here at various times with SITOR-A traffic. (Navary-VA)
11342.0	New York Aeradio working various aircraft at 1351. (Navary-VA)	16705.5	ELOR5- <i>Stolt Vinland</i> , 9HTP2-M/V <i>Seamonarch</i> , and HJNX-M/V <i>Mediterranea</i> noted at various times using SITOR-A. (Navary-VA)
11491.0	Spanish female 5-digit number station in AM at 1839 (Mon UTC). (Wilden-IN)	17049.5	DAN-Norddeich, Germany, with SITOR-A telex traffic to ships at 1520. (Hetherington-FL)
11781.0	Richmond 30/37 and Horseman 16A/18/163/16CHF/32HF/34HF heard at 1910 setting up radio net. Lots of burst communications heard. (Thompson-TX) <i>Nothing in my database for this one, Robert; probably a U.S. military tactical operation-Larry.</i>	17245.1	PWX33-Naval Radio Brasilia, Brazil, with 85 baud RTTY to RPFN at 1320. (Hetherington-FL)
12122.0	WUN-U.S. Army COE Hanover, NH, WUG-Vicksburg, MS, and WUJ35-John Jay Dam, WA, in USB and SITOR-B at 1559. New COE channel 11 (previously 12267). (Metcalfe-KY)	17976.0	Mangrove broadcasting repeat EAMs at exactly H+00 from 1500-2130, major STRATCOM warfare exercise. Also heard some Decent Foxtrot messages. (Haverlah-TX)
12423.0	PPRS-M/T <i>Pirajui</i> working PPO in CW at 1856. (Navary-VA)	18055.0	DFZO-MFA Belgrade, Serbia, sending 75 baud RTTY Y's and signing DFZO at 1400. Formerly signed DFZG. (Hetherington-FL)
12424.0	3EAO3-M/T <i>Countess</i> working WLO in CW at 0444. (Navary-VA)	18434.3	Unid, possibly Cuban diplo with encryption after VCVCVC using 75 baud RTTY at 1422. (Metcalfe-KY)
12425.0	9VEY- <i>Neptune Sirius</i> , 3FIK4- <i>Wild Rabbit</i> and 3FSD2-M/V <i>Balsa 31</i> working KFS at 0253/0601/1339. ELCI5-M/T <i>Pradicos</i> working JRC at 1502. DUVK- <i>General Mojica</i> working WLO at 1826. TCAA-M/V <i>Zeynep K</i> working TAH at 2310. All comms in CW. (Navary-VA)	18448.1	CLP1-MFA Havana, Cuba, with Minrex news in Spanish ending at 1719 then circular 781 in Spanish following. (Hetherington-FL)
12425.5	3EXY8-M/V <i>Pacific Way</i> with message in CW at 0130. (Navary-VA)	20029.5	Unid station with 5-digit groups using 50 baud RTTY at 1649. (Metcalfe-KY) <i>I have FEMA listed in the area, but nothing else-Larry.</i>
12426.0	ENAL-F/V <i>Vasily Kalenov</i> working KLB in CW at 0055. (Navary-VA)	20732.2	GMN with RYRY using 75 baud RTTY at 1645. Diplo? (Metcalfe-KY) <i>I have seen HDN-Quito, Ecuador Naval on this frequency in the past; maybe this is a new Naval station from Central or South America-Larry.</i>
12427.0	ELMP9-M/V <i>Zenovia</i> working WSC at 1600 in CW. (Navary-VA)	22314.0	A strong SELSCAN noted on this U.S. Customs frequency at 1433. (Metcalfe-KY) <i>Interesting, Jack; is this a customs channel?-Larry</i>
12428.0	LYBZ-M/V <i>Kapitonas Dubinin</i> with CW message at 1923. (Navary-VA)	22381.0	WLO-Mobile Radio, AL, with ID marker in CW at 2322. (Metcalfe-KY)
12430.0	3EKE3-M/V <i>Maam</i> working KPH in CW at 0335. (Navary-VA)	22537.0	FUF-FF Fort de France, Martinique, with 75 baud RTTY RYs at 1600. (Hetherington-FL)
12431.0	6ZSZ-M/V <i>Trade Dawn</i> working LPD at 1645 in CW. (Navary-VA)	22563.0	9AR-Rijeka Radio, Croatia, with V CW marker at 1242. (Boender-Neth)
12433.0	IBCVT-M/T <i>Filomena Lemba</i> working IAR in CW at 2048. (Navary-VA)		
12434.0	UTWF-M/V <i>Sosnogorsk</i> working HPP with CW traffic at 1717. (Navary-VA)		
12435.0	3EQM4- <i>Ocean Grace</i> with CW to KLB at 0255. (Navary-VA)		
12442.0	LASQ2-M/V <i>Wilmaster</i> working WNU in CW at 1758. (Navary-VA)		
12445.0	VRUV-M/V <i>China Mountain</i> with CW traffic to KPH at 0338. (Navary-VA)		
12448.0	WZJE-SS <i>Mayaguez</i> with CW traffic to WLO at 1928. (Navary-VA)		
12450.0	3ECJ5-M/V <i>Golden Challenger</i> with CW traffic to WCC at 0013. (Navary-VA)		
12452.0	SZPZ-M/V <i>Captain Sarantis</i> working SVB with CW traffic at 2204. (Navary-VA)		
12454.0	SZQH-M/V <i>Golden Horizon</i> with CW message to HPP at 1444. (Navary-VA)		
12472.0	3EKV4-M/V <i>Balsa 38</i> with CW traffic to VCS at 1630. (Navary-VA)		
12475.0	SVBB-M/V <i>Kimisis</i> working WCC with CW traffic at 2307. (Navary-VA)		
12479.0	Various ships working WLO with SITOR-A traffic. (Navary-VA)		

### Alive and Well

**D**uring the past few years, the hobby of scanning has begun to change. In fact, it would probably be more accurate to say that the very foundation of scanning has shifted. Gone are the days when you could monitor your entire police department on a single frequency. In today's world of scanning, 5, 10, 20, and 40 channel trunked systems are the norm. And, although it's very easy to spend a thousand dollars on new, computerized scanning equipment, there isn't any item on the market that can scan a trunked system. We're all aware that this inability of scanners to follow trunked systems has launched a barrage of newspaper headlines predicting the demise of scanning.

Did you read Skip Arey's October "Beginner's Corner"? Well, I agree with his conclusion: Scanning, my friends, is alive and well. Sure, trunked systems are difficult to monitor, but not impossible (see several items in the Oct issue of *MT*). And, while radio communications have become more sophisticated, there are millions of radio frequencies that are not trunked and are easily monitored. Your police and fire frequencies comprise only a fraction of the radio communications that are out there to hear.

The Department of Defense, for example, utilizes nearly half of all government frequency assignments. The Army, during simulated field maneuvers, can make use of more than 80,000 transmitters to support radio communications. The Navy employs more than a million personnel to operate a communications system, which makes the Navy the world's largest user of the airwaves. Other examples include the Air Force, the Marines, Department of Justice, Department of the Interior, the Space Administration, and non-government users as well.

The month of December is probably the best time to monitor non-government and non-public service frequencies. The business frequencies are a prime example. The shopping malls will be crowded with holiday shoppers and shopping mall security guards will be utilizing two way radio communications (See August *MT*). In addition to the mall frequencies, don't forget to check out the train and bus frequencies. A large number of shoppers will be using public transportation—especially during inclement weather.

Other hot monitoring targets to consider are hotels, newspaper delivery, public utility crews, construction crews, and tow truck operators. If you live in the snow belt, don't forget to monitor mountaintop ski resorts. All of the above are likely to be quite active on single frequencies, transmitted in clear voice. For exact frequency information, check out the frequency chart that accompanies this text.



*December is a great month to explore the frequency bands for new and exciting monitoring targets.*

Since we're talking about scanning the non-public service bands, we can't forget about monitoring the itinerant (see chart), cordless, and cellular frequencies. Sure, the last two are illegal to monitor, but they can be used to check your antenna system on both ends of the spectrum. As you know, cordless phones operate between 46.61 and 46.97 MHz. The cellular phone frequencies are between 869.04 and 893.97 MHz. Listening to baby monitors is another popular scanning target. These low power transmitters have the ability to indiscriminately fling household conversations

into the air. The frequencies to monitor are: 49.83, 49.845, 49.86, 49.875, 49.89.

Monitoring your local police and fire departments is the single greatest thrill in scanning. Nothing can compare to sitting in your living room and monitoring a high speed chase. And it's certainly exciting to hear emergency sirens in the background of a radio communication. But these public service bands still comprise only a very small portion of the radio spectrum. There are millions of non-public service frequencies out there that are testimony to the fact that scanning is alive and well.

#### ■ Treasure Hunt

During the month of November and December, we'll get into the holiday spirit by making everyone a winner. To receive a free frequency list that includes frequencies for bumper beepers, wireless microphones, itinerant frequencies, and fast food frequencies, simply answer the following:

1. Provide an itinerant frequency.
2. Spell out the abbreviation APCO.
3. What is the frequency for Marine channel #1?
4. A computer virus can be spread by airborne dust particles. True or False?
5. In the 806 to 894 MHz band, the higher frequency is the base frequency and the lower frequency is for mobiles. True or False?

To receive your free frequency list, please include a #10 SASE with your response. The address is P.O. Box 98, Brasstown, NC 28902.

#### ■ Frequency Exchange

Our first holiday invitation is from David Smith. Dave lives near Clarksville, Indiana, and here are his holiday frequencies.

42.12	State Police
42.16	State Police
42.26	State Police
42.42	State Police
155.235	Sellersburg Fire Dept.
155.31	Clark Co. Sheriff
155.475	Helicopter - State Police
155.67	Sellersburg Police
453.15	Clarksville Police

## Good December Scanning Frequencies

### Tow Trucks

150.83	150.845	150.875	150.89	157.47
157.485	157.50	461.725	453.875	853.4875

### Business Radio

27.43 to 27.53	30.76 to 31.24	33.14 to 33.40
35.02 to 35.98	461.00 to 461.975	462.00 to 462.925
463.20 to 463.975	464.00 to 464.975	

### Buses

30.66	30.74	30.82	43.72	30.86
30.90	30.94	43.74	31.02	31.08
31.12	31.14	44.48	44.50	44.52
44.54	44.56	44.58	44.60	43.70

### Utility Companies

37.46 to 37.86	47.70 to 48.54
153.41 to 153.725	451.025 to 451.675

### Taxi Cabs

152.27/157.53	152.30/157.56	152.315/157.575
152.33/157.59	152.345/157.605	152.36/157.62
152.375/157.635	152.37/157.65	452.10/457.10
452.15/457.15	452.30/457.30	452.45/457.45

### Newspapers

173.225	173.325	173.375	452.975	452.9875
173.275	450.05 to 455.950			

### Security/Alarm monitoring

151.625	464.56	469.55	154.57	154.60
464.50	464.55			

### Ski Resorts

151.655	151.715	151.865	154.515	157.56
151.685	151.775	151.805		

### Hotels

158.46	154.57	468.2875	469.2875	151.865
461.0625	461.0875	157.68	466.175	462.00
464.40				

### Federal Frequency Ranges

29.90 - 30.55	32.01 - 32.99	34.01 - 34.99
36.01 - 36.99	38.27 - 38.99	40.01 - 41.99
46.61 - 46.99	49.61 - 46.99	49.61 - 49.99
162.025 - 173.20	225.000 - 400.00	406.125 - 419.993

### Itinerant Frequencies

27.49	35.04	43.04	151.505	151.625
158.40	451.80	456.80	464.50	464.55

### Railroads

159.81	159.93	160.05	160.185	160.20
160.215	160.23	160.245	160.26	160.275
160.29	160.305	160.32	160.335	160.35
160.365	160.38	160.395	160.41	160.425
160.44				

The hills of **Clinton, Tennessee**, are our next stop. Thad Osborne has home made apple cider and a list of fresh frequencies.

37.90	Rescue Squad
46.08	Clinton Fire
154.295	Oak Ridge Fire
154.37	Oak Ridge Fire
154.57	Garden Plaza Hotel
155.04	Oak Ridge Public Works
451.85	Key Limestone Co.
452.075	Harrison Construction
453.225	Sheriff
453.375	Sheriff's phone patch
453.55	Relay for Medcom
453.975	Sheriff
460.30	Sheriff
460.325	Oak Ridge Police
460.40	Sheriff
460.425	Clinton Police
460.775	Berry funeral home
461.40	Proffit's Dept. Store
461.425	CRC Ready mix concrete

Thad's complete listing contains over four hundred frequencies for East Tennessee and Bristol City, Virginia. To receive the complete list, send a #10 SASE with three dollars to Bob Kay, P.O. Box 131, Gunpowder Branch, APG MD 21010. Please allow three weeks for delivery.

Robert W. Winter has invited us to spend the holidays in **Topeka, Kansas**. Bob's frequency "gift" appears below.

39.68	Shawnee Sheriff
39.80	Shawnee Sheriff
154.085	Wabaunsee County Fire
154.43	Topeka Fire
452.20	Yellow cab
460.20	Topeka Police
460.25	Topeka Police
460.35	Topeka Police
460.40	Topeka Police
460.475	Topeka Police
463.275	A&A Services

Pat Collins will enjoy Christmas in **Green Bay, Wisconsin**. Here are Pat's favorite frequencies.

48.24	Power and Light
48.38	Power and Light
151.655	Excel Driving School
153.71	Green Bay Power
173.325	Green Bay Gazette
451.075	Power and Light
461.2375	Northeast Vocational Tech
461.875	Metro Ambulance School
464.325	Green Bay Country Club
464.875	Port Plaza Mall
851.0125	Green Bay Packers (football)

America's #1 Scanning Magazine is

## National Scanning Report



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But don't take our word for it. Check it out yourself. \$3.00 cash will get you a sample copy rushed to you by First Class Mail. Or subscribe for just \$19.90 and you'll get a free custom frequency print-out for your county.

Paul Loren lives near **Boston, Massachusetts**. To celebrate the holidays, Paul has invited everyone to stop in and listen to the following:

- 46.54 ..... Road Maint.
- 155.16 ..... Ski patrol
- 156.03 ..... State Police (turnpike)
- 453.6125 ..... Prisons
- 453.7125 ..... Prisons
- 460.025 ..... Capitol Police
- 471.7125 ..... Auto theft task force

### Port Authority

- 810.0625    810.8125    811.4375    811.8125    812.4375
- 812.8125    813.2625    813.4375    813.8125    814.2625
- 814.4375    814.8125

Tom Sears has invited us to spend a white Christmas in **Woodstock, Vermont**. Here are the frequencies that melt the snow from Tom's scanning antennas.

- 135.175 ..... Ski patrol
- 151.475 ..... Fish & Game
- 155.865 ..... Brandon youth camp
- 159.405 ..... Fish & Game
- 453.225 ..... Vermont University

### Woodstock Police

- 460.15    460.25    460.50    465.025    465.10

If you enjoy spending Christmas in the snowy northeast, you'll love our final stop. Welcome to **Bangor, Maine!** Chris Andrecka calls this place home and here are his favorite frequencies.

- 154.68 ..... Prisons
- 154.695 ..... State Police
- 154.71 ..... State Police emergency
- 154.725 ..... Fish & Game
- 154.815 ..... Fish & Game
- 155.73 ..... Fish & Game
- 156.15 ..... State Police helicopter
- 452.45 ..... Turnpike authority
- 452.975 ..... State prison

To invite the frequency exchange to your home town, send your favorite frequencies to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

### Radio Mods

In Tulsa, Oklahoma, a federal jury convicted an individual of illegally modifying two-way radio equipment. The two-way radios were modified to monitor the city's trunked radio system. The defendant argued that police frequencies were public and that his modified two way radios were no different than scanner radios.

The prosecution argued that the modified two-way radio equipment had the potential for disrupting communications. The fact that the defendant was paid \$1000.00 dollars to modify each radio, helped to convince the jury that the defendant's intentions were not solely devoted to the hobby of monitoring. (News clipping from *Tulsa World*) (See last month's feature article on the Gass case.)

### Antenna Heights

Doubling the height of your antenna will increase your monitoring range about 33%. Triple the height and your monitoring distance increases by 65%. Raise the antenna by four times the height and your monitoring distance increases by 100%

As you probably realize, the above formulas are not fool proof. As the antenna height increases, so does coax cable loss. There's also a point where raising the antenna cannot compensate for the additional cable and subsequent loss in signal.

The rule of thumb is to mount your antenna above the "line of sight" to the horizon. If you're surrounded by tall buildings or trees it may not be possible to mount your antenna above the line of sight. The majority of roof mounted antennas are usually attached to a mast that is less than 10' high.

### Monitoring MDT's

Can Mobile data terminals (MDT's) be monitored? The answer is no. The transmission data is converted into numeric values and is sent at a very high baud rate. If you monitor an MDT frequency, you'll hear annoying high-pitched chirps and squeals.

### New Cordless Freqs

The new cordless phone frequencies can be found between 902.00 and 928.00 MHz. The exact frequencies vary between each model and manufacturer. As you monitor this new frequency range, you'll also hear a variety of strange noises from medical equipment and other gadgets.

### Easy Plug-in, after Modification

In the October issue, we stated that using the new Scout to "reaction tune" your AR-8000 or AR-2700 was as easy as plugging in an earphone. Well, yes, but, as an experienced reader points out, that's true only after you've done a modification which includes drilling a hole in the side of your scanner case. We didn't mean to be misleading.

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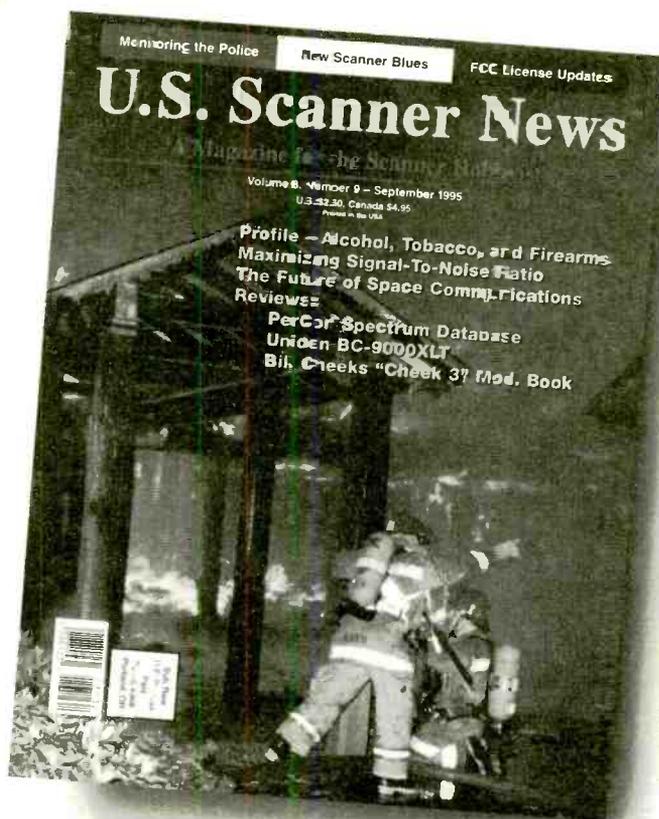
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### Mobilizing Mobile Mobility

**M**obile monitoring is a great way to experience the radio hobby. If you check out the parking lot of any gathering of radio enthusiasts, you are likely to find more than one car that is covered with a nearly solid veneer of antennas. But not everyone who would like to experience mobile radio monitoring is prepared to break out the drill and turn the family sedan into a porcupine. Those multiple antennas could have a negative effect on the car's trade-in allowance. Besides, not every monitor's significant other wants the cockpit clogged with radio gear.

Is it possible to go mobile monitoring and leave the car un-radioized upon completion of the journey? Of course! With a little planning on your part, you can take the radio monitoring hobby anywhere you want to go. A great side effect of developing a mobile monitoring system is that the equipment can be removed from harm's way and potential theft. With a little additional effort, this mobilized mobile setup can also be used in the home, the office, or hotel room.

Basically, there are three parts to any mobilized mobile system: power, receivers and antennas. Let's look at them in turn and see what is possible.

#### ■ Mobilized Mobile Power

Receivers need electrical power to get the job done. Although we live in a society that places health warnings on tobacco products, nearly every car comes with a cigarette lighter as standard equipment. The cigarette lighter provides the hobbyist with an easily reached source of (in most cases) fused, 12 volts DC. Cigarette lighter power plugs that can be adapted to mobile radio use can be found in most electronics supply houses.

But what if the receiver you intend to use does not operate at 12 volts DC? Many modern solid state circuits expect somewhat less juice. This is a problem that is easily rectified! (Pun intended.) Several manufacturers produce "universal" power adapters that plug into the car's lighter socket and allow you to switch to a number of different voltage settings and DC polarities. One of these devices might allow you to use any number of different receivers in your mobile application.

However, let me stress one point here: ALWAYS READ THE MANUAL! ALWAYS READ THE MANUAL! ALWAYS READ THE MANUAL! In this case I am referring to both the receiver and the universal power adapter's manuals. Making a mistake in voltage level and polarity will probably result in a small puff of smoke, followed by a deep sigh and a call to the Grove Enterprises repair service. Just take your time and pay attention to what you are doing.

If you want to avoid the hassle of plugging in to your

car's cigarette lighter, (or if you own a Bricklin—one of the few cars that was produced without one), you can always make use of receivers that have internal batteries. If you are using rechargeable cells, most receiver's batteries will last for at least one or two commutes back and forth to work. Just plan to do your recharging overnight for the next day's trip to the office. If you are more of a "high use" type of person, go with two sets of rechargeables. Keep one charging while the other is in use.

#### ■ Mobilized Mobile Receivers

We live in amazing times, my friend! Within most of our lifetimes, quality monitoring radios have gone from large tabletop devices to lightweight, handheld receivers that can be easily tucked in a glove box, briefcase, or pocket. If you are a student of Old Uncle Skip's beginner philosophy, you have no doubt taken the time to examine several of the reasonably-priced portable and handheld receivers on the market for use as a first hobby radio. Such gear has many advantages for folks planning to listen on the road but who still plan to pull their gear out of the car when the trip is done. In addition to being easy to carry, most portable and handheld receivers operate on batteries and have the option of drawing power from a resource such as the aforementioned cigarette lighter.

A relatively new class of monitoring receiver has hit the market in the last few years. These are known as "DC to Daylight" receivers. Receivers such as the AR-8000, ICOM R1, and Yupiteru MVT-7100 cover a wide range of signals that formerly would have required separate shortwave and scanning receivers. While on the expensive side for a first receiver, you may want to keep such rigs in mind if you find you do a lot of listening while traveling. Their small size, wide frequency coverage, and ability to receive power from either batteries or external sources make them just the ticket for mobilized mobiling.

But don't think you have to go running out to buy a new receiver just to listen in your car, (although it is a great excuse, and this is, of course, the gift-giving season). Why not first try to apply a bit of radio hobbyist tenacity and take a good look at your existing equipment? Does it have internal power, or a jack for external power? If it has a jack for an external antenna, you will probably be able to get it to work in most applications.

Since you're taking the rig out of the vehicle when not in use, size is less of a concern. I've traveled with a Kenwood TS-520 transceiver (which measures a fairly large 7" x 13" x 14") propped up on the passenger seat, and I had a blast doing it. Given a few minutes to unhook things, it was out of the car and back in my shack,



*A couple of well-placed mag-mount and trunk lip antennas make this car a "mobilized" mobile.*

essentially doing double duty as a base and mobile rig. Smaller size is certainly desirable, but not indispensable when planning a mobilized mobile system.

### ■ Mobilizing Mobile Antennas

When operating mobile, antenna structures are almost always a bit of a compromise. The mobilized mobile monitor has to accept the additional compromise of using antennas that are easily removable. Fortunately, manufacturers have given some thought to this area. For applications beginning around the ten meter ham band and going up through the VHF and UHF scanner frequencies, many well-designed antennas are available with magnetic mount bases. Nothing could be simpler than slapping the antenna on to the car roof and running a length of coax into your car through any convenient window. When the mobile listening experience is over, off comes the antenna and no one could tell that the car was a haven for mobile monitoring.

The only real concern with using mag-mount antennas is making sure the magnet in the base is strong enough to keep the antenna upright while tooling down the road at highway speeds. Another tip is to make sure the area on which you mount the antenna is completely clean and free of dust, grit, and dirt. Tiny particles under the magnet can get ground into the paint by the antenna's vibration caused by its movement through the wind. Likewise, check the bottom of the antenna base for cleanliness before placing it on your car. You will be amazed at how many teeny-tiny metallic particles can be attracted by this relatively powerful magnet. Nothing can curtail a spouse's tolerance of radio faster than a scratched-up car.

Several radio hobby suppliers offer clip-on antenna mounts that connect over your car window's edge. Usually these mounts allow you to connect any standard BNC-based antenna whip to the mount's coaxial cable that can then be strung to your receiver. Radio Shack offers such a unit under the catalog number 20-023. You will also see similar antenna mounts sold that utilize suction cups that stick to the car's windows. These appear to also work well, but I would have some concern with degradation of the plastic suction cups over time, due to exposure to UV radiation and the weather.

Shortwave listeners are going to want something a bit longer than the whip that does the job at VHF/UHF scanner frequencies. If you are using a portable receiver with telescopic whip antenna attached, resist the temptation to DX while driving with the whip extended in the car. Not only will your results be limited, but you stand a chance of putting someone's eye out if you take a corner too fast.

The first practical option would be a longer whip attached to a mag-mount or window clip mount. This plan has some limits in that too long an antenna will reduce the reliability of the mounting device due to increased wind load at speed. You might also consider using a splitter to connect your receiver to the car's existing AM/FM antenna. This will yield better results than the extended whip inside the car, but will still be somewhat limited in its effectiveness.

Another option would be a bumper-mount, 102" CB radio whip. These antennas make a great mobile shortwave antenna when coupled with a small tuning unit. An unobtrusive bumper mount could be used and the antenna can have a quick release connector at its base. This idea stretches the limits of the mobilized mobile design, but it is very effective and worth considering.

Yet another possibility is to look into devices such as the Grove No-Tenna. Units such as these work by essentially turning the metal in your car's structure into a big antenna surface. If you take your mobile shortwave listening really seriously, you may want to check through catalogs that cater to the amateur radio operator. Several manufacturers make very sophisticated mobile HF ham antennas that can easily be adapted to shortwave monitoring.

In spite of the seemingly endless compromises presented by mobile

antennas, the good news is that most mobile antenna designs are reasonably priced. They also tend to lend themselves to easy removal for mobilized mobile. You may not hear everything you normally hear at your desktop station connected to a good dipole, but you'll hear more than enough to keep things interesting.

### ■ Mobilized Mobile Packing

Since the whole idea of this exercise is to get the radio hobby in and out of the car, you will want to give some thought to carrying everything and keeping it all together. Scour the local thrift shops for a good used briefcase. You can gut it of its original business purpose and have enough room for a couple of receivers, your power unit, wiring, and antennas. This makes setting up and moving around very simple.

If you are using larger receivers, you may want to check your local discount or department store for plastic storage cases. When I'm taking my radios along with me to radio conventions or get-together with monitoring friends I use one of the Rubbermaid brand "Keepers" snap cases. This is slightly larger than a briefcase and it takes care of all my mobilized mobile and motel room monitoring needs.

So what are you waiting for, Compadre? Let's get those radios out of the shack and into the car! A whole new world of radio listening is available to you.

Oh, by the way, you folks in Florida, Indiana, Kentucky, Michigan, Minnesota, New York, Rhode Island, and South Dakota need to take a look at your state law's limits on mobile listening. It wouldn't hurt the rest of you to check out your own state's feelings on such matters, too. You don't want your hobby to get you in trouble with the local constabulary. Beyond that, have a lot of fun on the road! If you pass a car with the license plate WB2GHA, wave as you go by.

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**ARMENIA** V. of Armenia, English at 2147 on new 9965 (Edwin Southwell, UKOGBANI) Very good here and also on poor //7480 from 2130; and in English at 0100 on 7480, covered by Bulgaria (Kevin Hecht, PA, *World of Radio*)

**AUSTRALIA** R. Australia's best morning frequency for us used to be 9580, but lately they had been closing it at 1200\*. Now it's heard later (gh, OK) It's Shepparton, switching at 1200 from 70 to 30° until 2100\* (RA S95 via DSWCI *SW News*)

**BANGLADESH** RB, exactly 9650, with an unID open carrier on 9648, 1232-1257\* in English //7185 (David Clark, Ont., *Fine Tuning*)

**BELARUS** (?) Commercial broadcasts heard for first time on 90 and 120m bands, programs of R. Roks, Minsk, R. 101.2, and another Minsk station as well as Mayak—0300-0500 on 2372 and 3392, 0500-1600 on 4852, 5044, 1600-2400 on 2372 and 3392, all USB only (Mikhail Timofeyev, St. Petersburg, HCJB *Latest Catch*) Good here daytimes; site unknown, could be feeders (Mika Makelainen, Finland, *Jihad-DX* c/o Hans Johnson, Compuserve 73042,3644)

**BELGIUM** RVI's 6030 to us at 0030 was smashed by R. Martí, following a deal with Norway which got Martí off 6010 at 0100, opening earlier at 2300 on 6030 instead (gh, Joe Hanlon)

**BOLIVIA** R.-TV Colonia on 6557 at +1810-2100\*, later on weekends at 0042\*, from Santa Cruz (Len Iversen, Paraguay, DSWCI SWN)

**BRAZIL** Three stations heard on 11765: R. Universo, Curitiba, 0230 sermon, covered by China via Brasília in Spanish \*0310-0357\*, A Voz do Brasil \*0415-0513\*v (Ernie Behr, Ont)

**BULGARIA** R. Bulgaria DX program is in these one-hour slots: Fri 2000, Sat 0000, Sun 2200, Mon 0500, 1230 (Tom Kuca, NY)



**CANADA** RCI's funding fate we hope will be known by Christmas (André Courey, RCI *Mailbag*) If at least \$500K is cut, RCI will probably have to drop another language (Ian McFarland, *Grove Expo*) Program changes include *Mystery Project*, old-time radio from CBC, such as *The Saint*, now Sats 2330 on 5960, 6040, 9755; another airing of *Now the Details* Sun 2330 as well as Mon 0330 on 6010, 9755. Besides UT Sun 0005 on 5960, 9755, *Quirks and Quarks* repeats Sun 1305 on 9635, 11955 (RCI) New 5905 for French at 0100, English at 0200, clashed and often lost out to persistent heavy RTTY (gh) D-95 relays via Sackville include: BBC at 2300-0500 on 6175; CRI at 0300-0400 & 0500-0600 on 9595; DW at 0100-0200 on 5960, 6145; RKI at 1130-1200 on 9650 (via Diane Mauer, Bill Westenhaver)

**CHILE** I visited R. Triunfal Evangélica, Talagante; uses 500 watts very irregularly on 5825, trying to find a time when WENW doesn't block; have applied for license to broadcast within the 49m band (Gabriel Iván Barrera, Argentina, *Onda Corta* via *Radio Nuevo Mundo*)

**COSTA RICA** RFPI news: wide voltage variations keep damaging equipment, putting 6200 off the air; hopes to install protective device. RFPI Reports is weekdays at 2200, not 2230, and weekends 2030. *Report from the Desert*, on the Gulf War, is getting a trial run, Wed 1840 +8 and 15 hours. Spanish block expanded to daily 1200-1700, with second repeat of Spanish FIRE moved from 0800 to 1200, and 2nd repeats of English programs advanced an hour in the 0800-1200 UT period only, 15 hours after original broadcast.

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; W-95 = Winter season

*Mundo Radial*, gh's monthly Spanish DX report, appears Mons around 1530 and Sats around 1330; check 7385, 9400-USB, 15050 (RFPI *Mailbags* via gh, Diane Mauer)

**CZECH REPUBLIC** R. Prague laments that every year the opposition in parliament maintains that the station is illegal since it is financed directly by the government, rather than being private or public-service (via Mark Veldhuis, Internet via DSWCI *SW News*)

**DENMARK** [non] R. Denmark starts a monthly 15-minute English broadcast Jan 7, the first Sunday of each month via Norway (Erik Kjøie, Bob Thomas) Since Copenhagen is 1996 European City of Culture (BBC Monitoring) Probably at :45 past every hour into UT Mons (gh)

**ECUADOR** HCJB has resumed one TWR broadcast, German at 2230-2300 on 12005 (Rich McVicar, W.O.R.)

**EGYPT** R. Cairo to S. Africa has inserted English news at 1615-1625 on 11874.6v (Wolfgang Büschel, Germany, WDXC *Contact*) and WGTG was clashing in Oct on 9475 at 0200 (gh)

**FINLAND** It seems YLE's 1630 broadcast in English is only on satellite, not SW; the 1330 on Suns is in Finnish on 11735, 15400; and *Media Roundup* vanished from its Fri 1245 slot (gh)

**GOA** AIR well heard here from \*0128 on 7250 (Rich McVicar, Ecuador, HCJB *DXPL*) That's Nepali until 0228; also from this site in Tibetan 0130-0200 on 9565, Hindi 0315-0415 on 11855 (*DXPL*)

**GREECE** for D95, VOG planned to replace 9420 or 9935 with 6260 or 6245 at 0000-0350, also on 7450; at 1300-1450 probably on 12105, 15630 or 15410 (John Babbis, MD)

**HONDURAS** R. Copán Internacional closed Oct 31, awaiting a new transmitter and antenna; RCI programming carried instead on WRMI (Jeff White, *Grove Expo*) Will be 3.5 kW, and replacing 15675 with a lower frequency for better coverage of NAM, perhaps back early in 1996 (Adrian Peterson, AWR *Radio News Bulletin*)

**HUNGARY** R. Budapest, English: Eu 2000 on 3975, 5970, 7250, 9835; 2200 on 3975, 5935, 7250, 9835; NAM 0200 on 6190, 9850, 11870; 0330 on 5965, 9850, 11870 (Bob Thomas, CT) Still one *DX Show*, Wed 2005, Thu 0205, Sun 2205, Mon 0335, but in three segments: DX World, DX Tips, DX Catches; 6190 and 5965 both very poor here (John Norfolk, OK) Now on Internet: <http://www.eunet.hu/radio/> (RN *Media Network*, BBCM, Bob Thomas)

**INDONESIA** RRI Jakarta equally strong on 9525 and //9680 at 1300 news past 1600; must have added another 250 kW transmitter (Ernie Behr, Ont) VOI English very strong at 0800-0900 back on 9525 (Craig Seager, Australia, *Jihad-DX*)

**INTERNATIONAL VACUUM** *World of Radio* via World Radio Network, winter sked: Europe, Sat 1700 on Astra 1B, tr. 22-V, 7.38 MHz audio; NAM, Sat 2000 on Galaxy 5, tr. 6-V, 6.8; no longer delayed a week. VOA *Communications World* added to Eu service, Sun 1500 (WRN)

**IRAN** VOIRI not having much luck in picking clear freqs—new 6150 under AWR-Costa Rica for \*0028 English to us, ex-7260, //6175 under BBC, weak 9022 (Brian Alexander, PA, W.O.R.)

**ITALY** IRRS on new 3985 to 1950\*, still mentioning 7125 (Daniel Atkinson, England) 3985 from +1400, mostly English, good until CRI via Switz relay; also around 0700, times vary (Edwin Southwell, England) W-95 sked: 0600-0830 3985, 0830-1530 7125, 1530-2100 3985; also Fri, Sat, Sun 2100-2300 on 3950 (NEXUS-IBA); web site: <http://www.nexus.org/>

**KYRGYSTAN** Tho VOR may QSL 17775 as Bishkek, Olle Alm writes that the

only SW transmitters here are on 4010 and 4050 (Mika Makelainen, *Jihad-DX*)

**LAOS** LNR, Luang Prabang, tentative on 7162.1 at 1215 weak mod, 1240 peaking, ex-7154/6970? (Kirk Trummel, MO)

**LIBYA** Sabha or (Sebha) Local Radio heard in Arabic on 11815 at \*0745-0958\*, while other Tripoli frequencies 7120 and 11770 were not parallel; Sabha, in the desert 400 mi SSE of Tripoli, was birthplace of Qadhafi's revolution (BBCM)

**MALI** National R. on 5000.47 at 2210, over WWV at 2320 (Ed Rausch, NJ, HCJB *TLC*)

**MALTA** V. of the Mediterranean expanded and retimed English on Sun to 0700-0830 on 9765, Mon-Sat still 0600-0700 daily, 1400-1500 on 11925 (Edwin Southwell, England)

**MÉXICO** RMI, 5984.7, English poetry at 0320 on a UT Wed (Hans Johnson, CO, *Jihad-DX*)

**MONGOLIA** Sorry you can't hear RUB at 0300 in English; 12000 fair to good here, not 9960. Very interesting features—death customs, fermented mare's milk; great listening (David Norcross, GU, *W.O.R.*)

**MOZAMBIQUE** R. Moz, 3369.60, \*0252 with xylophone IS, IDs for Beira in several languages including English (Piet Conradie, RSA, *Jihad-DX*)

**NETHERLANDS** Strictly speaking, defunct *Happy Station* not replaced by *Siren Song* as announced, since it's on the alternate-hour Sunday broadcasts. In the *H.S.* hour are *Sincerely Yours*, new mailbag with Pete Myers vowing not to discuss dead subject of *H.S.*, and *Sounds Interesting*. Tuesdays at 2352, a long series on Africa. Documentaries UT Weds 0052, 0452, Fris 2352 in Dec: week of 6th and 13th, Dutch friendship with Germany; 20th, the year of the Alone; 27th, UN Conference on Women; Jan 3rd, homosexuality in Japan; 10th, changing face of Japanese youth (via Bob Thomas, Steven Cline) *Media Network*, Dec 28 features "British across the border," the people who set up a transmitter in Botswana upon Rhodesia's UDI in 1965 (RNMN)

**NEW ZEALAND** RNZI has issued a nice program booklet with illustrations of staffænot including Rudi Hill, Arthur Cushen. *Sounds Historical* is Suns 0706 on 11900, 0758-0900 on 9700 (via Gigi Lytle, TX) Volcano threatened to break SW antennas with ash; crews stood by to hose it off (RNZI Mailbox)

**NICARAGUA** R. Miskut is getting a 1 kW MW transmitter for 970 or 1550 kHz, donated by Mr. J. Freeman of Pinehurst, NC (Evaristo Mercado Pérez, Director, via Tetsuya Hirahara, *Radio Nuevo Mundo*) He doesn't say so, but once this is on they might quit SW (gh) 5770 USB still heard in Sept to 2345\* (Brian Alexander, PA)

**NORWAY** RNI, Sunday English to us for W-95: 1400 on 11840, 2200 on 6195, Mon 0100 on 6010, 0300 on 6030. 6195 was very good but 6010 and 6030 blocked by R. Martí and jammer! (Bob Thomas, CT) Oct shifted 6195 to 6200, got Martí off 6010 to 6030, blocking Belgium. *q.v.* Planned more changes Nov. 1 (Joe Hanlon, PA) 6 MHz is best band for winter to USA evenings, but if bad reception, must change to 7. 13 MHz works well on curtains, but problems with log-periodics to USA, so had to use 11 at 1400. Kvitsøy site not yet upgraded so cannot use extended bands. Second Sveio transmitter and curtains under installation this winter, reducing daytime broadcasts including to USA (Olav Mo Grimdalen, RNI via Bob Thomas)

**PARAGUAY** R. Encarnación, 11939.35, weak but clear around 0000-0200 when RCI inaudible (Ernie Behr, Ont.) Anyone know how to transfer money from Brazil? Our SW station here held up by currency

regulations (Dr. Walter Scragg, AWR at *Grove Expo*)

**PERÚ** On 5264.72 heard a new station named for its frequency, R. 5,264 at 0348-0426\*, location sounded like Chiliaco (Rich McVicar, HCJB via *Jihad DX*)

**PORTUGAL** RDP International, English Tue-Sat at 0230 on new 6095 clashing with Vatican (Tom Kuca, Bob Thomas, Joe Hanlon) W-95 sked shows only this and 9570 in use; at 1430-1500 M-F on 21515; 2000-2030 M-F 6130, 9780, 9815 to Eu, 15515 to Af (via Gigi Lytle)

**QATAR** QBS had been using only one SW transmitter for a decade, aside from Iraqi claud on 9570, but now heard with two at a time: 1235-1305 on 9570, 15265.2, 1305- on 9570 and 15265 (BBCM) QBS at \*0243-0300+ on 7210.12, weak mod (Brian Alexander, PA, *W.O.R.*)

**ROMANIA** A relay deal may be in the works for RRI to be heard better here, brokered by Larry Magne at *Grove Expo* (gh)

**RUSSIA** One new program on VOR WS is *Our Treasure Chest*, Russian history, daily at 0430 & 2030. For W-95, relays on 7360 and 7250 moved down to 5940, obscured by WWCR-5935: 0000 Vilnius, 0030 Minsk, 0100-0300 Hanoi (Kevin Hecht, PA, *W.O.R.*) And Vietnam in Spanish from 0300 on 5905 (Rich McVicar, Ecuador, *Fine Tuning*) BBCM's survey of VOR showed fewer frequencies for many languages including English, typically five, as many as a dozen, as few as two at certain hours, while Golos Rossii, the external service in Russian has 35 to 55 every hour! (gh)

**SAIPAN** MRI plans to add three hours per day from KHBI to Australia, India, and even Africa which is getting a very good signal, so WSHB may reduce African beams. KHBI and other U.S. Pacific SW stations expect to sell time to R. Free Asia, if and when established (C. Ed Evans, WSHB, at *Grove Expo*)

**SLOVAKIA** AWR *Wavescan* heard at 0120 UT Sun on 7315 (Brian Alexander, PA) Not on sked, some other site? (Tom Sundstrom via Joe Hanlon) Yes it is, but in Punjabi; must have substituted English (AWR *RNB* and gh) *Wavescan* also Sun 2120 on 9465 (Alexander) Only WMLK heard here on extended sked, skipping over you (gh, OK) See Hauser's Highlights for schedule

**SOUTH AFRICA** TWR's only English via Meyerton is 0600-0700 on 11730 (Wolfgang Büschel, WDXC *Contact*) See also TANZANIA

**SPAIN** REE D-95 in English: 2100-2200 Eu 6125, 2200-2300 Af 11775, 0000-0200, 0500-0556 NAm 9540 (REE)

**SWEDEN** R. Sweden at 0230 & 0330 on 7115 ex-7120 due to 7125 splatter; not much better, with CW QRM (Bob Thomas, CT) What do they expect, in the ham band?

**TANZANIA** [non] R. Tanzania heard in mid-Oct on 7290 with numerous IDs in Swahili at 0300-0430+, strong modulation, I think via a relay (Bob Thomas, CT) Right! Surprised to hear it on 15435, frequency unused for a sesquidecade, and R. Tanzania is in no position to get a new transmitter. Mystery solved when Sentech told us they are



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relaying Tanzania from Meyerton, South Africa, during election period, for better reception within the country, all 500 kW: 0300-0455 7290, 0900-1100 & 1300-1525 15435, 1530-1655 & 1800-2115 7280 (Chris Greenway, BBCM) Relay scheduled to end on 1 Dec (RNMN)

**TURKEY** VOT began W-95 with five new 500 kW transmitters at Emirler, south of Ankara; the site cost 1.91 teralira (*Yeni Gunaydin* via BBCM) Is at 32E51, 39N29, while previous site of Cakirlar is at 32E40, 39N58. For now all transmissions specified as DSB, with English rescheduled to: Eu 0400

7190-E, 1330 9445-C, 1930 9445-C, 2300 7190-E & 7280-C. As 0400 9560-E & 9685-C, 1330 9445-C & 9630-E, 2300 9560-E. Au 0400 & 2300 9560-E. NAM

**TRT** **TURKISH RADIO TELEVISION CORPORATION**

**TRT Sited, Kat : 5/C Or-An, ANKARA 06450 - TURKEY**

0400 & 2300 7190-E (TRT & via Joe Hanlon, Bill Westenhaver) 7190 not very good here, undermod and ham QRM; they failed to take my advice and put a transmitter in the Caribbean (gh)

**UAE** Dubai English at 1330-1355 and 1600-1640 on 21605, 15395, 13675, and 17825 which had interference (Brian Alexander, PA, *W.O.R.*)

**UKOGBANI** [ & non] BBC WS surprisingly expanded hours to NAm, reducing gaps in SW coverage, but implementation delayed until late Oct by hurricane repairs to Antigua. Morns, 17840 from 1400 to 1900, but for quite some time second BBC transmitter on same channel around 1500-1600 with echo or even different stream. At 1900-2000 we can hear Af stream on 17830. From 2000 on 11750 Ascension, clear with summer Russian clash gone. After Sackville on 9590 until 0000, Delano (?) picks up until 0430, after a mistaken evening on 9490. Sackville 6175 scheduled 2300-0500, but BBC from somewhere on 6175 until 0800. Antigua 6195 on an hour earlier from \*1000; it and 15220 from \*1200 include weekday *Caribbean Report* at 1105-1130 and 1209-1215 tho 15220 must skip over Caribbean. For winter, two traditionally Singapore frequencies scheduled for western Nam, so really on Am stream now?—11955 at 0500-0915 and 9740 at 1130-1615. Contrary to original plans, BBC did not simply shift all Am stream programming one hour later at our Oct 29 time change; some programs did such as *Newshour* at 2000 instead of 1900, but others did not, or were totally retimed. *From Our Own Correspondent* is now Sun 0430, 0810, 1505; Thu 0030, 1130. *Write On* Fri 1505, Sat 1905, Mon 0145. *Waveguide* Fri 1235, Sun 2320, Mon 0745 (gh, *W.O.R.*)

**UKRAINE** RUI monitored on fewer freqs than usual due to power bills; English: 2200 on 5905, 5940, 6080, 7205, 7240 and 6010 with a loud buzz making it useless; 0100 & 0400 on 6010 and 7205 also announcing 5905, 5915, 6055 (Kevin Hecht and John Hanz, PA & NJ)

**USA** With only three days' notice, VOA canceled English SW broadcasts to Europe Sept. 24; budget cuts and the availability of MW and FM made Europe most expendable (Kim Elliott, *VOA Communications World*) Continues SW in Albanian, Croatian, Hungarian, Romanian, Russian, Serbian, Slovak (BBCM) Tho it might seem one of the most important, VOA had to close its Tokyo news bureau, relying instead on stringers (R. Japan *Media Roundup*) Tho capable of 500 kW, Thailand and Morocco relays restricted to 250 (Elliott, *VOA CW*) I don't miss *Talk to America*, weekdays after 1700 news, as Af service still booms in on 13710, 15445 (Daniel Atkinson, England, *W.O.R.*) Due to solar trough, VOA W-95 scheduled on only three 13mb freqs: 21485, 1730-1800 daily and 1800-1830 M-F Portuguese to Af from Greenville; 21490 1200-1300 M-F Spanish from Ascension; 21550 0100-0300 English to SAs from Philippines (via Dan Ferguson, VOA, via George Thurman) Thursday-only 2300-2400 Spanish on 9670, etc. is live call-in simulcast on Worldnet TV (gh)

Bad frequency management at R. Martí—11815 clashing with Spain

via Costa Rica at 1600; 6030 blocking Belgium at 0000 (George Thurman & gh)

RFE/RL also hit by budget cut; US Senate voice-voted to transfer \$48 million of their \$75 million annual budget to the Maritime Commission (Jerry Gray, *NY Times* via Malcolm Kaufman, Ed Rausch) Transfer proposed by Sen. Inouye, Hawaii, whose state depends on shipping to supply the American way of life in the South [sic] Pacific (Ben Barber, *Washington Times* via Chet Copeland)

WEWN has reduced service to just English and Spanish. Richard Jones, manager, says in order to concentrate on pursuing re-broadcasts on AM and FM via satellite. In future hope to procure and broadcast programs in many different languages (Andreas Volk, *BDXC Communication*) Started with many European langs (gh) See Hauser's Highlights for schedule.

Prophecy Countdown is in trouble over WVHA—behind in paying off its several-million-dollar loan to purchase WCSN; trying to raise funds over broadcasts, and cut power by half to 250 kW, reduced hours. Got federal tax exemption, but still fighting with Greenbush over local property tax exemption (*W.O.R.*) May have to put WVHA on market if can't pay off loan (Gerry Dexter, *NU* via HCJB *TLC*, Jim Moats) The 1995 *Passport* made a false connection between WVHA and Waco. WVHA has no more security now than it had when it was WCSN or than WSHB or WEWN have. The only stockpiles of food are for distribution to poor families in the area that may have taxes increased because of exemption. It has no stockpiles of any weapons. Diesel fuel tanks are not even kept full. There is no threat from or to WVHA and the community. I'm no longer with Prophecy Countdown (Gordon Simkin, FL, *W.O.R.*) See SW Guide for schedule.

WRMI may put up a second corner reflector antenna toward NAM, but not add another transmitter. WRMI has made money since day one (Jeff White, *WRMI*, at *Grove Expo*)

WSHB plans to sell airtime to an outside non-religious program from January, two hours per night, seven days per week (C. Ed Evans, *WSHB*, at *Grove Expo*) see also SAIPAN

WRNO often has atrocious noisy modulation, causing QRM to adjacent stations. I have phoned their xmtr site at least 15 times with little success. After 15420 was badly over-modulated with horrific noise, I phoned FCC Allegan, MI, monitoring station, 616-673-3055, and two hours later WRNO had perfect audio, to my surprise (Ernie Behr, Ont., *W.O.R.*)

WGTG began carrying Brother Stair Sept. 29 on 9475, Fri/Sat/Sun 1200-2100 and 0000-?? regardless of propagation, then lost power in Opal storm, resumed three weeks later. Interrupted at hourtop for English & Spanish IDs, but no other programming heard. WWCR has prior claim to expand hours on 9475 with #4, so WGTG may shift to 9370 (Kevin Hecht, Ernie Behr, Brian Alexander, Jim Moats, George McClintock, gh)

Another milestone in US SW broadcasting Oct 18, as WWCR began testing 3315 at 0500, then expanded to \*0000 or \*0100 ex-7435. Even with *MT*'s short turn-around time, it's often impossible to keep up with frequent *World of Radio* time changes; listen for announcements on RFPI at constant timings, check BBS postings or packet. At presstime: Fri 2215 on 9475, Sat 1130 on 5065, 1400 on 15685, Sun 0800 on 3315, Tue 1330 on 15685. See also INTERNATIONAL VACUUM (gh)

*W.O.R.* wasn't the only program to be edited by WHRI. A Chuck Harder *For the People* hour on the Roswell UFO "autopsy" which a caller said could "empty the churches" was replaced by an old program about NAFTA on WHRI (Jim Frimmel, TX)

**ZAIRE** VOZ, Kinshasha briefly reappeared on SW 15244 in August, but last observed 13 Sept (BBCM)

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

Gayle Van Horn

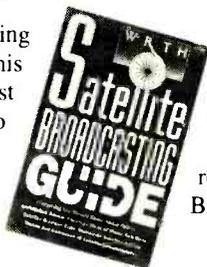
- 0005 UTC on 5930**  
CZECH REP: **Radio Prague**. News item on free trade zone among the former communist bloc countries. *Calling All Listeners* program. (John Bellovich, Macclenny, FL) Audible on 15640 at 1657. (Gerald Brookman, Kenai, AK) Noted at 2240 on 7345//5930. (John Hanz, Old Bridge, NJ) Czech's **Radio Ropa Info** heard on 5980 at 0716 in German. (Giovanni Serra, Rome, Italy)
- 0015 UTC on 15520**  
PHILIPPINES: FEBC. English news, chat and IDs to 0030\*. (Jerry Witham, Kenai, HI) Lady in Chinese noted on 9475 at 1025 with excerpts from *Grand Canyon Suite*, fair signal quality. (Maywoods DX Team, KY; Loy Lee, Dr. Joel Roitman, Chuck Everman, Jim McClure) *Thanks, guys!-GVH*
- 0030 UTC on 9022**  
IRAN: VOIRI. Sign-on identification to Holy Koran. Frequency announcement to news on Iranian backed militia activities in Lebanon. (Bellovich, FL)
- 0105 UTC on 5065**  
UNITED STATES: WWCR. *Free At Last* ministry from Morganton, West Virginia. Additional program heard on 5065 at 0500-0515. (George Knight, Garfield, NJ)
- 0107 UTC on 3249**  
ECUADOR: **La Voz del Triunfo**. Spanish. Regional music, talk and station ID. Ecuador's **La Voz del Napo** heard on 3280 at 1036 with, religious programming of text and music (Maywoods DX Team, KY)
- 0218 UTC on 6185**  
MEXICO: **Radio Educacion**. Spanish. Excellent Mexican folklorica music! Tentative logging on Mexico's **La Voz de Veracruz** on 9545 at 1640. (Maywoods DX Team, KY; Sue Wilden, Columbus, IN)
- 0222 UTC on 7490**  
UNITED STATES: WJCR. Old time gospel music show to religious promo and station ID. Additional religious station **KTBN**, heard on 7510 at 0645-0703. (Knight, NJ)
- 0350 UTC on 6150**  
KENYA: Kenya BC Corp. Swahili. Commercials to "KBC Nairobi" ID. Regional music to ID and 0400 newscast. (Witham, HI)
- 0351 UTC on 12095**  
UNITED KINGDOM: BBC. *Waveguide* show. Noted also 11955 at 0407. *Letter From America* feature on 15070 at 1445. (Brookman, AK)
- 0405 UTC on 3220**  
SOUTH AFRICA: **Channel Africa**. News and sports wrap up report. *Memory Lane* visit on Africa's history. This station also noted in Portuguese on 3345 at 0415, with report on Nelson Mandela. (Witham, HI) Station monitored in Chinyanja at 0342 on 3955, 1742 on 4945. (Serra, Italy) **SABC** noted on 3320 at 0049. (Maywoods DX Team, KY)
- 0415 UTC on 6210**  
ETHIOPIA: **Radio Fana**. Regional dialect. Vocal and instrumental African music. Mentions of Ethiopia to "Radio Fana" ID at 0418. (Witham, HI) **Radio Ethiopia** heard on 7165 at 1614. (Serra, Italy)
- 0415 UTC on 7190**  
PORTUGAL: **Radio Free Europe/Radio Liberty**. Russian. Commentary to music bridges. "Radio Svaboda" IDs at 0420 and 0430. Great signal for Hawaii! (Witham, HI)
- 0517 UTC on 5745**  
UNITED STATES: WHRI. *Soul Saving Blues* tune to ID. (Knight, NJ) Powerhouse signal this frequency at 0100, with ultra-this and radical that mutterings. (Maywoods DX Team, KY)
- 0555 UTC on 4919**  
ECUADOR: **Radio Quito**. Spanish. Standard pop music vocals to ID and news at 0600. Commercial jingles and station promos. (Witham, HI) Ecuador's **HCJB** heard on 5900 on 0935. (Wilden, IN; Maywoods DX Team, KY)
- 0640 UTC on 9780**  
PORTUGAL: **Radio Portugal International**. News and commentary. (Witham, HI) Excellent signal for sporting event. (Maywoods DX Team, KY)
- 0750 UTC on 5054.5**  
COSTA RICA: **Faro Del Caribe**. Spanish. Inspirational text and music to station ID at 0800, heard on // 6175. (Witham, HI) Heard on 9644.7 at 1621. (Maywoods DX Team, KY)
- 0810 UTC on 15607**  
AUSTRALIA: Australian Defense Forces Radio. Male DJ spinning rock tunes, ballads and pop vocals to ID. (Witham, HI)
- 1017 UTC on 6085**  
GERMANY: **Bayerischer Rundfunk**. German. Political commentary and discussion. Pop music bridge to 1030 newscast and world political news update. (Serra, Italy) Germany's **Deutsche Welle** noted on 11740 at 011-0120 with *Letterbox* show. (Knight, NJ)
- 1145 UTC on 11900**  
FINLAND: YLE/Radio Finland. *Business Roundup* program to ID and QSL info. (Wilden, IN) Noted on 15400 at 1540. (Maywoods DX Team, KY)
- 1204 UTC on 5995**  
AUSTRALIA: **Radio Australia**. International newscast. Noted also on 9580 at 0950. (Wilden, IN) Station audible on 9710 at 1150. (Brookman, AK)
- 1215 UTC on 13625**  
FRANCE: **Radio France International**. Report that the French government is surprised at the strength of the world's anti-nuclear protest. (Fraser, MA) RFI noted on 15365 at 1523-1557\* (Knight, NJ)
- 1345 UTC on 15585**  
VATICAN STATE: Vatican Radio. News update on assistance for victims of landmine in Cambodia, and the role of the church. Station ID and 1403\*. (Bellovich, FL; William McGuire, Cheverly, MD)
- 1620 UTC on 6480**  
SOUTH KOREA: KBS/Radio Korea. Travelogue show to northern South Korea, including a stop to overlook North Korea from the Freedom House. (Witham, HI; Maywoods DX Team, KY)
- 1625 UTC on 3220**  
NORTH KOREA: **Korean Central BS**. Korean. Direct service programming of orchestral music with brief announcement breaks. No ID heard at 1630 on this new frequency, stronger signal on // 2850. North Korea's **Radio Pyongyang** noted on 6520 at 1630 in Korean. No sign of // 6540. (Witham, HI; Maywoods DX Team, KY)
- 1630 UTC on 15400**  
RUSSIA: Voice of Russia. *Time Lines* show reporting on finding mushrooms! VOR heard on 11750 at 2230 with *Russian By Radio*. (Bob Fraser, Cohasset, MA; Wilden, IN)
- 1655 UTC on 15345**  
MOROCCO: RTV Marocaine. French. Lady DJ with phone-in calls. Middle Eastern music program in Arabic. (Maywoods DX Team, KY)
- 1739 UTC on 5035**  
KAZAHSTAN: Kazakh Radio. Kazakh. Local lyric songs to male/female duo. ID noted on // 5960 till 1758 under Radio Norway International's interval signal. (Serra, Italy)
- 1740 UTC on 6150**  
JAPAN: Radio Japan. DX program with program frequency quote to 1800\*. (Witham, HI)
- 1830 UTC on 15315**  
NETHERLANDS ANTILLES: Radio Netherland Bonaire relay. *50 Plus* show discussing golf! (Fraser, MA)
- 1840 UTC on 11990**  
KUWAIT: Radio Kuwait. Report on resumption of fighting in Chechnya. (Fraser, MA) Monitored on 9840 at 2222. (Wilden, IN; Brookman, AK) Heard this frequency to 1950+. (Maywoods DX Team, KY)
- 1930 UTC on 15345**  
ARGENTINA: RAE. Spanish ballads of flutes and guitars to feature on Argentine literature. (Maywoods DX Team, KY)
- 1935 UTC on 11655**  
NETHERLANDS: Radio Netherlands. The last of the *Happy Station* program. (Fraser, MA) Station heard on 6165// 5995 at 0432. (Brookman, AK)
- 1935 UTC on 11905**  
ITALY: RAI. News items on local politics and continued protest over French nuclear testing. (Fraser, MA; Maywoods DX Team, KY) Report on economy improving and the national inflation rate has remained the same, heard on // 9575, 11905 at 1935. (Fraser, MA)
- 1948 UTC on 4850**  
UZBEKISTAN: **Uzbek Radio**. Uzbek. Local recitations to instrumental music. Two interval signals to station ID and newscast. Uzbekistan's **Radio Tashkent** heard on 5060 in German at 2012. Newscast, IDs and regional folk music. Heard on // 9540 with 2029\*. (Serra, Italy)
- 2000 UTC on 9435**  
ISRAEL: Kol Israel. *News Magazine* show plans for Jerusalem's 300th anniversary. (Fraser, MA) Station in Hebrew on 17545 at 1241, // 15615. (Serra, Italy)
- 2015 UTC on 11675**  
RUSSIA: Voice of Russia. *Adamov's Mailbag* on cossacks, Moscow University and former Soviet republics. VOR noted on 7360 at 2145 with *This is Russia* featuring film festivals. (Fraser, MA; Wilden, IN)
- 2030 UTC on 11750**  
MOLDOVA: Radio Dneister International. Sign-on ID/info to *News Magazine* program. (Fraser, MA)
- 2050 UTC on 7285**  
POLAND: Polish Radio Warsaw. Interesting program expounding the many virtues of garlic! Interferences from Deutsche Welle at 2100. (Hanz, NJ)
- 2117 UTC on 9825**  
USA: Radio Marti. Spanish. American and Latin pop music vocals. Frequency quote and ID at 2130. (Wilden, IN)
- 2130 UTC on 9690**  
ROMANIA: Radio Romania Intl. *Listener's Letterbox* to *Skylark*, a folk music program. (Fraser, MA)
- 2300 UTC on 7190**  
TURKEY: Voice of Turkey. Twelve minutes of excellent Middle Eastern music into review of the *Turkish Press*. Noted on // 7280 in English. (Hanz, NJ) Station noted on 11925//15385 in Turkish. (Witham, HI)
- 2325 UTC on 9925**  
BELGIUM: Radio Vlaanderen. Instrumental music to *Brussels Calling* show closing with music from movie *Don Juan de Marco*. (Wilden, IN) Heard on 13670 at \*1300 Bellovich, FL)

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

### QSLing the Clarke Belt

Looking for a new QSL challenge? Why not try DXing and QSLing the TVRO satellites in the Clarke Belt? This part of the hobby has been largely ignored by most listeners, but there are plenty of targets "up there" to view and hear.

Written as a conventional reception report, include the satellite name, transponder number, date, time (in EST), and details of your reception. For a complete list of addresses, be sure to get a copy of the



1995 *Satellite Broadcasters Guide* (Grove BOK-79/95) at \$24.95 plus shipping. The 1996 edition (BOK-79/96) is available from Grove at the pre-publication price of \$19.95 with free shipping until Dec. 31, 1995.

For a sample of what's "up there" to view and hear, request a sample copy of *Satellite Times* at P.O. Box 98, Brasstown, NC 28902.

Have a safe and happy holiday season from QSL Report!

#### AUSTRIA

Radio Austria Int'l, 9655 kHz. Full data verification letter unsigned plus program schedule and map. Received in 23 days for an English report. Station address: Wurzburggasse 30, A-1136 Wien, Austria. (Charles Washburn, Robbinston, ME)

#### CANADA

Voice of Free China via Sackville relay. Full data QSL card unsigned. Station sticker, program schedule and newsletter enclosed. Received in 32 days for an English report and souvenir postcard. Station address: P.O. Box 24-38 Taipei, Taiwan, Republic of China. (Jennifer Hull, New York, NY)

#### CONGO

RDTV Congolaise, 4765 kHz. Full data verification letter and personal note from A. Fayette Mikano-Directeur. Received in 45 days after 2nd French follow-up report, one U.S. dollar, self-addressed-envelope (used for reply) and sent via registered mail to Congo. Total time for QSL, 3 years and 45 days. Station address: Boite Postal 2241, Brazzaville, Rep. of the Congo. (Gayle VH, Brasstown, NC)

#### FRENCH GUIANA

Radio Japan relay, 11895 kHz. Full data QSL card signed by H. Kawamoto. Program schedule and brochures enclosed. Received in 23 days for an English report. Station address: NHK, Tokyo 150-01, Japan. (Gerry LeStrange, East Brunswick, NJ)

Swiss Radio Int'l relay, 9905 kHz. Full data *Sr. Gall* card unsigned. Received in 23 days for an English report. Station address: Giacomettistrasse 1, 3000 Berne 15, Switzerland. (Washburn, ME)

#### IRELAND

Shannon VOLMET Aeradio, 5505 kHz USB. Full data QSL sheet signed by Edmond Lawrence-Operations Manager. Form letter with personal note enclosed with "QSL" folder. Received in 11 days for an English utility report and two IRCs. Station address: Irish Aviation Authority, Ballygirreen, Newmarket-on-Fergus, Co. Clare, Ireland. (Randy Stewart, Springfield, MO)

#### ISRAEL

Kol Israel. Full data QSL card unsigned. Received in 41 days for letter and English report and two U.S. dollars. Station address: P.O. Box 1082, Jerusalem 91010 Israel. (Hull, NY; Frank Hillton, Charleston, SC)

#### JORDAN

JYO-Aqaba Radio, 8474 kHz. Full data letter plus prepared QSL card returned as full data, verified by M. Moraqtan. Received in 62 days after a follow-up utility report, mint stamps, and an address label (used on reply). Station address: The Ports Corporation, Aqaba Coastal Station, P.O. Box 115, Aqaba, Hashemite Kingdom of Jordan. (Mike Hardester, Jacksonville, NC)

#### PALAU

KHBN/Voice of Hope, 9965 kHz. Full data unsigned network card and frequency schedule. Received in 26 days for taped report and mint Palau stamp (not used on reply). Station address: P.O. Box 66, Koror, Palau 96940. (Stewart, MO)

#### PERU

Radio Satellite, 6725 kHz. Partial data QSL on multi-colored *Certificado de Sintonia* card. Personal letter from Sr. Sabino Llamo Chavez-Gerente. (Power is listed as 300 watts into a 1/2 wave horizontal dipole). Received in 78 days after a Spanish follow-up report with stamped envelope (not used) and prepared QSL card (not used). Station address: Radio Satellite E.I.R. Ltda., c/o Gerente, Jiron Cuterve 543, Provincia Santa Cruz, Cajamarca, Peru. (Hardester, NC)

#### QATAR

Qatar Broadcasting Service, 9585 kHz. No data QSL letter unsigned, schedule and station booklet. Received in 172 days for an English report, cassette tape, and one U.S. dollar. Station address: c/o Public Relations, Exchange & Research Section, P.O. Box 3939, Doha, Qatar. (Washburn, ME)

#### SHIP TRAFFIC

*Moderation* WCA3311, 156.8 MHz (Large Pleasure Yacht). Full data prepared QSL card verified. Received in 12 days for an English utility report and mint stamps. Ship address: c/o Moderation Inc., 358 Bishop Rd., Highland Heights, OH 44143. (Hank Holbrook, Dunkirk, MD)

*Royal Majesty* 3ETGQ, 156.65 MHz (Passenger Ship). Full data prepared QSL card verified and nice photo of vessel. Received in 45 days for an English utility report and mint stamps. Ship address: c/o Majesty Cruise Lines, P.O. Box 025420, Miami, FL 33102. (Holbrook, MD)

*Continental* ELPV2, 156.7 MHz (Tanker). Full data prepared QSL card verified and Conoco stickers. Received in 31 days for an English utility report and mint stamps. Ship address: c/o Conoco Inc., 600 N. Dairy Ashford Rd., P.O. Box 2197, Houston, TX 77046. (Holbrook, MD)

*USS Gettysburg* (CG-64) NGET, 156.8 MHz (Aegis Guided Missile Cruiser). Excellent letter signed by Scott A. Suozzi. Received in 47 days for an English utility report and mint stamps. Ship address: FPO aa 34091-1184, (Holbrook, MD) Ship's MARS call is NNN0COF. (GVH)

#### SINGAPORE

BBC Far Eastern relay, 9740 kHz. Full data antenna/transmitter card, unsigned. Received in 153 days for an English report and one U.S. dollar. Station address: c/o Far East Resident Engineer, BBC F.E.R.S., Singapore. (Washburn, ME)

#### UGANDA

Radio Uganda, 4976 kHz. Full data confirmation letter signed by Julius K. Magembe, via the U.S. Ugandan Embassy, on embassy letterhead. Received in 10 days for two follow-up reception reports and personal letter to the embassy, mint stamps and a self-addressed envelope (both used for reply). Total time attempting to verify Radio Uganda is 7 years and 267 days! Embassy address: 5909 16th St. N.W., Washington, DC 20011-2896. *Yes, it was worth the wait!* (GVH/NC)

#### UNITED ARAB EMIRATES

UAE Radio, 11970 kHz. Full data QSL letter on station letterhead, signed by Ms Aida Hamza-Director Foreign Language Services. Station program schedule enclosed. Received in 102 days for an English report. Station address: c/o Ministry of Information & Culture, Dept. of Broadcasting, P.O. Box 63, Abu Dhabi, United Arab Emirates. (Bill Kent, Hamburg, NY)

#### UNITED STATES

KNLS-Alaska, 9690 kHz. Full data map card unsigned. Personal letter received from Mike Osborne-English Language Host. Received in 37 days for an English report. Station address: Anchor Point, AK 99556. (Mike Redfox, Seattle, WA)

WOO/AT&T Ocean Gate radio, 4387 kHz USB. Full data logo card signed by Frank Beecher-Station Manager. AT&T High Seas booklet enclosed. Received in 30 days for an English utility report and two mint stamps (not used on reply). Report mailed to: P.O. Box 550, Manahawkin, NJ 08050, reply received from: AT&T WOM, 1340 N.W. 40th Ave., Ft. Lauderdale, FL 33313. (Stewart, 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 Standard Time) 3, 4, 5, or 6 hours for Eastern, Central, Mountain or Pacific Time, respectively.

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

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

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

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

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

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

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

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

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

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

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

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

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

## HOT NEWS AND HOT SPOTS

## More SW News Compiled by Glenn Hauser

After an absence from SW, **R. Afghanistan** announced it had inaugurated a 100-kW homemade transmitter which cost only a sesquikilopound, 1/100 of the cost for commercial purchase. BBC Monitoring then found it on 7200 at 0130-0335 except Fridays 0300-0800, daily 0730-0830, not on announced 7260. In Quito on *DX Partyline*, Rich McVicar was hearing it well on 7200.0 from opening at 0125. On *Waveguide*, Chris Greenway of BBCM added another transmission at 1330-1700 ending with English at 1645.

BBCM also reports: **Republic of Iraq Radio**, anti-Saddam, moved its MW from 1053 to 1059 kHz to avoid jamming, but kept SW on 9570, 13670, 15130 via GCC facilities. **V. of Rebellious Iraq** was heard at 1200-1430, presumably now an hour later, varying 6030-6090, such as 6075 amid jamming. **V. of the Islamic Movement** in Iraqi Kurdistan was on 4400 in Kurdish then Arabic at 1530-1755.

Once again, **Deutsche Welle**

had to close down its Trincomalee relay in Sri Lanka. A renewed offensive by the Liberation Tigers of Tamil Eelam was expected to deteriorate the security situation in the area, so in mid-Sept, DW pulled out its 13 German employees and sent them to Colombo, but local staff and security guards remained to protect it. To compensate, DW hired 16.5 hours of airtime per day from Russia, says BBCM. This includes Novosibirsk 9525, 17845, 7150, 7130; Tashkent 7225, 9615, 7225; Samara; and Irkutsk 9670 as reported by Bob Padula. *Jihad-DX*.

**V. of Abkhazia**, from the separatist region of Georgia, was found at 0330-0445 on new 9494.747 kHz, replacing 9505 and now daily, says BBCM. Then changed to **Republic of Abkhazia Radio**, Sukhumi, at 0430-0530, extended Wed & Sat to 0615.

**R. Dniester International**, separatist from Moldova, was found by Kevin Hecht on 6205 with English at 2130-2200, but seemingly cut back to Tue/Thu/Sun only. From the other side, **R. Moldova International**, via Romania, chose 7500 as its

frequency for all four 25-minute English broadcasts, to Europe weekdays at 2200 and 2300, to America daily at 0330 and 0430, reports John Stewart in *BDXC Communication*. Rich McVicar found this in Spanish at 0230 on 9400 under RFPI, per *Fine Tuning*. 9400 also used at 1230 in Romanian to N. America, says Michiel Schaay, Netherlands, *Australian DX News*.

BBCM discovered a military-sounding broadcast with a Moldovan accent on 14201.5 USB between 0530 and 1100; no ID and seemed to come from the Bucharest area, per a packet posting via Anne Fanelli. Alternate frequency was 14814 USB, per BDXC.

From Serbia, **R. Yugoslavia** coordinated its English broadcasts with our time change on Oct. 29, to be as follows until March 3: 0100-0130 exc. Sun on 7115, 6195, 0200-0230 on 7115, 6100, say BBCM and B. Linck via Büschel, BDXC. A Yugoslav newspaper quoted a report by the station director that altho it was older than VOA, RY faced funding problems, and was

trying to reach agreements with China and Bulgaria for relays.

African news: Kanwarjit Sandhu, India, is back at the dials, finding **R. Mogadishu**, subtitled V. of the Somali Peace Forces, on 6710 with English daily at 1830-1855, reports RN *Media Network*. On *World of Radio*, Brian Alexander found **SNBC**, Sudan on 9025 for the English hour at 1800, ex-9200, apparently stuck on 9025 where it went first to block an opposition station at another time. And he found **R. Nacional**, Angola, with an English hour at 2000 on 9534.79 on a Saturday and Sunday, but missing the following weekend.

**R. Portugal's** broadcast to East Timor is nothing new, on 17595 weekends at 0700-0900, weekdays at 1105-1300 with the last hour in the local language Tetum in the sked via Gigi Lytle, but Paulo Texeira in Washington DC says both hours are from the Fretilin Resistance Movement, per *Jihad-DX*. When Dave Valko in PA tried to hear it, 17595 was blocked by Belgium.

## MT Monitoring Team

**Gayle Van Horn, Frequency Manager**

North Carolina

**Next Reporting Deadline**

**December 20, 1995**

**Jim Frimmel, Program Manager**

Texas

**Dave Datko**

California

**Jeff Demers**

New Hampshire

**Jacques d'Avignon**

Propagation Forecasts

Ontario, Canada

## newsline

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

### 0000 UTC

**(7:00 PM EST, 4:00 PM PST)**

BBC (am) (Newsdesk)  
 BBC (as pac) (Newsdesk)  
 BBC (south as)  
 Canada (North-Quebec) [S]  
 China Radio Intl  
 Croatian Radio  
 Monitor Radio Intl [T-A]  
 Radio Australia  
 Radio Bulgaria  
 Radio Canada Intl  
 Radio Exterior de Espana  
 Radio New Zealand Intl  
 Radio Prague  
 Radio Thailand  
 Radio Ukraine Intl  
 Radio Vilnius  
 Voice of America (am)  
 Voice of America (as)  
 Voice of America (ca)  
 Voice of Russia  
 0003  
 Radio Pyongyang  
 0010  
 China Radio Intl\*  
 Voice of America (ca) [T-A]\*  
 0015  
 Radio Cairo  
 0030  
 All India Radio  
 Radio Netherlands Intl  
 Radio New Zealand Intl [M-F]  
 Radio Sweden [T-A]  
 Radio Thailand [T-S]  
 Radio Vlaanderen Intl  
 Voice of America (am) [T-S]  
 (Special English)  
 Voice of America (as) (Special English)  
 Voice of Russia  
 0045  
 BBC (am)\*  
 BBC (as pac)\*  
 BBC (south as)\*  
 0050  
 RAI Italy

### 0100 UTC

**(8:00 PM EST, 5:00 PM PST)**

BBC (am) (Newsdesk)  
 BBC (as pac)  
 BBC (south as) (Newsdesk)  
 Canada (North-Quebec)  
 Croatian Radio  
 Deutsche Welle  
 HCJB (am)  
 Monitor Radio Intl [T-A]

R Slovakia Intl [A]\*  
 R Slovakia Intl [S/T-F]  
 Radio Australia  
 Radio Exterior de Espana  
 Radio Havana Cuba [T-S]  
 Radio Japan  
 Radio Korea  
 Radio New Zealand Intl  
 Radio Norway Intl [M]  
 Radio Prague  
 Radio Yugoslavia [M-A]  
 Swiss Radio Intl  
 Voice of America (am)  
 Voice of America (as)  
 Voice of America (ca)  
 Voice of Indonesia  
 Voice of Russia  
 Voice of Vietnam  
 0110  
 Radio Australia [M-F]\*  
 0130  
 Radio Austria Intl  
 Radio Havana Cuba [T-S]  
 Radio Netherlands Intl  
 Radio Sweden [T-A]  
 Voice of Greece  
 Voice of Russia  
 Voice of Vietnam  
 0145  
 Radio Tirana  
 0155  
 Vatican Radio [T-S]  
 Voice of Indonesia

### 0200 UTC

**(9:00 PM EST, 6:00 PM PST)**

BBC (af) (Newsday)  
 BBC (am) (Newsday)  
 BBC (as pac) (Newsday)  
 BBC (eu) (Newsday)  
 BBC (south as) (Newsday)  
 Canada (North-Quebec) [S]  
 Croatian Radio  
 Deutsche Welle  
 Monitor Radio Intl [T-A]  
 Radio Australia  
 Radio Budapest  
 Radio Canada Intl  
 Radio Havana Cuba [T-S]  
 Radio New Zealand Intl [M-A]  
 Radio Romania Intl  
 Radio Yugoslavia  
 RAE Argentina [T-A]  
 Voice of America (as)  
 Voice of Myanmar (Burma)  
 Voice of Russia  
 Voice of Vietnam  
 WHRI (Indiana) [T-A]

0203  
 Voice of Free China  
 0215  
 Radio Cairo  
 Radio Nepal  
 0230  
 Radio Austria Intl  
 Radio Havana Cuba [T-S]  
 Radio Netherlands Intl  
 Radio Pakistan  
 Radio Portugal Intl [T-A]  
 Radio Sweden [T-A]  
 Radio Tirana  
 Voice of Russia [T-A]  
 Voice of Vietnam  
 0255  
 Radio Canada Intl [T-A]

### 0300 UTC

**(10:00 PM EST, 7:00 PM PST)**

BBC (af)  
 BBC (am)  
 BBC (as pac)  
 BBC (eu) [S-F]  
 BBC (south as)  
 Canada (North-Quebec)  
 Channel Africa  
 China Radio Intl  
 Croatian Radio  
 Deutsche Welle  
 Monitor Radio Intl [T-A]  
 Radio Australia  
 Radio Canada Intl  
 Radio Havana Cuba [T-S]  
 Radio Japan  
 Radio New Zealand Intl [M-A]  
 Radio Norway Intl [M]  
 Radio Prague  
 Radio Thailand  
 Voice of America (af) [A-S]  
 Voice of Russia  
 WHRI (Indiana) [T-A]  
 WWCR #3 (Tennessee) [T-A]  
 0301  
 Voice of America (af) [M-F]\*  
 0303  
 Voice of Free China  
 0310  
 China Radio Intl\*  
 0315  
 Radio Cairo  
 0320  
 Radio Philippines [M-A]  
 Vatican Radio  
 0330  
 BBC (eu) [A]  
 Radio Budapest  
 Radio Dubai

Radio Havana Cuba [T-S]  
 Radio Prague  
 Radio Sweden [T-A]  
 Voice of America (af) [M-F]  
 (Special English)  
 Voice of Russia  
 0340  
 BBC (af) [S]\*  
 Voice of Greece  
 0355  
 Radio Japan [W-M]

### 0400 UTC

**(11:00 PM EST, 8:00 PM PST)**

BBC (af) (Newsdesk)  
 BBC (am) (Newsdesk)  
 BBC (as pac)  
 BBC (eu) [S-F] (Newsdesk)  
 BBC (south as) (Newsdesk)  
 Canada (North-Quebec)  
 Channel Africa  
 China Radio Intl  
 Croatian Radio  
 Deutsche Welle  
 Monitor Radio Intl [T-F]  
 Radio Australia  
 Radio Canada Intl  
 Radio Havana Cuba [T-S]  
 Radio New Zealand Intl [A]  
 Radio New Zealand Intl [M-F]\*  
 Radio Romania Intl  
 Radio Tanzania  
 Radio Ukraine Intl  
 Swiss Radio Intl  
 Voice of America (af)  
 Voice of America (me)  
 Voice of Russia  
 Voice of Turkey  
 WWCR #3 (Tennessee) [T-A]  
 WYFR (Satellite Network) [A]  
 ZBC Zimbabwe  
 0403  
 Radio Pyongyang  
 0410  
 China Radio Intl\*  
 0425  
 RAI Italy  
 0430  
 BBC (af) [A-S]\*  
 BBC (eu) [A] (Newsdesk)  
 Radio Havana Cuba [T-A]  
 Radio Netherlands Intl  
 Voice of Russia  
 0431  
 Voice of America (af) [M-F]\*

### 0500 UTC

**(12:00 AM EST, 9:00 PM PST)**

BBC (af) (Newsday)

BBC (am) (Newsday)  
 BBC (as pac) (Newsday)  
 BBC (eu) (Newsday)  
 BBC (south as)  
 Canada (North-Quebec)  
 Channel Africa  
 China Radio Intl  
 Deutsche Welle  
 HCJB (am)  
 Monitor Radio Intl [T-F]  
 Radio Australia  
 Radio Bulgaria  
 Radio Cameroon  
 Radio Exterior de Espana  
 Radio Havana Cuba [T-S]  
 Radio Japan  
 Radio New Zealand Intl [S-F]  
 Voice of America (af)  
 Voice of America (me)  
 Voice of Israel  
 Voice of Russia  
 0510  
 China Radio Intl\*  
 Radio Australia [M-F]\*  
 0530  
 BBC (af) [A-S]\*  
 Radio Austria Intl  
 Radio Havana Cuba [T-A]  
 Radio Romania Intl  
 Voice of Nigeria  
 Voice of Russia  
 0555  
 Radio Japan [A]

### 0600 UTC

**(1:00 AM EST, 10:00 PM PST)**

BBC (af)  
 BBC (am)  
 BBC (as pac)  
 BBC (eu)  
 BBC (south as)  
 Canada (North-Quebec)  
 Deutsche Welle  
 Monitor Radio Intl [T-F]  
 Radio Australia  
 Radio Canada Intl [M-F]  
 Radio Havana Cuba [T-S]  
 Radio Japan  
 Radio Korea  
 Radio New Zealand Intl [M-A]  
 Swiss Radio Intl  
 Voice of America (af) [A-S]  
 Voice of America (me)  
 Voice of Kenya  
 Voice of Malaysia  
 Voice of Russia  
 WWCR #1 (Tennessee) [T-A]  
 0601  
 Voice of America (af) [M-F]\*

0603  
Croatian Radio  
Radio Pyongyang  
0630  
BBC (af) [A-S]\*  
Radio Austria Intl [T-S]  
Radio Havana Cuba [T-S]  
Vatican Radio [H]  
Voice of Nigeria [M-F]  
Voice of Russia  
0631  
Radio Romania Intl  
0645  
Radio Romania Intl  
Voice of Nigeria [M-F]\*  
0655  
Radio Japan [W-M]  
Voice of Med. (Malta) [M-F]

**0700 UTC**  
**(2:00 AM EST, 11:00 PM PST)**

BBC (af)  
BBC (am)  
BBC (as pac)  
BBC (eu)  
BBC (south as)  
KWHR (Hawaii) [M-F]  
Monitor Radio Intl [T-F]  
Papua New Guinea  
Radio Australia  
Radio Japan  
Radio New Zealand Intl [A]  
Radio New Zealand Intl [M-F]\*  
Radio Norway Intl [S]  
Voice of Myanmar (Burma)  
Voice of Russia  
0703  
Radio Pyongyang  
Voice of Free China  
0710  
Radio Australia [M-F]\*  
0730  
HCJB (eu)  
Radio Netherlands Intl  
Radio Prague  
Radio Vlaanderen Intl  
Swiss Radio Intl (eu)  
Voice of Greece  
Voice of Russia  
0750  
Radio New Zealand Intl [M-F]\*  
0755  
Radio Japan  
Voice of Med. (Malta) [M-F]

**0800 UTC**  
**(3:00 AM EST, 12:00 AM PST)**

BBC (af)  
BBC (am)  
BBC (as pac)  
BBC (eu)  
BBC (south as)  
KNLS (Alaska)  
Monitor Radio Intl [M-A]  
Radio Australia  
Radio Korea  
Radio New Zealand Intl  
Radio Pakistan  
Radio Prague  
Voice of Indonesia [A-H]  
Voice of Malaysia  
Voice of Russia  
WWCR #1 (Tennessee) [M]  
WWCR #3 (Tennessee) [S]  
0803  
Croatian Radio  
Radio Pyongyang  
0810

Radio New Zealand Intl [M-F]\*  
0815  
Swiss Radio Intl (eu)  
0830  
R Slovakia Intl  
Radio Austria Intl [T-S]  
Radio Netherlands Intl  
Voice of Russia [T-A]  
0855  
Voice of Indonesia [A-H]

**0900 UTC**  
**(4:00 AM EST, 1:00 AM PST)**

BBC (af)  
BBC (am)  
BBC (as pac)  
BBC (eu)  
BBC (south as)  
China Radio Intl  
Deutsche Welle  
HCJB (pac)  
Monitor Radio Intl [M-A]  
Papua New Guinea [M]\*  
Radio Australia  
Radio Japan  
Radio New Zealand Intl [M-A]  
Swiss Radio Intl  
Voice of Russia  
WWCR #1 (Tennessee) [M-F]  
0910  
China Radio Intl\*  
Radio Australia [M-F]\*  
0930  
FEBC (Philippines) [M-A]  
Radio Netherlands Intl  
Voice of Armenia  
Voice of Russia  
0945  
Deutsche Welle [M-F]\*  
0950  
Russia (Radio Pacific Ocean) [A]  
0955  
Radio Japan

**1000 UTC**  
**(5:00 AM EST, 2:00 AM PST)**

All India Radio  
BBC (af) (Newsdesk)  
BBC (am) (Newsdesk)  
BBC (as pac) (Newsdesk)  
BBC (eu) (Newsdesk)  
China Radio Intl  
Monitor Radio Intl  
Papua New Guinea  
Radio Australia  
Radio New Zealand Intl [S-F]  
Radio Prague  
Radio Tanzania  
Radio Vlaanderen Intl [M-A]  
Voice of America (as)  
Voice of America (ca)  
Voice of Kenya  
Voice of Russia  
Voice of Vietnam  
WWCR #1 (Tennessee) [H-F]  
WWCR #3 (Tennessee) [A]  
WYFR (Satellite Network) [M-A]  
1010  
China Radio Intl\*  
Radio New Zealand Intl [M-F]\*  
1020  
Radio New Zealand Intl [H]\*  
1030  
FEBC (Philippines) [M-F]\*  
Radio Austria Intl [M-A]  
Radio Dubai  
Radio Korea  
Radio Netherlands Intl

Voice of Nigeria  
Voice of Russia  
WYFR (Satellite Network) [M-F]  
1045  
Voice of Nigeria [A-S]\*

**1100 UTC**  
**(6:00 AM EST, 3:00 AM PST)**

BBC (af) (Newsdesk)  
BBC (am) (Newsdesk)  
BBC (as pac) (Newsdesk)  
BBC (eu) (Newsdesk)  
BBC (south as) [H-T]  
(Newsdesk)  
Deutsche Welle  
Monitor Radio Intl [M-A]  
Papua New Guinea  
Radio Australia  
Radio Ghana [A-S]  
Radio Japan  
Radio Jordan  
Radio Mozambique  
Radio New Zealand Intl  
(Newsdesk)  
Radio Pakistan  
Radio Singapore Intl  
Swiss Radio Intl  
Voice of America (as)  
Voice of America (ca)  
Voice of Israel  
Voice of Russia  
WHRI (Indiana) [A]  
WYFR (Satellite Network) [M-F]  
1103  
Radio Pyongyang  
1110  
Radio Australia\*  
1120  
Vatican Radio [M-A]  
1130  
Radio Austria Intl  
Radio Netherlands Intl  
Radio Prague  
Radio Singapore Intl  
Voice of Asia  
Voice of Russia  
WYFR (Satellite Network) [M-F]  
1145  
Deutsche Welle [M-F]\*  
1155  
Radio Japan [S-F]

**1200 UTC**  
**(7:00 AM EST, 4:00 AM PST)**

BBC (af) [M-A]  
BBC (am)  
BBC (as pac) [M-A]  
BBC (eu)  
BBC (south as)  
Canada (North-Quebec) [A-S]  
China Radio Intl  
Croatian Radio  
Monitor Radio Intl [M-A]  
Papua New Guinea  
Radio Australia  
Radio France Intl  
Radio Korea  
Radio New Zealand Intl [H-T]  
Radio Singapore Intl  
Radio Tashkent  
Swiss Radio Intl (eu)  
Voice of America (as)  
Voice of Russia  
WWCR #1 (Tennessee) [M-A]  
WYFR (Satellite Network) [M-F]  
1203  
Voice of Free China  
1204

HCJB (am) [M-F]  
1210  
China Radio Intl\*  
1215  
BBC (af) [M-A]\*  
BBC (as pac) [M-F]\*  
BBC (eu)\*  
BBC (south as) [M-A]\*  
1230  
HCJB (am) [M-F]\*  
Radio Bangladesh [S-M]  
Radio Bulgaria  
Radio Cairo  
Radio Canada Intl  
Radio Finland  
Radio Korea [S-W/A]  
Radio Netherlands Intl  
Radio Singapore Intl  
Radio Sweden [M-F]  
Voice of Russia  
Voice of Vietnam  
WYFR (Satellite Network) [M-F]  
1231  
Radio France Intl [T]\*  
1240  
Voice of Greece

**1300 UTC**  
**(8:00 AM EST, 5:00 AM PST)**

BBC (af) (Newshour)  
BBC (am) (Newshour)  
BBC (as pac) (Newshour)  
BBC (eu) (Newshour)  
BBC (south as) (Newshour)  
Canada (North-Quebec) [A-S]  
China Radio Intl  
KNLS (Alaska)  
Monitor Radio Intl [M-A]  
Papua New Guinea  
Polish Radio [A]  
Polish Radio [M-F]\*  
Radio Australia  
Radio Canada Intl  
Radio Ghana  
Radio Norway Intl [S]  
Radio Romania Intl  
Radio Singapore Intl  
Radio Tanzania [A-S]  
Swiss Radio Intl  
Voice of America (as)  
Voice of Kenya  
Voice of Russia  
WYFR (Satellite Network) [M-F]  
1303  
Radio Pyongyang  
1310  
China Radio Intl\*  
Radiobras [M-F]\*  
1324  
HCJB (am) [M-F]  
1328  
Radio Cairo  
1330  
All India Radio  
FEBC (Philippines) [M-A]  
Radio Austria Intl  
Radio Canada Intl  
Radio Dubai  
Radio Finland  
Radio Netherlands Intl  
Radio Singapore Intl  
Radio Sweden [M-F]  
Radio Tashkent  
Radio Vlaanderen Intl [S]  
Radio Yugoslavia  
Voice of America (as) (Special English)  
Voice of Russia [M-A]

Voice of Turkey  
Voice of Vietnam  
1355  
Radio Singapore Intl

**1400 UTC**  
**(9:00 AM EST, 6:00 AM PST)**

BBC (af)  
BBC (am)  
BBC (as pac)  
BBC (eu)  
BBC (south as)  
Canada (North-Quebec) [S]  
China Radio Intl  
Monitor Radio Intl [M-A]  
Radio Australia  
Radio Cameroon  
Radio Canada Intl [S]  
Radio France Intl  
Radio Ghana  
Radio Japan  
Radio Norway Intl [S]  
Radio Prague  
Radio Vlaanderen Intl [M-A]  
Swiss Radio Intl (eu)  
Voice of America (as)  
Voice of Russia  
1410  
China Radio Intl\*  
1415  
Radio Nepal  
1424  
HCJB (am) [M-F]  
1430  
FEBC (Philippines) [M-A]  
Radio Austria Intl  
Radio Canada Intl  
Radio Netherlands Intl  
Radio Romania Intl  
Radio Sweden [M-F]  
RTM Morocco [S]  
Voice of Myanmar (Burma)  
Voice of Russia  
WYFR (Satellite Network) [M-F]  
1431  
Radio France Intl [T]\*  
1435  
Voice of Greece  
1440  
FEBC (Philippines) [M-F]\*  
1445  
All India Radio  
Voice of Myanmar (Burma)  
1455  
Radio Japan [A]  
Voice of Med. (Malta) [M-F]

**1500 UTC**  
**(10:00 AM EST, 7:00 AM PST)**

BBC (af)  
BBC (am)  
BBC (as pac) [A-S]  
BBC (eu)  
BBC (south as)  
Canada (North-Quebec) [A-S]  
Channel Africa  
China Radio Intl  
Monitor Radio Intl [M-A]  
Radio Australia  
Radio Canada Intl [S]  
Radio Japan  
Radio Jordan  
Radio Norway Intl [S]  
Radio Omdurman  
Swiss Radio Intl  
Voice of America (as)  
Voice of America (me)  
Voice of Russia

WWCR #1 (Tennessee) [M-A]  
 WYFR (Satellite Network) [A]  
 1503  
 Radio Pyongyang  
 1510  
 China Radio Intl\*  
 1525  
 Radio Veritas [T-F]  
 1530  
 All India Radio\*  
 FEBA (Seychelles)  
 FEBC (Philippines) [M-A]  
 Radio Netherlands Intl  
 Radio Portugal Intl [M-F]  
 Voice of Nigeria [M-H]  
 Voice of Russia  
 1540  
 Radio Veritas [A-M]  
 1550  
 Voice of Med. (Malta) [F]  
 1555  
 Radio Japan [A]  
 Radio Veritas [A-M]  
 Voice of Med. (Malta) [M-H]

**1600 UTC****(11:00 AM EST, 8:00 AM PST)**

BBC (af)  
 BBC (am)  
 BBC (as pac)  
 BBC (eu)  
 BBC (south as)  
 Canada (North-Quebec) [A-S]  
 Channel Africa  
 China Radio Intl  
 Deutsche Welle  
 Estonian Radio [M-F]  
 Monitor Radio Intl [M-A]  
 Radio Australia  
 Radio France Intl  
 Radio Jordan  
 Radio Korea  
 Radio Pakistan  
 Radio Tanzania  
 Voice of America (af) [A-S]  
 Voice of America (as)  
 Voice of America (me)  
 Voice of Ethiopia  
 Voice of Kenya  
 Voice of Russia  
 Voice of Vietnam  
 WWCR #1 (Tennessee) [M-F]  
 WYFR (Satellite Network) [M-A]  
 1610  
 China Radio Intl\*  
 1612  
 Vatican Radio [M-F]  
 1630  
 Channel Africa [F]\*  
 Radio Austria Intl  
 Radio Canada Intl  
 Radio Dubai  
 Radio Finland  
 Voice of America (af) [M-F]\*  
 Voice of America (as) (Special English)  
 Voice of America (me) (Special English)  
 Voice of Ethiopia  
 Voice of Russia  
 1633  
 Deutsche Welle [M]\*  
 1638  
 Deutsche Welle [T-F]\*  
 1645  
 BBC (am) [S-F]\*  
 BBC (as pac) [M-F]\*

BBC (eu) [S-F]\*

**1700 UTC****(12:00 PM EST, 9:00 AM PST)**

BBC (af)  
 BBC (am)  
 BBC (as pac)  
 BBC (eu) [A]  
 BBC (south as)  
 Canada (North-Quebec) [A]  
 Channel Africa  
 China Radio Intl  
 HCJB (eu)  
 Monitor Radio Intl [M-A]  
 Radio Australia  
 Radio France Intl  
 Radio Japan  
 Radio New Zealand Intl [M-F]\*  
 Radio Pakistan  
 Radio Prague  
 Swiss Radio Intl  
 Voice of America (af)  
 Voice of America (as)  
 Voice of America (me)  
 Voice of Russia  
 WRNO (Louisiana) [M-F]  
 WWCR #3 (Tennessee) [A]  
 1703  
 Radio Pyongyang  
 1710  
 China Radio Intl\*  
 Radio Australia\*  
 1715  
 Radio Sweden  
 Radio Tirana  
 Vatican Radio  
 1725  
 Radio New Zealand Intl [F]\*  
 1730  
 Radio Netherlands Intl  
 Radio Romania Intl  
 Voice of Russia [S-F]  
 1740  
 BBC (af)\*  
 1745  
 Radio Canada Intl [M-F]  
 1755  
 Radio New Zealand Intl [M-W]\*

**1800 UTC****(1:00 PM EST, 10:00 AM PST)**

All India Radio  
 BBC (af) (Newsdesk)  
 BBC (am) (Newsdesk)  
 BBC (eu) (Newsdesk)  
 BBC (south as) (Newsdesk)  
 Canada (North-Quebec) [A]  
 Monitor Radio Intl [M-A]  
 Polish Radio [A]  
 Polish Radio [M-F]\*  
 Radio Australia  
 Radio Cameroon  
 Radio Mozambique  
 Radio New Zealand Intl [M-F]\*  
 Radio Omdurman  
 Radio Prague  
 Radio Tanzania  
 Radio Yemen  
 Swiss Radio Intl (eu)  
 Voice of America (af) [A-S]  
 Voice of America (af) [M-F]\*  
 Voice of America (me)  
 Voice of Kenya  
 Voice of Russia  
 Voice of Vietnam  
 WHRI (Indiana) [M-F]  
 1830

BBC (af) [A-S]\*

Radio Bangladesh  
 Radio Kuwait  
 Radio Netherlands Intl  
 Radio Sweden [M-F]  
 Radio Yemen  
 Voice of America (af) [A-S]  
 (Special English)  
 Voice of America (me) (Special English)  
 Voice of Russia  
 1840  
 Voice of Greece [M-A]  
 1855  
 Radio New Zealand Intl [M-H]\*

**1900 UTC****(2:00 PM EST, 11:00 AM PST)**

All India Radio  
 BBC (af)  
 BBC (as pac) [M-A]  
 BBC (eu) [M-A]  
 China Radio Intl  
 Deutsche Welle  
 Monitor Radio Intl [M-A]  
 Radio Australia  
 Radio Japan  
 Radio Korea  
 Radio New Zealand Intl  
 Radio Norway Intl [S]  
 Radio Portugal Intl [M-F]  
 Radio Romania Intl  
 Radio Vlaanderen Intl  
 Voice of America (af)  
 Voice of America (as)  
 Voice of America (me)  
 Voice of Greece [M-A]  
 Voice of Russia  
 Voice of Vietnam  
 WHRI (Indiana) [M-F]  
 WWCR #1 (Tennessee) [S-F]  
 WWCR #3 (Tennessee) [M-F]  
 1910  
 China Radio Intl\*  
 Radio Australia [M-F]\*  
 Radiobras [M-F]\*  
 1930  
 Deutsche Welle [M-F]\*  
 R Slovakia Intl  
 Radio Austria Intl  
 Radio Netherlands Intl  
 Radio Tirana  
 Radio Yugoslavia  
 Voice of Russia  
 Voice of Turkey  
 1935  
 RAI Italy

**2000 UTC****(3:00 PM EST, 12:00 PM PST)**

BBC (af) (Newshour)  
 BBC (am)  
 BBC (as pac) [M-A] (Newshour)  
 BBC (eu) (Newshour)  
 China Radio Intl  
 Deutsche Welle  
 Estonian Radio [M/H]  
 Monitor Radio Intl [M-A]  
 Radio Australia  
 Radio Budapest  
 Radio Bulgaria  
 Radio New Zealand Intl  
 Swiss Radio Intl  
 Voice of America (af) [A-S]  
 Voice of America (af) [M-F]\*  
 Voice of America (me)  
 Voice of Indonesia

Voice of Israel  
 Voice of Nigeria [M-F]  
 Voice of Russia  
 WHRI (Indiana) [M-F]  
 WWCR #3 (Tennessee) [M-F]  
 2003  
 Radio Pyongyang  
 2007  
 Radio Damascus [M-F]  
 2010  
 China Radio Intl\*  
 Radio New Zealand Intl [S-H]\*  
 2025  
 RAI Italy  
 2030  
 Polish Radio [A-S]  
 Polish Radio [M-F]\*  
 Radio Netherlands Intl  
 Radio Thailand  
 Voice of Vietnam  
 2055  
 Voice of Indonesia [M]  
 2057  
 Radio Kuwait

**2100 UTC****(4:00 PM EST, 1:00 PM PST)**

All India Radio  
 BBC (af)  
 BBC (am)  
 BBC (as pac)  
 BBC (eu)  
 China Radio Intl  
 Deutsche Welle  
 Monitor Radio Intl [M-A]  
 Radio Australia  
 Radio Cameroon  
 Radio Canada Intl  
 Radio Damascus [F]  
 Radio Exterior de Espana  
 Radio Havana Cuba [M-A]  
 Radio Japan  
 Radio Korea  
 Radio New Zealand Intl [A-H]  
 Radio Prague  
 Radio Romania Intl  
 Swiss Radio Intl (eu)  
 Voice of America (af)  
 Voice of America (as)  
 Voice of America (me)  
 Voice of Russia  
 2110  
 China Radio Intl\*  
 Radio Damascus [S-M]  
 Radio New Zealand Intl [M-H]\*  
 2112  
 Radio Damascus [F]  
 2115  
 BBC (af)\*  
 BBC (eu)\*  
 Radio Damascus [T]  
 2120  
 Radio Cairo  
 2130  
 Radio Cairo  
 Radio Riga Intl [M-F]  
 Radio Sweden [M-F]  
 Voice of Armenia  
 Voice of Russia  
 2145  
 Radio Damascus [W]  
 2155  
 Radio Canada Intl [M-F]

**2200 UTC****(5:00 PM EST, 2:00 PM PST)**

All India Radio

BBC (af) (Newsdesk)  
 BBC (am) (Newsdesk)  
 BBC (as pac) (Newsdesk)  
 BBC (eu) (Newsdesk)  
 Canada (North-Quebec) [A-S]  
 China Radio Intl  
 Croatian Radio  
 Monitor Radio Intl [M-A]  
 Radio Australia  
 Radio Budapest  
 Radio Bulgaria  
 Radio Canada Intl  
 Radio Exterior de Espana  
 Radio Havana Cuba [M-A]  
 Radio Korea  
 Radio New Zealand Intl [A-H]  
 Radio Norway Intl [S]  
 Radio Ukraine Intl  
 Radio Vlaanderen Intl [S-F]  
 Radio Yugoslavia  
 RAI Italy  
 Voice of America (as)  
 Voice of Russia  
 WHRI (Indiana) [M-F]  
 WWCR #1 (Tennessee) [M-F]  
 2203  
 Voice of Free China  
 2210  
 China Radio Intl\*  
 2215  
 Radio Cairo  
 2230  
 Radio Austria Intl  
 Radio Finland  
 Radio Prague  
 Radio Sweden [M-F]  
 Voice of America (as) (Special English)  
 Voice of Russia [M-F]  
 2240  
 Radio Cairo  
 Voice of Greece [S-F]

**2300 UTC****(6:00 PM EST, 3:00 PM PST)**

All India Radio  
 BBC (af) [S-F]  
 BBC (am) [S-F]  
 BBC (as pac)  
 BBC (eu) [S-F]  
 Canada (North-Quebec) [S]  
 Croatian Radio  
 Deutsche Welle  
 KWHR (Hawaii) [M-F]  
 Monitor Radio Intl [M-A]  
 Radio Australia  
 Radio Canada Intl  
 Radio Japan  
 Radio New Zealand Intl [A-H]  
 Voice of America (as)  
 Voice of Russia  
 Voice of Turkey  
 WHRI (Indiana) [M-F]  
 2303  
 Radio Pyongyang  
 2315  
 Radio Cairo  
 2330  
 Radio Canada Intl [A-S]  
 Radio Netherlands Intl  
 Voice of Russia  
 Voice of Vietnam  
 2335  
 Voice of Greece [S-F]

# RAMSEY America's #1 Source For Hobby Kits

## TONE GRABBER

Grab Touch-Tone numbers right off the air, phone or tape. A simple hook-up to any radio speaker or phone line is all that is required to instantly decipher touch-tone phone numbers or codes. A 256 digit memory stores decoded numbers and keeps its memory even in the event of power loss. An 8 digit LED display allows you to scroll through the memory bank to examine numbers. To make it easy to pick out number groups or codes, a "dash" is inserted between sets of digits that were decoded more than 2 seconds apart. A "central-office" quality crystal controlled decoder is used allowing rapid and reliable detection of numbers at up to 20 digits per second! For a professionally finished look, add our matching case set. Start cracking those secret codes tomorrow with the Tone Grabber!

TG-1 Tone Grabber kit **\$99.95**  
 CTG Matching case set **\$14.95**  
 TG-1WT Fully assembled TG-1 and case **\$149.95**



## SCA DECODER

Tap into the world of commercial-free music and data that is carried over many standard FM broadcast radio stations. Decoder hooks to the demodulator of FM radio and tunes the 50-100 kHz SCA subcarrier band. Many radios have a demod output, but if your radio doesn't, it's easy to locate, or use our FR-1 FM receiver kit which is a

complete FM radio with a demod jack built-in. These "hidden" subcarriers carry lots of neat programming-from stock quotes to news to music, from rock to easy listening-all commercial free. Hear what you have been missing with the SCA-1.

SCA-1 Decoder kit **\$27.95**  
 CSCA Matching case set **\$14.95**  
 FR-1 FM receiver kit **\$24.95**  
 CRR Matching case for FR-1 **\$14.95**

## BROADBAND PREAMP

Ever wish you could "perk up" your counter to read really weak signals? Or, how about boosting that cable TV signal to drive sets throughout the house, or maybe preamping the TV antenna to pull in that blacked out football game. And, if you're into small broadcasting, boost your transmitter power up to 100 mW! The PR-2 broadband preamp is the answer to all those needs as well as many others. You can use the PR-2 anywhere a high gain, low noise, high power amp is called for: digging out those weak shortwave signals or putting new life into that scanner radio-especially at 800 MHz. The PR-2 has a high power compression point, meaning that it does not overload easily-in fact many folks use it for boosting the power on their FM-10A stereo transmitters. Newly designed microwave MMIC chips from NEC in Japan enable the PR-2 to have gain all the way up to 2 GHz, although we only spec it to 1 GHz-believe it or not, the connector lead length is the limiting factor! Customers tell us the PR-2 outperforms professional lab units by the "big boys" that go for hundreds more. The PR-2 is the ideal general purpose amp you'll wonder how you got along without.

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

PR-2 Broadband Preamp, Fully Wired and Tested **\$59.95**

## AIRCRAFT RECEIVER

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

AR-1 Aircraft Receiver Kit **\$29.95**  
 C-AR Case and Knobset for AR-1 **\$14.95**

## FOXHOUND DIRECTION FINDER

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

DF-1 Foxhound direction finder kit **\$59.95**  
 CDF Matching case set for DF-1 **\$14.95**  
 FHT-1 SlyFox Foxhound transmitter kit **\$129.95**  
 FHID-1 Voice ID option **\$29.95**  
 CFHT Heavy duty metal case set for FHT-1 **\$29.95**



shortwave bands. An additional switch allows the selection of any two bands of interest, each 1 MHz wide. Set one range for daytime frequencies and one for nighttime when propagation is different, choose any two frequencies between 3 and 22 MHz. Frequencies are tuned on your AM radio, making it easy to log stations or set presets. A built-in antenna switch automatically switches the existing AM antenna to either the radio or converter, making hook-up easy and fast. As with many of our kits, a handsome matching case and knob set is available to put the finishing touches on your kit.

SC-1 Shortwave Converter Kit **\$27.95**  
 CSC Matching Case and Knob Set **\$14.95**

## FM RECEIVER/TRANSMITTER

Keep an ear on the local repeater, police, weather or just tune around. These sensitive superhet receivers are fun to build and use. Tunes any 5 MHz portion of the band and have smooth varactor tuning with AFC, dual conversion, ceramic filtering, squelch and plenty of speaker volume. Complete manual details how the rigs work and applications. 2M FM transmitter has SW RF out, crystal control (146.52 included), pro-specs and data/mike inputs. Add our case sets for a nice finish.

FM Receiver kit **\$34.95**  
 Specify band: FR-146 (2M), FR-6 (6M), FR-10 (10M), FR-220 (220MHz) **\$14.95**  
 CFR Matching case set **\$14.95**  
 FT-146 Two Meter FM trans kit **\$99.95**

## SCANNER CONVERTER

Tune in on the 800-950 MHz action using your existing scanner. Frequencies are converted with crystal referenced stability to the 400-550 MHz range. Instructions are even included on building high performance 900 MHz antennas. Well designed circuit features extensive filtering and convenient on-off/bypass switch. Easy one hour assembly or available fully assembled. Add our matching case set for a professional look.

SCN-1 Scanner converter kit **\$49.95**  
 CSCN Matching case set **\$14.95**  
 SCN-1WT Assembled SCN-1 and case **\$89.95**

## STEREO TRANSMITTER

Run your own Stereo FM radio station! Transmits a stable signal in the 88-108 MHz FM broadcast band up to 1 mile. Detailed manual provides helpful info on FCC regs, antenna ideas and range to expect. Latest design features adjustable line level inputs, pre-emphasis and crystal controlled subcarrier. Connects to any CD or tape player, mike mixer or radio. Includes free tuning tool too! For a pro look add our matching case set with on-board whip antenna.

FM-10A Stereo transmitter kit **\$34.95**  
 CFM Case, whip ant set **\$14.95**



## INTERCEPTOR

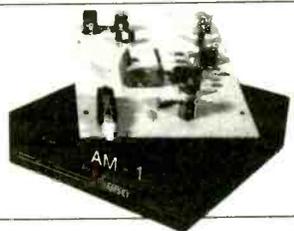
The Interceptor will lock on instantly to the nearest transmitter and allow you to listen with perfect audio quality. Since the Interceptor does not have to search through all frequencies, those quick transmissions that are hopelessly lost on scanners are captured easily. The Interceptor does not need tuning, making it ideal for hands-free surreptitious monitoring of nearby transmissions. The Interceptor is complete self-contained with internal speaker and earphone jack for private listening. Included are: Nicad battery pack, AC/adaptor charger, antenna and earphone. Increase your security and awareness-intercept the communications around you with the Interceptor. Fully wired with 1 year warranty. Covers 300-2000MHz frequency range, FM deviations from 5 kHz to 200 kHz.

R10 Interceptor, Fully Wired 1 year warranty **\$349.95**

## AM BROADCAST TRANSMITTER

High quality, true AM broadcast band transmitter is designed exactly like the big commercial rigs. Power of 100 mW, legal range of up to 1/4 mile. Accepts line level inputs from tape and CD players and mike mixers, tunable 550-1750 kHz. Complete manual explains circuitry, help with FCC regs and even antenna ideas. Be your own Rush Limbaugh or Rick Dees with the AM-1! Add our case set for a true station look.

AM-1 Transmitter kit **\$29.95**  
 CAM Matching case set **\$14.95**



## ACTIVE ANTENNA

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

AA-7 Kit **\$28.95**  
 CAA Matching case & knobset **\$14.95**



## SHORTWAVE RECEIVER

Here's a complete shortwave radio guaranteed to inspire awe in any listener. Imagine tuning in the BBC, Radio Moscow, Radio Baghdad and other services with just a couple of feet of antenna. This very sensitive (about a microvolt!) receiver is a true superhet design with AGC, RF gain control and plenty of speaker volume. Smooth varactor diode tuning allows you to tune any 2 MHz portion of the 4 to 11 MHz frequency range, and the kit conveniently runs on a 9 volt battery. Add our matching custom case and knob set to give your radio a finished, polished, look. Amaze yourself-and others-see how you can listen to the world on a receiver you built in an evening.

SR-1 Shortwave Radio Kit **\$34.95**  
 CSR Case and Knob Set **\$14.95**

## ORDERS ONLY CALL 1-800-446-2295

(No tech info at this number)

TECH/ORDER/INFO 716-924-4560 FAX 716-924-4555



TERMS: Satisfaction guaranteed. Examine for 10 days. If not pleased return it in original form for refund. Add \$4.95 for shipping, handling and insurance. For foreign orders add 20% for surface mail. COD (U.S. only) add \$5.00. Orders under \$20 add \$3.00 NY residents add 7% sales tax. 90-day parts warranty on kit parts. 1-year parts and labor warranty on wired units.

RAMSEY ELECTRONICS, INC.  
 793 CANNING PARKWAY, VICTOR NY 14564

FREQUENCIES

0000-0030	Australia, Radio	9610as	13605pa	13745as	17750as	0000-0030	Thailand, Radio	9655as	9680af	11905af	
0000-0100 vl	Australia, VL8A Alice Spg	4835do				0000-0100	United Kingdom, BBC London	5965as	5970sa	5975va	6175na
0000-0100 vl	Australia, VL8K Katherine	5025do						6195as	7110as	7265as	7325va
0000-0100 vl	Australia, VL8T Tent Crk	4910do						9590va	9915sa	11750sa	11955as
0000-0100	Bulgaria, Radio	7480na	9700na			0000-0030	United Kingdom, BBC London	9580as	11945as		
0000-0015	Cambodia, Natl Voice of	11940as				0000-0100	USA, KALJ Dallas TX	5810am			
0000-0100	Canada, CBC N Quebec Svc	9625do				0000-0100	USA, KTVB Salt Lk City UT	15590am			
0000-0100	Canada, CFCX Montreal	6005do				0000-0100	USA, KWHR Naalehu HI	17510au			
0000-0100	Canada, CFRX Toronto	6070do				0000-0100	USA, Monitor Radio Intl	7535am	9430ca		
0000-0100	Canada, CFVP Calgary	6030do				0000-0100	USA, VOA Washington DC	5995na	6130am	7215va	7405na
0000-0100	Canada, CHNX Halifax	6130do						9455am	9775na	9890as	
0000-0100	Canada, CKZN St John's	6160do						11695am	11760va	13740na	15185va
0000-0100	Canada, CKZU Vancouver	6160do						15290va	1735va	17820va	
0000-0030 mtwhfa	Canada, RCI Montreal	6040am	9535am	11940am				5825eu	7425na	7520sa	
0000-0100	Canada, RCI Montreal	5960na	9755na			0000-0100	USA, WEWN Birmingham AL	5745am			
0000-0100	China, China Radio Intl	9710na	11715na			0000-0100	USA, WHRI Noblesville IN	7490na			
0000-0100	Costa Rica, AWR Alajuela	5030am	6150am	7375am	9725am	0000-0100	USA, WJCR Upton KY	9955am			
		13750am				0000-0100	USA, WRMI/R Miami Intl	7355am			
0000-0100	Costa Rica, RF Peace Intl	7385am	9400am	15050am		0000-0025	USA, WRNO New Orleans LA	7355am			
0000-0005	Croatia, Croatian Radio	5895eu	7370eu	13830eu		0000-0100	USA, WWCR Nashville TN	3315am	5065am	5935am	
0000-0027	Czech Rep, Radio Prague	5930na	7345na			0000-0044	USA, WYFR Okeechobee FL	6085na			
0000-0030	Egypt, Radio Cairo	9900na				0000-0030	Yugoslavia, Radio	9580na			
0000-0015	Ghana, Ghana Broadc Corp	3366do	4915do			0028-0100	Iran, VOIRI Tehran	6150na	6175na	9022na	
0000-0045	India, All India Radio	9705as	9950as	11745as	13750as	0030-0100	Australia, Radio	9580pa	9660pa	11795as	13605pa
		15145as						13755as	15240pa	15365pa	15415as
0000-0100	Lebanon, Voice of Hope	6280va				0030-0100	Belarus, Radio Minsk	5940eu	7665eu	13640eu	
0000-0100	Lebanon, Wings of Hope	9960va				0030-0100	Belgium, R Vlaanderen Int	6030na	9925sa		
0000-0030 as	Lithuania, Radio Viinius	7360na				0030-0100	Ecuador, HCJB Quito	9745am	21455am		
0000-0100	Malaysia, Radio	7295do				0030-0100	Netherlands, Radio	5905as	7305as	9860as	11655as
0000-0100	Malaysia, RTM Kuching	7160do				0030-0100	Sri Lanka, SLBC Colombo	15425as			
0000-0100	Netherlands, Radio	6020na	6165na			0030-0100	Sweden, Radio	6065sa	9850sa		
0000-0100	New Zealand, R NZ Intl	15115pa				0030-0100	Thailand, Radio	9655as	11905as	15370as	
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na		0045-0100	USA, WYFR Okeechobee FL	6065na			
0000-0100	Palau, KHBN/Voice of Hope	9965as				0050-0100	Italy, RAI Rome	6005na	9645na	11800na	
0000-0100	Philippines, FEBC/R Intl	15450as									
0000-0100	Russia, Voice of	7105na	7125na	7180na							
0000-0100	Spain, R Exterior Espana	9540na									

SELECTED PROGRAMS

Sundays

- 0000 USA, WEWN Birmingham AL: Living the Word. Dominican Father Bryan Mullady on the subject of the Second Vatican Council.
- 0005 Canada, RCI Montreal: Quirks and Quarks. Updating what's new and what's next in science.
- 0011 Russia, Voice of: News and Views. Russian views on news developments.
- 0025 Netherlands, Radio: Program Info. Summary of upcoming program schedules.
- 0028 USA, WEWN Birmingham AL: Mother's Message. Spiritual guidance from Mother Angelica.
- 0032 Russia, Voice of: This is Russia. A program which helps you to get to know Russia and the Russians better.
- 0038 Netherlands, Radio: Newslines. Correspondent reports, interviews, and commentaries on current events.
- 0045 USA, WEWN Birmingham AL: Fr. DiLorenzo. A program of reflections.
- 0053 Netherlands, Radio: Weekend. NEW! Maggie Ayre joins colleagues from BBC World Service, Radio France International and Deutsche Welle for a weekly look at issues and themes important throughout Europe.

Mondays

- 0000 USA, WEWN Birmingham AL: Sunday Mass (from 2300). See S 1300.
- 0004 Canada, RCI Montreal: Tapestry. A look at the broad range of spiritual and human issues facing people of various cultures and religions.
- 0011 Russia, Voice of: News and Views. See S 0011.
- 0025 Netherlands, Radio: Press Review. Summary of items in the Dutch media.
- 0028 USA, WEWN Birmingham AL: Mother's Message. See S 0028.
- 0032 Russia, Voice of: Folk Box. One of the top ten entertainment programs (Passport to World Band Radio).
- 0035 Netherlands, Radio: Sincerely Yours. See S 1138.
- 0045 USA, WEWN Birmingham AL: Fr. DiLorenzo. See S 0045.
- 0053 Netherlands, Radio: Sounds Interesting. See S 1153.

Tuesdays

- 0000 Canada, RCI Montreal: As It Happens. See M 2330.
- 0000 Canada, RCI Montreal: The World at Six. See M 2300.
- 0000 USA, WEWN Birmingham AL: Get a Life. See S 0200.

- 0011 Russia, Voice of: News and Views. See S 0011.
  - 0025 Netherlands, Radio: Press Review. See M 0025.
  - 0028 USA, WEWN Birmingham AL: Franciscan University. See M 1628.
  - 0032 Russia, Voice of: Yours for the Asking. A 30-minute musical request program.
  - 0038 Netherlands, Radio: Newslines. See S 0038.
  - 0045 USA, WEWN Birmingham AL: Ann Shields. See S 0045.
  - 0053 Netherlands, Radio: Research File. See M 1153.
- Wednesdays**
- 0000 Canada, RCI Montreal: As It Happens. See M 2330.
  - 0000 Canada, RCI Montreal: The World at Six. See M 2300.
  - 0000 USA, WEWN Birmingham AL: Crisis in Culture. See S 1228.
  - 0011 Russia, Voice of: News and Views. See S 0011.
  - 0025 Netherlands, Radio: Press Review. See M 0025.
  - 0028 USA, WEWN Birmingham AL: Mother's Message. See S 0028.
  - 0032 Russia, Voice of: The Jazz Show. See M 0532.
  - 0038 Netherlands, Radio: Newslines. See S 0038.
  - 0045 USA, WEWN Birmingham AL: Fr. DiLorenzo. See S 0045.
  - 0053 Netherlands, Radio: Mirror Images. See T 1153.
- Thursdays**
- 0000 Canada, RCI Montreal: As It Happens. See M 2330.
  - 0000 Canada, RCI Montreal: The World at Six. See M 2300.
  - 0000 USA, WEWN Birmingham AL: Living the Word. See S 0000.
  - 0011 Russia, Voice of: News and Views. See S 0011.
  - 0025 Netherlands, Radio: Press Review. See M 0025.
  - 0028 USA, WEWN Birmingham AL: Franciscan University. See M 1628.
  - 0032 Russia, Voice of: Music at Your Request. See M 1232.
  - 0038 Netherlands, Radio: Newslines. See S 0038.
  - 0045 USA, WEWN Birmingham AL: Ann Shields. See S 0045.
  - 0053 Radio Netherlands: Documentary. Friendship with Germany (14th). See W 1153.
  - 0053 Radio Netherlands: Documentary. The UN Conference on Women (28th). See W 1553.
  - 0053 Radio Netherlands: Documentary. The Year of the Alone (21st). See S 0153.
- Fridays**
- 0000 Canada, RCI Montreal: As It Happens. See M 2330.
  - 0000 Canada, RCI Montreal: The World at Six. See M 2300.
  - 0000 USA, WEWN Birmingham AL: Christ the Light. See S 0228.
  - 0011 Russia, Voice of: News and Views. See S 0011.

- 0025 Netherlands, Radio: Press Review. See M 0025.
- 0028 USA, WEWN Birmingham AL: Mother's Message. See S 0028.
- 0032 Russia, Voice of: The Jazz Show. See M 0532.
- 0038 Netherlands, Radio: Newslines. See S 0038.
- 0045 USA, WEWN Birmingham AL: Fr. DiLorenzo. See S 0045.
- 0053 Netherlands, Radio: Media Network. See H 0153.

Saturdays

- 0000 Canada, RCI Montreal: As It Happens. See M 2330.
- 0000 Canada, RCI Montreal: The World at Six. See M 2300.
- 0000 USA, WEWN Birmingham AL: Seed of Abraham. See M 0428.
- 0011 Russia, Voice of: News and Views. See S 0011.
- 0025 Netherlands, Radio: Program Info. See S 0025.
- 0028 USA, WEWN Birmingham AL: Franciscan University. See M 1628.
- 0032 Russia, Voice of: Folk Box. See M 0032.
- 0038 Netherlands, Radio: Newslines. See S 0038.
- 0045 USA, WEWN Birmingham AL: Ann Shields. See S 0045.
- 0053 Netherlands, Radio: A Good Life. See M 1253.

HAUSER'S HIGHLIGHTS  
CZECH REPUBLIC: RADIO  
PRAGUE

W-95, English to Overseas, 27 min ea

0330	ME/As	6200
1000	Af/As	17485, 15640
1400	Af/Am	17485, 13580
2100	Af/Am	7345, 5930
2230	Am	7345, 5930
0000	Am	7345, 5930
0100	Am	7345, 6200
0300	Am	7345, 5930

(BBC Monitoring)



FREQUENCIES

0200-0300	Australia, Radio	9580pa 15365pa 17750as	9660pa 15415as 17795pa	13605pa 15510as 17860pa	15240pa 17715as	0200-0230	Sri Lanka, SLBC Colombo	15425as			
0200-0300	Australia, Defense Forces R	13525as				0200-0300	Taiwan, VO Free China	5950na 11825as	7130as 15345as	9680na 11740ca	
0200-0300 vl	Canada, CBC N Quebec Svc	9625do				0200-0300	United Kingdom, BBC London	5970sa 7235va 9915sa	5975va 7325va 11955as	6135af 9590va 15360as	6175na 9605as
0200-0300	Canada, CFCX Montreal	6005do				0200-0300	USA, KAIJ Dallas TX	5810am			
0200-0300	Canada, CFRX Toronto	6070do				0200-0300	USA, KTNB Salt Lk City UT	7510am			
0200-0300	Canada, CFVP Calgary	6030do				0200-0300	USA, KWHR Naalehu HI	17510au			
0200-0300	Canada, CHNX Halifax	6130do				0200-0300	USA, Monitor Radio Intl	5850na	9430am		
0200-0300	Canada, CKZN St John's	6160do				0200-0300	USA, VOA Washington DC	7115as 9740as 17820as	7205as 11705as	7215as 15205as	7651as 17740as
0200-0300	Canada, CKZJ Vancouver	6160do				0200-0300	USA, WEWN Birmingham AL	7425na			
0200-0300	Canada, RCI Montreal	5905na	9755na	11725am		0200-0300	USA, WHRI Noblesville IN	5745am			
0200-0300	Costa Rica, RF Peace Intl	7385am	9400am	15050am		0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0205	Croatia, Croatian Radio	5895eu	7370eu	13830eu		0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300	Cuba, Radio Havana Cuba	6000na	9820na	9830na		0200-0300	USA, WWCR Nashville TN	5065am	5935am	7435am	
0200-0300	Ecuador, HCJB Quito	9745am	21455am			0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200-0300	Egypt, Radio Cairo	9475na				0200-0300	Vietnam, Voice of	5940na	9840na	15010na	
0200-0250	Germany, Deutsche Welle	6035as 7355as	6130na 9515as	7265as 9615as	7285as	0200-0230	Yugoslavia, Radio	6100na	7115na		
0200-0230	Hungary, Radio Budapest	6190na	9850na	11870na		0230-0300	Albania, R Tirana Intl	6140na	7160na		
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0230-0300	Austria, R Austria Intl	9655na	9870ca	13730sa	
0200-0300	Lebanon, Wings of Hope	9960va				0230-0245	Pakistan, Radio	7290as 21730as	15190as	17705as	17725as
0200-0300 smtwh	Malaysia, Radio	7295do				0230-0300	Philippines, R Pilipinas	17760me	17865me	21580me	
0200-0230	Netherlands, Radio	5905as	7305as	9860as	11655as	0230-0300 mtwhf	Portugal, R Portugal Intl	6175sa	9570na		
0200-0300	New Zealand, R NZ Intl	15115pa				0230-0300	Sweden, Radio	7115na			
0200-0300	Romania, R Romania Intl	5990na 11940na	6155na	9510na	9570na	0250-0300	Vatican State, Vatican R	7305na	9605na		
0200-0300	Russia, Voice of	7105na 12030na	7270na	7345na	9580na						

SELECTED PROGRAMS

Sundays

- 0200 Romania, R Romania Intl: Radio Newsreel. All about the events of the day, a live special, media top news, To the Point, and Periscope.
- 0200 USA, WEWN Birmingham AL: Get a Life. Father Groeschel.
- 0206 Canada, RCI Montreal: Innovation Canada. Canadian entrepreneurs, inventors, and researchers and their ideas and discoveries.
- 0211 Russia, Voice of: Music and Musicians. World-famous performers and composers play for you.
- 0228 USA, WEWN Birmingham AL: Christ the Light. Father Mullady.
- 0230 Romania, R Romania Intl: The Week. A summary of the past week's world news events.
- 0231 Canada, RCI Montreal: Earth Watch. Environment and ecology matters.
- 0234 Romania, R Romania Intl: World of Culture. Romania's cultural highlights, events, crossroads, roots, and RRI encyclopedia.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0238 Romania, R Romania Intl: Romanian Folk Music at Its Best. One vocal and one orchestral piece.
- 0245 Romania, R Romania Intl: DX Mailbag. Listener letters are read and answered.
- 0253 Netherlands, Radio: Weekend. See S 0053.

Mondays

- 0200 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0200 USA, WEWN Birmingham AL: Christ the Light. See S 0228.
- 0207 Romania, R Romania Intl: Frankly Speaking. See S 1307.
- 0210 Romania, R Romania Intl: Sunday Studio. See S 1310.
- 0211 Russia, Voice of: Music and Musicians. See S 0211.
- 0228 USA, WEWN Birmingham AL: The Glory of the Papacy. Dr. O'Donnell.
- 0230 Canada, RCI Montreal: The Mailbag. See S 1440.
- 0238 Netherlands, Radio: Sincerely Yours. See S 1138.
- 0250 Romania, R Romania Intl: Romanian by Radio. See S 1350.
- 0253 Netherlands, Radio: Sounds Interesting. See S 1153.

Tuesdays

- 0200 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0200 USA, WEWN Birmingham AL: St. Joseph's Radio Presents. See S 1500.
- 0211 Canada, RCI Montreal: Spectrum. See M 1439.
- 0211 Russia, Voice of: Commonwealth Update. See M 2311.
- 0230 Romania, R Romania Intl: Pro-Memoria. See M 1330.
- 0232 Russia, Voice of: Folk Box. See M 0032.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0238 Romania, R Romania Intl: Pages of Romanian Literature. See M 1338.

- 0248 Romania, R Romania Intl: Romanian Hits. See M 1348.
- 0253 Netherlands, Radio: Research File. See M 1153.
- 0255 Romania, R Romania Intl: Special Program for Radio Amateurs. See M 1355.

Wednesdays

- 0200 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0200 USA, WEWN Birmingham AL: Life Issues. See S 0300.
- 0211 Canada, RCI Montreal: Spectrum. See M 1439.
- 0211 Russia, Voice of: Commonwealth Update. See M 2311.
- 0228 USA, WEWN Birmingham AL: The Glory of the Papacy. See M 0228.
- 0230 Romania, R Romania Intl: Business Club. See T 1330.
- 0232 Russia, Voice of: Music at Your Request. See M 1232.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0238 Romania, R Romania Intl: Romanian Anglicists. See T 1338.
- 0250 Romania, R Romania Intl: Youth Club. See T 1350.
- 0253 Netherlands, Radio: Mirror Images. See T 1153.

Thursdays

- 0200 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0211 Canada, RCI Montreal: Spectrum. See M 1439.
- 0211 Russia, Voice of: Commonwealth Update. See M 2311.
- 0230 Romania, R Romania Intl: Society Today. See W 1330.
- 0232 Russia, Voice of: The Jazz Show. See M 0532.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0238 Romania, R Romania Intl: Women (The Other Force). See W 1338.
- 0248 Romania, R Romania Intl: Romanian Musicians. See W 1348.
- 0254 Radio Netherlands: Documentary. Friendship with Germany (14th). See W 1153.
- 0254 Radio Netherlands: Documentary. The UN Conference on Women (28th). See W 1553.
- 0254 Radio Netherlands: Documentary. The Year of the Alone (21st). See S 0153.
- 0255 Romania, R Romania Intl: Partners in a Changing World. See W 1355.

Fridays

- 0200 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0211 Canada, RCI Montreal: Spectrum. See M 1439.
- 0211 Russia, Voice of: Commonwealth Update. See M 2311.
- 0228 USA, WEWN Birmingham AL: University in the Sky. See M 0428.
- 0230 Romania, R Romania Intl: Citizens of the Same Country. See H 1330.
- 0232 Russia, Voice of: Music at Your Request. See M 1232.

- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0238 Romania, R Romania Intl: Listeners' Letterbox. Romanian Folk Music at it's Best
- 0253 Netherlands, Radio: Media Network. See H 0153.
- 0253 Romania, R Romania Intl: Skylark. See H 1353.

Saturdays

- 0200 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0200 USA, WEWN Birmingham AL: St. Joseph's Radio Presents. See S 1500.
- 0211 Canada, RCI Montreal: Spectrum. See M 1439.
- 0211 Russia, Voice of: Commonwealth Update. See M 2311.
- 0225 Netherlands, Radio: Music Break. Five-minutes of music at the end of an hour's program.
- 0230 Romania, R Romania Intl: European Options. Romanian Folk Music at it's Best
- 0232 Russia, Voice of: The Jazz Show. See M 0532.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0238 Romania, R Romania Intl: Radio Pictures. See F 1338.
- 0253 Netherlands, Radio: A Good Life. See M 1253.
- 0253 Romania, R Romania Intl: Counterpoint. Romanian Folk Music at it's Best.

PROPAGATION FORECASTING

Jacques d'Avignon, VE3VIA  
965 Lincoln Drive  
Kingston, ON K7M 4Z3  
Canada

Distributor ASAPS Propagation Software  
E-mail: [monitor@limestone.kosone.com](mailto:monitor@limestone.kosone.com)

RadioMap™

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Robert Parnass, M.S.  
Radio Frequency Consulting  
2350 Douglas Road, Danvers, IL 60113

## FREQUENCIES

0300-0400	Australia, Radio	9580pa 15245as 17795pa	9660pa 15365pa 17860pa	13605pa 15510as	15240pa 17750pa	0300-0400	Taiwan, VO Free China	5950na 15345as 9655na	9680na	11745as	11825as
0300-0400 vl	Canada, CBC N Quebec Svc	9625do				0300-0330	Thailand, Radio	5970sa 15360as	11905na	7235va	7325sa
0300-0400	Canada, CFRX Montreal	6005do				0300-0330	United Kingdom, BBC London	3255af 6175na 9605as	6135af	5975va	6005af
0300-0400	Canada, CFRX Toronto	6070do				0300-0400	USA, KAJI Dallas TX	5810am			
0300-0400	Canada, CFVP Calgary	6030do				0300-0400	USA, KATN Salt Lk City UT	7510am			
0300-0400	Canada, CHNX Halifax	6130do				0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	Canada, CKZN St John's	6160do				0300-0400	USA, KWHR Maalehu HI	17510au			
0300-0400	Canada, CKZU Vancouver	6160do				0300-0400	USA, Monitor Radio Intl	5850na	7535af	7280af	7340af
0300-0330 twhfa	Canada, RCI Montreal	6010na	9755na			0300-0400	USA, VOA Washington DC	6035af 7405af	7105af	9885af	
0300-0400 sm	Canada, RCI Montreal	6010na	9755na			0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	China, China Radio Intl	9690na	9710na	11715na		0300-0400	USA, WHRI Noblesville IN	5745am			
0300-0400 vl	Costa Rica, Faro del Carib	5055do				0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	Costa Rica, RF Peace Intl	7385am	9400am			0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0305	Croatia, Croatian Radio	5895eu	7370eu	13830eu		0300-0400	USA, WWCR Nashville TN	5065am	5935am	7435am	
0300-0400	Cuba, Radio Havana Cuba	6000na	9820na	9830na		0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0327	Czech Rep, Radio Prague	5930na	7345na			0300-0315	Vatican State, Vatican R	7305na	9605na		
0300-0400	Ecuador, HCJB Quito	9745am	21455am			0300-0400	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
0300-0330	Egypt, Radio Cairo	9475na				0300-0400	Greece, Voice of	6260na	7450na	9420na	
0300-0350	Germany, Deutsche Welle	6045na 9650na	6085na	6120na	9535na	0315-0330 s	Vatican State, Vatican R	7360af	9660af		
0300-0400	Guatemala, Radio Cultural	3300do				0320-0350	Czech Rep, Radio Prague	6200as			
0300-0400	Japan, NHK/Radio	9605na	11840as	17810as		0330-0357	Hungary, Radio Budapest	5965na	9850na	11870na	
0300-0330	Japan, NHK/Radio	11885na	11895ca	11960na		0330-0400	Moldova, R Moldova Intl	7500na			
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0330-0400	Sweden, Radio	7115na			
0300-0400	Lebanon, Wings of Hope	9960va				0330-0400 vl	Tanzania, Radio	5050af			
0300-0330	Mongolia, R Ulan Bator	9960na	12000na			0330-0400	UAE, Radio Dubai	13675na	15395eu	21605na	
0300-0325	Netherlands, Radio	5905as	7305as	9860as	11655as	0330-0400	United Kingdom, BBC London	9610af	11730af	11955as	15280as
0300-0400	New Zealand, R NZ Intl	15115pa				0340-0350	Greece, Voice of	6260na	7450na	9420na	
0300-0330 m	Norway, Radio Norway Intl	6030na				0345-0400 irreg	Burundi, Radio Nationale	6140do			
0300-0330	Philippines, R Pilipinas	17760me	17865me	21580me							
0300-0400	Russia, Voice of	5940na 7345na	7105na	7125na	7270na						
0300-0400	S Africa, Channel Africa	5955af	7185af	9585af	11900af						

## SELECTED PROGRAMS

### Sundays

- 0300 USA, Monitor Radio Intl: Bible Lesson. See S 0100.
- 0300 USA, WEWN Birmingham AL: Life Issues. A pro-life program with Father Pavonne.
- 0305 Canada, RCI Montreal: Double Exposure. The comedy team of Bob Robertson and Linda Cullen present their award-winning brand of political satire and mimicry.
- 0311 Russia, Voice of: Moscow Mailbag. See S 0111.
- 0328 USA, WEWN Birmingham AL: Say Yes. Dana with a time of inspiration and special music.
- 0332 Canada, RCI Montreal: The Royal Canadian Air Farce. The traveling comedy show that was brought back by popular demand.
- 0332 Russia, Voice of: Your Top Tune. Win a prize by guessing which song of the three is the most popular.
- 0346 Russia, Voice of: You Write to Us. Listeners express their views about programs and opinions about events in Russia and the Commonwealth.

### Mondays

- 0300 USA, Monitor Radio Intl: Sunday from the Mother Church. See S 2300.
- 0300 USA, WEWN Birmingham AL: Retreat Teachings. See S 0500.
- 0304 Canada, RCI Montreal: The Inside Track. An award-winning program of sports journalism, examining the impact of sports on the lives of Canadians.
- 0311 Russia, Voice of: Moscow Mailbag. See S 0111.
- 0331 Canada, RCI Montreal: Now the Details. See S 2335.
- 0332 Russia, Voice of: Timelines. A variety program with an upbeat flair and an insight into Moscow life.

### Tuesdays

- 0300 USA, WEWN Birmingham AL: Mother Angelica Talks It Over. See S 0100.
- 0306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
- 0311 Russia, Voice of: Newmarket. See M 1311.
- 0315 Canada, RCI Montreal: Report to the Peacekeepers. See M 0614.
- 0328 USA, WEWN Birmingham AL: A Homily for Today. Various presenters.
- 0332 Russia, Voice of: Kaleidoscope. See S 1132.
- 0349 USA, Monitor Radio Intl: Letterbox. See M 1149.
- 0352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

### Wednesdays

- 0300 USA, WEWN Birmingham AL: The Catechism Explained. See M 1500.
- 0306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
- 0311 Russia, Voice of: Science and Engineering in the CIS. See S 0611.
- 0315 Canada, RCI Montreal: Report to the Peacekeepers. See M 0614.
- 0328 USA, WEWN Birmingham AL: A Homily for Today. See T 0328.
- 0332 Russia, Voice of: Russian by Radio. See M 0132.
- 0349 USA, Monitor Radio Intl: Letterbox. See M 1149.
- 0352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

### Thursdays

- 0300 USA, WEWN Birmingham AL: Christ the Light. See S 0228.
- 0306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
- 0311 Russia, Voice of: Moscow Mailbag. See S 0111.
- 0315 Canada, RCI Montreal: Report to the Peacekeepers. See M 0614.
- 0328 USA, WEWN Birmingham AL: A Homily for Today. See T 0328.
- 0332 Russia, Voice of: Audio Book Club. See S 0132.
- 0349 USA, Monitor Radio Intl: Letterbox. See M 1149.
- 0352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

### Fridays

- 0300 USA, WEWN Birmingham AL: Get a Life. See S 0200.
- 0306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
- 0311 Russia, Voice of: Moscow Mailbag. See S 0111.
- 0315 Canada, RCI Montreal: Report to the Peacekeepers. See M 0614.
- 0328 USA, WEWN Birmingham AL: A Homily for Today. See T 0328.
- 0332 Russia, Voice of: Russian by Radio. See M 0132.
- 0349 USA, Monitor Radio Intl: Letterbox. See M 1149.
- 0352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

### Saturdays

- 0300 USA, WEWN Birmingham AL: Today with Father Rutler. See S 1228.
- 0306 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1129.
- 0311 Russia, Voice of: Moscow Mailbag. See S 0111.
- 0315 Canada, RCI Montreal: Report to the Peacekeepers. See M 0614.
- 0328 USA, WEWN Birmingham AL: A Homily for Today. See T 0328.
- 0332 Russia, Voice of: Audio Book Club. See S 0132.

## THANK YOU ...

**Additional contributors to this month's Shortwave Guide:** John Babbis, Silver Spring, MD; Capt. K.J. Barry, Blackpool, England; Joe Brasier/WHRI; C. Clifford Coffman, Hammond, IN; Bob Fraser, Cohasset, MA; Clyde Harmcn, Anniston, AL; Kevin Hecht, Devon, PA; Rev. Michael G. Mayer, Dover, DE; Ian McFarland/Marbian Productions International; Jim Moats, Ravenna, OH; Giovanni Serra, Rome, Italy; Robert E. Thomas, Bridgeport, CT; Loyd Van Horn, Brasstown, NC; Sue Wilden, Columbus, IN; *DX Ontario*; *Fine Tuning*; *NASWA Journal*; *BBCMS*; *BBC Worldwide*; *BBC Summary of World Broadcasts*; *Grove Enterprises BBS*; *Internet Shortwave Newsgroup* via Larry Van Horn.

FREQUENCIES

0400-0500	Australia, Radio	9580pa 15240pa 17715pa	9660pa 15365pa 17750as	11880pa 15415pa 17795pa	13605as 15510pa	0400-0500	United Kingdom, BBC London	7205na 3255af 7160af 11760af 15310as	5975va 9410va 11955as 15575va	6005af 9600af 12095af	6175na 11730af 15280as
0400-0500 vl	Canada, CBC N Quebec Svc	9625do				0400-0430	United Kingdom, BBC London	3955eu	6180eu	6195eu	9610af
0400-0500	Canada, CBCX Montreal	6005do				0400-0500	USA, KAIJ Dallas TX	5810am			
0400-0500	Canada, CFRX Toronto	6070do				0400-0500	USA, KTNB Salt Lk City UT	7510am			
0400-0500	Canada, CFVP Calgary	6030do				0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	Canada, CHNX Halifax	6130do				0400-0500	USA, KWHR Naalehu HI	17510as			
0400-0500	Canada, CKZN St John's	6160do				0400-0500	USA, Monitor Radio Intl	7355eu	9840af		
0400-0500	Canada, CKZU Vancouver	6160do				0400-0500	USA, VOA Washington DC	6035af 7405af 15300af	6873va 9575af	7170va 9630af	7280af 9885af
0400-0430	Canada, RCI Montreal	6150me	9505me	9645me		0400-0500	USA, WEWN Birmingham AL	7425na			
0400-0500	China, China Radio Intl	9730na	11680na			0400-0500	USA, WHRI Noblesville IN	5745am			
0400-0500	Costa Rica, RF Peace Intl	7385am	9400am	15050am		0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0405	Croatia, Croatian Radio	5895eu	7370eu	13830eu		0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	Cuba, Radio Havana Cuba	6000na	6180na	9820na	9830na	0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	Ecuador, HCJB Quito	9745am	21455am			0400-0500	USA, WWCR Nashville TN	5065am	5935am	7435am	
0400-0450	Germany, Deutsche Welle	6015af 7265af	6045af 9565af	6065af	7225af	0400-0445	USA, WYFR Okeechobee FL	6065na			
0400-0500 twfta	Guatemala, Radio Cultural	3300do				0400-0500	Zimbabwe, ZBC/Radio 3	3306do			
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0425-0440	Italy, RAI Rome	5990eu			
0400-0500	Lebanon, Wings of Hope	9960va				0425-0500	Nigeria, FRCN/Radio	3326do			
0400-0458	New Zealand, R NZ Intl	15115pa				0430-0500	Australia, Defense Forces R	13525as			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as		0430-0455	Moldova, R Moldova Intl	7500na			
0400-0430	Romania, R Romania Intl	5990na 11940na	6155na	9510na	9570na	0430-0500	Netherlands, Radio	5995na	6165na		
0400-0500	Russia, Voice of	5920na 7180na	5930na 7270na	7105na 7330na	7175na	0430-0500	Russia, Voice of	7330na			
0400-0500	S Africa, Channel Africa	5955af	7185af	9585af	11900af	0430-0500	Swaziland, Trans World R	3200af	5055af	6070af	
0400-0427	S Africa, Trans World R	7165af				0430-0500	United Kingdom, BBC London	7150eu			
0400-0500	Slovakia, AWR	9450af	9465af			0430-0500	USA, VOA Washington DC	6110af	7340af		
0400-0430	Switzerland, Swiss R Intl	6135na	9885na	9905na		0430-0457	Yugoslavia, Radio	9580na			
0400-0430	Tanzania, Radio	5050af				0445-0500	Tajikistan, Tajik Radio	7245as			
0400-0500	Turkey, Voice of	7190na 9760au 4976do	9445na	9560as	9685eu	0455-0500	Nigeria, FRCN/Voice of	7255af			
0400-0415	Uganda, Radio	4976do				0459-0500 mtwhf	New Zealand, R NZ Intl	11900pa			
0400-0500	Ukraine, R Ukraine Intl	5905na	5915na	6010na	6055na						

SELECTED PROGRAMS

Sundays

- 0400 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0400 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallon. Divine worship.
- 0407 Canada, RCI Montreal: Innovation Canada. See S 0206.
- 0411 Russia, Voice of: News and Views. See S 0011.
- 0428 USA, WEWN Birmingham AL: The Truth Will Set You Free. Father Bourque.
- 0432 Russia, Voice of: Our Treasure Chest. A slice of Russian history from ancient to recent times.
- 0438 Netherlands, Radio: Newsline. See S 0038.
- 0454 Netherlands, Radio: Weekend. See S 0053.

Mondays

- 0400 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0400 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallon. See S 0400.
- 0407 Canada, RCI Montreal: The Mailbag. See S 1440.
- 0411 Russia, Voice of: News and Views. See S 0011.
- 0428 USA, WEWN Birmingham AL: Who Do You Say I Am?. Father Pacwa.
- 0432 Russia, Voice of: Our Treasure Chest. See S 0432.
- 0438 Netherlands, Radio: Sincerely Yours. See S 1138.
- 0453 Netherlands, Radio: Sounds Interesting. See S 1153.

Tuesdays

- 0400 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0400 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallon. See S 0400.
- 0411 Canada, RCI Montreal: Spectrum. See M 1439.
- 0411 Russia, Voice of: News and Views. See S 0011.
- 0432 Russia, Voice of: Our Treasure Chest. See S 0432.
- 0438 Netherlands, Radio: Newsline. See S 0038.
- 0453 Netherlands, Radio: Research File. See M 1153.

Wednesdays

- 0400 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0400 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallon. See S 0400.
- 0411 Canada, RCI Montreal: Spectrum. See M 1439.
- 0411 Russia, Voice of: News and Views. See S 0011.

- 0432 Russia, Voice of: Our Treasure Chest. See S 0432.
- 0438 Netherlands, Radio: Newsline. See S 0038.
- 0453 Netherlands, Radio: Mirror Images. See T 1153.

Thursdays

- 0400 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0400 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallon. See S 0400.
- 0411 Canada, RCI Montreal: Spectrum. See M 1439.
- 0411 Russia, Voice of: News and Views. See S 0011.
- 0432 Russia, Voice of: Our Treasure Chest. See S 0432.
- 0438 Netherlands, Radio: Newsline. See S 0038.
- 0453 Radio Netherlands: Documentary. Friendship with Germany (14th). See W 1153.
- 0453 Radio Netherlands: Documentary. The UN Conference on Women (28th). See W 1553.
- 0453 Radio Netherlands: Documentary. The Year of the Alone (21st). See S 0153.

Fridays

- 0400 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0400 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallon. See S 0400.
- 0411 Canada, RCI Montreal: Spectrum. See M 1439.
- 0411 Russia, Voice of: News and Views. See S 0011.
- 0432 Russia, Voice of: Our Treasure Chest. See S 0432.
- 0438 Netherlands, Radio: Newsline. See S 0038.
- 0453 Netherlands, Radio: Media Network. See H 0153.

Saturdays

- 0400 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 0400 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallon. See S 0400.
- 0411 Canada, RCI Montreal: Spectrum. See M 1439.
- 0411 Russia, Voice of: News and Views. See S 0011.
- 0432 Russia, Voice of: Our Treasure Chest. See S 0432.
- 0438 Netherlands, Radio: Newsline. See S 0038.
- 0453 Netherlands, Radio: A Good Life. See M 1253.

HAUSER'S HIGHLIGHTS  
COSTA RICA: RADIO FOR PEACE  
INTERNATIONAL

- 7385, 9400-USB, 15050
- Selected programs thru Dec
- CounterSpin Mon 18, Tue 01, 09, Sat 19, Sun 03, 10
- Tropical Conser- Mon 1845, Tue 0245, 0945
- vation Newsbureau Thu 2100, Fri 0500
- RFPI Reports Mon-Fri 2200, Tue-Sat 0600, Sat/Sun 2030, Sun/ Mon 0430, 1130
- Far Right Radio Tue 18, Wed 02, 09
- Review Sat 20, Sun 04, 11, Sun 22, Mon 06
- RFPI's Mailbag Tue 1930, Wed 0330, 1030
- Fri 2030, Sat 0430, 1130, Sat 1830, Sun 0230, 0930
- This Way OUT Wed 19, Thu 04, 11, Fri 0300, 1000
- Sat 23, Sun 07, 15
- Alternative Radio Mon 20, Tue 04, 12, Thu 19, Fri 03, 11
- World of Radio Fri 20, Sat 04, 11 Sat 18, Sun 02, 09
- Sun 23, Mon 07, Tue 19, Wed 03, 10

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R1-08	No Block FCC qualified users	\$549.95
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R100-03	No Block FCC qualified users	\$799.95
R7000	FCC qualified users	\$1839
R7100A-12	blocked 800-900MHz	\$1515
R7100A-02	FCC qualified users	\$1688
R9000	FCC qualified users	\$6250

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PRO26	NEW 200ch. WX, 25-1300MHz <sup>2</sup>	\$349.95
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PRO62	NEW, 50ch. V/UHF 800 <sup>2</sup>	\$259.95
PRO60	NEW, 200ch. V/UHF 800 UHF AIR <sup>2</sup>	\$299.95
PRO2037	200ch., V/UHF 800, triple conv. <sup>2</sup>	\$294.95
PRO2039	NEW, 200ch. V/UHF 800 doub. conv. <sup>2</sup>	\$229.95
PRO2040	NEW, 100ch V/UHF 800 WX <sup>2</sup>	\$219.95
PRO2042	NEW, 100ch. 25-570/760-1300MHz <sup>2</sup>	\$429.95

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ATS202	Mini digital 135W, AM FM	\$89.95
ATS606P	w/ Rec ANT AC adapt, 45 memo.	\$169.95
ATS303	NEW, Digital 20 memories	\$89.95
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ICFSW55	125 memo. AM/FM/SW SSB	\$349.95
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## FREQUENCIES

0700-0800	Australia, Radio	5995pa 9710pa 17695as	6020pa 9860pa	6080pa 15240pa	9580pa 15565as				
0700-0730	Australia, Radio	13605as	15415as	17795as					
0700-0800 vl	Australia, VL8A Alice Spg	4835do							
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	7385am	9400am						
0700-0800	Ecuador, HCJB Quito	5900pa	6050eu	21455am					
0700-0800 as	Eqt Guinea, R East Africa	9585af							
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do						
0700-0800	Italy, IRRS Milan	3985eu							
0700-0800	Japan, NHK/Radio	5975eu 11850pa	7230eu 15165me	11725as 17815af	11740as 21610as				
0700-0800 vl	Kenya, Kenya Broadc Corp	4885do							
0700-0800 vl	Kiribati, Radio	9825do							
0700-0800	Lebanon, Wings of Hope	9960va							
0700-0800 vl	Liberia, Radio ELBC	7275do							
0700-0800	Liberia, Radio ELWA	4760do							
0700-0800 asmtwh	Malaysia, Radio	7295do							
0700-0716 mtwhf	New Zealand, R NZ Intl	11900pa							
0700-0757 as	New Zealand, R NZ Intl	11900pa							
0700-0750	North Korea, R Pyongyang	15340af	17765me						
0700-0730 m	Norway, Radio Norway Intl	7180pa							
0700-0800	Russia, Voice of	5905na 7270na	5920na 7330na	5930na	7175na				
0700-0800 vl	Solomon Islands, SIBC	5020do							
0700-0730	Switzerland, Swiss R Intl	6165eu 15340af	9535af	9885af	13635af				
0700-0800	Taiwan, VO Free China	5950na							
0700-0800	United Kingdom, BBC London	3955eu 7145pa	5975va 7325va	6175na 9410va	6195va 9600af				
		9640sa	11760va	11940af	11955va				
		12095va	15070va	15280as	15310as				
		15360va	15575va	17640af	17790as				
	17830af								
0700-0730	United Kingdom, BBC London	6180eu	11780va						
0700-0715	United Kingdom, BBC London	6005af	7160af	11860af					
0700-0800	USA, KAIJ Dallas TX	5810am							
0700-0800	USA, KTVB Salt Lk City UT	7510am							
0700-0800	USA, KVOH Los Angeles CA	9785am							
0700-0800	USA, KWHR Naalehu HI	9930as							
0700-0800	USA, Monitor Radio Intl	7535eu							
0700-0800	USA, WEWN Birmingham AL	7425na							
0700-0800	USA, WHRI Noblesville IN	5745am							
0700-0800	USA, WJCR Upton KY	7490na	13595na						
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu							
0700-0800	USA, WWCR Nashville TN	5065am	5935am	7435am					
0700-0745	USA, WYFR Okeechobee FL	7355eu	9680eu						
0700-0745 mtwhf	Vatican State, Vatican R	4005va	5860va						
0700-0800	Zimbabwe, ZBC/Radio 3	5975do	6045do						
0705-0800	Switzerland, Trans World R	5055af	6070af	9500af	9650af				
0715-0730	Switzerland, Swiss R Intl	6165eu	7410eu						
0717-0800	New Zealand, R NZ Intl	9700pa							
0730-0800	Australia, Radio	9660pa	17880as						
0730-0800	Belgium, R Vlaanderen Int	5985eu	9925va						
0730-0745 s	Greece, Voice of	7450eu	9425eu	11645eu					
0730-0800	Netherlands, Radio	9720au	11895pa						
0740-0800	Monaco, Trans World Radio	7115eu							
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do						
0745-0755	Greece, Voice of	7450eu	9425eu	11645eu					
0745-0800	USA, WRMI/R Miami Intl	9955am							
0755-0800	Guam, AWR/KTWR	15200as							

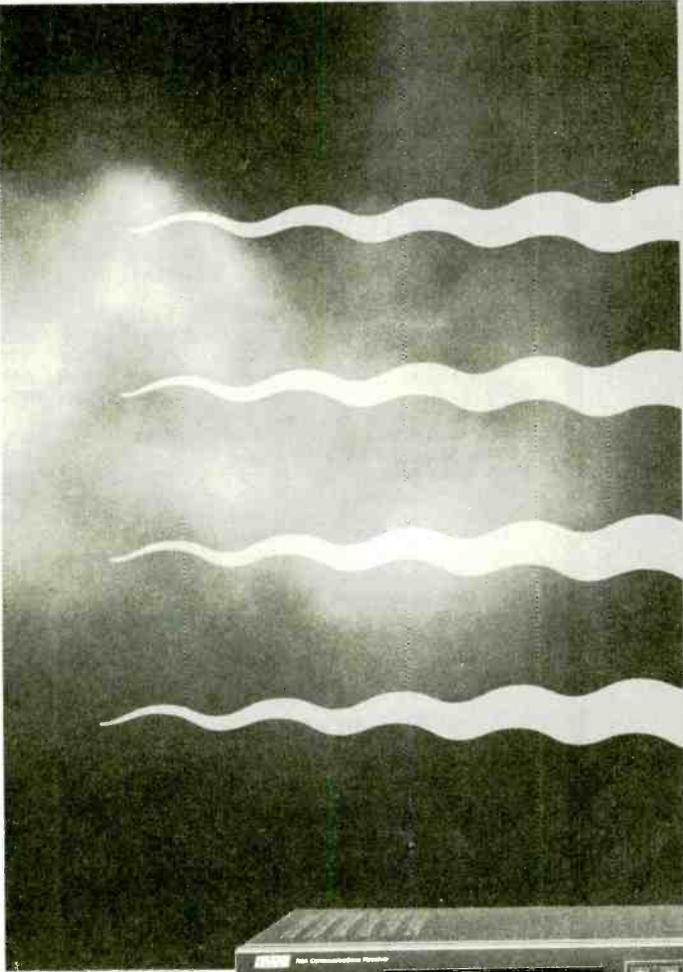
## 0800 UTC

0800-0900	Australia, Radio	5995pa 9710pa	6020pa 9860pa	6080pa 17715as	9580pa 21725as				
0800-0830 vl	Australia, VL8A Alice Spg	4835do							
0800-0830 vl	Australia, VL8K Katherine	5025do							
0800-0830 vl	Australia, VL8T Tent Crk	4910do							
0800-0900	Australia, Defense Forces R	15607af	18194af						
0800-0900 vl	Canada, CBC N Quebec Svc	9625do							
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							
0800-0900	Costa Rica, RF Peace Intl	7385am	9400am						
0800-0827	Czech Rep, Radio Prague	5930eu	7345eu						
0800-0830	Ecuador, HCJB Quito	5900pa	6050eu	21455am					
0800-0900 as	Eqt Guinea, R East Africa	9585af							

0800-0830	Georgia, Georgian Radio	11910eu							
0800-0805 s	Ghana, Ghana Broadc Corp	3366do							
0800-0900	Guam, TWR/KTWR	15200as							
0800-0900	Indonesia, Voice of	9525as							
0800-0830	Italy, IRRS Milan	3985eu							
0800-0900 vl	Kiribati, Radio	9825do							
0800-0900	Lebanon, Wings of Hope	9960va							
0800-0830	Liberia, Radio ELWA	4760do							
0800-0900	Malaysia, Radio	7295do							
0800-0825	Malaysia, Voice of	15295as							
0800-0900	Monaco, Trans World Radio	7115eu							
0800-0825	Netherlands, Radio	9720au	11895pa						
0800-0900	New Zealand, R NZ Intl	9700pa							
0800-0850	North Korea, R Pyongyang	15180as	15230as						
0800-0850	Pakistan, Radio	15625eu	17900eu						
0800-0900 vl	Papua New Guinea, NBC	4890do	9675do						
0800-0900	Russia, Voice of	9685as 17860va	12035va	15160va	17560va				
		3316do							
0800-0815	Sierra Leone, SLBS	5020do	9545do						
0800-0900 vl	Solomon Islands, SIBC	7550eu	13670me						
0800-0900	South Korea, R Korea Intl	6190af	6190af	7325ad	9410va				
0800-0900	United Kingdom, BBC London	11760va	11940af	11955va	12095va				
		15070va	15280as	15310as	15400va				
		15575va	17640va	17790as	17830af				
0800-0815	United Kingdom, BBC London	7145pa							
0800-0830	United Kingdom, BBC London	3955eu	9640sa						
0800-0900	USA, KAIJ Dallas TX	5810am							
0800-0900	USA, KNLS Anchor Point AK	6150as							
0800-0900	USA, KTVB Salt Lk City UT	7510am							
0800-0900	USA, KWHR Naalehu HI	9930as							
0800-0900	USA, Monitor Radio Intl	7535eu	13615pa	15665eu					
0800-0900	USA, WEWN Birmingham AL	5825eu	7425na						
0800-0900	USA, WHRI Noblesville IN	5745am							
0800-0900	USA, WJCR Upton KY	7490na	13595na						
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu							
0800-0900	USA, WRMI/R Miami Intl	9955am							
0800-0900	USA, WWCR Nashville TN	5065am	5935am	7435am					
0800-0900	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do					
0805-0835	Swaziland, Trans World R	5055af	6070af	9500af	9650af				
0815-0900 mtwtf	Nigeria, FRCN/Radio	3326do							
0830-0900 vl	Australia, VL8A Alice Spg	2310do							
0830-0900 vl	Australia, VL8K Katherine	2485do							
0830-0900 vl	Australia, VL8T Tent Crk	2325do							
0830-0900	Austria, R Austria Intl	6155eu	13730eu	17870pa					
0830-0900	Italy, IRRS Milan	7125eu							
0830-0900	Netherlands, Radio	9720au	11895pa	13700pa					
0830-0900	Russia, Voice of	9450as	12005va						
0830-0857	Slovakia, R Slovakia Intl	11990au	15640au	17485au					
0830-0900	Switzerland, Swiss R Intl	9885au	11640au	13685au					
0855-0900	Guam, TWR/KTWR	11830pa							



Courtesy of Arthur Cushen from New Zealand comes this 1938 QSL from R. Moscow of four scientists who rode an ice flow from the North Pole.



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## FREQUENCIES

0900-1000	Australia, Radio	5995as 9860pa	7240as 13605as	9510as 15170as	9580pa 21725as
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Australia, Defense Forces R	15607af	18194af		
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		
0900-1000	Costa Rica, RF Peace Intl	7385am	9400am		
0900-1000	Ecuador, HCJB Quito	5900pa	21455am		
0900-0950	Germany, Deutsche Welle	6160pa 15145af 21600af	7380as 15410af 21680as	11715as 17780pa	11725af 17820as
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do			
0900-1000	Guam, AWR/KSDA	9530as			
0900-0915	Guam, TWR/KTWR	15200as			
0900-1000	Guam, TWR/KTWR	11830pa			
0900-1000	Italy, IRRS Milan	7125eu			
0900-1000	Japan, NHK/Radio	6090as	11850pa	15190as	
0900-0948 vl	Kiribati, Radio	9825do			
0900-1000	Lebanon, Voice of Hope	6280va			
0900-1000	Lebanon, Wings of Hope	9960va			
0900-1000	Malaysia, Radio	7295do			
0900-0905 a	Monaco, Trans World Radio	7115eu			
0900-0930	Netherlands, Radio	9720au	13700pa		
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-1000 vl	Papua New Guinea, NBC	4890do	9675do		
0900-1000	Russia, Voice of	9685as	12005va	12025va	17860va
0900-1000	Slovakia, AWR	15620af			
0900-1000	United Kingdom, BBC London	6190af 11750as 15190sa 15575va 17885af	6195va 11940af 15280va 17640va	9410va 12095va 15380as 17705eu	9740as 15070va 15400va 17830va
0900-0915	United Kingdom, BBC London	7180as 11955va 17790as	7325af 15310as	9580as 15310as	11760va 15360va
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	5745am	9495am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WRMI/R Miami Intl	9955am			
0900-1000	USA, WWCR Nashville TN	5065am	5935am		
0900-1000	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do	
0905-0920 smtwhf	Monaco, Trans World Radio	7115eu			
0910-0940	Mongolia, R Ulan Bator	9960au	12000na		
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	7260pa 13700pa	9720au	9810pa	11895pa
0930-1000	Philippines, FEBC/R Intl	11635as			
0930-1000	Russia, Voice of	7305as	9450as		

1000-1100 vl	Malaysia, RTM KotaKinabalu	5980do			
1000-1100	Netherlands, Radio	7260as	9720pa	9810pa	
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100 vl	Papua New Guinea, NBC	4890do	9675do		
1000-1100	Philippines, FEBC/R Intl	11635as			
1000-1100	Russia, Voice of	7305as 12025va 17860va	9450as 15490va	9685as 15560va	12005va 17755as
1000-1100	Singapore, SBC Radio One	6155do			
1000-1100	United Kingdom, BBC London	6190af 11750as 15070va 15575va 17830va	6195va 11760va 15190sa 17640va	9410va 11940af 15310as 17705va	9740as 12095va 15400af 17790as
1000-1030	United Kingdom, BBC London	15280as	15280va		
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, Monitor Radio Intl	6095ca	7395sa	9430as	13625as
1000-1100	USA, VOA Washington DC	5985va 11720va	6165am 15425va	7405am	9590am
1000-1100	USA, WHRI Noblesville IN	6040am			
1000-1100	USA, WJCR Upton KY	7490na			
1000-1100	USA, WWCR Nashville TN	5065am			
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	7250na	9840as	12020as	15010as
1030-1100 mtwhfa	Austria, R Austria Intl	6155eu	13730pa	17870pa	
1030-1055	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me

### World Listener

Recently I became one of the rich,  
Setting out to become an adventurer  
To travel the world's many maps  
Not even caring about the weather.

Touring the world, reaching  
everywhere but the heavens.  
Night after night, traveling  
to hear and learn of global concerns.

I soon became an adventurous listener,  
Opening my eyes bright and my heart aware  
To exotic music and emotional literature,  
exciting sports, and the world's welfare.

Tonight's tour I strayed off the beaten path,  
Discovering pictures TV is missing.  
I learnt to keep my faith  
As I became one of the rich, exploring  
My way across my world band radio.

—Ryan O'Neill

### 1000 UTC

1000-1100	Australia, Radio	5995as 13605as	7240as 15170as	9580pa 21725as	9860pa
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Australia, Defense Forces R	13525as			
1000-1025 mtwhfa	Belgium, R Viaanderen Int	6035eu	15510af	17595af	
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		
1000-1100	Costa Rica, RF Peace Intl	7385am	9400am		
1000-1030	Czech Rep, Radio Prague	15640as	17845af		
1000-1100	Ecuador, HCJB Quito	5900pa	21455am		
1000-1100	India, All India Radio	15050as	15180as	17387au	17895as
1000-1100	Iraq, Radio Iraq Intl	13680eu			
1000-1100	Italy, IRRS Milan	7125eu			
1000-1100	Lebanon, Voice of Hope	6280va			
1000-1100	Lebanon, Wings of Hope	9960va			
1000-1100	Malaysia, Radio	7295do			
1000-1100 vl	Malaysia, RTM Kuching	7160do			



This beautiful QSL from Radio New Zeland Int'l was sent to MT by Gery LeStrange, of East Brunswick, NJ.

## FREQUENCIES

1100-1200	Australia, Radio	5995as 9710pa 15530as	7240as 9860pa 15565as	9510pa 13605as	9580pa 15170as	1100-1200	Singapore, R Singapore Int	9530as 11835as	15120as 17850au	17850au 9885as 11640as
1100-1200 vl	Australia, VL8A Alice Spg	2310d0				1100-1130	Sri Lanka, SLBC Colombo	6165eu		
1100-1200 vl	Australia, VL8K Katherine	2485d0				1100-1130	Switzerland, Swiss R Intl	13635as 7445as		
1100-1200 vl	Australia, VL8T Tent Crk	2325d0				1100-1200	Taiwan, Voice of Asia	5965na	6190af	6195va 7180as
1100-1200	Australia, Defense Forces R	13525as				1100-1200	United Kingdom, BBC London	9410va 11955as 15310as 17830af	9580as 12095va 15070va 17750va	11940af 15220am
1100-1200	Canada, CFCX Montreal	6005d0				1100-1200	USA, KTWB Salt Lk City UT	7510am		
1100-1200	Canada, CFRX Toronto	6070d0				1100-1200	USA, KWHR Naalehu HI	9930as		
1100-1200	Canada, CFVP Calgary	6030d0				1100-1200	USA, Monitor Radio Intl	6095na	7395ca	9355as 9430au
1100-1200	Canada, CHNX Halifax	6130d0				1100-1200	USA, VOA Washington DC	5985va 9590am 15160va	6110va 6165am 15425va	7405am 9760va 11720va
1100-1200	Canada, CKZN St John's	6160d0				1100-1200	USA, WEWN Birmingham AL	7425na		
1100-1200	Canada, CKZU Vancouver	6160d0				1100-1200	USA, WHRI Noblesville IN	6040am	6185am	
1100-1200	Costa Rica, AWR Alajuela	5030am	7375am	9725am	13750am	1100-1200	USA, WJCR Upton KY	7490na	13595na	
1100-1200	Costa Rica, RF Peace Intl	9400am				1100-1200 s	USA, WVHA Greenbush ME	13770af		
1100-1130	Ecuador, HCJB Quito	5900pa				1100-1200	USA, WWCR Nashville TN	5935am	7435am	15685am
1100-1200	Ecuador, HCJB Quito	12005am	15115am	21455am		1100-1200	USA, WYFR Okeechobee FL	5950na	7355na	
1100-1150	Germany, Deutsche Welle	15370af	15410af	17765af	17800af	1100-1130	Vietnam, Voice of	7250as	9840as	15010as
1100-1200	Iraq, Radio Iraq Intl	13680eu				1130-1200	Austria, R Austria Intl	13730na		
1100-1200	Italy, IRRS Milan	7125eu				1130-1200 vl	China, China Radio Intl	6995as	11445as	15135as
1100-1200	Japan, NHK/Radio	6090as	6120na	15350as		1130-1157	Czech Rep, Radio Prague	7345eu	9505eu	
1100-1200	Jordan, Radio	11970na				1130-1200	Iran, VOIRI Tehran	11745as 15260af	11790as 17750me	11875me 11930me
1100-1200	Malaysia, Radio	7295d0				1130-1200	Myanmar, Voice of	5990do		
1100-1200 vl	Malaysia, RTM Kuching	7160d0				1130-1200	Netherlands, Radio	6045eu	7190eu	
1100-1200 vl	Malaysia, RTM KotaKinabalu	5980d0				1130-1200	South Korea, R Korea Intl	11715na		
1100-1135	Mozambique, Radio Maputo	11820af	11835af			1135-1140	India, All India Radio	9595as		
1100-1200	Nepal, Radio	3230d0	5005d0			1145-1200	USA, WRMI/R Miami Intl	9955am		
1100-1200	New Zealand, R NZ Intl	9700pa								
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na						
1100-1120	Pakistan, Radio	15625as	17900as							
1100-1200 vl	Papua New Guinea, NBC	4890d0	9675d0							
1100-1200	Russia, Voice of	12005va 1556Cva	12025va 17755va	12055va 17860va	15490va					
1100-1200	Singapore, SBC Radio One	6155d0								

## SELECTED PROGRAMS

### Sundays

- 1100 Mozambique, Radio Maputo: Program Preview. A summary of today's program.
- 1100 USA, Monitor Radio Intl: Bible Lesson. See S 0100.
- 1110 Mozambique, Radio Maputo: Outlook Africa. A current affairs program.
- 1111 Russia, Voice of: Science and Engineering in the CIS. See S 0611.
- 1129 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. Discussions on how the Bible addresses the trends of thought of today.
- 1132 Russia, Voice of: Kaleidoscope. A variety of topics ranging from science and ecology to cultural matters.
- 1138 Netherlands, Radio: Sincerely Yours. The Sunday replacement for "Happy Station" that lets the listener comment about the RN's programming.
- 1153 Netherlands, Radio: Sounds Interesting. Robert Chesal takes listener feedback and incorporates their ideas into the show.

### Mondays

- 1100 Mozambique, Radio Maputo: Program Preview. See S 1100.
- 1106 USA, Monitor Radio Intl: Monitor Radio International. News, analysis, commentary, interviews and features in a magazine format.
- 1110 Mozambique, Radio Maputo: Outlook Africa. See S 1110.
- 1111 Russia, Voice of: Science and Engineering in the CIS. See S 0611.
- 1132 Russia, Voice of: Kaleidoscope. See S 1132.
- 1138 Netherlands, Radio: Newslines. See S 0038.
- 1149 USA, Monitor Radio Intl: Letterbox. Listeners make their views known by telephone or letter to host Lisa Dale.
- 1152 USA, Monitor Radio Intl: Religious Article from the CSM. As published in the Christian Science Monitor.
- 1153 Netherlands, Radio: Research File. A program of science and technology.

### Tuesdays

- 1100 Mozambique, Radio Maputo: Program Preview. See S 1100.
- 1106 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
- 1110 Mozambique, Radio Maputo: Outlook Africa. See S 1110.
- 1111 Russia, Voice of: Commonwealth Update. See M 2311.
- 1132 Russia, Voice of: Russian by Radio. See M 0132.
- 1138 Netherlands, Radio: Newslines. See S 0038.
- 1149 USA, Monitor Radio Intl: Letterbox. See M 1149.

- 1152 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.
- 1153 Netherlands, Radio: Mirror Images. Weekly magazine of music, the arts, culture, and European festivals, produced and presented by David Swatling.

### Wednesdays

- 1100 Mozambique, Radio Maputo: Program Preview. See S 1100.
- 1106 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
- 1110 Mozambique, Radio Maputo: Outlook Africa. See S 1110.
- 1111 Russia, Voice of: Commonwealth Update. See M 2311.
- 1132 Russia, Voice of: Audio Book Club. See S 0132.
- 1138 Netherlands, Radio: Newslines. See S 0038.
- 1149 USA, Monitor Radio Intl: Letterbox. See M 1149.
- 1152 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.
- 1153 Radio Netherlands: Documentary. Friendship with Germany (13th). Part II of a unique co-production with Deutsche Welle on the past, present, and future of the Netherlands' relationship with Germany.
- 1153 Radio Netherlands: Documentary. The UN Conference on Women (27th). See W 1553.
- 1153 Radio Netherlands: Documentary. The Year of the Alone (20th). See S 0153.

### Thursdays

- 1100 Mozambique, Radio Maputo: Program Preview. See S 1100.
- 1106 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
- 1110 Mozambique, Radio Maputo: Outlook Africa. See S 1110.
- 1111 Russia, Voice of: Commonwealth Update. See M 2311.
- 1132 Russia, Voice of: Russian by Radio. See M 0132.
- 1138 Netherlands, Radio: Newslines. See S 0038.
- 1149 USA, Monitor Radio Intl: Letterbox. See M 1149.
- 1152 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.
- 1153 Netherlands, Radio: Media Network. See H 0153.

### Fridays

- 1100 Mozambique, Radio Maputo: Program Preview. See S 1100.
- 1106 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
- 1110 Mozambique, Radio Maputo: Outlook Africa. See S 1110.
- 1111 Russia, Voice of: Commonwealth Update. See M 2311.

- 1132 Russia, Voice of: Audio Book Club. See S 0132.
  - 1138 Netherlands, Radio: Newslines. See S 0038.
  - 1149 USA, Monitor Radio Intl: Letterbox. See M 1149.
  - 1152 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.
  - 1153 Netherlands, Radio: A Good Life. See M 1253.
- ### Saturdays
- 1100 Mozambique, Radio Maputo: Program Preview. See S 1100.
  - 1106 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1129.
  - 1110 Mozambique, Radio Maputo: Outlook Africa. See S 1110.
  - 1111 Russia, Voice of: Commonwealth Update. See M 2311.
  - 1132 Russia, Voice of: Timelines. See M 0332.
  - 1137 Netherlands, Radio: Newslines. See S 0038.
  - 1153 Netherlands, Radio: Weekend. See S 0053.

## HAUSER'S HIGHLIGHTS SYRIA: R. DAMASCUS, EXTER- NAL SW

- entirely as monitored
- 0300-0430 Arabic V. of Iraq 12085
  - 1600-1700 Turkish 15095
  - 1700-1800 Russian 15095
  - 1805-1905 German 15095, 12085
  - 1900-2100 Arabic V. of Iraq 12085
  - 1905-2005 French 15095
  - 2005-2100 English 15095
  - 2105-2205 English 15095, 12085
  - 2215-2315 Arabic 15095, 12085
  - 2315-2430 Spanish 15095, 12085
- (BBC Monitoring)



## FREQUENCIES

1300-1400	Australia, Radio	5995pa 11800pa	7240as	9560pa	9610as	1300-1330	Switzerland, Swiss R Intl	7230as	7480as	11640as	13625as
1300-1330	Australia, Radio	6060pa	6080as	9510pa		1300-1400	Switzerland, Swiss R Intl	6165eu	9353eu		
1300-1320	Brazil, Radiobras	15445ra				1300-1400	United Kingdom, BBC London	5965na	5990as	6190af	6195va
1300-1330	Bulgaria, Radio	9810as	11605as					9410va	9515na	9740as	11750as
1300-1400 vl	Canada, CBC N Quebec Svc	9625dc						11760va	11940af	12095va	15070va
1300-1400	Canada, CFCX Montreal	6005dc						15220va	15310as	15420af	15575va
1300-1400	Canada, CFRX Toronto	6070dc						17640va	17705va	17830af	17885af
1300-1400	Canada, CFPX Calgary	6030dc				1300-1400	USA, KAIJ Dallas TX	21470af	21660af		
1300-1400	Canada, CHNX Halifax	6130dc				1300-1400	USA, KJES Mesquite NM	5810am	11715na		
1300-1400	Canada, CKZN St John's	6160dc				1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	Canada, CKZU Vancouver	6160dc				1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	Canada, RCI Montreal	9635na	11955na			1300-1400	USA, Monitor Radio Intl	6095na	9355as	9455na	13625au
1300-1400	China, China Radio Intl	7405na	9715as	11660pa	15440pa	1300-1400	USA, VOA Washington DC	6110va	9645va	9760va	11715va
1300-1400	Costa Rica, RF Peace Intl	6200am	9400am	15050am				15160va	15425va		
1300-1400	Ecuador, HCJB Quito	12005am	15115am	21455am		1300-1400	USA, WEWN Birmingham AL	7425na	11875na		
1300-1330	Egypt, Radio Cairo	17595as				1300-1400 irreg	USA, WGTG McCaysville GA	9370am	9475am		
1300-1400	Finland, YLE/Radio	11735na	15400na			1300-1400	USA, WHRI Noblesville IN	6040am	15105am		
1300-1400	Iraq, Radio Iraq Intl	13680as				1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	Italy, IRRS Milan	7125eu				1300-1400	USA, WRMI/R Miami Intl	9955am			
1300-1400	Lebanon, Wings of Hope	9960va				1300-1400 a	USA, WVHA Greenbush ME	11695af			
1300-1400	Malaysia, Radio	7295dc				1300-1400	USA, WWCR Nashville TN	5935am	7435am	15685am	
1300-1400 vl	Malaysia, RTM Kuching	7160do				1300-1400	USA, WYFR Okeechobee FL	5950na	9705na	11830na	11970na
1300-1400 vl	Malaysia, RTM KotaKinabalu	5980do						13695na			
1300-1325	Netherlands, Radio	6045eu	7190eu			1300-1330	Uzbekistan, R Tashkent	7285eu	9715eu	15295eu	17815eu
1300-1350	North Korea, R Pyongyang	9345as	9640eu	11740as	15230as	1307-1400 occsnal	New Zealand, R NZ Intl	9655pa			
		15430as				1330-1400	Austria, R Austria Intl	15450as			
1300-1330 s	Norway, Radio Norway Intl	7315as	9590eu	15605as		1330-1400 s	Belgium, R Vlaanderen Int	13670na			
1300-1400 vl	Palau, KHBN/Voice of Hope	9965as				1330-1357	Canada, RCI Montreal	6150as	9535as		
1300-1400 vl	Papua New Guinea, NBC	4890do	9675do			1330-1400	India, All India Radio	13732as	15120as		
1300-1400	Philippines, FEBC/R Intl	11995as				1330-1400	Netherlands, Radio	9895as	13700as	15150as	
1300-1400	Poland, Polish R Warsaw	6095eu	7145eu	7270eu	9525eu	1330-1400	Sweden, Radio	11650na	15240na		
		11815eu				1330-1400	Turkey, Voice of	9445as	9630as		
1300-1400	Romania, R Romania Intl	11940eu	15390eu	17745eu		1330-1355	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me
1300-1400	Russia, Voice of	12055as	13785va	15470va	17880as	1330-1400	Vietnam, Voice of	7250as	9840as	15010as	
1300-1400	Singapore, SBC Radio One	6155do				1330-1400	Yugoslavia, Radio	11835eu			
1300-1400	Singapore, R Singapore Int	9530as				1345-1400	Vatican State, Vatican R	11625as	13765as	15585as	

## SELECTED PROGRAMS

### Sundays

- 1300 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 1307 Romania, R Romania Intl: Frankly Speaking. A Romanian viewpoint on a current topic.
- 1310 Romania, R Romania Intl: Sunday Studio. Mailbag, stamps, interviews, music, and Romanian by radio.
- 1311 Canada, RCI Montreal: Quirks and Quarks. See S 0005.
- 1311 Russia, Voice of: Music and Musicians. See S 0211.
- 1338 Netherlands, Radio: Sincerely Yours. See S 1138.
- 1350 Romania, R Romania Intl: Romanian by Radio. Learn some of the words and phrases in the Romanian language.
- 1353 Netherlands, Radio: Sounds Interesting. See S 1153.

### Mondays

- 1300 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 1307 Canada, RCI Montreal: Double Exposure. See S 0305.
- 1311 Russia, Voice of: Newmarket. This program tells where and how to invest in Russia, how to sell your product, or start a business.
- 1330 Romania, R Romania Intl: Pro-Memoria. A program of archaeology, numismatics, treasures, museums, etc., that helps you understand and remember history.
- 1332 Russia, Voice of: Russian by Radio. See M 0132.
- 1334 Canada, RCI Montreal: The Royal Canadian Air Farce. See S 0332.
- 1338 Netherlands, Radio: Newline. See S 0038.
- 1338 Romania, R Romania Intl: Pages of Romanian Literature. A biographical sketch of a Romanian writer and his works.
- 1348 Romania, R Romania Intl: Romanian Hits. The latest Romanian pop music.
- 1353 Netherlands, Radio: Research File. See M 1153.
- 1355 Romania, R Romania Intl: Special Program for Radio Amateurs. A program for ham radio operators.

### Tuesdays

- 1300 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 1310 Canada, RCI Montreal: As It Happens. See M 2330.
- 1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
- 1330 Romania, R Romania Intl: Business Club. Romania's economic agenda, world trade, investments in Romania,

legislation, the stock exchange, business opportunities, and market wrap.

- 1332 Russia, Voice of: This is Russia. See S 0032.
- 1338 Netherlands, Radio: Newline. See S 0038.
- 1338 Romania, R Romania Intl: Romanian Anglicists. A program about yesterday's and today's Romanian writers.
- 1350 Romania, R Romania Intl: Youth Club. Lively topics for younger listeners, music, and letterbox.
- 1353 Netherlands, Radio: Mirror Images. See T 1153.

### Wednesdays

- 1300 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 1310 Canada, RCI Montreal: As It Happens. See M 2330.
- 1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
- 1330 Romania, R Romania Intl: Society Today. A look at everyday life in Romania and the character of the people and their relationships to each other.
- 1332 Russia, Voice of: Moscow Yesterday and Today. See S 0532.
- 1338 Netherlands, Radio: Newline. See S 0038.
- 1338 Romania, R Romania Intl: Women (The Other Force). The role of women in labor and business.
- 1348 Romania, R Romania Intl: Romanian Musicians. Musical selections of the works of a Romanian musician.
- 1353 Radio Netherlands: Documentary. Friendship with Germany (13th). See W 1153.
- 1353 Radio Netherlands: Documentary. The UN Conference on Women (27th). See W 1553.
- 1353 Radio Netherlands: Documentary. The Year of the Alone (20th). See S 0153.
- 1355 Romania, R Romania Intl: Partners in a Changing World. Romania's role in its relationships with its neighbors.

### Thursdays

- 1300 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 1310 Canada, RCI Montreal: As It Happens. See M 2330.
- 1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.

- 1330 Romania, R Romania Intl: Citizens of the Same Country. A look at what brings the Romanians together — their religion, identity, social makeup, standards of living, and their destiny.
- 1332 Russia, Voice of: This is Russia. See S 0032.
- 1338 Netherlands, Radio: Newline. See S 0038.
- 1338 Romania, R Romania Intl: Listeners' Letterbox. Romanian Folk Music at it's Best
- 1353 Netherlands, Radio: Media Network. See H 0153.
- 1353 Romania, R Romania Intl: Skylark. A program of Romanian folk music.

### Fridays

- 1300 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 1310 Canada, RCI Montreal: As It Happens. See M 2330.
- 1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
- 1330 Romania, R Romania Intl: European Options. Romanian Folk Music at it's Best
- 1332 Russia, Voice of: Moscow Yesterday and Today. See S 0532.
- 1338 Netherlands, Radio: Newline. See S 0038.
- 1338 Romania, R Romania Intl: Radio Pictures. A look at life in Romania.
- 1353 Romania, R Romania Intl: Counterpoint. Romanian Folk Music at it's Best
- 1355 Netherlands, Radio: A Good Life. See M 1253.

### Saturdays

- 1300 Romania, R Romania Intl: Radio Newsreel. See S 0200.
- 1305 Canada, RCI Montreal: Double Exposure. See S 0305.
- 1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
- 1330 Romania, R Romania Intl: The Week. See S 0230.
- 1332 Russia, Voice of: Your Top Tune. See S 0332.
- 1334 Romania, R Romania Intl: World of Culture. See S 0234.
- 1338 Netherlands, Radio: Newline. See S 0038.
- 1338 Romania, R Romania Intl: Romanian Folk Music at Its Best. See S 0238.
- 1345 Romania, R Romania Intl: DX Mailbag. See S 0245.
- 1346 Russia, Voice of: You Write to Us. See S 0346.
- 1353 Netherlands, Radio: Weekend. See S 0053.



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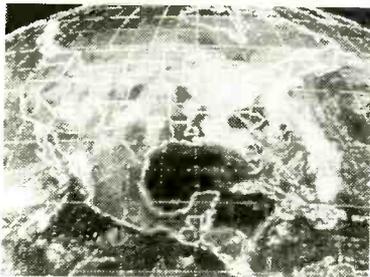
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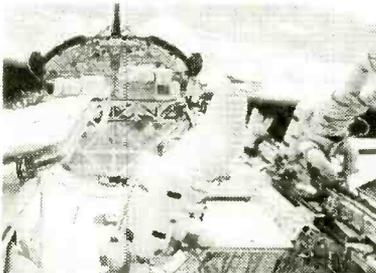


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FREQUENCIES

1500-1600	Australia, Radio	5995pa 9615as 11800pa	6060pa 9710pa	6080pa 11660as	7260as 11695pa	1500-1600	S Africa, Channel Africa	7240af	9545af
1500-1600	Australia, Defense Forces R	8743af	10623af			1500-1600 mtwhfa	Seychelles, FEBA Radio	9810as	
1500-1600 vl	Canada, CBC N Quebec Svc	9625do				1500-1530 s	Seychelles, FEBA Radio	11870as	
1500-1600	Canada, CFCX Montreal	6005do				1500-1600	Singapore, SBC Radio One	6155do	
1500-1600	Canada, CFRX Toronto	6070do				1500-1600	Sri Lanka, SLBC Colombo	9720as	15425as
1500-1600	Canada, CFVP Calgary	6030do				1500-1530	Switzerland, Swiss R Intl	9885as	12075as 13625as
1500-1600	Canada, CHNX Halifax	6130do				1500-1600	United Kingdom, BBC London	5965as	5990as 6190af 6195va
1500-1600	Canada, CKZN St John's	6160do						9410va	9515na 9740as 11750as
1500-1600	Canada, CKZU Vancouver	6160do						12095va	15070va 15260na 15400va
1500-1600 s	Canada, RCI Montreal	9640na	11955na			1500-1530	United Kingdom, BBC London	17705va	17830af 17840va 21470af
1500-1600	China, China Radio Intl	11815as	15165as					21660af	
1500-1600	Costa Rica, RF Peace Intl	6200am	9400am	15050am		1500-1600	USA, KTVB Salt Lk City UT	11860af	11940af 15400eu 15420af
1500-1600	Ecuador, HCJB Quito	12005am	15115am	21455am		1500-1600	USA, KWHR Naalehu HI	17880af	
1500-1600	Finland, YLE/Radio	11785na	13645na			1500-1600	USA, Monitor Radio Intl	15590am	
1500-1600	Guam, TWR/KTWR	11580as				1500-1600	USA, VOA Washington DC	9930as	
1500-1530	Italy, IRRS Milan	7125eu				1500-1600		9355as	
1500-1600	Japan, NHK/Radio	6090as	7240as	9535na	9695as			6110as	7125as 7215as 9645as
		15355af						9700as	9760va 15205as 15255as
1500-1600	Lebanon, Wings of Hope	9960va				1500-1600	USA, WEWN Birmingham AL	15395as	
1500-1600	Malaysia, Radio	7295do				1500-1600 irreg	USA, WGTG McCaysville GA	9455na	11875na 15235sa
1500-1600 vl	Malaysia, RTM Kuching	7160do				1500-1600	USA, WHRI Noblesville IN	9370am	9475am
1500-1600 vl	Malaysia, RTM Kota Kinabalu	5980do				1500-1600	USA, WJCR Upton KY	13760am	15105am
1500-1515	Mongolia, R Ulan Bator	7290as	9950as			1500-1600	USA, WRNO New Orleans LA	7490na	13595na
1500-1525	Netherlands, Radio	9895as	13700as	15150as		1500-1600 a	USA, WVHA Greenbush ME	15420am	
1500-1600 occsnal	New Zealand, R NZ Intl	6100pa				1500-1600	USA, WWCR Nashville TN	12160am	13845am 15685am
1500-1550	North Korea, R Pyongyang	9325eu	9640eu	9977na	13785me	1500-1600	USA, WYFR Okeechobee FL	11830na	15215na 17760eu
1500-1530 s	Norway, Radio Norway Intl	9520me	11730me			1530-1545	India, All India Radio	7410as	
1500-1600 vl	Palau, KHBN/Voice of Hope	9965as				1530-1600	Iran, VOIRI Tehran	11875as	15260as 17750as
1500-1600	Philippines, FEBC/R Intl	11995as				1530-1600	Italy, IRRS Milan	3985eu	
1500-1530	Romania, R Romania Intl	11740as	11810as	15335as		1530-1600	Netherlands, Radio	9890as	15150as
1500-1600	Russia, Voice of	9905as	11945as	12055as	12065me	1530-1600	United Kingdom, BBC London	7180as	
						1545-1600	Vatican State, Vatican R	11640as	15585as

SELECTED PROGRAMS

Sundays

- 1500 USA, WEWN Birmingham AL: St. Joseph's Radio Presents. Repeat broadcast.
- 1505 Canada, RCI Montreal: Sunday Morning (2nd hour). See S 1411.
- 1511 Russia, Voice of: News and Views. See S 0011.
- 1520 Romania, R Romania Intl: Romanian by Radio. See S 1350.
- 1532 Russia, Voice of: Kaleidoscope. See S 1132.
- 1538 Netherlands, Radio: Sincerely Yours. See S 1138.
- 1553 Netherlands, Radio: Sounds Interesting. See S 1153.

Mondays

- 1500 Romania, R Romania Intl: Pro-Memoria. See M 1330.
- 1500 USA, WEWN Birmingham AL: The Catechism Explained. Douglas Bushman discusses Catholic dogma.
- 1508 Romania, R Romania Intl: Pages of Romanian Literature. See M 1338.
- 1511 Russia, Voice of: News and Views. See S 0011.
- 1518 Romania, R Romania Intl: Romanian Hits. See M 1348.
- 1525 Netherlands, Radio: Press Review. See M 0025.
- 1525 Romania, R Romania Intl: Special Program for Radio Amateurs. See M 1355.
- 1528 USA, WEWN Birmingham AL: Crisis in Culture. See S 1228.
- 1532 Russia, Voice of: Folk Box. See M 0032.
- 1538 Netherlands, Radio: Newline. See S 0038.
- 1553 Netherlands, Radio: Research File. See M 1153.

Tuesdays

- 1500 Romania, R Romania Intl: Business Club. See T 1330.
- 1500 USA, WEWN Birmingham AL: Pillars of Faith (encore). See T 0100.
- 1508 Romania, R Romania Intl: Romanian Anglicists. See T 1338.
- 1511 Russia, Voice of: News and Views. See S 0011.
- 1520 Romania, R Romania Intl: Youth Club. See T 1350.
- 1525 Netherlands, Radio: Press Review. See M 0025.
- 1532 Russia, Voice of: Yours for the Asking. See T 0032.
- 1538 Netherlands, Radio: Newline. See S 0038.
- 1553 Netherlands, Radio: Mirror Images. See T 1153.

Wednesdays

- 1500 Romania, R Romania Intl: Society Today. See W 1330.
- 1500 USA, WEWN Birmingham AL: Mother Angelica Talks It Over. See S 0100.
- 1508 Romania, R Romania Intl: Women (The Other Force). See W 1338.
- 1511 Russia, Voice of: News and Views. See S 0011.

- 1518 Romania, R Romania Intl: Romanian Musicians. See W 1348.
- 1525 Netherlands, Radio: Press Review. See M 0025.
- 1525 Romania, R Romania Intl: Partners in a Changing World. See W 1355.
- 1528 USA, WEWN Birmingham AL: Survey of Theology. Bishop Hastrich.
- 1532 Russia, Voice of: The Jazz Show. See M 0532.
- 1538 Netherlands, Radio: Newline. See S 0038.
- 1553 Radio Netherlands: Documentary. Friendship with Germany (13th). See W 1153.
- 1553 Radio Netherlands: Documentary. The UN Conference on Women (27th). Martha Hawley reviews how successful the conference has been the year.
- 1553 Radio Netherlands: Documentary. The Year of the Alone (20th). See S 0153.

Thursdays

- 1500 Romania, R Romania Intl: Citizens of the Same Country. See H 1330.
- 1500 USA, WEWN Birmingham AL: Christ the Light. See S 0228.
- 1508 Romania, R Romania Intl: Listeners' Letterbox. Romanian Folk Music at it's Best
- 1511 Russia, Voice of: News and Views. See S 0011.
- 1523 Romania, R Romania Intl: Skylark. See H 1353.
- 1525 Netherlands, Radio: Press Review. See M 0025.
- 1528 USA, WEWN Birmingham AL: You and the God of Mercy. See S 0200.
- 1532 Russia, Voice of: Yours for the Asking. See T 0032.
- 1538 Netherlands, Radio: Newline. See S 0038.
- 1553 Netherlands, Radio: Media Network. See H 0153.

Fridays

- 1500 Romania, R Romania Intl: European Options. Romanian Folk Music at it's Best
- 1500 USA, WEWN Birmingham AL: The Catechism Explained. See M 1500.
- 1508 Romania, R Romania Intl: Radio Pictures. See F 1338.
- 1511 Russia, Voice of: News and Views. See S 0011.
- 1523 Romania, R Romania Intl: Counterpoint. Romanian Folk Music at it's Best
- 1525 Netherlands, Radio: Press Review. See M 0025.
- 1528 USA, WEWN Birmingham AL: You Better Believe It. Father Roberts.

- 1532 Russia, Voice of: Music at Your Request. See M 1232.
- 1538 Netherlands, Radio: Newline. See S 0038.
- 1553 Netherlands, Radio: A Good Life. See M 1253.

Saturdays

- 1500 Romania, R Romania Intl: The Week. See S 0230.
- 1500 USA, WEWN Birmingham AL: Retreat Teachings. See S 0500.
- 1504 Romania, R Romania Intl: World of Culture. See S 0234.
- 1508 Romania, R Romania Intl: Romanian Folk Music at Its Best. See S 0238.
- 1511 Russia, Voice of: News and Views. See S 0011.
- 1515 Romania, R Romania Intl: DX Mailbag. See S 0245.
- 1532 Russia, Voice of: Timelines. See M 0332.
- 1538 Netherlands, Radio: Newline. See S 0038.
- 1553 Netherlands, Radio: Weekend. See S 0053.

HAUSER'S HIGHLIGHTS  
FRANCE: RADIO FRANCE  
INTERNATIONALE

English, D-95, complete

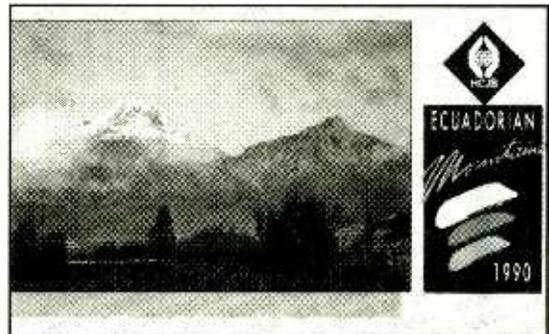
1200-1300	Am	15530, 13625, 11615
	SEAs	11890 or 11600
	Eu	9805, 15155, 15195
	Af	15325
1400-1500	Af/ME	17560
	SAs	7110, 12030
1600-1700	NAf	9485
	Af	11700, 12015, 15530
	Af/ME	9485, 11615, 12015
	Eu	6175
1700-1730	Eaf/ME	9485, 11615

(RFI via Bob Thomas, Kevin Hecht)



FREQUENCIES

1700-1800	Australia, Radio	6060pa 9580pa 11695pa	6080pa 9710pa 11880pa	6090pa 9860pa	7260as 11660pa	1800-1900 1800-1900 mtwhf 1800-1900	Algeria, R Algiers Intl Argentina, RAE Australia, Radio	11715me 15345eu 6060pa 9860pa 15265eu	15160eu 6080pa 11660as 11695pa 11880pa	6090pa 9580pa 11880pa
1700-1800 vl	Canada, CBC N Quebec Svc	9625do				1800-1900	Brazil, Radiobras			
1700-1800	Canada, CFCX Montreal	6005do				1800-1900	Canada, CFCX Montreal	6005do		
1700-1800	Canada, CFRX Toronto	6070do				1800-1900	Canada, CFRX Toronto	6070do		
1700-1800	Canada, CFVP Calgary	6030do				1800-1900	Canada, CFVP Calgary	6030do		
1700-1800	Canada, CHNX Halifax	6130do				1800-1900	Canada, CHNX Halifax	6130do		
1700-1800	Canada, CKZN St John's	6160do				1800-1900	Canada, CKZN St John's	6160do		
1700-1800	Canada, CKZU Vancouver	6160do				1800-1900	Canada, CKZU Vancouver	6160do		
1700-1800	China, Radio Intl	7405af	9535as	11575af		1800-1900	Costa Rica, RF Peace Intl	6200am	9400am	15050am
1700-1800 as	Costa Rica, AWR Alajuela	13750am				1800-1900	Czech Rep, Radio Prague	5835eu	9430eu	
1700-1800	Costa Rica, RF Peace Intl	6200am				1800-1900	Ecuador, HCJB Quito	15490eu	21455am	
1700-1727	Czech Rep, Radio Prague	5930eu	9430eu	15050am		1800-1830	Egypt, Radio Cairo	15255af		
1700-1800	Ecuador, HCJB Quito	12005am	15115am	21455am		1800-1845	India, All India Radio	7410eu 11935af	9650me 13750as	9950me 11620eu
1700-1800	Egypt, Radio Cairo	15255af				1800-1900	Italy, IRRS Milan	3985eu		
1700-1730	France, Radio France Intl	9485af	11615af	15210af	15460af	1800-1900	Kuwait, Radio	11990na		
1700-1730	Georgia, Georgian Radio	11910eu				1800-1900	Lebanon, Voice of Hope	6280va		
1700-1800	Italy, IRRS Milan	3985eu				1800-1900	Netherlands, Radio	4945af 9860af 17605af	6015af 9895af	6020af 11655af 9605af 15315af
1700-1800	Japan, NHK/Radio	6150as 11930me	7280as	9535na	9580as	1800-1849 mtwhf	New Zealand, R NZ Intl	5960pa		
1700-1730	Jordan, Radio	11970na				1800-1900 vl	Palau, KHBN/Voice of Hope	9965as		
1700-1800	Lebanon, Voice of Hope	6280va				1800-1900	Poland, Polish R Warsaw	6095eu	7270eu	7285eu
1700-1730	Lebanon, Wings of Hope	9960va				1800-1900	Russia, Voice of	7180eu	9890eu	13670af
1700-1800 mtwhf	New Zealand, R NZ Intl	5960pa				1800-1900	Sudan, Radio Omdurman	9025af		
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785me	1800-1830	Swaziland, Trans World R	9500af		
1700-1800	Pakistan, Radio	7485eu	11570eu			1800-1900	United Kingdom, BBC London	3255af 9410va 12095va 17840am	6180eu 9740as 15070va	6195eu 11955au 17830af
1700-1800 vl	Palau, KHBN/Voice of Hope	9965as				1800-1900	United Kingdom, BBC London	7160me	7205as	11750as
1700-1800	Russia, Voice of	7180eu	13670af			1800-1900	USA, KJES Mesquite NM	15385na		
1700-1800	S Africa, Channel Africa	7240af	9545af			1800-1900	USA, KTBN Salt Lk City UT	15590am		
1700-1800	Slovakia, AWR	9465af	9475af			1800-1900	USA, KWHR Naalehu HI	13625au		
1700-1730	Switzerland, Swiss R Intl	5850va	7510eu	9885va	13635va	1800-1900	USA, Monitor Radio Intl	9355va	9370eu	21640af
1700-1800	United Kingdom, BBC London	3955eu 7160me 11750as 15400af	6180eu 7205as 9410va 12095va 15070va 17840va	6190af 9410va 9740va 15070va 17840va		1800-1900	USA, VOA Washington DC	6040va 13710af	9760va 15410af	11920af 12040af 13595na 19379va
1700-1745	United Kingdom, BBC London	3915as	9630af	11860af		1800-1900 mtwhf	USA, VOA Washington DC	4875af		
1700-1800	USA, KTBN Salt Lk City UT	15590am				1800-1900	USA, WEWN Birmingham AL	11580eu	13615na	13695na
1700-1800	USA, KWHR Naalehu HI	6120as				1800-1900 irreg	USA, WGTG McCaysville GA	9370am		
1700-1800	USA, Monitor Radio Intl	9355af	21640af			1800-1900	USA, WHRI Noblesville IN	9495am	13760eu	
1700-1800	USA, VOA Washington DC	6040va 11920af 13710af 15445af	6110as 7215as 11945va 15205va 15255as 15410af	9760va 12040af 15410af		1800-1900	USA, WJCR Upton KY	7490na	13595na	
1700-1800 mtwhf	USA, VOA Washington DC	5990va 9770as	6045va 9525as	9670as		1800-1900	USA, WMLK Bethel PA	9465eu		
1700-1800	USA, WEWN Birmingham AL	11580na	13615na			1800-1900	USA, WRMI/R Miami Intl	9955am		
1700-1800 irreg	USA, WGTG McCaysville GA	9370am	9475am			1800-1900	USA, WRNO New Orleans LA	15420am		
1700-1800	USA, WHRI Noblesville IN	9495am	13760am			1800-1900	USA, WVHA Greenbush ME	15745af		
1700-1800	USA, WJCR Upton KY	7490na	13595na			1800-1900	USA, WWCR Nashville TN	12160am	13845am	15685am
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu				1800-1900	USA, WYFR Okeechobee FL	15566eu	17760ca	
1700-1800	USA, WRMI/R Miami Intl	9955am				1800-1830	Vietnam, Voice of	7250eu	9840eu	15010eu
1700-1800	USA, WRNO New Orleans LA	15420am				1800-1900	Yemen, Yemeni Rep Radio	9780as		
1700-1800	USA, WVHA Greenbush ME	15745af				1800-1900	Zambia, Christian Voice	4965af		
1700-1800	USA, WWCR Nashville TN	12160am	13845am	15685am		1815-1900	Bangladesh, Radio	7185eu	9648as	15520as
1700-1800	USA, WYFR Okeechobee FL	15566eu	17760eu			1830-1857	S Africa, Trans World R	9525af		
1700-1800	Zambia, Christian Voice	4965af				1830-1855 irreg	Somalia, Radio Mogadishu	6710af		
1715-1730	Albania, R Tirana Intl	7155eu	9740eu			1830-1900	Sweden, Radio	6065eu	7240eu	9655af
1715-1730	Vatican State, Vatican R	6245eu	7250eu	9645eu	11810eu	1830-1900	United Kingdom, BBC London	6005af	9630af	
1730-1800	Netherlands, Radio	6015af 9895af	6020af 11655af	9605af 15315af	9860af 17605af	1840-1850	Cote D' Ivoire, RDTV	11920do		
1730-1800	Romania, R Romania Intl	9750af	11740af	11940af		1845-1900 irreg s	Greece, Voice of	11645af	15150af	
1730-1800	Russia, Voice of	9890eu				1850-1900	Mali, RDTV Malienne	4783do	4835do	5995do
1730-1745	Sweden, Radio	6065eu					New Zealand, R NZ Intl	11735pa		
1730-1800	Vatican State, Vatican R	11625af	13765af	15570af						
1745-1800 mtwhf	Canada, RCI Montreal	5995eu 15325eu	9555eu 17820eu	11915eu 11935eu						
1745-1800	India, All India Radio	7410eu 11935af	9650me 13750as	9950me 11620eu						



Thanks to loyal MT readers Donald Micheal Choleva from Euclid, OH, and Bob Fraser, from Cohasset, MA, for sending these interesting QSL's from Kol Israel (left), and HCJB (right).

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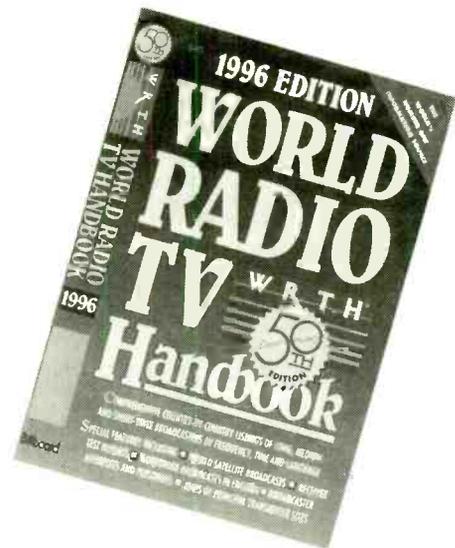
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FREQUENCIES

1900-2000	Australia, Radio	6060pa 7260as 11660pa	6080pa 9560as 11695pa	6150as 9580pa 11880pa	7240pa 9860pa	2000-2100 2000-2100 as 2000-2100	Algeria, R Algiers Intl Angola, Radio Nacional Australia, Radio	11715me 9534do 6060pa 9580pa 11855as	15160eu 6080pa 6150pa 7260as 11695pa 11880pa
1900-1930	Azerbaijan, Voice of	4957eu				2000-2100 vl 2000-2100 vl	Australia, VL8K Katherine Australia, VL8T Tent Crk	2485do 2325do	
1900-1945	Bangladesh, Radio	7185eu	9648as	15520as		2000-2100	Bulgaria, Radio	7335eu	9700eu
1900-1930	Belgium, R Vlaanderen Intl	5910eu	9925af			2000-2100	Canada, CFCX Montreal	6005do	
1900-1920	Brazil, Radiobras	15265eu				2000-2100	Canada, CFCX Toronto	6070do	
1900-2000	Canada, CFCX Montreal	6005do				2000-2100	Canada, CFVP Caigary	6070do	
1900-2000	Canada, CFCX Toronto	6070do				2000-2100	Canada, CHNX Halifax	6130do	
1900-2000	Canada, CFVP Caigary	6030do				2000-2100	Canada, CFVP Caigary	6030do	
1900-2000	Canada, CHNX Halifax	6130do				2000-2100	Canada, CHNX Halifax	6130do	
1900-2000	Canada, CKZN St John's	6160do				2000-2100	Canada, CKZN St John's	6130do	
1900-2000	Canada, CKZU Vancouver	6160do				2000-2100	Canada, CKZU Vancouver	6160do	
1900-2000 vl	China, China Radio Intl	9440af	11515me			2000-2100	Canada, CKZU Vancouver	6160do	
1900-2000	Costa Rica, AWR Alajuela	13750am	15460am			2000-2100	China, China Radio Intl	6950eu	9440af 9920eu 11715af
1900-2000	Costa Rica, RF Peace Intl	6200am	9400am	15050am		2000-2100		15110af	
1900-1930	Cote D'ivoire, RDTV	11920do				2000-2100	Costa Rica, RF Peace Intl	6200am	9400am 15050am
1900-2000	Ecuador, HCJB Quito	15490eu	21455am			2000-2050	Eqt Guinea, Radio Africa	15190af	
1900-1950	Germany, Deutsche Welle	9670af	9765af	11785af	11810af	2000-2030	Germany, Deutsche Welle	5960eu	7285eu
		11865af	13790as	15145af	15425af	2000-2100	Ghana, Ghana Broad Corp	3366do	4915do
1900-1910	Greece, Voice of	9375eu				2000-2030	Guatemala, AWR	5980am	
1900-2000	Guatemala, AWR	5980am				2000-2030	Hungary, Radio Budapest	3975eu	5970eu 7250eu 9835eu
1900-1945	India, All India Radio	7410eu	9950me	11620eu	11935af	2000-2100	Indonesia, Voice of	9675as	
		13750as				2000-2030	Iran, VOIRI Tehran	7260af	9022eu
1900-2000	Italy, IRRS Milan	3985eu				2000-2030	Israel, Kol Israel	7415na	7465na 9435eu 9845ca
1900-2000	Japan, NHK/Radio	6150as 11850pa	7140pa	9535na	9580as	2000-2100		13750sa	
		11850pa				2000-2100 vl	Italy, IRRS Milan	3985eu	
1900-2000 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		2000-2100 vl	Kenya, Kenya Broadc Corp	4885do	4935do 6150do
1900-2000	Kuwait, Radio	11990eu				2000-2100	Kuwait, Radio	11990eu	
1900-2000	Lebanon, Wings of Hope	9960va				2000-2100	Lebanon, Wings of Hope	9960va	
1900-2000	Liberia, Radio ELBC	7275do				2000-2100	Liberia, Radio ELBC	7275do	
1900-2000	Liberia, Radio ELWA	4760do				2000-2100	Liberia, Radio ELWA	4760do	
1900-2000	Netherlands, Radio	4945af 9860af 17605af	6015af 9895af	6020af 11655af	9605af 15315af	2000-2030 2000-2010 2000-2025	Lithuania, Radio Vilnius Mongolia, R Ulan Bator Netherlands, Radio	9710eu 11790as 4945af 9895af	12015as 6020af 9605af 9860af 11655af 15315af 17605af
1900-2000	New Zealand, R NZ Intl	11735pa				2000-2100	New Zealand, R NZ Intl	11735pa	
1900-2000	Nigeria, FRCN/Voice of	7255af				2000-2005	Nigeria, FRCN/Radio	3326do	4990do
1900-1930 s	Norway, Radio Norway Intl	5960eu	6195pa	7485af	9590af	2000-2100	Nigeria, FRCN/Voice of	7255af	
1900-2000	Romania, R Romania Intl	6105eu	7195eu	9510eu		2000-2050	North Korea, R Pyongyang	6576eu	9345as 9640af 9977as
1900-2000	Russia, Voice of	5940eu	7180eu	7205eu	9585eu	2000-2030 mtwhf	Portugal, R Portugal Intl	6130eu	9780eu 9815eu 15515af
		9890eu	13670af			2000-2100	Russia, Voice of	5940eu	6130eu 7180eu 7205eu
1900-2000	South Korea, R Korea Intl	5975eu	6480eu	7275as				9585af	
1900-2000	Swaziland, Trans World R	3200af				2000-2015	Swaziland, Trans World R	3200af	
1900-2000	Thailand, Radio	7200eu	9655eu	11905eu		2000-2030	Switzerland, Swiss R Intl	6165eu	9770af 9885af 9905af
1900-2000	United Kingdom, BBC London	3255af 6180eu 9410eu 12095eu	3955eu 6190af 9630af 15070eu	5975va 6195va 9740as 15400af	6005af 7325af 11780eu 17830af			11640af 9445eu 4976do	
		13815am				2000-2030	Turkey, Voice of	9445eu	
1900-2000	USA, KAIJ Dallas TX	15590am				2000-2015	Uganda, Radio	4976do	5026do
1900-2000	USA, KATN Salt Lk City UT	13625au				2000-2100	United Kingdom, BBC London	3255af 9630af 11835va	6005af 6180eu 6195va 9740as 11750sa 11780eu 11955va 15400af 17830af
1900-2000	USA, KWHR Naalehu HI	9355eu	9370eu	17510af		2000-2100		7510eu	9355eu
1900-2000	USA, Monitor Radio Intl	7415af	9525va	9760va	11870va	2000-2100	USA, KAIJ Dallas TX	13815am	
1900-2000	USA, VOA Washington DC	11920af	12040af	13710af	15180va	2000-2100	USA, KATN Salt Lk City UT	15590am	
		15410af	15580af	19379va		2000-2100	USA, KWHR Naalehu HI	11980as	
		11580na	13615na	13695af	15375sa	2000-2100	USA, Monitor Radio Intl	7510eu	9355eu
1900-2000	USA, WEWN Birmingham AL	9370am	9475am			2000-2100	USA, VOA Washington DC	15205va 15410af 15580af 17725af	15410af 15580af 17725af
1900-2000 irreg	USA, WGTG McCaysville GA	9495am	13760eu			2000-2100		7425na	13615na 15375sa
1900-2000	USA, WHRI Noblesville IN	7490na	13595na			2000-2100 irreg	USA, WEWN Birmingham AL	7425na	
1900-2000	USA, WJCR Upton KY	9465eu				2000-2100	USA, WGTG McCaysville GA	9370am	
1900-2000	USA, WMLK Bethel PA	9955am				2000-2100	USA, WHRI Noblesville IN	9495am	
1900-2000	USA, WRMI/R Miami Intl	15420am				2000-2100	USA, WJCR Upton KY	7490na	
1900-2000	USA, WRNO New Orleans LA	15745af				2000-2100	USA, WMLK Bethel PA	9465eu	
1900-2000	USA, WVHA Greenbush ME	12160am	13845am	15685am		2000-2100	USA, WRMI/R Miami Intl	9955am	
1900-2000	USA, WWCR Nashville TN	17760eu				2000-2100	USA, WRNO New Orleans LA	15420am	
1900-2000	USA, WYFR Okeechobee FL	7250eu	9840eu	15010eu		2000-2100	USA, WVHA Greenbush ME	15745af	
1900-1930	Vietnam, Voice of	4965af				2000-2100	USA, WWCR Nashville TN	12160am	13845am 15685am
1900-2000	Zambia, Christian Voice	3306do	3396do	4828do		2000-2100	USA, WYFR Okeechobee FL	7355eu	15666eu 21525af
1900-2000	Zimbabwe, ZBC/Radio 4	7260eu	9740eu			2000-2100	Vatican State, Vatican R	9645af	11625af 13765af
1930-2000	Albania, R Tirana Intl	5945eu	6155eu	9655me	13730af	2000-2030	Vatican State, Vatican R	4055eu	5885eu 7250eu
1930-2000	Austria, R Austria Intl	5940eu	7105eu	7205eu	7210eu	2000-2010	Zambia, Christian Voice	4965af	
1930-2000 t	Belarus, Radio Minsk	7260af				2000-2030	Zimbabwe, ZBC/Radio 3	3306do	3396do 4828do
1930-2000	Iran, VOIRI Tehran	4080as	7530as			2000-2100	Syria, Radio Damascus	15095na	
1930-2000	Mongolia, R Ulan Bator	7200eu				2005-2100	Swaziland, Trans World R	3200af	
1930-2000	Russia, Voice of	5915eu	6055eu	7345eu		2015-2045 s	Swaziland, Trans World R	3200af	
1930-2000	Slovakia, R Slovakia Intl	9445eu				2025-2045	Italy, RAI Rome	5990af	7110af 9710af
1930-2000	Turkey, Voice of	6100af	9720eu			2030-2100	Egypt, Radio Cairo	15375af	
1930-2000	Yugoslavia, Radio	6030eu	7235eu			2030-2100	Netherlands, Radio	15315af	
1935-1955	Italy, RAI Rome	5047do				2030-2100	Poland, Polish R Warsaw	6035eu	6095eu 7285eu
1945-2000	Togo, Radio					2030-2045	Thailand, Radio	9555eu	9655eu 11905eu
						2030-2100	Vietnam, Voice of	7250as	9840eu 15010eu
						2045-2100	India, All India Radio	7410eu	9910au 9950eu 11620eu
						2050-2100	Vatican State, Vatican R	11715pa 4055eu	15225pa 5885eu 7250eu

"MT is the best source of SW information I have had since 1937." —James Snow, Murray, KY

## FREQUENCIES

Frequency	Country/Station	6060pa	6080pa	7240pa	7260as	2145-2200 s	Greece, Voice of	9425au	7160as	9580as
2100-2200	Australia, Radio	6060pa 9580pa 11880pa	6080pa 9660pa 11955pa	7240pa 11660pa	7260as 11855as	2145-2200 s 2145-2200	United Kingdom,BBC London	9425au 5990as	7160as	9580as
<b>2200 UTC</b>										
2100-2130 vl	Australia, VL8A Alice Spg	2310do				2200-2300	Australia, Radio	9580pa	9610as	9645as
2100-2130 vl	Australia, VL8K Katherine	2485do						11660pa	11695pa	11855as
2100-2130 vl	Australia, VL8T Tent Crk	2325do						11955pa	13755as	15365pa
2100-2110	Bahrain, Radio	6010do						17860pa		17795pa
2100-2200 vl	Canada, CBC N Quebec Svc	9625do				2200-2300 vl	Australia, VL8A Alice Spg	4835do		
2100-2200	Canada, CFCX Montreal	6005do				2200-2300 vl	Australia, VL8K Katherine	5025do		
2100-2200	Canada, CFRX Toronto	6070do				2200-2300 vl	Australia, VL8T Tent Crk	4910do		
2100-2200	Canada, CFVP Calgary	6030do				2200-2230	Belgium, R Vlaanderen Int	5910eu	7250eu	
2100-2200	Canada, CHNX Halifax	6130do				2200-2300	Bulgaria, Radio	7105eu	9700eu	
2100-2200	Canada, CKZN St John's	6160do				2200-2300 vl	Canada, CBC N Quebec Svc	9625do		
2100-2200	Canada, CKZU Vancouver	6160do				2200-2300	Canada, CFCX Montreal	6005do		
2100-2200	Canada, RCI Montreal	5925eu	5995eu	5995eu	7260eu	2200-2300	Canada, CFRX Toronto	6070do		
		9755eu	9805eu	11945eu	13650eu	2200-2300	Canada, CFVP Calgary	6030do		
		13690eu	15150eu	17820eu		2200-2300	Canada, CHNX Halifax	6130do		
		6950eu	9920eu			2200-2300	Canada, CKZN St John's	6160do		
2100-2200	China, China Radio Intl	15110af				2200-2300	Canada, CKZU Vancouver	6160do		
2100-2130	China, China Radio Intl	6200am	9400am	15050am		2200-2230	Canada, RCI Montreal	5995eu	7260eu	9755am
2100-2200	Costa Rica, RF Peace Intl	11705eu						11705as	11945eu	13690eu
2100-2200	Cuba, Radio Havana Cuba	5930na	7345na			2200-2230	China, China Radio Intl	3985eu		
2100-2127	Czech Rep, Radio Prague	15375af				2200-2300	China, China Radio Intl	7170eu		
2100-2200	Egypt, Radio Cairo	15190af				2200-2300	Costa Rica, RF Peace Intl	6200am	7385am	9400am
2100-2200	Eq Guinea, Radio Africa	6185as	7225af	9670as	9690af	2200-2300	Cuba, Radio Havana Cuba	6180na	11960na	
2100-2150	Germany, Deutsche Welle	9765as	11785as	11810af	11905af	2200-2245	Egypt, Radio Cairo	9900eu		
		15270af				2200-2300	Eq Guinea, Radio Africa	15190af		
2100-2200	Guatemala, AWR	5980am				2200-2215	Ghana, Ghana Broadc Corp	4915do		
2100-2200	India, All India Radio	7410eu	9910eu	9950eu	11620au	2200-2300	Guatemala, AWR	5980am		
		11715au	15225au			2200-2230	Hungary, Radio Budapest	3975eu	5935eu	7250eu
2100-2200 fas	Italy, IRRS Milan	3950eu				2200-2230	India, All India Radio	7410eu	9910eu	9950eu
2100-2200	Japan, NHK/Radio	6035as	7125as	7140as	11850pa	2200-2230		11715au	15225au	11620au
		11865eu								
2100-2115	Japan, NHK/Radio	7190as	7280as			2200-2230	Iran, VOIRI Tehran	6175au		
2100-2110 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		2200-2300 fas	Italy, IRRS Milan	3950eu		
2100-2200	Lebanon, Voice of Hope	6280va				2200-2225	Italy, RAI Rome	5990as	9710as	11815as
2100-2200	Lebanon, Wings of Hope	9960va				2200-2300	Lebanon, Voice of Hope	6280va		
2100-2200 mtwhfa	Liberia, Radio ELWA	4760do				2200-2300	Lebanon, Wings of Hope	9960va		
2100-2125	Netherlands, Radio	15315af				2200-2300	Malaysia, Radio	7295do		
2100-2200	New Zealand, R NZ Intl	11735pa				2200-2300	Moldova, R Moldova Intl	7500eu		
2100-2200	Nigeria, FRCN/Radio	3326do	4990do			2200-2225 mtwhf	New Zealand, R NZ Intl	11735pa		
2100-2125	Poland, Polish R Warsaw	6035eu	6095eu	7285eu		2200-2205	Nigeria, FRCN/Radio	3326do	4990do	
2100-2200	Romania, R Romania Intl	5955eu	5990eu	7105eu	7195eu	2200-2205	Norway, Radio Norway Intl	6170as	6195na	
2100-2200	Russia, Voice of	5940eu	6055eu	7180eu	9890eu	2200-2230 s	Russia, Voice of	5940eu	6055eu	7180eu
2100-2115	Sierra Leone, SLBS	3316do				2200-2300		7360eu	7400eu	9890eu
2100-2200	Slovakia, AWR	9465af						3316do		
2100-2200	South Korea, R Korea Intl	6480eu	15575eu			2200-2215	Sierra Leone, SLBS	7100eu		
2100-2200	Spain, R Exterior Espana	6125eu				2200-2300	Slovakia, AWR	5965eu		
2100-2110	Uganda, Radio	4976do	5026do			2200-2230	South Korea, R Korea Intl	11775af		
2100-2200	United Kingdom, BBC London	3255af	3915as	3955eu	5975am	2200-2300	Spain, R Exterior Espana	12085na	15095na	
		6005af	6120as	6180eu	6190as	2200-2205	Syria, Radio Damascus	5810eu	9850eu	
		6195va	7325va	9410va	9740as	2200-2300	Taiwan, VO Free China	11885na	11970na	13605na
		11750sa	11780eu	11835va	11955va	2200-2300	UAE, Radio Abu Dhabi	4795eu	4820eu	5905eu
		9630af				2200-2300	Ukraine, R Ukraine Intl	6005eu	6010eu	6080eu
2100-2130	United Kingdom, BBC London	13815am						7135eu	7205eu	7240eu
2100-2200	USA, KAIJ Dallas TX	15590am				2200-2300	United Kingdom, BBC London	3955eu	5975am	6175na
2100-2200	USA, KTBN Salt Lk City UT	17775am				2200-2300		7110as	9410va	9590na
2100-2200 s	USA, KVOH Los Angeles CA	7510na	9355na	13840pa		2200-2230	USA, KAIJ Dallas TX	11750sa	11835va	11955va
2100-2200	USA, Monitor Radio Intl	6070va	7415af	9595va	9760va	2200-2230	USA, KTBN Salt Lk City UT	11780eu		
2100-2200	USA, VOA Washington DC	11870va	15185va	15205va	15375sa	2200-2300	USA, Monitor Radio Intl	13815am		
		15410af	15580af	17725af	18275va	2200-2300	USA, VOA Washington DC	15590am		
		19379va						7510eu	9430as	13770sa
2100-2200	USA, WEWN Birmingham AL	7425na	13615na			2200-2300		7215va	9770va	9890af
2100-2200 irreg	USA, WGTG McCaysville GA	9370am	9475am			2200-2300		15185va	15290va	15305va
2100-2200	USA, WHRI Noblesville IN	9495am	13760am			2200-2300		17820va	18275va	17735va
2100-2200	USA, WHCR Upton KY	7490na	13595na			2200-2230 mtwhf	USA, VOA Washington DC	7415af	12080af	13710af
2100-2200	USA, WMLK Bethel PA	9465eu				2200-2300	USA, WEWN Birmingham AL	7425na	11820sa	13615na
2100-2200	USA, WRMI/R Miami Intl	9955am				2200-2300	USA, WHRI Noblesville IN	13760am		
2100-2200	USA, WRNO New Orleans LA	15420am				2200-2300	USA, WJCR Upton KY	7490na	13595na	
2100-2200 a	USA, WVHA Greenbush ME	15745eu				2200-2300	USA, WRMI/R Miami Intl	9955am		
2100-2200	USA, WWCR Nashville TN	9475am	12160am	13845am		2200-2300	USA, WRNO New Orleans LA	15420am		
2100-2200	USA, WYFR Okeechobee FL	7355eu	11850af	15566af		2200-2300 w	USA, WVHA Greenbush ME	9852eu		
2100-2200	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do		2200-2300	USA, WWCR Nashville TN	12160am	13845am	
2105-2200	Syria, Radio Damascus	12085na	15095na			2200-2245	USA, WYFR Okeechobee FL	5810na	9985eu	11580eu
2115-2200	Egypt, Radio Cairo	9900eu				2200-2230	Yugoslavia, Radio	6100eu	6185eu	15566af
2120-2130 mh	Estonia, Estonian Radio	5925eu				2206-2300	New Zealand, R NZ Intl	15115pa		
2130-2200	Armenia, Voice of	7480na	9965na			2230-2300	Austria, R Austria Intl	5945eu	6155eu	9870ca
2130-2200	Australia, Radio	9610as	9645as	15365pa	17860pa	2230-2257	Czech Rep, Radio Prague	5930na	7345na	13730sa
2130-2200 vl	Australia, VL8A Alice Spg	4835do				2230-2300	Lithuania, Radio Vilnius	9710eu		
2130-2200 vl	Australia, VL8K Katherine	5025do				2230-2300	Russia, Voice of	7105eu		
2130-2200 vl	Australia, VL8T Tent Crk	4910do				2230-2300	Sweden, Radio	6065eu		
2130-2200	Iran, VOIRI Tehran	6175au				2240-2250	Greece, Voice of	9425au		
2130-2200 as	Latvia, Radio	5935eu				2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do	
2130-2200	Liberia, Radio ELWA	4760do				2245-2300	India, All India Radio	9705as	9950as	11745as
2130-2200 ths	Moldova, R Dniester Intl	6205na	11750na					15145as		13750as
2130-2200	Russia, Voice of	7400eu				2245-2300	Vatican State, Vatican R	9600au	11830pa	
2130-2200	Sweden, Radio	6065eu	7230af							

FREQUENCIES

2300-0000	Australia, Radio	9610as 11695as 17795pa	9660pa 11855as 17860pa	11645as 13755as	11660pa 15365pa	2300-0000 2300-2305 2300-2350 2300-0000	New Zealand, R NZ Intl Nigeria, FRCN/Radio North Korea, R Pyongyang Russia, Voice of	15115pa 3326do 11700na 5940eu 7180eu	4990do 13650na 7125eu 9550eu	7170eu
2300-0000 vl	Australia, VL8A Alice Spg	4835do				2300-2317	Sierra Leone, SLBS	3316do		
2300-0000 vl	Australia, VL8K Katherine	5025do				2300-0000	Turkey, Voice of	7190na	7280eu	9560as
2300-0000 vl	Australia, VL8T Tent Crk	4910do				2300-0000	UAE, Radio Abu Dhabi	11885na	11970na	13605na
2300-0000 vl	Canada, CBC N Quebec Svc	9625do				2300-0000	United Kingdom, BBC London	6175na	6195va	7110as 7180as
2300-0000	Canada, CFCX Montreal	6005do						7250as	7325va	9580as 9590na
2300-0000	Canada, CFRX Toronto	6070do						11750sa	11945as	11955va
2300-0000	Canada, CFVP Calgary	6030do				2300-2330	United Kingdom, BBC London	5975am	9915sa	
2300-0000	Canada, CHNX Halifax	6130do				2300-2315	United Kingdom, BBC London	9410af	11835va	
2300-0000	Canada, CKZN St John's	6160do				2300-2330	USA, KAIJ Dallas TX	13815am		
2300-0000	Canada, CKZU Vancouver	6160do				2300-0000	USA, KTBN Salt Lk City UT	15590am		
2300-0000	Canada, RCI Montreal	5960am 11940am	6040am	9535am	9755am	2300-0000	USA, KWHR Naalehu HI	17510as		
2300-0000	Costa Rica, AWR Alajuela	5030am 13750am	6150am	7375am	9725am	2300-0000	USA, Monitor Radio Intl	7510eu	9430as	13625pa 13770sa
2300-0000	Costa Rica, RF Peace Intl	6200am	7385am	9400am		2300-0000	USA, VOA Washington DC	7215va	9705va	9770va 9890af
2300-2305	Croatia, Croatian Radio	5895eu	7370eu	11635eu	13830eu	2300-0000		17735va	17820va	18275va 15305va
2300-0000	Egypt, Radio Cairo	9900na	6160as	7250as		2300-0000	USA, WEWN Birmingham AL	5745am		
2300-2350	Germany, Deutsche Welle	6000as				2300-0000	USA, WHRI Noblesville IN	7490na	13595na	
2300-0000	Guam, AWR/KSDA	11980as				2300-0000	USA, WJCR Upton KY	7355am		
2300-0000	Guatemala, AWR	5980am				2300-0000	USA, WRNO New Orleans LA	9852eu		
2300-0000	India, All India Radio	9705as 15145as	9950as	11745as	13750as	2300-0000 w	USA, WVHA Greenbush ME	5065am	9475am	13845am
2300-0000	Japan, NHK/Radio	6055eu 11850pa	6155eu	7125as	7140as	2300-0000	USA, WWCN Nashville TN	9645as	9850as	13605as 15240pa
2300-0000	Lebanon, Voice of Hope	6280va				2300-0000	Netherlands, Radio	6020na	6165na	
2300-0000	Lebanon, Wings of Hope	9960va				2300-0000	Palau, KHBM/Voice of Hope	15140as		
2300-2305	Lithuania, Radio Vilnius	7360eu				2300-0000	Vietnam, Voice of	7250eu	9840eu	15010eu
2300-0000	Malaysia, Radio	7295do				2335-2345	Greece, Voice of	9935sa	11595sa	11640sa
2300-2325 mtwhf	Moldova, R Moldova Intl	7500eu								

SELECTED PROGRAMS

Sundays

- 2310 BBC (am): East Asia Today. News, analysis, press reviews and reports from BBC correspondents.
- 2310 Radio Japan: Let's Learn Japanese. See S 0310.
- 2310 Voice of America (as): VOA Today. Up-to-the-minute news summaries, hourly business and sports updates, interviews on world news events, plus features on topics from movies to medicine.
- 2325 Radio Japan: Media Roundup. See S 0525.
- 2330 BBC (am): Short Story. See S 0430.
- 2330 BBC (as pac): Letter from America. See S 0030.
- 2345 BBC (am): Write On. See S 0145.
- 2350 Radio Japan: Viewpoint. See S 0550.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 BBC (eu): Take Five. See M 0410.
- 2310 Voice of America (as): VOA Today. See S 2310.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: Profile. See M 1525.
- 2330 BBC (am): Outlook. See M 1405.
- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 BBC (eu): An A-Z of Composers. Life-stories of some of the lesser known composers.
- 2310 Voice of America (as): VOA Today. See S 2310.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: Enjoy Japanese. See T 1525.
- 2330 BBC (am): Outlook. See M 1405.
- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

- 2310 BBC (af): Topical Reports. A five-minute current affairs program.

- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 Voice of America (as): VOA Today. See S 2310.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: History and Classics. See W 1525.
- 2330 BBC (am): Outlook. See M 1405.
- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 BBC (eu): Take Five. See M 0410.
- 2310 Voice of America (as): VOA Today. See S 2310.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: Enjoy Japanese. See T 1525.
- 2330 BBC (am): Outlook. See M 1405.
- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

- 2310 BBC (af): Science Five. See W 0410.
- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 BBC (eu): Science Five. See W 0410.
- 2310 Voice of America (as): VOA Saturday. See S 0010.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: Music and Book Beat. See F 1525.
- 2330 BBC (am): Outlook. See M 1405.
- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

- 2310 BBC (af): Spotlight. See S 0410.
- 2310 BBC (eu): Spotlight. See S 0410.
- 2310 Radio Japan: Asia Weekly. See S 0110.
- 2310 Voice of America (as): VOA Sunday. See S 0010.
- 2311 Radio Japan: Asian News Summary. See S 0111.
- 2321 Radio Japan: Business Report. See S 0121.
- 2325 Radio Japan: Entertaining in Asia. See S 0125.
- 2330 BBC (am): The John Dunn Show. See S 0330.
- 2340 BBC (as pac): Book Choice. See S 1525.
- 2346 Radio Japan: Asia Kaleidoscope. See S 0146.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

**HAUSER'S HIGHLIGHTS**  
**USA: WEWN, ALABAMA,**  
W-95 in English, mostly  
0000-1300 7425  
1300-1400 7425, 11875  
1400-1600 9455, 11875  
1600-2000 11580, 13615  
2000-2400 7425, 13615  
(via Diane Mauer)

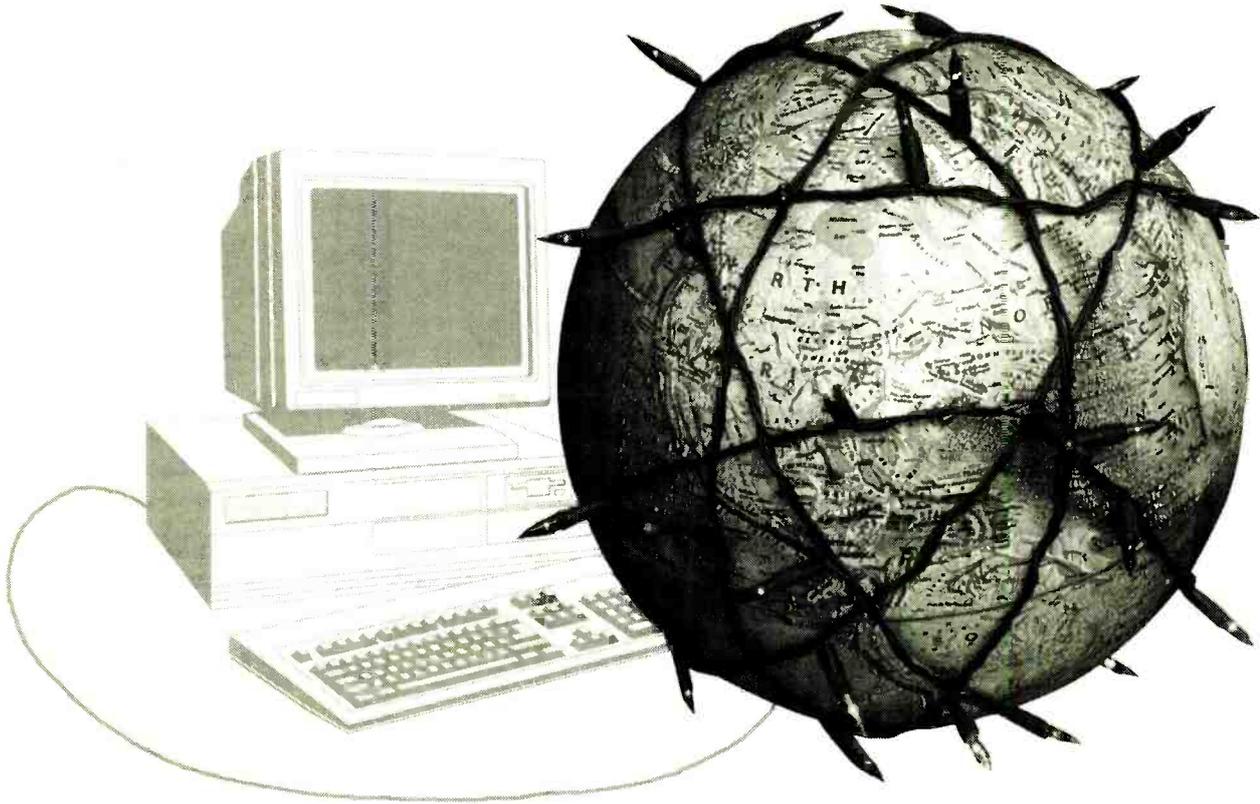
**HAUSER'S HIGHLIGHTS**  
**BULGARIA: RADIO**  
**BULGARIA**  
English thru March  
NAm 0000-0100 7480, 9700  
0500-0600 7480, 9700  
As 1230-1330 9810, 11605  
Eu 2000-2100 7335, 9700  
2200-2300 7105, 9700



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.

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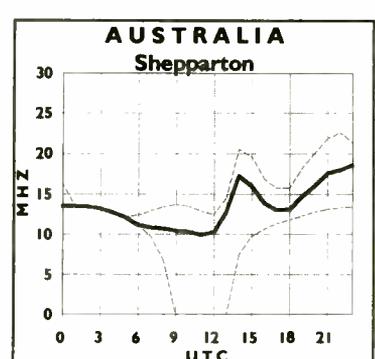
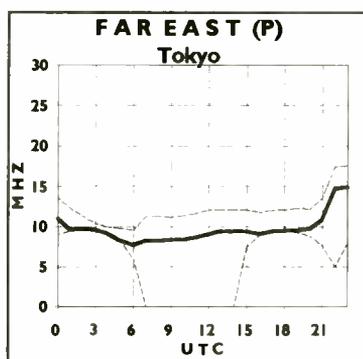
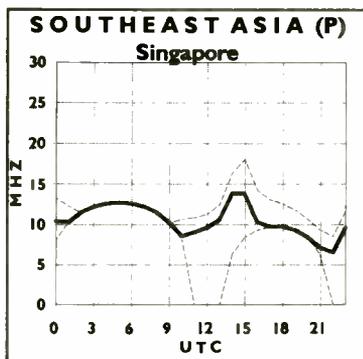
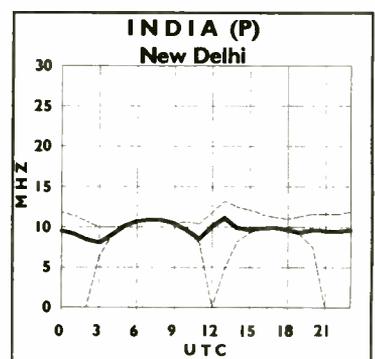
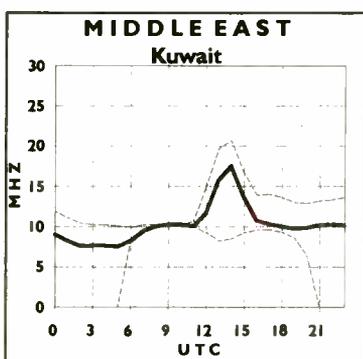
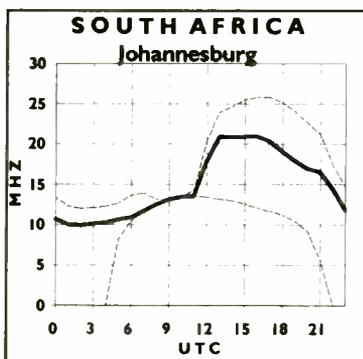
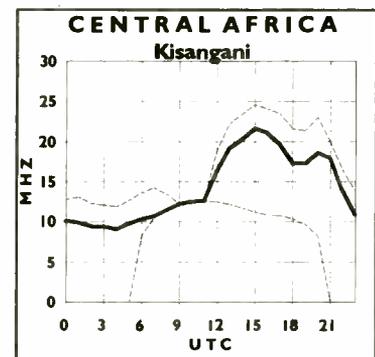
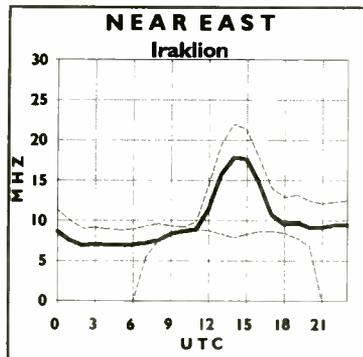
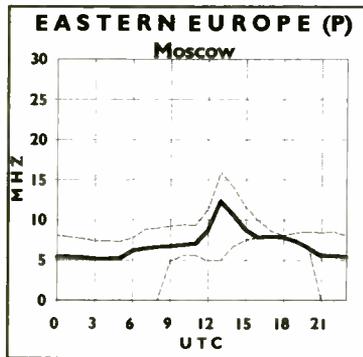
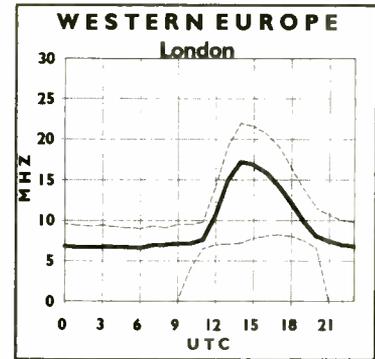
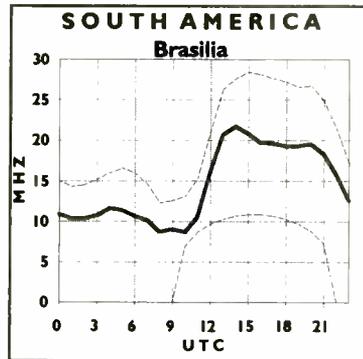
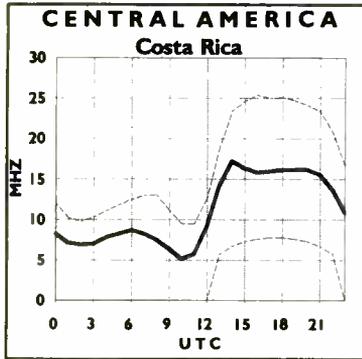
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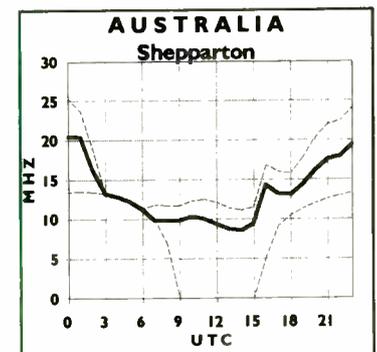
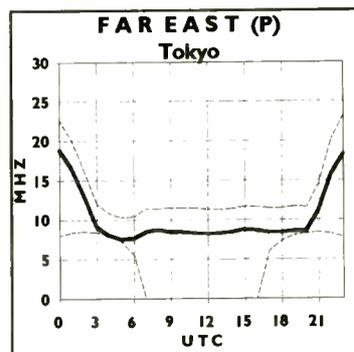
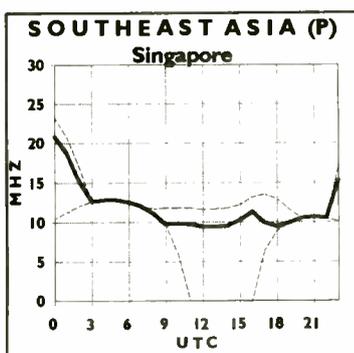
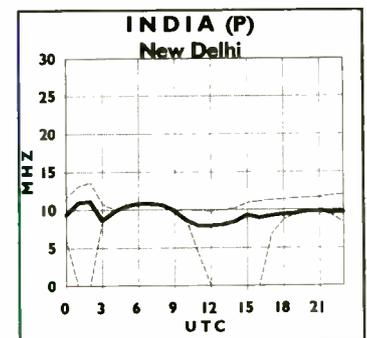
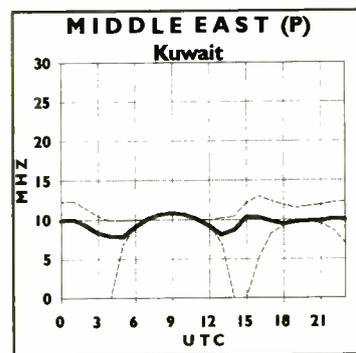
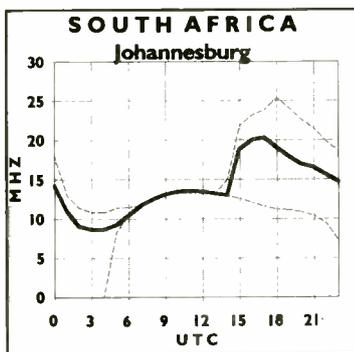
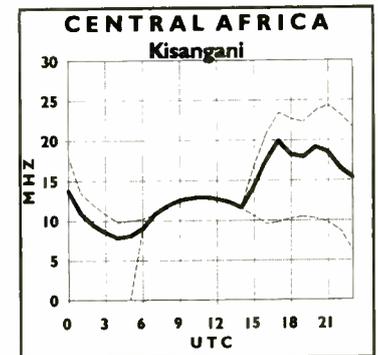
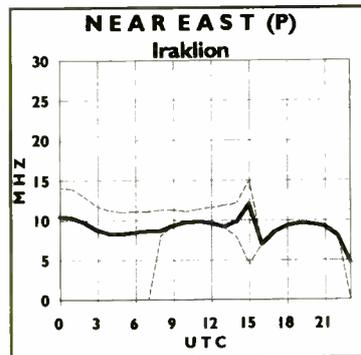
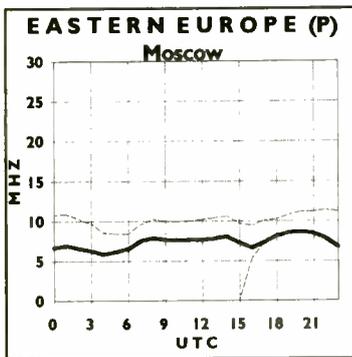
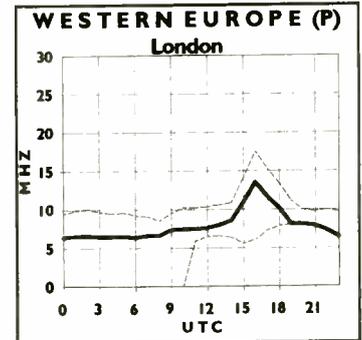
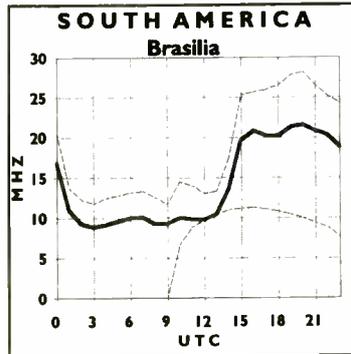
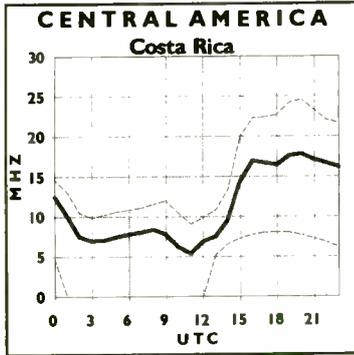
# Propagation conditions: Eastern United States

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



## Shortwave Simulcasting

### Superpower KTBN and Worldwide Catholic Radio WEWN

By Jim Frimmel

There once was a shortwave radio station in Salt Lake City, Utah, that billed itself as "Superpower KUSW Worldwide Radio." Their contemporary rock music format changed abruptly on December 18, 1990, when the voice of Trinity Broadcasting Network (TBN) began operation as KTBN with full-time simulcasting of TBN's television programs.



during which much hoopla about "millions of watts" of power were going to spread TBN's Christian message around the world. Now, five years later, I decided to see how KTBN was performing. I also wanted to compile an accurate listing for a future *Monitoring Times* program guide.

#### ■ Monitoring the TBN

From my location 20 miles west of Fort Worth, Texas, I embarked on my survey. Armed with a color TV tuned to channel 58 (KDTX Dallas), a Kenwood R-5000 dedicated to daytime frequency 15590 kHz and nighttime frequency 7510 kHz, a Sony Betamax VCR, Shortwave Navigator for the Macintosh, and the Fort Worth *Star-Telegram's* weekly TV guide, I began a week-long vigil. It was August 1995—a good time for this exercise since shortwave propagation was poor and the KTBN transmitter's 70 degree azimuth put me right in its path for excellent reception.

My objective was to log each program heard by UTC and program name and to write a short summary of the program content. The information would be posted to both Shortwave Navigator and a database program. Since Shortwave Navigator listed KTBN in hour-by-hour listings and contained program fields for each day of the week, it enabled me to track my monitoring with ease. The Betamax let me record audio from the Kenwood for up to five hours during periods of absence and late listening. (I discovered early on that some

of the TV programs only aired locally, which meant that I had to record from shortwave for accuracy.)

One of the first things I discovered was that the TV guide did not accurately or completely list the programs carried. Instead of listing by program name, the name of the TV evangelist/host was used. Late night programming was totally omitted, even though channel 58 was on the air. The TV guide helped, but it was necessary to closely monitor the beginning of each program to obtain the actual program name.

With both the TV and the R-5000 running, everything proceeded smoothly. The TV provided captions and other graphics which really helped. The project progressed much like a crossword puzzle. As the blanks were filled in, things became easier.

#### ■ Results of the TBN Survey

It was when shortwave only was monitored, either off-the-air or by audio tape, that it became apparent that something was missing. That old saw about a picture being worth a thousand words is true. Some TV evangelists came across as well (or better) on radio; however, most programs suffered without the video. This was especially noticeable during the full Saturday morning block of children's programs.

One program you won't find in your TV guide is called *Music of Praise*. This is a two-hour program of contemporary Christian music heard 1900-2100 UTC Monday to Friday when TV stations run other programming. Here in the Dallas area, the *700 Club* is carried at that time. Other breaks for local programs such as *Public Report* told me that KTBN provides other programs.

Practically all KTBN programs are in English, although Spanish may be spoken during some programs. One all-Spanish pro-



KTBN	
Location	Salt Lake City
Coordinates	40-39-07 West, 112-02-39 North
Transmitter	Harris SW-100B at 100,000 watts power
Antenna	Log periodic at 70 degrees azimuth
Effective Radiated power	2,500,000 watts
QSL Manager	Cheryl Gilroy 2442 Michelle Drive Tustin, California 92680
URL Address:	<a href="http://www.tbn.org">http://www.tbn.org</a>

gram was noted at 1030 UTC Saturday.

Some program hosts seemed to be unaware that they were also on radio, asking people to write to "the address on the screen." In *Behind the Scenes*, a sort of mailbag and program preview discussion group, it was once mentioned that there was a network of radio stations, but the existence of KTBN on shortwave radio from Salt Lake City was never mentioned on any programs heard during the time of this study.

#### ■ The Internet Connection

It was not until early September 1995 that I discovered that TBN had made its presence known on the World Wide Web. This revelation was startling at first, and my first reaction was that I had gone through an unnecessary and time-consuming exercise for nothing. But, a closer look at the program listing on their web page revealed that the listed programs were also by the name of each program host/TV evangelist, just as the programs are listed in the TV guide. So, as it turned out, I had created a very unique guide to TBN's programs by program name and program host.

#### ■ WEWN Worldwide Catholic Radio

Another simulcaster is Radio Station WEWN, the shortwave arm of the Eternal Word Television Network. Known as "Worldwide Catholic Radio," this powerhouse broadcaster operates four 500-kW transmitters from the hills near Birmingham, Alabama. Many of



Mother Angelica

the programs carried on shortwave are simulcasts of the cable television operation; those that are not are produced for television and retransmitted on shortwave.

Now completing its third year of broadcasting on December 27th, the station was founded by Mother M. Angelica as a logical extension of the cable television network.

In a recent television interview, Mother Angelica explained how she was inspired to found EWTN. She had been stricken with an affliction that had left her unable to walk. In her prayers to be healed she promised to spread the word of God. Her prayers were answered (she is now able to walk with a cane), she kept her promise, and the rest is history.

### ■ WEWN Programming

WEWN is a 24-hour a day operation. Some programs are repeated as "encore" presentations, such as *The Best of Mother Angelica Live*. Most programs are in English, but there are some in Spanish and French. Practically all have a religious theme, and live masses are broadcast at 8:00 AM and 2:00 PM ET. WEWN's most popular programs are *Mother Angelica Live* (Tue & Wed, 8:00 PM ET), and *LiveWire* (Wed, 9:00 PM ET), a live call-in show.

Both EWTN and WEWN scooped the rest of the television and shortwave media during the recent visit of Pope John Paul II to the United States. Live radio coverage on WEWN began each day at 8:00 AM ET, and programs were interrupted throughout each day to broadcast live events from places like Sacred Heart Cathedral in Newark, NJ, the Pope's address to the United Nations, the celebration of a Mass at Giants Stadium, Central Park in New York City and other places, and the departure of the Holy Father to Rome.

See the selected programs in the centerfold Shortwave Guide of this issue for many of the program offerings of WEWN.

### ■ Free Program Guides

WEWN puts out a slick, four-page monthly newsletter called *Gabriel's Horn*. Although free for the asking (write to P.O. Box 100234, Birmingham, AL 35210), the publication carries a tongue-in-cheek price of "One Hail Mary" on its masthead.

Included with each newsletter is an hourly program guide in a grid format. All times are in Eastern Time with no cross-reference to UTC, which makes the program guide somewhat difficult to refer to if one lives anywhere but the Eastern Time Zone.

WEWN followed the practice of citing only the "best" English language frequency

## Broadcasters on the World Wide Web - an Update

BBC World Service, UK	<a href="http://www.bbcnc.org.uk/worldservice/">http://www.bbcnc.org.uk/worldservice/</a>
Radio Vlaanderen, Belgium	<a href="http://www.brtn.be/rvi/">http://www.brtn.be/rvi/</a>
CBC Radio, Canada	<a href="http://www.radio.cbc.ca/">http://www.radio.cbc.ca/</a>
Channel Africa, South Africa	<a href="http://www.sabc.co.za/units/chanafr/index.html">http://www.sabc.co.za/units/chanafr/index.html</a>
Deutsche Welle (English), Germany	<a href="http://www.dw.gmd.de/english/index.html">http://www.dw.gmd.de/english/index.html</a>
KTBN	<a href="http://www.tbn.org/home.html">http://www.tbn.org/home.html</a>
KBS, South Korea	<a href="http://kbsnt.kbs.co.kr/">http://kbsnt.kbs.co.kr/</a>
Monitor Radio International, USA	<a href="http://town.hall.org/radio/Monitor/index.html">http://town.hall.org/radio/Monitor/index.html</a>
Radio Australia	<a href="http://www.abc.net.au/ra/default.htm">http://www.abc.net.au/ra/default.htm</a>
Radio Austria International	<a href="http://www.ping.at/rai/">http://www.ping.at/rai/</a>
Radio Budapest, Hungary	<a href="http://www.eunet.hu/radio/index.html">http://www.eunet.hu/radio/index.html</a>
Radio Denmark	<a href="http://www.mi.aau.dk/rdk/english.html">http://www.mi.aau.dk/rdk/english.html</a>
Radio Finland	<a href="http://www.yle.fi/">http://www.yle.fi/</a>
Radio for Peace Int'l, Costa Rica	<a href="http://www.clark.net/pub/cwillkins/rfpi/rfpi.html">http://www.clark.net/pub/cwillkins/rfpi/rfpi.html</a>
Radio France International	<a href="http://193.107.193.136/rfi1.html">http://193.107.193.136/rfi1.html</a>
Radio Japan	<a href="http://www.ntt.jp/japan/NHK/">http://www.ntt.jp/japan/NHK/</a>
Radio Netherlands International	<a href="http://www.rnw.nl/rnw/">http://www.rnw.nl/rnw/</a>
Radio New Zealand International	<a href="http://atlantis.actrix.gen.nz/users/rnzi/">http://atlantis.actrix.gen.nz/users/rnzi/</a>
Radio Norway International	<a href="http://nrk.hiof.no/utenland/">http://nrk.hiof.no/utenland/</a>
Radio Sweden	<a href="http://www.sr.se/rs">http://www.sr.se/rs</a>
Radio Canada International	<a href="http://radioworks.cbc.ca/radio/services/rci.html">http://radioworks.cbc.ca/radio/services/rci.html</a>
Swiss Radio International	<a href="http://www.srg-ssr.ch/SRI/index.html">http://www.srg-ssr.ch/SRI/index.html</a>
Vatican Radio	<a href="http://ftp.funet.fi/pub/dx/text/schedules/Europe/Vatican.sch">http://ftp.funet.fi/pub/dx/text/schedules/Europe/Vatican.sch</a>

for North America during a particular hour, even though a transmission was being broadcast on two or more frequencies. Listeners to the west of Alabama were finding that the listed frequency was not the best for their location. This shortcoming was corrected in June '95 when an alternate frequency began appearing in the program guide.

### ■ A Very Big Signal

WEWN's output is notoriously wide and strong, easily overpowering foreign stations unfortunate enough to be on (or near) adjacent channels. Although the station has been publicly criticized for its wide bandwidth, there is little evidence that any improvements have been made.

### ■ In Conclusion

Simulcasting seems to work satisfactorily in the WEWN style of TV broadcasting, since most programs are of the talk-show variety. Programs which suffer from the lack of video seem to be of the type involving a live audience.

There is no question that there are tremendous savings involved in the rebroadcasting of television programs as shortwave radio programs since the audio is already available. There are no signs that the practice of simulcasting will lose favor as long as the cost-benefit ratios remain at their current levels.

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## DX Tests - what, why, and when?

I hope you have noticed the DX Test listings, which formerly appeared towards the back of each issue of *MT* and are now a sidebar to American BandsScan. You may have wondered exactly what they are, and why they deserve the space they get in the magazine. I made brief mention of DX Tests back in April, but now that we're at the peak of the DX season, it's time to go into more detail.

Section 73.72 of the FCC regulations reads, in part:  
"73.72 Operating during the experimental period.

(a) An AM station may operate during the experimental period (the time between midnight and sunrise, local time) on its assigned frequency and with its authorized power for the routine testing and maintenance of its transmitting system, and for conducting experimentation under an experimental authorization, provided no interference is caused to other stations maintaining a regular operating schedule within such period.

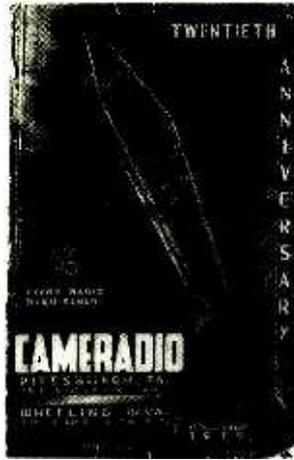
(b) No station licensed for 'daytime' or 'specified hours' of operation may broadcast any regular or scheduled program during this period."

Most AM stations are licensed for more power, or a different directional antenna pattern, during the day than at night. Adjustments to the night antenna pattern, or the lower night power, are usually made after midnight and require no special authority from the FCC. But without 73.72, these stations would be required to make the adjustments to their day pattern or power during the day. These adjustments would probably interrupt service—not a desirable situation either for the station or its listeners. 73.72 allows stations to make these adjustments after midnight. The "No station... may broadcast any regular or scheduled program..." clause ensures any operation in this period is strictly for test purposes.

A DXer could catch enough stations simply by listening for stations doing regular maintenance during this period. But luckily for the hobby, tests of distant reception are regarded as an acceptable use of the experimental period, too. This is a DX Test.

Those new to AM DXing may wonder, what's the point? If I can't hear KLMNO-530 at 9 pm, they aren't going to come in any better at 1:30 am! As we all know, AM

*Here's a station most of us won't need a DX Test to hear! The photo may have been taken in 1939, but this tower was still in use at KDKA-1020 Pittsburgh until about a year ago.*



stations carry further at night than during the day. We rely on this fact for most of our DX. But for the same reason, the potential for interference from a given station to "normal" listeners is greater at night. To reduce this interference, the FCC requires most AM stations to use directional antennas after sunset. These antennas beam most of a station's power away from other stations on the same frequency (and, unfortunately for the US/Canadian DXer, out into the oceans!). A New York station licensed for 5,000 watts full-time may, at night, have an "effective radiated power" of 25,000 watts over the Atlantic Ocean—and 30 watts in the direction of Philadelphia.

Many stations are also required to reduce power at sunset, some to as little as one watt. And a few others aren't allowed to operate at all after sunset. Many stations authorized for very low night powers voluntarily choose not to operate at night.

Because of this, there are many stations you'll never hear under ordinary conditions. Either their night "effective radiated power" is too low, their night "real power" is too low, or they simply aren't on the air at night.

The experimental period authorized by 73.72 offers a solution. During this period, a station can use its daytime antenna and power. In virtually all cases, these facilities will produce a much stronger signal than the night facilities.

### ■ Anatomy of a DX Test

DX Tests are generally produced by the engineers who run them. If you know a broadcast engineer, you know we have rather divergent tastes—which means you should expect

the unexpected! DX Tests generally include lots of station IDs. Often, IDs in Morse Code and/or phonetics are included; these special IDs can be more legible under noisy conditions. Some stations will transmit test tones or special, easily identifiable noises! Finally, a common part of a DX Test is distinctive and unusual music. One station, testing last March, used the theme songs of several old TV shows.

These tests generally run 30 minutes. In a few cases, the station will switch between daytime and nighttime facilities, providing a dramatic demonstration of the value of a DX Test! If you stumble across something that sounds like one of these tests, grab a pencil and paper and write down everything you hear. Stations running tests are expecting to hear from you, and they're much more likely to provide a QSL for an accurate report.

### ■ 1600-1700 kHz notes

A couple of things have happened to the expanded AM band in the last few months. First, the list of expanded band stations in April *MT* is now obsolete. (Darn; it looked final and official at the time!) Many broadcasters were very unhappy with the list, for a variety of reasons. Most expressed surprise at the small number of stations authorized to move. Under pressure, the FCC has agreed to generate a new list. The process is rather lengthy. A custom computer program is used to optimize the band, determining which allocations reduce overall interference the most. This program requires over a week to run! Don't expect any licenses for the expanded band until spring 1996 at the earliest.

Second, there *may* be one station in the expanded band by the time you read this. Kevin John Klein of Appleton, Wisconsin, sent an item from *Radio World* regarding WJDM-1530 Elizabeth, New Jersey. A special law signed by President Bush in 1989 ensured WJDM first place in line for an expanded band frequency, as Elizabeth is the largest city in the U.S. without a nighttime AM station. Now, it's reported that WJDM has been granted special authority to move to 1660 kHz, beginning in October.

On the other hand, I've seen information on the Internet to the effect that this was a premature announcement, and WJDM will have to wait for the rest of the expanded band

allocations. Please let us know if you hear WJDM on the new frequency.

**■ Odds and Ends**

• The FCC has now officially recognized DX! A Commission news release sent by *FM Atlas* publisher Bruce Elving reports some excellent tropospheric conditions in the Caribbean. In July, the FCC office in San Juan, Puerto Rico, began receiving numerous complaints of interference to WKAQ-TV channel 2 from viewers in Orocovis and Naranjito. English-language audio and Miami-area commercials were overriding the WKAQ-TV signals. Commission engineers concluded the source was WPBT-TV Miami, whose signals were carried into Puerto Rico by a tropospheric duct. TV DXers in South Florida should keep an eye on the dial; this kind of propagation works both ways, making it possible to receive Puerto Rican stations in Miami.

• Bob Ferrey, Jr. of Allison Park, Pennsylvania, enjoyed the September article on tower-hunting tips. Bob sent the cover of the 1939 *Cameradio* catalog, depicting the 718-foot tower of KDKA-1020 Pittsburgh. The tower is described in the catalog as weighing 60 tons; the pull of the six guy wires adds another 20 tons. A 10-inch porcelain base insulator was used. (Bob mentions the insulator was replaced once—I'd love to have seen how that was done!) Each face of the tower is 5-1/2 feet wide. This tower was still in use until mid-1994, when it was dismantled and replaced.

• Patrick Griffith in Denver mentioned another tip for hunting AM towers. He parks within 1/4 mile of the suspect tower, then removes the radio antenna from his car, puts the "DX/Local" switch on the car radio in "Local," and puts the radio in "scan." Almost always, it will only stop on the frequency of the station on the nearby tower.

By the way, the tower-hunting article has proven quite popular; I've received more mail on it than anything else I've written. If you have any unusual broadcast towers in your area, I'd appreciate hearing about them. Write me at Box 98, Brasstown NC 28902, or via the Internet at 72777.3143@compuserve.com. Good DX!



*KRKS's AM station on 990 kHz was on the expanded band list, moving to 1640. Recent FCC action leaves the future of the expanded AM band in doubt.*

**DX TEST BULLETIN**

These special test broadcasts provide a unique opportunity to hear and identify the following stations. If you hear their broadcasts, please let the engineer know at the address provided.

**Sunday, Dec 3** - HCJB-690, Casilla 17-17-691, Quito, Ecuador, will conduct a DX test between 1-1:15am EST. The test will include Morse code IDs and "other unique items." Correct reception reports will be verified with a special QSL card. According to the station, *if you hear code, you must report exactly when you heard it and what characters you heard.* Tape recordings OK, but cannot be returned. Please include one International Reply Coupon or first class postage in U.S. or Canadian stamps for a reply. Send to: Mr. Rich McVicar (HC1JMN), Frequency Manager, Attn: 690 DX test, c/o English language service, HCJB. (Arranged by Rich McVicar for the benefit of all DXers.)

**Monday, Dec 4** - WIXN-1460, 1460 South College Avenue, Dixon, IL 61021, will conduct a DX test between 1:30-2:30am EST. The test will include voice IDs, test tones, TV themes, and Morse code IDs. The first 30 minutes of the test will be run using a directional pattern, and the last 30 minutes will use a nondirectional pattern. Send reception reports to: Mr. Mark Baker (WB9YOE), Chief Engineer.

**Monday, Dec 11** - WPWA-1590, 12 Kent Road, Aston, PA 19014, will conduct a DX test between 12-12:30am EST. The test will include Morse code IDs. Send reception reports to: Mr. Lloyd B. Roach (K3QNT), President.

**Sunday, Dec 17** - WGDN-1350, 3601 West Woods Road, Gladwin, MI 48624, will conduct a DX test between 12:30-1:00am EST. The test will include Morse code IDs. Send reception reports to: Mr. Ralph Haines, Engineer.

**Monday, Dec 18** - WCGW-770, 3950 Lexington Road, Versailles, KY 40383-1742, will conduct a DX test between 1-1:30am EST. The test will include test tones, Morse code IDs, and assorted music. Prepaid phone calls will be accepted during the test at (606) 245-1770. *No collect calls, please.* Send reception reports to: Mr. Tom Mulvaney (KR4BD), Announcer.

**Monday, Dec 18** - WVLC-590, PO Box 1559, Lexington, KY 40592, will conduct a DX test between 2:30-3:00am EST. The test will include tones, Morse code IDs, and march music. Send reception reports to: Mr. Tom Devine, Chief Engineer.

**Saturday, Dec 30** - CKGY-1170, Bag 5339, Red Deer, AB T4N 6W1, Canada, will conduct a DX test between 2-4:00am EST. The test will include voice IDs, Morse code IDs, and country music. Send reception reports to Mr. Ron Thompson, General Manager.

These tests were arranged by J.D. Stephens for the International Radio Club of America Courtesy Program Committee (PO Box 1831, Perris, CA 92572-1831, USA); 32 cent stamp (US\$1 or 1 IRC overseas) for sample bulletin.

**SKIPPING IN**

George Knight recently logged these stations, among others, in Garfield, New Jersey:

- ?-530 Bergen Co. Police Radio, Paramus, N.J.
- WCKL-560 Catskill, N.Y.
- CKLW-800 Windsor, Ontario
- WWVA-1170 Wheeling, W.Va.
- WXXI-1370 Rochester, N.Y.
- ?-1610 N.J. Turnpike Authority Construction Info Radio

If you receive any DX Tests - or DX in general - please let the rest of us know! Send your loggings to Box 98, Brasstown, 28902

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## Exciting Monitoring Afoot

**T**he next year is going to be an exciting time for scanner listeners. For starters, there are the upcoming presidential elections. Then there are the Olympics to be held in Atlanta next summer.

At the time of this writing there were one hundred fifty people and one dog registered with the Federal Elections Commission for the Office of the President. A great majority of the people, and most likely the dog, will not get Secret Service protection in their upcoming presidential election bid. However, the field will be narrowed down to two or three people who will receive protection by the United States Secret Service.

Though all manner of frequencies have been reported to be assigned to the candidates, the frequencies used are the normal Secret Service Baker-Charlie-Mike-Tango assignments found in practically every Secret Service walkie talkie.

BAKER	165.7875
CHARLIE	165.3750
MIKE	165.2125
TANGO	164.6500

If you live in an area that does not have normal assignments, then you will have to look for the local field office on other channels. For example, San Diego uses 165.6875—also the reported frequency for the Washington, DC, field office.

When Jimmy Carter was running for President, there was a frequency in the 148 MHz band used by his support personnel in addition to the Secret Service channels. As the Republican candidate is announced, and even a possible third party candidate is chosen, there will be other such frequencies assigned. These will be reported as they are located with the help of our readers around the country.

### ■ Following the First Candidate

When the President comes to town, whether it's on a campaign trip or not, the advance teams will show up a week or so earlier, and other radio channels will come to life. The most common frequencies used are:

NOVEMBER	166.7000
OSCAR	164.8875
SIERRA	166.5125
WHISKEY	167.0250

WHISKEY is a digital paging channel, and is a good indicator that the advance teams

are in town. Other channels reported are 418.175 and 418.650 MHz, assigned to the Department of the Treasury. The advance teams are composed of Secret Service, Uniformed White House Police, and White House Communications Agency personnel.

Once the President is in town, watch for motorcade and helicopter flight radio traffic. The limousines use the following radio configuration: BAKER, CHARLIE, MIKE, TANGO, SIERRA, and YANKEE/ZULU. The YANKEE/ZULU is a digitally encrypted link from Air Force 1 to and from the limo. YANKEE is used from the limo to the airplane and is 162.6875 MHz. ZULU is used from the airplane to the limo and is 171.2875 MHz.

SIERRA has been reported as the White House Communications Agency Command post. There are reported satellite links of ALPHA—which is used as a downlink from the satellite on 262.050 MHz. The reported uplink is BRAVO and is 295.150 MHz.

The US Marine Corps Executive Flight Detachment is based at Quantico, Va. The Presidential helicopter is identified as Marine-1 when the President is on board. The callsign "NIGHTHAWK" is also used when the helicopter is used as air support when the President is traveling in the limousine. The NIGHTHAWK frequencies reported are 46.70, 46.75, and 46.80 MHz.

President Clinton recently visited Miami

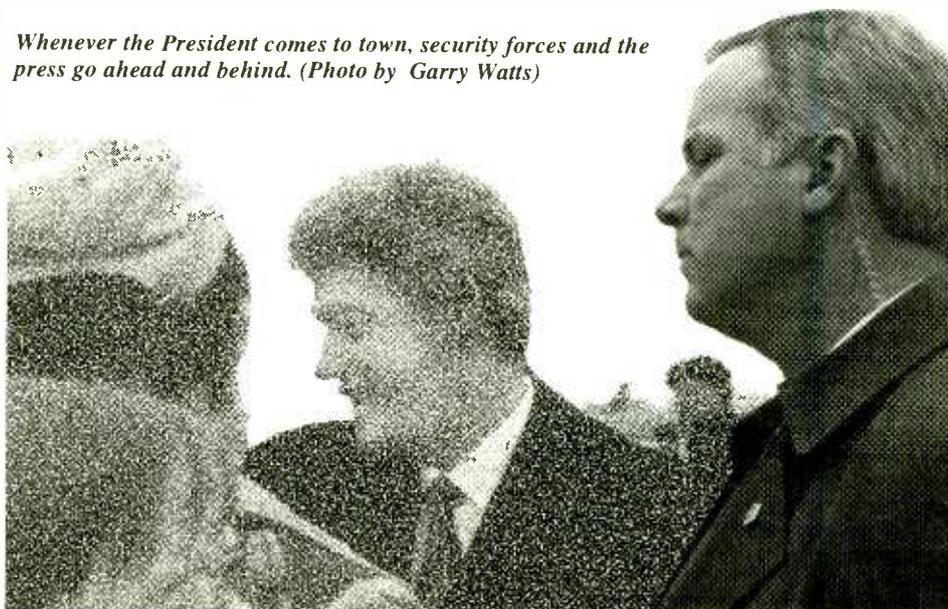
and the helicopter was heard on 46.70 MHz talking to ground units. The frequency of 265.800 MHz is assigned to the Marine Squadron Command and is a good one to monitor. The frequency of 375.000 has been reported as an intercom channel between NIGHTHAWK and Air Force 1. The helicopter is also outfitted with Secret Service radios on the channel plan of B-C-S-T-Y/Z.

When the helicopter is docked it is guarded by a Marine Corps guard. They are using the frequency of 169.9250 MHz. One, rather out-of-the-way channel to monitor is the local tower frequency. When President Clinton visited West Palm Beach, there was very interesting traffic on 119.10 MHz in the clear. The Secret Service channels were encrypted.

Once the Presidential aircraft, designated Air Force 1, has arrived with the President on board, the radio telephone traffic will increase. The aircraft has been heard using Secret Service channels C-Y/Z-B-E/F. The E/F is the Echo/Foxtrot pair. They are Echo on 407.85 MHz, which is ground to air. It is paired with FOXTROT on 415.7 MHz, which is air to ground. This pair, and its associated traffic, has been reported in previous columns, so we will not dwell on it. The 415.7 MHz frequency should be in every scanner. There is a reported channel of 407.475 (ground) and 415.800 (air), but it has never been heard.

A charter aircraft always accompanies the

*Whenever the President comes to town, security forces and the press go ahead and behind. (Photo by Garry Watts)*



President with the press corps onboard. The unofficial intercom channel between this aircraft and AF1 is 129.525 MHz. The Secret Service advance teams have been reported communicating with the press corps on 166.250 MHz and 170.150 MHz. These channels are not federal frequencies, but are assigned to the remote broadcast section of the spectrum.

Local police will be used for Presidential and candidate coordination with the Secret Service. It will be good to keep the local tactical channels plugged in the scanner. As an example, when President Clinton visited South Florida recently, the Secret Service channels were encrypted, as would be expected. By monitoring the local sheriff's department patrol channel (154.725 MHz) and the aircraft tower frequency (119.1 MHz), a monitor really did not need the Secret Service channels.

### ■ Monitoring the Rest of the Field

With non-incumbent candidates, there will be usually Secret Service protection along with their own, previously-mentioned staff frequency. One thing to remember is the proliferation of the Specialized Mobile Radio systems, referred to as SMR's. These are the trunked systems that are in every major community.

An advance detail will show up in town, go to the local radio shop (usually Motorola), and rent as many radios as they will need. When the visit is over, the radios will be turned back over to the SMR shop, and this scenario will occur in the next town. Watch for 800 MHz antennas at any type of presidential candidate speech.

### ■ Foreign Visitor Protection

Protection details aren't limited just to US dignitaries, and they can also show up on any frequency. These channels can be assigned federal channels such as Secret Service or Department of State, local SMR 800 MHz trunked channels, or something out of the blue. At the Atlanta Hilton, the guest banquet speaker at the Grove Communications Expo was Joe Adamov, a legendary figure from Radio Moscow/Voice of Russia. Being a Soviet citizen and a diplomatic, though unofficial, representative of his country, it is possible he was assigned a protection detail for his visit.

Federal monitors in residence at the Hilton challenged themselves to find the federal frequency, and soon located some likely radio traffic at 415.6250 MHz. All traffic was in the simplex mode. Could it have been

a federal protection detail?

Not being a visiting head of state, Secret Service protection would not likely be used. A check of the data base shows that, officially, 415.625 MHz is assigned to the Department of Transportation/Coast Guard, Health and Human Services, especially the Center for Disease Control in Atlanta. The Department of State - Office of Security main channels are in the 408/409 MHz band. This sort of rules out Department of State. FBI? Possibly, but the traffic was not encrypted and there were no security personnel with the look of FBI agents. If one of the intelligence services, such as CIA Office of Security, Department of Defense, or one of the other three-letter agencies was involved, you never can tell where their traffic will show up. Maybe they did; maybe they didn't.

The lesson is, whenever you go to public events, get a look at the radios. Start with that. Don't even discount the business band.

With the upcoming Olympic games to be played in Atlanta in 1996, security is becoming very evident. One of the scenarios being planned for is that of nuclear terrorism. On a television show known as *Behind Closed Doors*, host Jill London did a segment on the Nuclear Emergency Search Teams, also known as NEST. These are the federal government bomb squads. The program was mildly informative, with the most interesting topics not shown "for national security reasons." (On the other hand, the Discovery Channel ran a show taped at the Pantex, Texas, nuclear plant on how the hydrogen weapons are taken apart. Very little was blacked out—only the "physics package." So much for national security.)

What made the *Behind Closed Doors* segment of interest was what it showed about the organization and communications equipment used by the NEST teams. NEST exhibits strong military overtones, although it is a branch of the Department of Energy. During the show, a practice situation was enacted, which also involved the Explosive Ordinance Disposal (EOD) team, along with civilian technicians and scientists.

Here is the scenario: A "package" was hidden in the City of New Orleans. The operation involved close interaction between the FBI and the DOE units. The radio equipment shown was impressive, including Motorola MX series, digitally encrypted radios. Vehicles used in tracking the "package" were filmed traveling the streets with the equipment they had on board. Two antennas on the roof of the vehicles were observed: one a VHF antenna and the other a UHF antenna, most likely in the 406/420 MHz band judging by the length of the antenna.

The NEST team has VHF frequencies assigned to it, so what was the UHF antenna? No NEST frequencies are reported in the UHF band. Could it be UHF coordination with the FBI? There are only two DOE UHF assignments—412.7500 and 413.8500 MHz, both simplex—and they are assigned to the Federal Energy Regulatory Commission. Those people check out nuclear reactors; they don't look for "devices."

NEST has the following VHF frequency assignments:

149.2200	150.4500	164.0250
164.1000	164.1750	164.2250
164.2750	164.3750	164.4000
164.4750	164.5250	164.6750
164.7000	164.7750	

Don't mistake the frequency of 149.2200 for a walkie-talkie frequency. It is one of the uplink channels for the ATSI/ATS3 satellite groups. The associated downlink is 135.600. The satellites sit in a geosynchronous orbit. ATSI is not in use, but ATS3 still is operational. Look for it around 108 degrees West. Although it is not known if the satellite link is still used by NEST, the ATS satellite is in daily use, DEA being one of the primary users.

You might want to check out the military 240/270 MHz satellite downlink band. These was a 250 MHz antenna set up and pointed skyward in the background during an interview during the NEST exercise.

As already mentioned, some Motorola MX series radios were clearly evident. Examination of the video tape, frame by frame, shows what look like 800 MHz antennas on some of them. Does NEST have 800 MHz frequencies we do not know about? There are some DOE allocations in the 930/950 MHz band, but they are point-to-point links in Nevada and some other DOE installations. Come to think of it, NEST is headquartered—in Nevada.

The Department of Energy also has some high frequency links. They are (kHz):

3336	5309	5752	7701	8015
9919	11556	14657	17398.	

During any NEST exercise—whether practice or, heaven forbid, real—the FBI frequencies and the Federal Emergency Management Agency (FEMA) frequencies will come into use. Remember, FEMA is basically run by the US Army.

Most likely any FEMA operation will be heavily encrypted. If you happen to hear encrypted DOE/NEST channels, encrypted FBI channels, and encrypted FEMA channels, you might want to consider that something is going on. And yes: NEST has established an operations center in Atlanta.

## San Francisco Air Tower

**W**elcome aboard on your way to the happy holiday season! Here's hoping you get that scanner or receiver you've been drooling over all year. We have a treat for you as well—a tour of the San Francisco International Airport Air Traffic Control Tower (ICAO designator, SFO). Your *Plane Talk* editor was accompanied on the tour by Carolyn Stone (ARINC), her son Harrison Wheeler, and his roommate Mark Goens—both of whom are employees of Southwest Airlines.

To the average tower visitor, the view of the hills of San Francisco from the tower is a magnificent sight to behold. However, for those who work here, the foremost objective is not the panorama of the surrounding area, but the safe and expeditious movement of aircraft inbound and outbound to the airport, as well as those on the ground.

Thirty-one controllers are employed at the SFO Tower: seven each on the day and evening shifts, and two on the mid-watch, seven days a week, 365 days a year. With up to 1200 aircraft movements in a 24-hour period, this is a very busy ATC facility.

We were pleasantly surprised to find that the manager of the SFO Hub of towers is our old friend, Tom Parks. Tom used to be Air Traffic Manager for the Indy Tower/Tracon and then moved to the Indianapolis Air Traffic Control Center, where *Plane Talk* featured him in several interviews. After a couple of years in New York, Tom relocated to San Francisco, and assumed his present duties three years ago.

During our visit to the tower, we watched as the controllers gave out a steady stream of instructions directing an almost constant flow of aircraft—and yet, we were informed that this was a relatively “quiet” period of the day!

With the aid of a unit which displays the airport and surrounding area, as well as by direct viewing out the window, the controllers kept domestic as well as foreign aircraft—not to mention the freight carriers, military, and general aviation flights—moving in and out of their gates and bays, onto and off of the runways, and performing takeoffs and landings in an almost choreographed manner. There are approximately 39 airlines which serve SFO, on both a regular and limited basis.



Above, Tom Parks poses in the SF tower with visitor Carolyn Stone

The day watch supervisor, keeps a close eye on tower operations.

SFO does not have an approach and departure facility of their own; instead, they utilize a tracon known as Bay Approach/Departure. Similar to the metropolitan New York area, the San Francisco Bay area contains quite a few airports within a relatively small region (SFO, OAK, etc.) Consequently, to avoid the confusion and potential safety problems that would ensue if every airport had their own radar facility, Bay Approach/Departure controllers handle the portion of an aircraft's flight from a few minutes after takeoff until it's ready to be handed off to the Center. When a flight is inbound to an airport in the area, the Center hands it off to Bay Approach/Departure, who then will turn control over to the destination airport's tower on final approach.

Frequencies for SFO Tower are as follows:

ATIS:	118.850,	135.450
Ground:	121.800 (West)	124.250 (East)
Gate Control:	124.250	
Tower:	120.500/269.1, 128.65	
Clearance Delivery:	118.200	

Bay Approach/Departure Control freqs include:

135.650/350.800
135.400/354.100
127.000/398.900
135.100/307.200
120.900/323.200
132.500
134.500

After we toured SFO ATC Tower, we made our second visit to the Oakland Center. Our guide this time was Larry Clark, Air

Traffic Control Specialist in International Operations. Larry showed us through the area where controllers work the Domestic Sectors, as well as the Oceanic Operations which we featured in the February '95 column. He explained to us that Oceanic Ops will be moving to a new floor which is presently under construction. We'll report more on that later after the move and new equipment is installed.

Thank you, Tom Parks and the controllers at SFO, who made our visit both educational and interesting. Thanks also to Larry Clark; we appreciate your time in giving us the Oakland tour.

### ■ Scanning in St. Louis

Since I had to change planes in St. Louis coming and going from San Francisco, I decided to make good use of the time waiting for my connections by using my handheld scanner to collect some frequencies for the column:

ATIS:	119.925
Approach (N\E):	120.050, 123.700,
(S\W) -	126.500
Clearance Delivery:	119.5
Departures (S\W):	118.950, (N\E) - 119.150,
	120.050, 124.900
Ground:	121.650, 121.900
Tower:	118.500, 120.050
Security:	453.400, 465.021,
	465.037, 465.062

As TWA has both a hub here and is home-based in St. Louis as well, their frequencies predominated the bands. Here are some of them:

129.625, 129.775, 129.900, 130.625, 130.975, 460.675, 460.725, 460.750, 460.800, 460.825, 460.850 461.750

### ■ Book Review

If you only buy one book for your monitoring post this year, *World Air Carrier Radio Callsign Directory* by Bill Battles (2nd edition) should be the one! Its value lies in the fact that not only will it be of help to the beginning monitor, but it also has loads of info and topics for the more experienced listener, too. With an additional 60 pages over the first edition, sharper page layout, easy-to-read print, and spiral-binding so that the book lays flat on your desk, this writer has found it be the most informative aero comms monitoring handbook to date—hands-down!

A look at the table of contents reveals an expanded listing of worldwide air carrier callsigns; separate listings in alphabetical order by callsign *and* by their ICAO 3-letter identifier; all MWARA HF freqs worldwide; photos; new sections on monitoring Antarctic flights and Concorde flights; the reorganized Military Aero Bandplan frequencies; airline addresses; Medevac, Airevac and search-and-rescue comms, space communications; and much, much more.

The cost of the book is \$31.75 plus postage—a steal, believe me. W. J. Battles Enterprises accepts checks or money orders in U.S. funds for domestic addresses; shipping is via 3rd class. Elsewhere, payments must be by international bank cheques or money orders payable in U.S. dollars only. All orders from outside the U.S.A. will be shipped by air mail.

For more information, write to W. J. Battles Enterprises, P.O. Box 133, East Kingston, NH 03827-0133, USA. Don't miss this opportunity to obtain a copy!

### ■ Woops!

One very important detail I inadvertently left out when we were discussing basics for new monitors in October's column: When you buy a new scanner or shortwave rig, the most important first step is to **read the instruction booklet!** I think that applies to new and experienced listeners alike!

### ■ Readers' Corner

An anonymous reader sent us a fax with a correction on one of Concorde's frequencies from the August column. It seems that I quoted

a frequency not normally used for the route of flight which takes the Concorde along the southern portion of Moncton Area Control Centre's Flight Information Region, i.e., QM's control area. The reader states: "When a westbound Concorde flight is transferred to Moncton ACC by Gander ACC, it is normally assigned to frequency 133.700 MHz that covers the southeastern portion of Moncton's airspace. Midway along the Sierra Mike track, internal control transfer is affected between geographical control sectors and the aircraft is assigned frequency 135.200 (normally) which controls the southwest portion of Moncton's airspace. Prior to exiting Moncton's airspace, the aircraft is handed-off to Boston ARTCC as the common control boundary between Moncton and Boston control Centres."

"Eastbound Concordes are normally transferred to Moncton's ACC's control by New York ARTCC (oceanic sector) on frequency 133.700 (sometimes 132.750)."

"Plane Talk's reference to frequency 128.700 is in error in this case. This is a Moncton ACC frequency, but it is located at Schefferville, Quebec (approx 54°50" North, 66°45 West) near the northern extremities of Moncton's airspace. Line-of-sight characteristics of VHF frequencies plus physical sectorization within Moncton ACC makes this frequency 'out of the question.'

(However,) "Over the past couple summers, Concorde has been flying into Toronto's Pearson Airport (CYYZ). (*Probably charterflights-jb.*) The flight track of the aircraft in this situation is north and no way near the SM, SN, or SO tracks mentioned. It is along **this** northern track that Concorde utilizes 128.700." *Readers - any comments?*

- Ernest T. Bagley, Sr. (Maine) sends frequencies from the Portland, Maine. International Jetport: Approach/Departure-south: 119.750, North: 125.500; Tower: 120.900; Clearance Delivery: 121.650; Ground Control: 121.900.

- An anonymous employee of Burlington Air Express Hub at Toledo (OH) contributes the following: 129.950 - ARINC Company Frequency; 462.175 - Facility Radio (Operations Control).

Toledo (TOL) Express Airport: 118.100 - Tower; 118.750 - ATIS; 121.750 - Clearance Delivery; 121.900 Ground; 126.100 Approach/Departure; 128.000 - Departure/Approach; 134.350 - Approach; Air Transport International - 130.900; American International Airways (Connie Kalitta) - 131.750.

### ■ LDOC Frequencies

Larry Van Horn considerably contributed

the material for Plane Talk for me in the June issue since I had been in hospital and unable to get to a computer. Thanks, Larry! Just for fun, I decided to track down some of the LDOC frequencies he'd listed and came up with quite a few. We'll run some in each column for the next several months.

- 3007: Boyeros (Cubana Airlines); Meriden, Mexico City, Tijuana - Aeromexico; Hong Kong (DragonAir); Manila-Philippines Air; Seoul - Korean Air; Bombay - Air India; Sydney- Qantas; Bangkok - Thai Airways;
- 3497: Speedbird London (British Airways); Air Malta
- 4687: Seoul - Korean Air; Tokyo - Japan Air; Amsterdam - KLM; Frankfurt - Lufthansa; Rome - Alitalia; Warsaw - LOT Colombo- Air Sri Lanka; Perth, Sydney - Qantas
- 5538: Kinshasa - Air Zaire; Muscat - Gulf Air
- 6643: Berne (Bern Radio); Dusseldorf - LTU
- 6646: Algiers - Air Algerie; Grand Cayman - Cayman Air
- 8927: Entebbe - Ugandan Airlines; Nairobi Aeradio; Lagos-Nigeria Airways; Jeddah - Saudi Airlines
- 10033: Tunis - Tunis Air; Muscat - Gulf Air
- 11348: Iran - Tehran Aeradio; Moscow & Boyeros - Aeroflot
- 11351: Manila - Phillipines Air; Beijing Aeradio; Budapest-MALEV

That's all for this month. Next column, we move to a monthly, one-page format, but we still hope to cover airport and city codes (which tend to confuse even the most experienced traveler and monitor); LDOC freqs; and software. Until then, 73 and out.

## THE BECKER 2340 IN-CAR SOUND SYSTEM

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## SCPC Radio Listening on a Budget

**T**he question asked most by readers is, "Why can't I pick the right lottery numbers?" The second most-asked question concerns reception of Single Channel Per Carrier transmissions on satellite. Everybody wants to listen to the enormous number of radio stations and audio services which exist on transponders that appear to be otherwise unused. Just imagine: you can listen to the U.S. Naval Observatory MasterClock, tune into the Wal-Mart in-store network, monitor the Wisconsin Voice of Christian Youth, and hundreds more.

### ■ SCPC In a Nutshell

So, what exactly is SCPC and why is everyone so interested in it? The interest is because it's RADIO, and when it comes down to basics, we are all radio buffs. SCPC is simply a method of transmitting the audio signal to the satellite for reception by receivers on the ground.

We'll skip the techno-mumbo-jumbo and give you the Crayon sketch instead. Satellites have transponders which are like mirrors (or repeaters) in that they receive and send back radio signals which are sent up. Half of the transponder is vertically polarized and the other half is horizontally polarized, thus making two channels per transponder. Most of our domestic broadcast satellites have 12 transponders. Using the polarization technique, the satellite now has 24 channels.

Each channel is usually 36 MHz wide. Even allowing for guard bands there's still lots of room on each channel for a number of options. First we could opt for a video channel and a good number (say, three or six) of wideband audio subcarrier channels. Or, we could have no video and allow instead an even better number—say, 20 or 30—narrowband audio carriers.

SCPC signals are different from audio subcarrier signals in two important ways. They are much narrower in bandwidth, and they do not depend on the video carrier to "carry" them to the satellite—hence the term Single Channel Per Carrier. I know what you're thinking: "Well, who cares? How do I receive this stuff?"



### ■ Going Shopping

OK, if you have the bucks I urge you to rush out and buy a genuine consumer grade SCPC receiver from any number of sources (not the least of which is Grove Enterprises, where the Universal SC-100 sells for \$399). Commercial grade SCPC receivers will be 2-4 times as expensive. Of course, you'll still need the dish, drive, and LNB to make it useful. But, unless your short-term memory has been wiped clean, you'll recall that the title of this month's column is "Getting SCPC Cheap" or something to that effect. Anyway, let's see what we can do to get SCPC signals into your house as cheaply as possible.

First, always maintain a close and friendly relationship with your local satellite dealer. This is because dealers are always taking in older receivers and other gear in trade for new. After a while the stuff really starts to pile up in the back and they are often eager to get rid of gear they're not going to sell. Most of the gear can be had for \$25 to \$100, depending on the features and whether or not there's anything wrong with the equipment.

I've gotten some terrific buys, such as a 6-foot mesh dish with mount for \$75, a basic receiver for \$25, and an armload of positioners, receivers, and feeds with something wrong with them for free. Don't forget that there are "orphan" dishes out there whose owners have just gotten on the DBS bandwagon or who for some other reason are just hoping someone will come up their driveway and ask to take it away for a nominal charge.

With a little patience and careful shopping around you should be able to buy a used dish and used LNB/feedhorn for \$100-\$200.

*I've added an SO-259 connector to the back of my Portavision 50. This was done out of sheer necessity, the whip antenna having been unceremoniously busted off the radio. I chose this type of socket because this radio also picks up VHF from 108 to 174 MHz; by plugging a Radio Shack telescoping center-loaded whip (configured with a 90 degree elbow and BNC/259 adapter) into the socket I can monitor local repeaters and the NOAA weather broadcasts. You may choose to use a standard 75 ohm chassis socket with much less "plumbing" involved.*



*Connections on the back of a Uniden 5000 70 MHz loop to the TV band radio.*

### ■ Buying It New

In the event that you must resort to buying a new dish you should be able to have a nice 6-foot mesh dish with polar mount and quad feed support delivered for about \$250. Dishes with AZ/EL mounts (which stands for Azimuth/Elevation) are about \$50 cheaper, but they are not as versatile as polar mounts. Because they are intended for single satellite reception, they do not track the Clarke Belt. Even if you start out thinking that you want a stationary single satellite system, you'll eventually want to add an actuator to move the dish around—impossible with the AZ/EL mount.

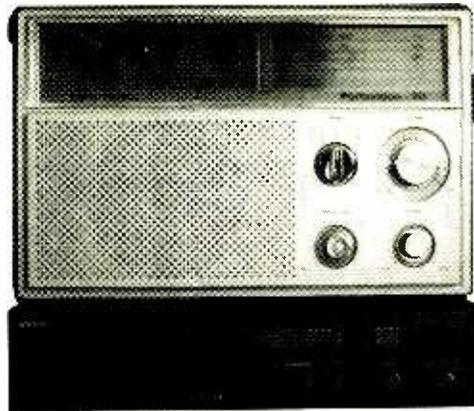
You will, of course, need a feedhorn; the new LNBFs at \$150 for a 30 degree feed will do nicely. I always recommend getting the direct burial all-in-one cable even if you aren't initially starting out with an actuator or additional Ku feed. The reason is that at \$.80 per foot this is not a place to scrimp. In addition, as you add an actuator motor or a Ku feed you'll be glad you have already laid the cable. (It's not a job you'll want to do more than once.)

### ■ Putting It All Together

Now, for anywhere from \$200 to \$500 you have the basics for whatever satellite reception you'd like to do. If you decide you want a fancy, brand new IRD with all the bells and whistles, you can just buy it and hook it up. If you are still in the Miser Mode this is where you hook up your \$25 satellite receiver and turn the dish to one of the satellites which carries a lot of SCPC traffic.

The reason I recommend the old, used receivers is that most of them have a set of jacks on the back which are joined by a short piece of coax cable and labeled "70 MHz loop," "TI filter In/Out," "Accessory Loop

*The Portavision 50 TV band radio sits atop the diminutive Uniden 5000 satellite receiver. Made ten years ago, this is a barebones receiver which can be bought for less money than the TV band radio. Without a dish positioner, remote control or stereo subcarrier tuning this was originally designed as a "slave" receiver for a location in the house remote from the main satellite receiver.*



Through," or something similar. The original purpose of the loop was to add future accessories such as terrestrial interference filters. It was discovered early on in the TVRO hobby that connecting a scanner or TV band radio capable of tuning 15 or so kHz either side of 70 MHz would receive most of the SCPC signals on that satellite channel. (You should note, however, that not all such loops are 70 MHz. Some receivers, for reasons known only to their manufacturers, chose a frequency for which an ersatz SCPC receiver will be hard to find.) Among the newer, early-

90s receivers which have a 70 MHz second I.F. loop are: Channel Master 6442 Plus; Chaparral Monterey 30, 50, and 90; the General Instrument series IRDs; and Tee-Comm Startrak 8 Plus. Drake receivers use 140 MHz; Echostar uses 480 MHz, as does HTS Tracker 4, 5, and 9, and Panasonic's PS-300ST and the Uniden 4400. The Uniden 4800 uses 130 MHz; STS SR-300 uses 134 MHz. Zenith's 2500 and 700XL have no second I.F. loop.

Using a standard TV splitter and a couple of short pieces of 75 ohm coax cable, connect the output of the loop to the input of the splitter. Feed one leg of the splitter back to the loop input on the satellite receiver. Attach the other leg to the antenna of the TV band radio. It's not necessary to make a special connection, but you will get better results by making some more permanent modifications to the radio.

#### ■ Picking A TV Band Radio

Any portable TV band radio will work with this method, but there are some things to bear in mind. Avoid the pocket-style TV band radios, as they will make tuning the SCPC signals much harder. Besides, you'll want something you can plug into the wall. You'll find that you have it on quite a lot and dead batteries will start piling up in short order.

Radio Shack makes a good AM/FM/TV portable (catalog number 12-687) for \$39.99. It's similar to the Portavision 50 pictured in this article. Radio Shack associate stores may not carry this product. While you're at the

Shack you can pick up the splitter (RS Cat. #15-1141) and two lengths of coax (RS Cat. #15-1515).

An easy way to attach the coax to the TV band radio is to put an indoor/outdoor matching transformer (RS Cat. #15-1140) on the end to be attached to the radio. Attach the spade lugs to a TV/FM antenna clip (RS Cat. #15-832) and clip it to the unextended TV band radio whip antenna. You may have to experiment with wedging an insulator like a little piece of cardboard or foam between one of the clip sides and the antenna for best reception results.

#### ■ The Ultimate Test

Now that you have everything set up, make sure the satellite receiver is on an SCPC channel (such as Galaxy 4 channel 3), turn on the portable radio, set the bandswitch to the TV band, and slowly start tuning up the band. You will hear a number of test tones, and programming from NPR, the BBC, and a host of other sources.

Right away you'll notice a couple of things. First, not all SCPC signals are of the same strength. This is because some transmissions are wider bandwidth and easier for your radio to tune. You'll also notice that some signals appear to be right on top of each other. This is because the TV band radio isn't as selective as a real SCPC radio. The analog style tuning won't separate the signals the way a Phase Locked Loop (PLL) receiver would.

And another thing: you'll notice the fidelity isn't exactly what you've come to expect from FM radio. The reason for this is that the transmissions are sent up with a certain amount of compression, a technique whereby larger audio bandwidth is crammed into a smaller transmission bandwidth. And, finally, you'll notice that the signal is not stereo. As you tune around you'll find what appear to be identical but duplicate signals of the same source. This is usually the left and right channel transmissions. To receive stereo you'll have to use two such receivers and a different splitter.

There is no way to compensate for the

shortcomings of this method of SCPC monitoring. However, you'll find that the variety and breadth of audio sources coming in from all over the world may bring back that thrill you had the first time you tuned the shortwave bands. For a complete listing of SCPC services and frequencies found on the C and Ku band satellites get the latest issue of *Satellite Times* (see elsewhere in this magazine for ordering information). Here, two full pages of tiny little print are devoted to SCPC listings. You will be astounded.

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## A Visit to "Old CC"

If you keep an ear to the longwave or shortwave marine bands, you've almost certainly heard the call sign "WCC" being pounded out in Morse Code at one time or another. This Cape Cod powerhouse is especially well known to utility monitors in the Northeast U.S.

Much less is known about the accomplishment of WCC's predecessor, "Old CC." It was at this longwave station in South Wellfleet, Mass., that the first two-way radio contact was established between the United States and England on January 19, 1903. Charlie Paine, a delivery boy at the station back then, captured the excitement well in his first-hand description:

"All of a sudden...I see Marconi come tearing out of the plant with both hands full of white tape. He was just like a crazy man. He carried verification that the message had been received."

Interview with Charlie Paine, "Old CC" employee. *My Father Marconi*, 1962.

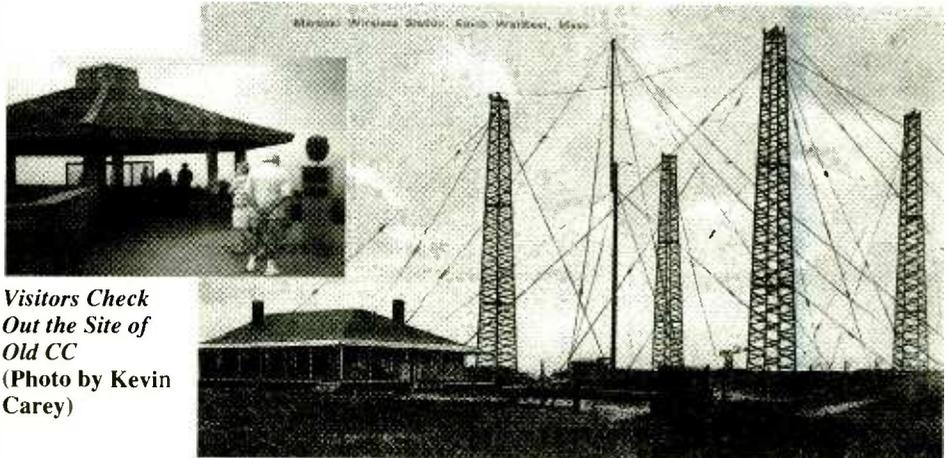
There's not much left of Old CC today—just a few chunks of brick wall, and some pieces of timber that were used to anchor the station's guy wires to the beach. Although the station has been silent for many years, a visit to the site tells you that something very special happened there.

In recognition of Old CC, the National Park Service has established a historic shelter at the site. It houses a detailed model of the station, interesting story boards, and a bronze figure of the station's founder, Guglielmo Marconi.

### ■ The Early Days

Radio was a new and mystical medium in 1903. It had been just over a year since the Morse letter "S" (...) sent from England, was received in Newfoundland—December 12, 1901. And it had been only a month since the first two-way exchange between the England and Marconi's station in Glace Bay, Nova Scotia.

A goal of even greater proportions remained, however, and Old CC was ready to meet the challenge: a successful two-way transmission between England and the United States. The distance of this test would be



Visitors Check Out the Site of Old CC (Photo by Kevin Carey)

### If you go...

If your travel plans take you near Cape Cod, be sure to check out the historic site of Old CC. It is located along Route 6A at Wireless Road in South Wellfleet, MA. The entrance is marked by a large National Park Service sign. No admission is charged.

3000+ miles. The South Wellfleet location of Old CC was ideal, because it offered an unobstructed path between the two countries.

The historic contact began with this 48-word greeting from President Roosevelt to King Edward the VII:

HIS MAJESTY EDWARD VII  
LONDON  
ENGLAND

INTAKING ADVANTAGE OF THE WONDERFUL TRIUMPH OF SCIENTIFIC RESEARCH AND INGENUITY WHICH HAS BEEN ACHIEVED IN PERFECTING A SYSTEM OF WIRELESS TELEGRAPHY I EXTEND ON BEHALF OF THE AMERICAN PEOPLE MOST CORDIAL GREETINGS AND GOOD WISHES TO YOU AND TO ALL THE PEOPLE OF THE BRITISH EMPIRE.

THEODORE ROOSEVELT  
WELLFLEET, MASS JAN. 19, 1903

From the Marconi station in Cornwall, England, the King returned the following message to South Wellfleet:

THE PRESIDENT  
WHITE HOUSE, WASHINGTON,  
AMERICA

I THANK YOU MOST SINCERELY FOR THE KIND MESSAGE WHICH I HAVE JUST RECEIVED FROM YOU THROUGH MARCONI'S TRANS-ATLANTIC WIRELESS TELEGRAPHY. I SINCERELY RECIPROCATE IN THE NAME OF THE PEOPLE OF THE BRITISH EMPIRE THE CORDIAL GREETINGS AND FRIENDLY SENTIMENT EXPRESSED BY YOU ON BEHALF OF THE AMERICAN NATION AND I HEARTILY WISH YOU AND YOUR COUNTRY EVERY POSSIBLE PROSPERITY.

EDWARD R. AND I.

### ■ CC's Technical Side

Old CC's specifications are still impressive today. The station operated on 1500 meters (200 kHz) and used a power level of 30,000 watts. The operating voltage for the station came from two kerosene-driven gen-

erators which were connected to a Tesla transformer. The transformer in turn supplied 20,000 volts to the transmitter.

Spark transmitters of that day typically had a harsh, low-pitched note that was difficult to separate from atmospheric noise. To deal with this problem, the designers of Old CC employed a 3-foot spark rotor with 240 studs along its edge. The studs passed a stationary point at the rate of 240 per second. The result was a near-CW quality note that was much easier to hear in the presence of noise.

Old CC's spark gap was four inches wide. It produced a crashing sound that could be heard four miles downwind from the station. The spark was so massive that compressed air jets had to be blown into the spark gap in order to minimize contact burning, and to secure a clean break when the key was released. (An early form of backwave prevention!)

### ■ The Antenna

The antenna system at Old CC may have been America's first "skywire." It consisted of four wooden towers 210 feet high and

spaced 200 feet apart. They were mounted on concrete bases measuring 30 feet square and each tower was secured to the beach with 12 guy lines.

The main antenna wire connected to the tops of the towers forming a large square. From this main wire, over 200 lead-in wires were attached and sloped downward to a centerpoint at the transmitter building. This gave the antenna a funnel-shaped profile.

The importance of an earth ground was well known in 1903, but because of the difficulty in obtaining an adequate ground in sand, a buried counterpoise (radial) system was used—a scheme still used today with most vertical antennas.

### ■ 19 Years of Change

From its start in 1901 until it was finally dismantled in 1920, Old CC enjoyed a rich wireless history. Beginning life as "CC," the station's call sign was eventually changed to "MCC," reflecting its ownership by Marconi Telegraph Co. of America. Eventually, the call sign was changed to "WCC," when transmitters on the East coast were issued the prefix "W." A timeline of important events in the life of Old CC appears in Table 1.

What caused the demise of Old CC? In researching this question, I found three main reasons.

- 1) At the outbreak of World War I, the U.S. Government shut down many coastal stations, and that included the operations at Old CC.
- 2) The invention of Dr. Lee De Forest's vacuum tube was making low frequency spark transmission obsolete. As the higher frequencies were explored with this new technology, it was found that they were not "useless" for long range work, as had previously been thought.
- 3) The ocean itself dealt the final blow to Old CC. As early as 1906, Marconi's engineers warned of significant bank erosion that threatened the antenna towers. The erosion continued, until, finally, the two eastern towers crashed into the Ocean.

"The huge towers, the roar of the old spark gapper, and the excitement of wireless contact with some distant listener are gone for ever from the dunes of South Wellfleet."

*Marconi and his S. Wellfleet Wireless*, Cape Cod History Guide, 1969

Old CC is long gone, but we owe a great deal to the engineers and operators of this station, who, in many ways, contributed to the refinement of the radio art, both from a tech-

nical standpoint, and also by proving to the world that radio was a viable alternative to landline telegraphy.

### ■ WCC Update

Today, MCI Communications runs WCC remotely from its facilities in San Francisco, California (at Station KPH). Although its operations are linked to the West Coast, the traffic lists for WCC and KPH are independent from one another. For the time being, you can still catch WCC transmitting on longwave (436 and 500 kHz), but its future remains uncertain. With the increased use of satellite transmission, WCC's days could be numbered.

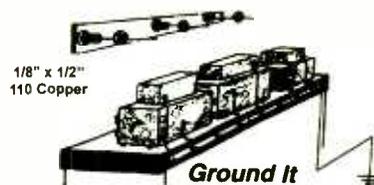
### ■ Credit

I want to thank Bruce Kelley, Curator of the Antique Wireless Museum (AWA) for providing valuable research material for this article. This material, along with a personal visit to the site, laid the groundwork for this story. Thanks also, to Jim Navary, Editor of the *Nautical News* column for the Worldwide Utilities Network. Jim provided updates on the modern-day WCC.

## TIMELINE OF EVENTS AT OLD CC :

- 1901 Construction begins. Cape Cod location chosen to give signals a clear path to England
- 1901 Major storm destroys the station's first antenna system
- 1902 Station rebuilt with simpler 4-tower array
- 1903 First trans-Atlantic two-way contact between England and the United States
- 1906 Marconi's Engineers warn of significant bank erosion at the station
- 1912 On-duty operator hears distress call from the sinking Titanic, April 14
- 1917 U.S. Government shuts down CC and many other coastal stations for wartime security reasons
- 1920 Station officially closed and dismantled
- 1961 Site acquired by the National Park Service
- 1963 Marconi historic shelter dedicated by the National Park Service

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## Holiday Stocking Stuffers

**B**ooks endure long after the gift giving is over. While not exactly ham radio, *Big Ear Two* is an exciting look into the beginnings of radio astronomy and the antenna that detected the edge of the universe. *Big Ear Two*, by John Kraus W8JK, is priced at \$14.95 in paper back or \$24.95 hard cover, postpaid, from Cygnus-Quasar Books, PO Box 85, Powell, OH 43065.

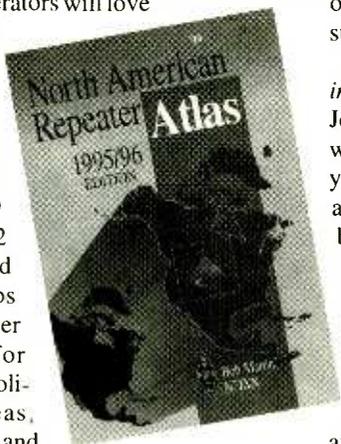
Another book by John Kraus, also available from Cygnus, is *Radio Astronomy, 2nd Edition*. This book provides the reader with a basic understanding of radio astronomy. With 430 illustrations and 410 pages this text will provide the reader with many hours of pleasure for \$39.95.

The following books are available from ARRL 225 Main St., Newington, CT 06111; 203-594-0200. Enquire for shipping charges before placing your order; most ham radio outlets also carry these books.

VHF FM operators will love the new *North American Repeater Atlas*. For ten dollars this handy reference lists repeaters from 29 MHz through 1.2 GHz. Included are street maps showing repeater frequencies for most US metropolitan areas, subaudible tone, and autopatch capability. There are repeater maps for every state and Canadian province, as well as Mexico, Central America, and the Caribbean.

An entertaining book that may pique the interest of younger or non-ham readers is Cynthia Walls' *Easy Target*. The setting is the Pacific Northwest where something is killing gray whales on their migration. Kim, the heroine of the story, sees too much while on a ham radio outing and becomes the target of drug dealers. Price is \$5.95.

For the newcomer to electronics, *Understanding Basic Electronics* provides a good starting point. The text leads the student through basic math and into the workings of various electronic components. Price is \$17.00



The *ARRL Operating Manual* is a must-read for all new hams. The wealth of information about operating will ease the way for the novice and open the eyes of the one who thought he knew it all. Price is \$22.00

A second publishing group that provides hams with a lot of good books is "CQ" magazine. You can order the following books from them by phoning 1-800-853-9797 or request their catalog on books and videos.

CQ features two buyers' guides. The first is the *Beginners Guide to Amateur Radio*. This manual gives the new novice info on buying gear, setting it up and getting started. Price is \$5.95. Also at \$5.95 is the *Equipment Buyers Guide*. Most major manufacturers of ham gear are featured, and loads of info on such things as installing towers, DXing, and SSTV.

K4ABT, Buck Rogers, *Packet Operating Manual* is the best of its kind and packed full of info that will help the new packeteer get started. Price is \$15.95

My latest favorite is the manual on *Building and Using Baluns and Ununs*. Author Jerry Sevick, W2FMI, has packed this manual with transformer theory and designs, tells you how and where to use the transformers, and gives full building info on all types of baluns and ununs—a real bargain at \$19.95.

**Software:** If there is a computer in the ham shack, chances are that some good ham software will be appreciated. My choice for the hamshack log is "LOG EQF": this program is so simple to use the average ham will have it running in minutes. It works with all major callsign databases to print QSL labels; it will run computer-ready rigs and TNC's; and it has databases included for DXCC, WAS, and beam headings. A CW keyer is built in and it runs packet cluster. Best of all is the price—only \$30.00 direct from EQF Software, 396 Sautter Drive, Coraopolis, PA 15108, or phone 1-800-995-1605.

A nice database is AmSoft's "World of Ham Radio." This CD includes all US and VE callsigns as well as many DX countries. Included on the CD are 20,000 software files, over 1,350 radio mods. Adding to the variety are thousands of images of lost or missing children, the latest

space photos, and thousands of SWL frequencies. At \$39.00 it's a fantastic bargain from AmSoft, POB 666, New Cumberland, PA 17070, or phone 717-938-8249.

ELNEC is a program for antenna builders and experimenters. There are many sample files included with ELNEC to help you get started. Price is \$49.00 from Roy Lewallen, W7EL, POB 6658, Beaverton, OR 97007.

**Equipment:** What ham wouldn't like a good hand key? Bencher Inc. sells an excellent straight key. The key has individual locking adjustments for arm height, tension and contact spacing, oil impregnated pivot bearings, and non-skid rubber feet. Phone 7018-238-1183, or write Bencher, 831 Central Ave, Wood Dale, IL 60191 for latest prices.

BayPac from Tigertronics is a small, easy-to-use packet TNC that features simple installation, no external power, and smart dog timer for only \$49.95. I highly recommend it for anyone looking for a TNC. Phone 800-8BAYPAC.

One last item in the gift bag is an ATV downconverter from Communication Concepts Inc, 508 Millstone Drive, Beavercreek, OH 45434. I have been playing around with their ATV-3 converter (420 - 450 MHz). The kit (\$40.95, or \$69.95 wired and tested) went together in a single weekend. The first signals were two stations within ten miles of home having a good rag chew on TV! Since then I have viewed several QSOs via a repeater about 45 miles distant and simplex out to 25 miles or so with a very simple 450 10-element quagi.

That's the best of my wish list for the holidays, gang. I have used all of the above during the past year and feel confident you will be happy with any of them. Happy Holidays, one and all. 73 de Ike, N3JK



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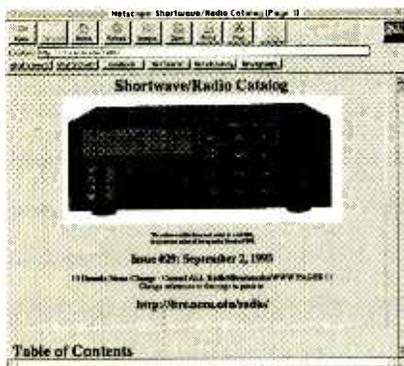
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## Radio Links

For years, people have been adding and adding to the already massive world of the Internet. A few sites stand out for recognition because of the time and the effort that was put into them. The following are worthy of particular notice because of their devotion to the radio and communication hobby. To the gentlemen and ladies who created these pages we say, "Job well done."

Links to the pages mentioned below can be found at [www.grove.net/netnews.html](http://www.grove.net/netnews.html). If you are using a WWW browser like NetScape, just type that address into the URL line, and it will bring up links to the sites featured each month in "Net News."

**The Internet Guide To International Broadcasters**, compiled by Thorsten Koch, is a step in the right direction for users wondering where to start finding radio-related information on the WWW. "The intention of this WWW page is to give a directory to the Internet's users who are in the (especially: shortwave) broadcasting business" states Mr. Koch. "How can I email station xxx? Where can I find schedules?" are questions that are well answered on this page. Links include not just the stations and the broadcast information, but also links to the home pages of shortwave/scanner companies on the WWW.



One of the best overall sites I have seen is the **Shortwave Radio Catalog** at North Carolina State University. This page is impressively designed and laid out, as well as containing up-to-date and pertinent information right off the home page. Categorized by topic, this list of links and information keeps you informed on the latest radios and radio-related sites. In addition, there is a

sizable amount of satellite information, with not only frequencies and sites, but also a Satellite Dictionary, with a fact sheet on every satellite that has been launched.

On the other side, radio enthusiast Clay Irving, N2VKG, has come up with an impressive page devoted to FAQs (Frequently Asked Questions) and links for **topics involving scanners**. From the latest laws to the oldest scanners and even the most up-to-date shuttle frequencies, Mr. Irving's home page is full of useful information for the hobbyist and expert alike.

Lastly, if you are interested in the "darker side" of scanning, you must tour to **Chris Smolinski's Radio Page**. This page has all the information you need on spy number stations, pirate radio stations, and even sources of equipment for a pirate station! Smolinski's page, like the others, is also linked to many other radio sources (including a source for radio-related Macintosh software), to lead you to whatever information you are looking for. Whether it is satellite, shortwave, scanner, or just general radio, you can find many things of interest on all of these pages.



These are the best links for this month; keep sending those sites to me to make the following months even better! If you find an interesting site, please email the URL to [bill@grove.net](mailto:bill@grove.net) and I'll check it out! Happy hunting!

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## Iranian Clandestine Loses Funding and Goes Silent

**T**he Voice of Human Rights and Freedom for Iran, a longtime Middle Eastern clandestine voice, ceased broadcasting on October 1. DXers have long suspected that the station, formerly known as **Iran's Flag of Freedom Radio**, was sponsored by the USA. The end of the United States government's fiscal year was precisely correlated with the clandestine's demise.

The first news of this major development came only two days in advance from Chris Greenway, the Foreign Media Editor of the BBC Monitoring Service, via *MT* reader and clandestine buff Ullis Fleming of Maryland. Greenway cited "an Iranian opposition source" who reported that a USA funding cutoff would cause the station to "cease broadcasting."

*MT* reader Harald Kuhl of Germany confirmed Greenway's scoop. Harald heard the station's final broadcast on September 30 at 1515 UTC on 9255 and 9270 kHz in parallel. Despite an undermodulated signal and co-channel jamming, he stayed with the transmission until 1700 UTC. On October 1 Harald found that this program had vanished. He noted no signal on their formerly common channel of 11470 kHz.

Greenway and BBCMS speculate that "it's possible that other US-funded clandestines may also cease operations or reduce schedules." Your tax dollars are no longer at work on this project.

### ■ Mexican Clandestines

Jay Murley, maildrop operator for the Mexican rebel clandestine **La Voz de Chiapas Libre**, reports that the station's transmitter "took a direct mortar hit from Federal fire in a skirmish in northeastern Chiapas this summer." In a news release to *Monitoring Times*, Murley said that this transmitter had been used mainly for "military radio traffic" instead of clandestine programming, thus accounting for its status as an extremely rare DX catch.

Murley now says that the station operated very occasionally on medium wave AM and near the 80 meter ham band, but that its clandestine shows aired "largely on the 39 meter shortwave" band. Jay reports that only eight reception reports were received via San Ysidro, CA 92143-4106. But, Murley has still failed to conclusively confirm that the station actually operated by providing date, time, and fre-

quency logging information from a broadcast.

While Chiapas Libre may be gone, other Mexican clandestines remain active on local FM frequencies. The September 6 edition of *Radio World* reported that five stations operate a weekend schedule on 90.1 MHz, including Radio Rebelde and Radio Liberacion in Chiapas, Radio Ciudadanos al Aire in Cuernavaca in Morelos, Radio Pirate in Plaza de Coyoaceln near Mexico City, and an unnamed station in Ensenada, Baja California. A sixth station, Radio Interferencia in San Juan Izhuatepec, uses 89.3 MHz to avoid local interference.

Noted radio author Harry Helms reports that the Ensenada station is inaudible in San Diego, but that because of mountainous local terrain, this is true of all FM stations from Ensenada. Thanks go to Harald Kuhl for forwarding the *Radio World* story to Brasstown.

### ■ Local FM Pirates

Every month we print plenty of unlicensed pirate loggings that are heard over long distances via shortwave. But, numerous local pirates continually pop up around the country on the FM broadcasting band. For instance, Robert Thomas of Bridgeport, CT sends in a *New York Daily News* account of **WJZR, Nasty Radio**, using 91.9 MHz in the New York metropolitan area. Paul Jablonowski of Greenfield, WI, sends a similar article from *Milwaukee Magazine* about **WTPS, The Pirate Station**, operated by Billy Stevens on 107.3 MHz in Milwaukee. It pays to tune around your local FM dial occasionally.

### ■ National Alliance On Web

A release from the National Alliance, producers of the semi-clandestine neo-fascist **American Dissident Voices** program on **WRNO** and several USA AM stations, says that they have joined the World Wide Web. You can contact their web page at <http://www.natvan.com> for additional information.

### ■ What We Are Hearing

Martin Thiel of Holiday, FL, asks for

advice on how to program pirate frequencies into a Sangean 803A receiver. As we see here with another bumper crop of over thirty different pirate intercepts submitted by our readers, 6955 kHz certainly should be a memory channel in any shortwave radio.

Christmas and New Years have often been the heaviest period of pirate activity that we see during the year, so if Santa places a new receiver under the tree, why not try it out on the pirate bands? Your pirate logs are always very welcome for this column c/o PO Box 98, Brasstown, NC 28902. Internet users can send them in via the E-mail address above. Times are in UTC, with frequencies in kHz.

Maildrop addresses used by pirate stations reported this month include PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 28413, Providence, RI 02908; PO Box 40554, Washington, DC 20016; PO Box 146, Stoneham, MA 02180; PO Box 17534, Atlanta, GA 30316; PO Box 293, Merlin, Ontario N0P 1W0; PO Box 3103, Onekawa, Napier, New Zealand; Ostra Porten 29, S-44254 Ytterby, Sweden; and Postfach 220342, D-42373 Wuppertal, Germany. Three 32¢ stamps should go in the envelope to USA addresses; \$2 US or two International Reply Coupons go to foreign drops.

**Altered States Radio-** 6955 at 0400. William Hurt's format is typical of pirates: rock music and comedy. They always sign off with audio from the "Outer Limits" TV show. Rob's QSL came in only two weeks! Addr: Merlin. (Pat Murphy, Chesapeake, VA; Robert Ross, London, Ontario; John Bellovich, Macclenny, FL; Isaac Kelly, Houston, TX; Dick Pearce, Brattleboro, VT; Jesse Rose, Hampton, VA; Michael Prindle, New Suffolk, NY; Randy Ruger, North Hollywood, CA; Barry Williams, Enterprise, AL; whew!)

**Bullfrog Radio-** 6955 at 2345. This rock music station has developed a relay relationship with Captain Ganja of **Radio Free Euphoria**. Addr: Wellsville. (Williams)

**Cell Block 13-** 6955 at 0100. This guy's test announcements have straddled the line between broadcasts and CB-style bootleg conversations. Steve has recently heard other unidentified examples of this genre. Addr: None. (Steve Wentzel, Montoursville, PA; Williams)

**Cosmic Space Radio-** 6955 at 2315. Unlike most Europirates with North American relays, this one supplements its rock music fare with theme discussions. Their **NAPRS** relay gave this one's ID as "Bill Cosmic Space Radio." Addr: Ytterby; use "SRS" on envelope, not station name. (Williams; Prindle)

**CSIC-** 6955 at 0100. Pirate Rambo's trademark "Psycho Chicken," Canadian rock, and pirate commentary have been with us throughout the 1990's. Addr: Blue Ridge Summit and Merlin. (David Chapchuk, Scranton, PA)

**East Coast Music Radio-** 6958 at 0045. The station's name accurately describes its programming. It generally transmits in AM, not sideband, mode. Addr: Wellsville. (Gayle Van Horn, Brasstown, NC; Williams; Prindle; Rose; Murphy; Pearce)

**Free Hope Experience-** 6955 at 0500. Major Spook plays rock music and features live discussions of two unrelated issues: UFO's and the FCC. Addr: None, but said would QSL logs in *ACE* and *Pirate Pages*. (Patrick Nobel, Eugene, OR; Kelly; Rose; Ruger; Williams)

**KDED-** 6955 at 0130. They say that despite Jerry Garcia's death, they will still program Grate'ul Dead music. But, their relays of other pirate stations have generated reception reports from Alaska, Alberta, and Argentina! Addr: Wellsville. (direct from the station via Kenneth Pendarvis)

**KNBS-** 6955 at 2330. Phil Muzik's veteran marijuana advocacy station has been more active lately. His "Fruit of the Loom News Briefs" have poked fun at goofy outdated local laws throughout this one's ten year broadcasting history. We see their current QSL here. Addr: Wellsville. (Chuck Hodell, Silver Spring, MD; Murphy; Chapchuk; Rose; direct from the station)



**CANNABIS SHORTWAVE**

KNBS is operated by The California Marijuana Cooperative to advocate the decriminalization of marijuana.

This will confirm your reception of KNBS

on 6953.4 kHz.  
at 0658-0100 UTC  
on July 30, 1995

The Station  
With Your Mind In Mind.



**KNBS**  
#205



**KAT-** 6955 at 2300. Their first show, which mixed eclectic music with funny comedy bits, received good reviews from DXers. They claim to transmit from a fraternity at the University of Wisconsin. Addr: None, but said would QSL logs in *ACE* and *PiPa*. (Paul Roales, Tulsa, OK; Van Horn; Williams; Pearce; Prindle; Murphy)

**KIWI-** 7445 at 0700. Graham Barclay's New Zealand station does not use local relays; this is the real thing from Oceania. Good catch, Jesse! Check for their weak but audible signal at least once a month around this time. Addr: Napier. (Rose)

**KTLA-** 6955 at 2100. Here's a new rock oldies station that plays tunes from the 1960's. Pat says that the announcer is "CJT." Addr: Providence. (Chris Lobdell, Stoneham, MA; Murphy)

**KVRT, Covert Radio-** 6955 at 0800. This new West Coast station was not logged in the East, but Patrick heard their first test broadcast on September 16. Captain Blackjack played rock music mixed with audio from old movies. Addr: None yet. (Nobel)

**Northern Music Radio-** 6955 at 2300. The rock on this Europirate, via North American relay transmitters, has a Scandinavian origin. Addr: Providence. (Rose)

**Outlaw Radio-** 6955 at 0115. The station management says that "Outlaw X (a different station) is totally unrelated (to us) and the similarity in names is purely coincidental." Gayle's QSL #29 arrived in 79 days. Addr: Providence. (Rob Keeney, Overland Park, KS;

Basil Shelley, Blythe, CA; Dennis Myhand, Mercedes, TX; Donald Tomkinson, Huntington Beach, CA; Van Horn; Murphy; Williams; Roales; Kelly; Nobel; Ruger; Rose; direct from the station)

**Primitive Radio-** 6955 at 0130. If you're tired of shrill radio programming, Holden Caulfield's rock music and poetry readings may be up your alley. Addr: Wellsville. (Rose)

**POLKA-** 6955 at 0315. In between the polka music, this new one features humorous interviews with farmers. They have also used 13900 kHz. Addr: Stoneham. (Shelley; Rose; Pearce; Kelly; Ruger)

**Radio Amazonia-** 6955 at 0200. KDED has added Europirate relays to its broadcasting schedule, including this one that programs rock and Spanish guitar tunes. Addr: Ytterby, "SRS" instead of station name on envelope. (Richard Peterson, Silver City, NM; Ruger; Myhand; Murphy; Rose; Williams; Shelley; Tomkinson; Prindle; Kelly; Roales; Pearce)

**Radio Doomsday-** 6955 at 0215. Nemesis has again announced his retirement from pirate radio broadcasting, but he's done this before. Addr: Wellsville. (Myhand; Pearce; direct from the station)

**Radio Free Euphoria-** 6955 at 0000. Captain Ganja has been working on his transmitter's frequency drift, although he advocates that listeners should let their minds drift. Addr: Wellsville. (direct from the station)

**Radio Free Speech-** 6955 at 0400. Bill O. Rights plugs open discourse and free radio. When he's on, he often transmits several short broadcasts during one evening. Addr: Wellsville. (Pearce; Murphy; Williams; Prindle; Van Horn; direct from the station)

**Radio Titanic International-** 6955 at 0200. This Europirate has a steady relationship with North American relay transmitters, so its rock music and Titanic ship short stories are frequently heard. Addr: Wuppertal. (Murphy; Shelley; Ruger; Rose; Williams)

**RBCN-** 6955 at 0145. Radio Bob's Communications Network still produces highly entertaining rock and comedy shows. Although it's highly unofficial, they have adopted the Grove Communications Expo, and are often active around convention time. Addr: Atlanta, no return postage necessary. (Murphy; Ross; Ruger; Pearce; Rose; Williams)

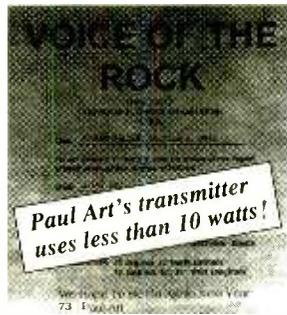
**RFM-** 6955 at 2300. H. V. Short's six year pirate career always has featured mellow rock/jazz songs with parodies of public service announcements. The call letters stand for Radio Free Massachusetts. Addr: Wellsville. (Frank Carson, Accokeek, MD; Ross; Murphy; Rose)

**Starshine Radio-** 6955 at 0200. Kim Hawk's Europirate slogan is "bringing you the good 'ol music on your good 'ol radio." He's heard here via North American relays, often **NAPRS**. Addr: Wuppertal. (Shelley; Rose; Roales; Kelly; Ruger)

**The Crooked Man-** 6955 at 0000. This guy's strangely compelling stream of consciousness monolog is weird but fascinating. He first appeared during the 1980's, but he's back. Addr: Washington. (Murphy; Williams)

**Voice of Helium-** 6955 at 0400. The gaseous theme on this new pirate combines classic rock and a clever mix of humor, including puns like "Propane" to the tune of "Cocaine." They claim to transmit from the stratosphere in New York. Addr: Blue Ridge Summit. (Rose; Prindle; Shelley; Williams; Murphy)

**Voice of the Orient-** 6955 at 2245. Dick seems to have been one of the very few to hear this new one's rock music and commentary on corporate control of broadcasting. It came from the Fox Broadcasting Group, which frequently develops new pirate stations. Addr: Blue Ridge Summit. (Pearce)



**Voice of the Rock-** 6955 at 2300. As we see here, QSL's have already arrived from this 10 watt experimental station that operated for hours from an island off the New England coast. They plan a similar broadcast for next summer. Addr: Providence. (Chapchuk)

**WREC-** 6955 at 0345. P. J. Sparx is among those rock music pirates who has been experimenting

with the Radio Animal "grenade" low powered and battery operated portable transmitter. He's had some success. Addr: Wellsville. (Rose; Shelley; Ross)

**WRV-** 6955 at 0130. Pete the Pirate's rock and hip hop music comes from "The Radio Virus, the station that nobody wants to catch." Addr: Wellsville. (Rose)

**WSKY-** 6955 at 0115. This very slick rock oldies station has reactivated after two years of silence, featuring live conservative political commentary from Doug Barley and Mike Richards. Addr: Wellsville. (Murphy; Rose; Prindle)

**UNDERSTANDING ACARS**  
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This new 92 page book by Ed Flynn is the definitive ACARS book for serious VHF aeronautical DXers worldwide. Third Edition.

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## Opto Cub

The price for frequency counters continues to shrink, and so does their size. According to Optoelectronics, their new pocket-sized Cub is small—just 3.7" x 2.75" x 1.2". It weighs only 7.5 ounces.

Opto says that the Cub is an improvement on the model 3300 mini-counter, used primarily in the test and measurement arena. They've added a digital filter to reduce false counts, auto capture to act as an intelligent auto-hold button, eight selectable gate times, and 9-digit LCD display for better visibility and longer battery life.

The Cub is \$144.95 plus \$7.50 shipping from Grove Enterprises (800-438-8155, or PO Box 98, Brasstown, NC 28902), or call Opto at 800-327-5912.

## Ramsey SS-70A Speech Descrambler

Ramsey Electronics has updated their popular SS70 Speech Descrambler Kit. The kit, which descrambles simple speech inversion scrambling (the type often used on cordless phones and in some under-funded police departments and which makes the speaker sound something like Donald Duck) is often used by hobbyists who want to—well, never mind. It's illegal to decode scrambled signals.

One of the troublesome things about the original SS70 was that there was no way to bypass the descrambler. It was "on" all the time. The new SS70A has a panel-mounted bypass switch. Additionally, the RCA jacks have been switched to mini phono plugs for input and output and the input is now switchable for line or speaker level (no longer an inter-



nal jumper). According to Ramsey, the price remains the same—\$39.95. For more information, write to Ramsey Electronics at 793 Canning Parkway, Victor, NY 14564 or contact your favorite dealer.

## QSL Cheat

A few years ago, a religious group started a shortwave station. It was a well-publicized start-up. They even offered a limited edition, numbered, QSL card. I wanted QSL card #1. I was willing to do almost anything to get QSL card #1.

I couldn't drive the reception report to the station—it would have taken 40 hours of non-stop driving, and someone living closer to the station might beat me. Airfare would cripple the wallet. So I settled on a compromise.

I monitored the station at their 0000 UTC sign-on, drove the reception report to the UPS hub a couple of towns over and at 0100, the reception report was on its way via Next Day Air. Bright and early the next morning, my reception report was on the engineer's desk. The brainstorm earned me the coveted #1 QSL—and an on-air censure on one of the DX shows. Using UPS Next-Day to send in a reception report, they claimed, was cheating.

So, I cheat. Here's another cheat, courtesy of a new service from multinational communications giant AT&T.

Say that you manage to wring a signal out of 5020 kHz and—behold—it's the Jiangxi People's Broadcasting Station. You want that QSL card. You send in your reception report and wait. Nothing happens. You send in follow up reports, stuffed with \$1 bills. Pictures of the family. All wrapped up in a neon-green envelope. Still nothing.

Want to know how to draw attention to your reception report? Call the station and speak

to the engineer in his native language—even if you don't know a word of it.

AT&T now offers a service called Language Line. All you do is call 1-800-462-4463, tell them the number you want to call and the language being spoken. An interpreter with "native fluency" comes on the line, places the call, and translates your words. According to AT&T representatives, interpreters are available in over 140 languages, 24 hours a day. And the price isn't too bad: \$4.15 to \$7.20 a minute plus the cost of the call and a \$2.50 service charge. You did say that you wanted that QSL, didn't you? The number to call is 1-800-462-4463.

## CB Buyer's Guide

We've been saying for some time that CB radio is poised for a comeback. Industry figures indicate that sales have been growing although there is some debate as to exactly who is buying the radios and what they're using them for. According to some, the good old days are back; according to others, the radios are being bought and put in the trunks of cars as a cheap form of emergency communications.

In any case, at least one big-time publisher has spotted this trend and come out with the first annual *CB Buyer's Guide*. CQ Communications, the people who publish *Popular Communications* and several other radio-related magazines, has produced an excellent 114-page guide to 11 meters. Included is information and specs on all of the latest rigs, tips from the experts, antennas, features, and more.

The 1995 *CB Buyer's Guide* is available at many newsstands and radio stores or direct from CQ Communications, 76 North Broadway, Hicksville, NY 11801. The price is \$3.95 plus \$2.50 shipping. Order toll-free 1-800-853-9797.

## \$12.00 Power for Radios

In recent editions of this column, we've discussed several new products designed to keep your shortwave, scanner, or HT running longer. The products range from special long-life batteries, to outboard battery chargers, to generators. Here's a simple solution that only costs \$12.

Edmund Scientific offers a wafer thin, high efficiency, 9 volt solar cell. According to Edmund, the unit can be mounted on the outside of your radio (it's only 1-1/2"W x 2-1/2"L x 1/16"T) and wired directly to the battery (leads are 2-1/2" long). So long as your radio is in light (the cell operates from normal room light to direct sunlight), your battery is charging.

To get your solar cell, order part E52,169 from Edmund Scientific at 609-573-6879. Their mailing address is 101 E. Gloucester Pike, Barrington, NJ 08007-1380. Tell them that *MT* sent you.

## AR8000 Leather Case

While the popular, new AOR AR8000 hand-held scanner comes with an outstanding variety of accessories, a protective carrying pouch is not one of them. Not to worry; Grove Enterprises has just introduced a heavy-duty, custom-made, black, soft leather



carrying case. Three separate clear windows allow access to the front and side keys as well as viewing of the display.

Rear slots permit use of the original belt clip or the pouch's own belt loop, while a bottom hole allows pushing the scanner out of its snug pouch if necessary.

The leather carrying case is \$29.95 from Grove Enterprises, PO Box 98, Brasstown, NC 28902; phone orders 800-438-8155. - BG

## Sun Clock

If you've been thinking about getting one of those desktop World Clocks to assist you in your DXing, you may want to check out Palo Alto Software's Sun Clock. Sun Clock loads into your computer—in either Windows or Macintosh versions—and graphically displays a world map with current time for up to 20 customizable sites. A night shadow moves realistically across the world map and changes



shape with the seasons—a great aid for predicting that grayline DX.

The price for Sun Clock is quite reasonable, too. It's just \$14.95. For more information or to order, call Palo Alto Software at 1-800-229-7526. You can see a demonstration of Sun Clock on Palo Alto's Home Page at <http://www.pasware.com>.

## New Guide to AM Radio

If you haven't put your hand to tuning the AM broadcast band lately, you may be missing some hot signals. Formats change. And

some stations go off the air, leaving "holes" for you to DX into.

Best of all, AM DXing does not require a lot of fancy equipment. But no matter what radio you use, you'll want a copy of the brand new 1995-1996 National Radio Club *AM Radio Log*.

This 16th edition of *The Log* contains over 310 pages with over 5,600 listings from the United States and Canada. Each listing consists of location, frequency, call letters, format, news network, station address, station slogan, day and night transmitter powers. There are even cross-references by city and call letter that help you identify those nagging, unidentified signals.

The price of the new 1995-1996 NRC *AM Radio Logbook* is \$22.95 postpaid. Send your check or money order to the National Radio Club Publication Center, Box 164, Mansville, NY 13661. Tell 'em that *Monitoring Times* sent you.

## Scanner Planner

The book is great, though the name sounds like a weight-control scheme from Richard Simmons. Nonetheless, *Scanner Planner* is in its third edition, so the name can't be doing too much harm.

Metro Concepts is the company that puts out *Scanner Planner* and it includes 300 pages of frequencies for Metro New York, New Jersey, and Philadelphia, plus portions of Connecticut and Delaware. Police, fire, military, aircraft, ambulance, forestry, federal, business, sports, casinos, colleges, universities, and 800/900 MHz trunking are listed.

The *Scanner Planner* is easy

to use, and virtually all of the frequencies listed are "live"—not

just another frequency dump from a government list. Each entry includes frequency, service, call sign, agency name, state, tone, and remarks. Order yours for \$21.95 check or money order (\$3 shipping/handling, N.J. residents add 6% sales

tax) from Metro Concepts/Scanner Planner, P.O. Box 74, Netcong, New Jersey 07857.

## Scan\*Star for Windows

Everyone, it seems, is doing Windows. And now so is Scan\*Star, a program for computer-aided radio monitoring. Signal Intelligence of San Jose, California, has solved the problem of poor scanning performance under Windows with a new technology that they call the Scanning Engine. By performing scanning functions from within the Windows 32 bit kernel, full performance is achieved, allowing you to enjoy high speed computer scanning and use your PC for other tasks at the same time.

Scan\*Star for Windows features blending of multiple search and scan groups together into a single scan program, tactical display for all in view picture, spectrum analysis (on the R7100, AR3000A, OS456, or OS535), PL/DPL/DTMF logging with the OS456/535 or DC440, scan or search by tone, alarms for high priority channels, data editor, browse and import from DBase files, concurrent scanning with up to ten radios, air time, hit count, log activity to disk or printer, and use of any serial port. Scan\*Star supports Windows 95, Windows 3.1 or Windows for Workgroups 3.11.

You can get a free demo by calling Signal Intelligence's BBS

at 1-408-258-6462 with your computer, or contact them directly at P.O. Box 640891, San Jose, California 95164-0891.

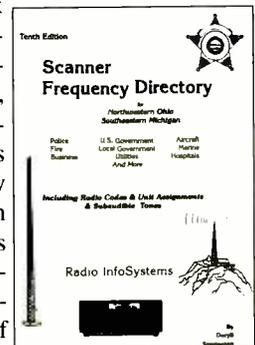
## Ohio/Michigan Freq Directory

Daryll Symington has just released his *Scanner Frequency Directory* for Northwestern Ohio and Southeast Michigan and parts of Canada. Sporting the usual "Tower on the Mountain Top" logo, this edition of the directory contains thousands of frequencies. As usual, the book is the standard 8-1/2" x 11" size, stapled in the middle.

New to this edition is the

Quick Reference section,

which answers many common questions about radio monitoring. If you live within the coverage area, this book is a must-have. If you want to know if you are in the coverage area, write to Daryll. His address is P.O. Box 399, Holland, OH 43528. The book is priced at \$12.95 plus \$3.30 UPS or \$2.30 USPS 4th class. Check it out.



## Photo ID Tags

If you're involved in ARES, RACES, SSC, NTS, or SKYWARN, you know how important identification can be, especially during an emergency. Old West Graphics has recently released their line of Photo ID tags. The tags are 2.25" wide by 4" high, heat-laminated with a 3" strap and lapel alligator clip, and feature the appropriate logo plus your photo. Wear one of these and you'll definitely stand out as a professional. Each tag sells for \$5.00 plus \$.30 shipping and handling; only official representa-

tives for local groups are eligible to place orders. If you're interested, write Old West Graphics, 749 S. Lemay, Suite A3-355, Fort Collins, Colorado, 80524-3259 or call 800-529-0959.

## Badge Guide

Scanner enthusiasts often become public safety buffs, many of whom collect patches and badges. Bill Mauldin, whose name is well known among scanning aficionados, has released *The State Police and State Highway Patrol Badge Guide*, an excellent collectors' guide to badges, listed state by state.

Nearly 200 badges are pictured with detailed accompanying text on how to recognize real issues from reproductions, along with pricing information for collectors.

*The State Police and State Highway Patrol Badge Guide* by William Mauldin, Major (Ret.) is \$15.95 plus \$3 shipping from William Mauldin Productions, 1010 Canonero Drive, Greensboro, NC 27410-3804.

- BG

## Packet with GPS

Advanced Electronic Applications' PK-96 dual speed 9600/1200 bps packet controller is now available with GPS firmware. The PK-96 also comes complete with PC PakRatt Lite, a packet DOS TNC terminal control software and APRS (Automatic Packet Reporting System) software.

AEA recently put GPS firmware in the PK-12, their 1200 bps packet TNC. The new firmware now in both units automatically detects if there is a GPS receiver connected to the TNC upon power-up. If one is detected, an initialization string is sent and the TNC is ready to work with GPS. The GPS commands can be remotely programmed for Stand-Alone Tracking Applications, allowing remote polling of units. The system can also be configured to transmit location information when a button on the radio is pushed.

Other features include time and date setting from the GPS receiver, remote programming of the GPS, and the ability to operate as a wide and relay digipeater.

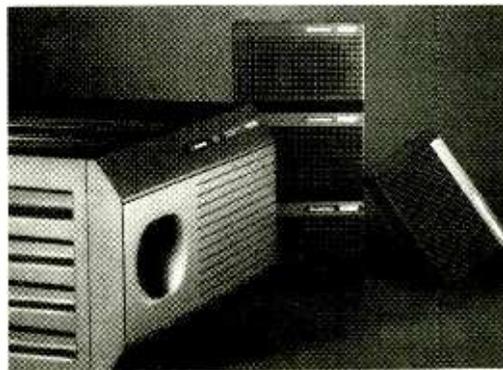
GPS firmware upgrades for early PK-96's and PK-12's are available directly through AEA for \$10 (free shipping). Call AEA's Upgrade Hotline at (206) 774-1722. The PK-96 and PK-12 packet controllers are available from amateur radio dealers or direct from AEA. For more information, call the company's Literature Request line at (800) 432-8873 or fax (206) 775-2340.

## Hearing is Believing

Audio-Technica has released their new home theater product, the CS2000. This complete home theater sound system includes amplifiers, subwoofer, left, center and right speakers, and a Dolby ProLogic decoder. With 160 watts of RMS power, this system fills even the largest room with real life sound. Simply connect it to your TV and stereo VCR to enjoy movie soundtrack quality sound.

The system is easy to set up, says Peter T. Sabin, Manager of Marketing Development. "The installation manual has only six steps and one of them says to take the system out of the box." The CS2000 includes a powered servo-controlled subwoofer with four powered speakers. The rear-channel speaker features a UHF receiver for wireless operation. Suggested retail price is \$599.95. Give Audio-Technica a call at (216) 686-2600 for more information.

### CS2000



## Digital Multitesters

Wavetek has announced two additions to their XL family of digital multitesters. The new handheld units are the DM30XL



### Digital Multitesters

and DM35XL for autoranging, DM16XL for extended functions and the CR50 capacitance/resistance meter. The DM30XL and 35XL feature 3200 count display, bargraph, Data Hold, Auto-Off to preserve battery life, diode tester and continuity beeper. They measure resistance to 30M ohm and AC/DC voltage to 600V. The pocket-sized DM16XL is a frequency counter which measures frequencies to 15 MHz and reliably tests capacitance, transistor gain and logic, plus resistance to 20M ohm. The CR-50 offers full range capacitance and resistance with zero adjust and features seven resistance ranges, 20 ohms to 20M ohms with a 0.01 ohm resolution and nine capacitance ranges.

All meters come with safety test leads and the XL meters include protective holsters, vinyl carrying cases and current probes. The meters come with a one year warranty. The SM16XL is

\$99.95, the DM20XL is \$79.95, the DM35XL is \$99.95 and the CR50 is priced at \$69.95.

Contact the Wavetek Corporation, Instruments Division, 9045 Balboa Avenue, San Diego, California 92123 or call (619) 279-2200 for more information or to order.

## Global TV News

Before the Information Superhighway, we relied on what some may call the Information Backroad (television news) to keep

us updated and in the know. Carla Brooks Johnston's new book *Winning the Global TV News Game* examines the worldwide TV news revolution of the 1990's as the industry pushes to stay in pace with other forms of information gathering.

Johnston offers the first publication to deal with live TV news as an industry-consumer relationship, where media professionals race to put new hardware in place, all in a struggle to win the TV news game. The book includes chapters on The Game and Its Players, Global Television News Agencies, The Consumers of Global TV News, New Programs, and more. *Winning the Global TV News Game* is \$44.95 from Focal Press, 313 Washington Street, Newton, MA 02158-1626 or call 800-366-2665.

*Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 300 S. Hwy 64 West, Brasstown, NC 28902.*

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#### Equipment Supported:

OS456, OS535, R7100, R7000, R9000, FRG9600, DC440, AR3000(A), AR8000, (EDCO, Opto & AOR I/F supported.)

#### System Requirements:

IBM PC 386/486/586 with 4 MEG ram, hard disk, VGA, mouse, serial ports. Windows 3.1 or 95. Cables and interfaces for radios may also be required.

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# Kiwa MW Air-Core Loop Antenna

By Larry Van Horn, N5FPW, MT Staff Writer

**M**ost listeners get started in the radio hobby listening to distant (DX) stations in the medium wave (MW) or broadcast band (BCB), and I'm no exception to this rule. In fact, over the last 30 years of radio listening I have never quit DXing the AM broadcast band. While I consider myself an ardent enthusiast of the utility bands in the shortwave spectrum, my favorite band to DX is still the broadcast band.

Over the years I have used a variety of antennas and receivers for broadcast band reception. Longwires, ferrite loop coils, and air-core loops (both commercial and homebrew) have graced my shacks over the years. All of these antennas have been used successfully to add to my station totals and AM BCB QSL collection.

Last year, while reviewing some technical literature I had received in the office, I discovered the Kiwa MW air-core loop antenna. Since the reviews of the Kiwa had been positive, I decided to purchase the antenna and use it during the upcoming AM DX season. After one complete DX season here in Brasstown the results have been nothing short of fantastic.

The Kiwa MW antenna is a high performance air-core loop antenna designed for 530-1700 kHz reception. The antenna has some special features that improve MW reception even in today's crowded broadcast band. The Kiwa loop features a fully balanced loop design that improves nulling ability and provides noise immunity. Electrically balancing the circuitry minimizes the pickup of electrical interference.

A regeneration control on the Kiwa is used as a variable bandwidth control. As the regeneration increases, the bandwidth narrows, and the gain also increases. This control can provide up to 75% bandwidth reduction as it is adjusted from minimum to maximum position. The antenna's electronics has an inherently narrow bandwidth to begin with, all of which helps reduce problems with strong signal splatter from nearby MW stations. If additional bandwidth and audio fidelity is needed, a local/DX preamp switch provides attenuation of strong signals in the "local" position while increasing the antenna bandwidth for improved fidelity.

The maximum -6 dB bandwidth occurs at the top of the band (1700 kHz). That bandwidth is typically 7.5 kHz or 15 kHz. The bandwidth narrows as the frequency decreases. At 650 kHz the -6dB bandwidth is approximately 6 kHz. The regeneration control typically provides a 70-75% reduction in bandwidth from those mentioned above.

One of the big advantages of an air core loop versus ferrite loop coils is the deep nulls obtained by the former. I have two local AM broadcasters (five kilowatts) within five miles of my shack. I am able to null both of these local stations completely, even when they are at full power during daylight hours. I have logged several stations in the null of these locals that I had not been able to hear on any other antenna in my shack.

Another advantage of the Kiwa over a lot of air core designs I have used is that the control surface is separate from the antenna, which makes adjusting the electronics much easier. On older loop designs, the tuning devices are located on the antenna itself. Given

**Specifications:**

Tuning Range: 530-1700 kHz continuous tuning using a main and fine tuning controls.

Regeneration: adjustable bandwidth control provides a 70-75% reduction in bandwidth from the minimum position.

Attenuator: adjustable from full sensitivity to an off position.

Outputs: two independent outputs capable of driving two 50 ohm receiver inputs simultaneously.

Output connectors mate with PL-259 coax connectors.

AC power: a 12 VAC @ 300 ma low-noise transformer provides the main power source.

DC power: a connection is provided for 13.7 VDC battery power when using the antenna in the field. Typical drain is 50 ma.

Antenna dimensions: Overall height 43 cm (17 inches), overall width 46 cm (18 inches)

Antenna coil dimensions: 32.5 cm (12.75 inches) in diameter

Total weight: (antenna, control surface, and power transformer) 6.3 kg (14 pounds)



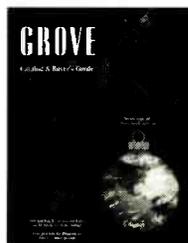
the null sensitivity that most air core loops exhibit, it is very easy to knock out all your careful adjustments of azimuth and elevation when you start cranking around on the tuning knobs of the antenna. This is not a problem on the Kiwa.

Most MW listeners are aware that turning a radio with a built-in loop antenna in azimuth can aid in nulling out a local station. But that is not the only axis that can achieve this effect. By moving an antenna in elevation, even deeper nulls are possible. The Kiwa loop tilt control includes a 3 to 1 gear reduction for precise nulling of local signals and interference. You can even change the antenna tilt up to 90 degrees from vertical.

In summary, this antenna has been a welcome addition in my radio shack. I now have heard over 22 states and 150 stations in the broadcast band during daytime hours alone (10 am to 2 pm local time). The Kiwa contributed to my best daytime BCB catch ever—WOAI-1200 from San Antonio, Texas, (1200 miles) at noon, local time. The receiver I used for this test is an old Drake SPR-4 that I bought at a hamfest for \$75.00.

If you want to improve your broadcast band reception on your communications or portable receiver, you should take a serious look at the Kiwa MW air-core loop. This antenna not only looks good, but it is a real workhorse in pulling in MW broadcast band stations

**The Kiwa MW air-core loop is available from Grove Enterprises (ANT 31) for \$349.95 plus shipping.**

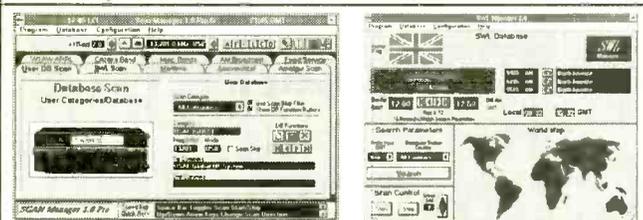


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## The Radio Shack PRO-2040 Scanner

The PRO-2040 scanner is a mid-line model manufactured by Uniden for Radio Shack. Although it is primarily suited for home use, it may be installed in a car or truck and powered by 12 VDC when equipped with an optional power cord (Radio Shack #270-1562). We tested a PRO-2040 with a serial number 55008120 for this report.

### ■ Features

PRO-2040 reception modes and step sizes are factory set and not user selectable. Frequency coverage is stated as:

- 29 - 54 MHz (5 kHz steps)
- 108 - 136.975 MHz (12.5 kHz steps, AM)
- 137 - 174 MHz (5 kHz steps)
- 406 - 512 MHz (12.5 kHz steps)
- 806 - 823.9375 MHz (12.5 kHz steps)
- 851 - 868.9375 MHz (12.5 kHz steps)
- 896.1125 - 956 MHz (12.5 kHz steps)

The PRO-2040 memory organization is typical: 100 memory channels divided into 10 banks. A 2-second rescan delay can be associated with each channel. One channel may be designated as a Priority channel and sampled every 2 seconds. The owner's manual says channels may be scanned at two speeds—12 and 73 channels per second—but we measured a 42 channel/second rate in the Hyper setting using an unsorted mixture of local channels on various bands.

Uniden scanners wearing the Bearcat name lock out empty channels by default—a common sense and labor-saving convention we miss in the Radio Shack models.

Instead of a switch on the volume control, a keypad pushbutton is used to

turn on the PRO-2040. The advantage is that the scanner can be turned on and off without disturbing the volume control setting. One side effect is that a potentiometer left at the same setting for long periods of time will develop a "dead spot" sooner. Too, the soft power key means the scanner will remain off after a power failure and must be turned back on manually.

The owner's manual claims memory will be backed up for three days in the event of a power failure, but we didn't verify this.

### ■ Searching

The PRO-2040 supports one search bank, as well as Direct Search operation. The search can be paused temporarily by pressing the Limit key. One can step through frequencies one increment at a time with each subsequent press of the Limit key, or resume automatic search by holding down the key for a moment. Up to 50 frequencies can be locked out during a search—a good feature for a scanner in this price range. As in other Radio Shack models, frequencies found active during a search can be stored in 10 monitor memories.

A data skip feature can be used to skip dead carriers and certain types of data signals during search mode, but not during a memory scan. The data skip is ineffective on noisy dead carriers and some types of digital paging.

### ■ Construction

The PRO-2040 is shaped the way a base scanner should be, with display and all controls mounted on a vertical front panel. The top is flat so one could rest a small accessory on top, although it could block the top-mounted speaker. The low cost construction does not provide for flip down front feet, so tilting the scanner upward is an exercise left to the user.

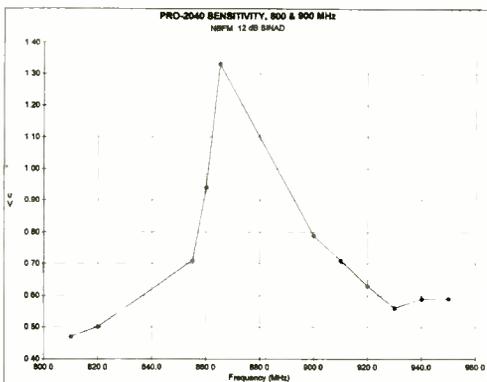
The PRO-2040 weighs only 23 ounces. The usually heavy power transformer is housed in an external "wall wart" power supply. There is no metal chassis and the two major circuit boards are screwed into the plastic case. The RF, IF, and audio circuitry is contained on the largest board.

Two small subassemblies are mounted to the main board. One is the unshielded 800 MHz front end, which looks the same as in the Bearcat BC860XLT. The other module is the phase locked loop circuitry. Keyboard and logic circuitry are contained on a second board, mounted vertically behind the front panel.

The LCD (liquid crystal display) is backlit at the center by a single incandescent bulb, recessed over an inch in back of the display. The bulb is tucked inside an amber boot, giving the display a low contrast, amber tint.

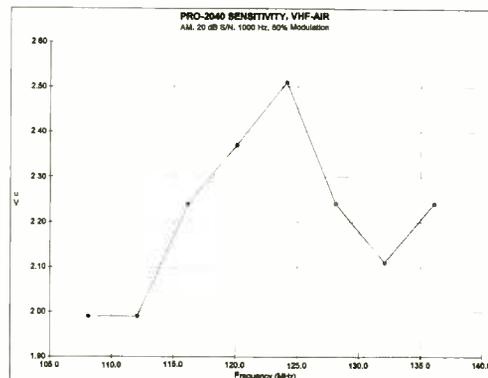
### ■ Sensitivity, Etc.

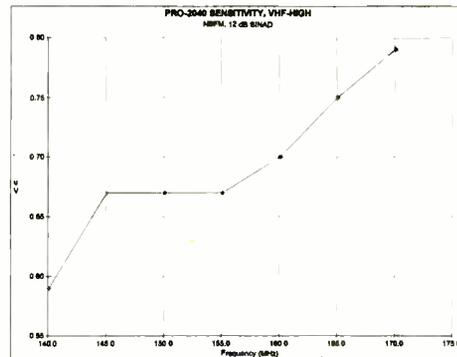
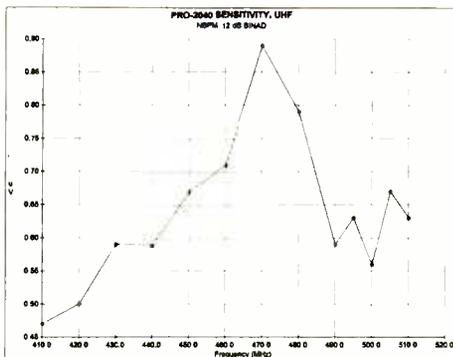
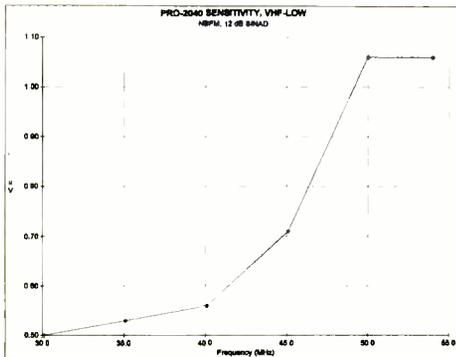
The sensitivity of our PRO-2040 wasn't quite as good as the specifications in the Owner's Manual except in the 800 MHz band. The accompanying graphs show our test results for NBFM sensitivity measured using the industry standard 12 dB SINAD criteria, a 1000



**PRO-2040 Measured Specifications**

Intermediate frequencies: 10.8 MHz and 450 kHz  
 Sensitivity: (see graphs) Selectivity: 12.3 kHz at 6 dB  
 Modulation acceptance: 13 kHz  
 Audio output: 950 milliwatts at 10% distortion  
 Rejection of images 21.6 MHz away:  
 28.5 dB at 35.0 MHz  
 19.5 dB at 155.0 MHz  
 2.5 dB at 462.0 MHz  
 3.5 dB at 900.1 MHz  
 5.5 dB at 930.1 MHz  
 Scan speed: 42 channels/sec. (approx.)  
 (Photo by Pam Parnass, N9HRZ)





Hz tone at 3 kHz deviation. Sensitivity in aircraft range is shown using an AM signal modulated 60% with a 1000 Hz tone and a 20 dB signal to noise ratio.

Modulation acceptance—a measurement which predicts how a scanner will perform when receiving over modulated or slightly off frequency signals—is reasonable and measures about 13 kHz.

### Multiple Images

The PRO-2040 uses a 10.8 MHz first IF and 450 kHz second IF. The low first IF, combined with almost nonexistent shielding and poor filtering in the front end, permits image signals 21.6 MHz away from the programmed frequency to interfere with normal reception. Using an image-prone scanner is akin to an unwelcome visitor speaking to you while you're trying to listen to someone else.

Aircraft on 133.4 MHz disrupts 155.0 MHz, where image rejection measures 19.5 dB. We hear 440 MHz ham repeaters strongly near 462 MHz, where image rejection is a tiny 2.5 dB. Cellular phone signals on 878.5 MHz are heard on 900.1 MHz, where image rejection measures only 3.6 dB. On the VHF-low band, the PRO-2040 image frequencies can be predicted by the equation:

$$\text{Image} = F + 2 * 10.8$$

On the other bands, the image frequencies can be predicted by the equation:

$$\text{Image} = F - 2 * 10.8$$

These images are common in budget models, but harmonics from our PRO-2040's synthesized local oscillator cause additional image problems, especially in the UHF band. The second harmonic of the local oscillator causes cellular phone conversations to be heard in the 462 MHz range. Cellular image rejection in the 462 MHz range measures about 26 dB. We'll skip the derivation, but the image frequency due to 2nd harmonic radiation in the PRO-2040 may be predicted from the equation:

$$\text{Image} = 2 * F - 3 * 10.8$$

Another harmonic relationship permits television channel 62 audio (763.75 MHz) to be heard when our PRO-2040 is tuned to 462.575 MHz:

$$\text{Image} = 1.667 * F - 7.2$$

### Decent Audio

The PRO-2040 audio quality is fair. Typical scanner specifications include a figure for audio output power, but this says nothing about the speaker's acoustic quality, power handling capability, or placement. Although it is important, you cannot rely entirely on an audio output specification to tell how "good" a radio sounds. In our tests, the PRO-2040 audio amplifier stage produces 950 milliwatts (0.95 watts) of audio power at 10% distortion.

The 2-1/4 inch PRO-2040 speaker is top mounted, and rated at 2 watts. We prefer to use an external speaker, aimed at the operator, with most base and mobile scanners. Luckily, the PRO-2040 rear panel is fitted with an 1/8" monaural external speaker jack for this purpose.

### Summary

The PRO-2040 has all the features needed in a moderately priced model, and the ability to lock out 50 channels during a search is a bonus. The main performance defect in our PRO-2040 is interference from multiple images, especially annoying in the 462 MHz range.

The PRO-2040 is a fair value for the \$180 we paid at time of writing, but is priced at \$250 in the 1996 Radio Shack catalog. You may also consider the Uniden/Bearcat BC860XLT reviewed in May 1995 *MT*.

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## Looking Ahead: Should You Buy a Receiver Now?

Oh, how the technological clock turns! Twenty years ago, shortwave listeners had to content themselves with analog receivers, often with mediocre selectivity. In the late Seventies and early Eighties, this gradually began to change as analog gave way to digital displays, then digital frequency synthesizers.

However, a watershed was reached in 1984 when Sony came out with its ICF-2010, sold in some parts of the world as the ICF-2001D. Its performance was top-drawer then, but what is surprising is that today, 11 years later, it is *still* the best shortwave portable on the market.

There's a big lesson here, which is that in buying shortwave receivers, timing and careful analysis are paramount. If you had bought a portable in 1983, within a year you already would have reason to upgrade. Yet, if you had waited until 1984, you would still be using the same radio today—assuming it hadn't worn out by now.

### ■ Digital Receivers Appearing...

Let's see what that might mean to us today. For starters, the digital evolution may be poised to spring forward again in a few years. Already, Watkins-Johnson (see 11/95 *MT*) has come up with a receiver that is largely digitalized throughout, not just in its frequency-tuning circuitry. Collins and others are also pursuing this path, mainly for the segment of the professional market that only needs "dumb" receivers to connect to "smart" computerized operating systems (also see 11/95 *MT*).

In the meantime, the Eureka project in Europe is seeding research by Motorola and other firms into consumer products that would receive everything from longwave to mediumwave AM to shortwave to FM to satellite, and more. These would approach the ideal of a "receiver on a chip," and have virtually completely digital operation—whether receiving digital signals, such as via

Eureka or the proposed American IBOC (in-band, on-channel) systems, or analog signals, such as traditional FM and shortwave.

### ■ ...but Affordability Years Away

It's this sort of thing that signals something new down the road. While the first offerings may or may not include shortwave, the one thing that is pretty certain is that they won't be cheap. Figure anywhere from \$300-500, with prices coming down over time. Futurists quote \$50 as a long-term figure, but that could be many years off.

The nice thing about digitalized radios is that to a certain extent they can be upgraded through software improvements, just as you upgrade your computer by changing to a newer operating system. But even this needs to be regarded with a jaundiced eye. Just as, say, going to Windows 95 or a more advanced word processor often calls for a hardware upgrade at the same time, so it may be with digitalized receivers.

As to performance, digitalized receivers can do better. However, in "Perotspeak," the devil is in the details. For example, with those pricey professional communications receivers, the primary goal is to receive communications-link voice signals properly. That takes, among other things, a certain sampling rate. But if you're listening to broadcasts, and especially to music, a somewhat higher sampling rate and certain other characteristics are called for if you're to get worthy fidelity.

Ironically, in terms of performance this means that you're probably better off waiting for a cheaper consumer-grade digitalized receiver than getting one of today's professional-grade digitalized models. Provided, of course, you don't mind the wait.

### ■ ...Multimedia Receivers Even Farther Off

Once these consumer radios kick in at affordable prices, something else is almost bound to happen. Just as the appearance of affordable PCs signaled the birth of a whole new software industry, so the inauguration of digitalized consumer radios may prompt all

manner of advances in what creative software can do for both reception quality and how the user interacts with the receiver.

Too, demand may surface for integrated telecommunication devices, in which not only radio of all sorts, but also television, fax, bulletin boards, e-mail, voice mail, telephones, and all the rest will reside comfortably within a single audio-cassette-sized device for your pocket. The media for feeding such an ADAV (analog/digital-audio/video) device could be multiple (e.g., terrestrial radio, satellite, infrared) linked via gateways in series (for primary service) and/or parallel (for filling in "shadows"); or direct and singular, sans gateways, such as shortwave.

### ■ Today's Receivers Look Good for Some Time

Okay, back to the here and now. First, we're not likely to see much in the way of any real improvement in consumer-grade shortwave portables over the next couple of years, perhaps more. Look for "improvements," rather than improvements; anything more dramatic won't come cheap for some time to come.

Second, it would be surprising if during that same time period one or two manufacturers of tabletop shortwave receivers didn't come up with consumer-grade products that mimic, say, the Watkins-Johnson HF-1000. If it were done right, a real competitive advantage could be obtained. However, the fly in the ointment is that many existing manufacturers' in-house staffs are weak in this new technology, something which takes time to remedy.

Third, the first wave of genuinely affordable digitalized portables with top-notch performance is not likely to appear until late in this decade. Following that will come the inevitable price reductions and software enhancements, probably putting off the "sweet spot" for buying into the opening years of the next century.

From this, some common-sense buying strategies emerge. If you already own a high-quality receiver and you're content with it, hang on to it unless you simply enjoy purchasing new models. Watch and wait.

If you are antsy with what you have,



ICF-2010

spring for something new with reasonable assurance that it will give you satisfaction for years to come. There's always something interesting lurking around the corner, and there's also the possibility that somebody will throw us a curve with something truly revolutionary before its time. But if your quest is for pleasure and satisfaction, rather than for the pursuit of optimization at any given moment, today's products are strong runners.

### ■ Shortwave Faces Competitive and Regulatory Hurdles

What about shortwave itself? Its demise has been predicted by learned minds for over 20 years, now. Should you wait for the funeral before buying something new?

What has happened over those 20 years is that international broadcasters have been searching for something along the lines of a technological "magic bullet." Initially, the idea was to replace shortwave with dedicated AM and FM transmitters. This worked only in a few instances. The next "for sure" was direct satellite transmission, which thus far has been even less successful.

Today's vehicles of hope are program placement and the Internet. Program placement, like the original AM/FM idea, succeeds in certain specific instances, and thus far has not only been successful to that extent, but also has had the side effect of *increasing* listenership to shortwave. However, program placement depends on the munificence of "gatekeepers," organizations along the distribution chain who for economic, political, or other reasons can cut off the flow of information from the originating station as they see fit.

The Internet is too new to be judged effectively. On one hand, the results thus far smack of novelty, with most "hits" being among university students. On the other, the technology is too embryonic to have any real idea whether reductions in cost and improvements in throughput and wider distribution will cause qualitative changes in listener reaction and

### RADIO DATABASE INTERNATIONAL WHITE PAPER®

reports contain virtually everything found during exhaustive tests of premium shortwave receivers and outdoor antennas. For a complete list, please send a self-addressed stamped envelope to RDI White Papers, Box 300M, Penn's Park PA 18943 USA.

thus audience size. However, if Internet-type vehicles were to replace shortwave, it might be that they would replace other forms of broadcasting, too.

While shortwave looks safe down the road, there is one imponderable: International broadcasters have been more preoccupied with technologies than with "software," their programming. Particularly with the end of the Cold War, the real issue has been to determine what international broadcasting is all about; whether it should continue; and, if so, in what manner. Most stations have been broadcasting for decades without seriously questioning their *raison d'être* or their entire dependence upon the government teat. Now that the events that gave birth to them have disappeared or evolved, the instinctive reaction has been to circle the wagons to protect the status quo where empires are centered—notably, staffs. Unless these stations can convincingly define their mission for the coming decades, as well as look to innovative sources of funding, their budgets are likely to continue to shrink.

Another threat to shortwave is that many international broadcasters are forced by law to use transmitting facilities owned by their national ministries of communication. However, there is usually no such restriction when it comes to other technologies. Because these shortwave broadcasters are captive clients, they usually wind up laying out top dollar for costly and sometimes ineffective service. Unless such broadcasters can pick and choose freely among shortwave broadcasting facilities worldwide, their ability to be cost effective with shortwave will continue to be severely limited.

Even in the United States, Federal rules that allow private broadcasters to transmit wherever they want via satellite and such, prohibit beaming to an American audience via shortwave.

Thus it is that the most serious threat to shortwave is not the technology itself, but obsolete government restrictions that place shortwave at a competitive disadvantage relative to emerging technologies.

### ■ Digital Shortwave Transmission a Possibility

But shortwave, too, may soon incorporate an emerging technology of its own: digital transmission. We already know that if this succeeds, the result could be a spectacular improvement in the quality of reception. Yet, little research has been done concerning difficulties brought about by shortwave's dependency on skywave propagation. Too, shortwave operates within much tighter channel spacing (5 kHz) than, say, AM (9 or 10 kHz).

The best guess is that these difficulties will be surmounted in time. But how much time depends in part on how much funding, and therein lies the rub. Just as shortwave could be entering a period of new growth and vigor, the players have their hands full simply trying to keep afloat.

The likelihood of digital shortwave broadcasting succeeding will also depend in part upon the success of IBOC, which unlike Eureka is "compatible." This means you can listen to a signal on either an existing ordinary radio...or a new digitalized radio. IBOC is an American gambit, with the Europeans and Canadians committed to Eureka, and the Japanese apparently working on a third system. So even when technical solutions are in place, political wrangling is likely to keep digital transmission in flux for some time.

*This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.*

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## AEA's FAX III and OCR Revisited

This month we will look at the latest, and very powerful AEA FAX III. Then we'll hear what you had to say about our original findings on using optical hand scanners for reading frequency lists.

First, a question: When is a Fax program not a Fax program? Read on for the answer.

### ■ FAX III - Son of Rocky

There must have been a shortage of titles in Hollywood when the run of Rocky sequels began coming out. Although I'll admit (now don't beat me!) that I liked most of the Rocky movies, I couldn't keep them apart. Rocky, Rocky II, Rocky III, and Rocky IV (I try to forget Rocky V)—what a wide variety of descriptive names!

Such is the case with AEA's FAX III. I had just written the fine review on AEA's FAX II

when I thought I was seeing double or there had been a misprint. In fact, I didn't comprehend that III was out for a number of weeks. I was reading FAX III, but thinking FAX II.

The problem is that the title of the program is now a very bad misnomer. This program has gone through so many evolutionary advances it's like calling an F-14 Tomcat fighter a Wright Flyer! Yes, it's true, they do have some things in common. But the similarities end very early in the comparison. Let's go over some of the functions that AEA's FAX III version 5.2 can perform. Then you can make your own decision as to what it should be named, okay?

The modes which FAXIII can decode, display, and store include: RTTY, FEC, NAVTEX, Morse, and (of course) FAX. The color of FAX images can be manipulated by the user. But, the real surprise to me was the

receiver control and frequency database that has also been quietly added by AEA— to a program called FAXIII!

Although these functions are not totally at the user's control, they do allow for time controlled, unattended, picture capture, on any number of frequencies. Receiver control is included for most ICOM receivers, Kenwood IC-10 equipped units including the R-5000, Yaesu's FRG-100, and Lowe's HF-150. This review was performed with an ICOM R-71A, which allows for unattended picture capture.

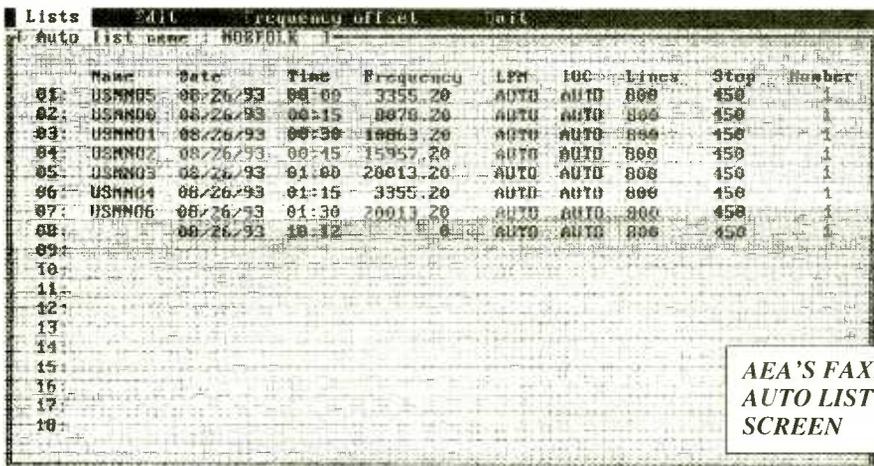
### ■ FAXIII Computer Hardware Requirements

The minimum PC hardware requirements are: IBM PC, XT, or AT, DOS 2.1 or higher, serial ports (one for decoding, one for receiver control), 2.5 Megs of hard drive space, a floppy drive, and just about any monitor type. It supports dot matrix, Deskjet, and Laserjet printers. These requirements can be fulfilled by my old Franklin XT, but for this review we have used a 486 DX50, 8 Meg of RAM, and SVGA. A minimum of 530 K free RAM memory is required. Use a memory manager program such as QEMM or DOS 6's Memmaker to make room in your conventional RAM. All requirements, and some good system suggestions, are included in a well-written, 130-page manual.

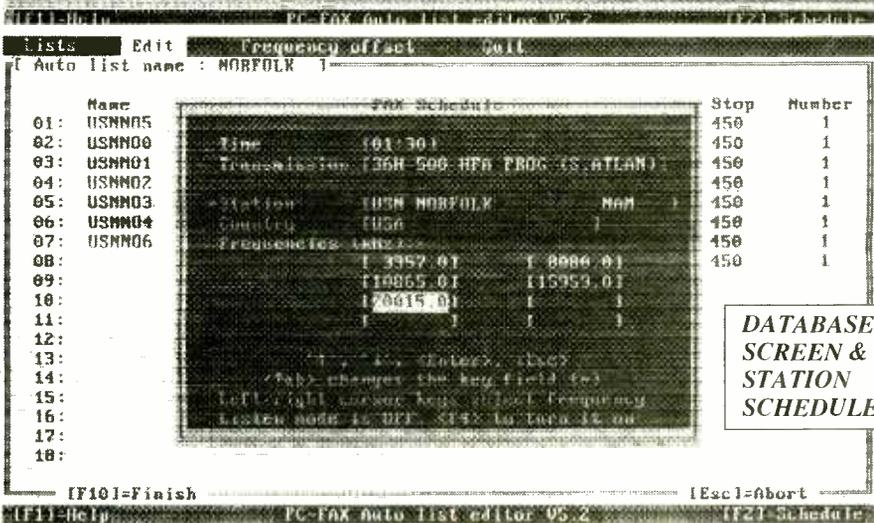
### ■ How Well Does It Work ?

Since many of the features are the same as in FAX II we will just cover the receiver control function in this review. See previous discussions of AEA's FAXII (June 1993 with update July 1994) for other details of operation.

A decoder which is housed in a serial port connector housing is included with the program and plugs into a DB25 serial port. The cable coming from the decoder plugs into your receiver's tape output or headphone jack. Installing the software is as simple as typing "install." However, configuring the program to the user's hardware is not exactly automated and will require careful reading of the manual. Customization of the software's receiver driver is required, so that it matches the user's hardware. This is performed via the DOS Edit command. Read the manual, pages



AEA'S FAXIII AUTO LIST SCREEN



DATABASE SCREEN & STATION SCHEDULER

26 to 30, very carefully.

The main screen has changed little from earlier versions. Choosing the "Auto List Menu" gets us to the editor. See Figure One. On this screen you can manually enter up to eighteen different capture station names, dates, times, frequencies, and FAX parameters.

By pressing the F2 key FAXIII's database of Fax station schedules, frequencies, and transmission type is displayed. See Figure Two. You can search the database by any of the displayed titles such as Time, Transmission, Station, Country, and Frequency. Pressing the "Tab" key changes the search category. The double arrow symbol to the left of "Station" indicates this is the current search category. We have chosen the US Naval Station at Norfolk, Virginia (call sign NAM).

Using the left/right arrow keys I have highlighted the frequency 20015.0 kHz. Using the up/down keys I have chosen a time of 01:30. Now with the push of the "Enter" key all this information is transferred to the editor screen at the position of the cursor. See Figure Two, line 07 for the result. It sounds more complicated than it really is. But novices to databases can get a bit confused. Again, just read the manual.

Once your list is complete, save it using the List pull-down menu at the top left of the screen. The "Q" key brings us back to the main menu. Under the "Auto List Menu" of the main menu, the file name of our list, Norfolk, is selected. Then the "Input a new picture" line is selected. Pressing "ALT" and "L" keys tells the program to use our Norfolk time and frequency schedule list. That's it. Now go to work, sleep, or whatever.

If propagation is good you'll have all these charts on your hard drive in a few hours. Warning! Each chart takes around 500-800K of disk space, so make sure you have lots of space available on your hard drive before you decide to capture every chart that Norfolk produces.

There are a number of useful tricks explained in the manual. By entering 99:99 in the time column of any entry it acts as a "wildcard" time allowing monitoring at the current time. Setting the date to 01/01/01 does the same for the current date, but also lets the program repeat the capture schedule each day automatically. By now you know the drill: Check the manual for more useful operating features.

### ■ So, Do I Like It?

The image results, as seen in AEA ads, are as good as any I have produced. And very acceptable results can be obtained with ease. This program is all that anyone who is a FAX

maven can ever want. In addition, it does a good job as a second digital mode decoder. Its basic decode features are easily available to the novice user. But—and it is a big "but"—to use the program to its full potential it takes a moderately experienced user and an hour or two with your radio, computer, and, yes, manual. Although the manual has a Table of Contents, it is missing a vital index, which would make life much easier.

If you want to run a FAX weather station, while having NAVTEX and RTTY weather station capabilities, and you don't mind investing some time in reading and learning, then this program is for you. The market price of FAXIII varies greatly. At the lower prices I have seen it's a good deal. Check your AEA distributors for exact prices. Or call AEA at (800) 432-8873 for more information. If you mention that you read it in *MT's* Computers and Radio, that will help keep the information on new AEA products flowing to your review columnist.

### ■ Almost Optical Character Recognition (A-OCR)

Back in April, we tried using a hand-held page scanner to input frequency lists from *MT*. After trying for a few weeks, my results were so disappointing that I chalked it up as a failure. Since I had had such good results on expensive flatbed scanners I was surprised by this disaster.

Well, Ron Cheshire of California wrote in with experiences using optical scanners and OCR. He started with a hand scanner a number of years ago and tried everything under the sun to get near 100% character recognition of frequency lists. The result ... he sold his hand scanner in a garage sale for 10 bucks! "I found a fax machine look-alike that, although had a sheet feeder, could emulate a flatbed scanner." The price was around \$200; excellent when compared to the \$2000 price of a flatbed. Unfortunately, Ron did not include the model or manufacturer of this product in his letter.

Ron has developed a number of tips to improve the OCR results, but they still vary from 10% up to 95% correct character recognition:

Original must be pristine.

Don't use a fax as an original.

If you have access to an enlarging copier, enlarge all frequency lists, making them large single columns.

Shop around for software which works best for your purpose.

However, Stephen Lord posted a note on the *MT* bulletin board which might explain our diverse OCR experiences. Stephen has

discovered a commercial product which allows a hand scanner to operate in a more precise manner, more like a flatbed scanner. The name of the product is *Scan:Align*, by a company of the same name. It consists of a thick plastic flatbed (surprise!) about 20x10 inches in size, a clear plastic sheet attached to the top of the flatbed, and a 18x6.5 inch hinged frame, or wide slot.

Stephen says, "A U-shaped slider holds the scanner as it is drawn along the slot, thus preventing skewing errors that effect OCR results." I have seen such a product in the chain computer stores, but at a price of \$30 it is almost equal to the \$50 price of a basic hand scanner! I must admit, however, that the concept should make a hand scanner work as well as a flatbed. Stephen reports excellent results.

If anyone has found a less expensive product which does the same function, please write to me so I can share the information in this column. In a very unscientific poll I have been taking of small to medium-sized companies, I have found none who have come close to continuous 90% OCR reliability with hand scanners. In fact, most have put their scanners on a shelf... 'way in the back.

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## Fixed and Variable Frequency Crystal Oscillators

The hearts of many simple pieces of test equipment and transmitters are crystal-controlled oscillators. Quartz crystals provide stable frequency control for many circuit sections in such equipment. Crystals

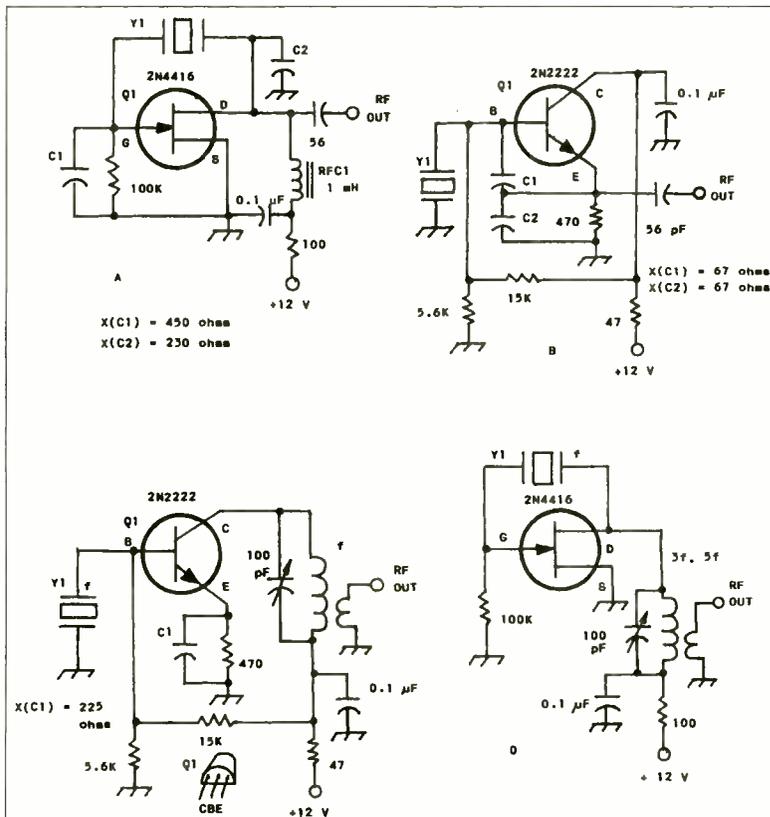
are used extensively in most receivers, where they serve in heterodyne oscillators and BFOs (beat frequency oscillators).

Some receivers contain crystals for use in calibrators that provide accurate markers ev-

ery 10 or 100 kHz across the tuning range of the receiver. This is an aid for ensuring correct dial calibration, especially when operating vintage receivers.

Learning how to make crystals oscillate is important for the experimenter or those who need to repair a piece of equipment. Knowledge about how to shift the frequency of a crystal is beneficial, too. This is especially true of crystals that have aged and no longer operate on their marked frequencies. This article provides basic information on how to build and maintain "rock-bound" oscillators, as they are often called.

**Figure 1 - Practical examples of simple crystal-controlled oscillators. A Pierce oscillator is shown at A. A Colpitts oscillator appears at B, a tuned collector oscillator at C, and an overtone oscillator at D. MPF102 field-effect transistors may be substituted for the 2N4416 devices shown. A 2N4400, 2N4401, or 2N3904 can be used in place of a 2N2222. All resistors are 1/4-W carbon types.**

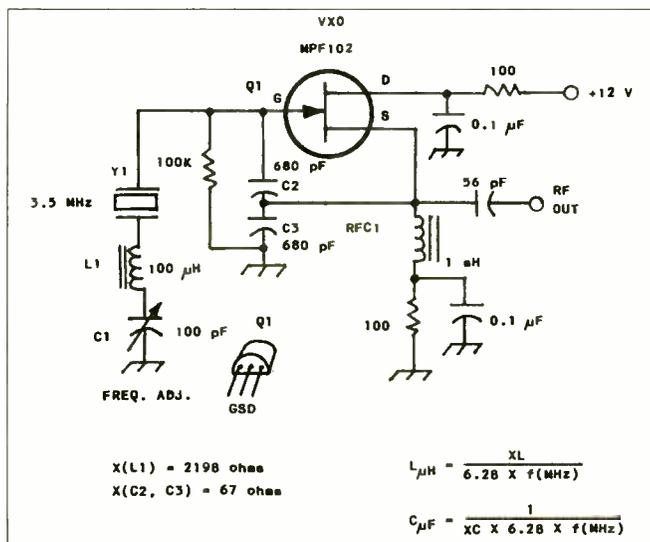


### Types of Crystals

Crystals come in all sizes and shapes today, but irrespective of the physical format, the innards are somewhat standard. It is the metal or plastic case in which they are housed that makes them look different.

Two basic types of crystals are marketed today. One is known as a "fundamental" crystal, which means it operates on its natural frequency, such as 7 MHz. The other type is called an "overtone" crystal. It is cut for a particular frequency, such as 7 MHz, but is made to oscillate at an odd harmonic (3rd, 5th, 7th overtones, etc.) of the fundamental crystal frequency. The 3rd overtone for a 7 MHz crystal would be approximately 21 MHz. In practice, the overtone is seldom related precisely to the fundamental frequency, but it is very close.

**Figure 2 - Circuit example of a VXO. The crystal frequency can be varied by adjustment of C1 (see text). The greater the L1 inductance the wider the frequency change for Y1. A maximum capacitance of 100 pF is suggested for C1. An RFC1 value of 100 microhenries is suggested for operation from 2 to 4 MHz. A 50-microhenry RF choke may be used from 4 to 10 MHz, and a 22-microhenry RF choke is suitable for operation from 10 through 20 MHz. Miniature RF chokes offer good performance in this circuit.**



### Basic Oscillator Circuits

Figure 1 shows four types of crystal oscillators. The circuit at A is a standard Pierce oscillator. It does not require a tuned (resonant) circuit at the output of the JFET device, Q1. Y1 oscillates on its fundamental frequency. Capacitors C1 and C2 provide the feedback power (output power fed back to the input circuit) needed to make the crystal vibrate at its marked frequency. Suggested reactance values are listed for C1 and C2.

Simple equations for determining the actual capacitance value when the reactance (XC) and frequency are known are given in *The ARRL Electronics Data Book* and *The ARRL Handbook*. Typical values for C1 and C2, respectively, for operation between 1 and 15 MHz are 39 pF and 69 pF, based on

10-MHz operation. These values increase as the operating frequency is lowered. A 1-millihenry RF choke is suitable for RFC1 over the above range of frequencies.

Figure 1B shows a standard Colpitts oscillator. It also operates without an output tuned circuit. C1 and C2 are the feedback capacitors. Their XC values are listed. For operation at 3.5 MHz an XC of 67 ohms computes to 680 pF.

The circuit at Figure 1-C is also a fundamental oscillator. It contains a tunable output circuit that is set for resonance at the crystal frequency. The feedback is controlled by C1. With an XC of 225 ohms we would use a 100-pF capacitor.

It should be noted that bipolar transistors (BJTs) and field-effect transistors (JFETs) can be used in any of the circuits shown, provided proper dc biasing (base or gate resistors, as shown) is used.

### ■ Overtone Operation

Figure 1-D illustrates how an overtone oscillator is configured. Feedback capacitors are not required because there is sufficient capacitive coupling within Q1 to provide feedback at typical overtone frequencies (generally above 20 MHz). Tuned circuit T1 is adjusted for resonance near the desired overtone in order to make oscillation begin and sustain.

Harmonic operation at various multiples of the crystal frequency (i.e., 14-MHz output from a 7-MHz crystal) can be obtained with the circuit of Figure 1C by resonating the output tuned circuit at 14 MHz and using 0.01 µF at C1.

### ■ Shifting the Crystal Frequency

Figure 2 shows how to move the crystal frequency in a circuit that is called a VXO (variable reactance oscillator). L1 and C1 are used in series with the grounded end of the crystal. As C1 is adjusted, the output frequency of the oscillator changes. This is called "pulling" or "rubbering" a crystal.

In most VXO circuits the output frequency starts slightly above the marked frequency of the crystal (C1 at minimum capacitance) and moves lower as the C1 capacitance is increased. Typical frequency swings are 3 kHz at 3.5 MHz, 8 kHz at 7 MHz and 15 kHz at 14 MHz with the reactance values listed. If L1 is eliminated the crystal can still be rubbered, but only a small change will occur with only C1 in the circuit. This circuit is ideal for experimental purposes.

Best VXO performance will occur when using plated AT-cut crystals in the larger HC6/U style of holder. The old WW-II sur-

plus FT-243 crystals can be made to work, but they do not allow much frequency change, and they may not oscillate if the internal electrodes are oxidized.

Some crystal-controlled oscillators in commercial radios can be changed to VXOs by adding a trimmer capacitor and a small inductance. This is a useful modification when the crystal or other components in the circuit have aged to the point where the oscillator can no longer be netted to the desired frequency by means of the related trimmers. Crystal-controlled CB transmitters and amateur VHF transceivers can be brought back on frequency by adopting the VXO principle rather than buying an expensive replacement crystal. VXOs are useful for frequency control in simple amateur CW transmitters, since they are more stable than many home-made VFOs.

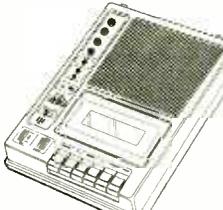
### ■ Wiring Tips

Short, direct leads are advisable in all RF

circuits, and this includes oscillators. In the interest of optimum frequency stability it is prudent to use NP0 ceramic, silver mica, or polystyrene capacitors in the feedback part of the circuit. Additional stability is assured when the oscillator operating voltage is regulated.

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## Building & Upgrading Computers—Part 2

If you didn't do it after last month's column, now is the time to pop the case of your computer and give the critter a good vacuuming and general housecleaning. Chances are there's enough dirt in it to start a potato farm. The process of cleaning your computer, inside and out, will help reduce your fear of it. That's more important than actually cleaning it. Familiarity is a powerful aid to conquering fear.

### ■ Motherboards

Last month, we examined a typical computer case and power supply with the idea of upgrading to modern standards. Once you get past the case and power supply, the main area for attention is the motherboard.....the large circuit board that covers most of the bottom of a desktop case or most of one side of a tower case.

Upgrading an obsolete computer generally means removing the old motherboard and replacing it with a new one. For those who suddenly clutched their hearts and gasped for oxygen, relax....this part is easy. In fact, the process of upgrading a computer is a cinch; it's not like yanking the engine out of your car. It is only a matter of disconnecting some wires and cables, removing the plug-in accessory boards and a few screws. In worst cases, you might have to remove the power supply (see last month), and maybe the floppy and hard disk drives. This might be intimidating, but believe me, IBM-compatible personal computers are much alike within a very narrow range of mechanical variance. You see one, you've seen 'em all, for most practical purposes.

### ■ Get Familiar

Just pop the case on your computer and give it another good cleaning. While you're in there, I want you to map it. Sketch the layout, including the locations of power supply, floppy and hard disk drives, plug-in cards, wire and cable terminations with color codes. Use a strong light and a magnifier, as necessary, to see the labels and markings on the motherboard where wires and cables terminate. Record these markings and labels: IDE, TURBO, RESET, KEY, LOCK, SPKR, COM-A, COM-B, TB, LED, P8, P9, and so forth. Make little

sketches and doodles to key your memory.

Map the color codes of all wire bundles. They're pretty much standard, so if you write them down, someone can help you if you ever get into trouble. The connectors on the power supply's wire bundles are polarized so you can't plug them into accessories the wrong way. Still, make a note of the color codes and the order in which they appear at the plug to the accessory. This helps with reconnecting the plug later when you can't see the polarity scheme very well. Connectors for other wire bundles are not always polarized, so take note of exactly how the color coded plugs connect to the motherboard: speaker, turbo LED, hard drive LED, etc.

Ribbon cables can be confusing. Connectors on the ends of ribbon cables are often neither polarized nor uniquely identifiable. This means that a ribbon cable connector can plug into a board or device the wrong way. If you insert a ribbon cable plug the wrong way, a mushroom cloud might plume to 40,000-ft over your city, so get it right. It's easy: Ribbon cables have one edge color-coded in a faint red or pink. This represents Wire #1 of the cable which goes to Pin 1 of its plug. Most of the time, the fixed termination points for ribbon cable connectors are clearly marked with their #1 pins, but don't count on this until you verify it.

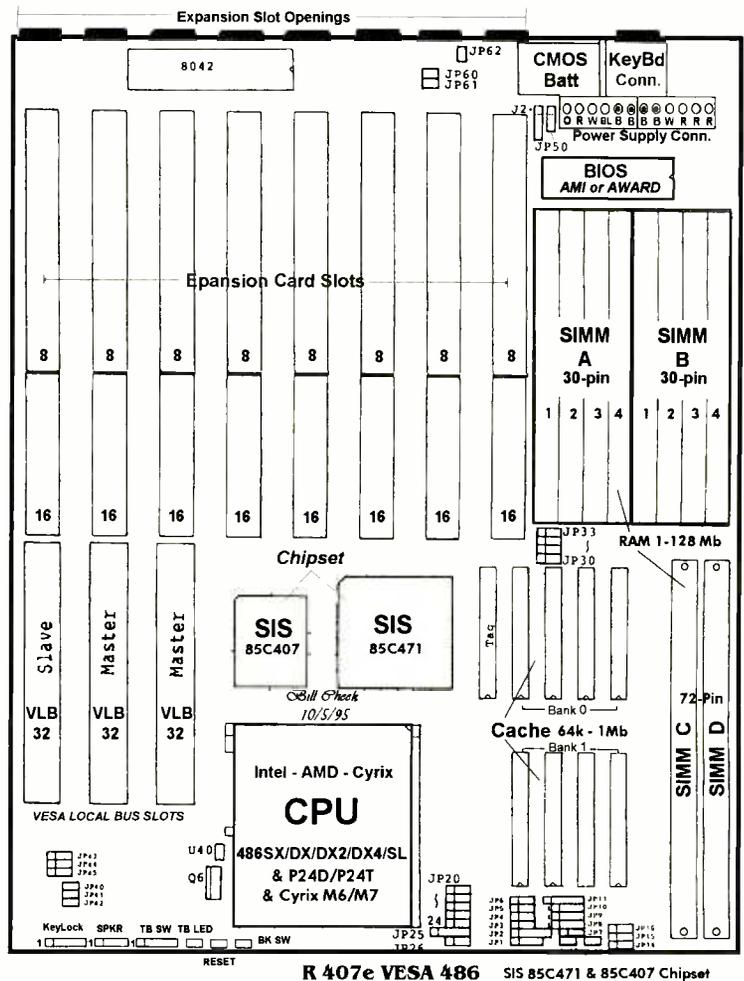
Clearly identify and mark wire #1 in all ribbon cables and the mating fixed terminals' Pin #1 so you can tell how to reconnect them. Ribbon

cables usually go between controller cards and hard disk drives, floppy disk drives, CD-ROM drives, and most SCSI devices. So before you disconnect any plugs, make sure you label the plug and the device to avoid confusion. Record these labels on your "map."

### ■ How and What Not to Upgrade

Most of us, yours truly once included, dream of cheap and easy upgrades, like popping a chip and sticking in a new one. Forget it. It's not that easy. Well, there are CPU upgrades that clip onto the existing CPU or in some cases, replace it. These are "easy" all right, and expensive. What's more, they don't offer much of an "upgrade." Don't go for this

Figure 1: Quality 486 upgrade motherboard



easy choice; you'll be sorry. You cannot upgrade a 386 to a 486 by a mere chip-swap.

With rare exception, the only righteous upgrade is a motherboard swap. And this you *can* do inexpensively! Some computers are not suitable for upgrade, including all models before 1985. It's not practical to upgrade the original IBM PC and PCjr, nor their compatibles, including models up to the XT (8086/8088) class. Even the later AT class (80286) are not good candidates for upgrade. AT286 and earlier computers are not only hopelessly outdated, but so, too, are their peripheral and accessory components. The only items of possible salvage value are the case, power supply, and maybe the RAM. New cases and power supplies sell for under \$50.

If yours is a 286 or older computer, you're better advised to hand it down to the kids; donate it to a school or church; or dedicate it to burglar alarm/security duty around home and shack. Forget it as ever having serious upgrade potential or ever being capable of computing at a modern level.

### ■ What to Upgrade

The remainder of this article and series focuses on upgrading 386 computers to 486DX2/66 through 486DX4/120 caliber. Within this narrower range, the do-it-yourselfer can save a bundle and still get positioned up near the bleeding edge of technology with some leeway into the future. Even as we chat, the entry-level computer from most manufacturers is the Pentium 75. (The Pentium 60 has been relegated to oblivion.) So, why don't we consider upgrading to Pentium technology? It's more expensive and complicated; far beyond the scope of this series. Maybe later.

I have built or upgraded to several 486DX/100 computers recently. It's really a low-cost piece-of-cake that yields performance comparable to the slower Pentiums, believe it or not! Your upgrade launch pad should be with a 386 computer, 386SX/16 through 386DX/40. In most cases, a swap of motherboards and CPUs with an increase of RAM to 8-Mb and a low-cost, VLB SVGA video controller board will place you right in the middle of journeyman class computing where you can stay comfortable for the next couple of years.

### ■ Homework Time

Figure 1 is a detailed diagram of a quality, general purpose upgrade motherboard. I recommend it or one like it for the easiest and most powerful of upgrades. The R407e VESA 486 board, made in Taiwan, is available *with* 128-k cache but *without* CPU for about US\$100. The board with an AMD 486DX4/

100 CPU is available for about \$179. This board is extremely flexible with respect to CPU, RAM, and cache. All versions of the 486 CPU from Intel, AMD, and Cyrix work fine.

The R407e board accepts eight 30-pin SIMMs (RAM) in groups of four, or two 72-pin SIMMs in pairs; or combinations of both to 128-Mb. 128-k cache is standard, but 256-k to 1-Mb is possible. If you don't have a source, try: SG Computers, Inc., 7830 Clairemont Mesa Blvd, San Diego, CA 92111, (619) 576-9393 or fax (619) 576-9395.

Designed for easy upgrading, the R407e board has all the basics including eight expansion slots, but no frills. There are no built-in video, comm, printer, or mouse functions. It is assumed that you will transfer the accessory cards for these from your old motherboard to the new one. In some cases, you may have to buy separate video, disk, comm, and/or printer controllers, but not to worry. I'll clue you on economical, high performance alternatives next month. For now, your mission is to locate an R407e or equivalent motherboard.

### ■ Caveats and Tips

Don't be tempted into bargain-basement motherboards! I suckered, into one for \$69. The board was thin, translucent, and cheaply fabricated. Luckily, I immediately stumbled onto the R407e board. A few weeks later, I horsetraded some goodies to a gentleman in Indiana for an R407e motherboard and CPU identical to the one I bought here. So I know the R407e is widely available. Consider it a reference standard, even if you go for something different.

The "chipset" is key to a quality motherboard. Motherboards are designed around a chipset. Some computer techs say the chipset from OPTI is the best. Others tout the SIS chipset. The R407e board has the SYS

chipset. Other quality chipsets include those from Intel, Triton, and Chips & Technologies. Don't confuse Intel CPUs with Intel chipsets; they differ. Study Figure 1 to glean the differences.

The CPU is important. Buy the fastest you can afford. Intel is considered the best, but AMD is very competitive. The best bet for your money is probably the AMD 486DX4/100. It rips! (*I know.....*)

BIOS is important. Your upgrade motherboard should contain a 1995 BIOS version from AMI or Award. When you boot your computer, the BIOS type and version briefly appear on the screen. The BIOS is a replaceable EEPROM chip on modern 486 computers. See Figure 1.

VESA Local Bus (VLB) is important. Your upgrade 486 motherboard should have it, and your video controller card should be of the VLB type with at least 1-Mb of video RAM.

Windows 95 is proving up! Your new 486 machine will be a screamer under Win95. It was my privilege and pleasure to beta test Windows 95 for 18-mos. I committed myself and eight production computers on a LAN to the Win95 Beta back in June 1994, if that tells you anything. Go for it!

Incidentally, I provide *no-cost tech support* on my books and columns through the e-mail and network addresses in the header of this column. If you run into trouble, I am pleased to help via those media. Next month, meat 'n taters. But save this and last month's columns. You'll need 'em.

### ■ Contest Time

Remember my offer for the next six months: submit an idea or a project for this column and if selected, you'll receive an autographed copy of my latest book, *The Ultimate Scanner*.

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## A Survey of Various Loop Antennas

Examples of loop antennas in use today are the open-frame loop, the ferrite-rod loop; directional-discontinuity ring radiator (DDRR) antennas; the small, high-Q, high-efficiency, loops; the quad loop, as in the driven element of a cubical quad beam; and large, horizontal, full-wavelength loop. All of these antennas (see fig. 1) are designed to be resonant at the planned frequency of operation. Except for the open-frame loop and the ferrite loop, all of these antennas are comprised of one single loop!

Interestingly enough we could design each of the types of antennas just mentioned to operate at a certain frequency, say 10 MHz, and find that they varied tremendously in physical size. For instance, a square, open-frame loop for that frequency could be designed measuring only a foot on each side and perhaps an inch thick at its thickest (this would be where the tuning capacitor was placed); a ferrite rod loop-antenna for this frequency might be 4 inches long, and no more than an inch thick at its tuning capacitor; a small, high-Q, high efficiency loop could have a diameter on the order of three feet with a thickness of its capacitor case of about 8 inches; a DDRR

would be about 6 feet in diameter and 7.5 inches high. Both the quad-loop and the large, square, outdoor horizontal loop would measure about 25 feet per side.

With such differing sizes would these loops all perform identically? Definitely not, but they would have some things in common. Let's take a look at their common traits and also their differences.

### Some characteristics of loop antennas

When the turns of a small loop antenna are in a plane vertical to the ground, its horizontal reception pattern has two nulls (directions of minimum responsiveness). These lie along a line perpendicular to the plane of the loop, and running through the center of the loop. But when the loop is mounted such that the plane containing the antenna is parallel to the ground, the antenna is omnidirectional, receiving equally well from all compass directions and having a null directly overhead. Large loops like the quad and full-wavelength horizontal loop radiate and receive maximally along a line perpendicular to the plane containing the loop and running through the center of the loop; they exhibit nulls off their edges. I have no data on the directional properties of the DDRR loop.

The bandwidth of loop antennas is determined largely by the Q, or quality factor, of the inductance and capacitance of the component parts of the antenna. Simply stated, the Q of an inductor or capacitor is based on the ratio of its reactance to its resistance; if resistance is low, Q is high. This makes sense

if you consider that resistance dissipates RF energy as heat, whereas reactance allows RF energy to continue to exist as electrical and magnetic energy.

### The effects of differences in antenna Q-value

All the loop antennas discussed have at least a modest Q value and are therefore relatively narrow-band devices; they require retuning for any sizable change in frequency of operation. The open-frame; ferrite-rod; small, high-Q types; and DDRR loop usually have variable capacitors to accomplish this tuning. The quad loop and large horizontal loop are tuned by making the loop itself the appropriate size.

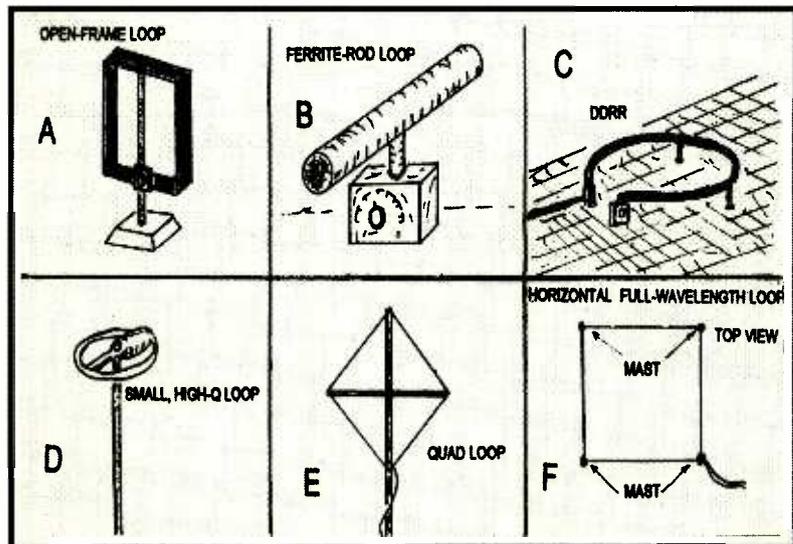
Besides differing in size there is a large difference in Q between these various antennas. As stated earlier, most of them have a modest Q value associated with their components; however, the small, high-Q antennas and the DDRR are designed with a very high Q for their inductors (a single-turn loop); their tuning capacitors are air-dielectric types which also have inherently high Q. This results in a very high efficiency for the antenna. (Higher efficiency means that more of the received signal is delivered to the antenna's output terminals.) Thus we find the DDRR and the small high-Q antenna, which are really small compared to a full-size halfwave dipole, giving performance comparable to that of a halfwave dipole.

The dipole has a wider bandwidth than these antennas, and this is useful, but the small, high-Q loops can be constructed to tune across a much broader frequency range than the dipole's bandwidth, up to a 3 to 1 range (i.e., 10 to 30 MHz); this makes them functional over several different bands. The sharp tuning of the higher-Q antennas can be frustrating, given the time required to retune when the operating frequency is changed; on the other hand, it can be an asset in reducing intermodulation due to strong, off-frequency signals.

### Some unique features of loops

The nulls of loop antennas can be put to very good use in eliminating interference. If

Some popular loop antennas: the open-frame loop (A), the ferrite-rod loop (B), the DDRR (C), the small, high-Q, single-turn loop (D), the quad loop (E), and the full-wavelength horizontal loop (F).



the interfering signal or noise is coming from a direction different from that of the desired signal it may be possible to turn the loop antenna such that one of its nulls is in the direction of the interference. This will often reduce or even eliminate the interference. Small tabletop loops are popular with medium-wave DXers for just this purpose: interfering signals occupying the same channel as the desired signal can often be reduced to a degree that the desired signal can be received satisfactorily. Unfortunately, the vagaries of skywaves make the null's directional characteristics of considerably less use on the HF band.

The nulls of loops also make them quite useful as radio direction-finding antennas on LF, MF, and at VHF and above. Because the nulls are very sharp (narrow) they will indicate quite precisely the direction from which a signal is being transmitted. The antenna is held with its loops in a vertical orientation and then rotated until the received signal is at its weakest; the received station is then located somewhere along the null line of the loop. Taking two null bearings from two widely separated points (the points must not be on the null line) will indicate the exact position of the received station at the point on a map where the two null lines cross. This technique has been much used in the past.

## RADIO RIDDLES

### Last month:

Last month I said that "The folks who study such things are saying that we are at the bottom of the 11-year sunspot cycle." Then I asked, "Just what is this cycle and what does it have to do with propagation of the signals our antennas send and receive? And why are hams who like to work 10 and 15 meter DX, and CBers who like that illegal CB (11 meters) DX, glad to hear that the cycle is about to take an upswing?"

Well, when the sunspot cycle is at its minimum, as it is now, the ionized layers are less ionized, and thus they lose much of their ability to "skip" shortwave signals around the world. As the sunspot cycle moves toward its maximum, these layers become progressively more ionized and HF communication gets a boost, especially in those upper frequencies such as the 10, 11, and 15 meter bands.

### This month:

In this jolly season can you tell me what antenna is known, perhaps not too correctly, as the "Christmas tree antenna?"

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

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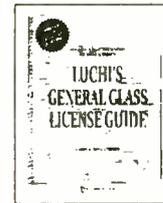
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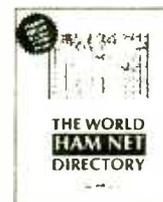
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**Q.** While Universal Coordinated Time (UTC) is virtually the same as the now-defunct Greenwich Mean Time (GMT), aren't there some British locations where, during certain times of the year, there is a one-hour variation? (Hugh Waters, Singapore)

**A.** Absolutely. London also sets its clocks ahead in the spring, and back in the fall.

**Q.** I have a PRO-2006 scanner, preamplifier, and outside antenna, yet I can't pick up a cordless phone next door while my hand-held hears it just fine. How come? (Michael Troy, Hudson Falls, NY)

**A.** First, try removing the preamp; next switch the scanner's rear-panel attenuator to -10 dB; finally, switch the attenuator back to 0 dB and replace the outside antenna with the original whip. My guess is that strong signals are being aggravated by the combination of outside antenna and preamplification, saturating the scanner and desensitizing it.

**Q.** During a summer evening a friend of mine and I both noticed an interesting phenomenon. Coinciding with lightning bursts, we heard FM broadcasts suddenly come in for a fraction of a second up to several seconds duration on normally-vacant frequencies. While I realize that these could be due to local ionization, ducting, or even temperature inversions, have there been serious studies done on this interesting characteristic? (Fred Wolf, Waterville, MN)

**A.** You bet. The military, often in conjunction with NASA, has done extensive tests on ionization-related propagation, both natural and artificial, at every imaginable frequency. These tests were considered vital for national security during wartime when nuclear detonation could produce blackouts and other electromagnetic pulse (EMP) events.

FM DXers know that long-distance reception is often associated with thunderstorm activity, and many experiment with similar effects produced by meteor scatter as well.

**Q.** My 5-watt CB portables don't work well with their whips, but connected to a mobile antenna they really perform. Why the difference? (Barry Koeb, La Canada Flintridge, CA)

**A.** On any hand-held radio, the whip is only half the antenna; the metal of the case and your body attached to it comprise the other half. But for efficiency, your body and radio case must be excellent conductors, and their added length should be one-half wavelength at the operating frequency. Clearly, this doesn't happen, especially at lower frequencies like CB where a quarter wave is about ten feet long.

When you connect the radio to a vehicle-mounted whip, you now have the missing metal—the car body, a good conductor. While the length may not be ideal, the sheer mass of the metal is a good concession.

**Q.** Why are there so many different sized 1.5 volt batteries? (Hugh Waters, Singapore)

**A.** The voltage generated by a chemical cell is a function of the choice of materials (anode and cathode) and the chemical in which they are immersed (electrolyte). The difference in size accounts for its ability to produce current—the quantity of electrons. Compare this to a small hose and a large hose. Connected to the same outlet, they both have the same pressure (pounds per square inch), but the larger hose can deliver more water.

The analogy became readily visible when we compare a nine-volt radio battery with a twelve-volt car battery. While there is a mere three volts difference, across the terminals of which one would you rather accidentally drop a screwdriver? But that extra power doesn't have to be delivered all at once; a flashlight bulb would glow for only a few hours or a fresh alkaline D cell, but for days on a car battery.

**Q.** Often callers to talk shows use cellular telephones. Since it is illegal to listen in on cellular conversations, is rebroadcasting those conversations—or even listening to them as they make the call—legal? (Glenn Torres, Reserve, LA)

## Bob's Tips of the Month

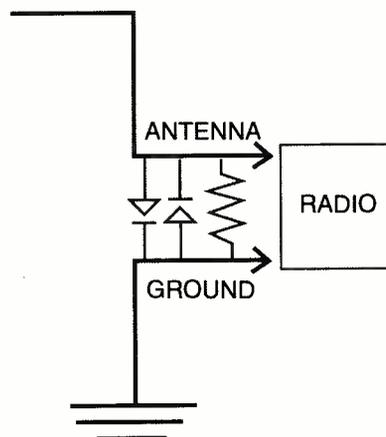
One of the most common complaints expressed by shortwave portable owners and scanner listeners alike is that the sensitivity of the radio suddenly decreases. Almost invariably, these radios have been connected to external antennas, and just as invariably the problem is a blown front-end (RF) transistor or two.

It's hard to tell when and where it happened; perhaps a nearby lightning strike, transmitter, or even the mere act of connecting and disconnecting the antenna can cause a static discharge which zaps the RF transistors.

While commercial lightning protection devices are available from your favorite radio dealer, several fixes have been suggested in the past, such as connecting back-to-back diodes (1N4148, 1N914 or equivalent) across the antenna connector (internally or externally; it doesn't matter).

Another trick is to connect a small resistor, a few hundred ohms or so (not at all critical), between the antenna and ground leads (or across the antenna jack, or coax center wire to shield), thus preventing the buildup of any potential static voltage.

## Zap-Proofing Your Radio From External Antennas



**To be extra safe, use both the diodes and the resistor.**

A. Sure. The prohibition is against listening in on the original cellular frequencies. Your same argument could be made against any rebroadcast telephone conversation, even wireline, since it is unlawful to tap those as well. But obviously, it is implicit when you call in on a talk show, you are giving permission for your conversation to be heard by others. Remember, the broadcaster doesn't tune in the caller on his cell phone, nor does he tap the service line of a wireline call.

**Q. What is the principle of the "artificial ground" and how does it compare to a real earth ground? (Hugh Waters, Singapore)**

A. An artificial ground, made for amateur transceivers, is a tuned circuit which helps prevent the generation of impedance-mismatched RF voltages which would otherwise be produced by improperly-installed antenna systems, causing painful burns and interference to home electronic equipment and accessories. It doesn't change antenna patterns, gain or efficiency, or improve reception.

An adequate earth ground will do the same thing as well as reduce shock hazard and, in some cases, reduce electrical noise interference during reception.

**Q. Why does my ten-channel, GE, "Crystal Clear Plus" cordless telephone continue to transmit after I hang up? Why would my regular telephone ring; then, when I pick it up, have only a burst of DTMF tone-dialing on the other end? (John Norton, Hinesville, GA)**

A. I haven't the foggiest notion about either one, so let's guess. Assuming the cordless set isn't broken, could it continue to transmit as a channel-holder to alert other multichannel phones to avoid that channel? Does your cordless have an intercom feature which may be trying to reach your remote handset? Anything about this in the owner's manual?

So far as the Touch-Tone sounds, many telemarketing companies use automatic dialers which continue to search for folks they can harass. Possibly you picked up on a redial before it had terminated your line. Readers—any other ideas?

**Q. I can hear cordless phones up to 1/4 mile away using a TV antenna, but I can't hear them on my**

**discone. How come? (Andy Boner, Gallatin, TN)**

A. Take a look at the longest (rearmost) elements on your TV antenna and compare them with the length of the discone. The TV antenna's longer elements provide greater "aperture" (signal intercept area) than the discone. TV antenna performance rolls off gradually outside of their design frequencies, so the longest element, channel 2, can receive signals well below 54 MHz, including the 46/49 MHz cordless telephone range.

Discones were designed during World War II for line-of-sight, UHF air-to-ground communications (225-400 MHz), maintaining a reasonably close 50 ohm impedance throughout that range. Discones for the scanner market typically work from approximately 100-1000 MHz; those with vertical elements like the ICOM and Diamond add a narrow band of frequencies near 50 MHz. No discone has the gain of other scanner monitoring antennas.

**Q. Are the Radio Shack "fringe area" TV antennas really that much better than shorter antennas? What if one or two elements were taken out by a storm; how would that affect their performance? (Tom Whitmore, San Antonio, TX 78213)**

A. A basic, narrow-bandwidth, three-element Yagi ("beam") antenna has approximately 6

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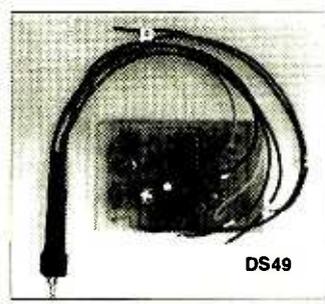
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dB gain over a half-wave dipole; each additional forward element (director) adds as much as one dB gain. A broken basic element (driven element or reflector) would have a disastrous effect on gain, while a missing director would have minimal effect.

On wide-bandwidth log-periodic antennas, recognized by their gradually-tapered, dozen-or-more element, profile, approximately 3-4 elements are active at any particular frequency. A lost element may have noticeable or no effect depending upon the frequency in question.

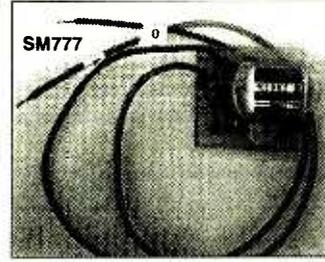
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(Continued from Page 4)

## A Frequency by any other Name ...

David Ragusa of Brooklyn writes, "I have been a federal law enforcement officer with the United States Park Police for over 18 years. I have read with great interest your September 'Federal File' column which lists frequencies in the New York City area. Some errors in agency titles should be corrected.

"In particular, Gateway National Recreation Area and Ellis Island National Monument have errors in their listings. There is no such agency as 'NPS Police.' Apparently it is referring to the United States Park Police, who have been in existence for 204 years, 125 years longer than the National Park Service. The US Park Police has been responsible for law enforcement at Gateway National Recreation Area since 1974. Additionally, the radio frequencies listed for Ellis Island should be the same as those at the Statue of Liberty. They are incorrectly listed in your table as the same as those at Gateway National Recreation Area.

"Another error which I noted is under Fire Island National Seashore. While the frequencies listed may be correct, the agency should be listed as Park Rangers. Park Police have never been permanently assigned to Fire Island."

Thanks for the input, David. No one knows local frequencies, especially when it comes to scanning, better than someone who lives in the area, or who has specialized in a particular agency. How about the rest of you? Do you have a special insight into some aspect of monitoring? Our columnists welcome the input. But be sure to do your homework, too. A well-organized, well-researched frequency list will help assure mistakes don't get introduced in interpretation.

## Ball and Chain Radials

Richard Koser of Croton Falls, New York, sent this scanner tip via Internet.

"I enjoyed W. Clem Small's 'Antenna Topics' article in the July 95 *MT* about improving scanner whip performance by adding radials. Using a 17-inch radio with a battery clip to enhance NOAA reception (162.55 MHz) was easy, but the 60-inch one for the local emergency frequency (46.260) was not flexible enough and quite unwieldy. Switching to ball chain (as in light fixture pull-chain) solved the problems and did perk up the scanner."

## Photo Credits

Barbra Mogan of CML Technologies, Inc. was surprised and gratified to see two pictures from CML printed in a feature article on 9-1-1 systems in *Monitoring Times*. Pages 10 and 11 of the September issue include pictures of dispatchers in front of their equipment; the latter one was recognized as being from a facility in Aylmer, Quebec. When I asked more about CML Technologies, Ms. Mogan sent the following description for interested readers:

"CML Technologies manufactures the only fully digital and fully redundant Enhanced 9-1-1 systems available on the market today. CML's user-friendly and flexible ECS-1000 and Rescue-STAR systems offer customers the ability to tailor their 9-1-1 system to meet the distinct needs of their community. Hundreds of customers across the US and Canada are served by the reliability built into every CML system."

Their address is 75 Boul de la Technologie, Hull, Quebec, Canada J9Z 3G4.

## Stereo Flim Flam

These comments came in response to publisher Bob Grove's October "Closing Comments" on high priced hi-fi equipment.

"First, the price of equipment alone does not make it good or bad, or a reasonable purchase or not. An example from your own catalog would be the Watkins-Johnson receiver at \$3799 vs. the Drake R-8A at roughly one-fourth the W-J price. Why would anyone buy the W-J, given the reviews that indicate the Drake is as good, or even better? I suggest that 'pride of ownership' in a hobby is real, and a motivation for people to buy things, even if people not as interested in a particular hobby regard the higher priced product as a foolish purchase.

"Then, too, the price of one's equipment has little to do with enjoyment. My own Yacht Boy 400 is far from the ultimate in SWL gear, but I enjoy it, and it fits my priorities for hobby costs.

"On another front, I have had friends reject a house site because of its unsuitability for a ham antenna, and pick another site with a better antenna location, but other, poorer, characteristics. How is this different from designing the house around the hi-fi? People keen on a certain hobby do things 'normal' people don't do.

"On the touchy subject of speaker wires ... I would guess that you have never tried 'better' wire for your system (no need, right?) so your opinion is probably not based on expe-

rience. I am not saying that perceived differences in wire sounds can be described scientifically. I am saying that claiming that there can be no perceived difference in sound without actually experimenting is poor practice."

"By the way, I enjoy the magazine. Keep up the good work!"

Mark Lyon, *Audio Systems*

"I read your comments about stereo; I couldn't agree more. As you indicated, one could spend a large fortune for this stuff. It's all hokum as far as I am concerned. Yes, I do have a nice system. And yes I will add to it one day. But I am not going to spend that kind of bucks.

"My question is this. Since this stuff costs so much, how can these companies afford to stay in business? A typical power amplifier—say 100 watts—from Krell is about \$6000 or more. How many can they sell? Who is buying them?

"Another observation: If you look in the back of any of those high end mags you will see ad after ad of someone selling their less-than-one-year-old equipment for about 50% off of the purchase price! Forewarned is forearmed!"

Edgar N. Cohen via Internet

## Hamming Around

Philip E. Galasso, K2PG/KA2XUK, of West Creek, New Jersey, has comments on two topics. He begins, "I have been involved in the monitoring hobby for 30 years and have held an amateur radio license for 27 of those years. Your magazine does an excellent job of serving both of those hobbies. However, I am disappointed that you are dropping Rob Gerardi's 'DX Tips' column. Couldn't you find space *somewhere* in the magazine for it? None of the currently available US amateur radio magazines appeal to me. The 'DX Tips' column in *Monitoring Times* did more than just tantalize newcomers to the amateur bands. It also provided juicy tidbits for longtime operators such as myself."

Philip, I'm glad to hear you enjoyed Gerardi's spot; I, too, thought he did an excellent job of selecting a fascinating mix of potential contacts on a number of modes. Sadly, however, yours is only the second letter in five years to indicate the spot was being read. (If readers ever doubt the benefit of reader contributions and feedback—whether positive or negative—doubt no longer.) Since space is at a premium, it eventually seemed it could be better used. Perhaps it's not totally ironic that the topic to replace it happened to

(Continued on Page 117)

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**Memphis Area Shortwave Hobbyists (MASH):** P.O. Box 3888, Memphis, TN 38173, Jim Pogue (901)873-4291 or Brandon Jordan 373-8046. Memphis area; SW, MW, FM, TV, utilities, pirates, etc.

**Metro Radio System:** Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. *M.R.S. Newsletter.*

**Michigan Area Radio Enthusiasts:** P.O. Box 530933, Livonia, MI 48153-0933. E-mail xx024@detroit.freenet.org. Great Lakes Region. All bands. *Great Lakes Monitor.* \$9.50 annual US & Canada. \$1 sample.

**Minnesota DX Club:** Greg Renner, P.O. Box 10703, White Bear Lake, MN 55110, 612-822-1186 for meeting info. Minnesota. All bands. *MDXC Newsletter.* \$10 annual.

**Monitoring the Long Island Sounds:** Ed, 2134 Decker Ave, North Merrick, NY 11566. Primarily scanner, some SWL. 50 mi. radius of LI. Net Tues 8pm 146.805. *Monitoring the Long Island Sounds.*

**MONIX (Cincinnati/Dayton Area Monitoring Exchange):** Mark Meece, 7917 Third St., West Chester, OH 45069-2212, (513)777-2909. SW Ohio, SE Ind., N Ken; All bands. Meets 2nd Sats 7pm. Net Thurs 9:30 145.210/4.610. No dues.

**Mountain NewsNet:** James Richardson, P.O. Box 621124, Littleton, CO 80162-1124, (303) 933-2195. Colorado statewide. Public Safety notification group. *Mile High Pages.*

**National Radio Club:** Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711, (913)266-5707. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp. Annual Labor Day convention.

**National Radio Club - DX Audio Service:** Ken Chatterton, P.O. Box 164, Mannsville, NY 13661-0164, (315) 387-3583. Worldwide. North American Broadcasters. *DX-Audio Service* (90-min.tape). Sample \$3.

**North American SW Assoc.:** Bob Brown, 45 Wildflower Lane, Levittown, PA 19057, (215) 945-0543. Worldwide; Shortwave broadcast only. *The NASWA Journal.* Regional meetings.

**North Central Texas SWL Club:** Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. North Central TX area; All bands.

**Northeast Ohio SWL/DXers:** Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities. Check for new meeting sked.

**Northeast Scanner Club:** Les Mattson, P.O. Box 458, Rio Grande, NJ 08242, (609) 423-1603 evenings.

Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN).* \$29 annual.

**Ontario DX Association:** Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada; 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:** Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. Pacific NW and BC Canada. DXing all bands. *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.

**RCMA (Radio Communications Monitoring Assn.):** Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *Scanning Journal.*

**Regional Communications Network (RCN):** Jay Delgado or Public Information Unit, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.#10 SASE for info.

**Rocky Mountain Radio Listeners:** Mike Curta, P.O. Box 470776, Aurora, CO 80047-0776. Metro Denver, Colorado. All bands. Meets monthly 2nd or 3rd Sundays 1-4pm, Aurora Central Library.

**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.* \$20 overseas airmail. Meets every 6 weeks in Reading, UK.

Monitoring Clubs Outside North America

**Associazione Italiana Radioascolto (AIR):** C.P. 1338, 10100 Torino A.D., Italy. All wave, utilities, pirates, clandestines, tropicals, lowfrets. *Radiorama* (Italian-monthly) Sample 2 IRCs, 70,000 lit.+ 102,000 air mail (for Americas). April annual mtg.

**Australian Radio DX Club Inc:** P.O. Box 227, Box Hill, Victoria 3128, Australia. SW, MW, Utilities. *Australian DX News.* Sample 2 IRCs or \$2US cash.

**British DX Club:** Colin Wright, 126 Bargery Road, Catford, London, SE6 2LR, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine. *Communication.* L10 UK, L12 Eur, L16 ww. Sample 3 IRCs or \$2 US cash. Meets monthly in Twickenham (London).

**DX Australia:** P.O. Box 422, Moonee Ponds, Victoria 3039, Australia. MW, SW. *DXers Calling.*

**DX Club of India:** Navin Patel, 1-Dutt Niwas, 809 - M.G. Road, Mulund, Bombay-400 080, India. India; MW/SW/Ham. *DX World* (quarterly) Rs 50/-, 30 IRCs outside India. 3 IRCs sample.

**DX Club Paulista:** Marcelo Toniolo Dos Anjos, C. Postal 592, Sao Carlos - SP (Brasil), 13560-970. South America. Shortwave, including utilities. *Actividade DX* (in Portuguese).

**Finnish DX Association:** Mr. Arto Mujunen, Suomen DX-Liitto, P.O. Box 454, FIN-00101 Helsinki, Finland; +358-0-842146 fax. Finland and worldwide. SW and BCB. *Radiomaailma.*

**Friendship DXers Club:** Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. Venezuela and Caribbean. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 kHz. Venezuelan membership free.

**International DX Association:** Bedanta Das, 1 - No. Galiyahati, Near Night School, Barpeta - 781301, Assam, India.

**International Listeners Organization:** Kalab Abbas, St. No. 1, H, No.231 Waris Rd, Sheikhupura, Pakistan 39350 South Asia. Broadcasting. *Listener Times.*

**International Radio Youth Club:** G.M. Mostafa Kamal, Amla Wapda Colony-1, Kushtia-7032, Bangladesh

**National Society of Pakistani DXers:** Mr. Liaqat Ali, E-161/1, Iqbal Park, Opposite Adil Hospital Defence Housing Society Road, Lahore Cantt., Pakistan. Worldwide. All wave. Has library, meets fortnightly 1400-1800 UTC at library. 4 IRCs for more info.

**New Zealand DX Radio Association:** Mr. R. Dickson, 88 Cockerell St., Brookville, Dunedin, New Zealand. MW, SW, amateur and utilities. *Tune-In.*

**New Zealand Radio DX League:** P.O. Box 3011, Auckland, New Zealand. MW, SW, FM, TV, utilities. *New Zealand DX Times.* NZ\$30 in New Zealand.

**North Ontario Radio Listener's Club:** P.O. Box 179, Oamaru, New Zealand.

**Pakistan SW Listeners Club:** Mrs. Fatima Naseem, Sultanpura, Sheikhupura, 39350 Pakistan; Pakistan; SWBC.

**QSL Club de France:** Patrick Frigerio, 40 Rue de Haguenu, 67700 Saverne, France. SWBC, pirates, CB-DX, hams, etc. Courrier (in French). 6 bulletins, 72 FF. EEC=16 IRCs, elsewhere 20 IRCs.

**Shortwave Radio Communications Club:** Atiqur Rehman, Dawood Street, Khalid Road, Sheikhupura, P.C. 39350 Pakistan. South Asia; MW/SW. *The Amateur* (Urdu language). Meets 1st Fri on SW Complex, S.K.P.

**South African DX Club (SADXC):** P.O. Box 18008, Hillbrow 2038, South Africa; MW, SW, utilities. \$60 annual airmail to US; *The South African Shortwave Listener.*

**Southern Cross DX Club Inc.:** Stephen Newlyn, G.P.O. Box 1487, Adelaide, SA 5001, Australia. Worldwide and Pacific. All bands. *DX Post.* \$25 annual in Australia. Meets last Fridays, 8pm, Thebarton.

**Swedish DX Federation (SDXF):** Box 3108, S-103 62 Stockholm, Sweden. 10 issues *Eter-Aktuellit.* Membership in Sweden 160 SC annual. SweDX BBS +46-(0)8-53034727; Fidonet 2:201/339; Internet sysop@swedx.ct.se

**Stichting ScanSearch Military Aircraft Communications (SC-MAC):** Gerbrand Diebels, Roer 29, 5751 TJ Deurne, Netherlands. Military aviation NW Eur (VHF/UHF) and worldwide (HF). *Airlift* (Dutch) bi-monthly. FL 35, up to FL 45 outside Netherlands.

**Universal DX League:** Mr. Kanwarjit Sandhu, 408, Krishna nagar, Ludhiana 141 001. India. India and Int'l; SW/MW/AM/FM/TV DXing/Pirate and Clandestine. *DX Post* bi-monthly, sample 4 IRCs. Annual 24 IRCs or US\$10. SWL net: Sun 0300 UTC on 7080 / 1600 on 14150 SSB, VU3SIO net control.

**Viamão DX-Club:** Alencar Aldo Fossá, P.O. Box 101, Cunhas Road 1286, Jaguaribe Residential Park, 94400-970 Viamão, Rio Grande Do Sul, Brazil, South America. SWBC. Meets occasionally; multi-lingual.

UMBRELLA ORGANIZATIONS (no individual memberships)

**Association of North American Radio Clubs (ANARC):** Richard d'Angelo, 2216, Burkey Drive, Wyomissing, PA 19610. 18 member clubs across North America.

**European DX Council (EDXC):** Michael Murray, P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE, England. 16 member clubs across Europe.

**South Pacific Association of Radio Clubs (SPARC):** Arthur Cushen, 212 Earn Street, Invercargill, New Zealand. Four member clubs covering all bands.

**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.yzu.edu for info - worldwide membership; non-broadcast under 30 MHz. Free electronic newsletter WUNNEWS, join by sending e-mail to majordomo@phoque.info.uqam.ca with following in e-mail message: "subscribe wunnews." Through World Wide Web: http://sun-gabriel.aero.org:8800/. For paper version: \$14.50/yr to Tim Braun, 15915 Smithy Dr., Haymarket, VA 22069.

## SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Dec 1-2	Little Rock, AR	Arkansas DX Convention / Dennis Schaefer W5RZ, 181 Schaefer Dr, Dover, AR 72837, 501-967-4372
Dec 2	Mesa, AZ	Superstition ARC / Gary Roberts KB7VCP, 607 North Miller St, Mesa, AZ 85203, 602-461-0644
Dec 2	Jacksonville, IL	Jacksonville ARS & IL Valley ARC / Rich Tavender KB9IXO, 721 East State St, Jacksonville, IL 62650, 217-245-0305
Dec 2	Minden, LA	Minden ARA / George Winford AA5OL, 111 Fuller St, Minden, LA 71055-3420, 318-377-5019

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

**Monitoring Times Special Events Calendar**  
P.O. Box 98, Brasstown, NC 28902-0098

## LETTERS

(Continued from Page 114)

be "Net News."

Internet, in fact, is the subject of the rest of Philip's letter:

"Although the Internet does contain a wealth of information, I am amused by the discussion of 'Internet phone' in the August issue, and the discussion of the use of Web sites by radio broadcast stations in *Broadcasting & Cable*. Gee, how innovative... sending audio over a telephone line! I guess what's old is new again!

"Meanwhile, while the computer buffs are running up their phone bills surfing the Internet, I will be 'surfing' the HF bands for free, looking both for DX and interesting 'ragchew' contacts. And I will also be on the 160-190 kHz experimenters' band with a licensed 200-watt station this winter."

### From the Editor

1995 has shaken us all up in a great many ways, and the uncertainties of the future have been reflected in the radio hobby as well. In order to address coming

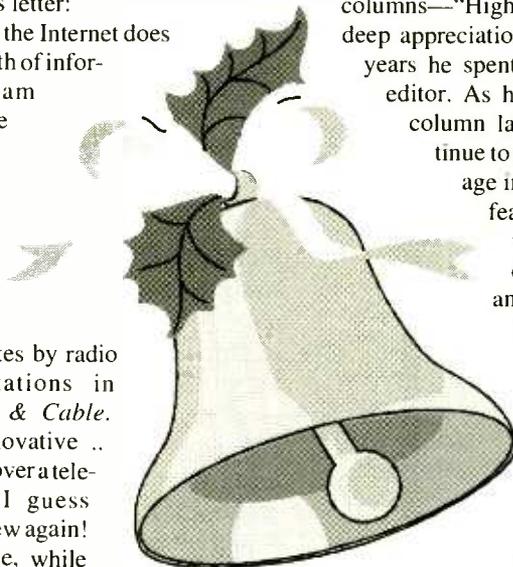
changes in communications, *Monitoring Times* has laid down one of its earliest columns—"High Seas." We express our deep appreciation to James Hay for the years he spent as this column's only editor. As he indicated in his final column last month, he will continue to provide maritime coverage in *Monitoring Times* as a feature writer. "Plane Talk" will continue as a shorter column, but on a much-anticipated monthly basis.

The rest of the space will be filled by a new department, "Skylink," in which Wayne Mishler will demystify new modes of communications.

November also marked the first issue of *Monitoring Times* without ICOM being represented on its back cover. Even the major manufacturers are finding it necessary to redefine their directions. We are glad to see Grundig's demonstration of confidence in the continuing strength of the shortwave market, and we welcome the return of this quality manufacturer to *Monitoring Times* as an advertiser.

Holiday greetings to all from the staff here in Brasstown, and across the US and Canada; we remain ever vigilant to bring you the very best of monitoring times.

—Rachel Baughn  
mteitor@grove.net



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# ESTOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

Ads for **Stock Exchange** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.  
Ad copy must be typed for legibility.

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**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.

**R-390A Sales & Service.** Info SASE Miltronix, P.O.B. 80041, Toledo, OH 43608. R-390 power input cables, \$25; antenna connectors, \$12.50; external AGC mod. \$20. PPD. Mon-Fri 9AM-6PM EST, (419) 255-6220

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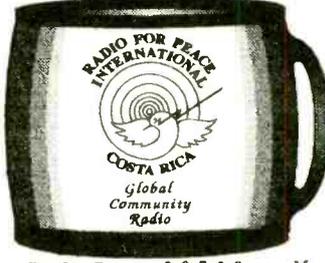
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