

# Monitoring Times

A Publication of  
Grove Enterprises, Inc.



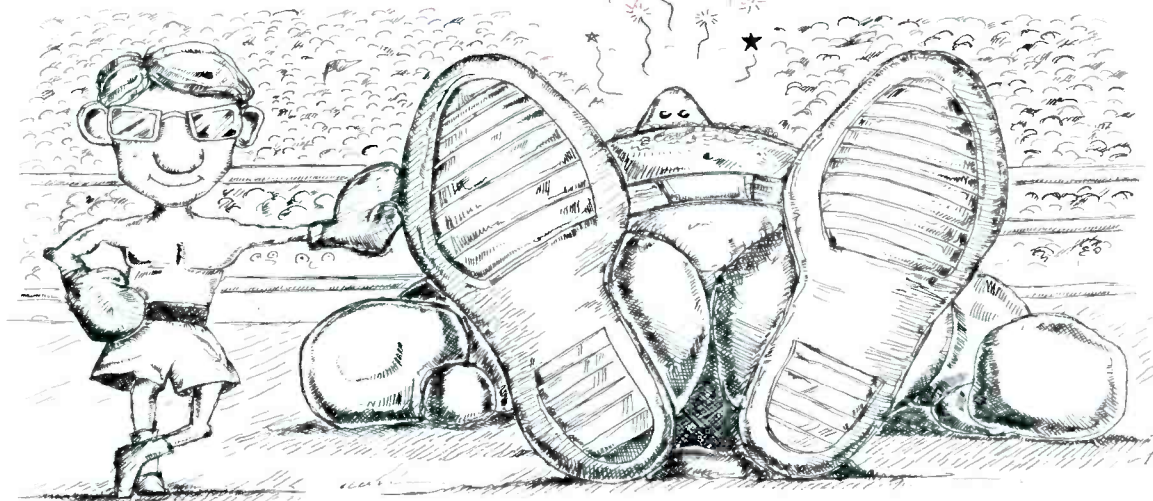
**Flight Test  
Communications**  
*Not your standard  
listening fare*

- **Tune in the Winter Olympics**
- **Life with Satellites**
- **So You Bought a Shortwave Receiver**
- **Spy Catchers -- The Other FBI**



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# Monitoring Times

## **Tuning in the Winter Olympics**

8

*By Jeff Chanowitz*

There is a contagious excitement about Olympic competition that will glue thousands of fans to their television sets February 12-27. In keeping with the nature of this international event, however, it makes sense to also tune around the shortwave dial for the international perspective. Radio Norway is the prime focus of this article since Norway is hosting the 1994 Games, but you'll find sports coverage by other stations here as well.



## **Life With Satellites**

14

*By Ken Reitz*

How did we ever get along without them?! The evolution of the satellite is inextricably linked with every aspect of modern life, from communication technology to the current state of political affairs. Reitz reminds us how it all happened and looks toward even bigger changes from the next generation of "birds."

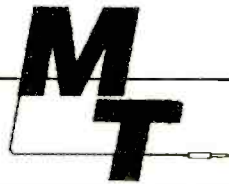
## **Flight Test Communications**

18

*By Jack Sullivan*

One type of aviation communications, linked neither to routine commercial traffic nor necessarily to off-limits military reserves, is flight testing. Putting a new aircraft or piece of equipment through its paces can sometimes produce exciting monitoring. There may be a test site near you; Sullivan provides a partial list of flight test facilities and frequencies to get you started.

**COVER:** New aircraft such as this Boeing V-22 Osprey helicopter are subjected to rigorous flight testing. Photo courtesy Boeing Corporation.



## Spy Catchers: The FBI

20

By Mark Chandler

While we've become accustomed to thinking of the FBI as the nation's premier law enforcement agency, we should not forget that one of its original directives is counterintelligence. What does that have to do with your neighborhood? You might be surprised. It never hurts to be prepared.

## An Old Pirate is Blown Away

24

By Christopher Jones

Over the past few months, tidbits of information have appeared in the pages of *MT* regarding a boat once called the *Sarah*. It was a new and intriguing story to Christopher Jones who wrote up this final bittersweet chapter.

## So You Got a New SW Receiver ...

26

By Jack Rettig

Jack is himself a relative newcomer to the shortwave hobby—new enough to remember the first impressions and unrealistic expectations of a first-time listener. He outlines three basic laws of shortwave listening: Once you are resigned to working with them instead of fighting them, you're on your way to the SWL adventure.

## And Much More ...

Maritime monitoring is featured this month in "High Seas" and "Digital Digest." These columns will answer such questions as, "why can I only hear one side of the conversation?" and "what is this gibberish that appears while I'm copying digital maritime comms?"

Hams who spend long hours under the earphones and TVRO owners who are making a significant investment in equipment are hobbyists who have a vested interest in audio quality. Big bucks aren't necessarily the solution. Turn to "On the Ham Bands" and "Satellite TV" for some economical ideas.

A new chip from Radio Shack makes it possible to record on-the-fly the last 20 seconds of whatever you're listening to; with a little ingenuity and some help from "Experimenters' Workshop," instant replay may now be within your grasp.

Receivers reviewed this month are the Sangean ATS 202 mini-portable shortwave receiver, and two new scanners from Radio Shack: the PRO-2030 and PRO-2032. *MT* welcomes you to a new year of listening fun in 1994!

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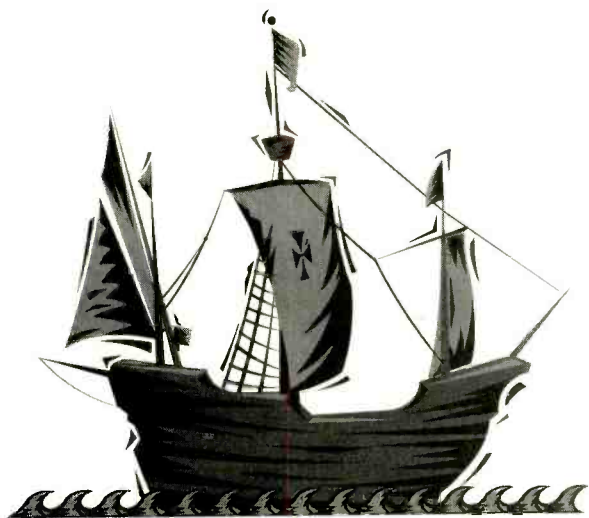
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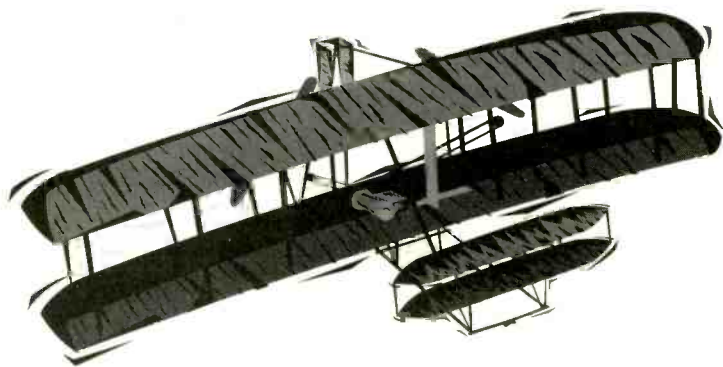
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"THE WORLD IS FLAT"



"THAT THING WILL NEVER FLY"



## "THAT ANTENNA IS TOO SMALL TO WORK"

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

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

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

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

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

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

see your favorite amateur radio equipment dealer.



# LETTERS



## A New Year's Gift to Our Readers

Welcome to 1994 and another new beginning. We hope the economy and Mother Nature will be kinder to us all in '94. Maybe if we are more responsive to what they're trying to tell us, they'll respond in kind!

*MT* is responding (how's that for a segue?) to a longtime request by shortwave broadcast and utility listeners alike, by positioning the Shortwave Guide mini-magazine in the centerfold. For convenience, Glenn Hauser's Shortwave Broadcasting column and the loggings and QSL reports are on adjacent pages. A redesign of the header to bleed off the edge will make the section easy to turn to by slightly fanning the pages.

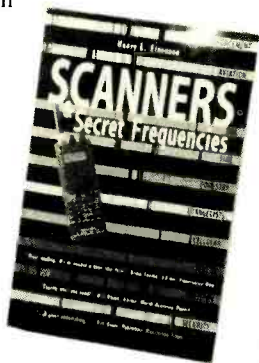
This month also marks the first issue to be polybagged, and we hope you notice an improvement in the magazine's preservation. Polybagging will also give us the opportunity to send renewal notices together with your magazine, for a more effective reminder. Also to your benefit, you may occasionally find inserts on specialized topics, sponsored by related advertisers at no additional cost to you.

We greatly value the support and the input of our readers, and welcome any suggestions on ways to make the magazine better; your contributions to all the columns are what keep the publication lively and relevant to your interests. Meanwhile, please accept our heartfelt thanks on behalf of the staff here at *MT*.

## Re-Viewing a Review

We received a few letters from folks taking strong exception to our review of *Scanners and Secret Frequencies* by Henry Eisenson (and some in support, as well). Publisher Linton Vandiver (Index Publishing Group) sums up a reviewer's responsibility as, "to encapsulate in an interesting, factual, and unbiased fashion the overall content and value of a published work for its intended audience." He adds, "Larry Miller's review in the November issue fails lamentably in this responsibility."

Missing from the review, says Vandiver, is an assessment of the "50-plus pages of radio and antenna principles and the 44 pages of comparative data on currently available



scanners, its fact-filled chapters on frequency allocations, channelization, scanner modifications, the various laws vital to scanning, its in-depth coverage of what can be scanned and how, and much more. Instead he devoted the bulk of the review to what he terms 'some disturbing trends.'"

A letter from Bill Cheek, who wrote the Foreword, concurs: "Miller seems to have dedicated considerable space to a couple of casual, innocent errors." Author Henry Eisenson points out that "There are probably more than 50,000 'facts' in the book (along with several disclaimers) so I'm surprised he listed only three errors—and those were in the Bibliography!"

Damien Thorn of Stockton, CA, wrote, "The book is chock full of valuable, useful and interesting information. I've never read a publication that contained so much technical information for those of us already entrenched in the scanning hobby, and yet was entertaining and interesting to those who are unfamiliar with radio. How Miller got away with glossing over the book's attributes and focusing on minor errors is beyond me."

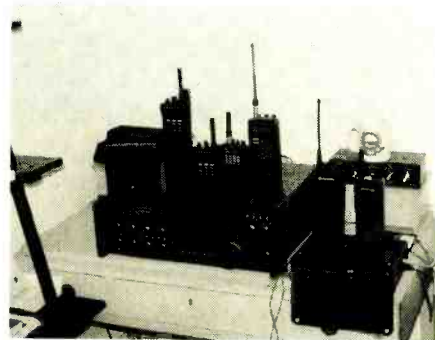
The job of a reviewer is not an easy one. Within unforgiving space constraints, he attempts to describe the contents of a book, enumerate its good and bad points, and make an overall assessment of its value to the readers. In fairness, a reviewer may feel that criticisms should be accompanied by representative examples, which then may take on more significance than perhaps they should. However, discovering errors in the details does beg the question: can one trust the rest of the text?

Admittedly, a review is ultimately subjective. *Monitoring Times* has encouraged its columnists to not only report the specs, but also to evaluate, even though that may mean sticking their necks out.

*Scanners and Secret Frequencies* has received mixed reviews from other radio publications, but no one disputes that this is an enjoyable and ambitious first effort. Most also agree that in the main, the information in it is correct. Certainly it is worth noting that Grove Enterprises deemed it to be a reference they wished to be carry in their catalog.

Of necessity, the "What's New" column is an odd mixture of product announcements based on press releases, book reviews, and product bench tests generally done by Bob Grove. Whenever possible, book reviews are based on a published copy of the book, unless otherwise stated. I would like to pose this question to our readers: would you rather see fewer, but more in-depth book

reviews, which can better meet the ideal as presented above by Vandiver, or the shorter "hit-the-highlights" approach which allows us to address more books? The column is here to meet your needs; what is your preference?



## Real Secret Frequencies

George Philips, who wouldn't part with his FBI frequencies at the *Monitoring Times* convention, sent a photo of his radio arsenal and says, "My area of expertise is federal agencies, especially the FBI, in my area. Other listeners and scanner enthusiasts can contact me at 219-09 Northern Blvd, Suite 49, Bayside, NY 11361." If our introductory article on the FBI gets you fired up and you're in the NYC area, go to George for more information.

George's equipment includes an ICOMR-9000, Motorola Saber 3 (encrypted; used by the FBI and aroused much interest at the Convention), Yaesu FT811, Bearcat 200XLT, Motorola Radius P50, Motorola Expo (encrypted), Marantz tape recorder, and mug with the NY FBI special operations group (he had a few of those at the Convention as well).

Some of the topics George says he would like to see in *MT* include cellular frequency tracking and how to break DVP. The *Monitoring Times* convention is a wonderful opportunity to speculate, fantasize, and swap ideas and information about such topics with other hobbyists. And who knows?, sometimes such tidbits begin to compose a larger picture. Our subscriber base comprises a barely-tapped wealth of information that never ceases to astound us.

## Hidden Cost?

Some U.S. residents ordering the Yupiteru-MVT-7100 from outside the country have been surprised to learn there is an additional cost to their purchase. You can call it by

**Continued on page 106**

# Scanners/Shortwave/GMRS/Ham

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For more information on Bearcat radio scanners or to join the Bearcat Radio Club, call Mr. Scanner at 1-800-423-1331. To order any Bearcat radio product from Communications Electronics Inc. call 1-800-USA-SCAN.

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- Bearcat 100XLT-H handheld ..... \$149.95
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### New FCC Rules Mean Last Buying Opportunity for Radio Scanners

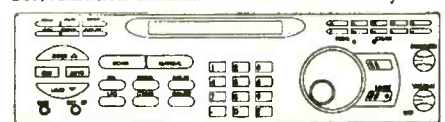
On April 19, 1993, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz cellular telephone service. Supplies of full coverage 800 MHz scanners are in very short supply. If you need technical assistance or recommendations to locate a special scanner or solve a communications problem, call the Communications Electronics Inc. technical support hotline for \$2.00 per minute at 1-900-555-SCAN.

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- 894,0125 - 1,300,000 MHz (NFM).

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



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### Other neat stuff

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## Mixed Signals

Last issue, we reported that the FCC decided to overrule state and local ordinances that outlaw ham transceivers because they can also receive public safety frequencies. The ARRL had said that amateur radio operators have "special needs for out of band reception" and the FCC concurred.

Now comes the case of a San Diego amateur who used his radio to summon help for a seriously injured and badly bleeding friend. After trying to raise assistance on five different amateur repeaters, the commercial repeater for the radio station where he works, and cellular telephone, Chris Boyer, KC6UQG, accessed a Sheriff's Department frequency.

Two weeks later Boyer received a letter asking him to meet with the Sheriff's Department and an FCC representative. At that meeting, Boyer was forced to surrender his radio. According to the *W5YI Report*, a Sheriff's Department official said that Boyer "got off lucky." The FCC, however, refuses to comment on the case saying that there is an open case pending. Bob Grove provides his commentary on this puzzling FCC action in his "Closing Comments" this month.

## Radio Hero



The date was August 22, 1992; the frequency 14.313 MHz. Somewhere off the Turks and Caicos Islands in the British West Indies, a vessel was reportedly sink-

ing. As the U.S. Coast Guard prepared to kick off a massive search and rescue operation, a solitary amateur radio operator listened.

Last month, the ham, Melvin I. Woods, KN4ZT, of Annandale, Virginia, was presented with a bronze plaque, the U.S. Coast Guard Distinguished Public Service Award, and a letter of appreciation from Federal Communications Commission Chairman James Quello.

Woods, a former Navy radioman, heard the "distress" call and immediately pegged it as a fake. He then contacted the FCC with important information regarding the suspected location of the transmitter being used in the hoax.

Jorge Mestre, NS3K, of Fairfax, Virginia, was later convicted in that case.



## Tapping into Cell Phone Profits

There are many ways to make money in the cellular phone industry. One way landed an ingenious Russian immigrant in federal court.

Aghavni Abarian, 28, was charged with telephone fraud after she allegedly operated her own long-distance company. According to reports, Abarian would take phone calls from "customers" on her home phone and then patch them through one of three cell phones using stolen electronic serial and mobile identifier numbers. Abarian would then collect the long-distance fee while the call would actually be charged to an unsuspecting cell phone user's bill.

Abarian's operation was so big that it monopolized several channels of a GTE MobileNet cell site. Authorities traced the tie-up to Abarian's home in Cupertino, CA, and found the woman alone in her bedroom with three cellular phones, antennas and a regular phone that "rang incessantly" with customers. A dish antenna mounted under the eaves of her home connected her to the cell site.

## FutureScan

Not many radios can receive the frequency. And even if yours can, there's not a lot to monitor — yet.

Dubbed the "foundation" for the Clinton Administration's information superhighway, the Personal Communications Services (PCS) has been officially assigned frequencies.

Here's the rundown on the 160 MHz of spectrum allocated in the 2 GHz range for the so-called "Emerging Technology." The information comes from Gene Elig of *Transponder* magazine:

The allocation was channelized into two 30 MHz blocks:

"A" at 1850-1856/1930, 1945 MHz

"B" at 1865-1880/1945-1960 MHz

one 20 MHz block:

"C" at 1880-1890/1960-1970 MHz

and four 10 MHz blocks:

"D" at 2130-2135/2180-2185 MHz

"E" at 2136-2140/2185-2190 MHz

"F" at 2140-2145/2190-2195 MHz

"G" at 2145-2150/2195-2200 MHz

In addition, the blocks will be available in two differing type of geographic units: channels A-C will be MTAs (Major Trading Areas), and D-G will be BTAs (Basic Trading Areas); there will be a total of 51 MTAs and 492 BTAs available.

## One for the Records

Sterling, Oklahoma, was catapulted into the space age last month. No, it wasn't one of those crazy "UFOs Stole My Baby" reports. Instead, a local farmer made contact with the space shuttle while on his tractor baling hay.

"I was ready," said Troy Fehring. "I've been listening for them."

Fehring, who says his "handle" is "John Deere Mobile," did manage to capture the astronaut's attention long enough to engage him in a four-word conversation: "N5VIN, you're 5.9. QSL." And was he excited.

"I didn't have anything to write on, so I jumped out of my tractor, took my screwdriver and scratched it on my toolbox so I wouldn't forget," said Fehring.

Now Fehring is wondering if he isn't ready for the record books. "I'm going to send my QSL card to find out if that's not the first tractor-to-satellite transmission."

## Cellular Monitoring

East Providence, Rhode Island, Patrolman Bruce Atwell was cruising the area and listening to his scanner when he heard a man bragging to his girlfriend. The man, who said he was driving on Crescent View Avenue, was talking about all the cars he had looted.

Looking up, Officer Atwell noticed that the man in the car in front of him on Crescent View Avenue was talking on the phone. The man told his girlfriend that there was a cop behind him.



# COMMUNICATIONS



## FCC to Prohibit Individual Scanner Imports!

With the passage of the Telephone Disclosure and Dispute Resolution Act last year, the Federal Communications Commission banned all pending and future certification of scanners that could receive cellular telephone calls, either right out of the box or after modification. An individual, however, by filing an FCC form 740, could import up to three uncertified radios for his own use.

Now, according to an official response to a former *MT* advertiser, Javiation of England, *it will be unlawful after April 26, 1994, for Americans to import such devices even with the proper filing of form 740.* On that same date it will no longer be lawful to import or manufacture for resale such scanners in the United States.

"Hang up the phone," urged the girlfriend. The police can listen in, she said.

"That cop doesn't even know I'm on the phone," the man replied.

That was enough. Patrolman Atwell pulled the man over. A large duffel bag on the front seat was filled with, among other things, a radar detector, golf clubs, a purse, another cellular phone, and a credit card belonging to a Bristol police officer.



Bob Grove

## We Want Babar

The French, still reportedly steaming about the intrusion of American culture into the Parisian countryside by the opening of a Disney theme park there, are now threatening Bugs Bunny, Tweety Bird and all their pals.

One week after Ted Turner's Cartoon Network began broadcasting via satellite from Britain, the French made a formal complaint to the European Commission. The complaint says that Turner has violated a European Community directive that says at least half the contents of a television network must be European. Further, said indignant French officials, the complaint was but a first step in an eventual complaint under Article 170 of the Treaty of Rome.

*Monitoring Times* is considering a retaliatory croissant boycott.

## Waiting to Get Started

As it stands right now, when you pass your ham test you will probably have to wait four to eight weeks before going on the air. That's because, even though you have passed your test, you are not allowed on the air until the official paper arrives in the mailbox.

According to a new proposal now under consideration, would-be hams would automatically get a six month authority to operate upon passing the test.

During 1992, 44,738 people passed the test for new amateur operator licenses. In the same time period, 11,000 amateur operator license applicants contacted the FCC to inquire about the status of their license. It is hoped that the new proposal would reduce the number of such inquiries.

"Communications" is written by Larry Miller from a variety of sources, including material submitted by the following reporters: Dave Alpert, New York, NY; Rachel Baughn, Brasstown, NC; Jeffrey Jones, Tracy, CA; Maryanne Kehoe, Atlanta, GA; Leroy Long, Edmond, OK; B. Maguire, Montreal, PQ; Dorothy Maguire, Harrisonville, RI; Bill Ritz, Cleveland, Ohio; Neil Rossow, Mesa, AZ; Jim Stellema; Peter Vieth, Roanoke, Virginia and Karl Zuk, Osborn, KY. Additionally, we consulted the *BBC Summary of World Broadcasts*, *National Scanning Report*, *Radio World* and *W5YI Report*. Thanks to all. *MT*

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# Tuning in the Winter Olympics

By Jeff Chanowitz

On February 12, 1994, over 2,000 athletes from 75 countries will descend on Lillehammer, Norway, and provide over a billion people worldwide with the thrills, action and competition that have become associated with the Winter Olympic Games. For radio hobbyists, in addition to providing hours of exciting competition, the Olympic spectacle offers an excellent opportunity to listen in on the action and receive unique national perspectives about the Games.

## Radio Norway International

Since Norway is playing host to the Olympics, it should not be surprising that Radio Norway International is preparing to use the event to highlight Norwegian culture, athletes and the many events that will be taking place in what has been dubbed a "national celebration."

In 1952, under Director Gunnar Nygaard, Radio Norway International gained recognition as an international broadcaster by transmitting in English, 24-hours a day, during the 1952 Summer Olympics which took place in Oslo. Continuing the tradition, Radio Norway International has announced that once again it will provide daily (although limited) broadcasts in English and Norwegian during the Olympics, which will take place from February 12th to 24th.

Discussing RNI's coverage of the Olympics, Bente Skjerven, a feature writer at the service, commented, "The goal of the broadcasts will be to use the games, and the international focus which it gives Norway, to try to give our listeners a better understanding of the country and its culture." Skjerven also stated that the Norwegian language coverage will focus on the athletic competition for Norwegian listeners abroad, while the English broadcasts, which will be five minutes daily in addition to Radio Norway International's regular 30-minute weekly broadcast, "will focus on the cultural aspects of the Games," with less emphasis placed on the sporting events themselves.

Covering the Olympics is a monumental task even for the big American television networks. For a small service such as Radio Norway International—whose English language service only had eight staff members at its peak—covering the Olympic Games may seem impossible. Skjerven described how RNI would cover the Olympics, stating, "Since Norwegian Radio is the host broadcaster for the Olympics, we will rely heavily on other Departments within the Norwegian Radio Corporation (also known under the acronym NRK) for our own coverage."

With all the events that will take place during the week of its broadcasts, even the resources of the NRK will barely enable Radio Norway to provide complete coverage. In addition to the athletic competitions, which will be held throughout Norway in Lillehammer, Kvitfjell, Hafjell, Hunderfossen, Gjøvik, and Hamar, the Olympics and Radio Norway will promote the theme of "environmental responsibility." In accordance with the theme, the Games, and all of the attendant Olympic celebrations will focus on limiting environmental damage from the Olympics. Also spotlighted in festivals conducted throughout the week of the Olympics will be Norwegian culture and Norway's indigenous northern Sami peoples (also known as Lapps).

With thousands of visitors coming to Norway and over a billion people watching the Games on television, the Olympics will be putting Norway's international reputation at stake. Norway hopes to present a positive image to the world that will counter the negative world press it has received from its decision to restart whaling. Listening to Radio Norway International, SWLs will be able to hear a unique viewpoint of the success of the games on a day-by-day basis from a Norwegian perspective. The national

importance of the Olympics was reiterated by Sverre Freidheim, then director of Radio Norway International, in the June 1991 issue of *Monitoring Times* when he stated, "We are a bit hidden in our northern corner, but by being host to the Olympics in 1994, Norway hopes to become more visible."

Norway hopes to continue the surprise success of its athletes that occurred in the last Winter Olympics, in which it won a record number of medals as a result of its successful downhill and cross country skiers. Listeners can tune into Radio Norway for updates on the progress and medals of its athletes. Bente Skjerven confirmed, "We will no doubt conduct interviews with athletes from Norway during our broadcasts."

For SWLs who want to obtain a souvenir from their Winter Olympic listening experience, Radio Norway International has tentative plans to offer a special QSL for their Olympic broadcasts. While plans have not been finalized, listeners should stay tuned to Radio Norway International for details. SWLs should note that Radio Norway International has a fairly strict policy with regards to verification of reception reports. Listeners must include the correct time and frequency, in addition to listing information for about 20 minutes of programming in its 30-minute broadcasts. The information is needed to ensure the reporting of interference with other stations. The address to which to send reception reports is: Radio Norway International, 0340 Oslo 3, Norway.

The Olympic Games are also seen as a benchmark for the service. While the 1952 Olympic Games sparked the experimental English broadcasts that led to Radio Norway's weekly English programs, the 1994 Winter Olympics are seen as a bright spot during a time of uncertainty and cutbacks. The English language service's output has been reduced to one hour a week. As Skjerven explained the service's situation, "The NRK's



## Radio Norway International on Sundays NORWAY NOW

a 30-minute broadcast in English with news, comments and feature programmes.

UTC	Freq. MHz	Target
0800	17.740	Far East, New Zealand
	15.175	Far East, New Zealand
1000	17.840	Europe
	21.705	Europe, West Africa
1200	21.705	Asia
	25.730	Australia
1800	9.590	Europe, West Africa
	9.590	Eastern Europe, Middle East
	11.860	East Africa
2000	9.590	Europe, Africa
	9.590	North America, east
2300	6.120	North America, east
2400	9.675	North America
	11.925	South America
0200	6.120	North and Central America
	7.165	South Asia
0300	6.115	North America, west

**Daily 5-minute Olympic reports will be given in English at 25 minutes past the hours above.**

directors have said that the English service should not be financed by the license payer's money [which is a tax paid by all TV owners in Norway]. As the situation is now, we will continue the Sunday English broadcasts for as long as we are allowed to, and can manage it within our budget."

Olympic coverage from Radio Norway will take place daily on the same frequencies and hours as the Sunday English broadcasts, at about 25 minutes past the hour. For additional information, write to Radio Norway International.

### National Perspectives on the Games via Shortwave

Since such national pride is taken in each gold, silver or bronze Olympic medal won by a nation's athletes, shortwave broadcasters worldwide will be providing their news and perspectives on the Games.

Olympic competition in Lillehammer will have changed largely as a result of the end of the Cold War. For decades, the former Soviet Union, along with members from the Soviet Block nations, won the bulk of the medals at the Winter Olympics. Now, many of the newly independent republics are competing under their own national flags for the first time. One such area previously controlled by the former Soviet Union is the Baltic region which will field Winter Olympic athletes. SWLs can tune to Radio Vilnius, which is Lithuania's service, and Latvian Radio to hear the latest updates on the progress of athletes from the Baltic countries.

While not the powerhouse the Soviet Union once was, Russia continues to field a strong Olympic team and Radio Moscow will provide all the information about Russian medal winners. It may be a surprise to most sports fans to discover that Ukraine is home to many gold-medal winners. Now, with its independence, the Ukrainian athletes can compete under their own flag instead of being swallowed up in Soviet anonymity. For the latest information about Ukrainian medal winners, SWLs can tune to Radio Ukraine for the latest updates.

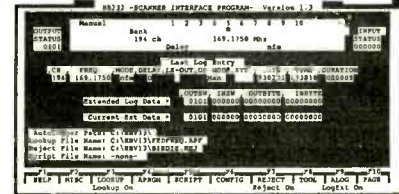
The newly united Germany is one of the main beneficiaries of the end of the Cold War from the perspective of Olympic competition. The former Democratic Republic of Germany dominated the Winter Olympics from the 1970's until its collapse, largely as a result of an investment of huge resources for Olympic training and the use of illegal drugs by its athletes. With the Federal Republic of Germany absorbing East Germany's athletes, a German perspective should not be missed.

To hear the changes that have emerged as a result of the fusion of the two German athletic programs, shortwave listeners can tune to Radio Deutsche Welle for updates on the progress of German athletes. The service will provide news and interviews during the Games in addition to Olympic coverage on its feature *Spotlight on Sports*. (Additional information can be obtained by calling its toll-free number in the U.S.: 1-800-392-3248).

The Nordic countries have traditionally been strong competitors in many of the Winter Olym-

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Opening Ceremony	16.00															
Luge men's singles	10.00															
Luge women's singles	10.00															
Luge men's doubles	10.00															
Luge women's doubles	10.00															
Figure Skating men's singles	11.00															
Figure Skating women's singles	11.00															
Figure Skating men's pairs	11.00															
Figure Skating women's pairs	11.00															
Figure Skating ice dance	11.00															
Short Track Speed Skating men's 500m	11.00															
Short Track Speed Skating women's 500m	11.00															
Short Track Speed Skating men's 1000m	11.00															
Short Track Speed Skating women's 1000m	11.00															
Short Track Speed Skating men's 1500m	11.00															
Short Track Speed Skating women's 1500m	11.00															
Short Track Speed Skating men's 5000m	11.00															
Short Track Speed Skating women's 5000m	11.00															
Short Track Speed Skating men's 10000m	11.00															
Short Track Speed Skating women's 10000m	11.00															
Speed Skating men's 500m	11.00															
Speed Skating women's 500m	11.00															
Speed Skating men's 1000m	11.00															
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Speed Skating men's 5000m	11.00															
Speed Skating women's 5000m	11.00															
Speed Skating men's 10000m	11.00															
Speed Skating women's 10000m	11.00															
Closing Ceremony	20.00	10.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00	9.30/13.00

pic events, such as the nordic skiing, biathlon and ice hockey. To receive comprehensive coverage from Scandinavia, tune to Radio Sweden. With its weekly sports program *Sports Scan*, the service will provide updates on all the countries from the Nordic Region, including Sweden, Finland, Norway, Iceland and Denmark, in addition to featuring profiles of Swedish athletes.

Many Olympic fans will remember the exploits of the famous, gold-winning "flying Finns,"

such as Tony Nieminen, Mati Nykanen and Veikko Kankkonen, in the ski jumping competition. Despite its small population, Finland has been a consistent medal winner throughout the history of the Winter Games. Those who are interested in hearing updates on the progress of Finnish athletes and a Finnish perspective on the games should listen to Radio Finland (YLE). In addition to providing daily updates on its program *Sports Fare*, the service will present

The traditional domination of European nations during the Winter Olympic competition is now being challenged by athletes from Asia. From South Korean and Chinese speed skaters to Japanese figure skaters, Asian nations are a new force in the games and SWLs can listen to Radio Japan, Radio Pyongyang, Radio Korea, Radio Free China and Radio China International to obtain the latest perspectives from countries in the region.



Photo: ©Allsport/Shawn Boterill

expanded news and commentary about the games. (Additional information can also be obtained by calling its toll-free number: 1-800-221-9539.)

Long known for its high quality news coverage, the BBC World Service is another shortwave broadcaster that provides listeners with comprehensive coverage of all the Olympic action. During the games, the BBC will provide added coverage, in addition to its regular features, *Sports International* and *Sports World*.

The Winter Olympics also offer an added incentive for those DXers who want to listen to more unusual finds. While trying to obtain news about lesser known Olympic athletes ranging from the Jamaican bobsled team—which has been made famous in beer commercials—to Algerian skiers, or while searching out the views of countries not normally associated with Winter Olympic competition, SWLs can at the same time challenge themselves to pick up new, hard-to-find stations.

For the times and frequencies of Winter Olympic coverage, listeners can use *MT's* frequency guide as a reference or write to the shortwave broadcast services. Most will be more than happy to provide information about their Olympic coverage.

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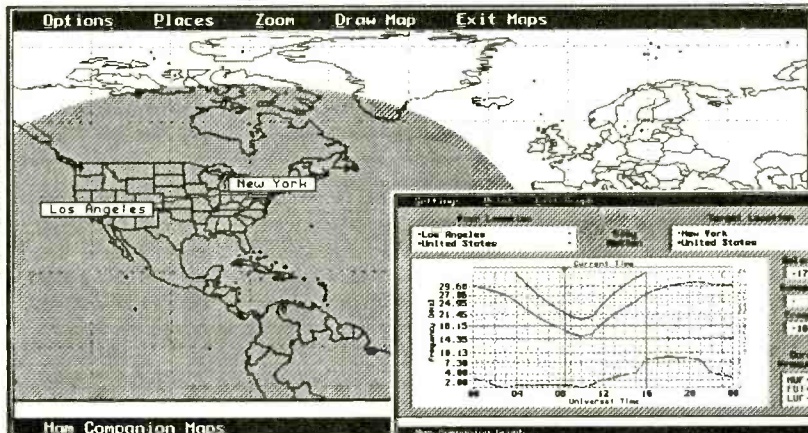
City: Los Angeles Country: United States Lat: 34° 03' N Lon: -118° 14' W Time Zone: PST Daylight Saving: No IATA: LAX ICAO: KLAX	City: New York Country: United States Lat: 40° 42' N Lon: 74° 00' W Time Zone: EST Daylight Saving: Yes IATA: LGA ICAO: KJFK
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Friday 2100-2150 (Africa)

### BBC

Sports International

30 min Wed 2215 rpt Thu 0230, 0630

Sports World

150 min Sat 1430-1500, 1515-1600, 1615-1730

Sports Roundup

15 min daily 0315, 0945, 1245 (ex Sun), 1745, 2245

**Radio Vilnius** 0000-0030, 2000-2030, 2230-2300

**Radio Netherlands** Friday 1750, 1950; Sat 0250, 0850, 1050, 1250, 1450, 2350

**Radio Ukraine** 0100-0200, 2100-2200, 2200-2300

**Radio Sweden** Sports Scan: Monday 1245, 1345, 1445, 1731, 1845, 2145, 2245, 2345; Tues UTC: 0048, 0148, 0248

## Radio Communications at the Olympics

In addition to reporting on the Games, radio communications also play a critical role in the successful running of the Games. From the opening and closing ceremonies to Olympic training to handling emergency situations, operational communications can provide interesting monitoring for radio hobbyists on the scene.

The sophisticated radio communications equipment used in the Olympics is largely due to the generosity of electronic corporations, which have supplied thousands of pieces of equipment to the U.S. and World Olympic Committees. This equipment is used for various tasks ranging from communications during training at sites all over the world, to assisting with the maintenance and support needed for the smooth running of operations.

In the 1992 Summer Games, in Barcelona, Spain, and the Winter Games in Albertville, France, Motorola Communications and Electronics, Inc. provided portable radios to the U.S. Olympics Team. Starting with the coordination of the arrival of the athletes through the actual

competition, portable radios were used throughout the Olympics. Motorola's equipment proved to be a great asset as the U.S. track and field and cycling teams used the radios extensively during training and competition.

In winter events such as the Alpine, Free Style and Nordic Combined Skiing, where seconds and tenths of seconds mean the difference between winning and losing, radio communications provide a competitive edge. In Alpine Skiing, from the top of the hill and throughout the ski run, coaches are placed at critical points to monitor the performance of the athletes. Dennis Agee, program director for the U.S. Olympic Alpine Ski Team in Albertville explained, "We would have up to 15 people networked together by radio out on the course on any given day. About five or six coaches would be positioned throughout the course, each giving critical performance analysis, information about conditions and visibility and even changes in the scheduling of our athletes at the start of the run."

The use of portable radio technology proved to be a valuable asset during the silver medal run of Diane Roffe. Agee explained that his coaches noticed a problem with the lower part of the giant slalom course the day Roffe made her run. After inspecting the section, it was determined that an adjustment was needed at one of the gates. Agee stated that the information, "was communicated to her (Diane Roffe) just before she began; the correction was made and the result was a spectacular run."

As radio hobbyists know, radio communications are extremely valuable during emergency situations and the Olympics is no exception. With athletes giving their maximum effort and intensity to receive the gold, it's inevitable that injuries will occur and fast, efficient communications are critical to insure their safety.

During the ice hockey competition in Albertville, Greg Brown of the U.S. received extensive injuries when he was slammed into the boards during a game against Sweden. Brown was bleeding profusely and needed to be taken to the hospital quickly in order to receive stitches and x-rays. Unfortunately, the hockey stadium was located on top of a mountain in Meribel and the hospital was located several miles away in Chambery. Greg Haney, director of international games preparation for the U.S. Olympic Committee, stated, "We reached our doctor at the Olympic Village in Brides-les-Bains by pager. He was able to coordinate medical care and later the hospital by portable radio. Everything worked quickly and efficiently under extremely difficult circumstances."

With the Olympics being a media extravaganza, the games are a tempting target for terrorist attack. Such fears were realized during the games in Munich, West Germany, when, on September 2, 1972, Palestinian terrorists broke into the Olympic Village, kidnapping and later killing 11 Israeli athletes. Despite the danger, many world leaders continue to attend the games and radio communications play a key role in ensuring their safety.

For instance, when former Vice President Dan Quayle visited the U.S. athletes in the U.S. Olympic Village of Brides-les-Bains in Albertville, security precautions had to be increased drastically, and the United States Olympic Committee coordinated security for the visit via portable radios. Greg Haney pointed out the importance of such radio technology stating, "The radios not only ensured his safety, but they assisted the staff in coordinating the entire visit."

In Lillehammer, the importance of portable radio technology has not gone unnoticed as over 50 million Norwegian kroner (over \$6 million U.S.) has been invested in the development in what has been touted as the "world's most advanced radio technology." The new portable radios will be used by the over 2,700 security personnel stationed in Lillehammer and are advertised as being impossible to monitor.

## Listening In

Whether you're one of the lucky ones who will attend the Winter Olympic Games or are enjoying the action from your living room, the Olympics can provide an exciting listening experience. While many programs will advertise that they have the most comprehensive coverage of the Olympics, radio hobbyists know that they have access to unique perspectives and viewpoints of the Games found nowhere else.

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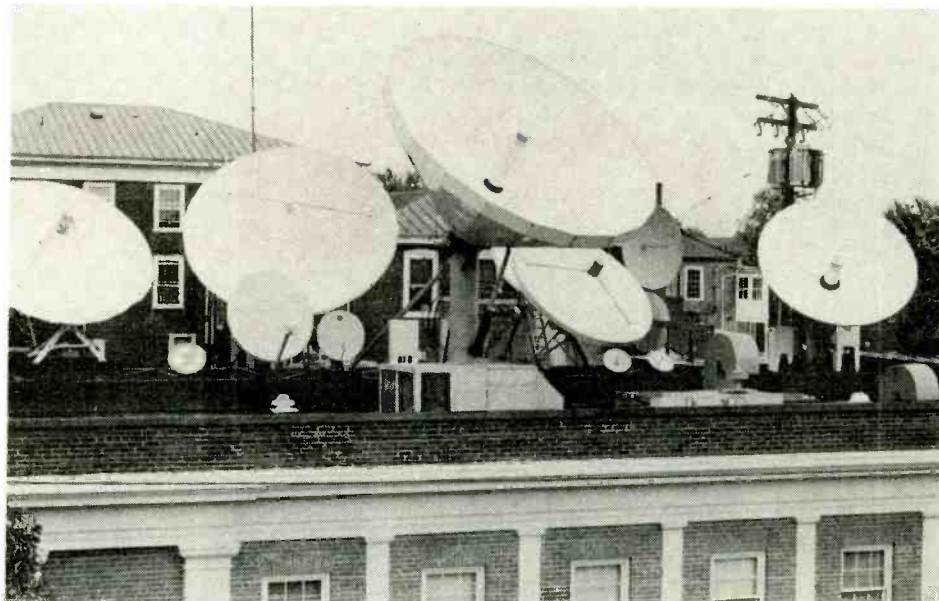
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# Life with Satellites

Story by Ken Reitz

Photos by Jensen Montambault



A familiar brown truck pulls into the driveway. The driver leaps out and bounds up the walk to the front door. He lays a package by the door and presses a sequence of buttons on an electronic clipboard he carries. Back in the truck he slips the clipboard into a holder on the dashboard. The contents of the clipboard are automatically sent by a small transmitter hooked up to a tiny antenna just under the fiberglass roof of the truck to a satellite thousands of miles away.

What is this, the introduction to a science fiction novel? No, it's just routine work for a United Parcel Service driver. And he's only one of millions of people whose work each day either depends on or is connected to satellites. Thirty-six years ago no one knew what a satellite was; now, it seems, we can't do without them.

Every day, every hour, these workhorses in the sky are busy relaying tens of thousands of simultaneous telephone calls, banking transactions, inventory data, television and radio programming, facsimile images, weather data, global positioning information, two-way voice, financial data, religious programming, distance learning, on-the-scene news, and urgent medical information to remote villages. That's just the tip of the iceberg when it comes to the tasks performed for us by satellites.

We have made ourselves inextricably dependent on these tiny specks in the sky and, in the process, brought ourselves closer to what the late futurist Marshall McLuhan called the "global village."

## In The First Place

The first use of a satellite to relay signals from Earth occurred on January 11, 1946, when

*Photo above: Dish farm atop channel 29 WVIR-TV, Charlottesville, VA. Large center dish is controlled from NBC headquarters in Burbank, CA. Very small dishes are for data reception.*

Army Signal Corps officer John H. DeWitt bounced a 112 MHz Radar beam off the Moon which was received back on Earth. Such transmissions, now known as Earth-Moon-Earth (EME), are routine fun for amateur radio operators today using a wider range of ham frequencies and sophisticated antenna arrays and transceivers.

The first "artificial satellite" came eleven years later, October 4, 1957, when the Soviet Union stunned the world and officially began the Space Age with the successful launch of its Sputnik 1 satellite. Soviet engineers purposely chose the frequency of 20.005 MHz as one of the two on which Sputnik operated. It was a frequency covered by virtually all shortwave radios used by hams and shortwave listening enthusiasts. Such listeners provided thousands of detailed signal reports which proved invaluable for the collection of data for space communications.

## The Pace of Progress

How we got from the short-lived, weak, insistent "beep" of Sputnik to the gigahertz, megabyte, powerful satellites of today is truly breathtaking. On January 31, 1958, American engineers created their own sensation with the launch of Explorer 1 transmitting a 10 milliwatt beacon at 108 MHz. Less than four months after the Soviet's magnificent achievement, the U.S. had joined the space age and the race was on.

On April 1, 1960, the U.S. launched its first in a long series of weather satellites designated as TIROS 1 (Television and InfraRed Observation Satellite). By August of that year ECHO 1, a massive balloon with a highly reflective surface, became the first man-made passive satellite for communications. It was a surface off which anyone could bounce transmissions, a fact which was not lost on amateur radio operators the world over. It stayed up for three years and logged over 400 million miles.

This satellite merely piqued amateur imagination. A scant four years after Sputnik 1 a group

of American amateur radio operators built, and convinced the U.S. military to launch, its very own satellite. Dubbed OSCAR 1 (Orbiting Satellite Carrying Amateur Radio) this tiny 10 pound satellite transmitted a 140 milliwatt beacon on 144.98 MHz. Its simple message in Morse Code were the letters HI.

On July 10, 1962, the U.S. scored a series of "firsts" with the launch of Telstar 1. It marked the first telecast relayed from space, the first transatlantic telecast, the first two-way voice and video transmissions via an orbiting satellite and the first satellite featured an American Top-40 rock and roll hit!

## The "Modern" Era

The first of what could be called modern satellites was launched June 28, 1965, and was called Early Bird. It was the first communications satellite to be put into geosynchronous orbit, which meant that it appeared to remain stationary over one spot on the Earth. Early Bird had a capacity for 1 television channel or 240 two-way phone circuits. Compare this with current satellites which accommodate 48 channels or tens of thousands of voice circuits.

Technological advances in electronics and solar powered photovoltaic cells were responsible for the big changes in satellites. New "birds," as these devices are often referred to, require the ability to generate large quantities of power. The only way to get this much power was through the use of massive solar cell arrays.

Earthbound users of all types of communications watched keenly this evolution of satellites. Once the price for utilization of this mode became competitive with land based communications, the switch would be on.

## The Military Connection

It should be noted that this period of satellite infancy and development was no benign compe-



tion between friends. The Soviet Union and the United States were locked in technological combat for bragging rights to space. During the ensuing 25 year period from Sputnik to the collapse of the Soviet Union, thousands of military spy and communications satellites were launched by both sides in a free-wheeling, budget-busting, spending spree.

In the end, the private sector appears to have been the greatest beneficiary. Micro-miniature circuitry and super sensitive microwave communications equipment are almost entirely the result of military and NASA related research and development.

Oddly, the fizzling of the Cold War, sluggishness of the world economy and public attitude toward huge government projects may have brought a halt to the heady activities of previous decades. But, the private sector in the 1990's has declared itself more than ready to pick up where government has left off.

## Overthrowing Ma Bell

Ten years after Early Bird, the face of domestic communications was about to change again. This time it would be driven by commercial enterprises and the result would change forever our insular and slow paced lives. The usual NASA, military and weather related advances in space and satellite technology had become so commonplace that only their failures warranted news coverage. Quietly, companies like RCA and Western Union had set up satellites for telephony and were doing box office business.

Yes, box office. Now Time, Inc., had a really great idea: Start a Pay-TV movie service, offer it to America's expanding Community Antenna Television (CATV) systems (as cable-TV was then known), distribute it not over land-laid telephone lines or equally expensive point-to-point microwave relay systems, but by satellite! And, oh yeah, call it Home Box Office.

In September 1975 HBO launched on Westar 1. Soon all the major television networks were adding satellite feeds for their news gathering and program distribution at a fraction of the cost of terrestrial distribution. New networks took advantage of the low threshold price and a frenzy began in American broadcasting, the likes of which had not been seen since the radio heyday of the 1920's. Religious broadcasters like Praise The Lord; entrepreneurs like Ted Turner with his little UHF TV station in Atlanta and dozens more clambered aboard the Cable-TV rocket for the ride of their lives.

## New Uses For Satellites

Big players with deep pockets jumped feet first into the satellite building and launching

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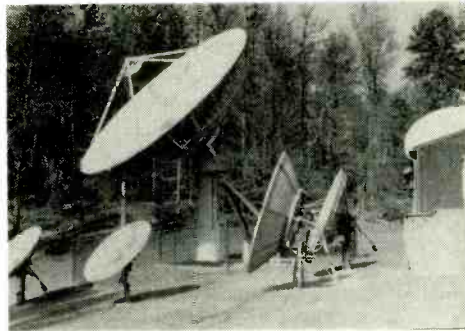


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**Above:** Distance learning uplink and downlink dish farm for The University of Virginia, Charlottesville, VA. Colleges and Universities continue a tradition of cutting edge technology begun in the early days of wireless.

**Right:** Antenna farm for radio station WQMC-FM in Charlottesville, VA. Note Associated Press news "wire" dish in lower right hand corner.



game. Hughes Aircraft, GTE Spacenet, and General Electric were among the eager entrants into the fray. Dozens of new satellites were built and launched in the first three years of the 1980's. Transmitting and receiving equipment got better and cheaper each year.

Colleges and universities signed up to beam classes to students far from the campus. An entire industry in "distance learning" sprang up in no time. Dozens of these institutions of higher learning today maintain no fewer than 34 separate satellite channels. From the University of Alaska to the University of Virginia and dozens of points inbetween, Americans attend college via satellite.

Churches with centralized headquarters and far flung worshippers such as the Church of Jesus Christ Latter Day Saints (Mormons) keep

in touch via satellite. Other religious organizations such as Robert Tilton Ministries, owe their very success in life to satellite's inexpensive ability to deliver their message anywhere in North America for one low price.

Corporations have found satellite communications to be multi-purpose. Many, such as Georgia Power, Wal-Mart, Computerland, General Motors, Chrysler, Ford, Home Depot, Union Pacific Railroad, Pacific Gas and Electric and others maintain private conferencing channels usually encrypted via Scientific Atlanta's B-MAC system. In addition, these corporations often use the same channels for employee training in a commercial twist on "distance learning."

## The Retail Edge

Dozens of retail stores use satellite broadcasting to deliver their in-store music programming. Most notable are large chainstores such as Safeway, SuperFresh, Payless and Pharmor. One satellite channel (Spacenet 3,



*Dish atop hotel (upper left) entertains guests while dish atop convenience store (lower right) relays store's transactions to regional headquarters.*

channel 18) has no fewer than 22 audio channels just for that purpose. Next time you go grocery shopping, "check out" the dish on the roof.

The major players in America's retail trade such as Sears and J.C. Penny have their own full video channels. Sears Videoenterencing Network (SVN) is on ASC 1 at 128 degrees west and J.C. Penny can be found on Gstar 4 at 105 degrees west on channels 13 and 16. It shares the same bird as Texaco, IDS, the FAA, the IRS and Whittle Communications' Channel One, among others.

Convenience store chains have found satellites an invaluable tool in retailing. Many use VSAT (Very Small Aperture Antenna Terminal) transceivers, which connect every store in the chain to the regional or national headquarters via a "hub" satellite. Every transaction which goes through the store cash register is immediately transmitted to the home office via a small dish on the roof. The data collected daily by headquarters from each store provides everything the company needs to know about how each store is faring. Potential problems with inventory, cash flow or theft can be quickly spotted. Lucky Stores has such a system on SBS 5 at 123 degrees west.

## On The Road

If you've stayed in a major hotel chain recently you may have noticed their TV channels are different from what you are used to. Participating hotels use Comsat Video Enterprises "Satellite Cinema" which offers eight channels on SBS 6, a Ku band satellite at 95 degrees west. They downlink separate feeds of popular cable fare such as ESPN, HBO, Showtime, CNN, TBS, and four pay-per-view movie channels, all encrypted via S-A's BMAC.

Hospitality Television (HTV) is a service for the restaurant industry featuring, among other morsels, the culinary arts. HTV is found on Galaxy 7 (91 degrees west) channel 18 in the Ku band.

## The New Age Skyway

The list of American businesses doing business with or on satellites reads like a list of the top Dow Jones 100. Each year dozens of new firms sign up for space on the satellites. As the old Wall Street adage goes: Nothing succeeds like success. Encryption methods and compression techniques assure businesses that their transmissions will be secure and remain relatively cheap.

Health industry organizations are using satellites, too. The Mayo Medical Clinic has six half transponders on Gstar 3. Insurance companies and teaching hospitals are aboard the birds as well.

Some of the biggest users of satellites are the banking and investment industries. You may have noticed dishes sprouting atop banks in your area. These are often for relaying transaction information and downlinking up to the minute financial information.

Brokerage houses also sport these dishes. Multimillion dollar corporations have started up in the last five years just to provide investors with market-specific data. If one is a commodities or stock investor, there are stand-alone systems which downlink proprietary data involving the markets in which one has an interest. Pre-sorting this information saves the investor the tedious task of wading through piles of paper and provides information and data which is only minutes old. Linked to special software in the user's computer, these devices track specific stocks and trends and print out charts on demand. Unlike land-line based computer hook-ups, there are no on-line charges. Users pay a flat monthly or yearly subscription fee.

## And The List Goes On

There are more than thirty-three channels of horse, harness and dog racing live from their respective venues. There's Jai-Alai, bingo and at least a dozen state's lotteries. It's a gamblers' paradise.

There are the regular sports channels, of which you may already be watching a few on your local cable system, but no single cable system carries them all: there are nearly thirty.

There are dozens of channels of daily feeds from as many news services. Every TV station in America which can afford to rent an uplink vehicle has a live feed to send. Each college, university or even high school which has a sports broadcast contract has a feed. There are literally hundreds of satellite transponders in use in our portion of the Clarke Belt every day.

## A Crowded Future

As this is being written there are dozens of new satellites on the launch pad, in production,



*Well placed shrubbery conceals this downlink dish in front of a Church of Jesus Christ Latter Day Saints.*

on the drawing table or just in the twinkle of an engineer's eye. Old satellites are being decommissioned to make way for the new breed. New higher powered, higher capacity and higher frequency birds will take their place. Engineering solutions such as 10:1 video compression and visual wonders such as High Definition Television (HDTV) make the continuing success of this industry inevitable. The pace, incredibly, appears to be accelerating.

As an example, no fewer than nine companies are currently working on new systems for mobile satellite services. Figuring on start up costs from .5 to 6 billion dollars these companies hope to provide customers with total global voice and data communications from personal communications devices much smaller than the currently popular cellular phones. What does this mean? More fancy toys for the disposable income crowd? Not necessarily. One company plans a system of 840 Low Earth Orbit (LEO) satellites for global voice and data services. The market they are targeting is the forty million people worldwide who are currently waiting for telephone service!

In just three months the next wave of Direct Broadcast Satellite receiving systems will be on the shelves. Eighteen inch dishes will provide customers with up to 150 channels of entertainment and information from one satellite. Our ability to amuse ourselves has never been greater.

Right now airline passengers are listening to real-time radio broadcasts via satellite. This year companies will experiment with real time-video reception on airplanes. Other companies are working on radio broadcasts intended for reception by car.

From hikers tramping in the wilderness to boaters in uncertain waters; from isolated people miles from the nearest phone line to rural Americans away from cable's reach; from airline passengers relaxing to music at thirty thousand feet to investment bankers looking for action on Wall Street, satellites have irrevocably penetrated our civilization. It has brought an entirely new meaning to the old fashioned term "wireless."

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# SCANNING FLIGHT TEST COMMUNICATIONS

By Jack Sullivan

**F**light test communications are among the most interesting and exciting listening targets around. This is not routine, day-to-day stuff. Instead, flight test operations combine the experimental and high-tech with the unexpected and dramatic. What kinds of communications are these, and where and how can the hobbyist listen in?

Flight testing is intended to accomplish many different objectives. In both the civilian and military sectors, new aircraft designs are studied and evaluated with the objective of identifying and eliminating design and engineering problems and readying the aircraft for routine service. "New aircraft designs" include not only entirely new, experimental aircraft, but also major or minor modifications to existing aircraft types and their many internal and external systems. Final flight testing of new aircraft also takes place prior to delivery by the manufacturer and acceptance by the final user.

In the military sector (including NASA), flight testing can involve almost anything that moves through the air, including rockets, missiles, pilotless vehicles and even bombs, "smart" or otherwise.

The most exotic forms of flight testing are done by the military, such as the super-secret experimental aircraft being developed at hidden bases, and the evaluation of aircraft designed and built in countries that are not friendly to the United States. Though intentionally hidden from casual public view, these secret test activities are just as available as any of the other types to the informed monitor who finds himself in the right place at the right time with the right receiver and the knowledge of what frequencies to monitor. (See the December Federal File for an example.)

## What Can I Expect to Hear?

Since the applications are so broad, flight test operations are extremely varied. Usually (if manned) the test aircraft pilot is in constant radio contact with the flight test controller, who has overall supervision of the testing. In the early stages, the aircraft may only be involved in studying its ground handling characteristics during taxi runs at various speeds. To monitor these communications, you will have to be within a few miles of the facility in order to hear both sides of the communications. In later stage testing, the aircraft operates at various altitudes

above the ground and you should be able to receive the aircraft communications from many miles away.

Most flight test activities occur around major aircraft factories or military facilities (see Table 2), so a visit to one of these locations can prove to be a very educational experience. High-performance aircraft (jets and some helicopters) tend to travel "cross country" along regular routes with each end of the route located at the major base facility. Very-high-performance (missiles and supersonic aircraft) are generally tested over established geographical "ranges" that have intentionally limited access and positive control over aircraft and/or ship operations via radar and multi-frequency air-to-ground radio systems.

In these types of operations a number of people get involved in the radio communications: a range control officer, who has overall responsibility for operations on the range; a range safety officer, who has primary responsibility for the safety of aircraft and personnel operating on the range; and chase aircraft, who fly alongside test aircraft and monitor flight characteristics visually as well as with cameras and other sensors.

Most flight test ranges are found in unpopulated areas for safety (and security) reasons. The western desert areas and the Warning (or "Whiskey") areas off the coast of the United States are home to most of the high- and very-high-performance aircraft flight test operations in the United States.

Most communications may seem to be short and puzzling at first, since they concern various cockpit instrument readouts and aircraft control responses. At other times, missile launch count-downs and actual emergencies make the listening very exciting. I recommend close monitoring of



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*Testing of this V-22 Osprey was heard at a county airport in Delaware (see Table 2).*

**Table 1**

2,000-29,999 MHz (Single sideband [upper])
Used by military and commercial manufacturers for long range communications.
30,000-87,975 MHz (FM)
Mainly used by military helicopters.
118,000-136,975 MHz (AM)
Mainly used by commercial manufacturers.
Both military and non-military aircraft can be heard using this band. Look for activity primarily between 123.125 and 123.6 MHz.
137,000-143,975 MHz and 148,025-150,775 MHz (AM) Exclusively used by military aircraft.
153,035 - 153,395 MHz (FM)
Used by commercial manufacturers.
225,000 - 399,975 MHz (AM and digital)
Exclusively used by military aircraft.

even routine flight test communications so that you can gain a better understanding of what is actually happening and so that you will not miss important information, such as directions to switch to alternate frequencies. (By contrast to those brief and cryptic reports, cross-country test flight communications usually involve at least two aircraft and the interplane chatter tends to be more informal and very interesting.)

Besides voice communications, flight testing also involves telemetry transmissions between the test aircraft and instruments and recorders on the ground. Information on every aspect of the aircraft's operations, from the position of the throttle levers to the temperature of the cabin air, are combined together, or multiplexed, and sent both to onboard recorders as well as to ground receivers over wideband digital datalinks.

## Getting Started

The frequency bands and modulation modes in Table 1 are used for flight test communications. While it is ideal to have a receiver with you that can cover all of these frequency bands, it is not absolutely necessary. Various portable and base receivers that cover all or most of these bands are advertised by Grove Enterprises and other *MT* advertisers.

For short range monitoring near a flight test facility, a programmable handheld scanner with its whip antenna should do an adequate job for you. For longer range flight test monitoring I use a discone antenna connected to my ICOM R-7000 receiver via 50 feet of the coaxial cable supplied with the ICOM discone (when at a temporary location) or via 1/2" "hardline"

**Table 2**

**Northeast:**

Sikorsky Division, United Technologies, Stratford, CT: Major military/commercial helicopter manufacturer. Frequencies: 17.9830, 123.20, 305.8

Grumman Aerospace Corp., Calverton, NY: Major military aircraft (F-14/E-2) manufacturer. Frequencies: 127.55, 340.2

Boeing Helicopters, Ridley Twp., PA: Major military helicopter manufacturer with flight test operations headquartered at New Castle County Airport in nearby Delaware. (See the adjacent photo of the V-22 Osprey tilt-rotor aircraft that was recently tested here.) Frequencies: 123.2, 123.25, 123.4, 123.475, 123.525, 123.55

Naval Air Warfare Center Patuxent River, MD (Patuxent River Naval Air Station): This is the main aircraft flight test center for the Navy and Marines. Frequencies: 123.2, 344.4, 354.8

**Southeast:**

Patrick AFB, Cocoa Beach, FL: Main control point for the Air Force's Eastern Test Range and for test activities in the Cape Canaveral Area.; Frequencies: 138.3, 383.0, 122.85, 372.2

Lockheed Aircraft Co., Marietta, GA (adjacent to Dobbins Air Reserve Base): Major military aircraft manufacturer. Frequencies: 123.55, 382.6

Eglin AFB, Valparaiso, FL: Principal Air Force test range for both aircraft and weapons systems. Frequencies: 328.025, 318.05, 122.85, 372.2

**Central:**

McDonnell Douglas Aircraft Co., St. Louis, MO (Lambert Field): Major military aircraft manufacturer (F-15, AV-8B, etc.). Frequencies: 123.2, 382.6

Lockheed Aircraft Co., Ft. Worth, TX (adjacent to Carswell AFB): Major military aircraft manufacturer (F-16). Frequencies: 123.2, 281.4

Boeing Military Airplane Company, Wichita, KS (adjacent to McConnell AFB): Major military and government aircraft manufacturer. Frequencies: 113.45, 354.4

Bell Helicopter Textron, Arlington, TX: Major helicopter manufacturer. Frequencies: 123.475, 234.3

**Southwest:**

White Sands Missile Range, NM: The Army's main test range for missiles and other weapons systems. Frequencies: 126.95, 294.6

McDonnell Douglas Helicopters, Mesa, AZ (Falcon Field): Major manufacturer of Army attack helicopters. Frequencies: 123.35, 226.3

Utah Test and Training Range, Hill AFB, UT: Large test range for weapons systems such as air launched cruise missiles. Frequencies: 122.85, 372.2, 381.3, 301.7, 233.4, 375.9

Tonopah Test Range, NV: Very large and remote area used for testing of secret Air Force weapons systems. Associated with Nellis AFB and the super-secret Groom Lake test base. Frequencies: 126.95, 118.7, 126.15, 255.8, 260.95, 272.5, 361.3, 377.8

**West:**

Edwards AFB, CA: Primary flight test facility for new Air Force aircraft. Also hosts Army, NASA and some Navy testing. Frequencies: 120.7, 132.75, 269.8, 272.0, 304.0

Vandenberg AFB, CA: Major Air Force test base for intercontinental missiles and for flight test operations over Pacific Ocean. Frequencies: 121.4, 296.5, 386.6

Palmdale, CA (Air Force Plant 42): High security production and test facility for new aircraft types. Frequencies: 123.7, 317.6, 126.1, 290.3

China Lake Naval Air Weapons Station, CA: Major test center for Navy aircraft and weapons systems. Frequencies: 133.65, 348.7, 120.15, 340.2

Point Mugu Naval Air Weapons Station, CA: Principle test facility for Navy aircraft and weapons systems over the Pacific Ocean. Frequencies: 267.5, 128.65, 325.0

Boeing Field, Seattle, WA: One of several Boeing production and test facilities for both commercial and military aircraft in this state. Frequencies: 123.55, 291.8, 120.6, 257.8

coaxial cable when at home. I also find that use of a computer-controlled scanning package and a cassette tape recorder make an ideal setup for this kind of monitoring. (One note of caution concerning some handheld scanners: the 137-150 MHz range is often preprogrammed to receive in narrowband FM mode only, making this band segment unusable with these receivers.)

Once you are equipped to monitor these communications, the only thing you need is a good listing of the various facilities where flight test activities happen and the frequencies that are known to be used at these sites. Table 2 is a sample listing of some of the flight test facilities that are active almost constantly along with some principal communications channels.

**Suggested Further Reading**

There are many additional flight test facilities around the country, both military and commercial. The following publications will lead you to additional locations and frequencies. Good luck and enjoy the action!

*Directory Of North American Military Aviation Communications (HF/VHF/UHF) -2nd Edition* by Jack Sullivan. Four regional editions from Hunterdon Aero Publishers.

*Monitoring the Military-2nd Edition* By Daryll Symington from

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# Spy Catchers:



## The Other Side of the FBI

By Mark Chandler

**The** FBI's role as America's premier law enforcement agency is common knowledge. Their role as spy catchers is somewhat less well known. It is the responsibility of the FBI's Counter-Intelligence branch to investigate, identify, collect evidence on and arrest foreign intelligence agents working in the U.S.

It may come as news to some that the FBI has agents working in U.S. Embassies and diplomatic missions around the world. They officially serve as legal counsel to the Embassy. They also conduct counter-intelligence investigations. It is from this post that agents preparing to enter the U.S. from foreign countries are occasionally identified, tailed and apprehended before they hit the shores of the U.S.

Because much of the FBI's activities are undercover or counter-intelligence, virtually all of their highly classified voice and data communications are conducted via secure telephone lines.



In Washington, D.C., and around most District FBI centers you may be hard pressed to hear open voice communications. Communication Sec-

urity (Comsec) requirements and common sense require encryption. The most common voice communications heard in my district are mobile units trying to coordinate their encryption devices. The mobile and base radios must have the same key codes to operate properly. Without the proper coordination the encryption units will not understand each other. After the keys are set all you hear is a swish and a tone at the end of each transmission. Encryption keys are changed every twenty-four hours.

Today's FBI radio communications are conducted on a nationwide network of VHF/UHF repeaters. These repeaters are usually located on



the same telephone microwave towers or radio and TV broadcasting towers as state police repeaters. Except as an emergency back-up sys-

tem, the FBI's HF network has not been in operation for some years. The HF equipment that remains would only be used in the case of a national or regional emergency.

Telephone lines and microwave links connect district and regional communications centers with remotely located transmitters. An audio signal can be sent via telephone lines to a transmitter on the other side of the country, for example. This system is similar to the system of remotely located repeaters used by commercial and military aeronautical radio communication links.

Most FBI centers use Motorola Radio equipment. The encryption equipment is built to FBI specifications by the same manufacturers who design satellite TV encryption systems. This equipment is incredibly complex and secure.



There are eight district offices, each equipped with laboratories for forensics, photo, fingerprint and "flap and seal work" (examining postal

# The Television Gray Market

by Henry Eisonson

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# Scanners & Secret Frequencies

FOREWORD BY  
BILL CHEEK!

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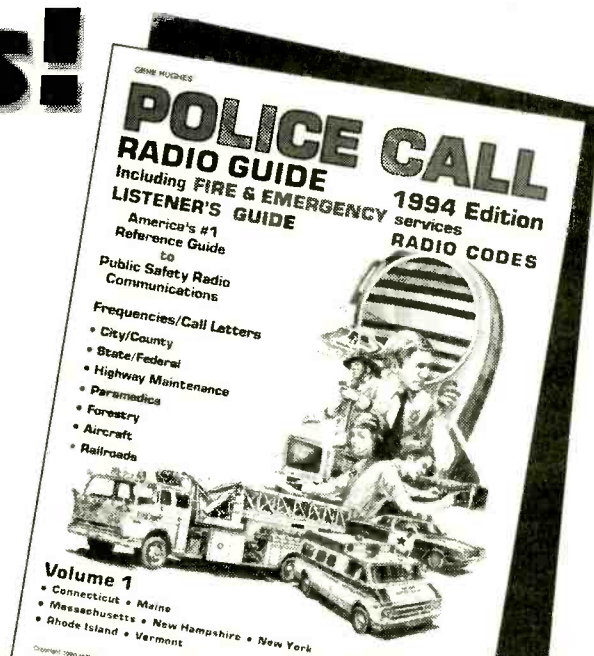
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**Table 1**

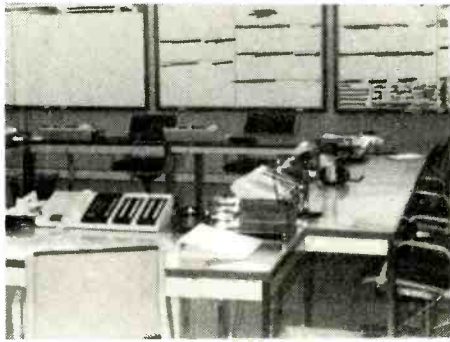
<b>FBI Frequencies</b>											
<u>VHF Allocations (MHz)</u>				<u>Michigan</u>				<u>Montana</u>			
163.310	163.610	163.825	163.835	163.310	163.835	163.875	163.925	167.220	167.375	167.610	
163.850	163.865	163.875	163.885	163.950	163.975	167.250	167.310				
163.910	163.925	163.975	163.985	167.400				<u>Washington DC</u>			
164.260	164.410	167.210	167.220	<u>Texas</u>				163.825 167.410 167.525			
167.250	167.275	167.285	167.325	167.210	167.250	167.310	167.325	<u>South Dakota</u>			
167.385	167.395	167.400	167.410	167.360	167.385	167.410	167.450	167.230 167.300 167.650 167.935			
167.425	167.435	167.450	167.460	167.500				<u>New Mexico</u>			
167.475	167.500	167.510	167.525	<u>Virginia</u>				167.210 167.360 167.375 167.435			
167.560	167.575	167.585	167.600	163.610	163.835	163.985	167.275	<u>Wisconsin</u>			
167.625	167.635	167.650	167.675	167.410	167.685	167.725		167.235 167.625 167.785			
167.700	167.715	167.725	167.735	<u>Florida</u>				<u>Arizona</u>			
167.750	167.760	167.785	167.875	163.835	167.220	167.485	167.500	167.335 167.485 167.935			
167.925	167.935	167.950	167.975	167.575	167.685			<u>Indiana</u>			
167.985				<u>Oregon</u>				167.210 167.315			
<u>UHF Allocations (MHz)</u>				163.875	163.925	167.450	167.465	<u>Illinois</u>			
412.425	412.450	412.425	412.500	167.625	167.735			163.910 167.385			
412.575	414.025	414.050	414.075	<u>Massachusetts</u>				<u>Vermont</u>			
414.100	414.125	414.150	414.175	163.835	163.865	163.885	167.325	167.250 167.650			
414.200	414.225	414.275	414.300	167.350				<u>Idaho</u>			
414.325	414.350	414.325	414.400	<u>Alaska</u>				163.910 167.610			
414.425	414.450	414.475	414.500	167.220	167.235	167.360	167.410	<u>Georgia</u>			
414.525	414.550	414.575	417.400	164.410	164.475	167.335	167.410	167.410 167.935			
417.450	417.550	417.600	419.175	167.450				<u>Oklahoma</u>			
419.200	419.225	419.275	419.300	<u>Washington</u>				167.275 167.485			
419.325	419.375	419.400	419.425	164.410	164.475	167.335	167.410	<u>Minnesota</u>			
419.450	419.475	419.500	419.525	167.450				167.230 167.300 167.650			
419.575				<u>Missouri</u>				<u>Pennsylvania</u>			
<b>Best Bet Frequencies (MHz)</b>				163.835	163.910	163.925	167.220	167.685 167.835			
<u>California</u>				167.300				<u>Kentucky</u>			
163.810	163.885	163.910	164.260	<u>Maryland</u>				167.935			
164.275	165.525	167.220	167.360	163.850	163.950	167.410	167.450	<b>FBI UHF Bands (MHz)</b>			
167.385	167.400	167.435	167.500	167.650				408.850-409.250 411.025-411.175			
167.610	167.650	167.586	167.775	<u>Connecticut</u>				412.425-412.575 413.975-414.550			
167.925				163.885	163.975	167.275	167.325	417.150-417.550 419.075-419.550			
<u>New York</u>				167.410				<b>FBI VHF Bands (MHz)</b>			
163.835	163.910	163.925	163.950	<u>Rhode Island</u>				163.825-164.550 167.200-167.925			
163.975	167.220	167.250	167.400	163.185	167.275	167.325	167.410				
167.575	167.650	167.685	167.760	<u>New Jersey</u>							
<u>Ohio</u>				167.325	167.525	167.575	167.610				
163.875	163.910	163.950	163.985	<u>Colorado</u>							
167.235	167.285	167.360	167.410	163.910	167.685	167.950					
167.500	167.650	167.675	167.725								
167.785											

material). The communications center for the district consists of three rooms. One room contains radio consoles for district wide communications with field officers. A second room allows nationwide or worldwide commu-

nications. It is an engineering center where all of the radio, satellite, and computer links are maintained. The FBI conducts audio and video as well as the monitoring of commercial satellites.

The third is a briefing or situation room. This can be used for inter-agency task forces, to brief other agencies or people involved in special operations. It is centered around a large video screen, like a miniature NORAD control room.





Each desk is equipped with audio and video equipment that lets the participants monitor agents on the job, much like the CIA operations center in the movie, *The Russia House*.

The FBI and CIA both lease transponders on Intelsat and domestic telecommunications satellites. This insures that secure (encrypted) voice and data can be flashed around the world when needed.

The Agency has come a long way since its humble beginning in 1908, when President Theodore Roosevelt created a thirty-five man law enforcement agency known as the Bureau of Investigation. It would not be known as the Federal Bureau of Investigation until 1935, eleven years after the now infamous J. Edgar Hoover joined the force. In 1939, President Franklin Delano Roosevelt gave the FBI responsibility for counter-intelligence. Agents undergo an eleven-week training course at the Quantico Marine Base in Virginia. The agency now has over eight thousand field agents and a total of twenty thousand employees.

You may think there is no spy catching going on in your state or area. After all, you are so far away from Washington. Ask yourself this: Do

you have a military base, Federal government office, a depot, a think-tank, universities, government contractors, high-tech industry, libraries, trade associations, book or magazine publishers in your state? Of course! These are all targets of foreign intelligence agents who are, in turn, targets of FBI counter-intelligence agents.

There are two types of spies: legal and illegal. Legal spies are the ones that have a diplomatic cover and work out of an embassy in Washington or a foreign mission in New York or San Francisco. In the espionage game, an embassy is nothing more than a spy station—all under a "gentleman's agreement," of course.

The second type of spy is an illegal. He is a deep cover agent who assumes the identity of a legal resident of the target country. He has a regular job, speaks perfect English, drives a Chevy, belongs to the lodge, may live in the house next door, supports conservative causes, may be an amateur radio operator or SWL, flies "old glory" and recruits people with access to useful information to betray their country.

This is the reason the counter-intelligence agents of the FBI must use mail covers (intercepting the mail), electronic and visual surveillance, and wiretaps to collect information on such suspected persons.

Spy catching by its very nature requires large amounts of radio communications and FBI agents are not unlike their notorious secret service counterparts, who sometimes forget or refuse to use encryption because of the negative effect it has on voice quality and clarity. With persistence you will hear agents confirming arrests, special operations, wire taps, and visual surveillance. So, my advice to you is to punch in some of the frequencies listed in Table 1 and just keep listening. **MT**



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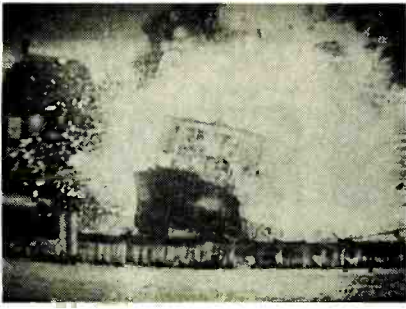
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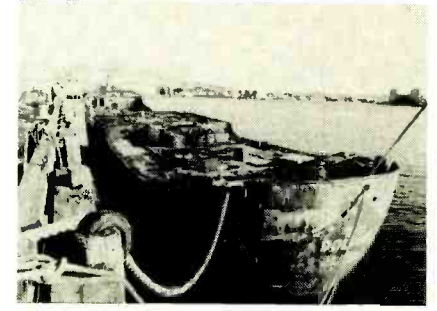
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# An Old Pirate is *BLOWN AWAY*

By Christopher Jones



Pirate DXers bid farewell this past fall to the symbol of a world famous thorn-in-the-side of the FCC. In a series of explosions sending a pillar of fire and smoke hundreds of feet into the air, the ill-fated ship *m/v Sarah* signed off in a spectacular blaze fit for a Viking funeral.

On September 24th the rusting hull of the *m/v Sarah*, better known as the original home of Radio Newyork International (RNI), staged what may (or may not) be the grand finale in a long and troubled career. An ex-Japanese fishing vessel built 33 years ago, the *Sarah* became the focus of much controversy in the late 80s when she operated in international waters just 4-1/2 miles off Long Beach, Long Island.

For years the rusting hull has been sitting in the Boston harbor as a reminder of the station that once graced the pages of *Monitoring Times* and other radio enthusiast periodicals. Retrofitted with additional decks of plywood and timber, the *Sarah's* characteristic port list has become part of Hollywood history. At 6:40 pm on September 24th in front of thousands of curious Boston residents, members of the Boston Police Explosive Ordinance Unit blew her sky high for the final scene in the new Jeff Bridges movie, *Blown Away*. Bridges plays Jimmy Dove of the Boston Bomb Squad, hot on the trail of an Irish pyro-terrorist portrayed by *Fugitive* actor Tommy Lee Jones.

The final scene was filmed in East Boston where the *Sarah*, sold by RNI technician Allen Weiner in June to MGM, underwent two months of construction in preparation for thirty seconds of pow. Five thousand feet of Primacord laced the makeshift decks linking 30 pounds of explosives to five hundred gallons of gasoline.

Just seconds before igniting the floating bomb, two stunt men leaped from its deck into the harbor. The ensuing four explosions at five second intervals sent a fireball billowing over three hundred feet into the air dwarfing the Boston skyline. Area residents described the scene as breathtaking as sky high embers fell to East Boston roofs igniting small flames for the waiting firefighters.

Other residents weren't so lucky. Hundreds of windows were blown out by the explosions and further inspections revealed cracked walls and foundations as well as a few collapsed ceilings. Residents had reason to be thankful the producers had taken a large insurance policy just

for the scene. Robert Ross, owner of the commercial building next to the blast sight, told the *Boston Globe* the movie company had his building covered in a \$20 million policy.

Other East Boston residents displayed colder feelings towards the movie makers. As director Stephen Hawkins prepared for the shoot, production assistants blanketed the surrounding neighborhood with pamphlets warning of the next day's demolition. Several residents claimed they had not been notified. Many people were frightened when their houses were suddenly shaken and their windows were sucked out.

Most who witnessed the explosion had no idea of the history of the boat. A few residents thought she was abandoned while others claimed she had been seized in a marijuana raid by the Coast Guard. "Either way she's been in the harbor since long before I started working here," Chief Petty Officer Sullivan of the U.S. Coast Guard said.

In a recent interview, Allen Weiner summed up his decision to sell the *Sarah* to Metro-Goldwin-Mayer in just a few words, "It paid off the debts on the bloody thing."

## Building on the Ashes

At present, the *Sarah* is tied to a pier in Charlestown. From her oil soaked berth one can easily see her resurrected antenna towers on Weiner's new project, the *m/v Fury*, rising above the East Boston Marina.

Before becoming part owner of the *Sarah*, Weiner had established himself as a battle-scarred veteran of confrontation with the FCC. At 16, he operated his first pirate station in Yonkers, New York, and was shut down. Later in the 80s, he lost two legitimate stations in Maine when he challenged the government by using an unauthorized transmitter out of New York.

Weiner, now approaching 40, is presently outfitting a new ship, the *m/v Fury*, for future operations in the Caribbean. Weiner admits he will not be part of this new adventure scheduled to be active as early as December.

"I'm doing the engineering and the outfitting. Once she's done, the new owners set sail, and I'll have nothing more to do with it," Weiner said. The only reminders from the past are the salvaged antennas and some of the equipment on board the *Fury*.

The company in charge of the new project, Voyager Broadcast Services, will be leasing three of the *Fury's* four transmitters to those desiring air time. November's *Monitoring Times* mentions that the *Fury's* owners were seeking a "license agreement" from the islands of St. Kitts-Nevis in the British West Indies. Weiner mentioned that an agreement has been reached with an island, but it was not the same one as mentioned in their October press release.

By mid-November the *Fury* should be underway to warmer waters. For new shortwave listeners this will be an "easy log," and for veterans, the *Fury* provides a nostalgic continuation of the ship-board broadcasting of her sister ship *Sarah*. Those familiar with WRNO broadcasts will recognize a familiar voice. The fourth transmitter on board *m/v Fury* is reserved for the Overcomer Ministry of Brother Stair.

Weiner hinted the *Fury* will probably start broadcasting on the 25 and 49 meter band although "nothing is definite and anything is possible."

## Postscript

As to the *Sarah*, her charred hull has been towed from its film mark in East Boston to a pier in the Charlestown Naval Yard where her upper deck is currently being dismantled by a marine salvage company who purchased her from MGM. Her stern still bears her registry name *The Dolphin* from La Cieba, Honduras. Two dolphins are faintly silhouetted on either side of her markings.

Jack Schmelzer of New England Marine Salvage reports he has two ship brokers interested in buying the hull. "One Haitian firm and a Portuguese firm are interested in her. I'm not sure if they'll try to outfit her with a motor or just use her as a barge, but we're looking for about \$15,000," Schmelzer said as he fired his welding torch. If she doesn't sell, she'll be broken up for scrap, he continued.

The *Sarah's* black paint is loosing territory on the rusting steel hull beneath and her deck is charred. As her days in Boston dwindle down to single digits, the once proud pirate still limps to port with her ever present defiance. As the cutters torch tears *Sarah's* rivet from plate, satisfaction can be had in knowing a new broadcaster has risen from her ashes— **MT**

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# So You Got a New Shortwave Receiver ...

## Advice to the New Listener

By Jack L. Rettig



For those of you who discovered a new multiband radio under the tree, or who ran out and spent that Christmas money on a neat receiver promising signals from exotic lands ... for those of you who wanted to hear the news direct from Timbuktu ... this article was written for the moment when you may be beginning to feel it was all a scam.

Shortly after turning on your new shortwave radio you will have discovered that receiving shortwave broadcasts is more difficult than receiving domestic radio or TV. It is very likely that after a few hours of frustration, you will have unwittingly discovered three laws of shortwave listening, (though it's possible you are still blaming the receiver/yourself/the manual, etc.):

**#1 If a station is not on the air, you can't hear it.**

Many shortwave stations broadcast to the U.S. only a few hours per day.

**#2 Even if you can hear it, you may not understand it.**

Only a fraction of shortwave broadcasts are in English. Some of those are in modes your receiver can't decode.

**#3 Even if you can understand it, it may be garbled.**

Shortwave broadcasts are adversely affected by natural and man-made interference.

The message of this article is: don't be discouraged. Part of the problem is knowing what to expect. With a few pieces of additional information under your belt, your shortwave listening will become much easier and a lot more enjoyable. First, it helps to know where to turn for help.

### Listening Aids

The best listening aid a new shortwave listener (SWL) can have is an experienced friend who is willing to share his or her knowledge. If there is an SWL club in your area, that, too, can be a wonderful source of information and support. (One place to start looking for one is in *MT's* "Club Circuit.") But if you don't have these resources—or even if you do—you need reliable published information.

There are a lot of publications available, but I suggest that the new SWL begin with the following, which are almost indispensable:

· Harry L. Helms' *Shortwave Listening Guidebook* from High Text Publications, 7128 Miramar Road, San Diego, CA 92121. A very informative, well-written book for the beginning SWL.

· *Passport to World Band Radio*, an annual publication providing up-to-date information on shortwave stations and frequencies, reviews of shortwave equipment and several helpful articles. Published by International Broadcasting Services, Box 300, Penn's Park, PA 18943.

· *Monitoring Times*, the monthly magazine you are now reading, which contains a current (English language) listening guide, equipment reviews, and interesting articles. Published by Grove Enterprises, P.O. Box 98, Brasstown, NC 28902.

· *1994 Guide to Shortwave Programs*, by Kannon Shanmugam. A detailed minute-by-minute, day-by-day program and frequency guide to English broadcasts from the world's major shortwave stations. This is the next best thing to having an individual program guide from every major broadcaster. Published by Grove Enterprises, P.O. Box 98, Brasstown, NC 28902.

### Listening Techniques

When you listen to domestic radio or TV, chances are that you don't just listen at random. You check the newspaper or *TV Guide* and then tune to a specific program on a specific channel at a specific time. Programs are 30 or 60 minutes in length, and the station frequency is always the same.

Shortwave broadcasts are not so regular, and published schedules are less dependable (Shanmugam's guide is the best single source I've seen, but even it is not complete and programs often differ from the listings).

Programs vary in length, some lasting only 5-10 minutes. Stations also change their broadcast frequencies during the day and during the year, so it's not always easy to know what's on and where to tune in. After a while you learn when and where to find your favorite programs, but in the beginning it's wise to consult a schedule, plan your listening, and expect some changes.

You can always get *something* on your shortwave receiver, regardless of the time of day, but you'll find that 80% of the programs are news. Broadcasters tend to schedule their best programs during prime time (2300-0700 UTC for North America). It's not unusual for two or more interesting programs to come on at the same time.

Table 1: A Sample Summer Listening Session

Time UTC	Freq	Station	Program
0300	17770	R. New Zealand	News
0309	9545	Deutsche Welle	European Journal
0330	5950	V. of Free China	Economic Journal
0340	9590	R. Netherlands	News
0350	15230	R. Japan	Understanding Japan
0400	9455	C.S. Monitor	News
0430	17795	R. Australia	Pop music/interviews
0445	15425	R. Moscow	Russian language lesson
0500	5975	BBC	News
0513	17795	R. Australia	Sports report
0520	17770	R. New Zealand	Band concert
0530	11925	HCJB-Ecuador	Ham Radio Today
0550	9510	R. Havana	Latin music

A few months ago, using Shanmugam's 1993 *Guide*, I sketched out a plan for three hours of shortwave listening. I wanted to hear 13 programs, but when the evening was over, I found that only five of them were broadcast as indicated in the schedule. The other eight had been changed in one way or another, usually in program content. The programs I actually heard (listed in Table 1) were enlightening and enjoyable, but I was reminded once again that broadcasters change programs, times and frequencies on a whim, and what's on the air often differs from even their own published schedules.

These were all powerful stations, easily received by my Sony portable. I have tried, with some success, to pick up weaker stations. Altogether, I've logged stations in about 50 countries, but much of this has been difficult listening.

This brings us to the subject of equipment.

## Equipment for the Job

I suppose it's fairly common for a new shortwave listener to expect too much of his or her equipment. We read reports about people picking up Tibet, Tahiti or Timbuktu, and then are disappointed when we can't do the same. We need to understand that there are two kinds of shortwave listeners and that they use different kinds of equipment.

The casual listener (SWL) like me wants to tune in foreign radio stations with good programs that arrive on strong, easy-to-hear signals. He probably has just a portable radio with a whip or a piece of wire that serves as a "random wire" antenna. He has not made a big investment, and should not expect miraculous results. Serious program listeners can certainly spend as much money as the next hobbyist, but his more sophisticated equipment is likely to focus on such aspects as improvements in audio quality, for example.

The second approach is the radio hobbyist (DXer) who wants to dig into the noise and pull out and log all of those faint, far away transmissions. To do that, he needs a powerful communications receiver with special filters coupled with a high-performance, rooftop antenna. If he's a really serious hobbyist, he may have a radio shack out back or in the basement with several receivers, several antennas and lots of other equipment. Very likely the DXer started out as an SWL and got hooked on technology, the romance of far away places, or the challenge. It's an addicting hobby!

The point is that all shortwave listening is rewarding. Each of us just needs to discover what kind of listening appeals to us and then

## What Time Is It UTC?

Since shortwave broadcasters transmit worldwide from locations all over the globe, interpreting station schedules in each broadcaster's local time would be a nightmare. Fortunately, a standard has been established called Coordinated Universal Time (UTC), which operates on a 24-hour format (0000-2400) and is based on the time in Greenwich, England.

All frequency and programming schedules from shortwave broadcasters are given in UTC, as well as station listings in well-known shortwave publications like *World Radio TV Handbook*, *Passport to World Band Radio*, and the "Shortwave Guide" in *Monitoring Times*.

To convert your local time to UTC, add (during Standard Time) 5, 6, 7, or 8 hours for Eastern, Central, Mountain, or Pacific Time, respectively. For example, if you live in Brasstown, North Carolina, and the local time is 1:00 pm (or 1300 hours on a 24 hour clock), it is 1800 UTC.

Keep in mind that all dates, as well as times, are in UTC. For example, The BBC's *Sports Roundup* program (0305 UTC Sunday) will be heard on Saturday evening (10:05 Eastern, 7:05 Pacific) in North America, not on Sunday. *Monitoring Times* gives its readers the benefit of doing a part of the conversion for them. Eastern and Pacific times are already converted to UTC at the top of each page of the "Shortwave Guide" section.

There are products available that make the conversion even easier. The MFJ-108B Dual Digital Clock (available from Grove Enterprises for \$19.95 plus shipping, 1-800-438-8155) provides both 12-hour local time and 24-hour UTC time.

Converting standard time to UTC time can be confusing, even for the experts. Since UTC benefits both broadcasters and listeners by enabling frequency and programming schedules to be used worldwide, it is worth the effort of determining, "what time is it ...UTC?"

obtain the knowledge and equipment that is needed to reach our goals. We have now come full circle, because the publications mentioned at the beginning of this article will help us do those very things.

So, now that you are prepared for the adventures offered to you by your new receiver, let's get started!

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## Playground Intrigue

*"Fox Tango, Fox Tango this is Lima, I have good Ping Pong your unit at this time."*

*"Night Rider, Night Rider this is Foxtrot Tango, are you at Texaco?"*

*"Fox Tango this is Sierra, I have the following players in the playground: Whiskey, Echo, Tango, Lima, Juliet, India, Tango Echo, Foxtrot Tango and Night Rider."*

Communications like these have been reported for years by MT readers who have asked which government agency is conducting these transmissions and what are they used for. Thanks to the efforts of Jeff Haverlah in Texas, Robert Evans in Canada, and Neal Perdue in Alabama, we'll find the answer by visiting a playground. Not just any playground: this is the US Navy's Alligator Playground.

What is an Alligator Playground? Many years ago the Navy developed HF and UHF data links amongst Navy units ashore and afloat. These data links are used to pass surface and air radar information to all units in a particular task force. By sharing radar information within a particular task force or group, all ships gain a much bigger picture of the surface and airspace around them.

This Naval Tactical Data System (NTDS) uses computers and data link radio communications to get information to the ships in the battle groups. The HF side of all of this is known as Link 11. The tactical term heard on the air for the Navy NTDS Link 11 is the Alligator Playground.

Here let's pause a minute to become familiar with some Navy communications terminology. The US Navy terms refer to two primary transmission modes: **Playground** for Data and **Coordination** for Voice. In voice modes, **green** is for secure or scrambled communications and **red** means in the clear. A Romeo Charlie circuit refers to a clear circuit and Golf Charlie is a secured circuit. Alligator is the USN Link 11. Therefore Alligator Playground refers to a USN secure data link circuit.

Some other terms you will hear on these nets include: Ping Pong (some sort of interrogation), Papa Uniform (Unknown), Texaco (Aircraft refueling), Players (units involved with the operation), Delta channels (Data channels), UTS (Unknown), Robin Robin (unauthorized station on net), Romeo Mikes (Radiomen), TAC 7 (Up on playground OK), SF tracks (no valid targets in playground), R and T sides (Receive/Transmit), Charlie Tangos (Communications Technicians) and Foxtrot Charlie (Fire Control Technicians).

What does a Link 11 sound like? One layman describes it this way, "One to six thunks followed by either a long data burst (3 seconds or longer) or one short data burst (less than 1 second) that sounds like a dot matrix computer printer in operation." That short data burst has also been likened to the low growl of an alligator. Thus the tactical term, Alligator Playground.

One only has to tune into the frequency range from 9006 to 9014 kHz day or night to hear an Alligator Playground.

A quick check during the 1900-2000 UTC time frame from the Grove Enterprises monitoring post on a Drake R8 found the following wide band Link 11 type signals on upper side band:

4055-4060 kHz	7687-7692 kHz	10182-10190 kHz
4859-4867 kHz	9005-9015 kHz	13250-13257 kHz

Center frequency of these signals is nearly impossible to measure. The best method I have found is to tune to the lower/upper limits of these wide band signals, note the bandwidth in kHz and divide by 2. Then add

that to the lower limit and use that as the center frequency.

The Link 11 signals themselves are quite boring and will definitely irritate family members and fellow employees. But there is a better way to peek inside what these Link 11 data signals are sending through the **Foxtrot Tango** and **Foxtrot Whiskey** networks.

Foxtrot Tango/Whiskey networks get their names from the NCS (Net Control Station) call sign that is used on every FT/FW net. Other stations in the FT nets use single letter calls with some notable exceptions. These single letter call signs are probably Navy surface units that are actively participating in the Alligator Playground network. A variety of calls will be heard on FW nets.

From the context of conversations, "Alpha Whiskey" (AW) is quite probably FT's boss. AW appears to be either a land station, flag ship or command ship. Communications have been monitored from FT saying he would get with AW to clear up certain operational matters before he would allow certain things to take place.

Another non-single letter call sign on FT nets is Hershey. Regular readers will recognize that call sign as belonging to CINCLANT (Commander-in-Chief Atlantic) Air Reconnaissance Center in Key West, FL.

During recent intercepts, the Night Rider call sign has been monitored on FT frequencies. A couple of months ago, call sign Night Rider was heard working Saber Ops via MacDill AFB on 11176 kHz. Night Rider ID'ed himself as near "Bingo" fuel status (low fuel) and that he was part of JTF4 (Joint Task Force 4—a DOD counterdrug smuggling network based out of Key West). He also said he was part of the "963rd." The 963rd AWACS is based out of Tinker AFB and flies the E-3B/C AWACS aircraft.

The Lobo call sign has also been associated with the FT nets. These aircraft have used 6750 kHz as well as 8972 in the past. Based on some recent monitoring, it has become obvious that Lobo aircraft in Panama has on-hand Colombian military liaison staff available to aircraft personnel on a moment's notice.

At the end of October 1993, the FT net was very active on 13207 in the afternoon. Participants were primarily FT and various Closeout ## call signs in orbit in the Caribbean. FT advised these aircraft to work through call sign Bluestar as a relay if they had trouble working each other due to changing propagation conditions (sunset). FT advised that Bluestar was part of the "CN101" net but that Bluestar would help them out. Bluestar was being heard on 8972 kHz.

As mentioned before, FW networks have a variety of call signs on them. Recent intercepts indicate US Coast Guard cutters are involved with these nets. The *CG Cutter Thetis* (WMEC-910) and the *CG Cutter Mohawk* (WMEC-913) have been heard on FW nets. These cutters have been seen on press video off the coast of Haiti enforcing the Haitian blockade.

Aircraft associated with FW operations use either trigraph call signs (Letter-number-letter) or other word-number tactical call signs (i.e.-Airlift ##).

One of the most revealing pieces of the FT puzzle is the choice of frequencies being used regularly by this net. 6735 and 6750 kHz have both been ID'ed as Charlie 2 and 3. A quick check with the *Grove Shortwave Directory*, 8th edition, shows these frequencies and designators used by NORAD (North American Air Defense Command). FT operations have also been monitored on 13207 kHz (daytime) and 18027 kHz (on a secondary basis daytime). Although the designators have not been heard on these frequencies, the NORAD designations are Charlie 7 and 8 respectively. Other frequencies known to be in use include:



# Utility World

## Utility Loggings

### Abbreviations used in this column

AF	Air Force	MAP	Maghreb Arabe Presse
AFB	Air Force Base	MARS	Military Affiliate Radio System
AM	Amplitude Modulation	Meteo	Meteorological
ARQ	Automatic Repetition on Request	MFA	Ministry of Foreign Affairs
ARQ-M2	Multiplex ARQ teleprinter system	NCS	Net Control Station
ATA	Agence Telegraphique Albanaise	Net	Network
AWS	Air Weather Service	Ops	Operations
CG	Coast Guard	PTT	Point-to-point
CGC	Coast Guard Cutter	QRA	The name of my station is...
CIS	Commonwealth of Independent States	QSE	The estimated drift of the survival craft is...
Comms	Communications	RAF	Royal Air Force
CQ	Calling any station	RTTY	Radioteletype
CW	Continuous Wave (Morse Code)	RU	Russian Republic
DE	Morse code for 'From'	SAM	Special Air Mission
EAM	Emergency Action Message	SITOR-A	Simplex teleprinting over radio system
FAF	French Air Force	Tac	Tactical
FAX	Facsimile	Unid	Unidentified
ID	Identification	US	United States
INA	Iraqi News Agency	USB	Upper Side Band
JAF	Japanese Air Force	VHF	Very High Frequency
JANA	Jamahiriyyah News Agency	ZKP	...has radio watch for station...on...kHz
KCNA	Korean Central News Agency	ZSM	Microvolt input to the receiver is...
		ZWT	Send words twice

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

- 512.0 SPE-Szczecin Radio, Poland, with CW traffic list at 0295. (Ary Boender-HR Spykenisse, The Netherlands)
- 2965.0 Sydney VOLMET, Australia, with a very good signal in USB at 1100. Unusual catch at such a low frequency. (Jacques d'Avignon-Kingston, ON) *Yes it is, Jacques, very nice catch-Larry.*
- 3130.0 Fox Tango net with usual single letter calls and 3AV in USB at 0519. (Jeff Haverlah-Humble, TX)
- 3710.0 RGJ61-Samara Meteo, Armenia, with FAX weather chart at 2318. (Boender-Neth)
- 4002.0 YRR2-Bucharest Meteo with 50 baud RTTY weather at 1808. (Boender-Neth)
- 4029.0 Spanish female 5-digit number station in AM at 0500. (Tom Mazanec-Maple Heights, OH) *Welcome back, Tom, hope to see you here more often-Larry.*
- 4045.0 YRR4-Bucharest Meteo with 50 baud RTTY weather at 1808. (Boender-Neth)
- 4208.5 ESA-Tallin Radio, Estonia, with CW DE marker at 1823. (Boender-Neth)
- 4296.0 IQX-Trieste Radio, Italy, with DE CW marker at 0020. (Boender-Neth)
- 4303.0 QZX2-Lyngby Radio, Denmark, with traffic list in CW at 0022. (Boender-Neth)
- 4402.0 KMI-Dixon Radio, CA, with traffic list (computerized voice) in USB at 0411. (Tom Draugas-Denver, CO)
- 4442.5 RGC72-Kiev Meteo, Ukraine, with 50 baud RTTY weather at 0031. (Boender-Neth)
- 4444.0 SAM 203 working Andrews AFB, MD, with phone patch in USB at 0319. Believe this is F-980, however it is not confirmed. (Jeffery Jones-Tracy, CA) SAM 205 working Andrews with phone to SAM command in USB at 0310. (John Robinson-Antioch, TN)
- 4560.0 Moscow Meteo, RU CIS, with fax weather charts at 2250. (Boender-Neth)
- 4600.0 IZB-Swedish Navy, unid location with coded SITOR-A messages at 1900. (Boender-Neth)
- 4602.0 Irish military XVQV and OA-Dublin with plain language SITOR-A messages at 1758. (Boender-Neth)
- 4613.0 LZA8-Sofia Meteo, Bulgaria, with 50 baud RTTY weather messages at 1758. (Boender-Neth)

- 4704.0 DOD Cape working King 01/02, USS Underwood in USB at 1333, moved from 10780. (Haverlah-TX)
- 5015.0 WB4 (NCS) working WB36/37/45/48 in USB at 1202. Army Corp net. (Neal Perdue-Madison, AL)
- 5117.0 FGY4 working 4CJI in CW with coded messages at 0055. (Boender-Neth)
- 5138.0 ATPL working CE9L in CW sending ZSM ZWT ZKP QSE at 0058. (Boender-Neth)
- 5140.0 RWW73-Moscow Meteo, RU CIS, with 50 baud RTTY weather at 0102. (Boender-Neth)
- 5284.0 VLB2-Israeli Mossad number station in AM at 0615. (David Howden-PA via Ute World conference on Grove BBS) *Thanks for the logs, David, others can leave logs here for the column as well-Larry.*
- 5317.0 DFZG-MFA Belgrade, Serbia, with 75 baud RTTY English news at 1605. (Boender-Neth)
- 5320.0 MIW2-Israeli Mossad number station in AM at 0317. (Fernandez-MA)
- 5397.0 FDX-FAF Paris with coded ARQ-M2 messages at 1543. (Boender-Neth)
- 5430.0 RVM45-Tashkent Meteo, Uzbekistan, with 50 baud RTTY weather at 0115. (Boender-Neth)
- 5696.0 CGC Orcas enroute to debris sighting after 0003 in USB, see 6230. (Bart Boyer-Newport, OR) *Welcome to the Ute Log section, Bart-Larry.* Huntress working Omaha 92 who gave position off coast of Haiti in USB at 0040. (Perdue-AL) CG1717 working CG2120 in USB at 1250, advising 5320 was primary on scene frequency (Lonnie Bunn-Raleigh, NC)
- 5750.0 German female 3/2-digit number station in AM at 0330. (Fernandez-MA)
- 5762.0 Spanish female 5-digit number station in AM at 0400 and 0600. (Mazanec-OH)
- 5886.7 IMB32-Rome Meteo, Italy, with 50 baud RTTY CQ/RYS at 0535. (Bill McClintock-Minneapolis, MN via Grove BBS)
- 5905.2 RPFN-Portuguese Navy? with RTTY test RYs at 75 baud at 0320. (McClintock-MN via Grove BBS) *Yep, Bill, it is the Portuguese Navy from Lisbon-Larry.*
- 5906.0 Unid RTTY LSB and FAX on USB at 0220. Offutt??? (McClintock-MN via Grove BBS) *Looks like an AWS MO but I have no listing-Larry.*
- 6230.0 Coast Guard air to any vessel reference sighting of debris at 0003 in USB. Tuna fishing boat overdue at Newport, OR. (Boyer-OR)
- 6337.0 CBV-Playa Ancha Radio, Chile, with V CW marker at 0415. (H.S. Strohecker-San Diego, CA)
- 6683.0 SAM 206/Air Force 1 working Andrews/Crown in USB at 0100. Also trying to run analog data on 5517.0. (Allen Hodge-MA) Air Force 2 working Andrews in USB at 0511. (Draguas-CO via Grove BBS)
- 6693.0 CFH-Halifax Military, NS, Canada, working aircraft call sign Iroquois in USB at 2030. Gave channel designator as Delta-1-Delta. (James P. Ashe-Weymouth, MA) *Interesting, James, My list shows Delta-1-Golf for this one, maybe they are changing things-Larry.*
- 6713.5 King 61 Hotel calling Moffett Rescue in USB at 0208. (Jones-CA)
- 6720.0 8HW working 5AV and others in net with radar tracking ops/tac comms in USB at 0557. (Fernandez-MA)
- 6735.0 US Navy FT network here most evenings when not on 6750.0 (usually early) in USB with Nightrider (probably an AWACS aircraft from Air Force). (Larry Van Horn-Brasstown, NC)
- 6738.0 RAF-Architect on with weather broadcast in USB at 0601 under a USSTRATCOM EAM broadcast. (Fernandez-MA)
- 6750.0 SAM 206 working Andrews in USB at 2130. (Hodge-MA) FT net with radar tracking and tactical comms in USB at 0125. (Fernandez-MA) Offutt with EAM through Croughton in USB at 0322. Signal had noticeable satellite delay when compared to 6738, 11176, etc. (Haverlah-TX) US Navy FT network here most evenings working single letter call and with USAF Nightrider in USB. (L. Van Horn-NC) Same FT net around 0315. (Haverlah-TX)
- 6753.0 Edmonton Military, AB, with weather for various Canadian cities in USB at 0220. (Howden-PA via Grove BBS)
- 6761.0 Shamu 61 periodically calling Any Radio, Skybird, MacDill and Offutt requesting a conference skyhook on 67 upper in USB at 2034. No reply to any of his calls. (Haverlah-TX)
- 6805.0 SAM 203 working Andrews in USB at 2320. (Hodge-MA)
- 6812.0 SAM 203/204 working Andrews in USB at 2230/2139. (Hodge-MA)
- 6813.0 Executive 1 working Andrews AFB, MD, Crown and Royal Crown at 1315 in USB. (Boyer-OR)
- 6814.0 SAM 81 working Andrews for weather in USB at 2340. (Hodge-MA)



6905.0	FSB-Interpol Paris, France, with CW marker at 0248. (Bob Pettengill-Blanchard, OK)	11174.0	Willie Echo Ronnie, Willie Echo George and Willie Echo Frank working each other in USB at 1547. These guys are still active daily. I never hear reference to secondary frequency and they seem to keep normal weekday business hours. (Haverlah-TX)
7475.0	Daredevil working Eyegoggle then moved to 5700 in USB at 0422. (Haverlah-TX)	11195.0	RAF station giving weather for Manchester, UK in USB at 2105. (John Simpson-NY Mills, NY) <i>Welcome to the column, John, think this might be RAF Uphavon on 11200 you were hearing-Larry.</i>
7520.0	5-digit CW cut numbers station at 0815, cut numbers-ANDUWRIGMT. (HS-CA)	11198.5	LYNX-MFA Lagos, Nigeria, with CW ID and idling with SITOR-A at 2022. (Dix-NY)
7548.5	V9P repeating the following CW text, "QRA DE V9P IIP11 T?12?00Z GR120 BT (and repeat)". From 2302-2308. (Mike Hardester-Jacksonville, NC) <i>Mike, bet this is a US Navy code practice net. Bubbleheads still use CW. Congratulations on your Navy retirement and welcome to the ranks of the civilian work force-Larry.</i>	11220.0	Andrews working 799 with phone patch to Raymond 21 at 1502 in USB. (Haverlah-TX)
7552.1	KJN950-unid with SHARES traffic for Army MARS St. Paul, MN in USB at 1617. Other freqs included: 7635.0 10493.0 10891.0 13457.0 18063.0 (Metcalfe-KY)	11243.0	Raincoat working Fruitful and Mushroom in USB at 2055. Moved to W-108 (12070) and X-906 (13217). Rest Camp working Bee Honey through MacDill in USB at 2330. (Bunn-NC)
7831.0	Night Owl working Big Town in USB at 0316 with USSTRATCOM activity. (Haverlah-TX)	11253.5	Y9Y periodically calling any station this net in USB at 1835. (Haverlah-TX)
7850.0	ZAA-ATA Tirana, Albania, with English 48 baud RTTY news at 1906. (Jack Dix-Yonkers, NY)	11334.7	Boustane Lomo, Togo, working Khargia Cairo with SITOR-A record 647 5-letter groups at 1824. (Hall-RSA) <i>Is this an Egyptian embassy, Robert-Larry?</i>
7863.5	SPW-Warsaw Radio, Poland, with DE CW marker at 2048. (Dix-NY)	11443.7	Boustane Brussels working Khargia Cairo via Paris using SITOR-A more 5 letter groups at 1835. (Hall-RSA)
7868.0	5-digit CW cut numbers station at 0846, cut numbers-T123456789. (HS-CA)	11477.9	KCNA Pyongyang, North Korea, with FAX pictures at 0005. (McClintock-MN via Grove BBS) <i>The FAX and RTTY KCNA outlets might be worth watching for the North Korean slant regarding the current tensions-Larry.</i>
7887.0	YOU18 and H2O56 using 300 baud packet at 1608. (Metcalfe-KY)	11488.0	Spar 65 working Andrews AFB in USB at 1333. (Robinson-TN)
7888.0	Spanish female 5-digit number station in AM at 0700. (Mazanec-OH)	11638.0	DDK8-Hamburg Meteo, Germany, with 50 baud RTTY reports. (Dix-NY)
7935.0	Spanish female 5-digit number station at 0913. Extremely poor audio. Loud buzz in background. New frequency in my database. (HS-CA) <i>Mine to HS: looks like things are getting worse in Cuba these days-Larry.</i>	'2204.0	NBA-US Navy Balboa with unclassified RTTY military traffic at 2300. (McClintock-MN via Grove BBS)
7962.8	NBA-US Navy Balboa, Panama, with 75 baud RTTY test tape at 2312. (Metcalfe-KY)	12186.0	5AQ62-JANA Tripoli, Libya, with RTTY English news 50 baud at 1814. (Dix-NY)
8012.0	4XZ-Haifa Naval, Israel, with V CW marker at 0215. (Pettengill-OK)	13119.0	TFA-Reykjavik Radio, Iceland, with traffic list in USB at 1005. (Robin Hood-UK)
8049.0	9BC25-IRNA Tehran, Iran, with English RTTY 50 baud news at 2012. (Dix-NY)	13203.0	German AF 344 calling DHM91 in blind at 2304 in USB. (Haverlah-TX)
8078.5	6P calling 5K for radio check in the red. Also did check in green using USB at 2257. (Jones-CA)	13205.0	Andrews maintaining watch on '76'. 76 enroute to Iceland in USB at 2230. (Haverlah-TX)
8085.5	6B sending data to 3D in USB at 0230. (Jones-CA)	13207.0	November 44 Alpha and November 44 calling each other in USB at 1925. (Haverlah-TX)
8442.0	TCR-Istanbul Radio, Turkey, with CQ CW marker at 2159. (Dix-NY)	13208.5	Fluff 92 working Rent Control in USB at 1327. (Haverlah-TX)
8476.0	9VG56-Singapore Radio with CQ CW marker at 2210. (Dix-NY)	13245.0	Japanese AF001 working JAF002 in USB at 0850. (Robin Hood-UK)
8478.5	FUF-French Navy Fort de France, Martinique, with V CW marker at 0112. (Pettengill-OK)	13250.0	Two Swedish AF aircraft carrying Bosnian wounded in USB at 1501. (Robin Hood-UK)
8567.0	Station repeating 5T1 at 2120 transmitting CW 5-figure groups. (Dix-NY)	13333.3	Female and male in Spanish using USB at 2300-0100 using no call signs. (Roger Paramenter-Hyannis, MA)
8585.0	UFL-Vladivostok Radio, RU, CIS, with V CW marker at 1111. (Dix-NY)	13457.0	78 (ground station) working 68 (aircraft enroute Denver) passing Denver VHF frequency of 130.57 using USB. (Jones-CA) <i>This is a Shares frequency-Larry.</i>
8586.0	KPH/WCC-San Francisco/Chatham Radio with combined V CW marker at 1201. (Dix-NY)	13506.8	Egyptian Embassy possibly in Spain transmitting 5-figure SITOR-A groups at 2041. (Dix-NY)
8635.0	UTD-Kiev Radio, Ukraine, with CQ CW marker at 2137. (Dix-NY)	13582.0	DEA47-Unid German station sending V CW marker at 1409. (Dix-NY)
8678.0	VSG-Unid station sending a CW traffic list at 2201. This was not XSG. (Dix-NY) <i>Maybe they were mis-keying, Jack-Larry.</i>	13907.0	Customs SELSCAN burst but no voice traffic noted at 2155. (Fernandez-MA)
8855.0	United 982 working Montevideo in USB at 0422, moved to 5526. (Bunn-NC)	13921.0	CIO2-Israeli Mossad number station in AM at 1545. (Bob Grove-Brasstown, NC)
8967.0	Scooter 61 working Darkstar and Corpus (and also Offutt briefly when Offutt did not realize that these three were using 8967 as a tactical discrete freq). Somone briefly passed out a threat direction in a manner similiar to comms on 9014. In USB at 1925. (Haverlah-TX)	14933.0	8BY-Unid station sending V CW marker at 1549. (Dix-NY) <i>Anybody know anything about this station?-Larry</i>
8972.0	S5E calling Pelican 711 but working Bluestar in USB at 1516. (Haverlah-TX)	15004.0	RID-Time Station Irkutsk, RU CIS, with time signals in AM. (James Laughlan-Youngstown, NY) <i>Welcome back to the column, James, missed the time on this one-Larry.</i>
9041.0	5YE-Nairobi Meteo with 100 baud RTTY weather at 2001. (Dix-NY)	15821.0	Andrews AFB working numerous SAM flights on F-988 and Key stone Command in communications with SNAP flights 51/53 on 15-upper in USB at 2340. (Jones-CA)
9120.0	CW station transmitting 3-figure/letter groups at 2056. (Dix-NY)	17017.1	OST-Oostende Radio, Belgium, with CW marker at 1458. (Pettengill-OK)
9162.0	MFA Berne with message in French about wounded Bosnians using SITOR-A at 0821. (Robin Hood-UK)	17964.0	Rockwell Flight Test working AC005 in USB at 1427. (Bunn-NC)
10162.0	YIL71-INA Baghdad, Iraq, with English news bulletins using RTTY at 1854. I haven't seen INA listed on that frequency. (Bill Mussen) <i>With English news at 1807. (Dix-NY) Klingentuss lists Arabic from 1400-2000, looks like a change-Larry.</i>	17975.0	Quid 24 working a weak Offutt with phone patch to Raymond 38 in USB at 1542. (Haverlah-TX)
10167.5	CW station transmitting 1-06906-2-06884-3-06897 at 1951. (Dix-NY) <i>Jack, this might be another US Navy practice net-Larry.</i>	19430.0	German female numbers station with September Julio repeated in AM at 1300. (Grove-NC)
10634.1	CNM-MAP Rabat, Morocco, with French 50 baud RTTY French news at 1645. (Dix-NY)	20462.5	PTT Lumumbashi, Zaire, with ARQ-M2 telexes in French for Brussels at 1110. (Hall-RSA)
10803.2	RTTY Argentine news and racetrack payoffs in Spanish using 75 baud at 0010. (McClintock-MN via Grove BBS) <i>Wonder if this is a Noticias Argentina outlet-Larry.</i>	20590.2	HBD20-MFA Berne with SITOR-A urgent 5-letter groups to embassies at 1743. (Hall-RSA)
10855.0	Radio Moscow broadcast feeder with Russian news in USB at 1955. (Robert Hall-RSA)	20670.0	World Food Program (WFP) Rome, Italy, with SITOR-A messages regarding air supply drops for the Sudan at 1133. (Hall-RSA)
10896.0	MFA Budapest, Hungary, with DUP-ARQ messages from Zurich at 1823. (Robin Hood-UK)	21859.1	DFZG-Belgrade, Yugoslavia, with RTTY 72 baud English news at 1455. (Hall-RSA)
10993.5	C4H-CGC working Key West with vessel intercept in USB at 2307. (Metcalfe-KY)	22628.5	HZY-Ras Tannurah Radio with CW traffic list at 1000. (Robin Hood-UK)
11056.0	SAM 206 working State Ops via Andrews in USB at 1453. (Robinson-TN)	22670.5	PPR-Rio Radio, Brazil, with traffic list in CW at 1507. (Robin Hood-UK)

# The Scanning Report

**Bob Kay**

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



## Scanning and Gremlins

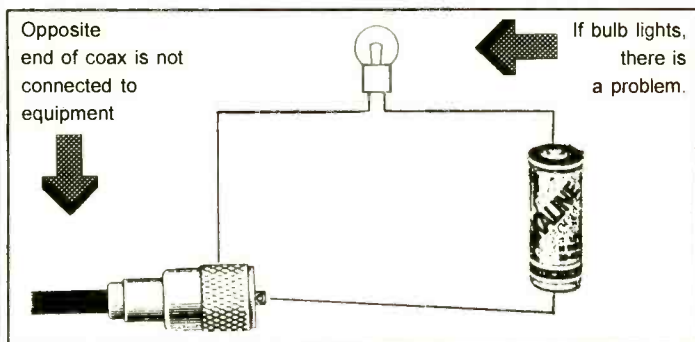
In the movie *Gremlins*, small, mischievous critters caused catastrophic problems. In the hobby of scanning, when things go wrong, it can certainly seem like your equipment is under attack by gremlins. Intermittent signal problems, loose and/or dirty connectors, scanner memory loss, and dozens of additional "gremlins" can attack your listening post. To keep the critters away, here are a few winter maintenance tips that you can perform.

Did you know that a dirty, indoor coax connector can reduce an 800 megahertz signal by as much as 40% percent? To prevent problems from developing, hobbyists will clean and waterproof their outside connectors on a regular basis. Indoor connectors, however, are usually ignored. And although your inside connectors may not look dirty, they should be cleaned at least twice a year with a liquid electrical cleaner.

There are several electrical cleaners on the market. The brand that you select is not as important as how you choose to apply the product. Don't allow the cleaner to contact the vinyl jacket on your coaxial cable. If the cleaner deteriorates the outer covering, that portion of the cable will need to be removed and a new connector installed. If you don't have a sufficient amount of cable slack, it may become necessary to replace the entire length of the cable.

Dirty connections are not the only gremlins that can affect signal strength. A loose connector can cause a complete loss of signal. The problem is common to BNC connectors. The center contacts on female BNC connectors occasionally need to be squeezed together. The problem and solution were presented in the October 93 issue of *MT*, page 106. If you don't have that issue, send an SASE to the Scanning Report, and I'll mail you a copy of the page.

Checking for loose connections is easy. Gently shake the coax cable at the connection point. If the received signal is intermittently lost, the connector is loose. Twist-on BNC connectors are especially prone to these type of problems. Any movement of the cable may cause twist-on connectors to loosen. Twist-on BNC connectors installed in mobile applications should be checked regularly.



Newly installed connectors should be checked for shorts. If you don't have a test meter, use an "AA" battery and flashlight bulb (refer to sketch). Connect the gadget as shown and if the bulb lights, it's an indication that the center conductor wire is touching the outside braid. To solve the problem, you'll need to remove the connector and install another.

Your scanner's memory back-up battery should be replaced on a yearly basis. If it should fail, it's possible to lose all of the frequencies stored in the receiver's memory. It's a good idea to change your scanner radio's battery when you replace the battery in your smoke detector (which some folks do religiously on New Year's Day). A listening post that's not protected by a smoke detector is an ideal target for gremlins. The little critters will enjoy watching your listening post go up in smoke.

Developing and following a preventative maintenance plan is your best protection against a gremlin attack. Since the majority of hobbyists are using computers, there's no excuse for not keeping a maintenance log on your hard drive. The log should contain specific dates and cleaning records. If you don't have such a log, start one today—before the gremlins begin to attack!

## Treasure Hunt

If the gremlins have attacked your old and worn out antenna, don't get excited. You can win a brand new antenna from Electron Processing, Inc. The "Antenna Stick" provides complete coverage between 25 and 1000 megahertz. The antenna is enclosed in PVC pipe and it is virtually indestructible. It's probably the only base station scanning antenna on the market that can be quickly removed and tossed into the back of a closet. Here are the clues:

1. Mobile signals will be heard 5 MHz below the repeater frequencies in the 450-470 MHz range. True or False?
2. A half-wave dipole antenna for the cordless phone band would be approximately \_\_\_\_\_ feet long. (Fill in the blank)
3. In residential house wiring, what color is the load wire?
4. Name the three leads on a transistor.
5. Name two of the elements that are found in vacuum tubes.

The "Antenna Stick" is a unique and rugged scanning antenna that can be mounted permanently or used as a portable antenna. If you're a camping buff, this antenna could be stored with your tent poles! For more information contact Electron Processing, P.O. Box 68, Cedar, Michigan 49621, (616) 228-7020.

## Frequency Exchange

Welcome to the bathroom of Kevin Callahan. Kevin lives in *Montagnes, Quebec*, and that's his favorite spot for listening to aero frequencies. According to Kevin, the bathroom window provides the best view of air traffic near Dorval Airport. If anyone has to make a pit stop before we get started, this would be the ideal time.

119.90	Tower	126.70	Communications	151.16	Fire
122.50	Tower	132.375	Air/ground	267.10	Tower
121.90	Ground	132.55	Control	268.30	VFR
122.85	Air/ground	134.15	Departures	282.40	Tower
123.40	VFR	134.40	Control	287.20	Arrivals
124.65	Departures	135.325	Air/ground	323.20	Departures

Since we're already listening to the aero band, let's visit with the Bay Area Scanner Enthusiasts Club (BASE). The club is located in *Milpitas, California*, and they have provided an alphabetical list of *airport frequencies* in major cities.

**Atlanta**

118.35 Approach  
 119.65 Arrival  
 125.00 Departure  
 125.55 Departure  
 125.70 Departure  
 126.90 Approach  
 127.25 Approach  
 127.95 Approach

**Boston**

118.25 Approach  
 120.60 Approach  
 127.20 Approach  
 128.20 Tower  
 134.05 Gate Control

**Dallas**

118.55 Departure  
 119.05 Approach  
 119.40 Approach  
 124.25 Departure  
 125.80 Approach  
 132.10 Approach

**Honolulu**

118.10 Tower  
 121.90 Ground  
 131.95 ARINC  
 460.65 ARINC

**New York JFK**

123.70 Approach  
 126.80 Approach  
 127.40 Approach  
 151.115 Maintenance  
 461.05 Marriott Kitchens  
 464.325 Marriott Kitchens  
 464.825 Marriott Kitchens

**Seattle**

119.90 Tower  
 121.70 Ground  
 128.00 CLNC  
 453.20 Police  
 453.30 Fire

The complete list by the BASE club includes frequencies for twenty-four cities. The list is free for a #10 SASE. Send your request to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. For more info on this very active club, write to their address in Club Circuit.

An anonymous reader from *Capistrano, California*, sent in the following:

46.00	Capistrano School District buses
151.60	Dana Point local govt.
151.715	Sacramento School District
154.115	Dana Point Reclamation Authority
154.57	Sacramento School District
154.60	Sacramento School District
158.835	Dana Point Sanitation
158.97	Orange County Jail
173.2375	Santa Margarita Water District
851.0625	Orange County, GSA
853.2625	Capistrano School District

Our next stop may seem confining, but I promise that we won't stay too long. An anonymous contributor sent in the frequencies used by the *Statesville, Illinois*, Correction Center.

37.36	Prisoner transport	458.875	Warden & Staff
453.30	Warden & Staff	866.4375	Prison Communications
453.625	Warden & Staff	866.9625	Prison Communications
453.800	Warden & Staff	868.4375	Prison Communications
458.80	Warden & Staff	868.4625	Prison Communications

Brian Keith reports that folks living near *Wichita, Kansas*, are using marine band transceivers on their farms. Marine channel #8—156.40 MHz, is used for house to tractor and truck to truck communications. Channel #18—156.90 MHz, is used for house to house communications. Here are the "legal" frequencies that also accompanied Brian's letter:

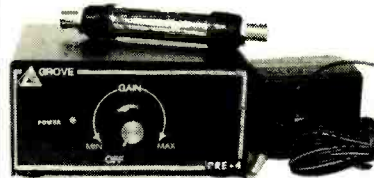
47.70	Kansas Power & Light	155.655	Baxter police
47.80	Kansas Power & Light	450.087	KODE TV
151.895	Freeman Auto Salvage	451.325	AT&T
154.60	Baxter fire	461.425	KSNF TV
155.13	Galena Police		

*Sulfur Springs, Texas*, is the home of Tracy Tipping. Here are Tracy's favorite frequencies.

47.02	Highway Dept.	47.06	Highway Dept.
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47.18	Highway Dept.	155.25	Paris Police
154.115	Sulphur Springs City Crews	155.88	Paris local government
154.43	Sulphur Springs Fire	451.35	GTE telephone

Our final stop is *Luzerne County, Pennsylvania*.

43.70	Frank Martz Coach Company
43.84	Capitol Bus-Wilkes Barre
47.76	Gas & Water
47.80	Gas & Water
47.84	Gas & Water
47.98	Gas & Water
48.18	Gas Emergency
124.50	Wilkes Barre Transit
153.35	WBRE radio
154.89	Sheriff
161.64	WARM radio
161.70	WARM radio
173.225	Scranton Times
173.325	Sunday Independent newspaper-Wilkes Barre
425.975	Times Leader newspaper-Wilkes Barre
453.325	Dallas Prison
455.312	WNEP TV
457.975	Times Leader newspaper-Wilkes Barre

The complete list, sent by an anonymous contributor, contains more than 300 frequencies for Luzerne County. To receive the list, send \$3.00 dollars to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

If you want the Frequency Exchange to visit your neck of the woods, send us a list of your favorite frequencies. Handwritten lists are okay and everyday, common frequencies are welcomed.

## Radio Jamming Part 1

Police officers in Hialeah, Florida, have been allegedly broadcasting love songs, making kissing sounds and mooing like cows on their police radios. Their actions are presumably directed against other officers "milking" a report.

The officers have been interrupting emergency police calls and the department's main radio channel has been totally blocked. In 1991 Hialeah Officers signed a petition asking for an investigation into police radio interference. An internal investigation into the problem is ongoing. (News clipping from Robert Thomas, Bridgeport CT.)

## Radio Jamming Part 2

Sacramento, California, police officers have been harassed by a practical joker who is transmitting on police radio frequencies. The joker plays music, sings and mocks policemen on the radio. At this writing, the police have no clues as to the identity of the prankster. (News clipping from Steve Gibson.)

## Computer Corner

The winter season is an excellent time to store, sort and print your scanning frequencies. My favorite frequency management program is "Radiolog." It's an easy program to master (you'll be up and running in less than 15 minutes), and it's offered as shareware. As you probably know, shareware isn't free. If you decide to use the program, a registration fee is sent to the author.

To receive the program, send a blank, formatted disk with a return mailer and return postage to: Bob Kay, P.O. Box 173, Prospect Park, PA 19076. If that's too much of a hassle, here's the flip side of the offer. Send \$5.00 dollars to Bob Kay, P.O. Box 173, Prospect Park, PA 19076, and I'll provide the disk (specify size and format), copy the program, purchase the mailer and lick the stamps.

Your requests will be mailed on a first come, first served basis. Please remember to include your proper mailing address and allow two weeks for delivery.



## Mobilized Police Station

The "Mobilizer" is a mobile police station that the Wisconsin State Police will use to patrol Fox Valley roads.

The 34 foot long vehicle is designed to stop

alcohol or drug impaired drivers. The unit offers the facilities of a police station and the convenience of a motor vehicle.

It is equipped with testing facilities, a work station to complete paperwork, security lockers and a holding cell.

## There Should Be A Law — Revisited

In November '93's column, I asked for your comments regarding people who use cellular phones while driving. According to your letters, there are a lot of novel things that people do from behind the wheel that

are just as distracting. A reader in New Jersey wrote in to say that he was given a ticket for kissing his girlfriend. A New York woman was cited for applying make-up while driving in the high speed lane. Lastly, a group of college kids were cited in Delaware, for driving with six people in a Corvette.

On a more serious note, a woman was killed in Vancouver, Washington, when her car flipped over. The Vancouver Police reported that she was talking on a cellular phone when her car veered across the roadway's center line.

Since this is a new year, here's a new question. Portable cellular phones that will fit into your pocket or purse are gaining in popularity. With portable cellular prices falling, more and more people are walking around with a cellular phone pressed to their ear. Have you seen a "cellular pedestrian" do something stupid while talking on a cellular phone? Send your cellular adventures to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

## Campus Call Boxes

College universities in Canada are experimenting with a new idea—radio call boxes on campus. The call boxes, similar to the type used on highways, will be located in strategic locations on campus. The boxes will be linked via two-way radio (UHF Band) to a 4 channel base station. Campus security will be responsible for responding to calls for help.

## Capital Idea

The director of Sun Microsystems, John Gage, told the House Energy and Commerce subcommittee that "every cellular phone is a scanner." To prove his point, Gage held a portable cellular phone to the microphone and allowed the committee to listen to six different cellular calls.

Gage explained that any kid could hit about 10 buttons to make a cellular phone behave like a scanner radio. "A lot of kids do it," Gage said. "It's more fun than a Super Soaker water pistol." (News clipping from Paul Wright, Deming, New Mexico.)

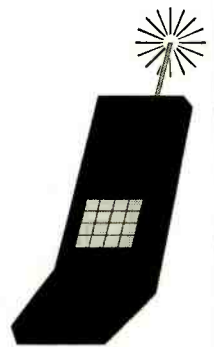
As most of you know, Gage failed to tell the committee that the procedure cannot be randomly activated. A precise number of keys must be entered in logical order. The procedure also varies between manufacturers—some models must be disassembled to activate the scanning feature.

## To Surge and Protect

Not all surge protectors are created equal. The less expensive protectors only provide protection on the "load" line. The neutral and ground wires pass around the device and are connected to your equipment. If a short circuit sends a voltage surge through the neutral wire, your equipment could be damaged.

When you purchase a surge protection device, whether it is a stand alone unit or installed within a plug board, look for the following features: (1) The unit should have three line protection—hot, neutral, and ground; (2) Response time should be less than five nanoseconds (billionth of a second); (3) It should possess a surge indicator light; (4) It should have a reset button—(allows the unit to be reset and used again.).

Units that do not have reset buttons must be discarded after they are tripped. If you live in an area prone to voltage surges, this feature will save you money.





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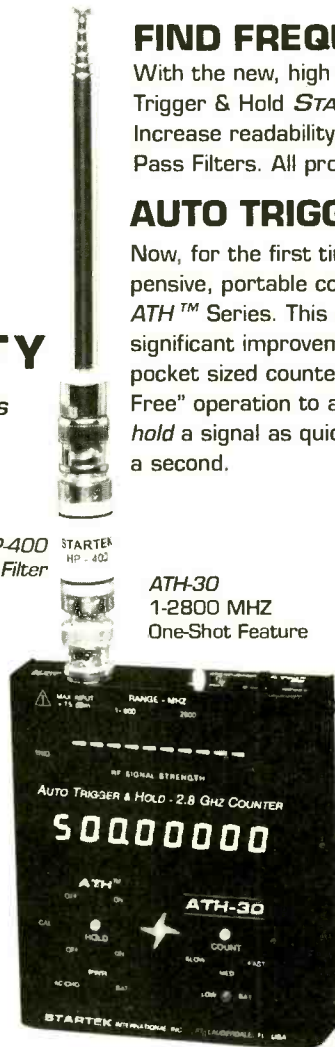
ATH-50  
5 Hz to 2800 MHz  
One-Shot Feature

ATH-30  
1-2800 MHz  
One-Shot Feature

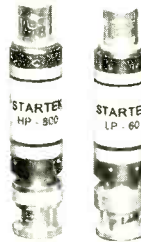
HP-400 STARTEK  
Band Pass Filter HP-400

ATH-15  
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ATH-30	1-2800 MHz, High speed, one shot	259.	<del>289</del>
ATH-50	5 Hz to 2800 MHz, one shot	289.	<del>389</del>
HST-15	Optional 0.2 PPM TCXO High Accuracy Timebase (installed)	100.	<del>125</del>

### Economy Frequency Counter

1350	1-1300 MHz, 10 Hz Res. 3 gate times, Hold switch	\$119.	<del>129</del>
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### Band Pass Filters

Increase range or distance from a transmitter with a Band Pass Filter. <1 dB pass band insertion loss.

LP-60	DC-60 MHz Usage	\$69.
HP-400	400-1500 MHz Usage	69.
HP-800	800-2000 MHz Usage	69.
BP-3	Above 3 filters (SAVE \$30)	\$177.

### Accessories

A	CC-90	Case for all models	12.
B	TA-90	Telescope BNC antenna	12.
C	TA-90-L	Telescope elbow antenna	16.
D	RD-150	150 MHz rubber duck	16.
E	RD-2750	27-50 MHz rubber duck	28.
F	RD-800	800 MHz rubber duck	29.
G	M-207-IC	Interface cable for MFJ-207	10.
H	P-110	200 MHz, 1x, 10x probe	39.
J	LP-22	Lo-Pass, audio usage probe	25.
K	DC-10	Direct, 50 OHM probe	20.

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# The Beginner's Corner

*"Uncle Skip" Arey, WB2GHA*

*Genie T.AREYI*

## QSLing The Hard Ones

I often get letters and E-Mail from folks who have been involved in the shortwave broadcast monitoring hobby for about a year. I think the second year in the SWBC hobby can be the most frustrating for beginners. You see, at this point, the mailbox starts to get empty. Allow me to explain.

Most beginners, once they get their listening post up and running, rush along on a wave of enthusiasm and log their first fifty or so broadcast stations. In most cases, these are the higher powered international broadcasters. With a few notable exceptions, these broadcasters are easy to contact for verification. They very often respond to your report with an attractive QSL card, perhaps throwing a schedule or pennant in the envelope, too. These QSLs usually serve to keep a beginner fired up and hitting the dials.

However, as your log of stations gets longer and longer, the verification game becomes harder and harder. Increasingly the listener has to climb over the hurdles of the international postal system and radio station ignorance of the radio hobby. In other words, even if you manage to get your report letter delivered, the folks on the receiving end may not have any idea about what to do with it.

At this point it would be easy to fall back on some platitude such as "Nobody said it was going to be easy." But Old Uncle Skip is here to tell you that, while there are a few obstacles to overcome, getting those elusive QSLs can be challenging and fun. (Remember fun? It's why we do this thing we do!) So let's break this problem down into its component parts and give your local letter carrier a bigger load.

### A Matter of Attitude

If you had the chance to sit down and have a chat with a broadcaster and asked him or her "Why are you on the air?" you could bet the house and the dog that their first response would NOT be, "We exist solely for the purpose of sending out QSL cards to radio hobbyists!" You need to start from the premise that broadcasters are under absolutely no obligation to respond to you in any way, shape or form. Reception reports that demand response often find their way into the wastebasket even at



*Some stations, like RTV Broadcasting, Pyongyang, are harder to get a QSL card from than others. S.M. Kolesov of Russia was lucky to get this one!*

friendly stations. Remember that someone on the other end is going to have to go out of their way to respond to you. That "someone" may be overworked and underpaid. So begin every reception report attempt by being friendly and polite in all your communications.

A broadcaster is likely to answer your hypothetical question in this form: "We are on the air to provide \_\_\_\_\_ to \_\_\_\_\_ for \_\_\_\_\_." The skill to extracting a QSL from stations that are not familiar with the radio listening hobby resides in your ability to honestly and accurately fill in those three blanks. The station provides something to someone for some reason.

The first blank is likely to be filled with the words information or entertainment. This is the program content that usually makes up the bulk of most reception reports. Your accurate report of what you heard is often adequate information to warrant a response from a large international station that is used to responding to such letters. As your reports move further from the beaten QSL path, however, your response becomes more critical.

For example, reporting that you heard Radio Freedomia's broadcast of native Freedomian folk music is a simple fact. Writing at length about how much you enjoyed the music, comparing it to other forms of music you enjoy, expressing your appreciation to the producers for putting the program on the air for your listening enjoyment all go a long way in soliciting a response from a station. If the station's reason for being on the air is to provide entertainment, let them know you have been entertained, Bunkey!

If the station's intent is to provide information (which is often the case with politically motivated stations), you will want to let the station know what you have learned. Your letter should include something on the order of "I was surprised to discover that Freedomia is the chief exporter of navel lint to the Western World." Feeding back the information lets the station know they are getting their message across.

But don't forget to tell the station how this information makes you feel. For example; "I was not aware that the Peoples Movement for Clean Sweat Socks has the support of the Freedomian School for Wayward Girls and Boys. I am a formerly wayward child and I would have appreciated clean sweat socks." Get the picture, pal? Don't just tell them what you heard. Tell them what impact the information/entertainment had on you.

### Finding the Welcome Mat

The second blank can be a bit tricky to many newcomers. Most major international broadcasters have you, the overseas listener, in mind. Your accurate reports serve to let them know if the frequencies and times on which they broadcast are allowing them to hit their intended audience. Details about reception conditions will enhance your report.

However, you will eventually begin to run across stations that use shortwave to broadcast domestically or to target audiences that do not include your home country. If the station's primary audience is folks in their own country, a report from a listener in a far off land is reduced to a curiosity. Telling a domestic broadcaster that you had a hard time hearing their signal because of interference from a powerful RTTY station on an adjacent frequency is not going to result in the station filing a complaint with the International Telecommunications Union.

With that said, you are now poised to take full advantage of your "curiosity" status. Take some extra time in your report to explain the radio monitoring hobby. Let the folks on the other end know that you fully understand that their broadcast was not intended for your ears but explain how excited you are to hear a signal from so far away. Since it is likely

that the folks at the domestic station will have little knowledge of our hobby, avoid using hobby jargon or SINPO codes in making your report.

Instead, write your report in the form of a personal letter. Tell the folks on the other end a little bit about yourself. Take extra time to explain why you are seeking a verification card or letter from the station. Check hobby club publications and Gayle Van Horn's "QSL Corner" column each month to see if anyone else has had any success in QSLing the station. Both *The World Radio TV Handbook* and *Passport to World Band Radio* (available from many MT advertisers) are excellent sources for station addresses and sometimes QSL policies.

If you have no indication of a station's QSL history, you may want to include a PFC. (No, I am not asking you to mail out a Private First Class; the postage would be too expensive.) In this case, PFC stands for PREPARED FORM CARD. This is simply a postcard on which you have printed or typed all the relevant information that you would expect to find on a QSL card. You will need to put mint stamps from the country of the broadcaster on the card (more on this later).

In your letter, politely ask the station folks to sign and date the card and mail it back to you if they found your report of reception to be accurate. While not as personal and attractive as a card or letter from the station, the PFC is often the only way to successfully verify many stations.

It is very often helpful to write your report in the language of the station or in an international language that might be common to that country. English may be becoming the "Lingua Franca," but it ain't there yet. Don't let this scare you away from writing. Contact your nearest college language department and see if they can put you in touch with a student who could help you write the letter. Some DX hobby suppliers sell prepared forms in many languages. These can also be helpful.

## The Mouse That Roared

Blank number three is trickiest of all. A station's motivation for broadcasting can be political, commercial, religious, or even personal. Figuring out the reason a station broadcasts becomes important if you don't want to step on anyone's toes in writing your reception report. Remember that some countries espouse social, political or religious views that might disagree with yours. A reception report is not a good vehicle in which to foster debate, at least not if you expect the favor of a reply. Every broadcaster is trying to put their best foot forward for their particular way of looking at things. Accept this "in the spirit of international understanding" and save your critical comments for another forum.

## Playing Post Office

Now that you have become the master of diplomacy, you still have to get your reception report to the station. It is also your responsibility to provide for safe return of any QSL, PFC or verification letter.

Send your letter out in a standard "Air Mail" envelope, such as those found at most stationary stores. Be sure to get the kind that are printed inside to assure that no one can discern the letter's contents by holding it up to the light. This bit of paranoid behavior is brought about by the fact that a few postal employees in foreign lands have been known to go through overseas mail in search of money and information that is useful to them.

For the same reason, use "Plain Jane" airmail stamps which will not draw unusual attention to your envelope. Also, get yourself a Post Office Box and use it for all return mail. This will help frustrate attempts to solicit your services in such things as immigration scams.

When dealing with large international broadcasters, return postage can often be provided in the form of IRCs (International Reply Coupons) which you can purchase from the Post Office. Smaller countries and stations may not be as familiar with IRCs. Remember: you cannot send along US postage to get a letter returned from a foreign country. A widely used tactic is to send along mint (i.e., unused, current) stamps from the

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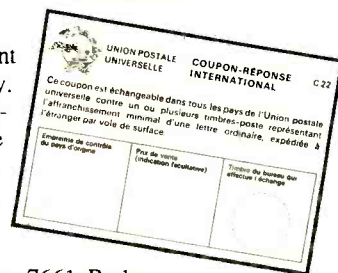
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broadcaster's country in an amount sufficient for them to return a reply.

Mint stamps can usually be purchased from stores that cater to the stamp collecting hobby. Two organizations who deal in stamps for radio hobbyists are: William J. Plum, 12 Glen Road, Flemington, NJ 08822 and DX Stamp Service, 7661 Roder Parkway, Ontario, NY 14519. You can even attach the mint stamps to a self-addressed envelope to further assure everything gets back to you safe and sound.



## Following Up

International mail often runs at a snail's pace at best. If you have not heard anything back from a station for about six months, you may want to send out a follow-up report. A good strategy is to log the station anew again, if possible, and send out a more current report. You might mention that you have written before; just remember not to get demanding about a QSL. You might politely suggest that your original report may have become lost in the mail.

## Hang In There, Bunkey!

That second fifty verifications will be a bit harder to acquire than the first fifty. But with a little practice and perseverance, you will succeed. You will also develop the skills to make the next few hundred QSLs a breeze. **MT**

# Shortwave Broadcasting

## Glenn Hauser

P.O. Box 1684-MT

Enid, OK 73702

(do not use previous 505 fax or phone)

**ALGERIA** International Service of R. Algiers with English news at 1505 on 15205 (Roger Chambers, NY) English now at 1500-1600, also on 17745, 11715 (BBCM via RVI *Radio World*)

**ANGOLA** Vorgan, V. of the Resistance of the Black Cockerel, UNITA clandestine, announced new frequencies, times approx.: 0445-0845 on 9550, 4960; 1045-1440 on 11830, 7290; 1630-2200 on 7290, 4960, sometimes English 2125-2150; often extended beyond scheduled sign-off; in Portuguese, vernaculars (BBC Monitoring)

**AUSTRALIA** Australian Armed Forces Radio curtailed service since troops pulled out of Somalia, Cambodia: one hour at 0100 and 0430 on 13525, 0930 on 11465, subject to real-time shifts for better propagation to 11465, 13525, 8115, 18725 in 19969, all USB; 30 kW from Canberra to Malaysia, rhombic. (R. Netherlands *Media Network*)

ABC Brisbane plans to close 9660 at yearend, future of 4920 also bleak, Perth 6140, 9610, 15425, seem likely to close after Xmas—only regular audience are Saturday night horse racing fans in W. Australian outback (John Kecskes, Chris Hambley, Dave Onley, *OzDX*) Perth is what SW radio should be—domestic services in English always more interesting than most big giants of the air (Bruce MacGibbon, OR, FIDOENT *SW Echo* via George Thurman) Brisbane has been running “anybody listening?” messages. Both likely closing Dec. 17 (RNMN)

**AZERBAIJAN** R. Dada Gorgud, English at 1700-1800 winter shift from 15240 to 7160 via Russia (RVI, *Radio World* via Steven Cline, Wolfgang Büschel) English heard at 1828 (Edwin Southwell, UK, WDXC *Contact*)

**BOLIVIA** Easiest outside S. America should be R. Fides, 9625, loud and clear from 1052 (Rich McVicar, HCJB *DXPL*) R. Velmar is new pirate on 6325.1, local evenings, 100 watts from Campamento Minero de Santa Marta, operated by miners' syndicate (Takayuki Inoue, *Relámpago DX* via FT)

**BRAZIL** R. Universo on new 11765.43, perhaps ex-11905, canned ID at 2100 // 6059.6, 9565 (Hans Johnson, *et al.*, Gifford Pinchot State Park, PA DX-pedition) Rdif. Londrina, 4815, had Spanish religion, not Portuguese at 0110-0130 (Don Moore, IA, HCJB, *DXPL*)

**BULGARIA** R. Bulgaria feature programs after half an hour of news, current affairs: Mon., *Business and Finance*, *Sports Roundup*, *History Club*. Tue., *Cultural Review*, *From School to Campus*. Wed., *Economy and Farming*, *Science*, *Technology and the Environment*, *Across the Map of Bulgaria*. Thu., *Lifestyle*, *History and Religion*, *Women's Own* alternating with *Youth Corner*. Fri., *Sports and Tourism*, *DX*. Sat., *Weekly Spotlight*, *Folk Studio*. Sun., *Answering Your Letters*. Also, Mon., Wed., Fri., *Timeout for Music*—classical, pop and folk; program info on Tue., Sat., Sun. (via John Carson, OK)

**BURMA** [non] Democratic V. of Burma, via Norway, 1430-1455 changed to 11850; controlled by the Burmese government in exile, National Coalition Government of the Union of Burma; address is P.O. Box 6720, St. Olavs Plass, 0130 Oslo; fax +47 2 114988 (BBCM)

**BURUNDI** R. Burundi off 6140 since Oct. 21 coup for at least two weeks; they say it's unrelated technical breakdown, waiting for part. Site is Gitega (BBCM)

**CANADA** CHNX, 6130, Halifax, still on at times, must have been this at 0845 with “Oldies 96” ID (Larry Russell, MI, *World of Radio*) Drifty and weak these days, 0945 on 6130.3v (Hans Johnson, MD, *Fine Tuning*) and separable from Laos 6129.9 at 1200 (Johnson, PA)

**CANARY ISLANDS** [?] Spain's RNE R. Uno relay on new 14880 USB, fade in 1115 to fade out 1930 (Alan Roberts, PQ, *W.O.R.*)

**CHINA** CRI finally went to winter channel 7405 at 1400 and 1500

All times UTC; all frequencies kHz.

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

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

= 2 x indicates 2nd harmonic of following frequency.

(gh, NM) and 9655 at 1200 (Tom Sundstrom, NJ via Thurman) Guangxi Economic Broadcasting Station replaces PBS-2 program on 5010 at 0920-1400, 2220- (Tetsuo Guinan, RJMR)

**COLOMBIA** Rdif. Nacional now has special external service including live newscasts, 1740-2150 on 11785, intended for Europe, Africa, Asia, Pacific, repeated 2150-0300 on 9655 for Americas; DW 11785 blocks at 1900; 9655 has Sweden, Norway/Denmark, Austria, so bad frequency choices. Their 20 kW Thomson-Houston can switch between 25 and 31 m only. Ondas del Orteguzaza heard morning and night on 4639.5 = 4 x 1160. La Voz del Guainía, 3501.3, opening before 1100 with *Despertar en la selva*, closing just before midnight, good level (Henrik Klemetz, Colombia, *W.O.R.*)

**COSTA RICA** RFPI plans to move 7385 USB transmitter to 9 or 11 MHz band; 7375 may shift plus or minus 5 due to interference (RFPI *Mailbag*)

**CUBA** RHC winter changes: Europe 2100-2200 on 15165 (George Thurman, IL) 0200-0430+ to Central N. America on 9510 ex-13660 (Arnie Coro, RHC *DXers Unlimited*) Coro proudly promotes it, but inaudible here, squished between WYFR and BBC; then on west coast beam quite strong with open carrier before 0500 (gh, NM) 9815 SSB at 0000-0200 is 10 kW PEP, 17° (*DXUL*)

**CZECHIA** R. Prague announced it won external service contract, but must agree to new terms or runner-up gets it; staff cuts, but remaining eight plan usual offbeat New Year Eve show (RNMN)

**ECUADOR** Ecos del Oriente, weak but regular around 2200 on 6540.3 = 2 x 3270 (Henrik Klemetz, Colombia) R. Oriental, Tena added SW 4780, about 2.5 kW, but frequent voltage variations 85-110 are a problem; signal not clear and intermittent; horizontal wire antenna; trying to adjust frequency, a bit on low side; got DX reports to be answered when gifts are ready, but needs closer reports from Amazon; \*1100, and 2300-0200; info from Director, Luis Enrique Espín, R. Oriental, Cas. 260, Tena, Napo (HCJB *DX Partyline*)

HCJB on 11925 has caused mess since late Sept.; distorted, overmodulated signal ruins entire band, with heavy splatter from 11400 to 12200 most nights, still there a month later. Does anyone care? (Ernie Behr, Ont.) Judging from old item on *DXPL*, it takes them several years to get around to reading *MT*; some of HCJB's greatest admirers should tell them they have a serious problem (gh) Ken MacHarg returns to *Saludos Amigos* in late Jan.; Sun. 0730, 1000, 1900, Mons. 0030, 0500 (HCJB *Program Notes*)

**EQUATORIAL GUINEA** R. Africa, last heard in May, was back at October end on 7190.24 until 2327\* on a Friday with US gospel, Sunday on 7203.3, until 2257\* (Brian Alexander, PA, *W.O.R.*)

**FRANCE** On a cycling tour in August I met the ex-director of R. Neige; pre-recorded tapes at ski resorts are being replaced by direct satellite feeds of R. Nostalgie from Paris. This had already happened when I heard 25710 Nov. 1 at 1300-1600; other days just open carrier, and program heard once more in Nov., but not the other two frequencies (Alan Roberts, PQ, *W.O.R.*) RFI English at 1200-1300 on 21645 and new 13640 ex-15365, very good, likely relay (Joe Hanlon, PA and gh)

**GERMANY** DW plans lots of holiday programming Dec. 24-26, 31, Jan. 1, in German service, especially music.

**GREECE** VOG to us at 1300-1450 escaped WEWN on 17510 by moving 17515 to 17535, including English at 1435 (John Babbis, MD, *W.O.R.*)

**GUAM** KSDA at 0000-0200 on 17645 ex-15610 (B. Cooley, B.C.)

**HAITI** [non] Radyo 16 Desanm has decided to continue indefi-



nately since Pres. Aristide was prevented from returning; on R. Miami International weekdays 2200 via WHRI 17830, 2300 via WRNO 7355 (Jeff White, WRMI)

**HONDURAS** R. Copán Internacional, 15675, has new program, *Radio Roquero*, Sats. 2200-2230, filling a void in Cuban radio programming, music for alienated young people emulating North American and European fashions, labeled delinquents by the government, "roqueros." It's the brainchild of Victor García-Rivera, exile in Ohio; theme is a twist on the Cuban anthem, *Himno Racional* (Jeff White, WRMI) R. Litoral, La Ceiba, heard at 1300 on 4830 (Björn Malm, Guatemala, SWB via RNM)

**INTERNATIONAL WATERS** Bro. Stair says the *Fury* will be flying the flag of Belize (Diane Mauer, WI) stationed between Cuba and Central America; says he will use all four transmitters, not RNI; claimed to be on Copán 15675 too but not heard there (Ernie Behr, Ont.) Al Weiner of RNI, and engineer for Stair, would not confirm or deny Belize. Birdwatcher Gary Bourgois thinks Stair will be unhappy when the boat finally starts transmitting, with muddy audio, carrier barely receivable, and satellite system not working properly (Steve Coletti, *Spectrum* via Mauer)

**IRAN** VOIRI has new English at 1530-1627 on 11790, quite strong (Philip Yant, Belgium, USENET via Thurman)

**IRAQ** [non?] V. of Rebellious Iraq, representing pro-Iran Shiite rebels in southern Iraq, heard at 0330-0600, 1300-1530, 1630-1900 on 7070/7090 (BBCM)

**JAPAN** BBC W-93 transmission schedule shows Yamata: 6120 at 1305-1330 and 2100-2200 English, 2200-2300 Mandarin; 7180 at 0900-1000 English, 1000-1300 Mandarin; 15370 at 2305-0030 English, all 300 kW, 290 degrees (via Dan Ferguson, VOA, USENET via Thurman)

**KIRIBATI** R. Kiribati QSL card showing canoe racing gives call sign as T3K1 for station, apparently applies to any frequency, with 9825 filled in (via Allan Garshowitz, BC)

**KOREA SOUTH** Retirement age at KBS is 58 (R. Korea *SW Feedback*)

**KURDISTAN** V. of the People of Kurdistan heard on new 4095 in Arabic at 0342 ID (Hans Johnson, *et al.*, PA)

**LEBANON** Wings of Hope on new 9960 at 1400 (Gustafsson, Sweden, RNMN)

**LITHUANIA** R. Vilnius at 2000 using Centras transmitter on 9400 (Julius Hermanns, Neth., RNMN)

**MALI** Chinarelay deal renewed until 1998, totalling 1.65 gigafrancs CFA (RTM via BBCM)

**MEXICO** R. Educación, 6185, XEPPM-OC is separating its shortwave signal from MW in order to better inform the world about what is happening in Mexico. The process began in May and will be consolidated in January; programming will be mostly musical, 50% Mexican, 25% from the rest of Ibero-America, 25% representing the world. Bilingual announcements, Spanish/English, will include brief info about Mexican regions, greetings to listeners abroad; news in English and French to be added, and other programs in those languages from January if financing comes through (Miguel García de Fernando, *Audio Tinta*, via Gigi Lytle, TX)

**MOZAMBIQUE** R. Nacional at 0313, drifts transmitter on 4854.9v, //3210, 6111.26, 7242.34 (Hans Johnson, *et al.*, PA, *W.O.R.*)

**NETHERLANDS** RN previews for Jan.: *From Sapphire to Laser* returns with new series on classical music recording, Mons. 0905, 1105, 1505, 1905, Tues. 0005. *Mirror Images* starts 1994 with the Rotterdam Film Festival, Tues. 0750, 0950, 1150, 1450, 1850, Weds. 0050, 0250, 0350. *Sounds Interesting* continues gastronomic monthly, Sat. Jan. 8, "dessert storm"—candies, chocolate, cakes, liqueur, at 0750, 0950, 1150, 1350, 1550, 1850, Sun. 0050, 0350. Wednesday documentary begins 1994 with crime wave in Eastern Europe, Wed. 0750, 0950, 1150, 1350, 1550, 1750, 1950, Thu. 0550, 0250, 0350, Fri.

0850, 1050, 1250, 1450, 2350, Sat. 0150 (via W. Martin, F. Orcutt, G. Lytle, D. Mauer)

**NEW ZEALAND** RNZI's revised schedule since Dec. 4: 1650-2137 Mon.-Fri. on 9655, 1850-2137 Sat. & Sun. on 11735, 2138-0658 daily on 15115, 0659-1206 on 9700; 1207-1649 occasional on 9655 (Adrian Sainsbury, RNZI via C. Ed Evans, WSHB, USENET via Thurman) 15120 clashed with VOA around 0000 (gh)

Contrary to some rumors, Kiwi Radio has not been given a license to broadcast yet. We are still in the process of applying for one—it is not as straightforward as one may think (Kiwi Radio, early Nov., via Gigi Lytle)

**NICARAGUA** R. Miskut, Puerto Cabezas, 5770 uses 1 kW SB, dipole, at 1400-2400 including bilingual *Country Ride International* at 2300; hopes to expand to 1100-0500 (Tetsuya Hirahara, visiting the station, *Nica DXing* via RNM)

**PAKISTAN** R. Pakistan, 0229 IS, 0230 ID and English on 15191, very good signal but bad modulation (Rich McVicar, HCJB *DXPL*) 0230-0245 on 7290, 15190, 17705, 17725, 21730; 1100-1120 on 17900, 21520; 1600-1630 on 9485, 11570, 13590, 15515, 15675, 17725; 1700-1750 on 9865, 11570 (PBC via Gigi Lytle)

**PAPUA NEW GUINEA** NBC testing 100 kW on 9565, National Service in English, strong (Barry Hartley, NZ, RNMN) R. Enga broke down, off air since Sept. (R. Australia via BBCM) 2410

**PERÚ** A new one on 4254.5 is R. San Andrés de Llapa, at Llapa, provincia San Miguel, Cajamarca, daily from \*2350 with *Anochecer campesino*. R. Tayabamba moved to 4502v from 5385v, 1030 with *Amanecer campesino*. Imagen la radio at 1000 shifted from 4970-ish to 4968. R. Lider on 4860 seems to be the one in Cusco with 1100 kHz MW, at 1010 with *Opinión informativa*—no location given but street names, phones, etc. tally. Freq. clear, audio weak and fading. Estación Tarapoto on 5020.0 (Henrik Klemetz, Colombia, *W.O.R.*) Actually 5019.95, ex-5016, maybe got new tube, stronger over Cambodian Atrato 5019.98 at 1155 (Rich McVicar, HCJB *DXPL*) R. Concordia on 6141.35 0930-1030+ with Andean music, IDs, often mentions "La Voz de La Unión" which is a remote province in Arequipa dept.; no sign of Alto Mayo 6137.4 (Ernie Behr, Ont.) R. Nacional del Perú, 6095 from \*1100 and until 0457\* is from Tacna, not Lima, says Venezuelan DXer Manuel Rodríguez Lanza; offering pennant for reports to Avenida Hipólito Unanue, Tacna (Jerry Berg, MA, *Fine Tuning*) R. Hispana back on 5015v ex-5895.4 almost daily at \*0900-1200+, +2200-0400\*, 300 W from Arequipa (Takayuki Inoue, Bolivia, *Relámpago DX* via RNM) LV de Huamanga at 0930 IDs on 6070.1 ex-6200 (Hans Johnson, MD, *DXPL*)

**PHILIPPINES** FEBC alone has programs in about 140 languages and dialects (Frances Rivers, *The Progressive*, Nov.) a record for one station, or group? (gh) TWR has reached 100 languages (BBCM)

**POLAND** Polish R. Warsaw, English until March 27 when shifts one hour earlier: 1300-1355 on 11815, 9525, 7270, 7145, 6135; 1600-1655 on 9525, 7285; 1800-1855 on 7285, 7270, 5995; 2030-2125 on 7285, 6135, 5955, 1503, all for Europe. Fax: +48-22-444123 (BBCM) Good chance to catch it is at 1300 on new 11815 (Daryl Rocker, NY)

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

**RUSSIA** Some RMWS programs: new is *Timelines*, Robert Dell and Estelle Winters with an insight into life in Moscow through foreign eyes, info, entertainment and a few laughs—Sat. 0531, 1131, 1531, 2331, Sun. 1031, 1731, 2131, Mon. 0331. *Folk Box*, Mon. 0031, 1531, Tue. 0231, 1231, Wed. 0931, Thu. 0531, 2131, Fri. 1831, Sat. 0031, 0931. *Culture and the Arts* of over 100 nationalities in the Russian federation. Sun. 1111, 1711, Mon. 1011, 1611, Tue. 2231, Wed. 1711, Thu. 1411, Fri. 2011, Sat. 0711. N. American frequencies until March 5: 21480 at 2300-0300, 17760 1100-1600, 17690 2100-2300, 17605 2000-2300, 15425 1900-0400, 15380 1100-1700, 15210 1100-1600, 12050 1800-0400, 9750 2100-2400, 9620 2100-0300, 9550 1600-2300, 9540 1600-1800, 7345 1400-1800, 7270 0300-0400, 7260 1500-2100, 7250 1500-1900, 7180 1700-2300 and 0100-0600, 7165 0000-0600, 7150 2100-2300, 7105 1400-2000 and 0400-0600, 6165 1400-1900, 5915 0100-0600 (via Bob Thomas, CT) RMI reduced language from 60 to 46 (Joe Adamov, RMWS *Mailbag* via BBCM)

Radiostantsiya Tsentralnaya, also 0630-0700 on 12010; fax +7 095 921 16 24 or +7 095 956 75 46. R. Radonezh, 1600-1700 on 9795. R. Slavyanka, armed forces radio for the "near abroad", Mon. - Sat. 1700-1900 on 7265, 7140, 6175, 6090, 5945, 4975, 4940; Tue.-Sun. 0200-0400 on 7245, 6160, 5930, 5920, 4975, 4740; expanded to serve troops in Baltics, Kaliningrad, Caucasus, Central Asia, not just Tajikistan border with Afghanistan. Ostankino Radio-1 USB channels are 13820, 13760, 6822.5 during long hours. Polar news service still exists, Thurs. 1400-1430 on 9490 (BBCM) R. Yedinstvo (Unity) is new religious station, testing from Nov. with 200 kW, regular from Jan. to Mideast, Caucasus (Nikolai Rudnev, *OzDX*)

**RWANDA** Though DW denies their transmitters carry RRR on 9610 and 15340, a DW engineer at Kigali told me on ham radio this is a new 100 kW at the DW site (Goonetilleke, Sri Lanka, *RNMN*)

**SEYCHELLES** FEBA in English until 5th March: 0500-0553 Fri. to ME on 17750; 1500-1555 (Sat. 1550, Sun. 1558) to S. Asia on 11710; separate international program to S. Asia 1500-1600 exc. Sun. on 9810, 15330 (FEBA)

**SIKKIM** AIR, Gangtok, 4775, first noted Oct. 31 with fair carrier 1145 when at same time AIR Imphal 4760 nearby was fair and over Chinese; at 1210 4775 had chants, talks like religious program, 1231 almost certain ID mentioning Gangtok, announcements, local music, 1232-1237 possibly local news. Very good signal peak 1215-1230 on direct path from NE; then slowly weakening with best signal arrival swung around to the NW. Still weakly audible 1255. Best on LSB due to periodic CW ute on high side. Perhaps still in test phase, definitely not on air a week before. AIR Guwahati, formerly 4775.5v and scheduled to 1215\* may now be on 4990 as planned (David M. Clark, Ont., *FT*) don't spoil sport and merge this with India radiowise

**SLOVAKIA** [ & non ] Adventist World Radio plans to begin using a large SW station here for 22 hours daily, date not set; also plans more sites, including a Pacific island (Adrian Peterson, AWR) AWR inauguration Jan. 8, gets one transmitter originally for Prague (*RNMN*)

**SOMALIA** New \$2.5 million MW radio station will broadcast same programs as on UN's SW R. Manta (BBCM)

**SURINAME** R. Apintie at 0007 with salsa music, very few announcements, back on 4990.9 Nov. 5 after several weeks on 5005 (Hans Johnson, *et al.*, PA)

**SWITZERLAND** SRI Sat. programs take turns with 20-minute holiday specials—*Grapevine* Dec. 25, *SW Merry-Go-Round* Jan. 1 (gh)

**TURKS & CAICOS** Caribbean Christian Radio, 1020 kHz from Grand Turk, also heard at 0246 on 2nd harmonic 2040 (Don Moore, IA, Internet via HCJB *DXPL*) Announces 20 kW, calls itself "superpower" (via Tim Hendel, FL) Not

**USA** WRMI, Miami, began testing on 9955 Nov. 11, heard at 2125 (Mike Hardester, NC) Same date 2310-2329 with English and Spanish IDs repeated (Mrs. Leslie Edwards, PA) Again Sat. Nov. 13 more widely heard: 2050 with good signal but muffled audio, about 10 miles away

by groundwave (Tim Hendel, FL) Also here an hour later, barely audible on portable (gh, NM) At 2140, peaking S5-7 on R8, muddy audio; called Jeff White who confirmed only 400 watts, ant. test toward Venezuela (Rob Keeney, KS) And at 2232, also had Spanish 2-way QRM on frequency (Gigi Lytle, TX) Same here the next day at 2227, voice ID, tones, QRM (Robert Yowell, TX) Was auxiliary 400-watt transmitter to check corner reflector antenna; main 50-kW expected on by mid-December after refurbishing. Reports welcome to Box 526852, Miami, FL 33152 (Jeff White, WRMI) far out of band but not along on 9955—VOFC direct from Taiwan clashes at 1852 (Tom Sundstrom, NJ, *SW Echo* via Thurman)

A transmitter malfunction was the probable cause of last summer's fire. George McClintock said arson was also considered but not proved (Bob Kirby, *Radio World*, via Dennis Gibson) See last month for *WORLD OF RADIO* times on WWCR, WHRI.

WWCR's 15685 and 15610 are useless in Europe winter after 1800, only 5-9 MHz make it from Sackville and Okeechobee (Wolfgang Büschel, Germany) WWCR 5935 and 5810 put mixing product on 5685 at 0300 (Diane Mauer, WI) WEWN 18930 and 17510 put mixing product on 16090 at 1630 blending English and Spanish, (Alan Roberts, PQ, CIDX)

WHRI moved from 9590 to 9485 to escape Norway, 1800-2100 including Chuck Harder's *For the People*, live weekdays 1905-2100 (gh) *DX Radio Show*, UT Sun. 0200-0300 on 7315, carried family message to hostage in Colombia; and read out complete program schedule, including: *Croatian Radio Zagreb*, daily 0000-0100 on 7315, 0500-0600 on 7315, 9495, Mon.-Fri. 1600-1630 on 9465, 15105; *Macedonian World Congress*, Tue., Thu., Sat. 0100-0130 on 7315; *Croatian Party of Rights*, Wed. 0100-0130, Sun. 2330-2400 on 7315, 9495; *Bosnian-Canadian Association*, Fri. and Sun. 0100-0130 on 7315. In Turkish, *Voice of the Good News*, Fri. 1900-1930 on 13760. Second half of the Zagreb hour includes elements from Canada (gh)

WCSN, Maine, sold by Monitorradio for \$5 million to Prophecy Countdown, Mt. Dora, FL; proceeds to purchase WSHB-3 (Reuter via *DXPL*) Monitor Radio International changed to one-hour international edition weekdays; domestic early edition fills in only on Monday mornings (Leslie Edwards and Jim Moats)

KJES, New Mexico, heard on new 15545 at 2000-2100 (George Thurman, IL) ex 9510

**VATICAN** VR to us at 0250-0310, 7305 seems unreliable, not always on; 6095 reliable but plagued by low level rumble. Some monitored programs in early Nov., UT days: Mon., *Catholic Writers, Thinking it Through*. Tue., *A Room with a View of the Vatican*. Wed., *The Rome Report*. Thu., *Pilgrim City, Postcards from Rome*. Fri., *Crossreference, Chris by Numbers* (?) (John Norfolk, OK)

**VENEZUELA** Terribly distorted mess on 9430v, from 0000 to 0400v, seems to be R. Nacional de Venezuela; noted since late Sept., still there a month later; splatter from 9400 to 9480 every night; has IS at 0000, but not one word readable (Ernie Behr, Ont., *W.O.R.*) Brought this to attention of George Jacobs, who informed FCC; they confirmed it's Venezuela and an official complaint was filed to get it fixed or get it off (George Thurman, IL)

**VIETNAM** R. Lai Chau had not been heard since Nov. 1992 when it was on 6430; in Oct. 1993 found again on 6700 at \*1000-1500\*, with its own programs at 1000-1100, 1145-1215 in Vietnamese and local languages; Hanoi net-1 relays at 1100-1145, 1215-1300, 1330-1500// 5920 and 10060; and the Meo net at 1300-1330 // 5032 (Isao Ugusa, Japan, R. Japan *Media Roundup*)

**YEMEN** Yemeni Republic Radio, Sana'a has 30-minute English at 2100 on 9780, a rebroadcast of the 1600 program from Aden (BBCM)

**ZIMBABWE** ZBC is seriously considering reviving SW, three transmitters to serve border areas and Zimbs abroad (*RNMN*)

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

# Broadcast Loggings

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

## 0000 UTC on 9780

CHINA: China Radio International. Station ID to world news and regional updates. Feature on Russian political scene. (Jim Moats, Ravenna, OH; Sam Wright, Biloxi, MS)

## 0028 UTC on 9860

MADAGASCAR: Radio Netherlands relay. Station interval signal to ID/frequency quote. Newscast at 0030. *Newsline* program at 0038. (Moats, OH)

## 0100 UTC on 5930

SLOVAK REPUBLIC: Radio Slovak International. Frequency quote to newscast at 0102. Travelogue show on improving tourism between Slovakia and Indonesia. Slovak language lesson at 0113. (Moats, OH; Frank Hillton, Charleston, SC; Wright, MS)

## 0100 UTC on 9745

ECUADOR: HCJB. *Ham Radio Today* on propagation, rocket launch and ham news. (Moats, OH) HCJB on 21455 USB at 1330. (Scott Martin, Cleveland, OH)

## 0125 UTC on 9540

SPAIN: Spanish National Radio. Weather report, program lineup. Financial, business news. (Don Taylor, Green Cove Springs, FL; Martin, OH; Hillton, SC)

## 0142 UTC on 9655

AUSTRIA: Radio Austria International. Commentary on Bosnia, new electric locomotive system. German service \*0200. (George F. Peek, Safford, AZ)

## 0200 UTC on 6115

COLOMBIA: La Voz del Llano. Spanish. Caracol IDs and network news at the hour. Time check breaks, Caracol promos and chat. Colombia's La Voz de la Selva on 6170 kHz at 0320. (Martin, OH)

## 0230 UTC on 9570

PORTUGAL: Radio Portugal. Station ID/frequency quote. News, sports and weather update. Tourism feature *Visitors Notebook* at 0242. (Moats, OH) (Hillton, SC)

## 0350 UTC on 4909.5

ZAMBIA: Radio Zambia. Vernaculars/English. African musical vocals at tune-in. "Radio Zambia" ID into English world news. (GVH/NC)

## 0420 UTC on 7225

RWANDA: Deutsche Welle relay. Discussion on the United Nations mission in Somalia. (John Sedlacek, Omaha, NE)

## 0425 UTC on 7175

RUSSIA: Radio Moscow International. *News and Views* program on domestic and foreign issues. Radio Aum Shinrikyo monitored via Radio Moscow on 7175 kHz at 0430-0500. (Sedlacek, NE) Radio Moscow's *Commonwealth Update* audible on 9550 kHz at 1910; *Folk Box* program on children's tunes in classical music audible on 9410 kHz at 2130. (Fraser, MA)

## 0430 UTC on 15120

NEW ZEALAND: Radio New Zealand International. C&W music show. Lady DJ's guest was visiting from Pitcairn island. (Thomas Banks, Dallas, TX) News, ID and Maori feature on Papua New Guinea. (Giovanni Serra, Rome, Italy) *Round the Horn* show on 9700 kHz at 0930. (Fraser, MA)

## 0510 UTC on 9700

GREECE: Voice of America relay. Announcer duo discuss Asian/American relations and economy. World newscast to interval signal and station ID. (Bill Newberry, Bakersfield, CA)

## 0601 UTC on 4565 LSB

GERMANY: Radio Free Europe/Radio Liberty. Ukrainian. News on Ukraine, and Shevarnadze. *Europa Musicale* program, religious choral, festival and folk tunes. Station ID to language lesson. Sign-off at 0700. (Serra, Italy)

## 0620 UTC on 17710

SOUTH AFRICA: Channel Africa. Closing items on mailbag program. African highlife music to chat, ID and 0655\*. (Newberry, CA)

## 0640 UTC on 12035.7

Vietnam: Voice of Vietnam. English/Vietnamese. Language lesson program to 1645. Announcer duo to regional music at 0650. (Jerry Witham, Keauau, HI) English IDs to music on 6115 kHz at 1130 UTC. (Gigi Lytle, Lubbock, TX)

## 0640 UTC on 7275

LIBERIA: ELBC. Religious sermon to program breaks and "ELBC" IDs. Literature promotionals and time checks. (Wright, MS)

## 0706 UTC on 6055

CZECH REPUBLIC: Radio Prague. Newscast to ID and DX program *Calling All Listeners*. Interval signal and ID audible on // 7345, 11990 kHz. Station sign-off at 0726. (Serra, Italy) United Nations report noted on 7345 kHz at 2208. (Fraser, MA)

## 0730 UTC on 3289.8

ECUADOR: Radio Centro. Spanish. DJ announcer format with IDs and Ecuadorian music. (Witham, HI) Additional monitoring 1055 with canned IDs, local time checks, and guitar ballads. (GVH/NC)

## 0930 UTC on 6011.83

ITALY: TeleRadio Stereo. Italian. Station ID and jingles. American and British

pop tunes to local ads. 4th harmonic of 1503 kHz parallel FM frequency; pirate emission with no license. (Serra, Italy)

## 0940 UTC on 4712.4

BOLIVIA: Radio Abaroa. Spanish. Guitar ballads to announcer's "este es Radio Abaroa." Regional time check to jingles. Bolivia's Radio San Miguel tentative on 4925 kHz at 1015. Fair signal. (Brian Bagwell, St. Louis, MO)

## 0959 UTC on 15050

INDIA: All India Radio. Frequency quote, newscast and ID. Commentary on 17387//17895 kHz. (Serra, Italy) Presumed Hindu on 3277 kHz at 1635. English news noted on 4910 kHz at 1720. Sign-off 1740. (Witham, HI)

## 1035 UTC on 9575

MOROCCO: Radio Mediterranee. Arabic. Lady DJ presents music show of pops and Arabic vocals. (Jerry Wilkins, Denver, CO)

## 1115 UTC on 2310

AUSTRALIA: VL8A-Alice Springs. Very good signal for ukelele and 30's era music tunes. Parallel monitoring on 2325 kHz VL8T-Tennant Creek. (Jacques d'Avignon, Ontario, Canada)

## 1158 UTC on 4925

INDONESIA: RRI-Jambi. Indonesian. "Song of the Coconut Islands" interval signal to network ID at 1200. Jakarta news relay to 1214. Fair signal quality. RRI-Jakarta audible on 9679 kHz at 1205. (Mark Cladwell, Eagle River, MI)

## 1210 UTC on 5030

TONGA: Radio Tonga. Island music to station ID at 1215. Clear signal today, other days I have problems with splatter from 5025 kHz. (Lytle, TX)

## 1413 UTC on 11925

MALTA: Voice of the Mediterranean. Cultural music program of guitar selections. Station ID to *Ecological Panorama* feature. (Serra, Italy)

## 1515 UTC on 9515

ANTIGUA: BBC relay. *Concert Hall* program featuring Hungarian composers Bartok and Kodaly. (Fraser, MA)

## 1607 UTC on 21605

UNITED ARAB EMIRATES: Radio Dubai. Feature *The Streets of Jerusalem* to classical music. Station ID/frequency quote to program preview. Interval signal to time pips, ID and national newscast. (Serra, Italy)

## 1615 UTC on 15070

UNITED KINGDOM: BBC. *Radio History of Warfare* on the era of Napoleon. *Changing Reputations* feature on Lawrence of Arabia on 9410 kHz at 1715. Play of the week, *Brighton Beach Memoirs*. (Fraser, MA)

## 1620 UTC on 3259.8

INDONESIA: RRI-Kupang. Indonesia. Easy-listening music to announcer talk. RRI-Madan noted in Indonesian on 4766 kHz at 1705. Network news and regional music. Station sign-off at 1715. (Witham, HI)

## 1650 UTC on 5005

NEPAL: Radio Nepal. Nepali. Regional music to announcements and station ID at 1700. Asian music fading during sign-off and anthem at 1715. RTTY interferences. (Witham, HI)

## 1700 UTC on 4895.5

PAKISTAN: Pakistan BC Corp. Time pips to station ID. Newscasts and talk in unidentified language. Interview to station promotional and regional music program. (Witham, HI) Station monitored on 11570//15550 kHz with news, weather report, music, frequency quote, and Holy Koran recitations translated into English. (Serra, Italy)

## 1740 UTC on 5890

AUSTRALIA: Radio Australia. *Country Music Club* program to ID at 1800. World and regional newscast to signal fadeout 1815. (Witham, HI) Station monitored 1009 on 21745 kHz. *South Pacific* environment program heard on 7260 kHz at 1935. (Serra, Italy)

## 2200 UTC on 3316

SIERRA LEONE: SLBS. Time check to interval signal. National news and sports update. African music tunes to closing national anthem and sign-off. (Mike Prindle, Long Island, NY)

## 2215 UTC on 5975

CANADA: BBC relay. *Seeing Stars* on asteroids that pose a danger. (Fraser, MA; Charlie Patterson, Mobile, AL)

## 2215 UTC on 7125

CYPRUS: Cyprus Broadcasting Corp. Greek. Station ID to program announcements. Greek music vocals. Parallel programming heard on 9770 kHz. Brief radio drama, station ID and 2245\*. (Wright, MS)

## 2225 UTC on 15675

HONDURAS: Radio Copan International. Music played by Tony B. ID at 2233 followed by Jeff White's comments on sea turtles, sharks, and shipwrecks. (Lytle, TX)

## 2250 UTC on 4801

PERU: Radio Onda Azul. Spanish. Peruvian music program. Regional ads to clear station ID at 2300. Peru's Radio La Hora heard on 4900 kHz at 1000. (Pettersen, AL)

## 2350 UTC on 4755

BRAZIL: Radio Educacao Rural. Portuguese. Brazilian pop vocals at tune-in. Chat and local references to Campo Grande. Station ID and news update 0000. Brazil's Radio Bare audible 0800 on 4895 kHz. Nice pop vocals and news. (Pettersen, AL)

"I will obtain the confirmation directly from the station and personally mail your reply." So says Manuel Rodriguez Lanza from Caracas, Venezuela. DXers interested in QSL cards and letters from Venezuelan stations, send English or Spanish reports, two IRCs or one U.S. dollar to: P.O. Box 65657, Caracas 1066-A, Venezuela.

Radio Moscow International has adjusted their QSL policy to confirm only one transmitter site per letter. Send reports to; TV & Radio Agency "Astra," ul. Pyatnitskaya 25, 113326 Moscow, Russia.

The Danish SW Club International has released the 21st Edition *Tropical Band Survey*. This survey covers all broadcasting stations in the frequency range of 2000-5900 kHz, and their transmission schedules. Send \$10.00 to: ODXA, Box 161, Stn. A., Willowdale, Ontario M2N5S8 Canada.

## CYPRUS

Cyprus Telecommunications Authority, 8737.5 kHz. Full data station letter signed by Manager Engineering Resources. Received in 90 days for an English utility report, one U.S. dollar, and souvenir postcards. Station address: Head Office, Telecommunications St., P.O. Box 4929, Nicosia 142, Cyprus. (David Houghton, Santa Barbara, CA)

## NETHERLANDS

Radio Netherlands, 6165 kHz. Full data, colorful tulips card, unsigned. Received in 36 days for an English report. Station address: P.O. Box 222 JG, Hilversum, The Netherlands. (LeRoy Long, Edmond, OK; Thomas Banks, Dallas, TX; Brian Bagwell, St. Louis, MO; Steve Kosorok, Orem, UT)

## PAPUA NEW GUINEA

Radio Manus, 3315 kHz. Full data letter signed by Eliun Sereman. Received in 53 days for an English report, one U.S. dollar, and Texas souvenir trinket. Station address: c/o Radio Manus, Lorengau, Manus Province, Papua New Guinea. (Gigi Lytle, Lubbock, TX; Frank Hilton, Charleston, SC)

Radio Western Highlands, 3375 kHz. Full data handwritten letter signed by Esau Okole-Station Technician. Received in 28 days for an English report, one U.S. dollar, and Texas souvenir trinket. Station address: c/o RWH, P.O. Box 311, Mount Hagen, Western Highlands Province, Papua New Guinea. (Lytle, TX)

Radio North Solomons, 3325 kHz. Partial data letter signed by Station Manager. Received in two months for an English report. Station address: P.O. Box 393, Rabaul, ENBP, Papua New Guinea. (Dr. Adrian M. Peterson, Indianapolis, IN; Banks, TX)

## PERU

Radio Madre de Dios, 4953 kHz. Full data "map" card unsigned and station info sheet. Received in 63 days for a Spanish report, one U.S. dollar, and tourist pamphlets. Station address: Apartado 37, Puerto Maldonado, Madre de Dios, Peru. (Bagwell, MO)

## POLAND

Polish Radio Warsaw, 11840 kHz. Full data "Gorzow Wielkopolski" QSL card unsigned. Received in 73 days for an English report and two IRCs. Station address: External Service, P.O. Box 46, 00-950, Warsaw, Poland. (James C. Hirchak, Washington, DC)

## PORTUGAL

Radio Portugal Int'l, 17745 kHz. Full data "Old Map" QSL card signed by Winnie Almeida-English Service Producer. Received 28 days for an English report and one IRC. Station address: Box 1011, Lisbon 1011, Portugal. (Sam Wright, Biloxi, MS)

## SHIP TRAFFIC

DOCEGULF-D50V-156.600 MHz (Bulk Carrier). Full data prepared QSL card verified by ship's stamp/seal. Received 34 days for an English utility report, one IRC (returned), U.S. mint stamps, and self-addressed-envelope. Ship's address: V. Ships, L' Aigue Marine, 24 Avenue de Fontvieille, P.O. Box 639, 98013 Monte Carlo, Monaco. (Russ Hill, Oak Park, MI)

WHITESEA-ZDAM4-8267 kHz (Tanker). Full data prepared QSL card verified by ship's stamp/seal. Received in 33 days for an English utility report, one

IRC (returned), U.S. mint stamps, and self-addressed-envelope. Ship's address: V. Ship's, L' Aigue Marine, 24 Avenue de Fontvieille, P.O. Box 639, 98013 Monte Carlo, Monaco. (Hill, MI)

STELLAMARE-PJFA-156.600 MHz (Heavy Load Carrier). Full data prepared QSL card with personal note signed by Roel Vander Wellen-2nd Officer. Received for an English utility report, one IRC (returned), U.S. mint stamps, and self-addressed-envelope. Ship's address: c/o Jumbo Shipping S.A., P.O. Box 227, 54 Route de Acacias, 1211 Geneva 24, Switzerland. (Hill, MI)

FEDERALOTTAWA-LXAY-156.600 MHz (Bulk Carrier). Full data prepared QSL card verified by ship's stamp/seal. Received in 57 days for an English utility report, and a stamped-self-addressed-envelope. Ship's address: c/o Marine Post Office, Detroit, MI 48222 or Fednav Ltd., 600 de la Gauchetiere West, Suite 2600, Montreal, PQ H3B 4M3 Canada. (Hill, MI)

RIXTA OLDENDORFF-VPGA-156.600 MHz (Bulk Carrier). Full data prepared QSL card verified by ship's stamp/seal, signed by H.H. Wolter-Radio Officer. Received in 85 days for an English utility report, one IRC (returned), U.S. mint stamps, and a self-addressed-envelope. Ship address: Egon Oldendorff, Funfhausen 1, Postfach 1, Postfach 2135, D-2400 Lubeck 1, Germany. (Hill, MI)

M/S CARIBIA EXPRESS-DGCE, 16528 kHz (German Container). Full data QSL card verified by ship's stamp/seal, initiated by ship Radio Officer. Received in 33 days for a German utility report and two U.S. dollars. Ship address: c/o Hapag-Lloyd Aktiengesellschaft, Ballindamm 25, Postfach 10 26 26, 2000 Hamburg 1, Germany. (Rick Albright-KD6DKC, Merced, CA)

SKANDERBORG-OYRI4, 156.8 MHz (RO/RO Multi Purpose). Full data prepared QSL card. Received in 47 days for an English utility report and one U.S. dollar. Ship address: Telecom Denmark, Telecommunications Accounts, Telegade 2, 2630 Taastrup, Denmark. (Hank Holbrook, Dunkirk, MD)

AUTOCHAMP-D7ST, 156.425 MHz (Car Carrier). Full data prepared QSL card. Received in 90 days for an English utility report and one U.S. dollar. Ship address: Korea International Telecommunication Office (KIT), Korea Telecommunication Authority (KTA), 21-1 Chungmu-Ro, Chung-Ku, Seoul 100, Rep. of Korea. (Holbrook, MD)

## SRI LANKA

Sri Lanka Broadcasting Corp., 15425 kHz. Full data color station card, and personal note signed by Deputy Director General Engineering. Program schedule included. Received in 85 days for an English report, and two IRCs. Station address: P.O. Box 574, Colombo 7, Sri Lanka. (Frank McGowan, Shawnee Mission, KS)

## UNITED STATES

Comm. Station-NMO, 17314 kHz. Full data station QSL card with letter signed by C.E. Jewell, CWO. Received in 15 days for an English utility report. Station address: USCG Communications Station, Honolulu Wahiawa, HI 96786-3050. (Hill, MI)

*Policy is now one transmitter site per letter will be verified says Radio Moscow, who sent this picturesque QSL directly to our Brasstown office.*



## 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) 5, 6, 7 or 8 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 (7:30 pm Eastern, 4:30 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 "Newline" 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

### Program Notes

Jim Frimmel notes that WWCR's transmitter #3 is now carrying *World Wide Country* music beginning at 1800 Monday through Friday until 0100 UTC on 15610 kHz, and at 2200 on 12160 kHz. The six hours of country and western music are an experimental effort to attract advertising, according to George McClintock of WWCR.

Also a first, at least in Jim's memory, is a letterbox segment on Voice of America. He says the VOA's communications magazine program *Communications World* has asked listeners to write or phone in their questions to be included in a letterbox segment beginning in December. The spot will appear on the first Saturday each month. Write or fax 1-202-619-0211 to let them know how much this new responsiveness to listeners is appreciated—even though Glenn Hauser has a point in questioning whether they are interested in input from Americans!

### WCSM Has a Buyer

"Birdwatcher" Gary Boudreau reports via GENie observing a November telethon run by the Seventh Day Adventists to raise the initial \$400,000 needed for a downpayment on the Christian Science Monitor's transmitter in Scott's Corner, Maine. Birdwatcher got a tour of the state of the art facilities via the Adventists' feed on satellite G3 Ch 24. The "Prophecy Countdown Network" plans to use a second full time channel, G3/08, to uplink their signal to the shortwave station.

Birdwatcher adds, "For those who do not know, the first Church of Christ, Scientist, has had financial problems. This led to the demise of the Monitor Channel on satellite (it was a wonderful service) and the sale of their TV station in Boston. WCSM is being sold to cut costs. The final tube alone costs \$125,000 and is good for

two years: just one example of the high cost of running a shortwave station."

A press release from the Christian Science Church says it has signed a letter of intent to sell for \$5 million. "The cost of the additional broadcast equipment in South Carolina will be completely paid for with the proceeds of selling WCSN," said Al Carnesciali, president of Herald Broadcasting.

Prophecy Countdown will begin broadcasting over WCSN up to 30 hours a week starting January 17th, and will be full owner after the sale is completed in September 1994. By that date, WSHB expects to be ready assume Monitor Radio's broadcasts to Africa without any lapse.

### Changing Your Point of View

Jacques d'Avignon sent in some unique world view maps as a tutorial visual aid. Did you ever stop to think about how shortwave stations design their antenna coverage, or why your reception results differ so much from those across the country? For example, this month we have included some special propagation charts for Hawaii. Take a look at the first map to see how the world looks from Honolulu and you'll understand why their reception is so different from that on the mainland.

The second map shows the world from the perspective of WEWN. Jacques says, "all antennae are curtains and have at least 20 dB gain. The 005, 070, and 155 degrees are slewable 15 and 30 degrees on each side of the boresight. I was told that the 270 covers close to 90 degrees!"

Compare the area to be covered by WEWN to the way the world looks to Radio Netherlands; it's a world of difference!

## MT Monitoring Team

Gayle Van Horn, Frequency Manager  
North Carolina

Next Reporting Deadline  
January 21, 1994

Jim Frimmel, Program Manager  
Texas

Dave Datko B.W. Battin  
California New Mexico

Jacques d'Avignon  
Propagation Forecasts  
Ontario, Canada

## newslines

"Newslines" 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 ("Newsdesk")  
China Radio Int'l  
Czech Republic  
FEBC (Philippines)  
Monitor Radio Int'l [T-F]  
Radio Australia  
Radio Canada Int'l [S-M]  
Radio Havana Cuba  
Radio Moscow  
Radio New Zealand Int'l [M-A]  
Radio Norway Int'l [M]  
Radio Thailand  
Radio Vilnius [T-F]  
Radio Vlaanderen Int'l  
Spanish National Radio  
Voice of America (am/as/ca)  
WWCR #3  
Radio Vilnius [A]\*  
**0003**  
Radio Pyongyang  
**0005**  
Radio Vilnius [A]\*  
**0006**  
Radio Vilnius [F]\*  
**0008**  
China Radio Int'l\*  
**0010**  
Voice of America (ca) [T-A]\*  
**0012**  
Radio Havana Cuba\*  
**0015**  
Radio Vilnius [H]\*  
**0027**  
Radio Vilnius [W]  
**0030**  
HCJB  
Radio Havana Cuba  
Radio Moscow  
Radio Nacional de Venezuela [T-S]  
Radio Netherlands Int'l  
Radio Sweden [T-A]  
Voice of America (am/as) (SpE)  
Voice of America (ca) [S-M] (SpE)  
**0045**  
Korean World News Service  
**0057**  
Spanish National Radio [F]

### 0100 UTC (8:00 PM EST, 5:00 PM PST)

All India Radio  
BBC  
Czech Republic  
Deutsche Welle

Monitor Radio Int'l [T-F]  
R Slovakia Int'l  
Radio Australia  
Radio Havana Cuba  
Radio Japan  
Radio Korea  
Radio Moscow  
Radio New Zealand Int'l [M-A]  
Radio Thailand  
Radio Ukraine Int'l  
Radio Yugoslavia  
RAI Italy  
Spanish National Radio  
Swiss Radio Int'l  
Voice of America (am/as/ca)  
Voice of Indonesia  
WWCR #3 [S]  
**0103**  
Radio Bulgaria  
**0110**  
Radio Australia [M-F]\*  
**0112**  
Radio Havana Cuba\*  
**0119**  
Radio Ukraine Int'l [H]\*  
**0122**  
Radio Ukraine Int'l [W]\*  
**0123**  
Radio Sweden [T]  
**0130**  
Radio Austria Int'l  
Radio Havana Cuba  
Radio Moscow  
Radio Netherlands Int'l  
Radio Sweden [T-A]  
Radio Tirana  
Voice of Greece [M-A]  
**0145**  
BBC (ca) [T-A]\*  
**0155**  
Voice of Indonesia  
**0157**  
Spanish National Radio [F]

### 0200 UTC (9:00 PM EST, 6:00 PM PST)

BBC ("Newsdesk")  
Christian Science Sentinel [A]  
Deutsche Welle  
KVOH [T-A]  
Monitor Radio Int'l [T-F]  
Radio Australia  
Radio Canada Int'l  
Radio Havana Cuba  
Radio Moscow  
Radio New Zealand Int'l [M-A]  
Radio Norway Int'l [M]  
Radio Romania Int'l [T-S]  
Radio Thailand

Radio Yugoslavia  
Voice of America (am) [T-A]  
Voice of America (as)  
Voice of Myanmar (Burma)  
WHRI #2 [M]  
WWCR #3 [T-S]  
**0201**  
Radio Romania Int'l [M]  
**0203**  
Voice of Free China  
**0210**  
Radio Havana Cuba\*  
**0215**  
Radio Cairo  
Radio Nepal  
**0230**  
HCJB [M]  
Radio Havana Cuba  
Radio Moscow [T-A]  
Radio Netherlands Int'l  
Radio Pakistan  
Radio Portugal Int'l [T-A]  
Radio Sweden [T-A]  
Radio Tirana  
**0245**  
Korean World News Service

### 0300 UTC (10:00 PM EST, 7:00 PM PST)

BBC  
China Radio Int'l  
Christian Science Sentinel [A]  
Czech Republic  
Deutsche Welle  
HCJB [T-S]  
KVOH [T-A]  
Monitor Radio Int'l [T-F]  
Radio Australia  
Radio Budapest Int'l  
Radio Canada Int'l  
Radio Havana Cuba  
Radio Japan  
Radio Moscow  
Radio New Zealand Int'l [M-A]  
Radio Norway Int'l [M]  
Radio Thailand  
Vatican Radio [F]  
Voice of America (af)  
WHRI #2 [T-A]  
WWCR #1 [T-S]  
WWCR #3 [T-A]  
**0303**  
Voice of Free China  
**0308**  
China Radio Int'l\*  
**0309**  
BBC\*  
**0312**  
Radio Havana Cuba\*

**0315**  
Radio Cairo  
**0320**  
Radio Philipinas [M-A]  
**0330**  
Radio Austria Int'l  
Radio Dubai  
Radio Havana Cuba  
Radio Moscow  
Radio Nacional de Venezuela [T-S]  
Radio Netherlands Int'l  
Radio Sweden [T-A]  
BBC (af)\*  
**0340**  
Voice of Greece [M-A]  
**0345**  
Radio Yerevan  
**0355**  
Radio Japan [M-W]

### 0400 UTC (11:00 PM EST, 8:00 PM PST)

BBC  
BBC (af)  
Channel Africa  
China Radio Int'l  
Christian Science Sentinel [A]  
Czech Republic  
Deutsche Welle  
Monitor Radio Int'l [T-F]  
Radio Australia  
Radio Canada Int'l  
Radio Havana Cuba  
Radio Moscow  
Radio Moscow (na)  
Radio New Zealand Int'l [M-F]  
Radio Romania Int'l  
Radio Thailand  
Swiss Radio Int'l  
Voice of America (af/eu)  
Voice of Turkey  
WHRI #2 [T-A]  
WWCR #1 [T-A]  
WWCR #3 [T-A]  
**0403**  
Radio Pyongyang  
**0408**  
China Radio Int'l\*  
**0411**  
Channel Africa [T]  
**0412**  
Radio Havana Cuba\*  
**0415**  
RAI Italy  
**0430**  
Channel Africa [A]  
Radio Havana Cuba  
Radio Moscow (na)

**0431**  
Channel Africa [T/H/F]  
**0445**  
BBC (af) [T-F]\*

### 0500 UTC (12:00 AM EST, 9:00 PM PST)

BBC ("Newshour")  
Channel Africa  
China Radio Int'l  
Christian Science Sentinel [A]  
Deutsche Welle  
HCJB  
Israel Radio Int'l  
Monitor Radio Int'l [T-F]  
Radio Australia  
Radio Havana Cuba  
Radio Japan  
Radio Moscow  
Radio Moscow (na)  
Radio New Zealand Int'l [A-S]  
Radio Thailand  
Spanish National Radio  
Swiss Radio Int'l (eu)  
Vatican Radio [A]  
Voice of America (af/eu)  
Radio New Zealand Int'l [M-F]\*  
**0501**  
Channel Africa [A-S]  
**0503**  
Radio Bulgaria  
**0508**  
China Radio Int'l\*  
**0510**  
Radio Australia [M-F]\*  
**0512**  
Radio Havana Cuba\*  
**0530**  
Channel Africa [F-M/W]  
Radio Austria Int'l  
Radio Finland [M-A]  
Radio Moscow  
Radio Moscow (na)  
Radio Romania Int'l  
Radio Thailand  
Voice of Nigeria  
**0531**  
Channel Africa [T]  
**0548**  
Channel Africa [A]  
**0550**  
Radio Finland [S]

### 0600 UTC (1:00 AM EST, 10:00 PM PST)

BBC  
BBC (af) [M-F]  
Channel Africa

# newsline

Deutsche Welle  
 Monitor Radio Int'l [T-F]  
 Radio Australia  
 Radio Canada Int'l [M-F]  
 Radio Havana Cuba  
 Radio Korea  
 Radio Moscow  
 Radio Moscow (na)  
 Swiss Radio Int'l  
 Swiss Radio Int'l (eu)  
 Voice of America (af/eu)  
 Voice of Kenya  
 Voice of Malaysia  
 WWCR #1 [F]  
 BBC (af) [A-S]\*  
 Radio New Zealand Int'l [M-F]\*  
**0603**  
 Radio Pyongyang  
**0609**  
 BBC\*  
**0612**  
 Radio Havana Cuba\*  
**0627**  
 BBC (af) [M-F]\*  
**0630**  
 Channel Africa [W]  
 Radio Austria Int'l [T-S]  
 Radio Havana Cuba  
 Radio Moscow  
 Radio Moscow (na) [H-T]  
 Vatican Radio [H]  
 Voice of Nigeria [M-F]  
**0631**  
 Radio Moscow (na) [W]  
**0632**  
 Radio Romania Int'l  
**0640**  
 Vatican Radio [T]  
**0645**  
 Radio Romania Int'l  
 Voice of Nigeria [M-F]\*  
**0650**  
 Voice of Med. (Malta)  
 Radio New Zealand Int'l [M-F]\*  
**0653**  
 Channel Africa [S]  
  
**0700 UTC**  
**(2:00 AM EST, 11:00 PM PST)**  
 BBC ("Newsdesk")  
 Monitor Radio Int'l [T-F]  
 Radio Australia  
 Radio Ghana  
 Radio Japan  
 Radio Moscow  
 Radio Moscow (na)  
 Radio New Zealand Int'l [S]  
 Swiss Radio Int'l (eu)  
 Voice of Myanmar (Burma)  
 WWCR #1 [S]  
 Radio New Zealand Int'l [M-F]\*  
**0703**  
 Radio Pyongyang  
 Voice of Free China  
**0710**  
 Radio Australia [W]\*  
**0730**  
 HCJB  
 Radio Moscow  
 Radio Moscow (na) [H-T]  
 Radio Netherlands Int'l  
 Radio Vlaanderen Int'l  
 Vatican Radio [M-A]  
 BBC (af) [A]\*  
**0731**  
 Radio Moscow (na) [W]  
**0745**  
 Radio Finland [M-A]

**0755**  
 Radio Japan [M-F]  
  
**0800 UTC**  
**(3:00 AM EST, 12:00 AM PST)**  
 BBC  
 Christian Science Sentinel [A/M]  
 KNLS  
 Monitor Radio Int'l [T-F]  
 Radio Australia  
 Radio Korea  
 Radio Moscow  
 Radio New Zealand Int'l [S]  
 RBC Norway Int'l [S]  
 Voice of Indonesia [A-H]  
 Voice of Malaysia  
 WWCR #1 [A]  
 Radio New Zealand Int'l [M-F]\*  
**0803**  
 Radio Pyongyang  
**0830**  
 R Slovakia Int'l  
 Radio Austria Int'l  
 Radio Moscow [M-A]  
 Radio Netherlands Int'l  
**0855**  
 Voice of Indonesia [A-H]  
  
**0900 UTC**  
**(4:00 AM EST, 1:00 AM PST)**  
 BBC  
 China Radio Int'l  
 Christian Science Sentinel [A/M]  
 Deutsche Welle  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Finland [M-A]  
 Radio Japan  
 Radio Moscow  
 Radio New Zealand Int'l [S/M/A]  
 Swiss Radio Int'l  
**0908**  
 China Radio Int'l\*  
**0915**  
 Korean World News Service  
**0930**  
 FEBC (Philippines)  
 Radio Moscow  
 Radio Netherlands Int'l  
 Radio New Zealand Int'l [T]  
**0933**  
 Radio New Zealand Int'l [M]  
**0940**  
 Voice of Greece  
**0945**  
 Radio Yerevan [S]  
 Deutsche Welle [M-F]\*  
**0955**  
 Radio Japan [M-W]  
  
**1000 UTC**  
**(5:00 AM EST, 2:00 AM PST)**  
 BBC  
 China Radio Int'l  
 Christian Science Sentinel [A/M]  
 HCJB  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Moscow  
 Radio New Zealand Int'l [S]  
 Radio Norway Int'l [S]  
 Radio Vlaanderen Int'l [T-A]  
 Voice of America (as/ca)

Voice of Kenya  
 FEBC (Philippines) [M-F]\*  
 Radio New Zealand Int'l [M-F]\*  
**1008**  
 China Radio Int'l\*  
**1030**  
 Radio Austria Int'l [M-A]  
 Radio Dubai  
 Radio Korea  
 Radio Moscow  
 Radio Netherlands Int'l  
 Voice of Nigeria  
 Radio New Zealand Int'l [M-F]\*  
**1040**  
 Voice of Greece  
**1045**  
 Voice of Nigeria [A-S]\*  
  
**1100 UTC**  
**(6:00 AM EST, 3:00 AM PST)**  
 BBC ("Newsdesk")  
 Channel Africa  
 Christian Science Sentinel [A]  
 Deutsche Welle  
 Israel Radio Int'l  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Ghana [A-S]  
 Radio Japan  
 Radio Moscow  
 Radio New Zealand Int'l ("BBC Newsdesk")  
 Radio Pakistan  
 Swiss Radio Int'l  
 Swiss Radio Int'l (eu)  
 Vatican Radio [M-A]  
 Voice of America (as/ca)  
 WYFR (Satellite Network) [M-A]  
**1103**  
 Radio Pyongyang  
**1110**  
 Radio Australia\*  
**1115**  
 Korean World News Service  
**1130**  
 Czech Republic  
 Radio Moscow  
 Radio Nacional de Venezuela [M-A]  
 Radio Netherlands Int'l  
 Voice of Asia  
**1133**  
 Radio Bulgaria  
**1135**  
 Radio Thailand  
**1145**  
 Deutsche Welle [S-F]\*  
  
**1200 UTC**  
**(7:00 AM EST, 4:00 AM PST)**  
 BBC  
 China Radio Int'l  
 Christian Science Sentinel [A]  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio France Int'l  
 Radio Jordan  
 Radio Moscow  
 Radio New Zealand Int'l  
 Radio Norway Int'l [S]  
 Radio Tashkent  
 Radio Thailand  
 Voice of America (as)  
 WWCR #1 [M-F]  
**1203**  
 HCJB [M-F]

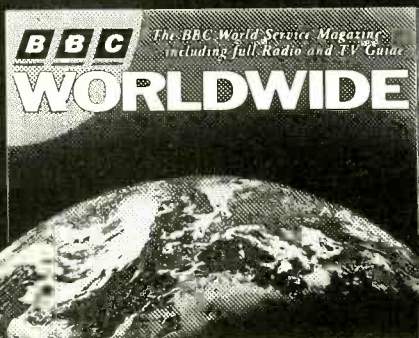
Radio Korea  
**1208**  
 China Radio Int'l\*  
**1209**  
 BBC [W]\*  
**1224**  
 HCJB [M-F]  
**1225**  
 WYFR (Satellite Network) [M-A]  
**1230**  
 Radio Austria Int'l  
 Radio Bangladesh [S-M]  
 Radio Cairo  
 Radio Canada Int'l  
 Radio Finland [M-A]  
 Radio Moscow  
 Radio Netherlands Int'l  
 Radio Sweden [W-F/T]  
 Voice of Vietnam [T/F]  
**1238**  
 Radio France Int'l [T]\*  
**1253**  
 Radio France Int'l [F]  
**1254**  
 Radio France Int'l [A-H]  
  
**1300 UTC**  
**(8:00 AM EST, 5:00 AM PST)**  
 BBC ("Newshour")  
 China Radio Int'l  
 Christian Science Sentinel [A]  
 KNLS  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Canada Int'l [M-F]  
 Radio Ghana  
 Radio Moscow  
 Radio Romania Int'l [M-A]  
 Swiss Radio Int'l  
 Voice of America (as)  
 Voice of Kenya  
 WYFR (Satellite Network) [M-A]  
**1301**  
 Radio Romania Int'l [S]  
**1302**  
 Radio Korea  
**1303**  
 Radio Pyongyang  
**1308**  
 China Radio Int'l\*  
**1310**  
 Radiobrçs [M]  
**1315**  
 Radio Nepal  
**1324**  
 HCJB [M-F]  
**1328**  
 Radio Cairo  
**1330**  
 All India Radio  
 FEBC (Philippines)  
 Korean World News Service  
 Radio Austria Int'l  
 Radio Canada Int'l  
 Radio Dubai  
 Radio Finland [M-A]  
 Radio Moscow [M-A]  
 Radio Netherlands Int'l  
 Radio Sweden [M-F]  
 Radio Tashkent  
 Radio Vlaanderen Int'l [S]  
 Radio Yugoslavia  
 Voice of America (as) (SpE)  
 Voice of Turkey  
 Voice of Vietnam

WYFR (Satellite Network) [M-A]  
**1333**  
 Radio Bulgaria  
  
**1400 UTC**  
**(9:00 AM EST, 6:00 AM PST)**  
 All India Radio [M/W/F]  
 BBC  
 China Radio Int'l  
 Christian Science Sentinel [A]  
 Israel Radio Int'l [S-H]  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Canada Int'l [S-F]  
 Radio Finland [S]  
 Radio France Int'l  
 Radio Ghana  
 Radio Japan  
 Radio Moscow  
 Radio Vlaanderen Int'l [M-A]  
 Voice of America (as)  
 WWCR #1 [M-F]  
 WYFR (Satellite Network) [M-A]  
**1403**  
 Radio Korea  
**1408**  
 China Radio Int'l\*  
**1411**  
 Radio France Int'l [T]\*  
**1420**  
 Israel Radio Int'l [H]\*  
**1422**  
 Israel Radio Int'l [S/T/W/H]  
**1424**  
 HCJB [M-F]  
**1430**  
 FEBC (Philippines)  
 Radio Canada Int'l [S]  
 Radio Finland [M-A]  
 Radio Moscow  
 Radio Nacional de Venezuela [M-A]  
 Radio Netherlands Int'l  
 Radio Romania Int'l [T-S]  
 Radio Sweden [M-F]  
 RTM Morocco [S]  
 Voice of Myanmar (Burma)  
**1431**  
 Radio Romania Int'l [M]  
**1435**  
 Voice of Greece  
**1440**  
 FEBC (Philippines) [S-F]\*  
**1445**  
 BBC (as) [M-F] (SpE)  
 Voice of Myanmar (Burma)  
**1450**  
 All India Radio  
 Voice of Med. (Malta)  
**1453**  
 Radio France Int'l [M-H/A]  
**1455**  
 All India Radio  
  
**1500 UTC**  
**(10:00 AM EST, 7:00 AM PST)**  
 BBC  
 BBC (af) [M-F]  
 Channel Africa  
 China Radio Int'l  
 Christian Science Sentinel [A]  
 Deutsche Welle  
 Monitor Radio Int'l [M-F]  
 Radio Australia





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**BBC WORLD SERVICE**

## DELTACOMM™ DSS

### Digital Signal Strength

### Option For Your ICOM™ R7000

DELTACOMM™ I-7000 and your MS-DOS computer integrated with the Delta Research custom CI-V interface and optimized software will not just control but will maximize the potential of your ICOM™ IC-R7000's monitoring capability.

- CYBERSCAN function allows scan file tracking control of systems employing frequency hopping techniques.
- Spectrum log at speeds in excess of 1300 channels a minute, generate a real time histogram of activity and create scan database file automatically.
- Birdie log during frequency search automatically characterizes your R7000, then locks out those frequencies.
- Activity log function continuously monitors and logs all frequencies of a scan database while displaying active, was active and never active channels.



Optional DELTACOMM™ DSS (Digital Signal Strength) upgrade for your DELTACOMM™ I-7000 communication manager.

- Innovative interface design allows digitizing and storing the R7000 signal level information with 8-bit accuracy via your computer's game/joy stick port.
- DSS allows user programmable upper and/or lower signal level detection limits during DELTACOMM™ I-7000's spectrum log, scan and search functions.
- Log signal strength information to printer or delimited log file while DELTACOMM™ I-7000 is scanning or activity logging the selected database file.

DELTACOMM™ I-7000 communication manager program includes all cabling, manual, UL listed power supply and Delta Research custom CI-V interface for \$299.00 + \$8.00 (U.S.) or \$25.00 (foreign) S&H. The DELTACOMM™ DSS interface upgrade comes complete with easy to follow NO SOLDER installation instructions, all cabling and 8-bit DSS A/D converter module (game port required) for \$99.00 + \$8.00 (U.S.) or \$25.00 (foreign) S&H and is available as an upgrade option to registered I-7000 users. Contact us for additional information on DELTACOMM™ communication managers for ICOM™ R7100, R71A, R72 and IC735.



**Delta Research**



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**SEE** the signals you are now just hearing!

# SDU 100

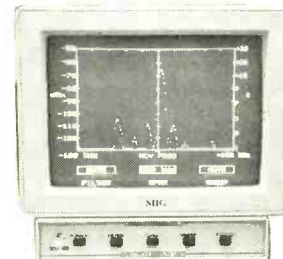
## SPECTRUM DISPLAY UNIT

Turn your ICOM R7000, R71000, or R9000 into a powerful spectrum analyzer! Plugs into any receiver or transceiver that has an IF output jack!

Enjoy the high-tech advantage of counter-surveillance professionals who depend upon spectrum analyzers to find eavesdropping transmitters ("bugs").

As the "spikes" appear on the screen, you can tune them in quickly; no need to wait for the slow, hit-and-miss search of a scanner. A "freeze" function allows you to hold and examine all of the signals present at any moment in time!

Connect the SDU-100 to any TTL monochrome monitor, or order the matching VID-100 9" CRT monitor. 12 VDC powered for mobile or field environments; AC adaptor included (the VID-100 is AC powered).



**SPECIFICATIONS:**  
 SPAN: 10, 5, 2, 1 MHz; 500, 200, 100, 0 (Time) kHz  
 DISPLAY ACCURACY: +/-3% or +/-3 dB, whichever is larger  
 RESOLUTION BANDWIDTH: 5, 30 kHz  
 SWEEP TIME: 0.1, 0.5, 2, 6 seconds  
 IF: 10.7 (others available by special order)  
 VIDEO OUTPUT: TTL to optional monochrome monitor  
 MINIMUM DETECTABLE SIGNAL (MDS): -130 dBm nom.  
 DISPLAY DYNAMIC RANGE: 80 dB

Only \$499<sup>95!</sup>  
 or order the SDU & monitor  
 together for only \$599<sup>95!</sup>



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(704) 837-9200 (outside Canada and US)  
 (704) 837-7081 (technical assistance)

**FREQUENCIES**

0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0100	Australia, Radio	13605as	15320pa	15365pa	15510as
		17750as	17795as	21740as	
0000-0100 vl	Australia, VLBA Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VLBT Tent Crk	4910do			
0000-0015	Bulgaria, Radio	7455na	9700na		
0000-0015	Cambodia, Natl Voice of	11938as			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	Canada, RCI Montreal	5960na	9755na		
0000-0100	China, China Radio Intl	9780na	11715na		
0000-0100	Costa Rica, AWR Alajuela	9725ca	11870ca		
0000-0015	Croatian Radio via WHRI	7315na			
0000-0100	Cuba, Radio Havana Cuba	6010na	9815na		
0000-0030	Czech Republic, R Prague	5915na	5930na	7345na	9405na
		9810na			
0000-0045	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
0000-0100 irreg	Iraq, Radio Iraq Intl	15180am	17940am		
0000-0100	Lebanon, King of Hope	6280me			
0000-0100	Lebanon, Wings of Hope	11530me			
0000-0030 twhfs	Lithuania, Radio Vilnius	7150am			
0000-0100 vl	Malaysia, RTM Kota Kinaba	5980do			
0000-0100 vl	Malaysia, RTM Sarawak	4950do	7160do		
0000-0025	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15120pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0030 m	Norway, Radio Norway Intl	9675na	11925sa		
0000-0100 mtwhfa	Palau, KHBN Voice of Hope	11980as			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100 vl	PNG, Natl BC	4890do			

0000-0100	Russia, Radio Moscow Intl	7165na	7180af	7195am	9620na
		9750am	9860na	11685am	11790am
		11875am	11960as	11970as	12050na
		13775as	15375am	15425am	15470am
		17570as	17590as	17610as	17665na
		17720na	17860as	17890as	21480na
		21625na	21690na		
0000-0100	Singapore, SBC Radio One	5010do	5052do	11940do	
0000-0100	Spain, Spanish Natl Radio	9540na			
0000-0100	Thailand, Radio	4830as	9655as	11905as	
0000-0100	United Kingdom, BBC London	5975na	6175na	6180na	7180eu
		7325na	9580na	9590na	9915na
		11750sa	11955as	12095sa	15260sa
		15310as	15360as		
0000-0100	USA, KCBI Dallas TX	13740na			
0000-0100	USA, KTVB Salt Lk City UT	7510am			
0000-0100	USA, KVOH Los Angeles CA	1775am			
0000-0100	USA, Monitor Radio Intl	5850na	9430ca	13760sa	
0000-0100	USA, VOA Washington DC	5995sa	6130sa	7215as	7405sa
		9455ca	9770as	9775ca	11580sa
		11695sa	11760as	15120sa	15185as
		15205sa	15250as	15290as	17735as
		17820as			
0000-0100	USA, WEWN Birmingham AL	7425am			
0000-0100	USA, WINB Red Lion PA	15145eu			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WWCR Nashville TN	5810am	7435am		
0000-0100	USA, WYFR Okeechobee FL	6085na			
0010-0015	Kirghizia, Kirghiz Radio	6080as			
0030-0100	Australia, Radio	11720pa	11880pa	15240pa	17715pa
		17795pa	17880as	21740pa	
0030-0055	Belgium, R Vlaanderen Int	7370na	9930na		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	9022am	11790am	15260am	
0030-0100	Netherlands, Radio	6020na	6165na	7305as	9840na
		9860as	11655na		
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	Sweden, Radio	9695am	11650am		

**SELECTED PROGRAMS**

**Sundays**

- 0000 Radio New Zealand Int+I: National Radio or Sport. Regular programming is preempted for sports events.
- 0005 WWCR #3: Inspirations Across America. Anderson Communications.
- 0007 Radio Canada Int+I: The Inside Track. A sports feature magazine.
- 0030 BBC: Play of the Week. "Ivanov" (2nd, 90 min). An early work of Chekhov that grapples with the fragile emotions and thwarted ambitions of men and women in impossible situations.

**Mondays**

- 0000 WWCR #1: World of Radio. See S 0415.
- 0005 Radio New Zealand Int+I: Correspondence School. See S 0508.
- 0005 WWCR #3: America's Greatest Heroes. See S 0205.
- 0007 Radio Canada Int+I: Open House. Conversations on religion, politics, social justice, and personal relations.
- 0040 HCJB (am): Saludos Amigos. An international friendship program with listener contributions.

**Tuesdays**

- 0000 Radio Canada Int+I: As It Happens. See M 2330.
- 0005 Radio New Zealand Int+I: Correspondence School. See S 0508.
- 0005 WWCR #3: The Golden Age of Radio. See T 0405.
- 0030 HCJB (am): Studio 9. Thirty minutes of world news, features and interviews with Ralph Kurtenback and Curt Cole.

**Wednesdays**

- 0000 Radio Canada Int+I: As It Happens. See M 2330.
- 0005 Radio New Zealand Int+I: Correspondence School. See S 0508.
- 0005 WWCR #3: The Golden Age of Radio. See T 0405.
- 0030 HCJB (am): Studio 9. See T 0030.

**Thursdays**

- 0000 Radio Canada Int+I: As It Happens. See M 2330.
- 0005 Radio New Zealand Int+I: Correspondence School. See S 0508.
- 0005 WWCR #3: The Golden Age of Radio. See T 0405.
- 0030 BBC: Feature. "J Kingston Platt". See W 1530.
- 0030 HCJB (am): Studio 9. See T 0030.

**Fridays**

- 0000 Radio Canada Int+I: As It Happens. See M 2330.
- 0005 Radio New Zealand Int+I: Correspondence School. See S 0508.
- 0005 WWCR #3: The Golden Age of Radio. See T 0405.
- 0030 BBC: Music Feature. "The Story of Western Music". The works of Haydn, Mozart, Beethoven, and Schubert are explored in the context of their times.
- 0030 HCJB (am): Studio 9. See T 0030.

**Saturdays**

- 0000 Radio Canada Int+I: As It Happens. See M 2330.
- 0005 Radio New Zealand Int+I: National Radio or Sport. See S 0000.
- 0005 WWCR #3: The Golden Age of Radio. See T 0405.
- 0030 HCJB (am): Studio 9. See T 0030.

**Thank You...**

**Additional contributors to this month's Shortwave Guide:**

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## FREQUENCIES

0100-0200	Argentina, RAE	11710am			
0100-0200	Australia, AAF Radio	13525af			
0100-0200	Australia, ABC Brisbane	4920do	9660do		
0100-0200	Australia, ABC Perth	9610do			
0100-0200	Australia, Radio	11720pa	11800pa	15240pa	15320pa
		15365pa	15510as	17715pa	17750as
		17795pa	17880as	21740pa	
0100-0200 vl	Australia, VL8A Alice Spg	4835do			
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200	Bulgaria, Radio	7455na	9700na		
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0100-0200	Cuba, Radio Havana Cuba	6010na	9815na		
0100-0130	Czech Republic, R Prague	5915na	7345na	9405na	9485na
		11990na			
0100-0200	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6120na	6145na
		9565na	9670na	9700na	
0100-0200 mwf	Guam, KSDA AWR Agat	15610as			
0100-0200	Indonesia, Voice of	9675na	11752na		
0100-0130	Iran, VOIRI Tehran	9022am	11790am	15260am	
0100-0120	Italy, RAI Rome	6005na	9725na	11800na	
0100-0200	Japan, NHK/Radio	11860as	15195as	17775as	17810as
		17845as			
		7116as			
0100-0130	Laos, National Radio of	6280me			
0100-0200	Lebanon, King of Hope	3290af			
0100-0200	Namibia, Namibia BC Corp	7305as	9860as		
0100-0200	Netherlands, Radio	6020na	6165na	9840na	11655na
0100-0125	Netherlands, Radio	15120pa			
0100-0200	New Zealand, R NZ Intl	15450as			
0100-0200	Philippines, FEBC Manila	4890do			
0100-0200 vl	PNG, Natl BC	5915na	7165na	7180na	7295me
0100-0200	Russia, Radio Moscow Intl	7340me	9565me	9620na	9675me
		9685au	9725me	9755me	9775me
		9885me	11875as	12650na	15425na
		15475am	17560am	17570na	17590na
		17610as	17655as	17720na	17860na
		17890as	21480na	21690na	

0100-0130	Serbia, Radio Yugoslavia	9580eu	11870na		
0100-0200	Singapore, SBC Radio One	5010do	5052do	11940do	
0100-0127	Slovakia, R Slovakia Intl	5930am	7310am	9810am	
0100-0200	South Korea, Radio Korea	7550eu	13670eu	15575eu	
0100-0200	Spain, Spanish Natl Radio	9540na			
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0100-0130	Switzerland, Swiss R Intl	6135am	9885am	17740am	
0100-0200	Thailand, Radio	4830as	9655as	11905as	
0100-0200	Ukraine, R Ukraine Intl	6070eu	6090eu	7150eu	7195eu
		7240eu	9550eu	9640eu	9860na
		11720na	15195na	17605na	17690na
0100-0200	United Kingdom, BBC London	5975na	6175na	6180na	7325na
		9590na	9915na	11750na	11955na
		15260sa	15280as	15310as	15360as
		17790as	21715na		
0100-0200	USA, KCBI Dallas TX	13740na			
0100-0200	USA, KTBN Salt Lk City UT	7510na			
0100-0200	USA, KVOH Los Angeles CA	17775am			
0100-0200	USA, Monitor Radio Intl	5850na	9430sa	13760sa	
0100-0200	USA, VOA Washington DC	5995sa	6130sa	7115as	7205as
		7405sa	9455ca	9740as	9775as
		11580sa	11705as	15120sa	15160sa
		15205sa	15250as	17740as	21550sa
0100-0200	USA, WEWN Birmingham AL	7425as	9825as		
0100-0200	USA, WINB Red Lion PA	15145na			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	USA, WWCN Nashville TN	5810am	5935am	7435am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na	15440na	
0100-0130	Uzbekistan, R Tashkent	9540as	9715	15295as	17745as
		17815as			
0130-0200	Albania, R Tirana Intl	9580na	11840na		
0130-0200	Austria, R Austria Intl	9655na	9870sa	13730sa	
0130-0150	Greece, Voice of	9380na	9420na	11645au	
0130-0200	Netherlands, Radio	9845as	9860as	11655as	
0130-0200	Serbia, Radio Yugoslavia	9580eu			
0130-0200	Sweden, Radio	9695au	11695as		
0130-0200	USA, WHRI Noblesville IN	7315am			
0145-0200 smtwhf	Finland, YLE/Radio	11755na	15185na		
0145-0200	Vatican State, Vatican R	5975as	9650as		

## SELECTED PROGRAMS

### Sundays

- 0100 Radio New Zealand Int+I: National Radio or Sport. See S 0000.
- 0101 BBC: Play of the Week. "After the Lions" (30th). The last years of flamboyant superstar Sarah Bernhardt are told in this play by Ronald Harwood.
- 0101 BBC: Play of the Week. "Laura Singer" (23rd). A young woman married to an older peasant farmer gets a taste of another kind of life in the city.
- 0101 BBC: Play of the Week. Play of the Week. "Stages" (9th, 16th). Two linked plays ("Figure Dancing" and "Caring") by David Storey.
- 0105 WWCR #3: The Bible's Greatest Heros. Sound tracks from animated bible stories.
- 0130 HCJB (am): Science/Scripture and Salvation. Proving scientific principles with the Bible.
- 0130 WWCR #1: Sound Currents of the Spirit. James Bean.
- 0145 WWCR #3: USA Radio Sports. USA Radio News Network.

### Mondays

- 0100 WWCR #1: Truth House. Evangelistic teachings by E. C. Fultcher and his global shortwave club.
- 0100 WWCR #3: Full Disclosure (live). Glen Roberts.
- 0101 BBC: Special Feature. "Let Down Your Hair" (3rd). An examination of societal attitudes towards women's hair styles.
- 0101 BBC: Special Feature. "Opera of the Week". NEW. Special-ists help to demystify Bizet's "Carmen" (10th), Offenbach's "Orpheus in the Underworld" (17th), Britten's "Gloriana" (24th), and Massenet's "Don Quichotte" (31st).
- 0105 Radio New Zealand Int+I: In Touch with New Zealand. Wayne Mowat hosts this variety program.
- 0130 HCJB (am): The Sower. Michael Guido presents music and inspiration.
- 0145 BBC: Music Feature. "Sharp Talents". NEW. Natalie Whoen talks to one of the Western World's leading young composers each week.

0145 HCJB (am): YouthTime Radio. Interviews and music for college students.

### Tuesdays

- 0100 HCJB (am): Introspect. Len Kinzel hosts this program of current events from a Christian perspective.
- 0105 Radio New Zealand Int+I: In Touch with New Zealand. See M 0105.
- 0130 HCJB (am): Focus on the Family. See M 1330.



*Channel Africa radio comprises seven language services reaching more than 600 million potential listeners in some 50 different countries.*

### Wednesdays

- 0100 HCJB (am): El Mundo Futuro. The world of science and technology and a "Computer Corner" segment.
- 0105 Radio New Zealand Int+I: In Touch with New Zealand. See M 0105.
- 0130 BBC: Feature. "Science or Fiction?". Exploring the speed of light (5th), suspended animation (12th), thinking robots (19th), and the search for aliens (26th).
- 0130 HCJB (am): Focus on the Family. See M 1330.

### Thursdays

- 0100 HCJB (am): Ham Radio Today. John Beck with features, tips, news, and helps for radio amateurs.
- 0105 Radio New Zealand Int+I: In Touch with New Zealand. See M 0105.
- 0130 HCJB (am): Focus on the Family. See M 1330.

### Fridays

- 0100 HCJB (am): What's Cooking in the Andes?. Peruse the foods, cooking, and culinary cultures of Latin America with Karen Schmidt.
- 0105 Radio New Zealand Int+I: In Touch with New Zealand. See M 0105.
- 0130 HCJB (am): Focus on the Family. See M 1330.

### Saturdays

- 0100 HCJB (am): Musica del Ecuador. Jorge Zambrano presents a unique mix of Ecuadorian music. (Highly rated in *Passport 1994*)
- 0105 Radio New Zealand Int+I: National Radio or Sport. See S 0000.
- 0130 BBC: Feature. "Seeing Stars." (1st). See S 0430.
- 0130 BBC: Short Stories. See S 0430.



**FREQUENCIES**

0300-0400	Australia, ABC Brisbane	4920do	9660do		0300-0400	Russia, Radio Moscow Intl	4940me	4975me	5915na	5940am
0300-0400	Australia, ABC Perth	9610do					7130af	7155me	7165na	7180na
0300-0400	Australia, Radio	11720pa	11880pa	15240pa	15320pa		7270na	9750na	9755me	9760me
		15365pa	15510pa	17715pa	17750as		9775af	9860am	11765me	12050na
		17795pa	17880as	21525as	21595as		15280me	15320me	15425na	17780af
		21740pa					17860as			
0300-0400 vl	Australia, VL8A Alice Spg	4835do				0300-0400	S Africa, Channel Africa	5960af	9730af	
0300-0400 vl	Australia, VL8K Katherine	5025do				0300-0400	Singapore, SBC Radio One	5010do	5052do	11940do
0300-0400 vl	Australia, VL8T Tent Crk	4910do				0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as	
0300-0400	Bahrain, Radio	6010do				0300-0400	Taiwan, VO Free China	5950na	9680na	9765au
0300-0330	Canada, CanForce Network	6000eu						15345na		
0300-0400	Canada, CFCX Montreal	6005do				0300-0400	Tanzania, Radio	5985af	9685af	11765af
0300-0400	Canada, CFRX Toronto	6070do				0300-0400	Thailand, Radio	9655as	11905as	
0300-0400	Canada, CFVP Calgary	6030do				0300-0400 vl	Uganda, Radio	4976do		
0300-0400	Canada, CHNX Halifax	6130do				0300-0330	United Kingdom, BBC London	7155me	9915am	11750sa
0300-0400	Canada, CKZU Vancouver	6160do						15260sa	15310as	15380as
0300-0400	China, China Radio Intl	9390na	9690na	9780na	11715na	0300-0400	United Kingdom, BBC London	3255af	5975na	6175na
0300-0400	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am			6195eu	7230eu	7325na
0300-0400	Costa Rica, Faro del Carib	5055do						9600af	11760me	11955me
0300-0400	Cuba, Radio Havana Cuba	6010na	9550na					15310me	15420af	21715as
0300-0330	Czech Republic, R Prague	5915na	5930na	7345na	9405na	0300-0400	USA, KCBI Dallas TX	9815am		
		9810na				0300-0400	USA, KTBN Salt Lk City UT	7510am		
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am	0300-0400	USA, KVOH Los Angeles CA	9785sa		
0300-0330	Egypt, Radio Cairo	9475na	11660na			0300-0400	USA, Monitor Radio Intl	5850na	7465eu	
0300-0350	Germany, Deutsche Welle	6045na	6085na	6120na	9535na	0300-0400	USA, VOA Washington DC	6065af	7105af	7265af
		9545na	9640na					7405af	9885af	7280af
0300-0400	Guatemala, Radio Cultural	3300do				0300-0400	USA, WEWN Birmingham AL	7425am		
0300-0400 sm	Honduras, R Luz y Vida	3250ca				0300-0400	USA, WHRI Noblesville IN	7315na		
0300-0315 vl	Italy, IRRS Milano	7125na				0300-0400	USA, WJCR Upton KY	7490na	13595na	
0300-0400	Japan, NHK/Radio	5960am	11875na	11885am	15210am	0300-0400	USA, WRNO New Orleans LA	7355am		
		15230am	15325am	17810am	21610am	0300-0400	USA, WWCR Nashville TN	5810am	5935am	7435am
		4935do				0300-0400	USA, WYFR Okeechobee FL	6065na	9505na	
0300-0400	Kenya, Kenya BC Corp	11530me				0300-0315	Vatican State, Vatican R	6095na	7305na	9605na
0300-0400 mtwhf	Lebanon, Wings of Hope	7295do				0315-0345	Vatican State, Vatican R	9695af	11625af	
0300-0400 smtwh	Malaysia, RTM Radio 4	6185am				0330-0400	Austria, R Austria Intl	9870sa	13730sa	
0300-0400 vl	Mexico, Radio Educacion	15120pa				0330-0400	Netherlands, Radio	6165na	9590na	
0300-0400	New Zealand, R NZ Intl	6115na				0330-0400	Sweden, Radio	9695am	11650am	
0300-0330 m	Norway, Radio Norway Intl	17760as	17840as	21580as		0330-0400	UAE, Radio Dubai	11945na	13675na	15400eu
0300-0330	Philippines, R Pilipinas	4890do						21485na		17890eu
0300-0400 vl	PNG, Natl BC					0340-0350	Greece, Voice of	9380na	9420na	11645au
						0345-0400	Armenia, Radio Yerevan	7105na	10344na	17605na
						0345-0400	Tajikistan, Radio	7245eu		17690na

**SELECTED PROGRAMS**

**Sundays**

- 0300 Radio New Zealand Int+: National Radio or Sport. See S 0000.
- 0300 WWCR #3: Spectrum (WWCR #3). SWLs and Hams call 1-800-774-7435 with technical questions and comments.
- 0307 Radio Canada Int+: The Inside Track. See S 0007.
- 0330 WWCR #1: Scriptures for America. Peter J. Peters exposes the world's evils.

**Mondays**

- 0300 HCJB (am): Saludos Amigos. See M 0040.
- 0305 Radio New Zealand Int+: In Touch with New Zealand. See M 0105.
- 0307 Radio Canada Int+: Quirks and Quarks. The latest trends in science and technology.
- 0330 HCJB (am): Mountain Meditations. See S 1400.

**Tuesdays**

- 0300 HCJB (am): Studio 9. See T 0030.
- 0305 Radio New Zealand Int+: In Touch with New Zealand. See M 0105.
- 0305 WWCR #3: Radio Free America (live). Tom Valentine hosts this talk/interview program.
- 0315 Radio Canada Int+: Between the Covers. Dramatized book readings.
- 0330 HCJB (am): Introspect. See T 0100.
- 0330 Radio Canada Int+: Music. Music into the night.

**Wednesdays**

- 0300 HCJB (am): Studio 9. See T 0030.
- 0305 Radio New Zealand Int+: In Touch with New Zealand. See M 0105.
- 0305 WWCR #3: Radio Free America (live). See T 0305.
- 0315 Radio Canada Int+: Between the Covers. See T 0315.
- 0330 HCJB (am): El Mundo Futuro. See W 0100.
- 0330 Radio Canada Int+: Music. See T 0330.

**Thursdays**

- 0300 HCJB (am): Studio 9. See T 0030.
- 0305 Radio New Zealand Int+: In Touch with New Zealand. See M 0105.
- 0305 WWCR #3: Radio Free America (live). See T 0305.
- 0315 Radio Canada Int+: Between the Covers. See T 0315.
- 0330 HCJB (am): Ham Radio Today. See H 0100.
- 0330 Radio Canada Int+: Music. See T 0330.

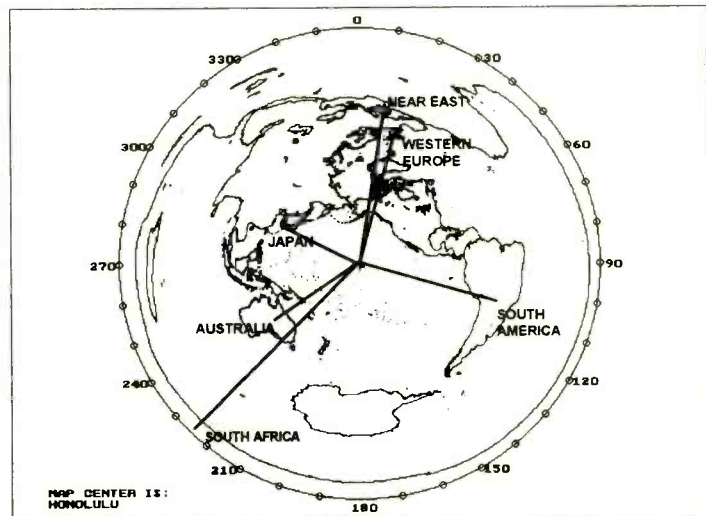
**Fridays**

- 0300 HCJB (am): Studio 9. See T 0030.
- 0305 Radio New Zealand Int+: In Touch with New Zealand. See M 0105.

- 0305 WWCR #3: Radio Free America (live). See T 0305.
- 0315 Radio Canada Int+: Between the Covers. See T 0315.
- 0330 HCJB (am): What's Cooking in the Andes?. See F 0100.
- 0330 Radio Canada Int+: Music. See T 0330.

**Saturdays**

- 0300 HCJB (am): Studio 9. See T 0030.
- 0305 Radio New Zealand Int+: National Radio or Sport. See S 0000.
- 0305 WWCR #3: Radio Free America (live). See T 0305.
- 0315 Radio Canada Int+: Between the Covers. See T 0315.
- 0330 HCJB (am): Musica del Ecuador. See A 0100.





**FREQUENCIES**

0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0530	Australia, Radio	17750as			
0500-0600	Australia, Radio	11720pa	11800pa	15240pa	15320pa
		15365pa	17715pa	17795pa	21525as
		21595as	21740pa		
0500-0600 vl	Australia, VL8A Alice Spg	4835do			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Bahrain, Radio	6010do			
0500-0600	Bulgaria, Radio	9700na	11720eu		
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0500-0515	Croatian Radio via WHRI	7315na	9495na		
0500-0600	Cuba, Radio Havana Cuba	6180na	9510na		
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	9670na
0500-0515	Israel, Kol Israel	7465eu	9435na	11605na	
0500-0600	Japan, NHK/Radio	6025na	6085me	7230eu	11740as
		15410as	17810as		
0500-0600	Kenya, Kenya BC Corp	4935do			
0500-0600 mtwhf	Lebanon, Wings of Hope	11530me			
0500-0505	Lesotho, Radio	4800do			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 vl	Mexico, Radio Educacion	6185am			
0500-0600 mtwhf	Namibia, Namibia BC Corp	3270af	3290af		
0500-0600	New Zealand, R NZ Intl	15120pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0600 vl	PNG, Natl BC	4890do			
0500-0600	Russia, Radio Moscow Intl	5905eu	5915eu	5950eu	6165eu
		7105na	7130af	7165na	7180eu
		7270na	7295af	7330af	7335eu
		9665eu	9705me	9830af	11765me
		12030na	12055af	15280me	15320me
		15425na	15465af	17655af	17725af
		17835af	21655me	21690af	
0500-0600	S Africa, Channel Africa	7230af	11745af		

0500-0600 vl	S Africa, Radio Oranje	7270do			
0500-0553 f	Seychelles, FEBA Radio	17750me			
0500-0600	Singapore, SBC Radio One	5052do	11940do		
0500-0515 vl	Somalia, R Free Somalia	7460do			
0500-0556	Spain, Spanish Natl Radio	9540na			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0530	Swaziland, Trans World R	3200af	7200af	7215af	
0500-0530 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu		
0500-0600	Thailand, Radio	4830as	9655as	11905as	
0500-0600 vl	Uganda, Radio	4976do			
0500-0600	United Kingdom, BBC London	3955eu	5975na	6005eu	6180eu
		6195eu	9410af	9600af	9640ca
		11735eu	11760me	11820as	12095af
		15070me	15310as	15400af	15420af
		15575me	17830as	21470af	21715as
0500-0600	USA, KCBI Dallas TX	9815am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9785am			
0500-0600	USA, Monitor Radio Intl	9840af			
0500-0600	USA, VOA Washington DC	3980eu	5995eu	6035af	6040eu
		6140eu	6873eu	7170eu	7405eu
		9530af	9665af	11965eu	12080af
		15205eu	15600af		
0500-0600	USA, WEWN Birmingham AL	7425am			
0500-0530	USA, WHRI Noblesville IN	7315na			
0500-0600	USA, WINB Red Lion PA	15145eu			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, WWCR Nashville TN	5810am	5935am	7435am	
0500-0600	USA, WYFR Okeechobee FL	5985na	9850eu	11580af	
0500-0530	Vatican State, Vatican R	9695af	11625af	15090af	
0510-0520 mtwhfa	Botswana, Radio	3356af	4830af	7255af	
0525-0600	Ghana, GBC Radio 2	3366do			
0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0555	Finland, YLE Radio	9635af	11755me		
0530-0600	Georgia, Georgian Radio	11910eu			
0530-0600	Romania, R Romania Intl	15340af	15380af	17720af	17745af
		17790af			
0530-0600 vl	Russia, Radio Centre	12010eu			
0530-0600	Swaziland, Trans World R	3200af	7200af	11740af	
0530-0600	UAE, Radio Dubai	15435as	17830as	21700as	

**SELECTED PROGRAMS**

**Sundays**

- 0500 WWCR #1: Backwoods Home Magazine. Self-reliance with David Duffy.
- 0508 Radio New Zealand Int+: Kupu Korokori (Maori Comment). No information available.
- 0519 Radio New Zealand Int+: Te Karere O Rongo. See S 0430.
- 0530 Radio Finland: Focus. A documentary of an event in world history or of Finland's post World War II legacy.
- 0530 Radio New Zealand Int+: Pasifika Style. See S 0508.
- 0545 Radio New Zealand Int+: Storytime. Tales for children.

**Mondays**

- 0500 Radio New Zealand Int+: Pacific Islands News from New Zealand. News about happenings in the South Pacific.
- 0500 WWCR #1: The Happening Network (live). Billy Goodman.
- 0505 Radio New Zealand Int+: Hymns For Today. Hymns recorded in New Zealand and English churches are featured.
- 0509 HCJB (am): Saludos Amigos. See M 0040.
- 0530 Radio New Zealand Int+: Calling the Cook Islands. Birthday Calls, dedications, and requests (Cook Islands Maori/English).

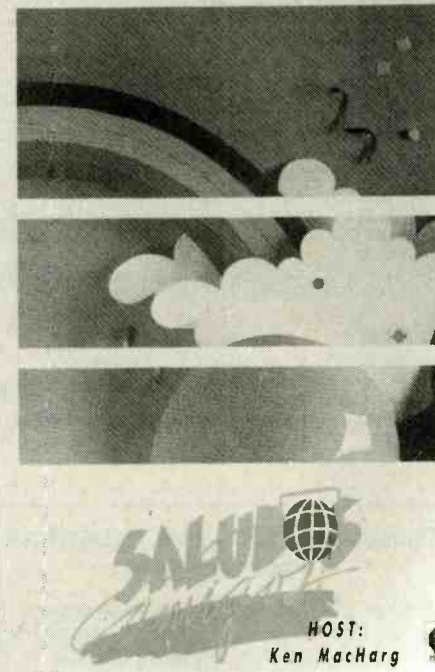
**Tuesdays**

- 0500 HCJB (am): Studio 9. See T 0030.
- 0500 Radio New Zealand Int+: Pacific Islands News from New Zealand. See M 0500.
- 0500 WWCR #3: The Hour of the Time (live). William Cooper live.
- 0505 Radio New Zealand Int+: Calling Tonga. Regional news and topical programming for Tonga.
- 0505 WWCR #1: Point of View. See M 1205.
- 0530 HCJB (am): Introspect. See T 0100.
- 0530 Radio New Zealand Int+: Ears. See S 0508.

**Wednesdays**

- 0500 HCJB (am): Studio 9. See T 0030.
- 0500 Radio New Zealand Int+: Pacific Islands News from New Zealand. See M 0500.

HCJB'S · INTERNATIONAL · FRIENDSHIP · PROGRAM



*This HCJB QSL—received by John Carson, Norman, OK—highlights their "Saludos Amigos" program hosted by Ken MacHarg.*

- 0500 WWCR #3: The Hour of the Time (live). See T 0500.
- 0505 Radio New Zealand Int+: Pacific Beat. Popular Pacific islands music is played and discussed.
- 0505 WWCR #1: Point of View. See M 1205.
- 0530 HCJB (am): El Mundo Futuro. See W 0100.
- 0530 Radio New Zealand Int+: Ears. See S 0508.

**Thursdays**

- 0500 HCJB (am): Studio 9. See T 0030.
- 0500 Radio New Zealand Int+: Pacific Islands News from New Zealand. See M 0500.
- 0500 WWCR #3: The Hour of the Time (live). See T 0500.
- 0505 Radio New Zealand Int+: On the March. Recordings of march music from New Zealand and the world.
- 0505 WWCR #1: Point of View. See M 1205.
- 0530 HCJB (am): Ham Radio Today. See H 0100.
- 0530 Radio New Zealand Int+: Ears. See S 0508.

**Fridays**

- 0500 HCJB (am): Studio 9. See T 0030.
- 0500 Radio New Zealand Int+: Pacific Islands News from New Zealand. See M 0500.
- 0500 WWCR #3: The Hour of the Time (live). See T 0500.
- 0505 Radio New Zealand Int+: New Zealand Top Pop Singles. The pop music hit parade in New Zealand.
- 0505 WWCR #1: Point of View. See M 1205.
- 0530 HCJB (am): What's Cooking in the Andes?. See F 0100.
- 0530 Radio New Zealand Int+: Ears. See S 0508.

**Saturdays**

- 0500 HCJB (am): Studio 9. See T 0030.
- 0500 WWCR #1: Hawaiian Talk Show (live). Sam Peters.
- 0500 WWCR #3: The Hour of the Time (live). See T 0500.
- 0508 Radio New Zealand Int+: Maori News. See S 0508.
- 0517 Radio New Zealand Int+: Pacific Requests. Music request and dedications.
- 0530 HCJB (am): Musica del Ecuador. See A 0100.





0700-0800	Australia, ABC Brisbane	4920do	9660do		
0700-0800	Australia, ABC Perth	15425pa			
0700-0730	Australia, Radio	15320pa	17715pa	21740pa	
0700-0800	Australia, Radio	6020pa	9710pa	11720pa	11880pa
		11910pa	15240pa	15365pa	17695as
		17715pa	17790as	21525as	21595as
0700-0800 vl	Australia, VL8A Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio	6010do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0700-0730	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
0700-0800	Ecuador, HCJB Quito	6205eu	9600eu	9745au	11835eu
		21455eu			
0700-0715	Ghana, GBC Radio 1	4915do			
0700-0715	Ghana, GBC Radio 2	3366do			
0700-0800 vl	Italy, IRRS Milano	7125am			
0700-0800	Japan, NHK/Radio	6050as	7230au	11740au	15170as
		15325au	15410au	17765as	17810as
		17860as	21575me	21610me	
0700-0800	Kenya, Kenya BC Corp	4935do			
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800 vl	Mexico, Radio Educacion	6185am			
0700-0730	Myanmar, Radio	9730do			
0700-0800	New Zealand, R NZ Intl	9700pa			
0700-0800 smtwhf	New Zealand, ZLXA	3935do			
0700-0800	Nigeria, Radio	3326do	4990do		
0700-0750	North Korea, R Pyongyang	15340as	17765as		
0700-0800 vl	PNG, Natl BC	4890do			
0700-0800 vl	PNG, Radio Central	3290do			
0700-0800 vl	PNG, Radio Enga	2410do			
0700-0800 vl	PNG, Radio Milne Bay	3365do			
0700-0800 vl	PNG, Radio Western	3305do			
0700-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			
0700-0800	Russia, AWR Russia	11835eu			
0700-0800	Russia, Radio Moscow Intl	5905eu	5930eu	7130af	7165eu
		7175eu	7270na	7345na	9830af
		9890eu	11765me	12010eu	13650eu
		15190eu	15320me	15345eu	15440eu
		15465af	15480me	15540eu	15550me
		17655af	17725af	17735af	17805me
		17835af	21610af	21655me	21785af
0700-0755 vl	S Africa, Radio Oranje	7270do			
0700-0800 vl	Sierra Leone, SLBS	3316do			
0700-0800	Singapore, SBC Radio One	5010do	5052do	11940do	
0700-0800	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Trans World R	7200af	11740af		
0700-0715 as	Switzerland, Swiss R Intl	3985eu	6165eu		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800 as	Thailand, Radio	4830as	9655as	11905as	
0700-0800	United Kingdom, BBC London	3955eu	5975ca	6190af	6195eu
		7150af	7325eu	9410eu	9600af
		9640na	9660eu	9760eu	11760me
		11780ca	11940af	12095eu	15070eu
		15310as	15400af	15575me	17790af
		17885af	21470af		
0700-0800	USA, KCBI Dallas TX	9815na			
0700-0800	USA, KTNB Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785na			
0700-0800	USA, Monitor Radio Intl	5850eu			
0700-0800	USA, WEWN Birmingham AL	7425am			
0700-0800	USA, WHRI Noblesville IN	7315eu	9495am		
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCN Nashville TN	5935am	7435am		
0703-0715	Croatia, Croatian Radio	6145eu	9830eu	13640eu	
0730-0800	Australia, Radio	9580pa	17750as		
0730-0755	Belgium, R Vlaanderen Int	5910eu	9925as		
0730-0800	Czech Republic, R Prague	11990pa	13590as	15605as	17535as
		21705as			
0730-0800	Georgia, Georgian Radio	11910eu			
0730-0745 mtwhf	Iceland, Natl BC Service	9265am			
0730-0800	Netherlands, Radio	9630pa	9720pa		
0740-0800	Monaco, Trans World Radio	7385eu			

0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425do			
0800-0900	Australia, Radio	6020pa	6080pa	7240pa	9580pa
		9710pa	11910pa	15240pa	17695as
		17750as	21525as	21595as	
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R Peace Intl	7385am	15030am	21465am	
0800-0830	Ecuador, HCJB Quito	6205eu	9600eu	9745pa	11835eu
		11925pa	17490au	21455eu	
		21550as			
0800-0900	Finland, YLE/Radio	17800as			
0800-0805 s	Ghana, GBC Radio 1	4915do			
0800-0805 s	Ghana, GBC Radio 2	3366do			
0800-0900 asmtwh	Guam, KTVR Agana	15200as			
0800-0900	Indonesia, Voice of	9675as	11752au		
0800-0900 vl	Italy, IRRS Milano	7125eu			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0900 vl	Mexico, Radio Educacion	6185am			
0800-0900	Monaco, Trans World Radio	7385eu			
0800-0825	Netherlands, Radio	9630pa	9720pa		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0900 smtwhf	New Zealand, ZLXA	3935do			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0830 s	Norway, Radio Norway Intl	15175as	17740pa		
0800-0845	Pakistan, Radio	17900eu	21520eu		
0800-0900 vl	PNG, Natl BC	4890do			
0800-0900 vl	PNG, Radio Central	3290do			
0800-0900 vl	PNG, Radio Enga	2410do			
0800-0900 vl	PNG, Radio Milne Bay	3365do			
0800-0900 vl	PNG, Radio Western	3305do			
0800-0900	Russia, Radio Moscow Intl	7130af	7165eu	9580eu	9680eu
		11765me	12010eu	12055af	12070eu
		13650eu	15190eu	15210eu	15345eu
		15380eu	15440eu	15485eu	15540eu
		15550me	17595eu	17625af	17655af
		17725af	17735af	17835af	21450af
		21515eu	21610af	21785af	21825af
0800-0900 vl	S Africa, Radio Oranje	9630do			
0800-0830 vl	Sierra Leone, SLBS	3316do			
0800-0900	Singapore, SBC Radio One	5010do	5052do	11940do	
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, Radio Korea	7550af	13670eu	15155eu	
0800-0835	Swaziland, Trans World R	7200af	11740af		
0800-0900	United Kingdom, BBC London	3955eu	6190af	7150au	7325eu
		9410eu	9640na	9660eu	9760eu
		11760me	11940af	15400af	15575me
		17790as	17885af	21470af	21660af
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900 vl	USA, KNLS Anchor Point AK	7365as			
0800-0900	USA, KTNB Salt Lk City UT	7510am			
0800-0900	USA, Monitor Radio Intl	13615pa			
0800-0900	USA, WEWN Birmingham AL	9350am	9985am		
0800-0900	USA, WHRI Noblesville IN	7315am	9495am		
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCN Nashville TN	5935am			
0803-0805	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
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	15450as	17870au
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Georgia, Georgian Radio	11910eu			
0830-0900	Netherlands, Radio	9720pa			
0830-0857	Slovakia, R Slovakia Intl	11990au	15605au	17535au	21705au
0835-0850 mtwhf	Swaziland, Trans World R	11740af			

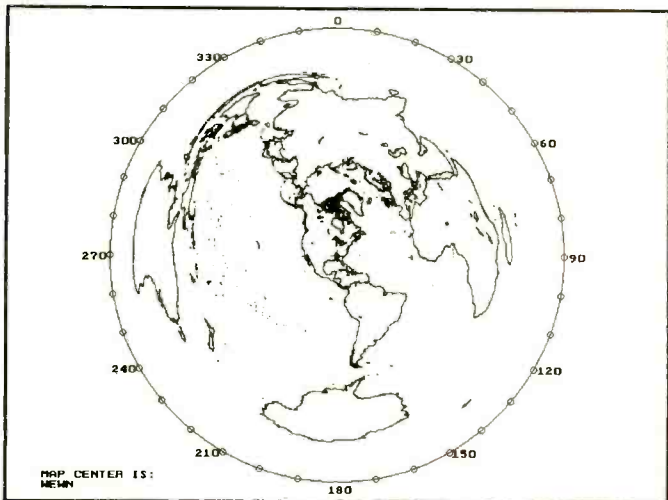
0900-1000	Australia, ABC Brisbane	4920do	9660do		
0900-1000	Australia, Radio	5995pa	9510as	9580pa	13605as
		15170as	21745as		
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Bahrain, Radio	6010do			
0900-1000	Bhutan, BC Service	6035do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa	17710pa	
0900-1000	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-0950	Germany, Deutsche Welle	6160as	11715as	17780as	17820as
		21650as	21680as		
0900-0915 mtwtf	Ghana, GBC Radio 1	4915do			
0900-0915	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWR Agana	11805pa			
0900-0915 vl	Italy, IRRS Milano	7125eu			
0900-1000	Japan, NHK/Radio	9610as	9750as	11740as	11815as
		15190as			
0900-1000	Kenya, Kenya BC Corp	4935do			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0920 mtwhf	Monaco, Trans World Radio	7385eu			
0900-0935 a	Monaco, Trans World Radio	7385eu			
0900-0945 s	Monaco, Trans World Radio	7385eu			
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-0930 mtwhf	New Zealand, ZLXA	3935do			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000 mtwfta	Palau, KHBN Voice of Hope	9830as			
0900-1000	Philippines, FEBC Manila	11690as			
0900-1000 vl	PNG, Natl BC	4890do			
0900-1000 vl	PNG, Radio Central	3290do			
0900-1000 vl	PNG, Radio Enga	2410do			
0900-1000 vl	PNG, Radio Milne Bay	3365do			
0900-1000 vl	PNG, Radio Western	3305do			
0900-1000	Russia, Radio Moscow Intl	7130af	9680eu	9830af	12010eu
		12020eu	12055af	12070eu	13650eu
		15190eu	15345eu	15380eu	15440eu
		15465af	15470af	15495eu	15540eu
		17595eu	17605eu	17665af	17760eu
		17835af	21515eu	21540eu	21610af
		21785af	21825af		
0900-1000 vl	S Africa, Radio Oranje	9630do			
0900-1000	Singapore, SBC Radio One	5010do	5052do	11940do	
0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	21820au	
0900-1000	United Kingdom, BBC London	6190af	6195eu	9410eu	9660eu
		9750eu	9760eu	11760me	11940af
		12095eu	15070eu	15190sa	15310as
		15400af	15575me	17640eu	17705eu
		17790af	17885af	21470af	21660af
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTVN Salt Lk City UT	7510am			
0900-1000	USA, Monitor Radio Intl	7395am	9840pa	13615au	17555as
0900-1000	USA, WEWN Birmingham AL	9370eu			

0900-1000	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5935am			
0910-0940 smha	Mongolia, R Ulaanbaatar	11850as	12015as		
0915-1000	Ghana, GBC Radio 2	6130do	7295do		
0915-0930 smtwh	Guam, KTWR Agana	15200as			
0930-1000	Australia, AAF Radio	11465as			
0930-1000	Italy, AWR Europe	7230eu			
0930-1000	Netherlands, Radio	7260as	9720pa	9810as	9865pa
0930-0957	Slovakia, R Slovakia Intl	11990au	15605au	17535au	21705au
0940-0950	Greece, Voice of	15650au	17525au		
0945-1000 s	Armenia, Radio Yerevan	15455eu	15485eu	15510eu	

1000-1100	Australia, ABC Brisbane	4920do			
1000-1100	Australia, Radio	5995pa	9580pa	15170as	21745as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Bahrain, Radio	6010do			
1000-1025 mtwfta	Belgium, R Vlaanderen Int	9925eu	17515eu	21815af	
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, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa	17710pa	
1000-1100	Costa Rica, AWR Alajuela	9725ca			
1000-1100	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100	Ghana, GBC Radio 2	6130do	7295do		
1000-1100	India, All India Radio	15050as	17387au	17895as	21735au
1000-1100 vl	Italy, IRRS Milano	7125eu			
1000-1100	Kenya, Kenya BC Corp	4935do			
1000-1100 vl	Malaysia, RTM Kota Kinaba	5980do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100 vl	Malaysia, RTM Sarawak	4950do	7160do		
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Radio	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1030 s	Norway, Radio Norway Intl	17840eu	21705af		
1000-1100 mtwhfa	Palau, KHBN Voice of Hope	9830as			
1000-1100	Philippines, FEBC Manila	9800as	11685as		
1000-1100 vl	PNG, Natl BC	4890do			
1000-1100 vl	PNG, Radio Central	3290do			
1000-1100 vl	PNG, Radio Enga	2410do			
1000-1100 vl	PNG, Radio Milne Bay	3365do			
1000-1100 vl	PNG, Radio Western	3305do			
1000-1100	Russia, Radio Moscow Intl	7130af	9680eu	9830af	12010eu
		12015af	12020eu	12055af	12070eu
		13650eu	15210eu	15320me	15345eu
		15380eu	15435me	15440eu	15455eu
		15465af	15470af	15480me	17605eu
		17625af	17760eu	17780af	21515eu
		21540eu	21610af	21785af	21825af

1000-1100	S Africa, Channel Africa	17805af			
1000-1100 vl	S Africa, Radio Oranje	9630do			
1000-1100	Singapore, SBC Radio One	5010do	5052do	11940do	
1000-1100	United Kingdom, BBC London	6190af	6195af	9410eu	9660eu
		9740eu	9750eu	9760eu	11760me
		11940af	12095eu	15070eu	15190sa
		15310as	15400af	15575me	17640eu
		17705eu	17790af	17885af	21470af
		21660af			

1000-1100	USA, KCBI Dallas TX	9815am			
1000-1100	USA, KTVN Salt Lk City UT	7510am			
1000-1100	USA, Monitor Radio Intl	7395am	9430as	9840am	13625pa
1000-1100	USA, VOA Washington DC	5985pa	7405ca	9590ca	11720pa
		11915ca	15120ca	15425as	
1000-1100	USA, WHRI Noblesville IN	7315am			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5935am	15685am		
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1003-1006	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1030-1100 mtwfta	Austria, R Austria Intl	6155eu	13730eu	15450au	17870as
1030-1100	Netherlands, Radio	7260as	9810as		
1030-1100	South Korea, Radio Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605eu
1040-1050	Greece, Voice of	15650as	17525as		



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## FREQUENCIES

1100-1200	Australia, ABC Brisbane	4920do			
1100-1200	Australia, Radio	5995pa	6020pa	6080as	7240pa
		9510as	9510pa	9580pa	9710as
		13605as	15170as	17910as	
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Bahrain, Radio	6010do			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, AWR Alajuela	9722ca	11870ca		
1100-1200	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1150	Germany, Deutsche Welle	15370af	15410af	17765af	17800af
		21600af			
1100-1115	Ghana, GBC Radio 1	4915do			
1100-1130	Israel, Kol Israel	15640eu	15650as	17575eu	
1100-1200 vl	Italy, IRRS Milano	7125eu			
1100-1200	Japan, NHK/Radio	6120na	9610as	15445as	
1100-1200 vl	Malaysia, RTM Kota Kinaba	5980do			
1100-1200	Malaysia, RTM Radio 4	4950do	7295do		
1100-1200 vl	Malaysia, RTM Sarawak	4950do	7160do		
1100-1200	New Zealand, R NZ Intl	9700pa			
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1200 mtwhf	Palau, KHBV Voice of Hope	9830as			
1100-1200 vl	PNG, Natl BC	4890do			
1100-1200 vl	PNG, Radio Central	3290do			
1100-1200 vl	PNG, Radio Enga	2410do			
1100-1200 vl	PNG, Radio Milne Bay	3365do			
1100-1200 vl	PNG, Radio Western	3305do			
1100-1200	Russia, Radio Mpscow Intl	7130af	9635af	9830af	12010eu
		12020eu	12070eu	13650eu	15210eu
		15345eu	15380eu	15435me	15440eu
		15465af	15470af	15525af	15550me
		15585eu	17605eu	17625af	17725af
		17760eu	17780af	17880eu	21465as
		21515eu	21540eu	21785af	21825af

1100-1200	S Africa, Channe Africa	9730af			
1100-1200 vl	S Africa, Radio Oranje	9630do			
1100-1200	Singapore, SBC Radio One	5010do	5052do	11940do	
1100-1200	South Korea, Radio Korea	6145na	9650na	9980na	
1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1100-1130	Switzerland, Swiss R Intl	9885as	13635as	15505as	
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200	United Kingdom, BBC London	5965na	5975na	6190af	6195na
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11760me	11940af
		12095eu	15070eu	15220na	15310as
		15400af	17640eu	17705eu	17790sa
		17885me	21470af	21660af	
1100-1200	USA, KCBI Dallas TX	9815am			
1100-1200	USA, KTBN Salt Lk City UT	7510na			
1100-1200	USA, Monitor Radio Intl	7395am	7465am	9430pa	
1100-1200	USA, VOA Washington DC	5985pa	6110as	7405ca	9590ca
		9760as	11720pa	11915ca	15120ca
		15160as	15425as		
1100-1200	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1100-1200	USA, WJCR Upton KY	13595na			
1100-1200	USA, WWCR Nashville TN	5935am	15685am		
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1120-1130	Vatican State, Vatican R	11740af	15210me	21665eu	
1130-1200	Bulgaria, Radio	11645na	13645me		
1130-1157	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
		15355eu			
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1150 mtwhf	Finland, YLE/Radio	11735na	15400na		
1130-1200	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
		11930as			
1130-1200	Netherlands, Radio	5955eu	9850eu		
1130-1200	Serbia, Radio Yugoslavia	21605au			
1130-1200	Thailand, Radio	4830as	9655as	11905as	
1130-1200	Vietnam, Voice of	6115as	10059as	12025as	15010as

## SELECTED PROGRAMS

### Sundays

- 1100 HCJB (pa): Communication. A series of devotional thoughts.
- 1115 HCJB (pa): Sounds of the Times. A review of contemporary issues.
- 1130 BBC: Play of the Week (2nd, 90 min). See S 0030.
- 1130 HCJB (am): Morning Song. Music and thoughts to start the day.
- 1130 Radio New Zealand Int+I: Good Night from Wellington. The personalities of Radio New Zealand Int'l.

### Mondays

- 1100 HCJB (pa): Rendezvous. Dick Saunders presents Bible study and evangelism.

- 1100 WWCR #1: Project Saturn Global. Bringing education to the world.
- 1115 HCJB (pa): Guidelines for Family Living. Help for the family from Harold Sala.
- 1130 HCJB (am): Insight for Living. Chuck Swindoll applies the Bible to life today.
- 1130 Radio New Zealand Int+I: Good Night from Wellington. See S 1130.

### Tuesdays

- 1100 HCJB (pa): Rendezvous. See M 1100.
- 1100 WWCR #1: Project Saturn Global. See M 1100.
- 1115 HCJB (pa): Guidelines for Family Living. See M 1115.

- 1130 HCJB (am): Insight for Living. See M 1130.
- 1130 Radio New Zealand Int+I: Good Night from Wellington. See S 1130.

### Wednesdays

- 1100 HCJB (pa): Rendezvous. See M 1100.
- 1100 WWCR #1: Project Saturn Global. See M 1100.
- 1115 HCJB (pa): Guidelines for Family Living. See M 1115.
- 1130 HCJB (am): Insight for Living. See M 1130.
- 1130 Radio New Zealand Int+I: Good Night from Wellington. See S 1130.

### Thursdays

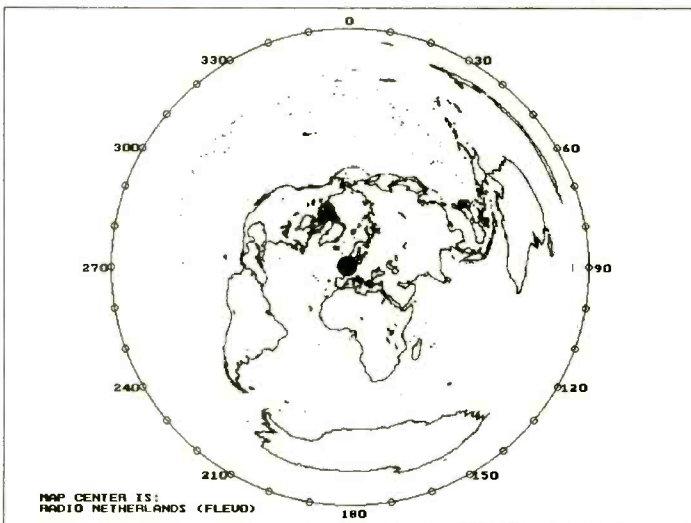
- 1100 HCJB (pa): Rendezvous. See M 1100.
- 1100 WWCR #1: Project Saturn Global. See M 1100.
- 1115 HCJB (pa): Guidelines for Family Living. See M 1115.
- 1130 BBC: Drama. "Cat's Whiskers" (27th). A long-suffering wife fills her husband's sandwiches with cat food.
- 1130 BBC: Drama. "Galalah at Blandings" (6th, 13th). Final two parts of the adaptation of a novel by P. G. Wodehouse set in the peaceful English countryside of the '20s.
- 1130 BBC: Drama. "Writing to Rose" (20th). Rose's parents threaten to disinherit her if she decides to marry Tom.
- 1130 HCJB (am): Insight for Living. See M 1130.
- 1130 Radio New Zealand Int+I: Good Night from Wellington. See S 1130.

### Fridays

- 1100 HCJB (pa): Rendezvous. See M 1100.
- 1100 WWCR #1: Project Saturn Global. See M 1100.
- 1115 HCJB (pa): Guidelines for Family Living. See M 1115.
- 1130 HCJB (am): Insight for Living. See M 1130.
- 1130 Radio New Zealand Int+I: Good Night from Wellington. See S 1130.

### Saturdays

- 1100 HCJB (pa): Family Foundations. Interviews and discussions about issues affecting today's family.
- 1130 HCJB (am): Sounds of Joy. See W 0630.
- 1130 Radio New Zealand Int+I: Good Night from Wellington. See S 1130.



## FREQUENCIES

1200-1300	Australia, ABC Brisbane	4290do		
1200-1300	Australia, ABC Perth	6140do	9610do	
1200-1230	Australia, Radio	6020pa	6080as	9710as
1200-1300	Australia, Radio	5995pa	6020pa	6080pa
		9580pa	17910as	7240pa
1200-1300 vl	Australia, VL8A Alice Spg	2310do		
1200-1300 vl	Australia, VL8K Katherine	2485do		
1200-1300 vl	Australia, VL8T Tent Crk	2325do		
1200-1300	Bahrain, Radio	6010do		
1200-1300	Brazil, Radiobras	15445na		
1200-1300	Bulgaria, Radio	11645na	13645me	
1200-1215	Cambodia, Natl Voice of	11938as		
1200-1300	Canada, CFCX Montreal	6005do		
1200-1300	Canada, CFRX Toronto	6070do		
1200-1300	Canada, CFVP Calgary	6030do		
1200-1300	Canada, CHNX Halifax	6130do		
1200-1300	Canada, CKZU Vancouver	6160do		
1200-1300	China, China Radio Intl	9655as	9715as	11660as
		15210na	15440na	11795as
1200-1300	Costa Rica, AWR Alajuela	9725ca	11870ca	
1200-1300	Costa Rica, R Peace Intl	7375am	7385am	15030am
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17490am
		21455om		17890am
1200-1230	Iran, VOIRI Tehran	9525me	11715me	11790me
		11930as		11910as
1200-1300 vl	Italy, IRRS Milano	7125eu		
1200-1300	Jordan, Radio	9560eu		
1200-1300	Kenya, Kenya BC Corp	4935do		
1200-1300 vl	Malaysia, RTM Kota Kinaba	5980do		
1200-1300	Malaysia, RTM Radio 4	7295do		
1200-1300 vl	Malaysia, RTM Sarawak	4950do		
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as	
1200-1206	New Zealand, R NZ Intl	9700pa		
1200-1300	Nigeria, Radio	4990do	7285do	
1200-1300 mtwhf	Palau, KHBN Voice of Hope	9830as		
1200-1230 a	Palau, KHBN Voice of Hope	9830as		
1200-1300 vl	PNG, Natl BC	4890do		
1200-1300 vl	PNG, Radio Central	3290do		
1200-1300 vl	PNG, Radio Enqa	2410do		
1200-1300 vl	PNG, Radio Milne Bay	3365do		
1200-1300 vl	PNG, Radio Western	3305do		

1200-1300	Russia, Radio Moscow Intl	7130af	7160am	7295me	9635af
		9830af	11675me	11980eu	12065na
		12070eu	13650eu	15190eu	15210na
		15345eu	15380na	15440eu	15465af
		15480me	15495eu	15525af	15540eu
		15585eu	17605eu	17760na	17780af
		17880eu	21515eu	21540eu	21825af
1200-1300 vl	S Africa, Radio Oranje	9630do			
1200-1300	Singapore, SBC Radio One	5010do	5052do	11940do	
1200-1245	South Korea, Radio Korea	9640na			
1200-1230	Thailand, Radio	4830as	9655as	11905as	
1200-1300	United Kingdom, BBC London	6190af	6195am	9410eu	9515na
		9660eu	9740na	9750eu	9760eu
		11760me	11940af	12095eu	15070eu
		15220na	15310as	15400af	15575me
		17640eu	17705eu	17790af	17885af
		21470af	21660af		
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, Monitor Radio Intl	7465am	9425pa	9455na	13625as
1200-1300	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1200-1300	USA, WEWN Birmingham AL	9350am	15695am		
1200-1300	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1200-1300	USA, WJCR Upton KY	7490na			
1200-1300	USA, WWCR Nashville TN	5935am			
1200-1300	USA, WYFR Okeechobee FL	5950na	7355na	11830na	11970na
1200-1225	Uzbekistan, R Tashkent	7285as	9715as	15420as	17745as
1200-1300	Vietnam, Voice of	6115as	10059as	12025as	15010as
1207-1300 ocasnal	New Zealand, R NZ Intl	9655pa			
1215-1300	Egypt, Radio Cairo	17595as			
1220-1230 vl	Ghana, GBC Radio 1	4915do			
1230-1300	Austria, R Austria Intl	6155eu	13730na	15450as	
1230-1300	Bangladesh, Radio	13615eu	15220eu		
1230-1300	Canada, RCI Montreal	6150as	11730as		
1230-1300	Finland, YLE/Radio	11900na	15400na		
1230-1300	France, Radio France Intl	9805eu	11670na	15155eu	15195eu
		15365na	21645na		
1230-1300	Ghana, GBC Radio 2	6130do	7295do		
1230-1300	Netherlands, Radio	5955eu	9650eu		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as		
1230-1300	Sweden, Radio	15240au	17740au	17865as	
1230-1300	USA, VOA Washington DC	11805as			

## SELECTED PROGRAMS

### Sundays

- 1200 HCJB (am): Kids' Corner. Mr Lizard and friends present a program for children.
- 1201 BBC: Plays of the Week (9th, 16th, 23rd, 30th). See S 0101.
- 1230 HCJB (am): Your Story Hour. Dramatized children's stories.
- 1237 Radio Canada Int+I: The Mailbag. Listener letters, musical selections, and happenings in Canada.

### Mondays

- 1200 HCJB (am): Morning in the Mountains. Magazine program of music, features, news, and inspiration.
- 1205 WWCR #1: Point of View. Marlin Maddoux interviewing on current events of interest to Christians.
- 1215 BBC: Quiz. "Inspiration". NEW. A panel of experts must answer questions about inventions and come up with new ideas.
- 1230 Radio Canada Int+I: Spectrum. A weekday magazine program of current affairs, features, and a business report.
- 1245 HCJB (am): Guidelines. A five-minute commentary on living.

### Tuesdays

- 1200 HCJB (am): Morning in the Mountains. See M 1200.
- 1205 WWCR #1: Point of View. See M 1205.
- 1230 Radio Canada Int+I: Spectrum. See M 1230.
- 1245 HCJB (am): Guidelines. See M 1245.
- 1249 Radio Finland: Finnish Press Review. Editorial opinion and reports on Finnish and world events.
- 1254 Radio Finland: Closeup. Focus on an aspect of life in Finland.

### Wednesdays

- 1200 HCJB (am): Morning in the Mountains. See M 1200.
- 1205 WWCR #1: Point of View. See M 1205.
- 1230 Radio Canada Int+I: Spectrum. See M 1230.
- 1235 BBC: Special Features. See M 1635.



*Michael Goldfarb, a broadcaster whose been away from the States for about eight years, returns to the U.S. to travel the Midwest. He reports on his Midwest journey on the BBC's "Homeward Bound."*

- 1244 Radio Finland: Environmental Scene. Weekly look at environmental issues in Finland.
- 1245 HCJB (am): Guidelines. See M 1245.
- 1249 Radio Finland: Finnish Press Review. See T 1249.
- 1254 Radio Finland: Closeup. See T 1254.

### Thursdays

- 1200 HCJB (am): Morning in the Mountains. See M 1200.
- 1205 WWCR #1: Point of View. See M 1205.
- 1230 Radio Canada Int+I: Spectrum. See M 1230.
- 1245 HCJB (am): Guidelines. See M 1245.
- 1250 Radio Finland: Finnish Press Review. See T 1249.
- 1254 Radio Finland: Closeup. See T 1254.

### Fridays

- 1200 HCJB (am): Morning in the Mountains. See M 1200.
- 1205 WWCR #1: Point of View. See M 1205.
- 1215 BBC: Feature. "You Know It Makes Sense". The final four parts of this series deal with taste, hearing, smell, and touch.
- 1230 Radio Canada Int+I: Spectrum. See M 1230.
- 1245 HCJB (am): Guidelines. See M 1245.
- 1245 Radio Finland: Highlights. A review of developments in the arts and culture.
- 1250 Radio Finland: Finnish Press Review. See T 1249.
- 1254 Radio Finland: Closeup. See T 1254.

### Saturdays

- 1200 HCJB (am): We Kids. A fast-moving program for children.
- 1230 HCJB (am): A Visit With Mrs. G. Bible stories for children.
- 1237 Radio Canada Int+I: Innovation Canada. See S 0206.
- 1243 Radio Finland: Starting Finnish. Finnish language lessons for English speakers.
- 1245 HCJB (am): Critter County. Christian Wyrzten and her friendly critters present a children's program.

## FREQUENCIES

1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, Radio	5995pa	7240pa	9580pa	11800pa
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485do			
1300-1400 vl	Australia, VL8T Tent Crk	2325do			
1300-1400	Bahrain, Radio	6010do			
1300-1320	Brazil, Radiobras	15445na			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400	Canada, RCI Montreal	11855na	17820na		
1300-1400	China, China Radio Intl	7405na	9715as	11660as	11855as
		15440pa			
1300-1400 vl	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Finland, YLE/Radio	15400na	21550na		
1300-1330	Ghana, GBC Radio 1	4915do			
1300-1400	Greece, Voice of	17535na			
1300-1400 vl	Italy, IRRS Milano	7125as			
1300-1325	Kenya, Kenya BC Corp	4935do			
1300-1400 vl	Malaysia, RTM Kota Kinaba	5980do			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400 vl	Malaysia, RTM Sarawak	4950do			
1300-1400 ocasnal	New Zealand, R NZ Intl	9655pa			
1300-1400	Nigeria, Radio	4990do	7285do		
1300-1350	North Korea, R Pyongyang	13760as	15230as		
1300-1400 mtwhf	Palau, KHBN Voice of Hope	9830as			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400 vl	PNG, Natl BC	4890do			
1300-1355	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	9525eu
		11815eu			
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, AWR Russia	11855au			
1300-1400	Russia, Radio Moscow Intl	7130af	7295as	9635af	9715me
		9830af	9890eu	11715af	11765me
		11980eu	12030eu	15205af	15210na
		15345eu	15380eu	15440eu	15480me
		15495eu	15540eu	17610me	17725me
		17760na	17775as	17780as	17790as
		17880eu	21540eu	21610af	21785af

1300-1400 vl	S Africa, Radio Oranje	9630do			
1300-1400	Singapore, SBC Radio One	5010do	5052do	11940do	
1300-1330	South Korea, Radio Korea	9750as	13670as		
1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as		
1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as
1300-1400	United Kingdom, BBC London	6190af	6195am	7180as	9410eu
			9515na	9660eu	9740na
			9760eu	11750as	11760me
			11940af	12095eu	15070eu
			15310as	15400af	15420af
			17640eu	17705eu	17790af
			21470af	21660af	
1300-1400	USA, KJES Mesquite NM	11715am			
1300-1400 vl	USA, KNLS Anchor Point AK	7355as			
1300-1400	USA, KTNB Salt Lk City UT	7510am			
1300-1400	USA, Monitor Radio Intl	7465na	13625as		
1300-1400	USA, VOA Washington DC	6110as	9760as	15160as	15425as
1300-1330	USA, VOA Washington DC	11715as	11805as		
1300-1400	USA, WENW Birmingham AL	9350am			
1300-1400	USA, WHRI Noblesville IN	9465na	15105na		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WWCR Nashville TN	5935am	15685am		
1300-1400	USA, WYFR Okeechobee FL	5950na	9705na	11550as	11830na
		11970na	13695na		
1300-1330	Vietnam, Voice of	6115as	10059as	12025as	15010as
1315-1325	Nepal, Radio	3230do	5005do	7165do	
1325-1400 mtwhf	Kenya, Kenya BC Corp	4935do			
1330-1400	Austria, R Austria Intl	15450as			
1330-1355 mtwfta	Belgium, R Vlaanderen Int	17555na	21810na		
1330-1400	Bulgaria, Radio	11630as			
1330-1357	Canada, RCI Montreal	6150as	9435as		
1330-1400 mtwhf	Finland, YLE/Radio	11900na	15400na	17740na	21550na
1330-1400 tw	Ghana, GBC Radio 1	4915do			
1330-1400	India, All India Radio	11760as	15120as		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands, Radio	9895as	13700as	15150as	15530as
1330-1400	Sweden, Radio	15240am	17870am		
1330-1400	Turkey, Voice of	9675as			
1330-1400	UAE, Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1355	Uzbekistan, R Tashkent	7285as	9715as	15295as	17815as
1345-1400 vl	Myanmar, Radio	7185do			
1345-1400	Vatican State, Vatican R	15090as	17525au		

## SELECTED PROGRAMS

### Sundays

- 1300 HCJB (am): Adventure Club. A weekly adventure program on Christianity for children.
- 1315 HCJB (am): The Word Today. A discussion of Biblical themes.
- 1330 HCJB (am): Telling the Truth. Stuart Briscoe presents a religious program.
- 1336 Radio Canada Int+: Arts Canada. A look at the Canadian arts scene.
- 1345 WWCR #1: Weekly Presidential Radio Address. Bill Clinton.

### Mondays

- 1300 HCJB (am): Morning in the Mountains. See M 1200.
- 1310 Radio Canada Int+: Open House. See M 0007.

- 1330 HCJB (am): Focus on the Family. Psychologist James Dobson on everyday family matters.
- 1330 Radio Canada Int+: Spectrum. See M 1230.

### Tuesdays

- 1300 HCJB (am): Morning in the Mountains. See M 1200.
- 1310 Radio Canada Int+: As It Happens. See M 2330.
- 1330 HCJB (am): Focus on the Family. See M 1330.
- 1330 Radio Canada Int+: Spectrum. See M 1230.
- 1330 WWCR #1: World of Radio. See S 0415.
- 1339 Radio Canada Int+: The Business Report. See T 0211.
- 1344 Radio Canada Int+: Spectrum Features. Canadian politics, lifestyles, and current affairs.
- 1349 Radio Finland: Finnish Press Review. See T 1249.
- 1354 Radio Finland: Closeup. See T 1254.

### Wednesdays

- 1300 HCJB (am): Morning in the Mountains. See M 1200.
- 1310 Radio Canada Int+: As It Happens. See M 2330.
- 1330 HCJB (am): Focus on the Family. See M 1330.
- 1330 Radio Canada Int+: Spectrum. See M 1230.
- 1344 Radio Finland: Environmental Scene. See W 1244.
- 1349 Radio Finland: Finnish Press Review. See T 1249.
- 1354 Radio Finland: Closeup. See T 1254.

### Thursdays

- 1300 HCJB (am): Morning in the Mountains. See M 1200.
- 1310 Radio Canada Int+: As It Happens. See M 2330.
- 1330 HCJB (am): Focus on the Family. See M 1330.
- 1330 Radio Canada Int+: Spectrum. See M 1230.
- 1350 Radio Finland: Finnish Press Review. See T 1249.
- 1354 Radio Finland: Closeup. See T 1254.

### Fridays

- 1300 HCJB (am): Morning in the Mountains. See M 1200.
- 1310 Radio Canada Int+: As It Happens. See M 2330.
- 1330 HCJB (am): Focus on the Family. See M 1330.
- 1330 Radio Canada Int+: Spectrum. See M 1230.
- 1345 Radio Finland: Highlights. See F 1245.
- 1350 Radio Finland: Finnish Press Review. See T 1249.
- 1354 Radio Finland: Closeup. See T 1254.

### Saturdays

- 1300 HCJB (am): Adventures in Odyssey. Lively childrens' dramas from the "Focus on the Family" team.
- 1330 HCJB (am): Children's Bible Hour. Songs and stories for children.
- 1337 Radio Canada Int+: Innovation Canada. See S 0206.
- 1343 Radio Finland: Starting Finnish. See A 1243.



Here are two of Radio France Internationale's broadcasters: Left, Patrice Biancone; Right, Benoit Ruelle.









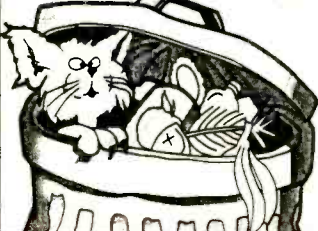


1700-1800	Australia, Radio	5995pa 7260as 11680as	6060pa 9510as 11695pa	6080as 9580pa 11880pa	7240pa 11660pa
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800	Azerbaijan, R Dada Gorgud	7160eu			
1700-1800	Bahrain, Radio	6010do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	9570af	11575af	15345af	
1700-1800	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	21480na
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Eq Guinea, Radio Africa	7190af	7203af		
1700-1730	Georgia, Georgian Radio	11760eu			
1700-1800 as	Guam, KSDA AWR Agat	13720as			
1700-1800 vl	Italy, IRRS Milano	7125eu			
1700-1800	Japan, NHK/Radio	9535na 11915na	9750as 17750me	11815as	11865na
1700-1730	Jordan, Radio	9560eu			
1700-1730	Kazakhstan, R Alma Ata	15270eu			
1700-1800 s	Lebanon, King of Hope	6280me			
1700-1713 mtwhfa	Lebanon, Voice of	6550eu			
1700-1800 a	Morocco, RTV Marocaine	17815af			
1700-1800 mtwtf	New Zealand, R NZ Intl	9655pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785af
1700-1800	Pakistan, Radio	11570eu	15550eu		
1700-1800 vl	PNG, Natl BC	4890do			
1700-1800	Russia, Radio Moscow Intl	6165na 7205eu 7340eu 9575af 12060af	7105na 7250na 7345na 9830af 15380na	7170eu 7260na 9540na 9890eu 17760na	7180na 7330eu 9550eu 11890eu
1700-1800 vl	Rwanda, Radiodiff Rwanda	9610do			
1700-1800	S Africa, Channel Africa	7270af	15240af		
1700-1800 vl	S Africa, Radio Oranje	4875do			
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1715 vl	Somalia, R Free Somalia	7499do			
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as		
1700-1715	Swaziland, Trans World R	7120af			
1700-1730	Switzerland, Swiss R Intl	9885af	13635me	17635af	
1700-1800 irreg	Tanzania, Radio	11765af			
1700-1800 vl	Uganda, Radio	4976do			
1700-1730	United Kingdom, BBC London	6005af 17860af	9515na 21660af	12095eu	15260na
1700-1800	United Kingdom, BBC London	3955eu 7160me 9740me 15260af 21470af	6180eu 9410eu 11940af 15400af 21660af	6190af 9515eu 12095af 15420af	6195eu 9630af 15070af 17880af
1700-1800	USA, KCBI Dallas TX	15725am			
1700-1800	USA, KTVN Salt Lk City UT	15590am			
1700-1800	USA, Monitor Radio Intl	13625af			
1700-1800	USA, VOA Washington DC	6040eu 9700as 11995af 15255me 19379af	6110as 9760eu 12040af 15395as	7125as 11855as 13710af 15445af	7215as 11920af 15205eu 17895af
1700-1800	USA, WEWN Birmingham AL	13615am			
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WINB Red Lion PA	15295eu			
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwfhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WWCN Nashville TN	13845am	15610am	15685am	
1700-1800	USA, WYFR Okeechobee FL	21500af			
1715-1730 mtwhf	Swaziland, Trans World R	7120af			
1715-1730	Vatican State, Vatican R	6245eu	7250eu	9645eu	
1730-1800	Netherlands, Radio	6020af	9605af	21515af	21590af

1730-1800	Romania, R Romania Intl	15340af	15365af	17745af	17805af
1730-1800 vl	Sierra Leone, SLBS	3316do			
1730-1800	Vatican State, Vatican R	11625af	15090af	17730af	
1735-1745 th	Paraguay, Radio Nacional	6025sa	9735sa		
1745-1800	India, All India Radio	7412eu 11935af	9950me 15080af	11620eu	11860eu
1800-1900	Algeria, Radio Algiers	9535eu	17745eu		
1800-1900	Argentina, RAE	15345eu			
1800-1900	Australia, Radio	5960as 7240pa 11695pa	5995pa 7260as 11855as	6060pa 9580pa 11880pa	6080as 11660pa
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1800-1900	Bahrain, Radio	6010do			
1800-1900	Brazil, Radiobras	15268eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1800-1827	Czech Republic, R Prague	6055eu 13580af	7345eu	9490eu	11990af
1800-1900	Ecuador, HCJB Quito	21455am			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Eq Guinea, Radio Africa	7190af	7203af		
1800-1815	Ghana, GBC Radio 1	4915do			
1800-1815	Ghana, GBC Radio 2	3316do			
1800-1900 as	Guam, KSDA AWR Agat	13720as			
1800-1900	India, All India Radio	7412eu 11935af	9950me 15080af	11620eu	11860eu
1800-1815	Israel, Kol Israel	7465eu	11588na		
1800-1900 vl	Italy, IRRS Milano	7125eu			
1800-1900	Kuwait, Radio	9840na	13620na		
1800-1900	Lebanon, King of Hope	6280me			
1800-1900	Netherlands, Radio	6020af 21590af	9605af	17605af	21515af
1800-1900 mtwtf	New Zealand, R NZ Intl	9655pa			
1800-1830 s	Norway, Radio Norway Intl	9590eu	11860af		
1800-1900 vl	PNG, Natl BC	4890do			
1800-1855	Poland, Polish R Warsaw	5995eu	7270eu	7285eu	
1800-1830 mtwhf	Portugal, Radio	9780eu			
1800-1900	Russia, Radio Moscow Intl	6165na 7260na 9575af 11890eu 15380af	7105na 9540eu 9830af 12045af 17760af	7180na 9550na 9890eu 12050na 17790na	7250na 9565eu 11685af 12055af
1800-1900 vl	S Africa, Radio Oranje	4875do			
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900 vl	Sierra Leone, SLBS	3316do			
1800-1900	Sudan, Radio Omdurman	7200do	9165do		
1800-1900	Swaziland, Trans World R	3200af	9500af		
1800-1900 irreg	Tanzania, Radio	11765af			
1800-1900 vl	Uganda, Radio	4976do			
1800-1900	United Kingdom, BBC London	3255af 6190af 9630af 12095af 17880af	3955eu 6195eu 9740me 15070af	6005af 7160me 12040af 15400af	6180eu 9410eu 11955as 15420af
1800-1900	USA, KCBI Dallas TX	15725am			
1800-1900	USA, KJES Mesquite NM	9510na			
1800-1900	USA, KTVN Salt Lk City UT	15590am			
1800-1900	USA, Monitor Radio Intl	9355pa	21640af		
1800-1900	USA, VOA Washington DC	3980eu 11920af 15205eu 17895af	6040eu 11995af 15410eu	9700me 12040af 15580af	9760eu 13710af 17800af
1800-1900	USA, WEWN Birmingham AL	13740am			
1800-1900	USA, WHRI Noblesville IN	9485na	9590na	13760na	
1800-1900	USA, WINB Red Lion PA	15295eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WWCN Nashville TN	13845am	15610am	15685am	
1800-1900	USA, WYFR Okeechobee FL	21500eu			
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1815-1900	Bangladesh, Radio	9570me	12030eu		
1815-1855	Gabon, Numero Un	9580af	15475af		
1830-1900	Bulgaria, Radio	7455eu	9700na		
1830-1855	Finland, YLE/Radio	6120eu	9730eu		
1830-1857	Slovakia, R Slovakia Intl	5915eu	7345eu	9605eu	
1830-1900	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1830-1900	Sweden, Radio	6065af	9655me	15145eu	
1840-1850 mtwhfa	Greece, Voice of	15630af	15650af	17525af	
1845-1900 irreg s	Mali, Radio Malienne	4783do	4835do	5995do	
1850-1900 as	New Zealand, R NZ Intl	11735pa			

**SOME THINGS ARE MEANT TO BE CLOSED**

YOUR MIND ISN'T ONE OF THEM.



MDA has shown how valuable people with disabilities are to society. Talent, ability and desire are more important than strength of a person's muscles. The barrier these people can't overcome is a closed mind. Keep yours open.

1-800-572-1717

MUSCULAR DYSTROPHY ASSOCIATION



1900-2000	Australia, Radio	5960as 7240pa 11695pa	5995pa 7260as 11720pa	6060pa 9580pa 11880pa	6080as 11680pa
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-2000	Bahrain, Radio	6010do			
1900-1925	Belgium, R Vlaanderen Int	5910eu	13685af		
1900-1918	Brazil, Radiobras	15268eu			
1900-2000	Bulgaria, Radio	7455eu	9700na		
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955af	9440af		
1900-2000	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1900-2000	Ecuador, HCJB Quito	15270eu	17490eu	17790eu	21455eu
1900-2000	Eq Guinea, Radio Africa	7190af	7203af		
1900-1950	Germany, Deutsche Welle	9665af 11785me	9765af 13790ad	11740me 15425af	11765me
1900-1910 mtwhfa	Greece, Voice of	7450eu	9380eu		
1900-1945	India, All India Radio	7412eu 11935af	9950me 15080af	11620eu	11860eu
1900-2000 vl	Italy, IRRS Milano	7125eu			
1900-2000	Japan, NHK/Radio	9535as 11865pa	9640am 11875pa	9750as 11915pa	11815pa
1900-2000	Kuwait, Radio	9840na	13620na		
1900-2000	Lebanon, King of Hope	6280me			
1900-2000	Liberia, Radio ELWA	4760do			
1900-2000 s	Morocco, RTV Marocaine	11920as			
1900-2000	Netherlands, Radio	6020af	21590af		
1900-1930	Netherlands, Radio	9605af	17605af	21515af	
1900-2000	New Zealand, R NZ Intl	9655pa			
1900-2000 as	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, Radio	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-2000 vl	PNG, Natl BC	4890do			
1900-2000 vl	PNG, Radio Central	3290do			
1900-2000 vl	PNG, Radio Milne Bay	3365do			
1900-2000 vl	PNG, Radio Western	3305do			
1900-1930 mtwhf	Portugal, Radio	15515af			
1900-2000	Romania, R Romania Intl	9750eu	11810eu	11940eu	15365eu
1900-2000	Russia, AWR Russia	9835eu			
1900-2000	Russia, Radio Moscow Intl	7105na 7260na 9685af 12055af 15580af	7170eu 9470af 11890af 15205af 17560na	7180na 9530af 11995eu 15380af 17710na	7205eu 9550na 12050na 15425na 17760na
1900-2000	Saipan, KFBS Marpi	9465as			
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu		
1900-2000 vl	Sierra Leone, SLBS	3316do			
1900-2000	Spain, Spanish Natl Radio	15375af			
1900-2000	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1900-2000	Swaziland, Trans World R	3200af	3240af		
1900-1915 irreg	Tanzania, Radio	11765af			
1900-2000 vl	Uganda, Radio	4976do			
1900-2000	United Kingdom, BBC London	3255af 6190af 9630af 15400af	3955eu 6195eu 9740me 17880af	6005af 7160me 12095af 21640af	6180eu 9410eu 15070af
1900-2000	USA, KCBI Dallas TX	15725am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, Monitor Radio Intl	9355eu	15665eu	21640af	
1900-2000	USA, VOA Washington DC	3980eu 9700me 11995af 15410af 19379af	6040eu 9760eu 13710af 15540af	7415af 11870pa 15180pa 17800af	9525pa 11920af 15205eu 17895af
1900-2000	USA, WEWN Birmingham AL	9985am	13740am		
1900-2000	USA, WHRI Noblesville IN	9590na	13760na		
1900-2000	USA, WINB Red Lion PA	15295eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000	USA, WWCR Nashville TN	13845am	15610am	15685am	
1900-2000	USA, WYFR Okeechobee FL	15355af	21615af		
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1925-2000 vl	Lithuania, Radiocentras	9400eu			
1930-2000	Austria, R Austria Intl	5945eu	6155eu	9880eu	13730af
1930-2000	Georgia, Georgian Radio	9565me			
1930-2000	Iran, VOIRI Tehran	9022eu	15260eu		
1930-2000	Netherlands, Radio	17605af			
1930-1957	Slovakia, R Slovakia Intl	5915eu	7345eu	9440eu	
1940-2000 mha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
1945-2000	Armenia, Radio Yerevan	4810me	4990me	6065me	

2000-2100	Australia, Radio	5960as 7260as 11880pa	6060pa 9580pa 11695pa	6080as 11695pa	7240pa 11720pa
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bahrain, Radio	6010do			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	6950eu	9920eu	11715af	15110af
2000-2100	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
2000-2100	Ecuador, HCJB Quito	21455am			
2000-2100	Eq Guinea, Radio Africa	7190af	7203af		
2000-2030	Ghana, GBC Radio 1	4915do			
2000-2030	Ghana, GBC Radio 2	3366do			
2000-2100	Indonesia, Voice of	9675me	11752eu		
2000-2030	Iran, VOIRI Tehran	9022eu	15260eu		
2000-2030	Israel, Kol Israel	7465eu 11675na	9435eu 17575af	11588na	11603na
2000-2100 vl	Italy, IRRS Milano	7125af			
2000-2010 mtwhf	Kenya, Kenya BC Corp	4935do			
2000-2100	Kuwait, Radio	9840na	13620na		
2000-2030 as	Latvia, Radio	5935eu			
2000-2100	Lebanon, King of Hope	6280me			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2030	Lithuania, Radio Vilnius	9710am			
2000-2010 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
2000-2025	Netherlands, Radio	17605af	21590af		
2000-2100	New Zealand, R NZ Intl	9655pa			
2000-2100 as	New Zealand, R NZ Intl	11735pa			
2000-2100	Nigeria, Radio	3326do	4990do		
2000-2100	Nigeria, Voice of	7255af			
2000-2100	North Korea, R Pyongyang	6576eu	9345eu	9640af	9977af
2000-2030 s	Norway, Radio Norway Intl	9590eu			
2000-2100 vl	PNG, Natl BC	4890do			
2000-2100 vl	PNG, Radio Central	3290do			
2000-2100 vl	PNG, Radio Enga	2410do			
2000-2100 vl	PNG, Radio Milne Bay	3365do			
2000-2100 vl	PNG, Radio Western	3305do			
2000-2100	Russia, Radio Moscow Intl	7170eu 7400eu 9550na 11890eu 12055af	7180na 9470af 9890eu 11905na 15425na	7205na 9515af 11760na 12015na 17605na	7260na 9530af 11805af 12050na
2000-2100 vl	S Africa, Radio Oranje	4875do			
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu		
2000-2100 vl	Sierra Leone, SLBS	3316do			
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do		
2000-2045	Swaziland, Trans World R	3200af	3240af		
2000-2030	Switzerland, Swiss R Intl	6110sk 15505af 4976do	6110sk 15505af	12035af	13635af
2000-2100 vl	Uganda, Radio	4976do			
2000-2030	United Kingdom, BBC London	6190af 9740me	6195eu 15070af	7160me 17880af	9630af
2000-2100	United Kingdom, BBC London	3255af 6005af 15260sa	3255af 6180eu 15400af	3955eu 6180eu 7325eu	5975am 9410eu
2000-2100	USA, KCBI Dallas TX	15725am			
2000-2100	USA, KJES Mesquite NM	15545am			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100	USA, Monitor Radio Intl	9355eu	13770af		
2000-2030	USA, VOA Washington DC	11785af	15160af		
2000-2100	USA, VOA Washington DC	6040eu 13710af 17800af	7415af 15205eu 17895af	9700me 15400af 19379af	9760eu 15580af 21485af
2000-2100	USA, WEWN Birmingham AL	13740eu			
2000-2100	USA, WHRI Noblesville IN	9590am	13760am		
2000-2100	USA, WINB Red Lion PA	15295eu			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100	USA, WWCR Nashville TN	13845am	15610am	15685am	
2000-2100	USA, WYFR Okeechobee FL	15355af	21615af		
2000-2030	Vatican State, Vatican R	9645af	11625af		
2005-2100	Syria, Radio Damascus	12085eu	15095eu		
2010-2100 sa	Kenya, Kenya BC Corp	4935do			
2015-2045 s	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Rome	7235me	9575me	11800me	
2030-2035	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2030-2100	Poland, Polish R Warsaw	5995eu	6135eu	7285eu	
2030-2057	Slovakia, R Slovakia Intl	7345eu			
2030-2100	South Korea, Radio Korea	5975eu	6035af	9640me	9870eu
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	India, All India Radio	7412eu 11715pa	9910au 11880pa	9950eu 15265pa	11620eu
2050-2100	Vatican State, Vatican R	5885eu	7250eu		

2100-2200	Algeria, Radio Algiers	11715eu			
2100-2200	Australia, Radio	9645as	11720pa	11855as	
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2106	Bahrain, Radio	6010do			
2100-2200	Bulgaria, Radio	6085eu	9700eu		
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	China, China Radio Intl	6950eu	9920eu	11715af	15110af
2100-2200	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
2100-2200	Cuba, Radio Havana Cuba	15165eu	17760eu		
2100-2130	Czech Republic, R Prague	6055eu	7265eu	7345eu	9490eu
2100-2130	Ecuador, HCJB Quito	21455am			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	6185as	9670as	9690af	9715as
		9765as	11785as	15425as	
2100-2200	Honduras, R Copan Intl	15675am			
2100-2200	Hungary, Radio Budapest	6110eu	7220eu	9835eu	11910eu
2100-2200	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		
2100-2200 vl	Iraq, Radio Iraq Intl	11810na			
2100-2130 vl	Italy, IRRS Milano	7125af			
2100-2200	Japan, NHK/Radio	6035eu	9640eu	9750eu	11815au
		11925eu	15430af		
2100-2200	Lebanon, King of Hope	6280me			
2100-2200 mtwtf	Lebanon, Wings of Hope	11530me			
2100-2200	Liberia, Radio ELWA	4760do			
2100-2137 as	New Zealand, R NZ Intl	9655pa			
2100-2200	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, Radio	3326do	4990do		
2100-2200 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2100-2200 vl	PNG, Natl BC	4890do			
2100-2200 vl	PNG, Radio Central	3290do			
2100-2200 vl	PNG, Radio Enga	2410do			
2100-2200 vl	PNG, Radio Milne Bay	3365do			
2100-2200 vl	PNG, Radio Western	3305do			
2100-2125	Poland, Polish R Warsaw	5955eu	6135eu	7285eu	
2100-2130 mtwhf	Portugal, Radio	15250af			
2100-2200	Romania, R Romania Intl	7195eu	7225eu	9690eu	9750eu
		11940eu			
2100-2200	Russia, Radio Galaxy	11880eu			
2100-2200	Russia, Radio Moscow Intl	4795af	4860eu	5920eu	5950eu
		6055eu	7115af	7150na	7170eu
		7180eu	7205eu	7330eu	9520af
		9550na	9620na	9750na	9795eu
		9890eu	11890eu	12050na	15425na
		17605na	17690na		
2100-2200 vl	S Africa, Radio Oranje	4875do			
2100-2200 vl	Sierra Leone, SLBS	3316do			
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2130	South Korea, Radio Korea	6480af	7550me	15575eu	
2100-2200	Spain, Spanish Natl Radio	6125eu			
2100-2200	Sri Lanka, SLBC Colombo	15120as			
2100-2105	Syria, Radio Damascus	12085eu	15095eu		
2100-2200	Turkey, Voice of	9445eu	11895		
2100-2200	Ukraine, R Ukraine Intl	4825eu	6070eu	6090eu	7150eu
		7195eu	7240eu	9685eu	
2100-2200	United Kingdom, BBC London	3255af	3955eu	5975am	6005af
		6180eu	6195eu	7325eu	9410eu
		9590na	11955as	12095na	15260sa
		15400af			
2100-2200	USA, KCBI Dallas TX	15725am			
2100-2200	USA, KTVN Salt Lk City UT	15590na			
2100-2200	USA, Monitor Radio Intl	7510eu	9355eu	15665eu	
2100-2200	USA, VOA Washington DC	6040eu	7415af	9700me	9760eu
		11870pa	13710af	15185as	15205eu
		15445af	15580af	17735as	17800af
		17895af	19379af	21485af	
2100-2200	USA, WEWN Birmingham AL	13740eu			
2100-2200	USA, WHRI Noblesville IN	13760am	17830am		
2100-2200	USA, WINB Red Lion PA	15185eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200	USA, WWCN Nashville TN	13845am	15610am	15685am	
2100-2200	USA, WYFR Okeechobee FL	7355eu	15566eu	17750af	21525af
2100-2110	Vatican State, Vatican R	5885eu	7250eu		
2105-2135	Croatia, Croatian Radio	9830eu	13640eu	13830eu	
2110-2200	Yemen, Rep of Yemen Radio	9780eu			
2115-2200	Syria, Radio Damascus	12085na	15095na		
2115-2130 mtwhf	Egypt, Radio Cairo	9900eu			
2130-2200	United Kingdom, BBC Carib	6110am	15390am	17715am	
	Australia, Radio	15240pa	15320pa	15365pa	17795pa
		21740pa			
2130-2200 vl	Australia, VL8A Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200	Canada, RCI Montreal	5995eu	7260eu	11945eu	13650eu
		13690af	15140af	15270af	15325af
		17820af			
2130-2200	Ecuador, HCJB Quito	15270eu	17490am	21455am	
2130-2200	Finland, YLE/Radio	6120eu	11755eu	15440eu	

2130-2140 mtwhf	Latvia, Radio	5935eu			
2130-2200	Sweden, Radio	6065af	9655eu		
2138-2200	New Zealand, R NZ Intl	15115pa			
2145-2200	South Korea, Radio Korea	6480eu	15575eu		
2200-2300	Australia, Radio	9645as	11720pa	11855as	15240pa
		15320pa	15365pa	17795pa	21740pa
2200-2300 vl	Australia, VL8A Alice Spg	4835do			
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2225	Belgium, R Vlaanderen Int	5910eu			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5995eu	7260eu	11705eu	11945eu
		13650eu	13690eu	15140af	15325af
		17820af			
2200-2300	China, China Radio Intl	9880eu			
2200-2230	China, China Radio Intl	3985eu			
2200-2220 s	Congo, R Natl Congolaise	4765do	5985do		
2200-2300	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
2200-2300	Cuba, Radio Havana Cuba	6180na			
2200-2230	Czech Republic, R Prague	6055eu	7265eu	7345eu	9490eu
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eq Guinea, Radio Africa	7190af	7203af		
2200-2245	Finland, YLE/Radio	9730eu	11740eu	11810eu	
2200-2300 mtwhfa	Honduras, R Copan Intl	15675am			
2200-2230	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		
2200-2230 vl	Italy, IRRS Milano	7125af			
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
2200-2300	Lebanon, King of Hope	6280me			
2200-2300 mtwtf	Lebanon, Wings of Hope	11530me			
2200-2300	Liberia, Radio ELWA	4760do			
2200-2300 vl	Malaysia, RTM Kota Kinaba	5980do			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300 vl	Malaysia, RTM Sarawak	4950do			
2200-2300	New Zealand, R NZ Intl	15115pa			
2200-2300	Nigeria, Radio	3326do	4990do		
2200-2300 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2200-2300 vl	PNG, Natl BC	4890do			
2200-2300	Russia, Radio Moscow Intl	4795af	4860eu	5950eu	5975eu
		6005af	6100eu	7115eu	7150na
		7180na	7185eu	7300eu	7380eu
		9550na	9620na	9750na	9890eu
		12050na	13775na	15425na	17570na
		17605na	17655na	17665na	17690na
2200-2300 vl	S Africa, Radio Oranje	4875do			
2200-2300 vl	Sierra Leone, SLBS	3316do			
2200-2300	Singapore, SBC Radio One	5010do	5052do	11940do	
2200-2300 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2230	South Korea, Radio Korea	7275as	9640as		
2200-2245	South Korea, Radio Korea	6480eu	15575eu		
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	9850eu	11915eu		
2200-2300	UAE, Radio Abu Dhabi	9770na	11710na	13605na	
2200-2300	Ukraine, R Ukraine Intl	4825eu	5960eu	6010eu	6020eu
		6055eu	7195eu	7240eu	9505eu
		9685eu	9745eu	9860eu	
2200-2300	United Kingdom, BBC London	3955eu	5975am	6195eu	7325eu
		9410eu	9590na	9915am	11750sa
		11955as	15260sa	15400af	
2200-2300	USA, KCBI Dallas TX	15725am			
2200-2300	USA, KTVN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	9430as	9465na	13625as	17555sa
2200-2300	USA, VOA Washington DC	7215as	9770as	11760as	15185as
		15290as	15305as	17735as	17820as
2200-2300	USA, WEWN Birmingham AL	1425am			
2200-2300	USA, WHRI Noblesville IN	13760eu			
2200-2245	USA, WINB Red Lion PA	15185eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300	USA, WWCN Nashville TN	12160am	13845am	15685am	
2200-2300	USA, WYFR Okeechobee FL	17750eu	21525af		
2200-2230 s	USA, KGEI San Francisco CA	15280sa			
2203-2209	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2230-2300	Finland, YLE/Radio	9615eu			
2230-2300	Israel, Kol Israel	7465eu	9435eu	11587na	11603na
		11675na	15640na	15650na	17575sa
2230-2300	Libya, Radio Jamahiriya	7245eu			
2230-2300	Lithuania, Radio Vilnius	9710eu			
2230-2300	Sweden, Radio	6065eu			
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Armenia, Radio Yerevan	7440eu	9705eu	10344eu	11920eu
2245-2300	Bulgaria, Radio	7455eu	9700na		
2245-2300	Ghana, GBC Radio 1	4915do			
2245-2300	Ghana, GBC Radio 2	3366do			
2245-2300	India, All India Radio	9910as	11745as	11785as	15110as
2245-2300	USA, WINB Red Lion PA	15145eu			
2245-2300	Vatican State, Vatican R				

## FREQUENCIES

2300-2315	Albania, R Tirana Intl	9760eu	11825eu						9750na	9815eu	11835na	12050na
2300-2400	Australia, Radio	11720pa	11855as	15240pa	15320pa				13775na	15425na	15470as	17570as
		15365pa	17795pa	21740pa					17665na	17675as	21480na	
2300-2400 vl	Australia, VLBA Alice Spg	4835do				2300-2400 vl	S Africa, Radio Oranje		4875do			
2300-2400 vl	Australia, VLBK Katherine	5025do				2300-2310 vl	Sierra Leone, SLBS		3316do			
2300-2400 vl	Australia, VLBT Tent Crk	4910do				2300-2400	Singapore, SBC Radio One	5010do	5052do	11940do		
2300-2400	Bulgaria, Radio	7455na	9700na			2300-2400 vl	Solomon Islands, SLBC	5020do	9545do			
2300-2400	Canada, CFCX Montreal	6005do				2300-2400	Turkey, Voice of	7185me	9445na	11895eu		
2300-2400	Canada, CFRX Toronto	6070do				2300-2400	UAE, Radio Abu Dhabi	9770na	11710na	13605na		
2300-2400	Canada, CFVP Calgary	6030do				2300-2400	United Kingdom, BBC London	3955eu	5975na	6175na	6195na	
2300-2400	Canada, CHNX Halifax	6130do						7180eu	7325na	9410eu	9590na	
2300-2400	Canada, CKZV Vancouver	6160do						9915am	11750sa	11955as	15260sa	
2300-2330	Canada, RCI Montreal	5960na	5995eu	7250eu	9535eu			15370as	15400af			
		9755eu	11845eu	11940eu		2300-2400	USA, KCBI Dallas TX	15725am				
		5030ca	9725ca	11870ca		2300-2400	USA, KTVB Salt Lk City UT	15590na				
2300-2400	Costa Rica, AWR Alajuela	3735am	7385am	15030am	21465am	2300-2400	USA, Monitor Radio Intl	9430as	9465na	13625as	17555sa	
2300-2400	Costa Rica, R Peace Intl	9745am	21455am			2300-2400	USA, VOA Washington DC	7215as	9650as	9770as	11760as	
2300-2400	Ecuador, HCJB Quito	15610as						11820as	15185as	15290as	15305as	
2300-2400	Guam, KSDA AWR Agat	9910as	11745as	11785as	15110as			17735as	17820as			
2300-2400	India, All India Radio	15145as				2300-2400	USA, WEWN Birmingham AL	7425am	11820am			
		6060eu	6125eu	7140eu	9660eu	2300-2400	USA, WJCR Upton KY	7490na	13595na			
		15430as	17810as			2300-2400	USA, WRNO New Orleans LA	7355am				
		6280me				2300-2400	USA, WWCR Nashville TN	12160am	13845am			
2300-2400	Lebanon, King of Hope	11530me				2300-2315	Vatican State, Vatican R	9600au	11830as			
2300-2400 mtwhf	Lebanon, Wings of Hope	7245eu				2330-2400	Austria, R Austria Intl	9870sa	13730sa			
2300-2400	Libya, Radio Jamahiriya	5980do				2330-2400 a	Colombia, Radio Nacional	11822am	17865am			
2300-2400 vl	Malaysia, RTM Kota Kinaba	7295do				2300-2400	Netherlands, Radio	6020na	6165na			
2300-2400 smtwha	Malaysia, RTM Radio 4	4950do	7160do			2330-2400 m	Sri Lanka, SLBC Colombo	15425am				
2300-2400 vl	Malaysia, RTM Sarawak	15115pa				2330-2400	Sweden, Radio	11910eu				
2300-2400	New Zealand, R NZ Intl	11700am	13650am			2330-2400	Thailand, Radio	4830eu	9655as	11905as		
2300-2335	North Korea, R Pyongyang	6120na				2330-2400	Vietnam, Voice of	9840as	12020as	15010as		
2300-2330 s	Norway, Radio Norway Intl	11980as				2335-2345 smtwhf	Greece, Voice of	9425sa	11595sa	11645sa		
2300-2400 mtwhfa	Palau, KHBN Voice of Hope	4890do				2345-2400	Armenia, Radio Yerevan	9685eu	11920eu	12010eu		
2300-2400 vl	PNG, Natl BC	7150eu	7180eu	9550eu	9620na							
2300-2400	Russia, Radio Moscow Intl											

## SELECTED PROGRAMS

### Sundays

- 2300 WWCR #1: Unshackled. Pacific Garden Mission's radio drama.
- 2305 Radio Canada Int+: Arts Canada. See S 1336.
- 2305 Radio New Zealand Int+: Midday Report. See S 0508.
- 2330 Radio Canada Int+: The Mailbag. See S 1237.
- 2330 WWCR #3: The Big Backyard. Australian Embassy.
- 2340 Radio New Zealand Int+: Rural Report. Farming and agricultural news.

### Mondays

- 2300 Radio Canada Int+: The World at Six. Half hour news magazine from the CBC domestic radio network.
- 2305 Radio New Zealand Int+: Midday Report. See S 0508.
- 2330 Radio Canada Int+: As It Happens. Live telephone inter interviews with newsmakers around the world.
- 2335 Radio New Zealand Int+: New Zealand Five-Day Weather Forecast. Weather for the continent and mariners.
- 2340 Radio New Zealand Int+: Rural Report. See S 2340.

### Tuesdays

- 2300 Radio Canada Int+: The World at Six. See M 2300.
- 2305 Radio New Zealand Int+: Midday Report. See S 0508.
- 2330 Radio Canada Int+: As It Happens. See M 2330.
- 2335 Radio New Zealand Int+: New Zealand Five-Day Weather Forecast. See M 2335.

### Wednesdays

- 2300 Radio Canada Int+: The World at Six. See M 2300.
- 2305 Radio New Zealand Int+: Midday Report. See S 0508.
- 2330 Radio Canada Int+: As It Happens. See M 2330.
- 2335 Radio New Zealand Int+: New Zealand Five-Day Weather Forecast. See M 2335.
- 2340 Radio New Zealand Int+: Rural Report. See S 2340.

### Thursdays

- 2300 Radio Canada Int+: The World at Six. See M 2300.
- 2305 Radio New Zealand Int+: Midday Report. See S 0508.
- 2330 Radio Canada Int+: As It Happens. See M 2330.
- 2335 Radio New Zealand Int+: New Zealand Five-Day Weather Forecast. See M 2335.
- 2340 Radio New Zealand Int+: Rural Report. See S 2340.

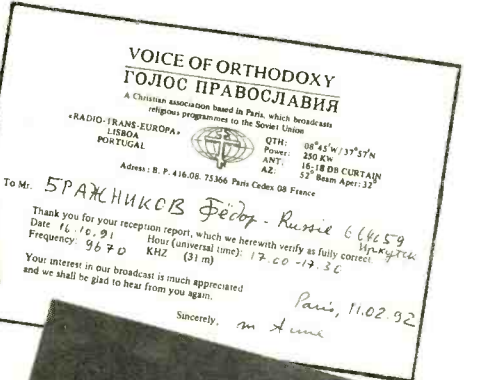
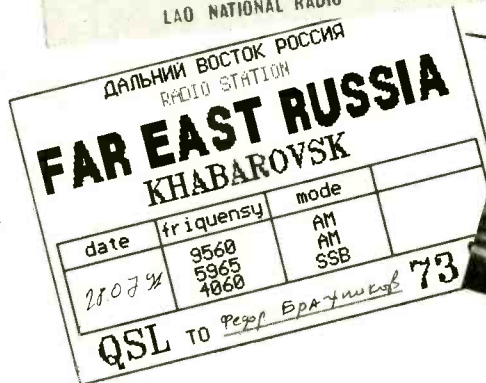
### Fridays

- 2300 Radio Canada Int+: The World at Six. See M 2300.

- 2310 Radio New Zealand Int+: Money Matters. See S 0508.
- 2330 Radio Canada Int+: As It Happens. See M 2330.
- 2345 Radio New Zealand Int+: Pioneer Families of New Zealand. A look back at New Zealand settlement.

### Saturdays

- 2305 WWCR #3: Inspirations Across America. See S 0005.
- 2308 Radio Canada Int+: Innovation Canada. See S 0206.
- 2329 Radio Canada Int+: Earth Watch. See S 0230.
- 2330 WWCR #1: Presidential Radio Address. See S 1345.

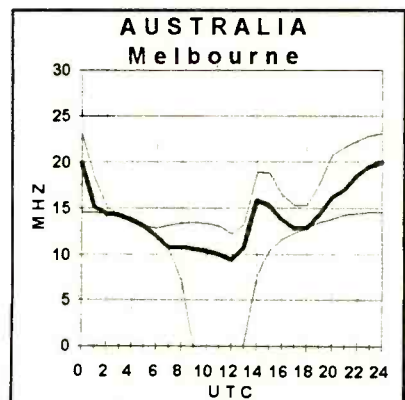
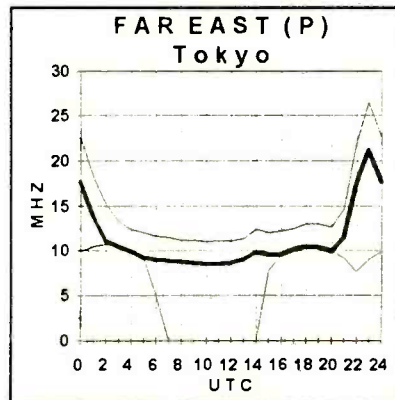
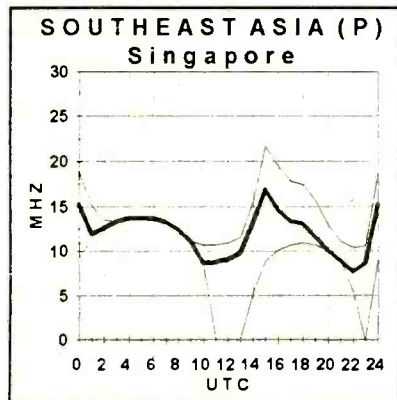
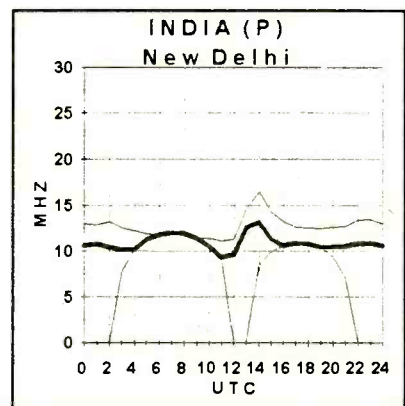
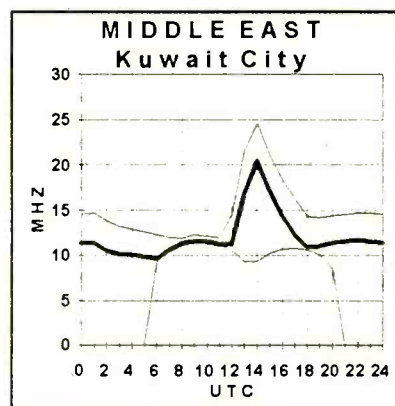
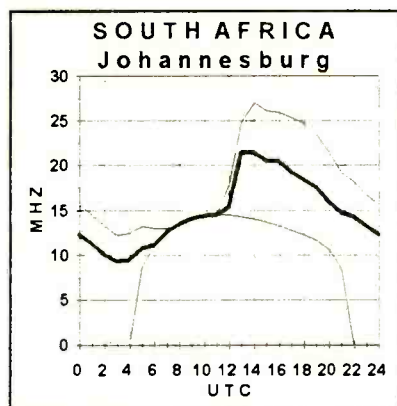
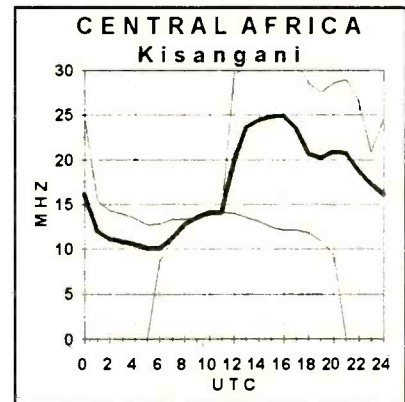
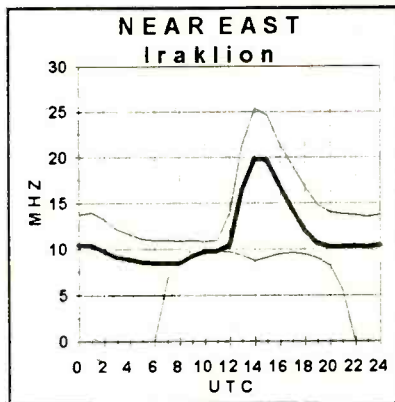
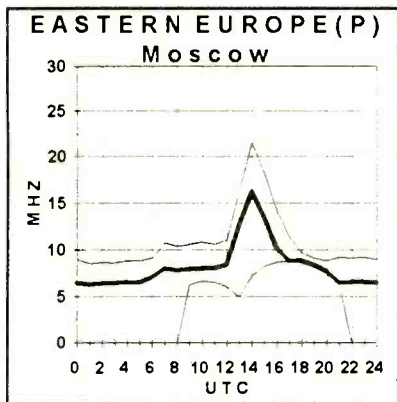
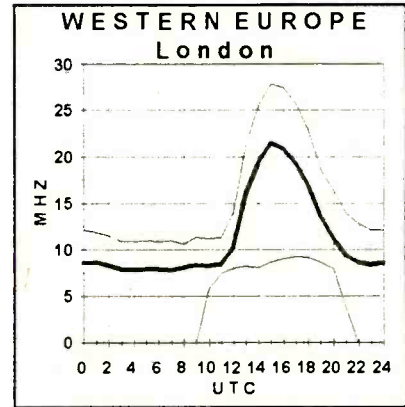
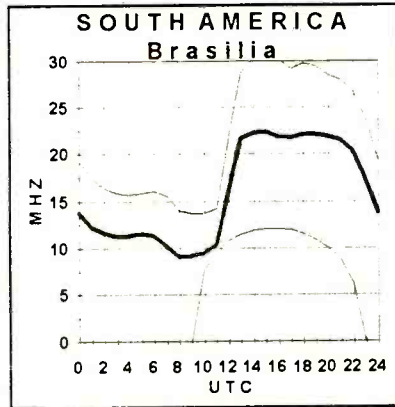
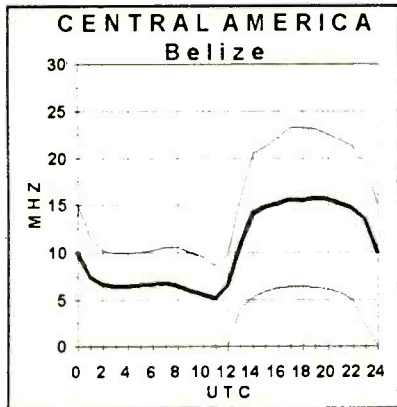


This assortment of QSLs was sent in by Fyodor Brazhnikov, Irkutsk, Russia. They include (clockwise from top left): Lao National Radio, Voice of Orthodoxy, Far East Russia and Voice of Free Asia.

# Propagation conditions: Eastern United States

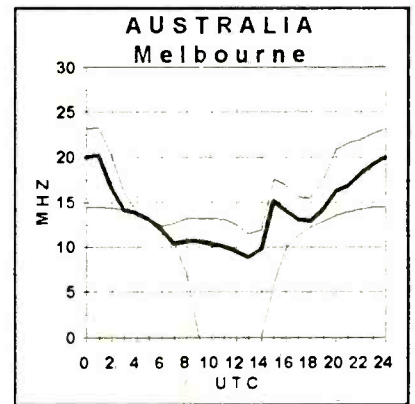
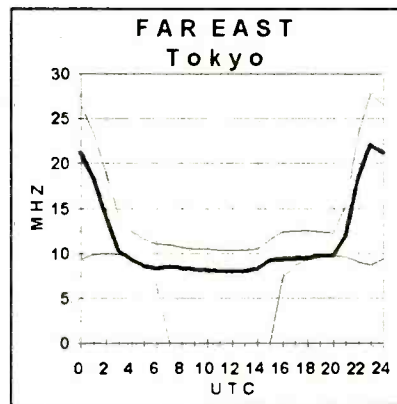
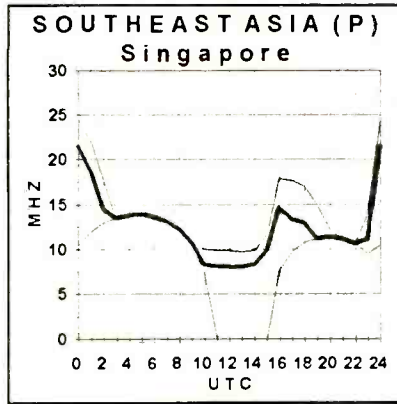
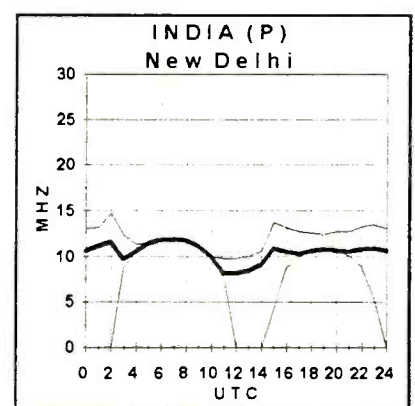
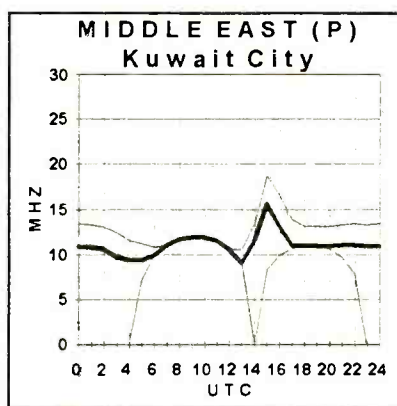
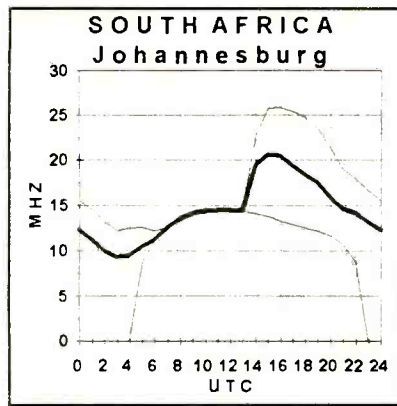
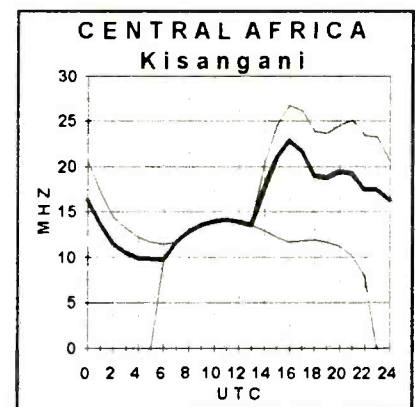
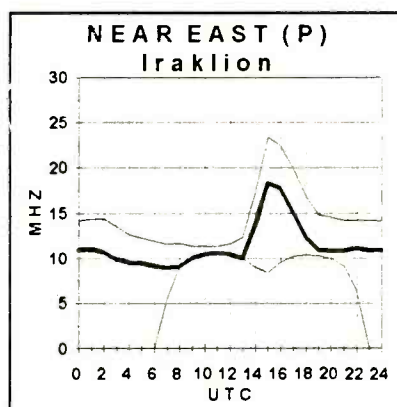
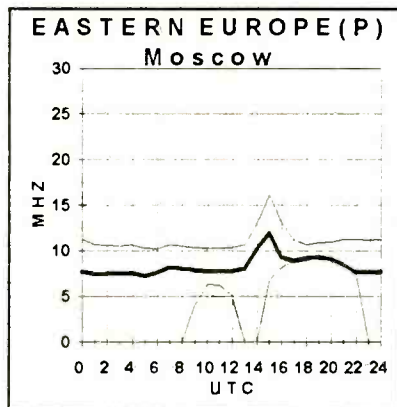
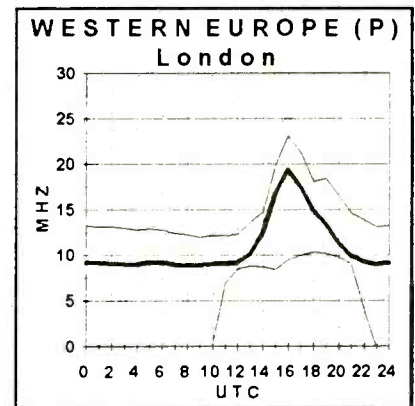
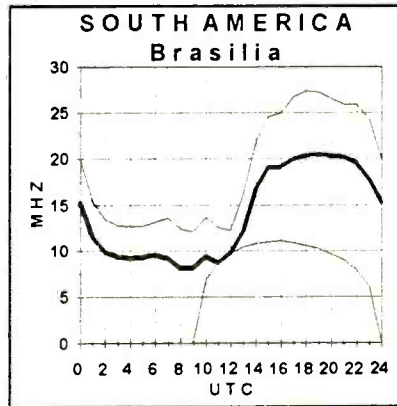
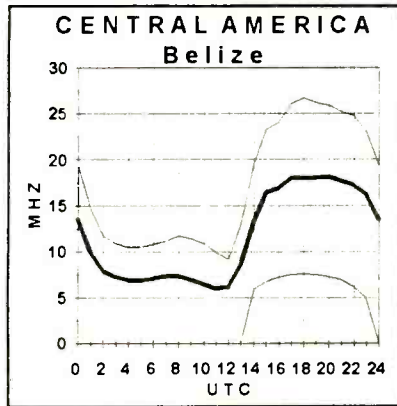
**How to use the propagation charts:** Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of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

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



# Propagation Conditions: Western United States

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. Due to the decrease in the sun cycle, the graphs have been adjusted so that the maximum frequency is now 30 MHz instead of 40 MHz.



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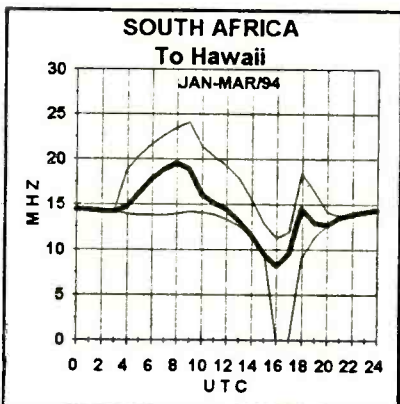
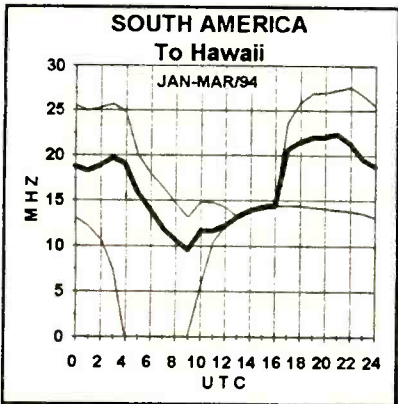
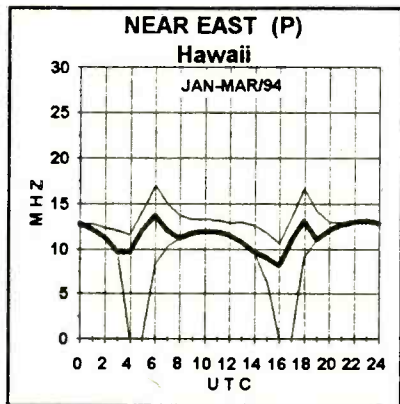
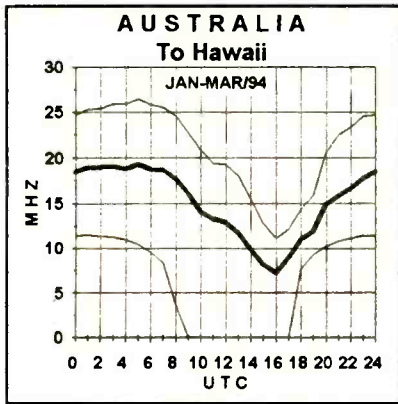
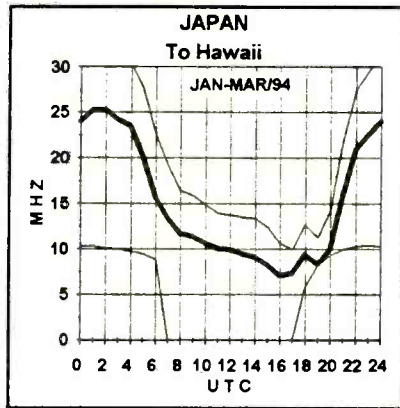
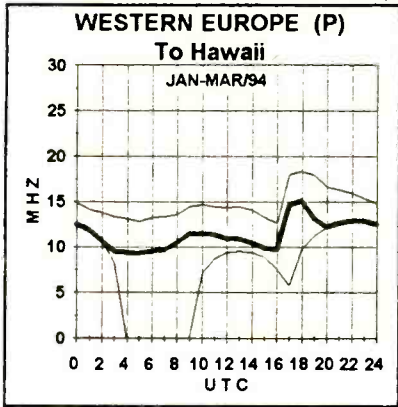


# Special Insert

In response to reader requests, these charts were produced on a space available basis. Please let us know if you found them useful.

## Propagation Conditions: Hawaii

**CAUTION:** These forecasts cover a longer time period than normal, thus the accuracy is not comparable to the regular monthly forecasts.

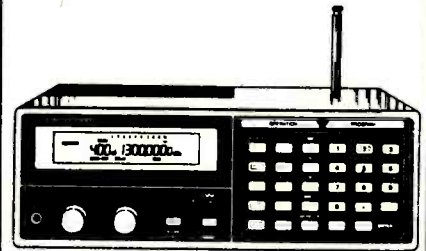


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## Decoding Ship-to-Shore Digital Communications

Tuning through the HF Maritime Mobile Bands you encounter the familiar “chirp-chirp-chirp” sound of an idling SITOR-A signal. Suddenly a string of characters begins to appear on your video monitor. You look on in disbelief at the lines of gibberish that are being printed.

Resisting the immediate temptation to recalibrate your decoder, you readily dismiss the transmission as just another encrypted message, or a faulty ship’s transmitter, and spin the radio dial in search of better catches. If you’re computer literate, you may surmise that these are simply control codes being sent to establish a communication link with a coastal station.

A closer examination of the message content, however, shows what appears to be the same four characters being repeated over and over again. Sometimes they’re regular letters of the alphabet [C, F, K, M, P, Q, S, V, X and Y], at other times they appear as a series of special characters intermixed with numbers [;, !, (, ., 0, 1, ‘, =, / and 6].

We all know that ships as well as coastal stations have ITU-assigned callsigns. It would be natural to assume that if one station were hailing another, they would use the appropriate call sign or station facility name of the station they wished to contact. While this may hold true for voice and CW communications, it’s a different kettle of fish, so to speak, for maritime digital communications.

In the SITOR-A mode, the transmitting station that originates the communications must be able to activate the receiving station’s automatic answerback transmitter. The originating station transmits on one frequency of a paired duplex set, while the receiving station transmits on another. Each of the Maritime Bands contains separate frequency ranges depending on whether the station is a ship (Maritime Mobile) or a shore (Coastal Station) facility.

For example, in the 8 MHz Maritime digital transmission band, frequencies between 8376.5 kHz and 8416.5 kHz are reserved for vessels only, while the frequency range of 8416.5 through 8437.0 kHz is set aside for coastal stations. See Table 1 for a breakdown of the NBDP (Narrow

Number	Letter	QWERTY
0	V	=
1	X	/
2	Q	1
3	K	(
4	M	.
5	P	0
6	C	:
7	Y	6
8	F	!
9	S	'

**Table 2: Maritime Coastal Station IN Translation Table**

Band Direct Printing) Maritime Mobile digital transmission bands. Different frequency ranges have been set aside for voice, CW and digital (SITOR) communications, both for ships as well as shore stations. Maritime NBDP channel spacing normally occurs every .5 kHz, and a frequency in the ship band is usually paired with one in the coastal station range, thus forming a duplex arrangement. This same duplex method is also used for Maritime Radiotelephone channels as well. (Note, however, that not all Maritime Digital channels are paired.) An example of this duplex arrangement is as follows:

Chnl #	Ship Transmits	Shore Station Transmits
2	8377.0 kHz	8417.0 kHz
3	8377.5 kHz	8417.5 kHz
5	8378.0 kHz	8418.0 kHz
6	8378.5 kHz	8418.5 kHz

The frequency offset for the duplex pairs varies by band. Table 1 also identifies the NBDP QSX (Answerback) factors. For example, if you monitor a ship transmitting on 12550.5 kHz, locate the appropriate frequency range in the table and add the “Add Factor” to determine the duplex shore station frequency. (12550.5 + 97 = 12647.5). For this example, the duplex shore station frequency would then be 12647.5 kHz.

Knowing the coastal station frequency, you could also subtract the

### SITOR-A Primer

The Simplex Telex Over Radio (SITOR) code (aka. SPECTOR, AMTOR) is a 7-bit synchronous error correction code based on the CCIR 476 standard. It is used extensively for maritime and embassy communications. SITOR signals are always sent at 100 baud and usually 170 Hz shift.

SITOR Mode A is used for individual communications between two stations. A duplex circuit is normally involved, with the transmitting station on one frequency and the receiving station on the other. As the transmission progresses, the receiving station acknowledges error-free reception or requests retransmission of the last part of the message. It is this procedure that normally makes this mode error-free between two stations. SITOR Mode B is a broadcast only mode from one station to several other stations. Error correcting is done at the transmitting station and there is no feedback from the receiving stations.

For the purposes of this issue, we will focus on SITOR Mode A (aka. ARQ, TOR). It is used almost exclusively for ship-to-shore communications. A number of embassies use it as well. Unlike other modes, SITOR-A is a relatively easy catch. The reasons for this are several. It is an easy mode to recognize — the characteristic “chirp-chirp-chirp” of a transmitting signal is unmistakable. It is also an easy mode to tune on your decoder since the baud rate and shift remain constant. For maritime usage, the signals are concentrated in specific frequency ranges in specially allocated marine bands. Maritime traffic is almost never encrypted, so that message content is always in-the-clear. In addition, even though your monitoring post is not in a position to request repetition of a garbled signal, it is a mode that seems the least prone to garbled text on your screen. And finally, although much maritime

traffic has gone to satellite, there still are thousands of vessels out there that continue to use this mode — and will for a long time to come.

The station originating the transmission is known as the Information Sending Station (ISS). The receiving station is known as the Information Receiving Station (IRS). During an ISS transmission, characters are sent in blocks of three. Watch your screen the next time to observe this characteristic. After the transmission of each block the IRS sends a control character to acknowledge reception or request retransmission. If you sometimes see characters being repeated on your monitor, there is nothing wrong with your decoder; the IRS has requested retransmission. It is possible to identify the IRS sending control characters by its unique one “chirp” sounds, but, as there is no printable message content, there’s not much point monitoring these signals.

On some frequencies you might hear what sounds like two SITOR-A broadcasts. In actual fact, what you are monitoring is the ISS and IRS on the same frequency. Using sophisticated timing protocol, both stations can share a Simplex frequency. During idle periods, you will hear the High and Low tones and your Mark and Space LEDs will alternately flash.

During a transmission, either station may send control codes which change the ISS/IRS arrangement — making the receiving station the sending station, and vice-versa.



Idling Signal

Transmitting Signal

**Table 1: NBDPVessel Frequencies and QSX Factors (see text)**

Freq Range From: (kHz)	To: (kHz)	Channel Range	Add Factor
4172.5	4177.0	1-10	38
4178.0	4181.5	12-19	37.5
6263.0	6267.5	1-10	51.5
6268.5	6275.5	12-26	51
6281.0	6284.5	27-34	46
8377.0	8396.0	2-40	40
12477.0	12519.5	1-86	102.5
12520.5	12549.5	88-146	102
12555.0	12559.5	147-156	97
16683.5	16694.5	1-23	123.5
16695.5	16733.5	25-101	123
16739.0	16784.5	102-193	118
18870.5	18892.5	1-45	810.5
22284.5	22351.5	1-135	92
25173.0	25192.5	1-40	928

appropriate factor to determine the vessel's frequency. Be aware, however, that although this arrangement will work most of the time, vessels and coastal stations, by agreement, may not observe the standard duplex arrangement, and one station may move off frequency (to avoid co-channel interference, etc.). New communications techniques now also permit the shore and ship to share a single (simplex) frequency.

The NBDPSITOR-A protocol utilizes Coastal Station Identification Numbers (INs). When a ship wishes to establish a circuit with a shore station, the vessel transmits the appropriate four-letter IN repeatedly until the shore station acknowledges. Coastal Station Identification Numbers are assigned in blocks by country. For example, block 1090 to 1119 is assigned to the United States. Refer to Table 3 for a selected list of country IN blocks.

Table 2 contains the key to the translation process. For example, suppose a vessel wishes to establish a circuit with WLO, Mobile Radio on 8378.5 kHz. The IN for WLO is 1090. From Table 2, 1090 translates to XVSV and hence you may see something like this on your screen:

**XVSVXVSVXVSVXVSVXVSVXVSV**

If you have just tuned in to a transmission already in progress, it may be difficult to tell which letter is actually the first one in the group.

There are several clues. Generally, if a break in signal occurs, the complete group will be sent once the transmission starts again. Similarly, before the vessel sends a ZCZC start-of-message header, the last four characters preceding the ZCZC should be in the right order.

If all else fails, try the power of deduction. For example, the IN being transmitted could be XVSV (1090) or VSVX (0901) or SVXV (9010) or VXVS (0109). Since 0901 is not in any assigned country range and 9010 exceeds all assigned ranges, the possibilities are reduced to only two. IN 0109 is assigned to Argentina, while 1090 is Mobile Radio. Is the vessel then transmitting to Mobile or General Pacheco Radio? A check of Klingenfuss will show that General Pacheco is not assigned to this duplex pair (this is by no means an infallible rule — vessels will often shift to off-pair frequencies). You may have to resort to actual message language and content, if you're lucky enough to get them, or signal strength, signal direction, etc.

Much of this information can be found in the 12th Edition of the *Radioteletype Code Manual* by Klingenfuss (carried by Universal Radio), an extremely technical work on all the most commonly used digital modes.

**Table 3: Selected Maritime Coastal Station IN's**

0060 - 0069	Ethiopia	1820 - 1889	Chile	2950 - 2959	Sweden	4640 - 4649	Sierra Leone
0100 - 0119	Argentina	1920 - 1929	Ghana	3170 - 3179	Maldives	4650 - 4659	Bahrain
0120 - 0129	Peru	1950 - 1959	Ethiopia	3200 - 3259	United Kingdom	4660 - 4669	Seychelles
0140 - 0149	Bolivia	1980 - 1989	Ireland	3450 - 3459	Israel	4670 - 4679	Czechoslovakia
0150 - 0159	Tanzania	2010 - 2039	China	3500 - 3509	Switzerland	4680 - 4689	Djibouti
0180 - 0189	Cyprus	2070 - 2109	Italy	3560 - 3579	Portugal	4690 - 4699	Qatar
0210 - 0219	Bangladesh	2130 - 2149	Iraq	3620 - 3769	CIS (Russia)	4710 - 4719	UAE
0220 - 229	Cape Verde	2180 - 2189	Kuwait	3800 - 3819	Malaysia	4750 - 4759	Ecuador
0270 - 0279	Algeria	2200 - 2209	Indonesia	3830 - 3839	Thailand	4800 - 4809	Zaire
0330 - 0339	Australia	2280 - 2289	Libya	3850 - 3859	Serbia	4810 - 4819	Yemen
0480 - 0489	Belgium	2300 - 2339	India	3870 - 3879	Uruguay	4820 - 4829	Egypt
0570 - 0579	Romania	2360 - 2409	Japan	3910 - 3919	Venezuela	4830 - 4839	Saudi Arabia
0580 - 0589	Canada	2450 - 2459	Morocco	3950 - 3959	Sudan	4860 - 4869	Surinam
0700 - 0719	Brazil	2480 - 2489	Malta	4010 - 4029	New Zealand	4900 - 4939	Mexico
0770 - 0779	Colombia	2500 - 2509	Monaco	4050 - 4069	Pakistan	4980 - 4999	Syria
0810 - 0819	Bulgaria	2510 - 2519	Cuba	4150 - 4159	Philippines	5010 - 5019	Oman
0830 - 0899	Denmark	2550 - 2599	Norway	4330 - 4349	South Africa	5100 - 5109	Senegal
0990 - 1089	Spain	2740 - 2749	Iceland	4360 - 4369	Turkey	5300 - 5309	Iran
1090 - 1119	United States	2770 - 2779	Netherlands	4400 - 4599	CIS (Russia)	6200 - 6209	Jordan
1590 - 1609	Finland	2830 - 2849	Germany	4600 - 4619	Germany		
1630 - 1669	France	2890 - 2899	Panama	4620 - 4629	Singapore		
1780 - 1789	Greece	2930 - 2949	Poland	4630 - 4639	United Kingdom		

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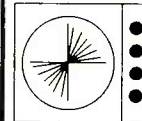
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More often than not, what you see on the screen is not an orderly repetition of four letters of the alphabet, but rather a succession of special characters.

For example: / = ' = / = ' = / = ' = / = ' = / = ' = / = ' =

What you are viewing as / = ' = is the QWERTY version of XVSV. Your decoder/computer did not sense the proper case/shift change. Table 2 also gives the equivalent QWERTY transpositions. **MT**

COUNTRY 92.5  
W W Y Z · F M

# Connecticut Sticks With Country

You'll see their bumperstickers almost everywhere you go! Fifty-seven FM broadcasters serve Connecticut, but everyone knows Country 92.5. Nestled in a cozy little studio complex atop a hill in Waterbury, WWYZ is an advertiser's dream come true: a consistent favorite of the 25 to 54 year old demographic group.

Why do hundreds of thousands of Connecticut Yankees enjoy listening to WWYZ? Country music! "We're not the old twangy country. This is the new country. And how do you define the new country?" asks Program Director Dale Carter. "We define the new country, because there is no tradition for Country music in Connecticut."

In a very competitive market, success doesn't come easily. "We work hard at it. Even if you have an eleven share in the market, 89 percent (of the population) don't know you or don't care. You've got to consistently strive to be a better

catch a tune by Chris Issak, Jimmy Buffett, Creedence Clearwater Revival, The Eagles, Jim Croce, or The Marshall Tucker Band. Country 92.5's audience is in musical transition. "We're like a bridge between what they were listening to and what they're coming to."

This adventuresome approach to programming a country radio station has generated excellent listener response, and overwhelming approval from record companies. Many hit records are first heard on Country 92.5. But, being on the cutting edge can create controversy! When WWYZ added Aaron Neville's *The Grand Tour* last year, they ruffled the feathers of some fellow country music broadcasters. The music directors of two major country stations, WUSN Chicago, and WMZQ in Washington, D.C., wrote to *Billboard Magazine* complaining about Dale and his staff because, in their eyes, Aaron Neville did not have a commitment to country music.

"What the heck does that mean?" quizzed Dale. "What's it take to have a commitment to country music? A cowboy hat? Boots? Spurs? Come on! (Aaron) did a cover version of a George Jones song, 'The Grand Tour,' that was almost better than the original. He also did 'You Never Can Tell,' that Emmy Lou Harris had a big hit with, and we played them both."

A former program director of rock radio stations, Dale uses his experience to enhance his station's sound today: "I don't limit our jocks to just talking about country issues and country artists...

When Michael Jackson is interviewed by Oprah Winfrey on ABC, and millions of people are watching it, our morning show ought to be talking about it."

In Dale's eyes, WWYZ is a full service radio station that just happens to play country music. "The number one reason they come to you is the music. Secondary reasons include news, traffic, and weather. So, the first thing that I did was to hire Dr. Mel Goldstein, who is the name for weather in Connecticut. Everybody knows who

he is. The two criteria I had was name recognition and credibility."

Dennis also fine tuned the station's news coverage. "When I got here, the station buried its news at 20 and 50 (minutes after the hour), which is an old programming gimmick that doesn't work. I believe if you do news it should be at the top and bottom of the hour."

To produce their newscasts, Country 92.5 uses news material provided by the Unistar radio network, and sound bites from Hartford's Channel 3, WFSB-TV, to augment their local coverage. Dale relies on a seasoned newswoman, Elizabeth McGuire, to report local news exclusively for his station. Her voice is familiar to many listeners who remember her as a reporter for New Haven's Channel 8 and rival radio station WTIC-AM in Hartford.

Number one rated WTIC is the station to beat in the Hartford/New Haven market. The 50,000 watt clear channel station is a winner "because they do so well in that 55 to dead category," chuckles Dale. "Ultimately, we're going to take some listeners from WTIC. Now, our listeners will listen to WTIC in the morning to get what they need, and they'll come to us for music. If we can just get our listeners to stay with us in morning drive, we'll see the ratings come up."

Very clever station promotions catch the attention of new listeners, too. Country 92.5 now offers a quarter of a billion dollars to everyone that tunes in. How can they afford it?

"Every state has an unclaimed property list. Connecticut is no different. Ours is 1200 pages long. When you add it all up, it totals a quarter of a billion dollars," reveals Dale. "We're not giving away the money. We're reading names from that list. We're very up front about it. 'Claim your share of unclaimed cash.' It's their money; money they didn't know they had. It comes anywhere from old abandoned bank accounts to insurance premium checks that were never cashed. One lady, whose name we read on the air, called us back, and she had almost \$8000 that she didn't know about! This is a public service that we are capitalizing on!"

Steve Peters, WWYZ's Marketing and Promotions Director, also helps put Country 92.5 on the map, and on everyone's car bumper! Steve is the leader of an amazing public relations group called The Hospitality Team. They're high school and college students and family of staff members, who extend a warm welcome to everyone attending station sponsored events.



Dale Carter loves his country.

radio station. We don't want to be the best country station, we want to be the best radio station, period."

Country 92.5's music is customized for Connecticut listeners by Music Director, John Saville. Dale thinks "John is the best in the business because he'll go outside the format to find things that will fit our radio station. We're the station where you'll hear Mary-Chapin Carpenter and everything you'd expect, but we're also going to branch out a little bit." Don't be surprised if you

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They produce a small miracle: Country 92.5 never sends a bumpersticker through the mail, or leaves them at retailers for people to pick up. Every Country 92.5 sticker you'll see across New England was handed out, one at a time, by members of The Hospitality Team! "Frankly," Dale beams, "we have the poorest distribution system for bumperstickers that I've ever seen, yet we're the most stickered station I've ever seen!"

Hundreds of stickers are given to listeners at Country 92.5's all-star concert and fair: The Great American Music Fest. A special team of employees work all year long to produce this first-class annual summer event at The Big E Fairground in West Springfield, Massachusetts. Last year, over 30,000 people attended! The fairgrounds were packed with vendor booths filled with western wear, food, crafts, and novelties to enjoy. The music was spectacular, served up by the hottest country show of the summer, "The Black and Wy Tour" featuring Clint Black and Wynonna Judd.

"I believe a radio station has to have a one to one relationship with its listeners, and that's what we've stressed to our jocks on the air. You've got to visualize one person. You've got to talk to that one person. We're making every individual listener important."

Dale enjoys working for a financially stable broadcasting company established in the 1930s. "This station doesn't have a mortgage, so we have flexibility to do a lot of things. The ownership allows some very creative people to come together and do what we need to do. We love coming to work at this place. This station, above all else, is a family. It's paid for and we work with people who care. It's as simple as that and it comes through the speakers."

### Bits 'N' Pieces

• After ten years, it's official. The United States has finally selected an AM stereo standard. Motorola's C-Quam system has gained FCC approval as the only way to provide two channel sound via medium wave. Many radio engineers still believe that the rival Kahn AM stereo system is technically superior, but car radio manufacturers embraced the Motorola system exclusively. What impact this will have on AM radio's future remains to be seen.

• Purple dinosaurs are about to invade your radio! Starting this month, programming syndicator MJI Broadcasting begins distributing *Bedtime With Barney*, a ten minute feature to be heard nationwide. According to a report in *USA Today*: "Barney will read an original or traditional tale, and sing a song designed to transport rug rats off to dreamland." Look for it on your

local stations at 7:30 pm Eastern and Pacific Time.

### Mailbag


AM radio stations across America actually gained listeners in 1993, according to an article from *Broadcasting Magazine*, sent to us by MT reader, Bruce Portzer, in Seattle, Washington. For only the second time in 17 years, FM broadcasters did not see a gain in audience share. Radio analyst Jim Duncan based the study on recent nationwide Arbitron ratings. Jim discovered: "All of that decrease, and more, was due to the success of talk radio." Nationwide, 74.4% of all listening was to stations on FM. Thanks for the insight, Bruce!

### International Bandscan

• The BBC has resorted to desperate measures hoping to retrieve the audiences they have lost to British independent radio stations. Radio One, their popular rock music network, has lost nearly half its audience since the mid 1970s. New commercial broadcasters, like Atlantic 252, Virgin 1215, and London's Capital FM, have had an destructive impact on Radio One's former monopoly, but the BBC is not standing still.

Matthew Bannister, the new Controller of Radio One, has released five classic disk jockies in an effort to bring new blood and a younger sound to the network. 24 year veteran host of the Saturday and Sunday *Morning Show*, Dave Lee Travis, has been replaced by Danny Baker of Radio Five. Simon Bates has left his mid-morning slot of sixteen years to Simon Mayo of Radio One's *Breakfast Show*. Also gone are Allan "Fluff" Freeman, overnighter "Whispering" Bob Harris, and heavy metal expert Tommy Vance. Tommy quickly accepted a position with competitor Virgin 1215.

In the shuffle, another legend, John Peel, has been promoted to host a Saturday afternoon show. It's the first time in 20 years John has had a regular daytime gig on Radio One. The BBC's most recent expansion network, Radio Five, will become a news and sports network, targeted toward to 25 to 44 year old listeners, eliminating most of the programming they have been broadcasting for children and young teens. Radio Four will remain active on its long wave frequency of 198 kHz. Hopefully, these changes will slow the erosion of listeners away from all the services of the BBC.

Many thanks to our reporter, Ron Carruthers, in Edinburgh, Scotland, for this update. Until next month, happy new year! and happy trails! 



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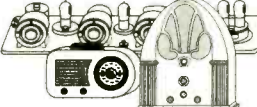
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## Clandestine Information Sources

Several *MT* readers, including new *ACE* publisher Rob Keeney of Overland Park, KS, wrote in to ask about this year's highly successful October *Monitoring Times* convention in Atlanta. Among this year's festivities was a session about clandestine broadcasting, hosted by yours truly. We discussed several important issues, including a common question from our readers: "Where can we locate current information about political clandestine stations?"

*MT* is one obvious source. Both the "Outer Limits" and Glenn Hauser's "Shortwave Broadcasting" column regularly feature news items about clandestines. Some of these are drawn from the very expensive *World Broadcast Information* report issued bi-weekly by the BBC Monitoring Service.

For instance, BBCMS recently noticed that UNITA's Angolan rebel voice Vorgang, better known as the **Voice of the Resistance of the Black Cockerel**, has a new schedule. It uses 4960/9550 kHz between 0445-0845 UTC, 7290/11830 kHz between 1045-1440 UTC, and 4960/7290 kHz between 1630-2200 UTC. BBCMS also says that the Norway-based transmitter for the **Democratic Voice of Burma** has changed its 1430-1500 UTC frequency to 11850 kHz.

No single publication is able to cover all clandestine station news. Clandestine buffs need to consult various sources. The new 1994 *Passport to World Band Radio* contains both schedules and addresses for dozens of shortwave clandestines.

The *World Radio and Television Handbook* normally omits coverage of unlicensed stations, but the 1993 *WRTH* contains a fine special clandestine section written by European Dxpert Matthias Kropf. Both *WRTH* and *Passport* are widely available from *MT* advertisers.

Two other North American sources fall into the "must have" category. Gerry Dexter's bi-monthly *Clandestine Confidential* newsletter covers worldwide clandestine news. Annual \$10 subscriptions or a \$25 (plus \$2 s/h) bound complete set of newsletters since 1984 are available from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147.

*MT* contributor Hans Johnson of Columbia, MD, now writes the monthly "Listener's Notebook" column in *The Journal* of the North American Shortwave Association. Hans speaks Arabic, and is an expert on Middle Eastern clandestines. The USA's largest shortwave club has plenty of other useful features in its bulletin. Annual dues are \$25 via NASWA, 45 Wildflower Lane, Levittown, PA 19057.

### Zündel

Our readers are reacting to Ernest Zündel's quasi-clandestine **Voice of Freedom**, heard on

15420 kHz at 2200 UTC Sundays via **WRNO**. David Gervals of College Place, WA, has listened to the station for three months. He objects to recent *MT* characterizations of Zündel, saying that he has never heard anti-Jewish or neo-Nazi program content from the V of F. On the other hand, European clandestine buff Harold Kuhl of Goettingen, Germany, writes in to say that he listened repeatedly to Zündel's German language show formerly on **WWCR**. Harold found that "there's absolutely no doubt that this guy spreads fascist ideas and views."

Zündel's 507 page book, *Did Six Million Really Die*, maintains that the World War II Holocaust is fiction. He says that no Nazi gas chambers or death camps operated in Europe during the 1940's under German jurisdiction. The V of F often explores this theme, so you can judge the station philosophy for yourself.

### Pirates in Bay Areas

Mark Seiden of Miami, FL, points out that metro Tampa may have the largest concentration of local pirates in the USA. Several DX South Florida members have been tracking current activity.

The most prominent Tampa pirate is **Base 90.1** or **Base 98.3**, with the ID depending on frequency usage. The station, which is a commercial operation serving Tampa's black community with local ads and talk shows, has continued broadcasting despite a \$16,000 Notice of Apparent Liability fine from the FCC in October.

*DXSF* reports several other local Tampa pirates in the 1600-1700 kHz range, including a Travelers Information Station on 1620 kHz known as **Radio Free Ybor**. We thank *DXSF* editor Terry Krueger for his permission to relay this news.

Another bay area, the San Francisco-Oakland complex, is still a local pirate hotbed. John Herkimer of Caledonia, NY, forwards an October 24 *New York Times* article about **Radio Free Berkeley**. Station operator Steven Dunifer has defied a \$20,000 FCC fine, and still broadcasts on 88.1 MHz. He has announced future plans for a 500 watt shortwave transmitter!

Another station, **San Francisco Liberation Radio**, is nominally scheduled at 0400 UTC Thursdays and Saturdays on 93.7 MHz. RFB is generally active UTC Mondays at 0500 UTC. Thanks go to Wayne Pierce of Oroville, CA, for the schedules.

### Equipment

Just about every month I get inquiries about receivers. Most of us don't have fancy equipment, and some of us worry that a \$2000 receiver

is needed for success in pirate DXing. David Bland of Columbia, SC, suggests that we clear up this myth.

Actual pirate loggings that we print this month were snagged on a great variety of receivers. David uses a DX-440, as does Ed Silvia of Taunton, MA. Gigi Lytle of Lubbock, TX, regularly hears pirates on another inexpensive portable, the Sangean 803-A. *MT*'s Skip Arey has several receivers, but he likes his classic Collins R-390A tube gear. Mark Seiden is having success with his fancy Japan Radio Corporation 93.

I have heard pirates on the multi-kilobuck ICOM 9000, my \$300 Sony 2010, and an old used Sony PRO-80 handheld. Expensive rigs are nice, but our reporters prove that you don't need an impressive new Watkins Johnson HF-1000 to hear pirate transmissions.

### What We Are Hearing

North American shortwave pirate activity continues at a very high level. This is particularly true around holidays, so Christmas and New Year's should be excellent times for pirate chasing. Many stations are QSLing reports that we listed in prior *MT* issues. Both Scott Krauss of Cleveland, OH, and our own Uncle Skip Arey bagged **Voice of Bono** QSLs. Scott's mailman also delivered a nice **North Jersey Coast Radio** verie.

Correspondence maildrops used by stations reported this month include PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 605, Huntsville, AL 35804; PO Box 17534, Atlanta, GA 30316; and PO Box 293, Merlin, Ontario N0P 1W0. Three mint first class stamps should be sent to domestic drops, with \$1 US required for mail outside your country.

**Altered States Radio**- 7415 at 0000. This hard rocker can sometimes be identified by their music from the old "Outer Limits" TV show. Addr: Merlin. (Mike LeClerc, Somers, CT)

**CRSM**- 7413 at 2330. Rob Roy now uses this call at **Radio Scottish Montreal** for his Scottish ethnic programming from Quebec. They recently have relayed New Zealand's pirate **KIWI**. According to the station, their new European and Oceania relays have generated a lot of mail. Addr: Merlin and Blue Ridge Summit. (Max Syko, Gaylord, MI; Silvia; direct from the station)

**CSIC**-Pirate Rambo's Canadian powerhouse still mixes rock music, political commentary, pirate radio coverage, and relays of other pirates. Every show begins and ends with the classic novelty tune "Psycho Chicken." Addr: Merlin and Blue Ridge Summit. (Scott Gentry, Matteson, IL; Silvia; Krauss)

**Grand Ol' Opry Radio**- 7414 at 2315. This new country music pirate has stolen both the call sign and format of licensed medium wave giant WSM in Nashville. Addr: Huntsville. (James Laughlan, Youngstown, NY)

**Heavy Dude Radio**- 7416 at 2300. Rob picked up this

interesting Europirate via **North American Pirate Relay Service**. It features rock and reggae music hosted by a man with a Caribbean accent. Though they use an address in Lund, Sweden, they can be contacted through NAPRS. Addr: Wellsville. (Rob Ross, London, Ontario)

**He Man Radio**- 15050 at 2030. He Man and He Man Jr. still produce an impromptu mix of heavy-handed sexism parodies, sports coverage, and imaginary voyages through Ohio. Their frequencies vary on both 41 and 19 meters. On Halloween they showed up on **La Voz de Alpha 66's** sold 6666.6 kHz channel. Addr: Blue Ridge Summit. (Mike Hardester, Jacksonville, NC; Laughlan; Arey; Gentry; Ross)

**Midnite Radio**- 7470 at 0200. Slam and Zwol appear occasionally with parody material, proving that FCC bust rumors from a couple of years ago have not silenced them. Sometimes their announced telephone number works, but sometimes it doesn't. Addr: Blue Ridge Summit. (William Hassig, Mt. Prospect, IL)

**Omega Radio**- 7465 at 0030. If the endless fire and brimstone preachers on licensed USA shortwave stations are not your cup of tea, Dick Tator's Christian rock format provides an alternative. Addrs: Wellsville and Blue Ridge Summit. (Alan Masyga, Winona, MN; Bland; Silvia)

**Radio After Dark**- 7415 at 0230. This new station is off to a promising start. Early program content has been dominated by criticism of politicians and lengthy sexual innuendo sketches featuring well-known DX personalities. Addr: None yet. (Seiden)

**Radio Airplane**- 7465 at 0315. Captain Eddy's "FCC Fighter" aircraft transmitter has been pretty active lately, and is generating better signals. He uses a singing jingle during many station ID's. Addr: Wellsville. (Silvia, Seiden, LeClerc, Gentry)

**Radio Beaver**- 7415 at 1445. Bucky Beaver's popular Canadian pirate has added backwards masked voices to his technical bag of tricks. He always signs off with old TV show music from "Leave It to Beaver." Addr: Merlin. (Arey, Gentry, Ross)

**Radio Free Salvation**- 7470 at 0100. Pastor Billy delivers sermons that attack his fellow preachers like Dr. Gene Scott and Brother Stair. (Sound familiar?) Instead of buying time on **WRNO**, he uses the pirate airwaves for this purpose. Addr: Huntsville. (Syko, Seiden)

**Radio Gumby International**- 7465 at 0030. Gumby has branched out from the cartoon industry into pirate radio. He plays music and discusses the North American pirate scene. Addr: Merlin. (Hassig, LeClerc, Masyga)

**Radio Halloween**- 7412 at 1500. Seasonal pirates like this one appear on various holidays. Their eerie programming has made annual appearances lately, so check for them again next October. Addr: Wellsville. (Ross, Arey)

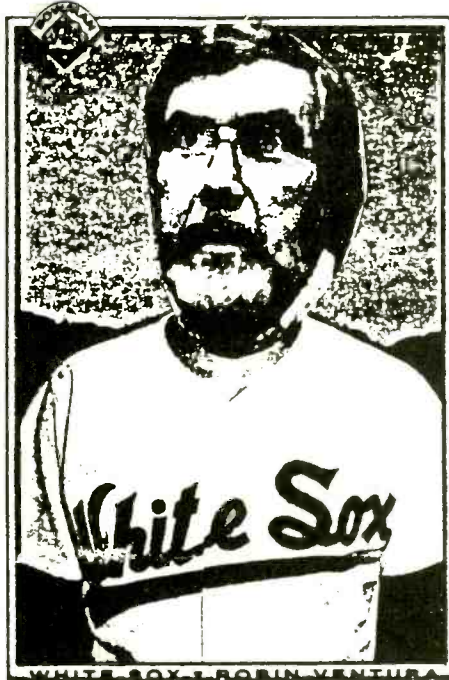
**Radio Strangelove**- 7465 at 0030. Here's another new one with doomsday military programming modeled after the movie "Dr. Strangelove." Although they have been widely heard, they are not yet communicating with listeners. Addr: None. (Lytle, Gentry, Masyga)

**RBCN**- 7475 at 0130. Comedy productions from Radio Bob's Communications Network have returned. Their entertainment value is very good. Stations like this one create real interest in pirate DXing. Addr: Atlanta. (Seiden, Masyga)

**RKNA**- 7410 at 2330. Harry I. Ball still transmits rock music without a license. Addr: Wellsville. (Masyga)

**Secret Mountain Laboratory**- 7470 at 0345. This friendly veteran station has a ten year history. Sometimes they relay other pirates from "Hilo, Hawaii," but they also program their own soothing country folk music. Addr: Wellsville. (John Knight, Fort Smith, AR)

**Solid Rock Radio**- 7465 at 0030. Dr. Love spins rock tunes while promoting pirate radio and publications such as **ACE**. Uncle Skip's QSL arrived in only 15 days! Addr: Wellsville. (Arey, Silvia, Masyga)



*WLIS trades Ian to Chicago.*

**Tube Radio**- 7425 at 2115. Ray Cathode generally spins rock tunes while discussing radio tubes, but he produces special programs in conjunction with holidays. Addr: Blue Ridge Summit. (Ross)

**Voice of Stench**- 7415 at 2245. Eddie Egghead Johnson says that his punk rock music shows are live. He recently transmitted a lower sideband broadcast on He Man's upper sideband frequency, producing an artificial ISB feeder effect. Addr: Wellsville. (Ross, Laughlan)

**WEED**- 7465 at 0500. Their distinctive style includes very slick rock music productions that always include jingle voice-overs and marijuana advocacy. They tend to operate at relatively late times of day, and have snuck up on us as one of the most active pirates of 1993. Addr: Huntsville. (Leclerc)

**Witch City Radio**- 7469 at 2345. Claiming to broadcast live from Salem, MA, this is another seasonal Halloween station that could reappear next year. Addr: Wellsville. (Hassig)

**WJLR**- 7465 at 0300. Captain Crook at John Lennon Radio plays diverse rock over his upper sideband transmitter. One recent program showed up on the unusual 13560 kHz frequency. Addr: Blue Ridge Summit. (LeClerc)

**WKND**- 7416 at 2300. After a long dormant period, Radio Animal is back with rock music shows. He formerly was among the most active North American pirate stations. New Addr: Blue Ridge Summit. (Silvia, Arey)

**WLBG**- 7413 at 0230. I am not making this up! This one appeared during the Atlanta **MT** convention with a "We Love Bob Grove" slogan, interviews with conventioners, ads for Grove discount prices of \$79.95 for kilobuck receivers, and coverage of Larry Van Horn's wild party. Addr: None. (Bland)

**WLIS**- 7470 at 0230. Jack Boggan's "We Love Interval Signals" format is still distinctive. He issues dozens of different QSLs. As we see here, Nolan Ryan's sparring partner Robin Ventura now looks very much like Ian MacFarland. Addr: Blue Ridge Summit. (LeClerc, Ross, Laughlan, direct from the station)

**WREC**- 7413 at 0045. Radio Free East Coast is making pirate news. Host P.J. Sparks programs rock music and seasonal shows. He relays other stations, sometimes including Europirates like **Radio Merlin International**. Plus, he experiments regularly on 49 meter frequencies such as 6295 kHz. Addr: Wellsville. (Syko, Laughlan, Ross, Gentry, Hassig)

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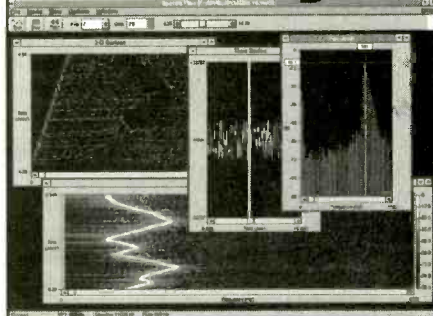
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## The Best of the Best

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Sounds like a beer commercial, right? But there are some monitors who can actually afford to do it. Many monitors write your Fed File editor and ask what is the best equipment to buy for federal monitoring. They also ask what equipment I use since I seem to have such good success. It appears that some monitors are still not hearing much, even though they have the proper equipment. They also (as I am) are in hunt of the perfect monitoring system.

### Personal Best

Many monitors think that because I write for *Monitoring Times*; I must have access to an incredible array of sophisticated monitoring equipment. To the contrary, my radio room is typical of most monitors. From time to time I do have the privilege of being able to test and evaluate a sophisticated piece of equipment provided by a manufacturer for review. However, after the review, most of it goes back to the factory.

Although my monitoring post is jammed packed with receivers and associated gear, it's nothing spectacular. In fact, many readers are surprised to see that I have great monitoring



**Left to right:** Built into the bookcase: Hallicrafters S-62B shortwave radio; below, Amber CRT for intercepts BBS. **Far left:** Tektronics RM-45A Oscilloscope. **Bottom shelf of desk (l-r):** Antenna rotator control for Grove Scanner Beam on roof, Sears shortwave receiver; **above Sears radio:** BC210XLT, PRO-2006, PRO-2004; **middle shelf:** PRO-2020; top shelf: Realistic® 16 channel programmable. Realistic® DX-440, GE RF-2600, Uniden BC142, Uniden BC170.

Antenna systems include the Grove Scanner Beam, two Lakeview discons and two random length SW dipoles. I also have a PRO-37 that goes with my everywhere.

success with such ordinary equipment. I consider that a compliment and proof that you don't have to go into debt to have an enjoyable and efficient monitoring system. The most important component of any monitoring shack is the person operating it. So don't be too intimidated when a blowhard starts bragging about how much expensive equipment he/she has. The best monitoring system is the one that works best for your monitoring lifestyle.

Still, if you win the state lottery, inherit a bundle or strike gold in the back yard, you might consult the Federal File's list of the best of the best. The following listings are your editor's opinion and are not an endorsement of any one company's equipment.

### Receivers

Even if money is no object, we are limited by what is generally available to the average consumer. With that in mind let's take a look at the top receivers (and what they cost).

#### 1. Watkins-Johnson HF-1000 \$4000

A truly stunning professional-grade receiver that promises the clearest reception of any shortwave radio. With (DSP) Digital Signal Processing, the HF-1000 may be setting the new standard that future high-end receivers will have a hard time matching. Not available at press time.

#### 2. ICOM R9000 \$5200

A dream machine with an amazing frequency range (100 kHz to 1999.8 MHz) and a built in spectrum analyzer. The ICOM R9000 combines high-quality performance with enough knobs, dials, bells and whistles to keep even your worst gadget freak happy for decades.

#### 3. JRC NRD535D \$1700

The triple superheterodyne receiving system, superb sensitivity, selectivity and image rejection capabilities of this radio makes clear shortwave reception a breeze.

#### 4. AOR AR3000 \$1100

The AR-3000 has the widest frequency coverage of any readily available receiver on the market (100 kHz to 2036 MHz) and its scanning capabilities, coupled with computer control, makes this receiver a mega-dream machine capable of 3,000 channel reception!

#### 5. Realistic® PRO-2006 \$539

What! Pick a scanner for our dream shack that costs under a thousand dollars? Why not? The PRO-2006 is a solid performer that features wide frequency coverage with strong signal overload immunity. It also is a radio-electronic hacker's dream because it can be easily modified well

beyond its design capabilities. Reception of the military UHF bands (225 to 400 MHz) on the PRO-2006 is exceptional.

### Dream Antenna Systems

Our dream equipment is pretty worthless without an antenna system to match. Let's dip into our lottery winnings again and see what's considered the cream of the crop.

#### 1. Create Log Periodic CLP5130-1 \$300

Sturdy professional construction, coupled with wide frequency sensitivity (50-1300 MHz) and 11 to 13 dB gain make this one of the best antennas on the market. Mounted vertically (and on a ham rotator capable of ascension and declination selection) would make FLTSATCOM reception a breeze.

#### 2. Grove Scanner Beam \$59.95

Although over \$200 less than the Create CLP5130, when it comes to reception, the Grove Scanner Beam is its equal. A monitor would be hard pressed to tell the two antennas apart when connected to a scanner. The main difference is in the construction materials used. Where as the Grove is made for general use, the Create is built to withstand a hurricane. However, my personal Grove Scanner Beam has been tough enough to hold up to severe Texas storms and shows no signs of giving in.

#### 3. Diamond D130J Discone \$80

While you are trying to zero in on that weak FLTSATCOM communication with your super-duper beam antenna, your scanner is missing the other communications that are going on around you. A good professional ground omni-directional antenna is needed to capture those signals. The Diamond D130J is an excellent antenna with wide frequency coverage (25-1300 MHz) for general use.

The receivers and antenna systems listed above are just a small sample of what is available to build your dream monitoring post. Check out the advertisements in this issue for sources from which to purchase this equipment (and much, much, more). But remember, great monitoring can be had with systems costing a tenth as much. Getting the most out of federal monitoring is dependent on what experience, know-how and ingenuity you put into it, not how much money you spend.

If you have a "dream system" that reflects the above qualities, the Federal File would like to hear from you. Send your photos to the author in care of this magazine. Keep in mind we are not looking for mega-expensive monitoring posts, but for those who show creativity and ingenuity



in designing a monitoring post that is right for their needs, not to impress others.

### An Offer You Can't Refuse!

The Federal File depends upon your input, and never more so than now. We want to hear from you about your monitoring adventures, favorite frequencies and topic ideas.

Here at the start of a new year, we would like to know if the Federal File is addressing the issues in which you are interested and is providing the information that the federal monitoring hobbyist demands. Now is your chance to tell us and to receive something for your trouble.

If you will xerox and fill out the accompanying questionnaire and send it to your Federal File editor (Steve Douglass at 6303 Cornell, Amarillo, TX 79109) along with a #10 SASE, we will send you our exclusive list of the top 100 federal frequencies! All you have to do is tell us how you feel about the Federal File. Internet members can also contact the Federal File editor via America On Line. Just address your E-Mail to "Steve1957@aol.com."

### Emptying The Mailbag

#### Vint Hill Closing

Henry McGann from Virginia sent in a news clipping detailing the Pentagon's decision to close down the Army's Vint Hill eavesdropping facilities. *Monitoring Times* subscribers might remember that some intrepid *MT* readers tracked down one of the mysterious "spy numbers station" to Vint Hill.

Long suspected as being one of "Washington's giant ears" Vint was the only Army base ordered to shut its doors during the most recent round of base closings because (as the Pentagon puts it) it was "low in military value." As a result, about 2,650 soldiers, civilians and contract employees at Vint Hill will be either posted elsewhere or will lose their jobs by 1998.

The army expects to save \$19 million a year, but Farquier County stands to lose its largest employer and an \$85 million payroll. It had been rumored for years that Vint Hill was packed with state-of-the-art signal intelligence gear used for eavesdropping on foreign countries, military, diplomatic and government radio transmissions for the CIA, NSA and the Pentagon. The official mission of Vint Hill is stated as "Research and development of signals warfare technology for military intelligence."

According to James Bamford's 1982 book, *The Puzzle Palace*, the Vint Hill facility once trained its mighty antenna arrays on nearby Washington's "Embassy Row" eavesdropping on international embassy traffic. In 1974 the facility's mission was changed to that of a research center concentrating on producing new signal

## The Federal File Questionnaire

**What type of federal monitoring do you listen to the most ?**  
(circle one)  
A. Military  
B. Utilities  
C. Federal law enforcement  
D. U.S. Government  
E. other \_\_\_\_\_

**What type of federal monitoring do you listen to the least?**  
A. Military  
B. Utilities  
C. Federal law enforcement  
D. U.S. Government  
E. other \_\_\_\_\_

**What type of federal monitoring coverage would you like to see more of?**  
\_\_\_\_\_  
Less of ?  
\_\_\_\_\_

**If you could change something about the Federal File, what would it be?**  
\_\_\_\_\_  
\_\_\_\_\_

**What do you like most about the Federal File?**  
\_\_\_\_\_  
\_\_\_\_\_

**What do you like the least?**  
\_\_\_\_\_  
\_\_\_\_\_

**Give us a grade : (A,B,C,D,F) \_\_\_\_\_**

intelligence technology, including a system that helped disrupt Iraqi communications during the Gulf War.

Although your Federal File joins those in Virginia who mourn the closing of Vint Hill, I can't help but look forward to the "going out of business sale." In any event, the closing marks the end of an era and is another symbol that the Cold War is definitely over.

#### Trunked in Alabama

From "AI" (an Alabama monitor) comes a new list of a federal trunking system frequencies to soon be used nationwide for DOD (and non DOD users). This system is going on line nationwide now (mostly at military bases) but also in some larger cities. Both DOD and other

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government agencies can use this DVP equipped system.

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| <b>Group 3:</b><br>406.550/415.350<br>407.350/416.150<br>408.350/416.350<br>409.150/417.150<br>409.950/417.950  | <b>Group 4:</b><br>406.950/414.950<br>407.750/415.750<br>408.550/416.550<br>410.150/418.150                                       |

## Back to Basics

With the holidays now past and 1994 settling in, I hope that the holidays were enjoyable for you and that you are all ready to start another year of radio activity.

A letter recently arrived from a reader in Boulder, Colorado, who has stumbled across some maritime frequencies. Being new to maritime monitoring he had some questions which are worthwhile answering in the column, since I suspect many others may be wondering about the same things as well.

Our reader mentions hearing one side of English and Spanish conversations between coast stations and cruise ships. Some traffic appears to be quite informal and some of it appears to be official and/or technical.

Most single sideband (SSB) transmissions in the maritime service are duplex, especially when a coast station is involved. Unlike the VHF channels, where there is a standard 4.6 MHz offset



Larry Van Horn

The tugboat June Pickett.

between the two duplex frequencies, there is no standard HF offset. The following are the customary frequency offsets to subtract from the coast

station HF voice transmit frequencies to find the ship station transmit frequencies:

Coast Station	Offset
4 MHz	292 kHz
6 MHz	301 kHz
8 MHz	524 kHz
12 MHz	847 kHz
16 MHz	882 kHz
18 MHz	975 kHz
22 MHz	696 kHz
25 MHz	1075 kHz

Table 1: Loggings

Chan	Freq	Time	Date
1201	13077	0030Z	11/03/93
1202	13080	1845Z	11/05/93
		2025Z	11/05/93
		1817Z	11/08/93
During one of these loggings, the station identified as "ATT High Seas."			
1203	13083	2000Z	11/05/93
		1558Z	11/03/93
		1725Z	11/05/93
"KMI/ATT" The operator listed ships being served by this frequency, along with their callsigns. He also said that this data is aired each four hours starting at 0000Z. He also gave the station's address and phone number in Inverness, CA.			
13092	1500Z	11/04/93	
As above, the operator listed the ships that are served by this frequency and said, "Wishing everyone at sea a good morning."			
13098	1840Z	11/08/93	
		1645Z	11/05/93
"ATT Operator" "ATT High Seas"			
13104	1955Z	11/08/93	
"Hold on for operator" "High Seas"			
13110	2030Z	11/08/93	
"The call was 14.25 minutes"			

The next question is how far apart are the channels spaced? To this there is a much simpler answer — 3.0 kHz on HF.

Our reader had a few loggings (shown in Table 1), only one of which was attributed to a specific station, so let's see what clues we have to figure them out.

The first three frequencies have their channel numbers already identified by the operator. The remaining four are channels 1206, 1208, 1210 and 1212 respectively. Now who are they? The activity on channel 1203 was identified by the operator as KMI/ATT; therefore, we know that that is the High Seas station at Dixon, California, KMI, one of three such stations owned by AT&T.

WOM in Fort Lauderdale, FL, sends its traffic lists every four hours starting at 0100Z, and therefore, we can assume that the list sent on channel 1206 came from there. Apart from these, channels 1201, 1202 and 1203 are all used by KMI and it is reasonable to assume that these probably were their transmissions. Channels 1206 and 1208 are both used by WOM.

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WOO, Ocean Gate Radio in New Jersey, the third AT&T station, may have been the origin of the logging on channel 1210, as they do use this frequency as well as channel 1203. With a bit more logging, or more information as to the ships with whom the stations were communicating, it would be possible to determine exactly which stations these were.

One of the items which turns up in the loggings is traffic lists. Our reader mentioned the lists of ships being "served on that frequency." However, it is more accurate to say these are ships for whom the station has messages or telephone calls awaiting delivery or connection. These lists are normally sent every two to four hours, depending on the station.

One problem which often arises and with which our questioner had difficulty is hearing the ship frequency. Bear in mind that the coast station may be using up to 10 kW of power and a directional antenna, whereas the ships are usually limited to 1.5 kW and an omnidirectional antenna. By comparison they are weak, but not necessarily impossible to hear. When looking for the ship's transmission, don't expect booming signals.

Generally speaking, the 8 and 12 MHz bands are probably the most active. 6 MHz is used widely on the Mississippi River and 4 MHz is often used

for coastal traffic. Many towing companies and other commercial marine operations can be found there with 9 MHz and above being more commonly used for "high seas" communications between ships and coast stations.

While SSB traffic is the easiest to monitor, don't forget that near the SSB channels there are also CW channels which are still quite active. The marker transmissions offer a good chance to practice copying CW as well.

### Topics for 1994

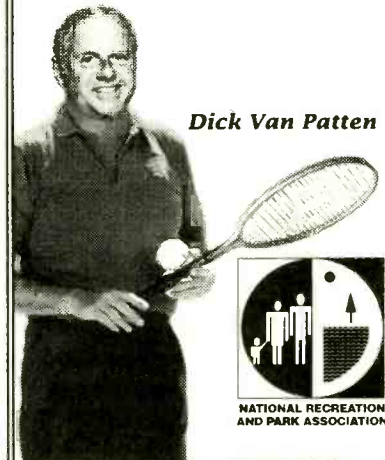
Our beginner correctly observes that cruise ships have not been addressed in this column for some time. (Not since September and November 1989, in fact.) In the not too distant future, I will try to remedy this. Remember that many ships now use satellites for their communications with the agent or shipping line.

In future columns I'll also put together an overview of what can be found on each band. The AT&T stations warrant attention as well; it has been a while since we looked at them.

Until next time, good listening and keep the cards, letters and loggings coming.

MT

**"At any age,  
there are dozens  
of things you can do  
to stay healthy, active  
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Dick Van Patten



# Getting Better Audio From Your Satellite Receiver

Much of the effort which goes in to the production of current satellite receivers is concentrated on the video aspects of satellite television. Audio appears to be an afterthought. About half of the current crop of receivers offer only monaural audio reception. How is this possible?

For one thing, it's an effort to squeeze just a few more bucks out of the customer at the store: "Oh, you want a stereo satellite receiver, well, that's going to be extra!" For another thing, the main reason most of the 3.5 million Americans have such a system is to watch the standard cable-TV fare. These signals are received by the decoder portion of the modern Integrated Receiver Decoder (IRD), the audio of which is digital stereo. This means the receiver manufacturer can save some money in producing a receiver with monaural audio for the non-scrambled channels.

These manufacturers often label the receiver as "stereo" even when it's not. While it's technically not fraud, it's definitely misleading. The only stereo you'll get out of these receivers is from the VCII encrypted channels when the decoding module is doing the reception work. When you switch to a non-scrambled channel you'll be back to mono. Or when you switch the decoder off and tune in a subcarrier on a scrambled channel, such as KJAZ-FM, San Francisco (G5, 7), it will only be in mono.

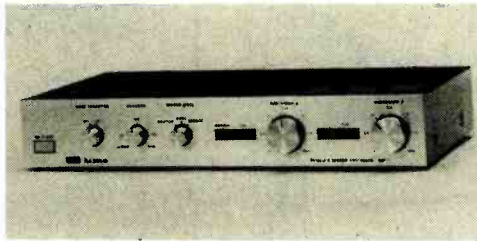
How can you be sure of what you're getting? You have to ask. Each manufacturer has high end and low end receivers in their line. Usually the low end receiver will be monaural, but it's wise to look at the receiver's spec sheet. Dealers often put together special package deals with an eye to getting the whole system price down. Monaural receivers are almost always in this package.

## A Little TVRO History

At the dawn of civilization, during the late 70's and early 80's, satellite reception equip-



Reuters screen showing sun outage details. Via Telecom Band 13 degrees East.



*The USS/Maspro SSP-1 Stereo Processor. You'll never listen to your high priced IRD again!*

ment was done with components. The earliest systems consisted of a 16 foot steel dish on an AZ/EL (azimuth/elevation) unmotorized mount. To switch polarity the entire feedhorn would be rotated by a standard TV antenna rotor. Inside the house would be only a small primitive receiver complete with click stop channel tuning (more expensive models featured a wired remote click stop channel tuner).

Within a very few years more satellites were launched, lighter weight movable dishes were made and an "antenna positioner" would be sitting next to the receiver. As more audio subcarriers came aboard the satellites, stand-alone stereo processors were made and could be found sitting next to the positioner. By 1986 cable services began scrambling and stand-alone descramblers were added to the line-up. Each piece in this assembly required its own power supply and adequate space became a real problem for many owners.

Receiver manufacturers realized by the mid 1980's that combining all these features would be good marketing, and so they ceased manufacturing the different components. This meant the only way to upgrade your system to stereo would be to buy a new receiver.

## Forward, Into The Past!

Happily, there is an alternative. In fact, even if your present receiver features stereo you can enjoy better audio than you've ever had by adding a stereo processor.

There are still thousands of stand-alone stereo processors around. Most dealers will have several used ones which can be had quite cheaply. You may have to look closely to find one for under \$50 but it can be done.

The best stereo processor ever made is still available, brand new and in the carton, even though they haven't been manufactured for nearly seven years. Suppose you found a stash of brand new Collins R390's at bargain basement prices;

would you spring for one? Ridiculous question!

Pictured on this page is the USS/Maspro SSP-1 stereo processor. It has all the great features of late 70's early 80's electronic component design. Remember when stereo gear was brushed aluminum, when knobs had weight and a feeling of certainty when clicked into position? Well, here it is: a masterpiece of the day. No black plastic to be warped and discolored with use, no on-screen graphics, no digital read-out, no "feather touch" buttons! Just top grade stereo sound reproduction the likes of which you haven't heard from your pricey, high-toned IRD.

## A Closer Look

Looking more closely at the SSP-1 several interesting points come to light. First, it has a variable audio bandwidth which allows one to custom tune the signals between wide and narrow audio transmissions; it has switchable noise reduction circuitry; switchable mode from Multiplex, Matrix, or Discreet (virtually all transmissions are done in discreet but it's good to have the option); tuning of each channel (left or right) is done manually using analog tuning knobs which tune a range from 5 to 8 MHz. Center-tuning LEDs light when the full carrier is tuned. The only negative for this stereo processor is that it will not tune above 8 MHz. The only real loss here is Jones Intercable's Super Radio Memories on G5,21 at 8.10 and 8.28 MHz.

How does a stereo processor work? It acts as a tuner separate from the video processor. Using the baseband output of any receiver, it takes the raw unprocessed signal from the transponder to which the receiver is tuned and, by using separate left and right tuners, tunes (processes) the audio portion of that signal. The output of the processor is then fed into a stereo amplifier.

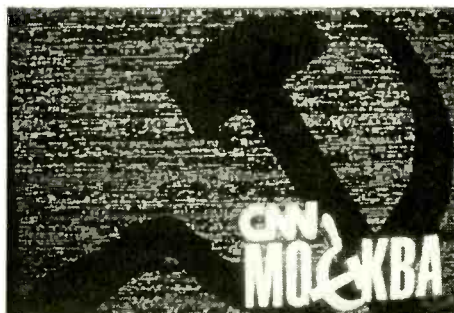
Those of you who have had to disable your VCII in order to listen to the other subcarriers on the channel will be happy to know that, since this processor is separate from your video processor, you no longer have to disconnect to listen to the other channels. Another advantage is that the TV screen does not have to be on since you are not using on-screen graphics to do the tuning. And, since it's just a knob twisting tuner it's much faster and easier to see what's on all the frequencies of all the channels: speedy DXing!

## The Bottom Line

I know what you're thinking, and I apologize for drooling all over your magazine! But, the fact is that if you're into satellite TV for more than just the pictures, you're missing half the pleasure without a stereo processor. Although a bargain



Morning TV program in the UK. Guess what it's called. Via Eutelsat I-F4 at 25.5 degrees East.



European monitors were riveted to their satellite systems last fall during the Moscow unpleasantness. Here's a CNN feed from Moscow on Intelsat K.

don't expect United Satellite Systems to give these units away. They sell for \$150 each (plus shipping). The catch is that there are only a hundred or more of these left. Once they're gone, that's it. Just like the R390, they're not making them anymore. By the way, when you get your SSP-1 they'll also give you a T1 Translator which converts frequencies below the tuning range of your receiver to those which it can receive.

There are other reasons to have this piece of gear in your listening post aside from the class it will add. It will take any block satellite receiver and turn it into a stereo receiver. That means if you can locate one of the older 950-1450 block receivers (which you should be able to buy from a local dealer very cheaply), you can take the baseband out from that receiver and still get great stereo. That makes it a great way for you to enjoy stereo music in your shack while the rest of the family watches their regular satellite TV fare.

For more information on the SSP-1 write United Satellite Systems, St. Hilaire, MN 56754-0247 or call them at 218-681-5616.

### MAILBAG

Hal Surosky, of Baltimore, MD, writes, "...I would like your opinion on satellite TV vs. cable TV comparing the new options that have been indicated to be available for cable TV sometime in the near future. I have made a thorough search of satellite system components and have many catalogs of companies such as recommended in your article. I have had site surveys for the dish antenna location. The question is, I feel that satellite TV offers more advantages and independence than cable; however, there are others in my family that indicate cable TV would be a much better option. I am aware, of course, of the initial expense of the satellite installation...much of which I will be doing myself."

Hal, this is a great question and signifies many a debate raging in homes across America. The big difference is in the way you see things. You see "The Big Satellite TV Picture" and the other folks see entertainment. You see interesting ways to expand your own knowledge about

the ways that new technology works and others see entertainment.

My solution is to have both. Give the family cable. They'll watch their HBO, MTV, ESPN etc., and they'll leave you alone! Then you can start work on enjoying the TVRO hobby for yourself. If you were to get a satellite system only, it would be tuned to the cable fare and you would never get to use it for your hobby. This way everybody's happy. If it's a question of finances (and for all but a select few, it is) start out with a used system, a cheap dish, a hand crank mount—anything cheap but useful. I'm putting together a complete TVRO system for under \$400. Most people will pay more than that for one year of cable service. It gets all the unscrambled channels and all the stereo subcarriers I could want and I get the satisfaction of doing it myself. Do it, Hal; you'll enjoy it!

• John Locker of Wirral, England, checks in again this month with more excellent pictures. I only wish there were space enough to print all that he sends. John keeps up with Space Shuttle activities via the EBU/PVS transponder on Intelsat 601. He writes, "...One thing that does amuse me is the size of dish you need to use, ...your main standard is C band, hence 2-3 metre dishes seem to be the norm. Over here there are a few C band viewers, but most of us just don't have the garden space to site such a beast; if we only did!"

John would also like to know if there are any SCPC signals to be heard on the European satellites. George Wood, in his *The DXers Guide To The Galaxy* says there are no reports of such activity. However, Mark Long's *World Satellite Almanac* indicates that there is SCPC activity on:

Intelsat I-VA-F12 (1 degree W) on transponder 21 [01]: Radio Gabon 3.7292 GHz and Pop Music at 3.7296 GHz.

Panamsat -1 (PAS-1 at 45 degrees W.) transponder 20A Horizontal polarization at 11.612 GHz

Arabsat 1-F2 (19 degrees E.) transponder 17: RTM Radio 4.0292 Ghz and RTM International Radio at 4.0303 GHz.

MT

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# Document Your DX!

You've probably heard it before: "No job is done 'til the paperwork is finished." However, the paperwork is the fun part when it comes to longwave DXing. Why not make 1994 the year to get started in the exciting game of collecting QSL cards?!

Getting your beacon catch verified by a QSL is quite a thrill. First, it's a bigger challenge than sending away for a card from the BBC or All India Radio, and for that reason it brings with it a strong sense of achievement. Second, and more importantly, a QSL gives you something tangible for your DXing efforts. It's the next best thing to actually visiting the beacon site—something that is impossible in many cases.

It's important to remember that the person or agency operating a beacon is under no official obligation to respond to requests for QSLs.

If they do respond, it's out of courtesy on their part. Fortunately for us, though, the great majority of QSL requests *are* honored when they're accompanied by an informative reception report and an SASE. This month, we'll discuss just how to do it.

Unlike broadcasters, beacon operators do not have pre-printed cards ready to send out to hobbyist listeners, so you'll need to make your own "homebrew" facsimile. This type of QSL is called a Prepared Form Card (PFC).

To make a PFC, all you'll need is an index card, a typewriter, some colored pencils and a bit of creativity. While there are no definite rules as to what the card should look like, the usual technique is to print the call sign and frequency of the beacon fairly large (you could use a stencil or dry-transfer letters for this), followed by the date and time of your reception, the beacon location, and a space for the Engineer to sign the card.

You may also want to include blank lines for the type of transmitting antenna used and the power output of the station. Figure 1 shows some examples of PFCs that got quick results.

## The Cover Letter

Just as important as the card itself is the cover letter. Properly written, it will get your request sent to the right person instead of lost in the bureaucratic shuffle. Above all, keep your cover letter *brief*. Two or three short paragraphs is sufficient. Also, I suggest that you *type* your letter for maximum legibility.

In the letters introduce yourself as a radio hobbyist seeking to verify reception of the beacon in question (give the call sign and frequency) and tell how well you received the station. It's best to avoid radio jargon such as RST or SINPO when describing signal quality. Stick to brief, plain language reports such as "weak but readable," "moderately strong," or "very strong." If there was interference from other beacons on the same frequency, say so.

You should also include a statement about your receiving setup. For example: "To hear your beacon, I am using a Realistic® DX-440 receiver and a 75 foot wire antenna." Politely ask the engineer to sign the card and return it to you in the SASE that you've provided. Lastly, don't forget to thank the person for his/her time.

You should also include a statement about your receiving setup. For example: "To hear your beacon, I am using a Realistic® DX-440 receiver and a 75 foot wire antenna." Politely ask the engineer to sign the card and return it to you in the SASE that you've provided. Lastly, don't forget to thank the person for his/her time.

## Mailing Your Request

Now that you've finished your creative work, it's time to mail the request. For most of my address information, I rely on the *Aero/Marine Beacon Guide*. It includes data for virtually all

Table 1: Beacon Loggings

Freq	ID	Location
212	OVE	Oroville, CA
242	XC	Cranbrook, BC
254	SPK	Reno, NV
266	FA	Fresno, CA
271	SC	Stockton, CA
341	AK	Oakland, CA
367	HA	Tuamotu I., Fr. Polynesia
368	SIR	Rawlings, WY
371	ITU	Great Falls, MT
379	SF	San Francisco, CA
396	ZBB	Bimini, Bahamas
397	LLJ	Challis, ID
408	MW	Moses Lake, WA
411	RD	Redmonds, OR

North American beacons, and it explains how to "manufacture" a mailing address using the information contained in the listings.

For an FAA beacon, this means addressing your request to the FAA field office closest to the beacon. Similarly, for most Canadian Aero beacons, reports go to the nearest Transport Canada office. In either case, I've found that putting "ATTN: Aids to Navigation" in the address will help direct your letter to the right department.

The *Guide* is available for \$15 from Ken Stryker, 2856-G West Touhy Avenue, Dept. MT, Chicago, IL 60645. Ken has advised me that the *Guide* now includes an Updater to cover any changes made since the last printing.

## LDXA Returns

The last time we ran the Longwave DX Award (LDXA) Contest, there was an excellent response, so I'm offering it once again for the '94 winter season. No longer is the award limited to just Canadian loggings. To apply for this colorful certificate, just send copies of three QSLs from *any* beacons more than 300 miles away from your location. The cards must be less than one year old, and please include two 29 cent stamps to cover the return postage.

As a bonus prize, the two DXers submitting cards from the farthest catch will receive free copies of the *Airport/Facility Directory*. The deadline for all entries is March 15, 1994.

To get you started in your quest for new stations, Table 1 lists some loggings sent in by Peter F. Warnke of Vallejo, CA. An enthusiastic listener to the low bands, Peter has been having great success with this Sony ICF-2010 and a loop antenna.

Join me next month for a mailbag feature where we'll review the best of your longwave monitoring times!



**A QSL gives you something tangible for your DXing efforts.**

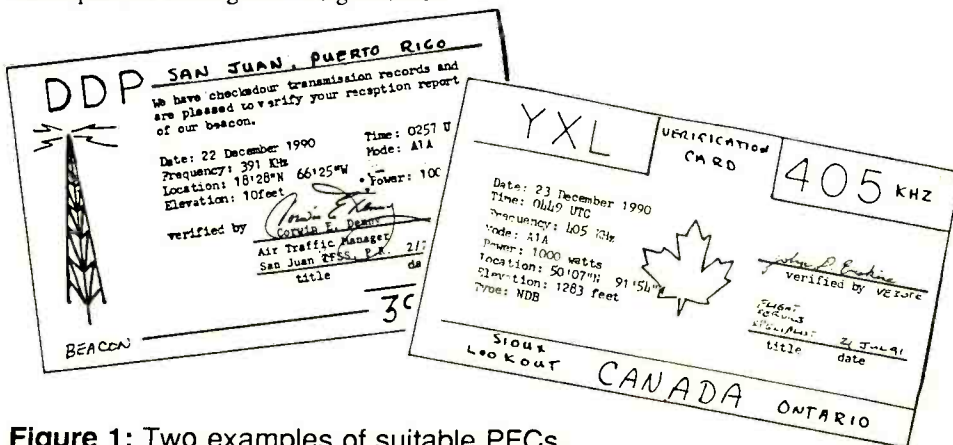
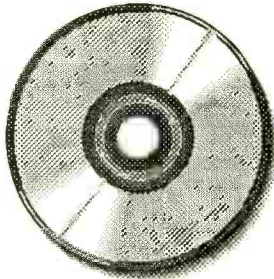


Figure 1: Two examples of suitable PFCs.

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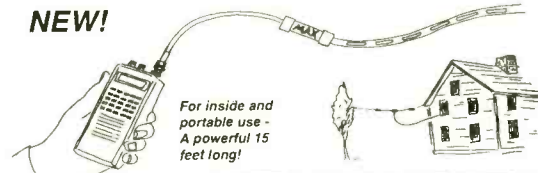
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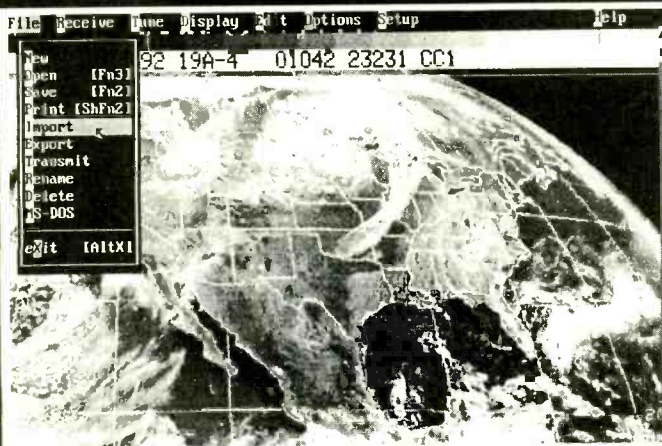
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## Hearing Aids

Ever see a photo of a ham with headphones? Usually the headphones (like the ones in the *MT* logo) look very official and very uncomfortable. There seems to be an unwritten rule that ham headphones must be of the communication type, having an audio response limited to the mid-range of the human voice. In theory, that should be the ideal frequency response for ham radio use; however, it does not hold up in practice.

For one thing, when buying headphones we too often look at the least expensive styles offered. Least expensive means least useful, and least comfortable, too. The more expensive communications phones do not necessarily provide performance equal to the money.

In case you hadn't noticed, audiophiles, on the other hand, use large headphones so comfortable you can fall asleep with them on, with a hi-fi audio response of from around 20 Hz to 20,000 Hz. I have used hi-fi headphones for many years for both SWLing and ham radio use. Radio Shack offers an extensive line of good hi-fi headphones at reasonable prices—frequently on sale at half price. So does Grove Enterprises. Any of these headphones will be far more comfortable and pleasant to listen to than any communication headphones in the same price range.

Since the audiophile phones are designed for stereo use they will only receive in one ear unless you use a stereo to mono converter plug with them. Radio Shack sells stereo to mono adapters for less than two dollars: Ask for part number 274-360.

Although you would expect the optimum frequency response for communications to be in the range of the human voice, during extended periods of listening (such as in contests) the average ham will find hi-fi phones to be less tiring than most of the communication type units.

The same principle holds true for speakers. I prefer a small Radio Shack speaker called the "Minimus 7," catalog number 40-2045. These small, aluminum housed speakers are heavy little devils and produce fantastic sound. Price of the Minimus is about fifty dollars, although they frequently go on sale for under thirty bucks.

### The MFJ-1272 Interface Switch

For some time I had a problem switching the microphone input on my Kenwood TS-680 between the mike and TNC or SSTV transmit lines. If I wanted to operate digital or SSTV I had to unscrew the mike and connect the TNC in place of it. Just as I was about to build a switch box, MFJ came out with the 1272 Interface switch which did exactly what I wanted to do. Price of

the 1272 is \$49.95 list, although I purchased one for \$39.95 from a discount dealer.

This little gem works great and it is only a matter of punching a push button switch to go from phone to the TNC. There are several models of the 1272 available, depending on the make of rig and TNC you have, so be sure to state the brand of transceiver and TNC you are using when ordering. It is a fairly simple matter to change the wiring inside the unit if need be to accommodate a different TNC or other device (I modified mine to accept the input from my SSTV system in 15 minutes).

The 1272 is available directly from MFJ, 921A Louisville Road, Starkville, MS 39759, or contact your local ham dealer.

### What's On The Bands

Many new Novices have written wanting to know more about what to expect from the various HF ham bands. So, over the next few months, we will outline each of the bands in more detail. This month we will look at the 80 and 75 meter bands.

80 and 75 meters are actually one band, since the frequency range is 3.5 to 4 MHz. Only the USA has the full use of the band; other countries have only partial use. Consequently, when working DX on phone it is necessary to listen to specific parts of the band, depending on what region of the earth you are attempting to work. CW is a different matter, as hams anywhere are allowed to use 3.5 to 3.75 for CW use (U.S. Novice operators are allowed CW only from 3.675 to 3.725 MHz).

80 meters is considered a local band; that is to say, its communications range is only a few hundred miles during the daylight hours. This restricted range is due to the absorption of signals by the D layer of the ionosphere. The D layer forms shortly after local sunrise and dissipates after sunset. When the D layer is gone, range can be up to halfway around the earth. During times of low sunspot activity, 80 meters can be a better DX band than 20.

Another limiting factor is static. 80 meters is strongly affected by electrical storms, especially during the summer. As you might expect, the best times to work the antipodes (the other side of the earth) will be during the spring and fall equinox

periods when there are a minimum of electrical storms in both regions.

80 meters is considered to be a night time band. When listening on the band during daylight hours, one might conclude only a few hams use it; however, after the sun sets 80 comes alive and round table discussions on 75 SSB often include several dozen stations. Rag chewing is extremely popular on 80 and nets that handle traffic are prolific on this band.

75 meter phone operation begins at 3750 in the USA and runs to 4000. Below 3750, U.S. amateurs are restricted to digital modes: CW, RTTY, Amtor, Pactor and Packet. Several band plans are in effect for this frequency range. The one U.S. hams adhere to is as follows: 3500 to 3605 CW; 3605 to 3645 RTTY, packet etc.; 3645 to 3750 CW; 3750 to 3790 phone; 3790 to 3800 DX phone window; 3800 to 4000 phone; and 3845 SSTV.

In addition, the band is divided by amateur class, with the Extra class portions being 3500 to 3750 CW, and 3750 to 4000 phone; Advanced is 3525 to 3750 CW, 3775 to 4000 phone; General is 3525 to 3750 CW and 3850 to 4000 phone; Novice/Tech is 3675 to 3725 CW only.

80 meters has traditionally been the CW training ground for the Novice license, and lots of higher class hams operate in the Novice/Tech portion of the band to afford the newcomer a chance to build their code speed, and gain experience with their equipment and operating techniques.



### The PA QSO Party

October 9th and 10th was the weekend of the Pennsylvania QSO party, and as in years past N3IK participated as a portable/QRP station. To



Rob Leonard's

## Ham DX Tips

Happy New Year to one and all! I hope that you have the best of luck in 1994, as well as the best of DX. While I might not be able to influence the former, I can help a bit with the latter...

**ARGENTINA** LU2BRG (Richard J. Grueneberg, Casilla de Correo 1589, Correo Central, 1000 Buenos Aires, CF, Argentina) has been looking for CW contacts on 3505 kHz (+ or - a few kHz due to QRM) at 0900 UTC daily.

**BALERIC ISLANDS** EA6NB (who is Jamie P. Ullivarri, P.O. Box 5, 07193 Palmanyoya, Mallorca, Spain) has been offering this country to RTTY DXers on 14090 kHz at 1700 UTC Saturdays and Sundays.

**BOTSWANA** A22MN, who works for the US embassy here, has been on 14195 kHz at 2100 UTC most days. QSL to his manager: WA8JOC, Kenneth Scheper, 5875 Cedaridge Dr., Cincinnati, OH 45247.

**DXCC INFO** The DX Advisory Committee will have decided by vote in December whether to have a separate "DXCC Honor Roll" for RTTY DXers who have contacted 100 countries, since that mode has become so popular! This month they will be voting to decide if the start date for the CW "Honor Roll" should be moved back to 1945.

**DX NETS** The "Butterfly Net" meets on 14226.5 kHz daily starting at 2000 UTC with DX stations checking in from around the world. The 40 meter DX net now meets on 7813 kHz starting at 0700 UTC due to SWBC station QRM on adjacent frequencies before that time.

**ETHIOPIA** ET3YU has been on 21030 kHz CW at 1500 UTC. QSL requests go to: P.O. Box 60349, Addis Ababa, Ethiopia.

**MACEDONIA** Z32PK has been in the 75 meter DX window (3790-3800 kHz) between 0445 and 0545 UTC. His address is: Petar Krajcev, Blagoinecev 44, 91400 Titov veles, Macedonia, Europe.

**PETER I ISLAND** 3Y is the prefix and 1-17 February is the time for what will be the biggest DXpedition for 1994 as an international team will be operating from this rare antarctic DX locale! There has only been one other ham operation from this uninhabited and extremely hostile Norwegian territory. Temperatures here are below 0°F year around and the winds are severe, making landings hazardous even in the antarctic summer. Plans call for operations to take place on 10 to 80 meters SSB, CW and RTTY. The callsign has not been announced, but the QSL route has: AA6BB, Jerry Branson, 93787 Dorsey Ln., Junction City, OR 97448.

**SINGAPORE** 9V1ZE, Gus Gostel, has been on 7010 kHz CW at 1015 UTC most days. QSL to his address: 223 St. Johns Road, Singapore 2775, Singapore, Asia.

**USA** WA0RCR of Wentzville, MO, airs amateur radio bulletins daily on 1860 kHz AM starting at 2330 UTC. This station should easily be heard by SWL's throughout the Midwest.

**ZIMBABWE** Z21HS has been on 10105 kHz CW at 0430 UTC most days. He is: Ralph Karhamumar, Box 4110, Harare, Zimbabwe.

Enjoy the DX and the New Year; be safe and be happy! 73 de Rob

help those working for county awards, I decided to operate from the Elk/Cameron County line in Pennsylvania. Both of these counties are very remote with few towns and lots of wild life (the animal kind). As expected, Elk County had one portable station operating this year, but Cameron had none, so contacting N3IK awarded two hard-to-work counties to those in the contest.


I parked my van on the county line marker on the McDonald, Douglas road. Built during WWII, this road (which until a few years ago did not appear on any map) allowed access to a secret air

field where Norden bombsights were installed in US bombers. Though Saturday morning dawned bright and clear, by the time the antenna was installed it settled in to rain.

Band conditions were terrible on 40 and only a handful of stations were worked on that band. Moving to 75 SSB provide more action; however, the microphone died and required one hour to repair. By the end of the first day's contest period (midnite) about 55 ARRL sections had been worked. Cold and tired, I returned to our camp

in Elk County to attempt sleep in spite of a nonfunctioning heater.

The next day it even snowed a bit, but we continued until 3 pm when fatigue made it too much to continue. We wound up with 75 sections worked for a final score of just under 55K points with 4 watts. The rig used was Argonaut 509 on SSB and HW 9 on CW. Pictured is one very tired N3IK at contest end.

That's all for this month, have a happy new year! 73 de N3IK 

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# what's new?

Larry Miller



## Radio Shack Frequency Counter

If the new fall catalog from Radio Shack is any indication, the world's largest electronics store is going into test equipment with a vengeance. Most interesting to us was the appearance of a pocket-size frequency counter, which in the hands of a patient and methodical hobbyist can produce a goldmine of information.

Both Bob Grove and Mark Swarbrick, a true scanner enthusiast and a genius when it comes to finding out new frequencies, tried the product and agreed that the Radio Shack frequency counter was an impressive product at an impressively low price. Here are their findings.

The Radio Shack counter is housed in a heavy diecast metal case with ergonomic side grips. The counter is intended for measuring transmitter frequencies from 1-1300 MHz, and sports a

large, good contrast, 8-digit LCD readout, with a resolution of 100 hertz.

The counter is powered by four AA alkaline, rechargeable NiCd cells, or a 9 volt wall adaptor/recharger (all optional). A low battery indicator alerts the user to possible readout inaccuracy.

Selectable gate speed means the RF frequency counter can be refreshed every 1.28 seconds (slow) or 128 milliseconds (fast). Accuracy is typically 1 part per million and operating temperature is +64 to +95 degrees Fahrenheit.

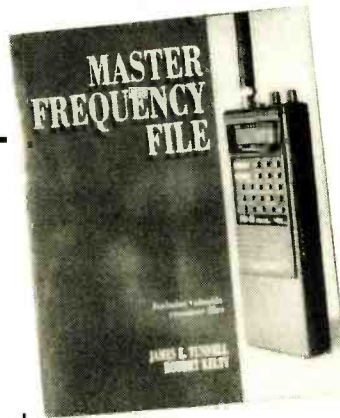
A ten second timed edgelight permits night viewing. A BNC connector accommodates the 4"-19" telescopic whip or a test probe for lab measurements. High and low (50 ohm) impedances are switch-selectable.

Typical input sensitivity is 2-20 millivolts throughout the specified frequency range; Bob Grove found that actual measurement capability extends down into the 200 kHz range and up into the 1600 MHz region at higher signal levels (100 millivolts). "Our in-house lab check verified the accuracy and sensitivity of the new Radio Shack RF frequency counter."

Swarbrick adds that "with a price tag of just \$99.95, it puts a frequency counter in the reach of everyone." The Radio Shack Frequency Counter is available from Grove Enterprises and Radio Shack dealers nationwide.

## Master Frequency File

Are you interested in using your scanner or shortwave receiver to monitor government, military, or law enforcement radio communications? If so, you'll



want to check out *Master Frequency File* by James Tunnell and Robert Kelly — both legendary names in monitoring.

Included are services, frequencies, call signs, and user IDs on the 25 MHz to 2110 MHz radio spectrum. Agencies covered are: FBI, DEA, Secret Service, Customs, IRS, Immigration-Border Patrol, Prisons Bureau, NOAA Weather and the National Park Service. Also included is a list of publications, organizations, institutions, and facilities that can assist you in expanding your radio monitoring skills.

*Master Frequency File* is \$29.95 and runs 525 pages. It's available from Grove Enterprises as well as other *MT* advertisers.

## A Passion for Radio

Information on stations like the BBC and the Voice of America are easy to come by. Write to them and they'll be happy to tell you their story, often in full color on glossy stock. There are other radio stations out there, of course. You may see them mentioned from time to time as some obscure "catch" in Glenn Hauser's DX column. Others, owing to their power, their politics, or their places on the dial, toil away in relative obscurity. Their stories, however, are no less fascinating and in some cases, far more.

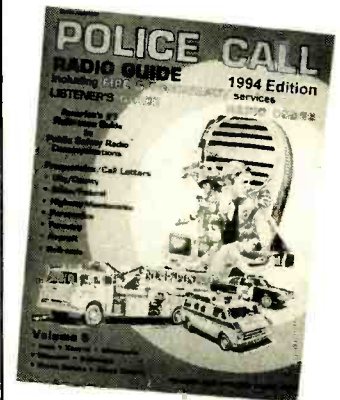
*A Passion for Radio* is the story of these stations—stations the book's liner notes refer to as "alternative" but which are, in

fact, simply different. Radio 100 is a combination cafe and radio station in The Netherlands. Francois Laureys tells the story of its 1992 raid. Radio Candip shows the new ideas that can come out of community radio in its purest (theoretical) form, where 140 Zairan community "mini studios" (a cassette recorder) and thousands of illiterate villagers provide the programming.

And who hasn't heard of Radio Venceremos, the official voice of Farabundo Marti National Liberation Front? But who has heard the horrific saga of this station and its role in the bloody Salvadoran civil war? In all, there are 20 such broadcasting stories.

*A Passion for Radio* is for the student of radio, the unashamed lover of radio. Some will find the stories disturbing, and rightly so. But all will learn of the power of the medium.

*A Passion for Radio* is edited by Bruce Girard. It is published by Black Rose Books, Montreal, Quebec, and can be ordered from University of Toronto Press, 5201 Dufferin St., Downsview, Ontario M3H 5T8; Ph 416-667-7791 for \$19.95. Get a copy and add it to your library.



## Police Call

This year, as in every one of the past 31 years, scanner listeners will be lining up to get the latest edition of *Police Call*.

The 1994 edition is the biggest ever, says editor Gene Hughes, and reflects the thousands of frequency additions and changes in the FCC's Public Safety Radio Services. The Radio Codes and Signals, consolidated Frequency List and Listener's Guide Book sections have also been updated.

In all, there are an astounding 305,000 records contained in 9 regional volumes. Each record contains the name of the licensee (alphabetically within each state), location of the transmitter (to nearest town or city), FCC designated radio service (police, fire, etc.), frequency, FCC call sign, quantity and type of equipment (base, mobile, etc.) plus additional information provided by correspondents.

Over the years, *Police Call* has been called "terrific," "the best," "the scanning bible," and even "perfect." From any other publication, this would be an idle brag, a piece of hype. From *Police Call*, it happens to be true.

Published by Hollins Radio Data, Los Angeles, the new 1994 *Police Call* retails for \$9.95 per volume and is available from Grove Enterprises and Radio Shack stores.

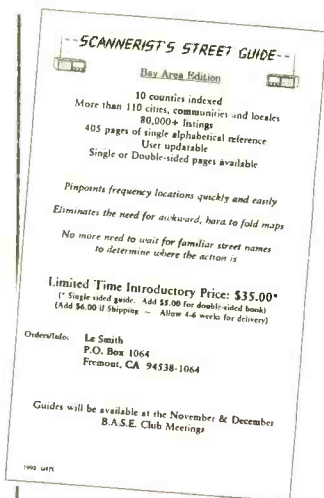
## Hot Flash!

*Police Call* has begat a new book. Called *Beyond Police Call*, it's designed, in one volume, to cover non-public safety frequencies. Look for *Beyond Police Call* at your favorite book seller for \$9.95. Expected release date is spring of 1994.

## Scannerist's Street Guide

We're operating at something of a disadvantage here since we haven't actually seen the publication, but it sounded like such a good idea, we thought we'd give it a mention.

Here's the scenario: you're listening to your scanner and hear a particularly interesting incident. But where, exactly?



Someone named Le Smith has produced a publication called the *Scannerist's Street Guide*. The book, says the author, eliminates the "need to wait for familiar street names to determine where the action is....[Forget] awkward, hard to fold maps.... pinpoints frequency locations quickly and easily."

The first book is the Bay Area (California) edition and it features 10 counties covering more than 110 cities, communities and locales. There are 80,000 listings on 405 pages.

That's about all we know about this effort except that it retails for \$35 plus \$6 shipping from Le Smith, P.O. Box 1064-MT, Fremont, California 94538-1064.

## Grisly Scanning

Bruce Ames of BASE (Bay Area Scanner Enthusiasts) says that he has found a book that may be of interest to scanner listeners who monitor the aero bands for disasters and then head out to investigate the scene of the crash. If you're looking for some off-beat holiday gift-giving, it's called *Wreck Chasing - A Guide to Finding Aircraft Crash Sites*.

The book has information on how to locate crash sites and how to research a crash from start to finish, including latitude/longitude of almost 500 known sites. The book, says Bruce, also explains

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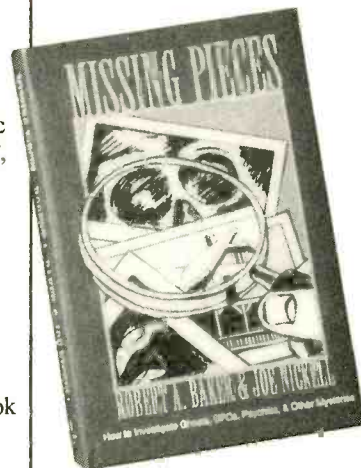
*Wreck Chasing* is 80 pages and retails for \$9.95 from Pacific Aero Press, P.O. Box 20092-MT, Castro Valley, California 94546.

## Missing Pieces

Bob Grove contributed the following review of a unique book entitled, *Missing Pieces*, by Robert Baker and Joe Nickell:

To those of us used to dealing with a pragmatic and factual field like radio monitoring, it is disturbing to note that a growing number of Americans believe in the occult and supernatural. Con artists are having a heyday scamming sincere, trusting, misguided individuals.

As a member of CSICOP (Committee for the Scientific Investigation of Claims of the



Paranormal), I was particularly pleased to see that two credible authors, one a private investigator, the other a psychologist, have prepared an authoritative guidebook on investigating unnatural mysteries.

*Missing Pieces* is not light reading; it is a concentrate of information on the paranormal,

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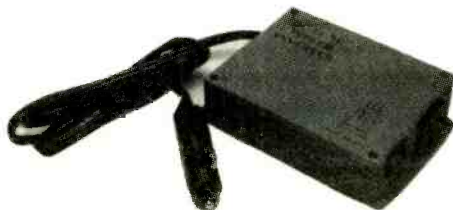


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but it is the scientist—the trained and prepared investigator—who gets the upper hand.

Nothing gets by Baker and Nickell; ghosts and hauntings, UFOs and abductions, psychics and channelers, healers and dowzers, mentalists and monsters—they and many more are all here in this handbook of hokum.

You may order *Missing Pieces* for \$23.95 from Prometheus Books, 700 East Amherst St., Buffalo, NY 14215; ph. 716-837-2475.



## Free Emergency Power

One of the most frustrating things about using a radio to monitor an emergency is the possibility that the emergency will knock out the electricity. Sooner or later, those batteries will run out. And you'll be left as uninformed as the next person—owner of a dead radio at the very time you need one most.

The MP-140X is a power inverter that connects to any 12 volt DC power supply (like a car battery) and produces 140 watts (300 watts peak surge) of 110 AC to power lights, radios, TVs, computers, cellular phones, even a small refrigerator.

The MP-140X is a compact 5-1/4" x 3-3/4" x 1-1/2" and uses the cigarette lighter of your car, truck, RV, boat or aircraft (or can be attached directly to the battery). Your favorite 110 volt appliance simply plugs into the outlet on the side of the inverter.

The MP-140X features fused overload protection, low battery alarm (at 10.6 v) and comes with a 5 foot DC power plug and one year limited warranty.

You don't ever have to be in the dark again. The next time a winter storm brings the power lines down, your house could be the only place in the neighborhood with lights, ready to handle the emergency needs of your family or community.

The MP-140X Power Inverter is available from DX Radio Supply for \$69.90 plus \$6 UPS at 215-273-7862 or write P.O. Box 360-MT, Wagontown, PA 19376.



## Plug-In Battery

A small Vancouver-based company has introduced a line of batteries with a twist. Called the Power Flip Top, the user merely flips the top to expose two prongs. The entire battery then plugs directly into a normal wall outlet for charging.

According to company officials, each battery can take about 500 recharges and will replace roughly 200 disposable alkaline batteries.

Currently, only a "D" size is in production. The Power Flip Top Battery is available at Home Depot stores, Fred Meyer and Payless. Other outlets are being added. No word on pricing.

## Kenwood TS-50S Mods

International Radio and Computer Inc. has announced two new products for the Kenwood TS-50S. These include an 8-pole SSB 2.1 kHz crystal filter and a true RF Speech Processor. Says IRCI President R. A. Pohorence, "with these two new products installed, the TS-50S will really 'come to life' with a new standard of selectivity. With the new RF clipper processor, you will achieve the punch you need to transmit out during difficult conditions!"

So far, no prices announced on the TS-50S mods. For more information contact IRCI at 3804 South U.S. 1, Ft. Pierce, Florida 34982 or call 407-489-5609. Be sure to tell 'em *MT* sent you!

## Review

By Chuck Morrison, Chief Engineer,  
Grove Enterprises

### SysCalc for Windows

Have you ever wondered how your new preamp affects your receiving system's intermodulation level? Or are you designing that ultimate receiver, and need to instantly evaluate trade-offs between sensitivity and dynamic range? Arden Technologies' *SysCalc for Windows* lets you model your system block diagram on your Windows PC and obtain instant answers to these questions.

*SysCalc* is a Windows program for modelling the noise, gain, and intermodulation performance of a system of cascaded blocks. Blocks are added to the sheet with amplifier, mixer, filter, attenuator, or generic block symbols using the convenient ToolBar. Labels may be added to each block. The noise figure, gain, and third order intercept point is entered for each block. A block may be linked to a separate subsystem using *SysCalc's* unique NoteBook metaphor, where the subsystem's data is automatically computed and scrolled into the parent sheet.

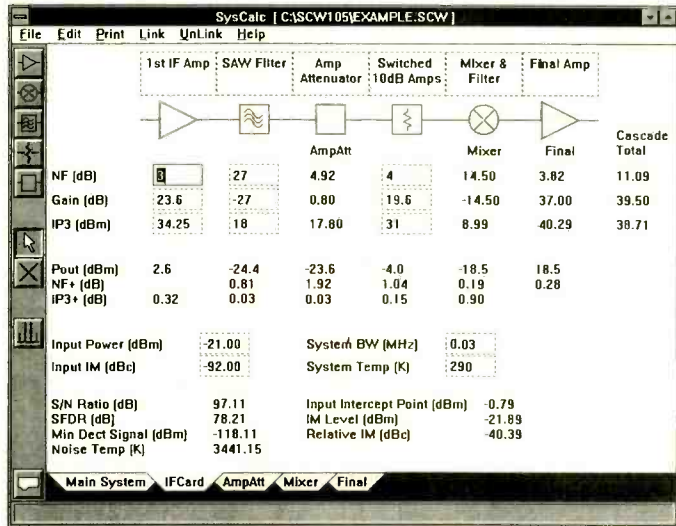
*SysCalc* automatically computes the total noise figure, gain, and third order intercept point of the cascade. It also displays each block's contribution to the overall noise figure and intercept point, highlighting the individual blocks which most degrade the system performance. Trouble areas can be instantly identified. Also, for a given input signal and system bandwidth, *SysCalc* computes the minimum detectable signal level, signal to noise ratio, spurious free dynamic range, noise temperature, input intercept point, and output intermodulation level of the cascade. Each figure is instantly updated as individual block parameters are changed, so system changes can be quickly evaluated.

Extensive on line help is provided, explaining the use of all aspects of the program. All input and output parameters are explained, so you can understand what that "spurious free dynamic range" number really means. A convenient "how-to" section is also included, quickly showing how to perform often used tasks.

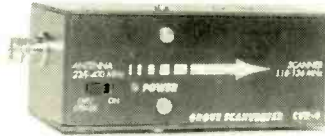
Block diagrams may be printed two different styles. Presentation style creates professional quality documentation suitable for presentations. Notebook style produces condensed output suitable for lab notebooks or binders.

*SysCalc* can run on any IBM compatible PC using Windows 3.1 or higher, with 4 MB of RAM, 5 MB of hard disk space, and a VGA or SVGA monitor. It comes with Arden Technologies' 30 day no questions asked money back guarantee.

Overall, *SysCalc* is an indispensable tool for anyone evaluating receiver performance. It is available for \$195 directly from Arden Technologies, 119 Cedarwood Court, Forest, VA 24551, phone (804) 525-6837.



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## Computer Aided Scanning

a new dimension in communications from Datametrics



Now Radio Shack PRO 2006 owners for the first time have access to the exciting world of Computer Aided Scanning with the highly acclaimed Datametrics Communications Manager system. Computer Aided Scanning is as significant as the digital scanner was five years ago and is changing the way people think about radio communications.

- The Datametrics Communications Manager provides computer control over the Radio Shack PRO2006 receiver.
- Comprehensive manual includes step by step instructions, screen displays, and reference information.
- Powerful menu driven software includes full monitoring display, digital spectrum analyzer and system editor.
- Extends receiver capabilities including autolog recording facilities, 1000 channel capacity per file, and much more.
- Uses innovative Machine State Virtualizer technology (patent pending) hardware interface by Datametrics.
- Simple 4 step installation - no soldering or modification to normal receiver operations.

## Datametrics, Inc

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

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

## Two New Scanners from Radio Shack

### Realistic® PRO-2030

With 80 memory channels in 8 banks, "Hyperscan" (selectable as 50 or 12 channels per second search and scan speed), and frequency coverage of 29-54, 108-174, 380-512, and 806-960 MHz (less cellular), Radio Shack's new PRO-2030 compact desktop scanner offers considerable bang for the buck.

A one-touch weather key autosearches all seven NOAA frequencies for the strongest channel(s). An amber-backlit LCD provides sharp readability day or night. The scanner's compact profile (8"W x 3"H x 7"D) assures easy nestling into a convenient desktop space, and it can be used mobile as well.

A 120VAC/12VDC wall power supply is provided, but no mobile mounting kit or cabinet holes; mobile users will need to provide a universal mount, typically available from autosound departments.

Made by Uniden for Radio Shack, the 2030 is extremely lightweight at barely 1-1/2 pounds; no front tilt legs are present, so the unit tends to walk around the desk when its keys are pressed.

Eight of the keys are only one-half inch above the bottom of the front panel, making finger presses awkward when the unit is placed on a desktop surface. This is acceptable for underdash mobile installations, but tabletop users will want to shim the front up with a block of wood or other lift.

The dual-conversion (10.8 MHz and 455 kHz) design provides sensitivity between 0.5 and 1.0 microvolts on all bands except aircraft where it is 2.0 microvolts: still entirely adequate for reception of air-to-ground communications.

A two-second delay is channel selectable, as is channel lockout from the scan sequence. During the search routine, a MON(itor) button may be pressed to hold the channel; up to 10 search-discovered frequencies may be stored temporarily

in this fashion. Search may be directed up or down by the appropriate arrow key.

A BNC external antenna jack is a welcome sight, although the attachable whip (included) is a screw-in variety which is inserted into a top cabinet hole.

A priority function is user-assignable to any one of the 80 memory channels; this is an improvement over most competitive scanners which provide a fixed priority channel location (channel 1).

Audio power of 1.3 watts is clean and loud from the top-mounted speaker; a rear-panel 1/8" external speaker jack is provided. Also found on the rear panel is a recessed reset button used to reinitialize the microprocessor should the unit lock up from a power glitch. No battery is needed for the non-volatile memory.

In a departure from previous products, a separate power on/off button is on the front panel; the volume control is only that.

All in all, the light weight belies the performance of this little scanner; it offers excellent signal and squelch-break sensitivity, adequate general-purpose frequency coverage and enough memory space for the majority of local monitoring applications.

The PRO-2030 is \$199.95 at Radio Shack outlets nationwide.

### Realistic® PRO-2032

For an additional \$100 over the price of the PRO-2030, scanner listeners may wish to consider the newly-introduced, stepped-up PRO-2032 with its 200 memory channels, built-in AC power supply, and front tilt feet.

Considerably more massive (3 lbs., 10 oz.) and slightly larger (8-1/2" W x 3"H x 8"D) than the 2030, the 2032 sits firmly in place as its keys are pressed; however, the push/



push power switch on the volume control does require enough activation force to slide the scanner across a flat surface.

Published specifications for the 2032 are somewhat less impressive than for the less expensive 2030. Sensitivity is 1-2 microvolts; scanning speed is 25 or 8 channels per second, and audio power is 1.2 watts. Frequency range is 30-54, 108-174, 380-512 and 806-960 MHz (less cellular).

But can you actually hear a difference in sensitivity between the two scanners with their fractional-difference specifications? We tried the two scanners side by side; they sounded the same to us, even on the weakest signals.

To their credit, Radio Shack publishes reasonably detailed specifications for their products; for example, IF rejection is 70 dB, spurious signal rejection at VHF is 50 dB, IF selectivity (filter bandwidths) at -6 and -50 dB is 20/40 kHz, squelch threshold is 1 microvolt, squelch tight on FM is 25 dB.

Other functions are pretty much the same as the lower-priced scanner. Fast search is 50 steps per second (slow is 8); any one channel may be assigned priority; 2 second delay is individual-channel assignable; dual conversion is used (10.7 MHz and 455 kHz); 10 temporary search monitor channels are provided; and channel(s) may be locked out of the scan sequence.

There is a reset button for reinitializing the microprocessor if necessary. The set may be powered by its internal 120 VAC power supply or a 13.8 volt mobile source (although there is no mobile mounting bracket or holes). A BNC external antenna jack is provided as well as a screw-in telescopic whip.

The owner's manuals provided with both scanners are excellent.

The PRO2032 is \$299.95 from Radio Shack outlets nationwide.



# No Matter What Scanner You Have It's Not Complete Without a DC440



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Scanning the busy VHF/UHF communications bands has always been exciting. Now monitoring enthusiasts are discovering that adding a DC440 to their Scanner or Communications Receiver\* adds a new dimension to listening. Virtually all commercial, industrial, business and governmental two-way radios are now using sub-audible tones or codes and being able to display them provides valuable insight into who is talking or being called. Keep tabs on individuals and monitor repeater access codes.

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\*Will likely require internal connection to scanner or receiver.

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## Sangean's New ATS 202 Digital Mini-Portable

Sangean is revered for its world band radios that are carefully constructed, yet perform better than usual for the price charged. Lately, though, competition has been hammering away at Sangean's lead. Right now, only Sangean's large ATS-803A and miniature ATS-606 really stand out.

The trouble with the '606 is that, at a list price of around \$250, it's pricey. That's an awful lot of money for a small portable to take on trips.

### One Third the Price of the '606

So, to improve upon this, Sangean recently introduced the new ATS 202, which lists for \$89.95. Like the '606, it is digitally tuned and palm-sized for travel. It uses ten presets for shortwave, plus signal-peek scanning and a pair of up/down slew buttons that tune in 5 kHz increments.

It also has a handy 24-hour World Time clock. And since it's for traveling, it has a power-lock switch to keep it from being switched on accidentally. For getting you to sleep and waking up, there's a delay-off "sleep" button and an alarm. The '202 includes a pushbutton light for the digital display so you can operate the radio more easily in dim light.

### Whither the Keypad?

Those little touches are welcome, especially in this price class. However, even more welcome would be a keypad or tuning knob, neither of which are on the '202. *Passport to World Band Radio* was involved earlier this year in a private survey of shortwave listeners; the results, which we printed in the 1994 edition, show that the favorite tuning device is a keypad. Yet, we're seeing more and more world band radios coming on the market *without* keypads!

Still, the '202's ten shortwave presets help overcome the slowness of tuning to some extent, because you can assign each preset to a given shortwave band. But it still requires persistence to tune this radio.

Another tuning nuisance is that the '202 has two shortwave ranges, "SW1" and "SW2." This means that if you're listening to a station on 7150 kHz and want to tune to



9600 kHz, in addition to all the other tuning steps you also have to switch the radio from "SW1" to "SW2".

The bottom line is that if you don't tune to a lot of different stations, the '202's operating arrangement is okay. But if you change station settings often, or like to dial bandscan to see what's on, this radio is definitely not for you.

### Good Sensitivity, Reasonable Audio Quality

So much for ergonomics. Performance is really the important thing, and in this regard the '202 comes out with a mixed report card.

Take sensitivity to weak signals, for example. This is important, particularly if you listen during the day. It's also of importance if you live in such places as California, Alaska, British Columbia or Hawaii—where shortwave signals tend to be weaker than they are in most other parts of the world.

Here, the '202 does a nice job. It snatches most stations out in the ether, even if it won't pull in "serious" DX like a Drake R8. Its audio quality on shortwave, although lacking in fidelity, is also quite reasonable for such a small radio.

Even though the '202's circuitry isn't terribly sophisticated, its rejection of spurious signals—while not very good—is a bit better than you would expect from a radio in this price class. Yet, its ability to keep out interference from adjacent channels—selectivity—is downright mediocre.

### Whither the Stations?

But that's not the real problem with this radio. The '202 doesn't so much as tune many important parts of the shortwave spectrum used for world band broadcasts.

For example, it misses the important 5800-5945, 7305-7550, 9350-9495, 11550-11645, 12055-12100 and 15000-15095 kHz ranges—plus a number of other segments, as well. A perusal of *Passport's* Blue Pages shows the wealth of juicy stations that cannot be tuned by the '202.

### Nice Try, No Cigar

Overall, the Sangean ATS 202, even at well under \$100, leaves too much to be desired. The new Sony ICF-SW30, with a street price of only around \$30 more, runs circles around the '202—and for travel it's not much bigger, either.



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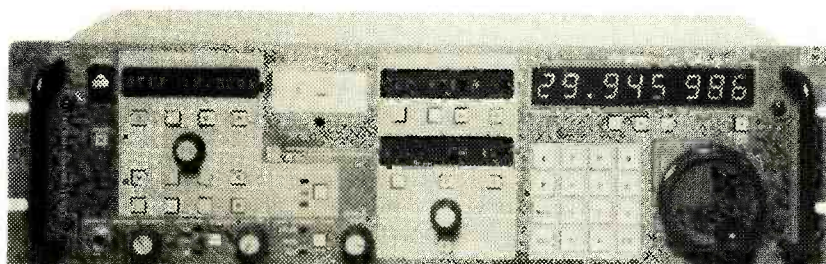
- \* Do the other shortwave radios just seem "ok?"
- \* Have you been wanting a shortwave radio that doesn't *HAVE* limits?
- \* Does the name **Watkins-Johnson** mean anything to you?

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## Cheap Earth Thrills: A \$30 Fax Program and Interface Or, Catalano Spaces Out!

In our continued five year mission to seek out listening programs with great value for money, to go where no listener has gone before, we came upon FAXCAP.

Earthdate: Summer 1993. After scouring the radio magazines, scanners indicated the presence of an unknown program, at least to this ship's Captain. This alien program promised an interface which, when connected to the serial port of a PC (XT or AT, the faster the better), and the speaker of a receiver, would allow the reception of WEFAX (weather fax), RTTY (radioteletype), CW (continuous wave/Morse code) and Packet. The price quoted: \$29.95 plus \$4.00 shipping! Impossible!

Further, it included a disk full of public domain programs to drive it! This price must be in Vulcan units of currency which equal 1/4 of a USA dollar. No, tricorder readings indicated it was in good ole' yankee dollars.

"Could this be?" I thought as I entered the earth phone number. After a pleasant audio communications session with Bill Nolle I received a small package a few days later at my post box, uh, starbase. In it was the usual 25 pin Cannon connector, used by most serial devices. But this one was different having only one thin cable coming out of it. The other side of this cable had a miniature audio plug, like those on portable headphones. This is also the size used on many receivers for external speaker connections.

One other fact noted by the Tricorder: the shell of the connector was metalized, a very good idea to minimize radio interference. A nice touch, but how would it operate? Along with the

connector was a 3.5 inch floppy disk with compressed, zipped, files and an unzipper program. So, how will this alien program stack up against regular issue Starfleet Command FAX programs from AEA and SSC? The price, even in Vulcan currency, was a BAA-GAN, in the words of a race from the Fileneian star system. Such good fortune is also known as a blue-photon special by the K-Martians. But was it truly a bargain?

The software that came with the interface included two individual programs: JVFAX and Ham Comm. An interesting fact is that both of these programs were produced by European ham authors. Ham Comm 2.1 is a very versatile program allowing the decoding of CW, Baudot and ASCII signals.

But before I could discover how this program would operate in the decode mode, a hypnotizing force field immobilized me. I could not make my fingers push exit after I had accessed the TUNE and SPECTRUM functions. I could only stare at the Spectrum function. To my amazement, it displays an audio spectrum of the signal being received, very similar to what we talked about in the review of Pioneer Hill Software's Audio Spectrum Analyzer. Ham Com/Faxcap interface does a very similar function without the need of a sound card accessory!

Ham Com cannot store, play back or manipulate the sound data as the excellent Pioneer Hill Software can. But it is light years ahead of ANY decoder tuning display I have ever seen, with the exception of an oscilloscope.

As you tune your receiver, and the pitch of the RTTY mark and space tones change, you can watch the two peaks on Ham Comm's spectrum

function. By going to the TUNE mode a simple bar graph is shown with the audio frequency of the signal displayed. No guess work here. Both graphs respond very quickly to the input signal, with almost no visible delay.

### Taking Off

Although its name was FAXcap, it promised the reception of RTTY and CW as well. OK, let's pit it against the decoder that's as well known throughout the galaxy as Sarian Brandy—the PK-232. After tuning to an 80 meter ham RTTY station, I tried to decode it with Ham Comm. No luck after five minutes of trying. Then the PK-232; immediate copy. This was repeated for CW with the same results; no copy with Ham Comm, solid copy with PK-232.

"What a sly Klingon trick to waste a Starfleet Captain's valuable time," I muttered almost an hour later. Trying one more source of RTTY—Meteos (weather stations)—I was able to do about 60% copy with Ham Comm as compared to the PK's 100%. Going to a slower (20 word per minute) ham station sending Morse, I was able to equal this 60% copy. This is not the kind of program you really want to use for Morse.

But the RTTY was showing more promise with strong stations in the clear. On 3.6252 MHz, the ARRL RTTY bulletin was copied with almost no flaws (95%)! Not bad for a back-up decoder in a pinch. But then, it was called FAXcap, and the Spectrum and Tune programs were extremely utilitarian, even if the decode functions were suspect.

I had to load the JVFAX program to check out FAX decoding since Ham Comm didn't seem to have this decode mode. JVFAX was written to decode FAX and Slow Scan TV (SSTV). After reading the English version of the included instruction document and setting the demodulator configuration to the "comparator" setting (it has to do with how the interface processes the data), we were ready to copy FAX images.

Upon pressing "F" the screen went dark and a box appeared at the lower right. Half of the box indicated command conditions: Printer on/off, FAX waiting/running, Lines per minute, and

*Check out the review of FAXCAP and you, too, could copy weather fax.*



others. The second half is a graph showing white and black levels and the actual signal. By tuning the receiver so that the black and white lines peak at the same levels, a recognizable fax quickly results.

I'm really impressed with the almost-real-time graphics in these programs. After starting the fax the screen "paints" one line at a time. When it gets into the bottom half of the screen, the command/input graph box automatically repositions itself to the top of the screen. Pretty sharp, uh, I mean, "very logical." The image quality is pretty good: The wind speed flags and longitude numerals are very readable. Unlike the experience with CW, and to a lesser degree, RTTY, the FAX operation was relatively quick and painless to get up and running and the results were very acceptable.

### Was This Detour Worth the Trip?

I understand your question. "Is FAXCAP as powerful as di-lithium crystals?" Let's consider the facts logically. Using the Ham Com program, the results we saw indicate that you should forget it for decoding CW, and it has only limited RTTY capabilities. But remember the excellent Spectrum and Tune functions that Ham Comm provides with the interface. The JVFAX program is well presented and works well with the interface.

The package has a lot to offer, but one of its biggest limitations is the lack of written instructions. Sure, there are printable instruction files included. But who is going to be patient enough to print out over sixty pages (forty-six just for JVFAX) before you start getting results? Not most of us, I fear.

Even a single summary sheet of the programs' main commands and configuration for the included interface would be a great help. It would bait and hook the new user like a Romulan trap. I'm afraid a large number of new users will give up before page twenty-six is printed. It is a shame because, as I said, there is so much here more than just simple fax reception for the person who wants to dig in and read (and print).

This is really the only reservation I had. JVFAX did lock up once which required the computer to be reset. Program bug or improper configuration for my system? I still don't know.

Are the results as good as the other fax programs we've looked at? (You guys are tough.) The other Fax programs and interfaces we reviewed were priced at around \$100. FAXcap is \$33.95 including shipping in the USA. After considering the programs that are included with the interface, I believe that this is an excellent package for getting into Fax on the cheap, with-

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out wasting a lot of time learning how to tune a Fax signal.

You'll need an XT, or better still, AT, with 640K of RAM, 25 pin serial port or adaptor, CGA, Hercules, EGA, VGA or SVGA monitor and a 3.5 inch floppy disk drive. There is no provision for an LCD display as found in a laptop. A hard drive speeds things up considerably.

That's it! FAXCAP is available from William Nolle, 122 Phillips Rd., Hazel Green, AL 35750 Tel (205) 828-7127 for the princely sum of \$34.95, including delivery in the USA.

### Messages From Earth

Eddy Waters, a regular reader from South Australia, writes in response to the HOKA decoder. Eddy becomes the first true user of the HOKA 3 decoder I have heard from. Eddy says that compared to his M7000 decoder the HOKA is less sensitive "but for signal analysis the HOKA is considerably better."

Eddy, I'm still waiting for the guys at J&J, who distribute the HOKA in the USA, to send me one to put through its paces. On another subject Eddy suggests that *MT* should provide one year's worth of *Monitoring Times* on a CD-ROM making for easy reference to articles and frequency data. I think it's a great idea. How 'bout it, Rachel (*MT* editor and Voice of Starfleet)? (*It is currently under consideration by Starfleet Command-RB*)

Finally, Eddy asks about programs which can help in monitoring of aviation communications, such as map routes and corresponding frequencies. Well, as a pilot, I couldn't agree with you more. A few years ago I saw a program that was suppose to decode meteo weather data. I had a copy for the C64 but I could never get it to work. Jean Baker, do you know of one?

Thanks to Eddy and all the readers who take the time to write. Continue to let me know what topics we should cover in the future. Even Starfleet scanners need help. Shields up and warp five. 'Til next month, "live *MT* long and decode."

### NEW: TONE READER SUPPORT!

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#### System Requirements

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## Add a BFO To Your Shortwave Radio

If you're an SWL that uses a receiver which has no BFO (beat-frequency oscillator), you are unable to copy CW and SSB signals. This can be frustrating when monitoring the amateur radio bands. CW sounds like a collection of thumps and SSB sounds like garbled speech. A BFO is needed to make these signals intelligible.

This article details a simple, inexpensive BFO that can be built in a few hours. It can be used with any radio that has a 455-kHz intermediate frequency (IF). But, even if you aren't interested in listening to CW and SSB, there is another advantage to having a BFO. Take, for example, the situation where standard AM broadcast-band stations fade up and down and, at times, exhibit what is called "selective fading," which tends to distort the speech for short periods. A BFO is then used to insert a steady carrier within the receiver. This minimizes the effects of the foregoing problems. The signal must be tuned in for a zero-beat condition (no whistle heard on the desired signal) to prevent an annoying heterodyne from accompanying the voice or music information that is transmitted.

### The Outboard BFO

The circuit in Figure 1 is used as an outboard module. This saves the grief of finding a spot for the circuit inside the radio cabinet. It is connected

to the IF/detector system in the receiver by means of a short length of RG-174 miniature coax. RG-58 can be used, but it would become "the tail that wagged the dog" because it is so stiff compared to RG-174.

Output from the BFO is routed to the detector (usually a diode) in the AM receiver. The connection is made between this diode and the IF transformer to which the diode is connected (see Figure 2 for an example). If a transistor is used for the detector, the BFO signal is injected at the base (input) of the transistor. C5 of Figure 1 can be made smaller in value if you wish to reduce the injection level. In fact, it can be replaced by a 100-pF trimmer capacitor to permit adjusting the BFO output level.

### Circuit Details

The usual BFO employs one or more quartz crystals for generating the BFO energy, but a 455-kHz crystal is a terribly expensive component these days. For this reason I chose to use an 85-cent miniature IF transformer that I purchased from Mouser Electronics (800-346-6873 for catalog). Frequency stability at 455 kHz is easily achieved with a coil and capacitor combination (T1 of Figure 1). The transformer contains a built-in resonating capacitor. I could detect no frequency drift with this circuit during a 1-hour operating period that was initiated from a cold start. Maximum frequency change at 72 degrees F was 3 Hz.

You will observe that the Figure 1 circuit is arranged for reception of upper and lower sidebands. This is necessary for monitoring amateur SSB signals because hams use LSB on 160, 75

and 40 meters, whereas they use USB from 20 through 10 meters. If you decide to use the BFO for only the standard BC band you may omit C1, C2, D1 through D4, R1, R2, RFC1, RFC2 and S1. The BFO is then tuned to the desired frequency by means of the slug in T1. The eliminated circuitry is only for selecting USB or LSB.

Q1 is an N-channel JFET. Other FETs may be substituted, such as a 2N4416 or similar device. The FET need not be designed for high frequency use.

Although the circuit in Figure 1 indicates a 12-V power source, you can obtain good operation when using a small 9-V transistor radio battery. The battery should last for nearly its shelf life because the circuit draws very little current.

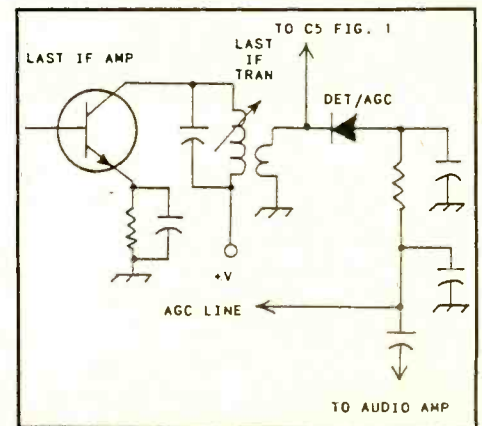
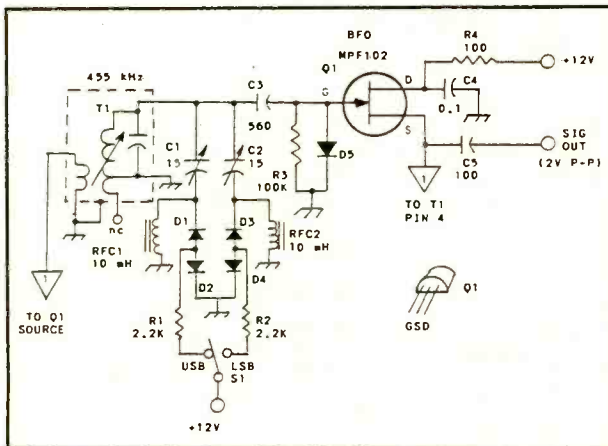
### Construction Notes

The photograph shows that the enclosure is made from single-sided PC board material. The joints of the box are joined by soldering them together with a 40-W pencil type of iron. Top and bottom covers may be fashioned from aluminum or tin that has been bent into a U shape. Sheet metal screws affix the covers to the box and provide a ground connection to the box walls.

The three feedthrough terminals seen in the photo are small press-fit teflon units that I bought at a flea market. You can substitute 4/40 screws and nuts if you remove the PC board copper around the screw heads to insulate them from ground. A motor tool is handy for that task.

You can make your own BFO PC board by following the simple method described in *Make Circuit Boards—Ugly Style* (July 1993 *MT*, p.100). Figure 3 provides a scale pattern for the

**Figure 1:** Schematic diagram of the 455-kHz BFO. C1 and C2 are 15-pF ceramic, plastic or mica trimmer capacitors. C3, C4 and C5 are disc ceramic, but silver mica or polystyrene units may be used at C3 and C5. Resistors are 1/4-W carbon composition or carbon film. Diodes are 1N914 or equiv. small-signal silicon types. See text for data about Q1, RFC1, RFC2 and T1.



**Figure 2:** Schematic diagram that shows a typical AM detector and how to connect the BFO to it.

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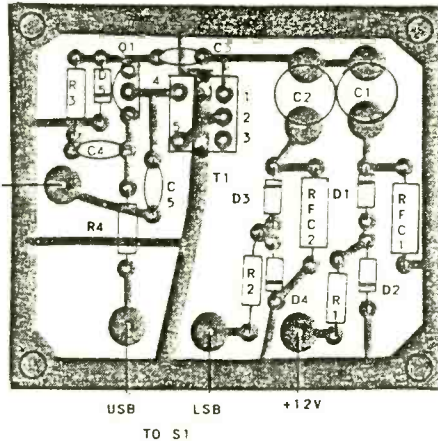
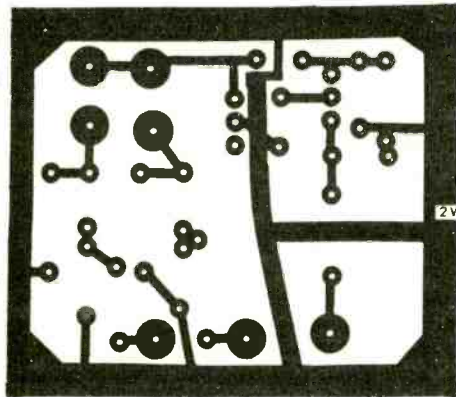
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3A

3B Component-side view (not to scale)

**Figure 3:** Illustration A is a scale etching pattern as seen from the etched side of the PC board. At B is a non-scale parts placement guide as viewed from the component side of the PC board.

PC board. The completed board is soldered along its edges to join it to the box walls.

None of the parts for this project are costly or hard to find. The 10-mH RF chokes are available from Hosfelt Electronics (2700 Sunset Blvd.,

Stuebenville, OH 43952; 800-524-6464) for 20 cents each. The five diodes cost me 1 cent apiece and the JFET came to 75 cents.

### Adjustment Procedure

Tune in an LSB signal and adjust your receiver for maximum peak S-meter reading. If you have no S meter, tune for maximum signal loudness. Adjust C1 carefully until the audio is clearly readable and sounds natural. Next, find an upper-sideband signal on 20 or 15 meters and tune it in for maximum strength. Adjust C2 for best voice quality. You will need to repeat the foregoing process three or four times, because there is some interaction between C1 and C2. It may be necessary also to adjust the core of T1 in order to get the basic BFO frequency near 455 kHz. In fact, it is wise to do that before tweaking C1 and C2.

Once the BFO is set up correctly for USB and LSB it will be suitable for CW and AM reception with no additional adjustments.

### Some Final Thoughts

D1 through D4 are used as switching diodes for selecting sidebands. D5 is a bias stabilization diode that aids overall frequency stability. T1 is a white-core IF transformer. It has the correct turns ratio to ensure ample feedback to make the circuit oscillate. You can find these transformers in junked AM-band transistor radios if you do not wish to purchase a new unit.  $M_T$

## Build a Solid-State Audio Recorder and Playback Circuit

Happy New Year! There's nothing like a little avant-garde technology to launch the new year, so what if we conjure up a tape recorder on a chip? If I had said that not too many years ago, you would have laughed me out of town. Well, you can laugh, but turn to your 1994 Radio Shack Catalog, top of page 126, and feast your eyeballs on #276-1325, "Digital Voice Record/Playback IC."

"ISD's patented Direct Analog Storage Technology (DAST™) brings analog data into the semiconductor memory world. This 'break through' EEPROM storage method writes analog data directly into a single memory cell without A/D or D/A conversion ... You need only a few external components—a microphone, loudspeaker, switches, a few resistors and capacitors, and a power supply or battery—to build a complete voice record and playback system," says the Archer™ ISD1000A Voice/Record Playback IC Data Sheet.

This means that the chip and a few external parts can be slapped together and installed inside a cherished shortwave or scanning receiver to greatly enhance monitoring capabilities. I know, we all have "real" tape recorders, but sure as tootin', when something hot comes along, that

PARTS LIST		
Ckt Sym	Description	Radio Shack Catalog No.
U1	Direct analog storage technology IC	276-1325
S1	Switch, SPST, push-button, mini, n.o.	275-1571
S2	Switch, toggle, SPST, mini	275-624
D1	Diode, silicon rectifier, 1N4001	276-1101
D2,3	Diode, silicon switching, 1N4148/1N914	276-1122
Q1,2	Transistor, silicon, switching, 2N2222A	276-2009
C1	Capacitor, 22- $\mu$ F/35v, electrolytic	272-1026
C2	Capacitor, 4.7- $\mu$ F/35v, electrolytic	272-1024
C3	Capacitor, 1- $\mu$ F/35v, tantalum	272-1434
C4-6	Capacitor, 0.1- $\mu$ F/16v, monolithic or ceramic	272-109
C7	Capacitor, 0.01- $\mu$ F/16v, monolithic or ceramic	272-131
R1	Resistor, 470-k $\Omega$ ; 1/4-watt, carbon or metal film	271-1354
R2,3	Resistor, 100-k $\Omega$ ; 1/4-watt, carbon or metal film	271-1347
R4-11	Resistor, 47-k $\Omega$ ; 1/4-watt, carbon or metal film	271-1342
R12	Resistor, 10-k $\Omega$ ; 1/4-watt, carbon or metal film	271-1335
R13	Resistor, 1-k $\Omega$ ; 1/4-watt, carbon or metal film	271-1321
MISC.	Project Board or perf board	Choice
MISC.	IC socket, DIP, 28-pin	276-1997
MISC.	Shielded Mic cable, salvaged from patch cable	42-2434

tape recorder is tucked away in a drawer or connected to another receiver. By the time it is hooked up, the interesting signal is long gone.

Even if your trusty tape recorder is handy, it takes time to find and press the Play/Record buttons in the dark. In that interval, a vital phrase, an address, or a telephone number can be forever lost in the ether. A simple circuit built around the

solid state voice recorder/playback IC and installed in your receiver with a couple of mini switches can offer timely and effortless recording and playback of received signals during the interval that you're fumbling around for the conventional tape recorder.

More importantly, perhaps, is the raw power for a quick repeat of some phrase or sentence that you miss while engrossed in something else. The solid state voice recorder/playback IC is versatile and can be connected in a number of ways, one of which might be to continuously record at all times, and to playback only when you desire. Think of it as a type of continuously running, endless loop!

The most significant drawback to this IC circuit is its a limited capacity of 20-seconds of audio. It also has a somewhat elevated cost of \$18.00 for the chip, plus another \$10 for other parts. \$30 for a 20-second recorder? Well, one of the pluses is that this technology has not been available to hobbyists until now. If you're a serious scannist or SWL, you'll appreciate the capability to instantly play back missed phrases and sentences. If you're a serious experimenter, you'll find a dozen other uses for this new technology of digital-analog recording.

If you think 20-seconds is not sufficient, then add a 2nd, 3rd or more chips to the first in a simple stack arrangement for an additional 20-seconds per chip. Three chips in one circuit will provide a full minute of recorded audio from the receiver, ample for most monitoring applications.

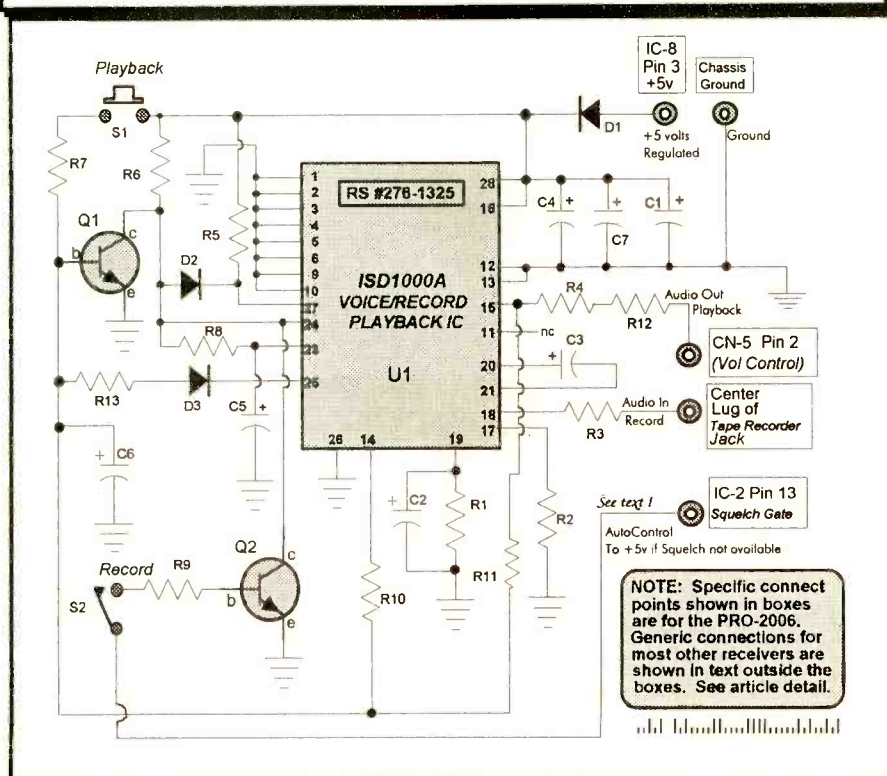
### Getting it all together

The timid experimenter can take cheer, because even though the manual says you need some extra components, you really don't need the microphone and loudspeaker for radio monitoring applications. This month's project offers nearly everyone an easy way to add a powerful, effective solid-state recorder to a shortwave or scanning receiver.

Besides the switches, up to five connections to the receiver are required. The first two include hookup wires to ground and regulated +5 volts DC. A third wire is needed for the RECORD function, best taken from the center lug of the receiver's TAPE REC jack, if it has one. Then a connection is needed for PLAYBACK, generally best applied to the high (ungrounded end) lug of the receiver's VOLUME control.

Last, but not least, if your receiver has a SQUELCH function, it can be used to automate the RECORD function when Squelch breaks; and

### SOLID STATE VOICE RECORDER/PLAYBACK DIAGRAM



to standby when squelch sets. If your receiver doesn't have squelch (and most shortwave rigs don't), then run that wire shown in the schematic to +5 volts and rely on the RECORD switch for when you want to record something.

As you can see, connection to the receiver is uncomplicated. Construction of the solid state voice recorder/playback circuit is also straightforward. You can build the circuit on a piece of perf board or even a small project board with copper foils on the bottom. I'll leave that up to you.

All parts are available from Radio Shack as seen in the Parts List. The transistors and diodes D2,3 are switchers and therefore not critical. D1 is reverse polarity protection so don't skimp on that one. I suppose there is a wide latitude for variance from the specified capacitors and resistors, but don't arbitrarily change anything; especially don't deviate from specs on capacitors C4-6.

I would suggest that you use shielded mini-coax or mike cable for the PLAYBACK and RECORD connections between the circuit and the receiver to minimize chances for noise pickup or injection into the receiver. RG-174/u mini coax is great, if you can get it; otherwise, Radio Shack's audio patch cable, #42-2434, will do fine.

I recommend you not skimp by soldering in the digital-analog IC chip. Use a 28-pin DIP IC socket to protect your investment. The documentation that comes with the digital-analog chip is pretty good, and offers a number of sample circuits and lots of technical details, so between this article and the spec sheet, you should experience success on your first try.

If your receiver doesn't have a TAPE REC jack, just about any line-level audio signal point will do nicely. A good point for receiver audio at line levels is almost always on the high end lug of the VOLUME control. This is also a good place to inject the PLAYBACK signal from the circuit, in which case you'll need to substitute a DPDT switch for S2 and use one section to switch between the Audio In and Audio Out points with the common lug of the switch going to the high lug of the receiver's VOLUME control. The appropriate half of the other section of the switch can be used as S-2.

If you have other recording needs and interests, the IC's data sheet offers several circuits with which to experiment.

## New Product Notice!

Speaking of tape recorders on a chip, an enterprising company has thrown their hat into the ring with an all solid-state signal recorder for the Commtronics HB-232 Scanner/Computer

Interface and its associated scanner receiver! Intercept Technology boldly introduced their Voice Activated Digital Electronic Recorder (VADER) at the recent Monitoring Times Convention.

Vader works with the HB-232 to record up to a continuous hour's worth of audio signals that are synchronized to the HB-232's AutoLogger function. In a word, this means positive identification of the time, date, channel, frequency, scanner mode settings and the audio content of transmissions that were recorded into Vader's 16-Mb of inexpensive audio RAM.

Vader comes on an AT-size printed circuit card that plugs into an expansion slot of a 286/compatible or higher computer. Digitized audio can be played back almost instantly from any point in the AutoLog file. "Smart logic" can be selected to play back only selected signals. For example, suppose a hundred frequencies were scanned over a 24-hr period. Obviously, there will be a mix of signals in consecutive order over that period. One simple Vader selection allows instant and consecutive playback of ONLY desired frequencies, such as you might want in order to follow a unique series of transmissions to the exclusion of all others!

Vader also offers a measure of signal manipulation that allows muddy, almost indecipherable audio to be understood. Vader signals can be saved to disk as a file or transcribed to regular audio tape. For more information, contact Intercept Technology at their BBS (513) 297-0250 or mail to: 74 Western Avenue, Enon, Ohio 45323

## Parallel Diodes: Reader Feedback

Readers Marvin Ross and Rob Cave pointed out to me that diodes in parallel can prove troublesome due to unequal characteristics of their solid-state junctions. This can result in one diode carrying more current than the other.

I suppose I should have pointed that out, but in low current situations, say under 5 amperes, this caveat is not too important. Most monitoring applications call for only a couple of amps or so where one diode will do nicely in the first place. But say your series reverse polarity protection diode is rated at 2.5 amps and you plan to provide at least 2-amps to the circuit: then two of those 2.5-amp diodes placed in parallel will not pose any jeopardy and definitely will safely accommodate upwards of 4 amps or more, well above the capacity of just one diode.

If you want to do it the right way from the get-go, then insert a resistor of some small value, say  $\frac{1}{4}\Omega$  to  $\frac{1}{2}\Omega$  in series with each diode that's used

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in parallel. The power rating of the resistor should be calculated as follows:

$$P = 2(I^2 R)$$

Where: P = power rating, watts  
I = maximum current through diode, amperes  
R = value of series resistor, ohms  
Double the I<sup>2</sup>R value provided a 100% safety margin for the resistor

Example: Assume 1-amp flow through a 1/2-Ω resistor:

$$P = 2(I^2 R) = 2(1^2)(.5) = 2(0.5\text{-watt}) = 1 \text{ watt}$$

Therefore: The series resistor should be rated at 1-watt even though only a half-watt is expected to be dissipated.

*M*<sub>T</sub>

## Some Effects of the Earth on Antenna Performance

As discussed in a past Radio Riddle in this column, a dipole antenna in free space has 2.15 dBi gain, but has as much as 6.8 dBi gain when mounted horizontally in one's backyard. Note that in free space (fig. 1A) the antenna's radiation-reception pattern (R-R pattern) extends out in all directions around the antenna wire, but in the backyard (fig. 1B) the antenna's vertical radiation is drastically reduced as it gives increased gain in more horizontal directions.

What has happened to make the difference? In the backyard, the ground under the antenna acts as a reflector to provide the aforementioned gain. Compare figs. 1B, 1C and 1D to see what happens to the dipole's R-R pattern as we move the dipole to different heights above ground.

### The Earth is an Antenna Element in Disguise!

A dipole near earth is actually something of a two-element beam antenna with the dipole as the active element of the beam and the earth acting as the reflector element. If the spacing of the dipole from the ground is as shown in fig. 1C, then the dipole-ground combination is like a two-element beam with its R-R pattern pointing directly upward. Above 8 MHz or so this energy may just pass through the ionosphere and on into outer space.

This upward-directed energy is wasted if the operator wants to work shortwave DX stations, because they require low-angle, much more horizontally-oriented R-R patterns. But if you want to work relatively nearby stations, then the antenna just described is often a good performer in the 2 to 4 MHz bands at night and from 4 to 8 MHz bands in the daytime; there these upwardly directed signals are usually reflected back from the ionosphere to a wide area centered on the antenna. This kind of antenna, called a "near vertical incidence skywave antenna" or "NVIS antenna," is much valued by the military as it will support communications between antennas separated by high hills or mountains.

### A "Solid Grounding" In Theory

A groundplane is a set of antenna elements connected to the bottom of a vertical antenna. They shield the antenna's vertical element from earth ground to some extent and also function as a part of the antenna's resonant length. Radials allow an antenna to work independently of earth ground.

A counterpoise is a reflector element placed below but not directly connected to an antenna. A counterpoise reflects energy it receives from the antenna much as the earth might otherwise do and, to an extent, takes the place of actual earth

ground. Consider any antenna *without* a groundplane or counterpoise which is functioning far from earth ground. Then bring it near the earth, and place it at various distances from earth. Antennas without groundplanes or counterpoises will show the same general variations in R-R patterns as the dipole.

What would happen if we employ an antenna *with* a groundplane or counterpoise and vary its distance from earth: As you may guess, the R-R patterns do not change nearly as much in this case. The reason is fairly obvious; an antenna with a groundplane or counterpoise already has something (the groundplane or counterpoise) as part of its design which reacts with it somewhat as the earth does when it is near the earth. And, of course, this holds true whether this antenna is far from earth, or even in outer space.

### Ground Effects at VHF and UHF

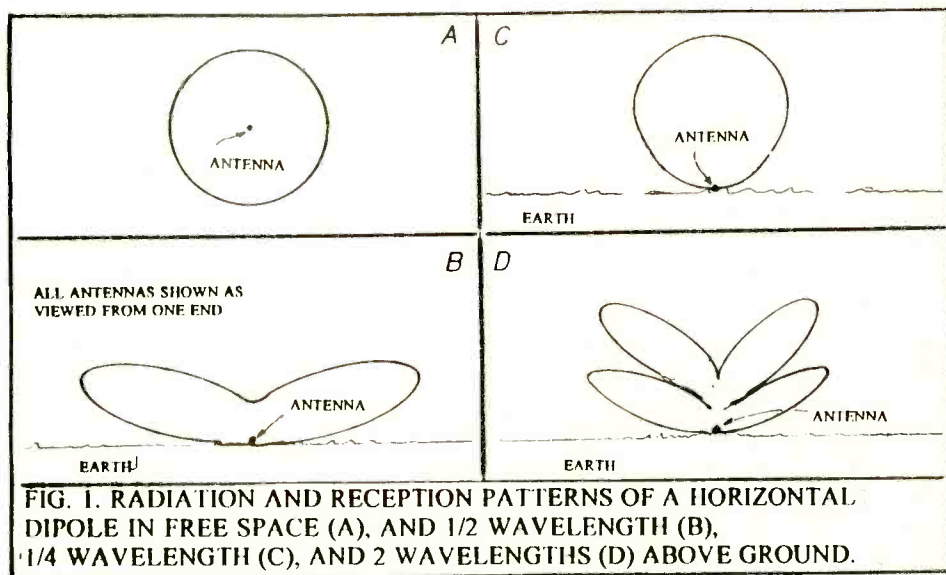
A wave that goes directly from a transmitting antenna to a receiving antenna is called a "direct wave." A wave that reflects from the ground first and then travels on to the receiving antenna is called a "ground-reflected wave." As these two waves combine at the receiving antenna the resulting wave is known as the "space wave."

If these ground-reflected and direct waves arrive at the receiving antenna in a phase relationship so that adds their strengths, then a relatively strong space wave is received. However, if they arrive out of phase, they may cancel one another and lead to a very weak or even zero-strength space wave.

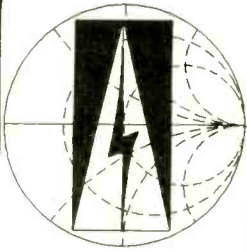
For important UHF-VHF commercial and military signal-paths an attempt is made to calculate antenna heights and the terrain between the transmitting and receiving ground which reflects signals will optimize the phase difference between the direct and ground-reflected waves. This will maximize signal strength at the receiving antenna.

### The Earth is Not Always a Good Ground

The degree to which the earth beneath an antenna reflects energy it receives from the antenna depends that earth's conductivity. If the earth is quite dry it is a poor electrical conductor







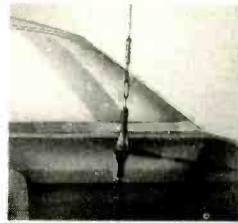
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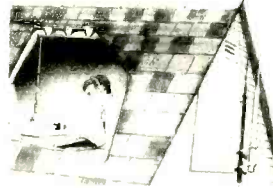
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and there will be little reflection from it. In such cases the top few feet or more of the earth is more of an insulator than a conductor and may be essentially "invisible" to the energy from the antenna. Thus the ground which the radio waves "see" will be below the surface of the earth. This depth is called "radio ground" — the ground that radio waves "see."

In damp soil, radio ground is not too far beneath the ground's surface. In dry or rocky soil radio ground may be many feet below the surface. Over salty water, radio ground is essentially at the surface of the water. The ARRL *Antenna Book* gives information which can help you determine approximately what to expect from the ground in your location.

## Can You Use an Antenna Under Ground?

Underground antennas buried close to the earth's surface in dry ground are actually somewhat above radio ground. Thus they are not actually "underground" as far as radio waves are concerned.

Some underground antennas work better than you would expect if you were to think of the earth as always being conductive and able to shield any

buried antenna from radio waves coming from the sky above. In the early days of wireless the legendary Guglielmo Marconi found that antennas laid out on the dry sand of the Lybian Desert functioned surprisingly well. On the other hand, antennas mounted high and in the clear almost always give much better signal strength than underground antennas.

In a future column, we will discuss grounded and above-ground radials, the effect of antenna height above radio ground on antenna impedance and on vertical antenna R-R patterns.

## RADIO RIDDLES

### Last Month

Last month I commented that the name of the Palomar "White Box" antenna "would seem to be a 'reverse English' reference to the infamous 'black box' so often mentioned in electronic circuit problems." Then I asked "what does this term 'black box' mean to a radio engineer or technician?"

Well, in electrical or electronic problems the term "black box" is often used to represent some circuit or circuit element which is unknown to the person trying to solve the problem. Information is

### Looking for a Good Antenna Handbook?

If you'd like a good source of information about antennas you will be interested in *THE ANTENNA HANDBOOK* by Clem Small. Within its 200-plus, 8 1/2" by 11" pages, there is much material from past "Antenna Topics" columns plus a considerable amount of new material.

It is an excellent source of information for selecting, constructing, understanding, and utilizing your antenna system. Also covered are subjects like the history of antennas, odd and unusual antennas, signal propagation, factors affecting antenna performance, antenna accessories, and antenna troubleshooting.

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then given on how the circuit functions and it can be quite exciting to solve the problem to find out just what is inside the black box.

### This Month

If the earth, or, at least, radio ground, is a conductor of radio currents, then is it possible in some way to make an antenna out of earth? How could you go about such a strange task? Do you suppose this has ever been attempted or even actually done? And if water is conductive also, how about a "water antenna?" Hmmm.

We'll have the amazing answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, **MT** Peace, DX, and 73.

**Q.** Why, when I connect my cigarette lighter power cord to my scanner, do I pick up more signals than when I use batteries only? (Al Shack, Simi Valley, CA)

**A.** It isn't because you have more power available; it's because the added metal of the cord, like the ground plane radials on an antenna or the body of a vehicle, add to the signal-collecting efficiency of the the vertical whip.

**Q.** Why do most scanners have 30 MHz as their low end? (Roger Cravens, Douglasville, GA)

**A.** While it is true that the FM land mobile services actually start at 25 rather than 30 MHz, the vast majority of scanner listeners are more interested in the public safety bands above 30 MHz. Use by the 25-27 MHz petroleum exploration and broadcast auxiliary is nil, and the 27 MHz citizens band and 28 MHz amateur band include upper and lower sideband, complicating the design of the scanner.

**Q.** Why can't I connect my frequency counter to my cable TV line and read the frequencies of TV stations? (Jim Hasan, Akron, OH)

**A.** A frequency counter can only show one frequency at a time, the strongest signal present. If two or more strong signals are present, as they would be on a TV cable, you will see an erroneous display.

### Dual-Diversity Radio Followup

In our November issue we pointed out the lack of dual-diversity car radios to overcome the flutter effects ("picket fencing") caused by movement. Harold Winard of Wharton, New Jersey, advises us that Sony recently introduced their model 8000 which, according to Winard, is equipped with two antenna inputs for dual diversity. Check for it at your Sony automotive products dealer.

**Q.** Is there a publication that rates scanners side by side like Larry Magne does with shortwave receivers? (Terrynce Ondola, Norwood, OH)

**A.** In a word, no. *MT* reviews scanners as they appear on the market, and the Grove catalog lists their key specifications, but there is no definitive publication that rates them. Readers, would you like such a list?

**Q.** Is there any way I can find the FBI frequencies in my area besides looking in books like the *Top Secret Registry*? (Tom Plank, Lawton, OK)

**A.** As a general rule, FBI repeater output frequencies were typically in the 163-164 MHz range, while their inputs and car-to-car frequencies were in the 167-168 MHz range. In many areas of the country that is now reversed. Frequencies between 412 and 415 MHz are occasionally heard linking repeaters between cities.

The official FBI frequency list is registered with the Interdepartmental Radio Advisory Committee (IRAC), part of the Department of Commerce, and is classified "Confidential," making it inaccessible to the public.

Your best bet for frequencies are the newer directories of federal agencies widely available through *MT* advertisers. Also see the feature in this month's *MT*.

**Q.** How does a programmable scanner work if it requires no crystals like the older scanners? (Al Shack, Simi Valley, CA)

**A.** Don't be fooled; a "crystalless" programmable scanner does, indeed, have crystals, but you don't need to plug in a crystal for each frequency. The programmable scanner has a frequency synthesizer which takes the basic crystal frequency and electronically divides it into many fractional frequencies which can be recombined into an unlimited number of combinations to produce any other desired frequency for reception.

**Q.** How can two or more shortwave receivers be coupled to the same antenna without the receivers interacting with each other while tuning? (Bill Edwards, Corpus Christi, TX)

**A.** Government and military installations use a rack-mounted, multichannel, active device consisting of a bank of wide dynamic range, solid state amplifiers, all mutually combined by transformers; they cost thousands of dollars. You can do the same thing for a couple of bucks.

Standard TV splitters, although rated for VHF and UHF applications (they work great for scanner antenna splitting), actually work well down into the HF spectrum. Remember, each port (output connector) will reduce signal strengths by half (3 dB—half an S unit), so choose one with only the number of ports you really need.

**Q.** How does metal reinforcing on a dwelling affect radio reception? Can a radio be attached to the framework and use it as an antenna? (Wayne Glenn, Cypress, CA)

**A.** The more dense the metal framing, the less it passes radio waves. For example, an all-metal



### Help for Electric Fence Interference

*MT* reader George Peek of Safford, Arizona, was plagued by his neighbor's electric fence discharges. The periodic pulses paralyzed reception.

A call to the charger manufacturer flushed out a ready-made "voltage reducer" which, by lowering the voltage pulse, cured the interference! If you are beset by similar problems, sometimes a call to the manufacturer can bring results.

### Try This Trick for Detecting Ducting

Want to try a little DXing on your scanner? Ducting is a weather phenomenon in which long distance—hundreds of miles—reception is often possible when conditions are right. But how will you know when conditions are right?

Bert Burland of Sanford, Texas, does it the easy way. He uses his local National Weather Service frequencies (typically 162.400, 162.475 and 162.550 MHz) as beacons. When the locals become swamped by distant weather broadcasts, Burt starts DXing the scanner bands!

Questions or tips sent to "Ask Bob," c/o MT, are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT.

mobile home shields long wave, short wave, and even scanner and TV VHF and UHF signals; wider-spaced metal beams, however, may shield only the longer wavelengths (lower frequencies), allowing scanner and TV signals through with little attenuation.

Yes, you can often attach an antenna lead to a large metallic mass and get good reception, but it won't be as good as an antenna designed for the application.

**Q. Why isn't single sideband (SSB) included as a mode on virtually any scanner? (Roger Cravens, Douglasville, GA)**

**A.** Scanners were originally designed for public safety monitoring, then expanded to include other land, air and sea mobile services. Above 30 MHz, there is almost no SSB on any of these services. Hams use occasional SSB here, but not enough for a manufacturer to justify the up-front cost of fine tuning steps and a product detector.

**Q. When my Bearcat 200 handheld scanner shuts off because of the low battery detector, I can turn it back on and it will operate several more minutes; I can do this several times. If the battery isn't really "dead," why does the scanner shut down?**

**A.** Uniden had problems with the low-battery shut-down on early production runs of the BC200XLT, but it was corrected. There is a disabling modification which allows the battery to be used until it's really discharged; reprints of the fix which was originally published in MT are available for \$2 plus a self-addressed, stamped envelope.

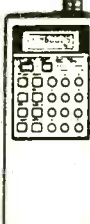
**Q. How can we use a 3-foot dish antenna for radio reception? (Darlyne Jaynes, Eugene, OR)**

**A.** You can't. Dish antennas are very frequency-specific; the larger the dish, the lower the frequency it can focus to the feedpoint. A 3-foot dish would be useless for reception below several thousand megahertz.

MT

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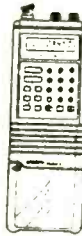
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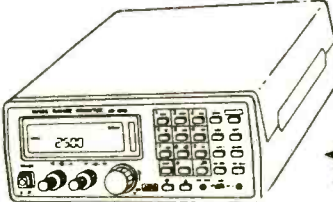


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several names—"excise tax," "duty costs," or "customs tax"—but it all adds up to about \$50 on the Yupiteru, by one customer's report. You can expect such charges any time you order from a company outside the U.S., just as folks outside the U.S. have to pay a duty whenever they purchase products from Grove Enterprises. In the U.S., duty is collected by the shipping agency, in this case, Federal Express.

Sad to say, it will soon be a moot point as far as the Yupiteru is concerned; as pointed out in "Communications," it will not be legal for even private citizens to import this receiver after April 26th. Already, *MT* advertiser Javation has been prevented from advertising the product here.

**Double Standard?**

An item appearing in this month's "Communications" ("Cellular Monitoring") was sent in by Erling Gruel of Fond du Lac, WI, who also had some comments on it.

"Although, as a Prison Correctional Officer, I generally agree with what my brothers in the police ranks do, I have a problem with this incident... given my radio background as a ham radio/scanner hobbyist.

"The Federal government loads up with rules and regulations, like the ECPA of 1986, prohibiting us, as hobbyists, from listening to the open-air communications on cellular telephone...and yet, it would appear that this police officer, without a warrant, and who 'happened to be listening in on the call on his cruiser's scanner,' intercepted a cellular communication and arrested this felon. I agree with the arrest, but disagree with the method.

"First, I find it hard that a police officer has a scanner in his car which is capable of intercepting cellular communications (and obviously listens) and does so obviously 'randomly,' while I AS A HOBBYIST am prevented from doing so officially by the same government that he is sworn to uphold.

"I wonder how the East Providence Police Department can support this action, given the contents of ECPA?"

**The Scramble to Scramble**

Bob Earl of Midway City, CA, sent in a comprehensive article regarding the communications difficulties experienced by the Laguna Beach, CA, agencies in fighting the devastating October fires. The article itself has been forwarded to Bob Kay for use in the "Scanning Report," but Bob Earl's commentary is representative of local residents who experienced great difficulties getting hard information regarding the exact location of the fires.

**SHORTWAVE LISTENER**

Ernest T. Bagley Sr., So. Portland, ME 04106

RECEPTION REPORT

Heard your station: \_\_\_\_\_ on \_\_\_\_\_ kHz at \_\_\_\_\_ Hrs UTC

Program Content: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Rcvr: \_\_\_\_\_ Ant: \_\_\_\_\_

Reception Quality (1-5)	Remarks:
Strength	
Interference	
Noise	
Fading	
Overall Rating	

Please verify receipt by QSL

UNITED STATES OF AMERICA Signed \_\_\_\_\_

*QSLs are the topic of three columns this month; here is a nice one made up by Ernest Bagley of So. Portland, ME.*

Bob says, "The county wants to put in a new system (80 million dollars bid), and one of their stated reasons for needing a new system is the system 'can be monitored by anyone with a scanner.' I certainly hope so, because this was the only way to get real information on the fire. Phone lines and cellular were either gone or jammed. The news media was only interested in sensationalizing, not any usable information or directions for the citizens affected by the fire.

"I wish there was a way *Monitoring Times* or some other organization could stop the mad rush by public service emergency, and other government agencies from encrypting and otherwise, preventing citizens from monitoring their communications. Don't we have the right to monitor under the freedom of information act? If not we should.

"These agencies are supposed to be working for us. Public safety is better served when the public can access communications of these services direct as they happen. A case in point: I had to go to an area about 35 miles away that had a fire between my home and my destination. I used my scanner to monitor both county fire agencies so as to avoid the areas where the firefighters might be working."

We have reported many other situations in which scanner owners became the eyes and ears, and sometimes the mouth, for law enforcement and emergency agencies. Putting the public into an adversarial position is about as sensible as shooting oneself in the foot. Unfortunately, I fear Bob has misread the county's intentions; I suspect they have requested the new system because the current system is monitorable "by anyone with a scanner."

**Selected Shorts**

"As one of seven winners of their Essay Contest, concerning the BosniaHercegovina tragedy and Turkey's importance in the Balkans, the Voice of Turkey provided a visit to their state of the art broadcasting studios. Their new TRT

facilities in Ankara are centered in a tree lined park. Several modern buildings are to be used for international broadcasting and television procedures.

"For great listening and a blend of Europe and the Near East, the Voice of Turkey is fascinating. I was privileged to meet the staff of both their English and French sections, viewing them at work, broadcasting the news and featured programs.

"Thank you, *Monitoring Times*, for keeping me informed about world programming."

*Meyer Sherman, Bay Shore, NY*

"We receive your fine publication—albeit with a several months' delay—regularly at Radio Prague, and all the staff enjoy it very much. It is an especially wonderful read because 'alternative' broadcasting is such a narrow field, and it makes us feel less lonely out here. Also, it is great to receive a real, American publication, because all of the media we get here—including *Time* and CNN—are European-ized."

*Nora Mikes, Radio Prague*

"On behalf of all the members at AMANDX (Assoc of Manitoba DXers) I would like to extend a warm and heartfelt thanks to your organization. I imagine when you started into the club listings you were not sure how things would progress, but you have proven to be a major asset to us. It is nice to see an organization such as yours really helping out the average listener. In a world full of companies paying lip service to its readers and customers it is great to see somebody putting their money where their mouth is."

*Shawn Axelrod, President AMANDX*

"Now that I have had some chance to recover from the drive to and from the convention and from the fall pledge drive at the NPR station where I work, I wanted to thank you for the prize of the Sangean radio and speakers (donated by Christian Science Monitor). Both have come in very handy. Thanks for all the hard work that goes into putting on a high-class convention."

*Marie Lamb, Brewerton, NY*

During the months of December and January, be on the lookout for special holiday greetings and QSL opportunities from the Russian Radio Sputnik RS-10.

In December of 1992 and in January of 1993, RS-10 sent "Merry Christmas and Happy New Year" followed by QSL instructions during repeated low broadcasts on 29.357 MHz.

The same is likely to happen this year.

*Theodore Walker, Jr., WB4MFI*

Happy monitoring times!

*Rachel Baughn, Editor*

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## Improve Your Scanning Coverage!

GRE America is proud to introduce a new family of products to enhance your scanning pleasure! First, GRE has designed the new **Super Converter 9001** for base model scanners. The 9001 converts 810 MHz - 950 MHz down to 410 MHz - 550 MHz. The 9001 is the perfect alternative to buying a new, expensive scanner covering the 800 MHz band. Next, GRE announces the new **Super Amplifier 3001** for base model scanners. The 3001 will increase gain by as much as 20 dB, and is engineered to help scanners with low sensitivity pull in weak signals. Both products use BNC connectors, (1) 9 volt battery and have an off/pass switch for returning to normal operation.



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# Club Circuit

## When Does a Club Need an Umbrella?

In Club Circuit we list those local, national and worldwide clubs you can join directly to enhance your favorite listening activity. However, several of these clubs belong to an "umbrella" organization which helps provide support, information and coordination between clubs. Write to these organizations if your club wants to know the benefits of membership, or to receive a list of their member clubs or other information. News from all three of the following organizations may also be found as part of the *DX Partyline* program over HCJB, Quito, Ecuador.

A few other organizations, such as the Finnish DX Association and Radio Communications Monitoring Association, contain member clubs or chapters, but they do accept individual memberships. The following umbrella groups are made up of club representation only.

## Association of North American Radio Clubs

This venerable organization (founded 1964) is currently comprised of about 18 member clubs. ANARC publishes a quarterly *Update* which is mailed to member clubs. Although individual subscriptions are not accepted, the most recent issue can be purchased by sending \$1 plus SASE to the ANARC Publisher at 5607 Lincoln Road, Ontario, NY 14519.

Several committees serve as a resource for information and coordinate activities such as contests or the preservation of old QSLs. Questions about these and other matters may be directed to chairman Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610. For the past few years, the annual ANARC meeting has been held concurrent with the Winter SWL Festival in Kulpville, PA, in March.

## European DX Council

Sixteen full member clubs and ten observer members make up the European DX Council, which has been in existence since 1967. The organization maintains a supply of publications,

tapes, and a yearly journal which are available not only to clubs, but also to individuals. Write to the EDXC secretary general Michael Murray, P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE, England (phone +44 480 68885) for a full list. Please enclose 2 IRCs if in Europe, 3 IRCs elsewhere, or return postage if in the UK.

Like ANARC, a number of working committees coordinate the activities and publications of EDXC. A yearly conference is held in a different location each year, and is attended by DXers from all over the world. The 1994 conference is planned for Paris.

## South Pacific Association of Radio Clubs

For the past ten years, SPARC has been promoting the activities of its four member clubs in the South Pacific area and the Handicapped Aid Program. For details regarding activities, conferences, and a sample copy of their bulletin, send 2 IRCs if outside Australia or New Zealand, return postage if within those countries, to 212 Earn Street, Invercargill, New Zealand.

## Club Listings A-L

**All Ohio Scanner Club:** Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. Ohio and surrounding states; VHF/UHF and some HF and amateur coverage. *American Scannergram*.

**American SW Listener's Club:** Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia, & Middle East; SWBC, utilities, longwave. SWL.

**Association of Clandestine Enthusiasts (A.C.E.):** Kirk Baxter, P.O. Box 1203, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.*

**Association of DX Reporters (ADXR):** Reuben Dagold, 7008 Plymouth Rd. Baltimore, MD 21208. International; Utilities, ham band, QSLing, MW, LW, and SWBC. *DX Reporter*.

**Association of Manitoba DX'ers (AMANDX):** Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF.

**Bay Area Scanner Enthusiasts:** 105 Serra Way #363, Milpitas, CA 95035. Western U.S.; 30+ MHz. *Listening Post*

**Bayonne Emergency Radio Network (BERN):** Ray Baron, P.O. Box 1203, Bayonne, NJ 07002, 201-662-2222. NE Jersey; Fire/disaster.

**Bearcat Radio Club:** Larry Miller, Box 360, Wagontown, PA 19376, 1-800-423-1331. US and Canada; Scanning only. *National Scanning Report*.

**Boston Area DXers:** Paul Graveline, 9 Stirling St., Andover, MA 01810, (508)470-1971, 50 mile radius Boston; SWBC.

**British DX Club:** Colin Wright, 54 Birkhall Road, Catford, London, SE6 1TE, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine radio. *Communication*. Sample 3 IRCs or \$2 US cash.

**Canadian Int'l DX Club:** Sheldon Harvey, President, 79 Kipps St., Greenfield Pk., Quebec, Canada J4V 3B1, (514)462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger*

**Capitol Hill Monitors:** Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531. DC, MD, No. VA, So. DE. Scanner bands. *Capitol Hill Monitor*.

**Central Florida Listeners Group:** David Grubbs, 956 Woodrose Court, Altamonte Springs, FL 32714-1261; (407) 273-5088 Andy Fountain. Central Florida; All bands. Net on 146.73 MHz Sun 8 pm.

**Central Indiana Shortwave Club:** Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

**Chicago Area DX Club:** Edward G. Stroth, 53 Arrowhead Dr., Thornton, IL 60476. 150 mile radius of Chicago; Dxing all bands. *DX Chicago*.

**Chicago Area Radio Monitoring Association (CARMA):** Ted & Kim Moran, 6536 N. Francisco 3E, Chicago, IL 60645. Chicago & midwest. Public safety & general coverage. *CARMA Newsletter*.

**Cincinnati Area Monitoring Exchange (MONIX):** Mark Meece, 7917 Third St., West Chester, OH 45069-2212. SE Indiana, Kentucky, SW Ohio, SWBC, utility, military, satellites, scanning, BCB.

**Communications Research Group:** Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

**DecalcoMania:** Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (206) 356-3927 (Phil). Collecting radio related items.

**DMS-News:** Jerry Pickard, 8961 Magnolia Ave #59, Santee, CA 92071. Nationwide; VHF/UHF; *Dreaded Mod Sheet*.

**Drake SPR4 Int'l Club:** Bill Swigger, Route 142, Box A, Bridgeport, WV 26330. Worldwide; Drake SPR4 owners.

**DX Audio Service (NRC):** NRC Publications Center, P.O. Box 164, Mannsville, NY 13661-0164. Worldwide; AM/FM; DXAS Cassette 90-min monthly audio magazine. Sample \$3 to above address.

**DX Australia:** P.O. Box 422, Moonee Ponds, Victoria 3039, Australia. MW, SW. *DXers Calling*.

**DX Club of India:** Navin Patel, 809, M.G. Road, 1-Dutt Niwas, Mulund, Bombay-400 080, India; India; SW DXing.

**DX Club Paultista:** 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, SF-00101 Helsinki, Finland; +38-0-8512410. Finland and worldwide. SW and BCB. *Radiomaailma*.

**Fire Net:** Tom Kravitz, Box 1307 Culver City, CA 90232, 310-838-1436. Southern California; alpha-numeric paging fire notification net, tied in with nationwide net.

**Friendship DXers Club:** Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. International. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 and 14113 kHz. Membership free.

**Houston Area Scanners & Monitoring Club:** 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW.

**International Listeners Organization:** Mohsin Abbas, St. Nisar Ali Shah Ahamed Pura, Sheikhpura, Pakistan, 1-(50359) 2-(50561). South Asia. Broadcasting. *Listener Times*.

**Int'l Radio Club of America (IRCA):** Ralph Sanserino, P.O. Box 70223, Riverside, CA 92503. Worldwide; BCB/AM DX. *DX Monitor*.

**Long Island Sounds:** Ed, 2134 Decker Ave, North Merrick, NY 11566. Public Safety. Net Tues 8pm 146.805. Newsletter.

**Longwave Club of America:** Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215)945-0543. Worldwide; Longwave only. *The Lowdown*.

## New Listing:

**Central VA Radio Enthusiasts:** Allen Cole, POB 34832, Richmond, VA 23234-0832. Richmond and nearby cities. VHF/UHF. SASE. No newsletter, no dues.

## SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Jan 2	South Bend, IN	Hamfest and Computer Expo/Michiana Valley Hamfest Assoc. SASE to MVHA, 21970 Kern Road, South Bend, IN 46614 or call Denny, KA9WNR, 7pm-10pm EST at 219-291-0252 weekdays. Location: Century Center Convention Center.
Jan 15	Hammond, LA	Hammond Hamfest/SELARC, P.O. Box 1324, Hammond, LA 70404 Location: SE Louisiana Univ., Upper Level of the University Ctr.
Jan 22	Loveland, CO	Northern Colorado ARC Winterfest Swapmeet Musser Moore, NOUNM, (303) 221-3698. Location: Larimer County Fairgrounds, 9 am-3pm, \$3 admission, \$8 tables. Talk in on 144.515/145.115.
Jan 23	Southfield, MI	Swap & Shop/Southfield HS ARC, Robert Younker, Southfield HS, 24675 Lahser Road, Southfield, MI 48034. Location: Southfield HS, \$5 admission.
Jan 29	St. Louis, MO	Winterfest '93/St. Louis Repeater, Inc. P.O. Box 50202, St. Louis, MO 63105; 314-567-8777. Location: St. Charles Expo Hall at Mark Twain Mall 8 am to 2 pm, talk-in on 146.94 and 442.100.
Jan 30	Villa Park, IL	Hamfest '94/Wheaton Community Radio Amateurs P.O. Box QSL, Wheaton, IL 60189 Location: The Odeum Exposition Center, 8 am-3pm, \$8 admission.
Feb 20	Dayton, OH	Dayton's Computer Blowout/Hank 1-800-798-2680 Location: Dayton Hara Complex, 10 am to 4 pm, \$5 admission.
Feb 26-27	Cincinnati, OH	ARRL 1994 Great Lakes Convention/St Stanley Cohen, WD8QDQ 2301 Royal Oak Court, Cincinnati, OH 45237; 513-531-1011. Location: Cincinnati Gardens Exhibition Center 8:30 am to 5:00 pm both days.

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 Event Calendar,**  
P.O. Box 98, Brasstown, NC 28902-0098

## DX RADIO TESTS

Information on more tests such as these can be found in *DX Monitor*, the official publication of the International Radio Club of America (IRCA). IRCA is a club devoted to the hobby of hearing distant stations on the standard AM broadcast band. *DX Monitor* is published 34 times a year and contains members' loggings, articles on radio stations, receiver reviews, technical articles, DX tips and other material of interest to the Broadcast Band DXer. For a sample copy of *DX Monitor*, send 1 US dollar or 3 IRCs to: IRCA, P. O. Box 70223, Riverside, CA 92505, USA.

This month's tests were arranged by J.D. Stephens for IRCA.

**Sunday, January 9, 1994: WSB-750**, 1601 W. Peachtree St. NE, Atlanta, GA 30309-2641, will conduct a DX test between 12:00 and 5:00 am EST. The test will include 750 Hz tones and voice IDs inserted in their regular talk format. Power will be 50 kW omnidirectional. Reception reports may be sent to: Mr. Ron Wilson, K4POZ, Chief Engineer.

**Monday, January 10, 1994: KURL-730**, P.O. Box 31038, Billings, MT 59107, will conduct a DX test between 2:30 and 3:00 am EST. The test will include various test tones and Morse code IDs. During the test, KURL will switch several times between powers of 5 kW and 235 watts. Reception reports may be sent to: Mr. Kent Abendroth, WA7DUC, Group Engineer.

**Sunday, January 16, 1994: KWCO-1560**, P.O. Box 1268, Chickasha, OK 73023-1268, will conduct a DX test between 1:05 and 2:00 am EST. The test will include Morse code, tones, march music and voice IDs. During the test, KWCO will switch between powers of 1000, 500 and 250 watts. Phone calls will be taken during the test at 406-224-1560. No collect calls, please. Reception reports may be sent to: Mr. John Carson, News Director.

**Monday, January 17, 1994: WJIB-740**, P.O. Box 848, Needham Heights Br., Boston, MA 02194, will conduct a DX test between 1:30 and 2:00 am EST. The test will include Morse code IDs. *This test will be repeated on January 24.* Reception reports may be sent to: Mr. Bob Bittner, Manager/Owner.

**Monday, January 17, 1994: WOC-1420**, 3535 East Kimberley Road, Davenport, IA 52807, will conduct a DX test between 1:30 and 2:30 am EST. The test will include Morse code, tones and voice IDs. Reception reports may be sent to: Mr. Jon Book, KB0EDE, Director of Engineering.

**Monday, January 31, 1994: WFRB-560**, Route 2 Box 373, Frostburg, MD 21532, will conduct a DX test between 1:00 and 1:30 am EST. The test will include Morse code, test tones and voice IDs. Reception reports may be sent to: Mr. Robert May, Chief Engineer.

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## *FCC Punishes Ham for Rescue Call*

A recent news item has brought a cry of indignation from the amateur radio community. Chris Boyer, KC6UQG, of San Diego, California, was mountain biking when his friend took a plunge and endured severe head injuries.

Boyer tried unsuccessfully to radio for help over five separate amateur repeaters and a cellular telephone before switching to the sheriff's frequency on his modified Kenwood TH47A handheld. The call brought rescuers who took the victim to a hospital where he underwent reconstructive surgery. This was an admirable act of citizen involvement which should have ended with a commendation for Boyer, but it didn't.

It seems that the sheriff turned him in to the Federal Communications Commission (FCC) for using an unauthorized frequency. FCC engineer Jerome Mann, although a ham himself (K9AAH), suggested Boyer forfeit his \$500 handie-talkie to avoid the possibility of a year in prison and a \$100,000 fine. Boyer cooperated.



But FCC Part 97.407 says that an amateur station may use "...any means of radiocommunication at its disposal to provide essential communication needs in connection with the immediate safety of

human life...when normal communication systems are not available."

Even the current American Radio Relay League (ARRL) license manual asserts, "In a life- or property-threatening emergency, you may send a distress call on *any* frequency (emphasis theirs), even outside the amateur bands, if you think doing so will bring help faster."

In spite of all this, it now appears that the FCC is considering yet additional penalties against Boyer for his humanitarian effort; San Diego FCC Chief Engineer William Grigsby refuses to comment on the case.

Boyer has retained the services of a former FCC attorney to regain his radio, while local amateurs have started a fund to help replace the radio if he is unsuccessful.

Has the FCC breached a public trust by selectively (mis)interpreting one of its own long-standing rules? Has bureaucracy become so self-important that it has replaced wisdom and justice? Will Boyer be fined and/or imprisoned for using non-type-accepted equipment on an unauthorized frequency? Stay tuned.

*Bob Grove  
Publisher*



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