



# Monitoring Times

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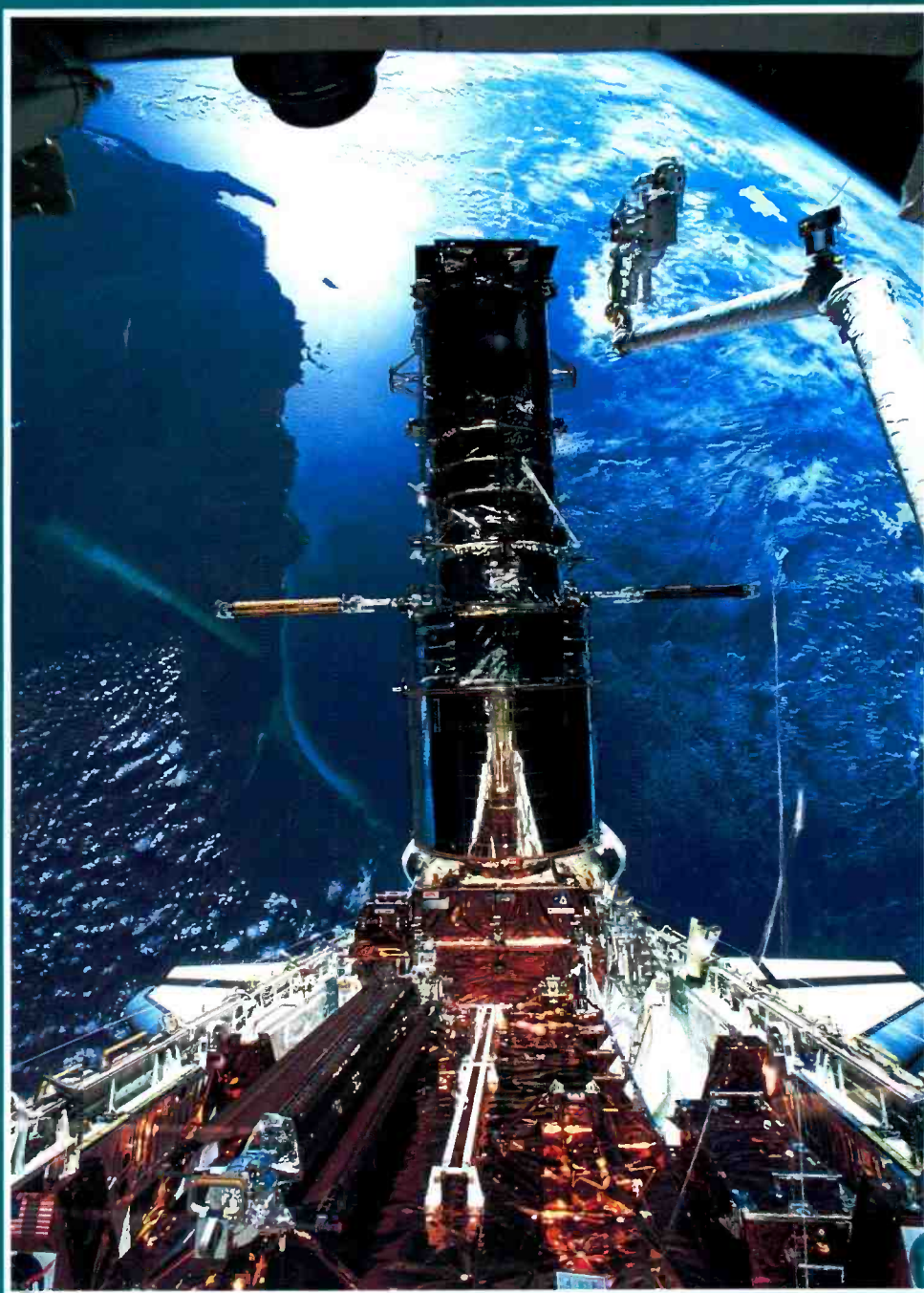
*Listening to the  
Navy's TOPGUN  
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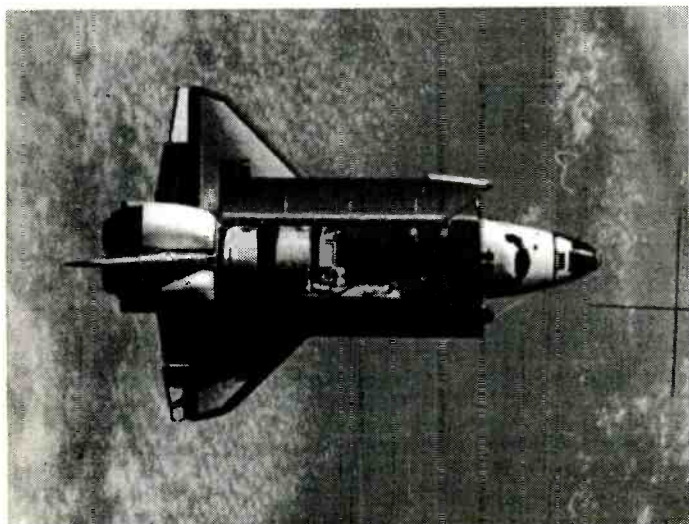


Photo courtesy NASA

## **Monitoring Space Shuttle Communications**

8

*By Jack Sullivan*

An increasing number of astronauts have been qualifying for their ham licenses and can be heard on the air from space. But did you know that you can actually hear the conversations between the Space Shuttle and an astronaut's flea-powered space suit during a space walk? With the right frequencies, some rudimentary orbit information and a scanner, you can hear them loud and in the clear.

## **Radio Nacional do Brasil**

14

*By Valter Aguiar*

Designed originally to reach the far-flung corners of Brazil in an attempt to bring some cohesiveness to such an enormous and diverse country, Radiobras (as it is also known) is an impressive network of mediumwave, tropical wave, shortwave, FM and television stations. Also very well heard is its international service: small, friendly and professional.

## **Microwave Monitoring — Build An INMARSAT System**

16

*By John Wilson*

Last month we discussed what can be heard by listening to the INMARSAT satellites. This segment describes how to configure your satellite receiving system to be able to receive INMARSAT signals.

**COVER PHOTO:** With the west coast of Australia in the background, astronauts Musgrave and Hoffman work with Endeavour's manipulator arm 325 nautical miles above the Earth. Courtesy of NASA.



**Topgun —  
The Navy's Fighter School** 20  
By Laura Quarantiello

When Navy pilots were being lost in frightening numbers in Vietnam, one far-sighted captain recommended the formation of a special school to train a nucleus of fighter crews who could then pass their skills on to other pilots. Topgun communications can be heard regularly off the coast of Southern California.

**A Guiding Force: Harry Dannals, W2HD** 25  
By Ken Reitz, KC4GQA

The Dayton Hamvention is coming up next month, when they nominate a new "Ham of the Year." Harry Dannals was their pick (and the author's, too!) for 1993, honored for his work in promoting the "No-Code" license.

**And Much More ... !**

Several receivers are put through their paces in this issue: Larry Magne takes a close look at the Grundig Yacht Boy 500, about which there has been much curiosity. Bob Grove outlines the specs for the new Realistic PRO-2027 and finds it generally pleasing. Karl Zuk analyzes a much-touted medium-wave receiver—the Bose "Wave"—in "American Bandscan."

In "Experimenters Workshop," Bill Cheek explains why inexpensive AC adapters may not be good for some sensitive equipment, especially homebrew projects. No problem; he tells you how to build your own regulated power supply. Doug DeMaw wants you to save money constructing your own antennas, and gives some great starter ideas for using materials found around the house. Clem Small tells you how to build "the real McCoy"—an antenna which is simplicity itself.

The first of the year is a favorite time for companies to announce new products and services. Ken Reitz updates us on the current state of TVRO, while John Catalano test drives new versions of a couple of old favorites in computer software. If your new Christmas hi-tech toy is on the blink or turns out to be a dud, Skip Arey walks you through the customer complaint process without resorting to the big guns.

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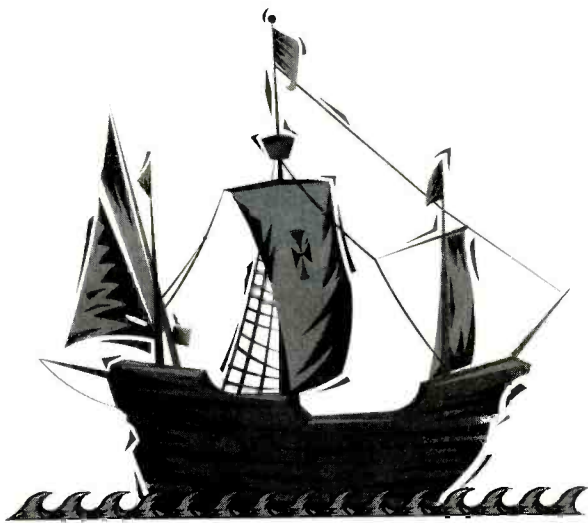
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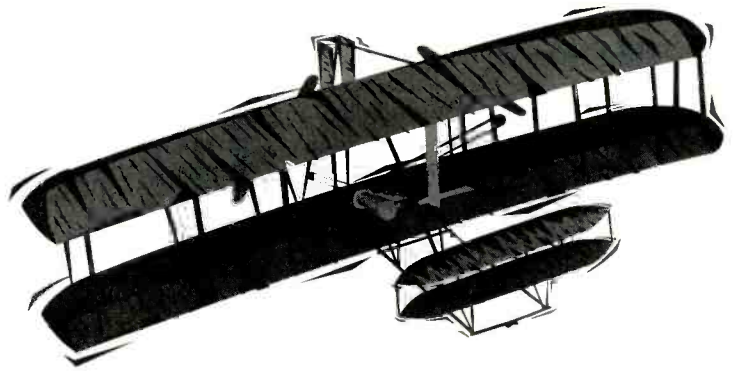
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# LETTERS

## Packing It In

A delightful letter arrived not long ago from Joe Glath of Tarentum, PA. He sums up the compliments sent by many readers on our recent improvements, saying, "The poly bag idea is great; well worth the increase in price. Thank you. The new look inside makes it much easier to find broadcasts and frequencies. Thank you again."

But he goes on... "Now the bad news. I got hell from my wife because of one of Bob's suggestions. Oh yes! December 1993 issue, pages 114-115. The question about speakers. You suggested that 'another trick is to pack the speaker enclosure with cloth like an old towel, etc.'

"I have an NRD-525 receiver in which, as you know, the audio quality isn't too great. I purchased an external speaker from Radio Shack which improved it somewhat but still left something to be desired. After reading your answer I immediately started looking for something to 'stuff into my speaker'! I didn't want to use a towel and the cat made too much noise once I put the back on the speaker!

"Finally I found something that would work. A big bag of stuffing which my wife, Barbara, uses when she makes holiday pillows. Well, she wasn't home so I couldn't ask her permission—right?

"When she found that her bag of stuffing had been tampered with she immediately suspected me! But she couldn't figure out

what I would use it for. So I simply told her I knew nothing about it. Yes, I lied! Did she buy it? NO. All is well that ends well, though; Santa treated her so good that she's forgotten about the stuffing and my speaker sounds better."

## Have You Read Your Radio Lately?

This month Magne reviews the Grundig Yacht Boy 500, one of the new radios that includes RDS (radio data system) capability—a subcarrier service that enables the radio to display alpha-numeric identification and can even enable the radio to search for a certain type of programming.

Reader Nathaniel Finestone of Mountainside, NJ, shares his first experience with RDS with fellow readers. "I was tuning around on my new Grundig Satellit 700 receiver, using only the whip antenna, when I received beautiful classical music at 95.7. Then, to my surprise, the call letters of the Philadelphia station popped up on my liquid crystal monitor along with the indication that I was receiving an RDS signal.

"I wrote a reception report to the station and received a call from Vice President Jim Perry. He asked me what instrument the 'station is now playing.' I simply turned up the volume because I was listening to the station at that very moment. He responded, 'It's coming in loud and clear.'

"I also receive two other RDS signals--one from Temple University's WRTI in Philadelphia, which identifies itself as JAZZ FM. It



*The Classical Music Station*

comes in powerfully and its identification appears quickly. The other is a local station, WHTZ, Newark. While its signal is very strong, its RDS identification, Z100, is slow to appear."

The confirmation letter Finestone received from Jim Perry says WFLN-FM transmits "not only our call letters, but accurate time and date, program type, and RadioText, a scrolling display of alphanumeric messages for receivers so equipped."

When Finestone asked what RadioText is and what receivers can pick it up, Larry Magne did some investigation on our behalf. This "turned out to be much more interesting than I had ever imagined," said Magne.

His report, while fascinating, is unfortunately too lengthy to print here. It will be forwarded to be covered in the column on medium-wave broadcasting. But briefly, RBDS is the American version of what in Europe is known as RDS. One of its features, RadioText, can be used to transmit the name and CD number of any musical selection being played, emergency warning messages, weather, corrective coordinates for global positioning satellites, "coupon radio," paging, etc. The possibilities are virtually limitless.

*Continued on page 106*

## Radio Broadcast Data System (RBDS) Stations courtesy of Radio World

<b>California</b>	KLON	88.1	Long Beach	<b>Minnesota</b>	KBEM	88.5	Minneapolis	<b>Pennsylvania</b>	WLTF	106.5	Cleveland	
	KTWV	94.7	Los Angeles		<b>New Mexico</b>	KKOB	93.3		Albuquerque	WKKO	99.9	Toledo
	KNPR*	88.1	Ridgecrest		<b>Nevada</b>	KKLZ	96.3		Las Vegas	WGTE	91.3	Toledo
	KSFM	102.5	Sacramento		KNPR	89.5	Las Vegas		WOUZ	90.1	Zanesville	
	KPBS	89.5	San Diego		KNPR*	88.7	Boulder City		WGLE	90.7	Lima	
<b>Colorado</b>	KEAR	106.9	San Francisco	KNPR*	91.7	Beatty	WRTI	97.1	Allentown/ Bethlehem			
	KMJI	100.3	Denver	KOMP	99.3	Henderson	WNCE	101.3	Lancaster			
<b>Florida</b>	WTMI	93.1	Miami	KNPR*	88.7	Indian Springs	WFLN	95.7	Philadelphia			
<b>Georgia</b>	WSTR	94.1	Smyrna	KNPR*	89.5	Laughlin	WRTI	90.1	Philadelphia			
<b>Illinois</b>	WXRT	93.1	Chicago	KNPR*	88.7	Moapa Valley	WPLY	100.3	Philadelphia			
	WLS	94.7	Chicago	KNPR*	88.7	Pahrump	WDUQ	90.5	Pittsburgh			
<b>Indiana</b>	WFMT	98.7	Chicago	KNEV	95.5	Reno	WRTI	97.7	Reading			
	WSHW	99.7	Frankfort	KNPR*	88.1	Scotty's Junction	<b>Tennessee</b>	WYPL	89.3	Memphis		
	WZPL	99.5	Indianapolis	KNPR*	105.1	Searchlight	<b>Texas</b>	KNLE	88.1	Austin		
	WZWZ	92.7	Kokomo	KLUC	98.5	Las Vegas	KAYD	97.5	Beaumont			
	WWKI	100.5	Kokomo	KFMS	101.9	Las Vegas	KQXY	94.1	Beaumont			
<b>Louisiana</b>	WGGZ	98.1	Baton Rouge	KEYV	93.1	Las Vegas	KKMY	104.5	Orange			
	KFXV	96.7	Morgan City	KRRI	105.5	Las Vegas	KYKR	93.3	Port Arthur			
	WLMG	101.9	New Orleans	KOMP	92.3	Las Vegas	KSOS	106.9	Ogden			
<b>Massachusetts</b>	WMYZ	95.7	New Orleans	KEDG	103.5	Las Vegas	KSOS*	92.1	Salt Lake City			
	KCIL	107.5	Houma	KFBI	107.5	Las Vegas	KSOS*	96.7	Salt Lake City			
<b>Maryland</b>	WGBH	89.7	Boston	KYRK	97.1	Las Vegas	KSOS*	98.3	Utah County			
	WBOQ	104.9	Gloucester	KLNR	91.7	Panaca	WLTJ	95.7	Norfolk			
<b>Michigan</b>	WHFS	99.1	Annapolis	KTPH	91.7	Tonopah	WNVZ	104.5	Norfolk			
	WIOG	102.5	Bay City	KEYV	103.5	Laughlin	WKOC	93.7	Virginia Beach			
	WLLZ	98.7	Detroit	WHTZ	100.1	New York	WCDX	92.7	Richmond			
	WKQI	95.5	Detroit	WOUB	91.3	Athens	KUOW	94.9	Seattle			
	WJLB	97.9	Detroit	WVXU	91.7	Cincinnati	KMPS	94.1	Seattle			
<b>Minnesota</b>	WQRS	105.1	Detroit	WWNK	94.1	Cincinnati	KRPM	106.1	Tacoma			
	WKAR	90.5	East Lansing	WGAR	99.5	Cleveland						
<b>Ohio</b>				WENZ	107.9	Cleveland						

\* translators



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## Public Relations Lebanese Style

Smiles are apparently in short supply at Lebanon's Hezbollah Radio in Lebanon. There's certainly no public relations department drawing happy faces on station flyers. A staffer announced the station's return to the air following a brief absence by shouting, "After an interruption resulting from a treacherous Zionist raid, your radio, The Radio of Islam, Voice of the Oppressed, has, praise be to God, resumed its broadcasts so that the word will support the bullet in the fields of jihad against the unjust usurper."

They could have just played a jingle.

## Happy Listeners

Meanwhile, the fun continued at Frequence Libre, a private radio station in the African nation of Gabon. There, personnel watched as a group of listeners approached the station during a broadcast of the popular "Happy Music" show. But the listeners were not interested in making a request and instead turned out to be a group of armed men dressed in camouflage gear who raked the studio and transmitter with machine gun fire. The station, owned by the Gabon Opposition Party, was "completely destroyed."

## "Hon, I'll be Late for Dinner Tonight"

According to local newspapers, rescuers in a helicopter plucked a stranded climber off a 10,000-foot-high ledge on Oregon's Mount Jefferson. Officials were tipped off to the problem when the climber, William Reeves, used his cellular phone to call his wife and ask for help.

Amazed that even daring mountain rescues have been made mundane by the use of cellular radio phones, we wonder why it couldn't make waiting for rescue more comfortable. Perhaps Reeves could have picked up the phone and ordered pizzas delivered.

## Radio Invasion of Privacy

A judge has ruled that a Tuckerton, New Jersey couple, who sued their ham radio operating neighbor for electronic trespassing must let the neighbor examine their home's electronic equipment. The couple, Mike and Marlene Morris, are seeking \$93,000 from Anthony and Sharon Marino for property value loss and legal fees because of the transmissions they allege are invading their privacy

## The *Fury* Bust

By Glenn Hauser



Joe Eisenberg

U.S. marshals and FCC agents raided the *Fury* on Jan. 20. A court order authorizing seizure of radio transmission equipment had been obtained in Charleston, SC, following FCC monitoring from there which claimed illegal broadcasts had been made from the *Fury* the previous week.

It was being refitted at Halsey and Cannon Boat Yard on the Wando River, near Charleston. No criminal charges were filed; only the equipment was "arrested," but since it was welded in place, it took two days, a barge and a crane to remove it all, after which the vessel was released. For the rest of the story, we look at different points of view from the principals, based on interviews, monitoring, published and private documents.

Allan Weiner was awakened aboard the *Fury* at 8 am by shotgun-bearing marshals, and ordered off the ship. Weiner, who has had several confrontations with the FCC before, said he was perplexed by why this was happening, since this time everything had been

**Continued on page 91**

and ruining their emotional health. Experts will now examine the Morris' door chimes and television antenna.

## Fanning the Flares of Controversy

Radio hobbyists who curse solar flares for the reception problems they cause might have to reconsider what they thought. Los Alamos National Laboratory scientist Jack Gosling said that the idea that solar flares cause magnetic storms on earth is just a myth. Instead, it's coronal mass ejections that are the culprit. Coronal mass ejections arise from the sun's corona—the outermost atmosphere of the sun. Gigantic globs of gas, they are propelled into space at speeds of 1 million miles an hour.

As they travel, said Gosling, they pile up magnetic field lines and highly charged particles

in a kind of "shock wave." When that shock wave hits the earth's magnetic field, it "distorts and connects with the planetary magnetic field," causing geomagnetic storms and intense auroras, threatening communications and electrical power grids.

## Welcome to The Radio State

New Jersey is apparently at it again. The same state that two years ago tried to jail ham radio operators who had rigs in their car and which more recently tried to force Radio Shack to stop selling certain scanners, is now going to try and tax radio waves.

According to reports received in Brasstown, the New Jersey Department of Environmental Protection and Energy (DEPE) is proposing a tax to owners of almost all radio frequency generating devices.

The rule will allegedly cover any transmitter from 300 kHz to 100 GHz that has the potential of exposing either workers or the general public to radio radiation in excess of certain limits. This includes AM and FM radio stations, cellular telephone systems, industrial heating and sealing operations, even microwave ovens. Also cited in the proposal are ham radio transmitters which the state says pose a health risk to the general public.

If all goes as planned, an initial registration fee will be assessed and owners of the devices will be required to submit technical data to the state. Later, fees will be based on the "services" performed by DEPE. Right now, we're told that the median fee for a commercial user will be in the vicinity of \$500 per antenna per year.

Does all of this sound outlandish to you? Hey. This is New Jersey. Better hide your garage door opener. Don't feel smug if you live outside of the Garden State, either. If this passes, it'll probably be used as justification for other states to try it, too.

## President Spillman's Private Radio

Roger Spillman's voice can reach his oil delivery trucks 10 miles away, but he wanted two, maybe three times as much power. He found it at a salvage auction in Cooleemee, North Carolina, in a plain cardboard box. It was a portable amplifier with power to spare.

Little did Spillman know how much power he had. Part of a 32 billion dollar system called Milstar, the little pale green amplifier in the plain cardboard box was designed to allow the President to transmit the "go codes" to the nation's nuclear arsenal. Roger Spillman, as owner of the amp, would now be able to send



# COMMUNICATIONS

his voice from Coolee to anywhere on the planet — even during World War III.

And it was a bargain, too. Spillman got it for \$75. It cost the Air Force \$363,735.

Amazingly, the Air Force might never have learned about Roger Spillman's super amplifier had he not consulted a local radio amateur, Isabell Ledman, to help him get it on the air. She called the manufacturer, hoping to obtain an instruction manual. The manufacturer, Ration, stalled Ledman, while they called the Air Force.

Despite the fact that Ledman had left her phone number when she called for the instruction manual, a criminal investigation was launched that included a clandestine survey of Ledman's farm (complete with detailed maps of the property) and the securing of a federal search and seizure warrant. Before long, two Air Force sergeants showed up in Coolee, demanding the keys to Ledman's house. "All they had to do was call me," said Ledman. "I would have took it to them."

Meanwhile, Spillman is out his \$75 and he's not too happy about it. "I thought that was pretty low," Spillman said. "That amp was mine."

Incidentally, the first Milstar satellite was scheduled to launch last month, several years after the end of the Cold War it was designed for and six years after its projected launch date.

Memorial Colliseum at 8:30 a.m. March 6th and Fred will be on 145.200, 146.925, 445.325, 447.235 and 146.52 MHz simplex. If conditions are right, you may even be able to hear Doob on 14.295 MHz.

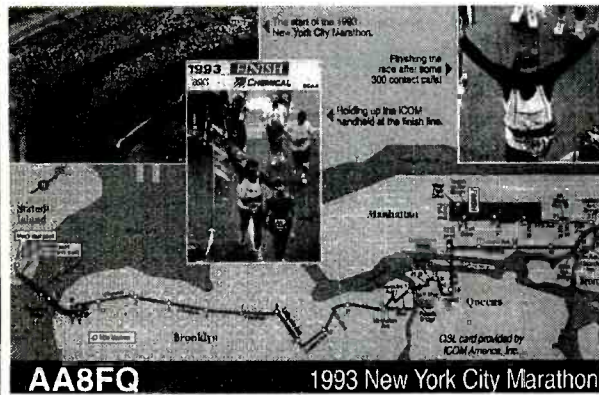
## Saying Goodbye

Eleven year old Randy Wight was a fifth-grader who joked with his classmates, imitated Ninja Turtles, and hugged his teacher before heading home every day. Randy's mother, Judy Wight, lifted spirits at the post office where she worked with comical memos to her boss. The father, George Wight, was a safety-minded mechanic who never took unnecessary chances and who kept a smiley face drawing on his toolbox. If the boss had to stay late to work on a car, Wight would sign out for the day and come back to help without pay.

"These were people who liked helping people, spreading compliments and making friends," said one neighbor. "They were people like you would expect to find 100 years ago," said another.

Last month, George, Judy and Randy were electrocuted as they were trying to maneuver an antenna onto the top of their new home. The antenna, on a mast of at least 30 feet, hit a power distribution line, sending 17,000 volts through them. Nobody knows exactly how it happened. There were no witnesses and Pacific Gas & Electric Co. investigators couldn't tell precisely where the antenna had touched the line, which was properly taut, not sagging anywhere to invite such danger.

"I suppose they were too excited and anxious to set up the new home," guessed Bill Sponseller, a sheriff's lieutenant and friend and neighbor of the Wights. George Wight was a volunteer fireman, *Monitoring Times* subscriber, RCMA Associate Editor and an example to the rest of us. **MT**



**AA8FQ** 1993 New York City Marathon

## On the Run

Fred Doob, AA8FQ, the ham who ran the New York City Marathon back in November, is at it again. This time, Doob will be churning up the rubble in Los Angeles, continuing to raise money for kids with cancer. During the grueling 26.2 mile marathon he'll be trying to make as many contacts as possible. ICOM America will donate \$5.00 for each one, sending the money to the Children's Cancer Research Fund. The race starts at the L.A.

"Communications" is written by Larry Miller from material contributed from the following readers. David Alpert, New York, NY; Harry Baughn, Brasstown, NC; Lonnie Bumm, Raleigh, NC; Jeff Christner, Brooklyn, OH; Steve Coletti; Michael Culbreth, Winston-Salem, NC; Rick Helnick, Orange, CA; Bill Mauldin; Thomas McCrea, Pocono Lake, PA; Hugh Miller, Woodinville, WA and Jim Niezanski, Hales Corner, WI; with special thanks to friend and colleague Rachel Baughn. Additionally, we extend our thanks to *National Scanning*, *Wall Street Journal*, *World Broadcasting Information* and *W5YI Report*.

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# Monitoring SPACE SHUTTLE Communications

By Jack Sullivan

The voice of astronaut Tom Akers on my cassette tape was crystal clear. "...Good. OK. Come up another foot, I guess. Stop. OK. Now keep coming up...another 6 inches. OK now. Stop now. OK. Keep coming. OK. Stop now."

I smiled as I reached for my log book. "Space Shuttle Mission 61, 4th EVA, 12/7/93. Good spacesuit coms on 259.7," I wrote. For the fourth time that week I had successfully monitored the direct radio communications between the Space Shuttle and the astronauts performing spacewalks to give improved vision to the Hubble Space Telescope. Good quality voice transmissions had been received on all three of their UHF-AM channels. Despite the common impression that these low power (1/4 watt!) transmissions cannot be easily received on conventional scanning receivers, I had proved to myself that it could be done.

## The Space Shuttle Communications System

Three channels in the military UHF band (225-400 MHz) have been set aside since before Project MERCURY in the 1960s for exclusive use by NASA for spacecraft communications: 259.7, 279.0 and 296.8 MHz. Since 1974 these channels have been reserved for use by the Space Shuttle for both air-to-ground and communications between the Shuttle and astronauts' spacesuits during spacewalks (or EVAs - Extra Vehicular Activity). The military emergency channel, 243.0 MHz, called GUARD, is also available on the Space Shuttle. An understanding of how these channels are used during Space Shuttle missions is necessary in order to make sense of what can be heard on them.

The principle communications link between the Space Shuttle and ground stations around the world is a wideband multiplexed digital system operating in the so-called "S-band" at 2287.5 MHz. The Space Shuttle also uses the S-band frequency of 2250.0 MHz for main engine telemetry during launch and for television video transmissions while in orbit. This is in FM mode

and is said to be easily copied on a receiver with the proper video demodulator, like the ICOMR-7000. The Space Shuttle also employs a "Ku band" link on 15.003 GHz. This is very high speed digital data that is beamed to NASA relay and tracking satellites and is not receivable on conventional equipment.

This digital system carries a number of channels for voice and telemetry. It is not possible to demodulate this signal using conventional scanning receivers even when equipped with a frequency converter designed to receive the microwave frequency. Both 296.8 MHz (primary) and 259.7 MHz (secondary) are frequently used for backup communications between the Space Shuttle and ground stations when it is out of range of S-band facilities, or when the other voice channels are tied up, and during critical mission phases such as blastoff and landing. These channels should be monitored whenever a Space Shuttle mission is in progress. All UHF voice communications on these frequencies are in AM mode.

During spacewalks the use of these channels changes (see box) Three different communications modes are available and can be selected by the astronauts by turning a four-position switch on a control box mounted on one arm of the spacesuit. Position 1 is called "hard wire," and enables the astronaut to communicate by physically plugging a cable into one of a number of jacks in the airlock and outside the Space Shuttle. The Space Shuttle transmits to the spacesuits on 296.8 MHz in all three of the following modes.

Modes A and B are designed to allow the spacewalkers to communicate both with the Space Shuttle and with each other. One astronaut selects mode A and the other selects mode B. Each spacesuit is then transmitting on its own frequency and simultaneously receiving both the other spacesuit and the Space Shuttle. (These communications are "full duplex," like a conversation on a telephone. The spacesuits and Space Shuttle transmit continuously.)

The third communications mode, called the backup mode, uses a separate transmitter and receiver in the spacesuit. In this mode the

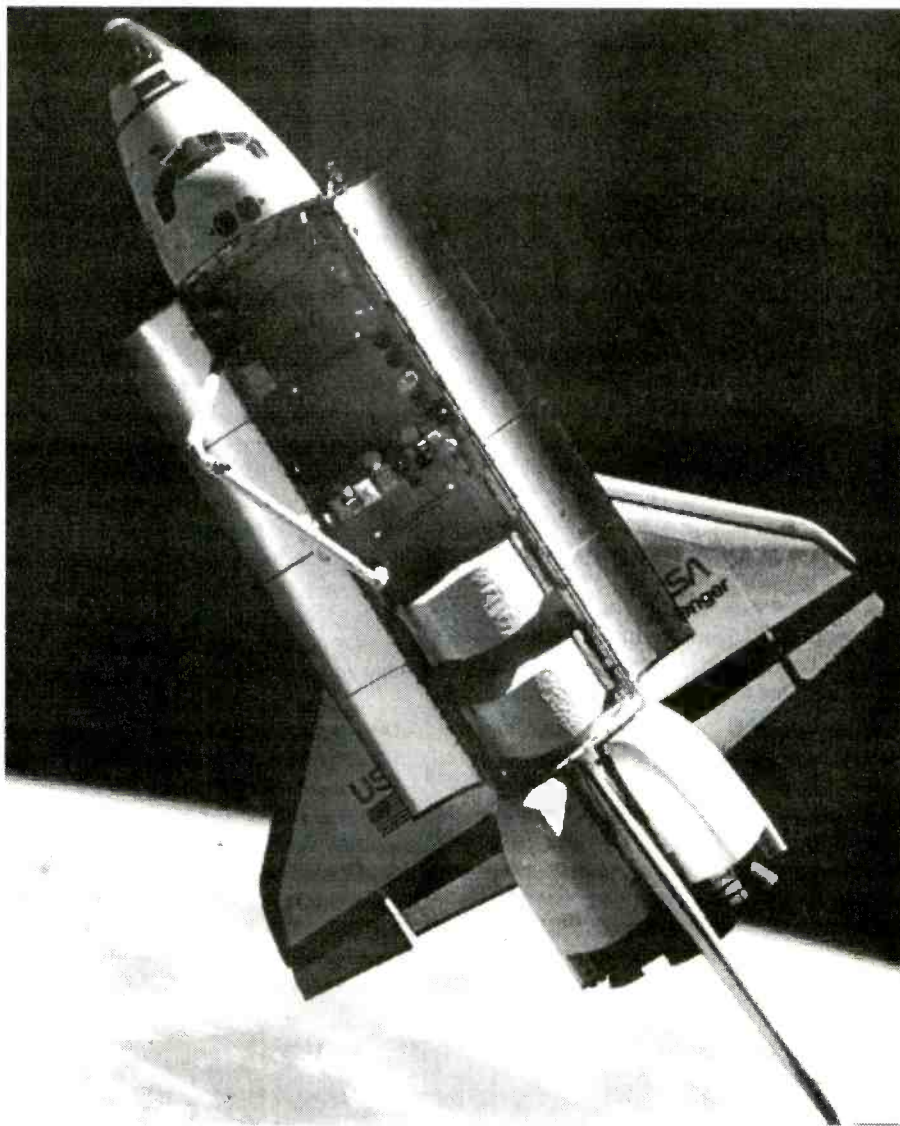


Photo courtesy NASA



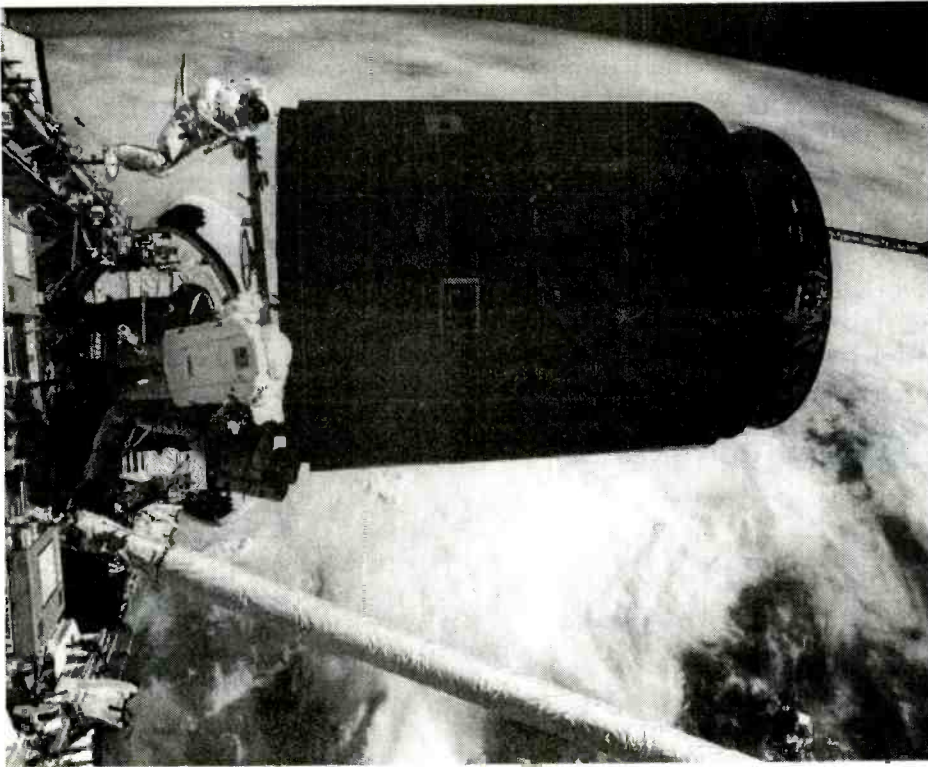


Photo courtesy NASA

Following the successful capture of Intelsat VI, astronauts (l-r) Richard J. Hieb, Thomas D. Akers and Pierre J. Thuot continue their chores toward moving the 4.5 ton communications satellite into Endeavour's cargo bay.

spacesuit transmits on 259.7 MHz while the receiver listens to the Space Shuttle on 296.8 MHz. In this mode the spacewalkers can only hear the Space Shuttle and not each other. The spacesuit transmitter is keyed manually (push-to-talk, or "PTT") in backup mode rather than being constantly on. This mode would be used in case of main transmitter/receiver (mode A/ mode B) failure, interference on 279.0 MHz or in a mission where more than two spacewalkers were deployed simultaneously. A recent Space Shuttle mission did encounter strong interference on 279.0 while over the western Pacific Ocean: a constant AM carrier with the Morse code identifier "NCP." On later checking, this turned out to be the non-directional UHF homing beacon at the former U.S. Navy base at Subic Bay in the Philippines!

How these communications modes are used in practice by the astronauts is apparent while watching the live television coverage of the EVAs during the Hubble Space Telescope mission. On the first EVA astronauts Story Musgrave and Jeff Hoffman could be heard confirming which one would be on mode A and which one would be on mode B while still on hardware mode inside the air lock. (There is also a UHF

antenna inside the airlock that allows communications between the spacewalkers and the Space Shuttle during the extended periods spent isolated inside.) After exiting into the payload bay, noise from one of the receivers in one spacesuit prompted the astronauts to switch modes with each other in an attempt to correct the problem.

Also, during the second EVA, astronaut Kathy Thornton's main (mode A/B) 296.8 MHz receiver was inoperative, requiring astronaut Tom Akers to relay instructions from the Space Shuttle and Mission Control in Houston on the other frequency she was able to receive. (The spacewalkers had chosen to continue using the mode A/B system rather than the backup because it would allow them the much more important opportunity to hear each other directly during the complex EVA program.)

Another interesting fact about the spacesuit transmissions is the presence of a 5.4 kHz subcarrier carrying biomedical telemetry. While not audible on a conventional scanning receiver, this data could probably be accessed using an SCA (subcarrier audio) detector. This subcarrier is a wideband FM signal containing multiplexed data on heart rate, respiration, suit temperature, etc.

EVA Frequency Usage			
Space Shuttle	Mode A	Mode B	Backup
296.8T	259.7T	279.0T	259.7T
259.7R	296.8R	296.8R	296.8R
279.0R	279.0R	259.7R	

(T = transmit, R = receive)

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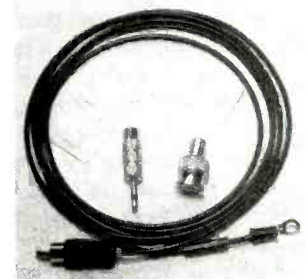


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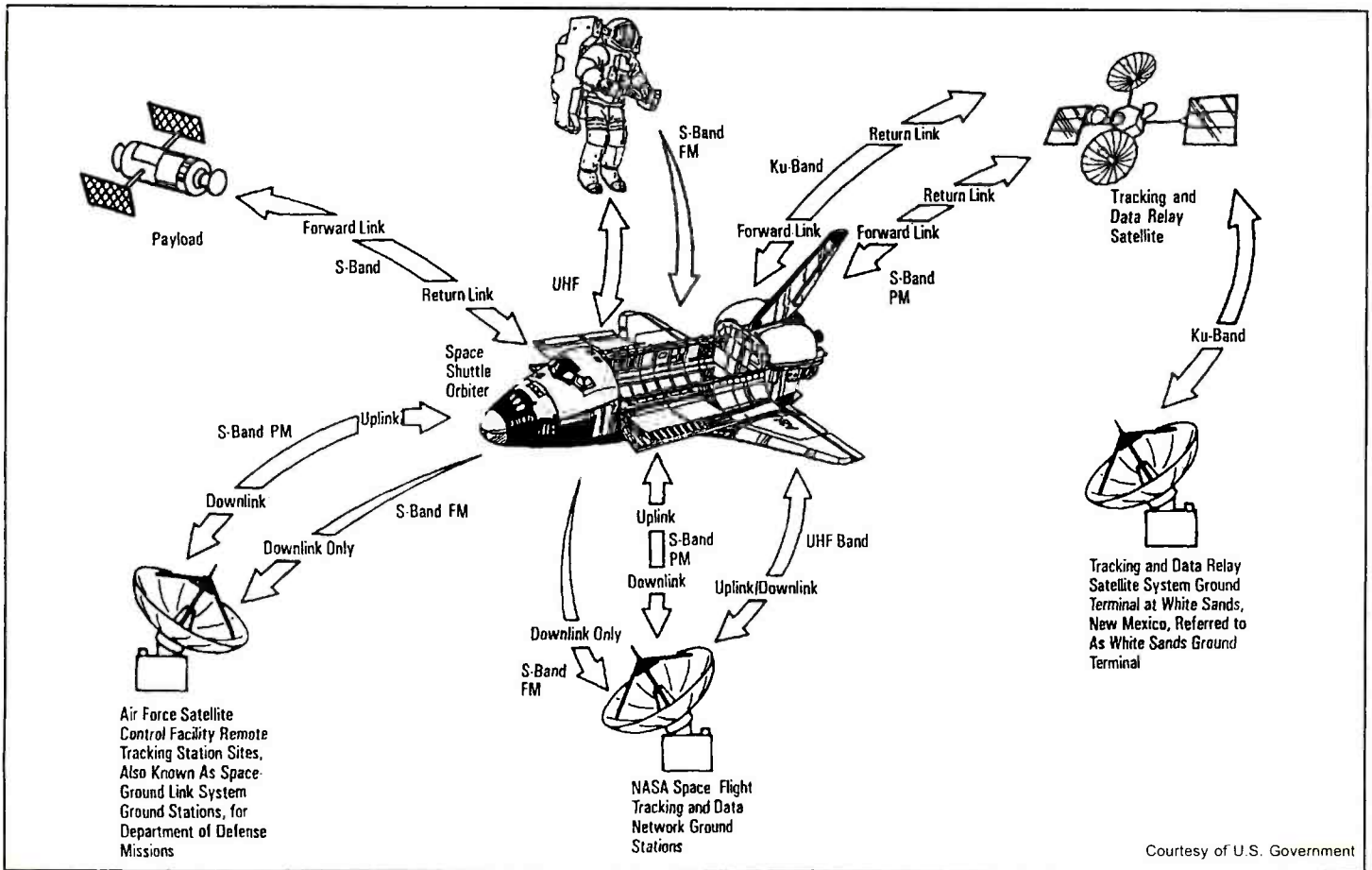
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## Space Shuttle Orbiter Radio Frequency Links

As stated earlier, both the Space Shuttle and the spacesuits transmit continuous signals. In the case of the spacesuits, this prevents loss of the important biomedical subcarrier telemetry. A "VOX"-type action can be clearly heard on transmissions from both the Space Shuttle and the spacesuits, where the background noise level increases when someone speaks and then decreases about 1/2 second after the speech stops. ("VOX" means voice activated transmit.) In the case of the Space Shuttle communications system, the VOX system serves to mute background noise from being transmitted when no one is speaking. The spacesuits have an additional control knob that selects between VOX and PTT transmission modes.

The Space Shuttle and spacesuit transmitters both have an output power of only 250 milliwatts, which is considerably less power than that of a flashlight bulb! On top of this, no gain antennas are used. In fact, the three antennas located on top of the backpacks on the spacesuits are hidden under flush plastic fairings and do not project up at all. While this may seem like "flea power" when compared to the 10 watts of an aircraft radio or the 110 watts of a land mobile transmitter, it is more than enough to do the job and then some. The net effect of their great altitude is to generate a signal as effective as a much stronger transmitter close to the Earth's surface.



### Monitoring Space Shuttle Operations

With only 1/4 watt of power, how can you expect to hear transmissions from the Space Shuttle or spacesuits? As I learned, you can expect to hear quite a bit. Here's why.

Typical Space Shuttle mission orbits are over a hundred miles above the surface of the Earth. As with every type of VHF/UHF communications, radio signals from orbiting satellites can be heard if your receiver is within the line of sight of the transmitter. In the case of the Hubble Space Telescope mission that I monitored, the altitude of the Space Shuttle was 320 miles. Using the approximate line of sight formula—range in miles equals 1.42 multiplied by the square root of the altitude in feet—you get over 1,800 miles! In theory, at least, any adequately equipped receiving station up to 1,800 miles from the ground track of the Space Shuttle should have been able to monitor its UHF communications.

In order to figure out if your particular location is going to be within range of a Space Shuttle mission it is necessary to find out the inclination of the orbit planned for that mission. All Space Shuttle missions fly "polar" orbits. If the inclination, or angle of the orbit with the equator, is 90 degrees, the ground track would

travel over both the North and South Poles. In this "ideal" case, the Space Shuttle would pass directly overhead nearly every point on the Earth each day and would be within optimum receiving range of any location. Most orbits, however, are inclined at some angle less than 90 degrees.

In the case of the Hubble Space Telescope mission, the orbital inclination was only 28.5 degrees, which is the latitude of its launch site at Cape Canaveral, FL. In other words, the Space Shuttle never got any further north than 28.5 degrees north latitude (and never any further south than 28.5 degrees south latitude). This is a line that would pass through central Florida, northern Mexico and southern Texas (as well as central Australia).

Drawing another line parallel to the ground track and 1,800 miles north gives the maximum distance for receiving Space Shuttle communications—the entire 48 lower United States and most of the populated areas of Canada!

Each orbit takes about 90 minutes, with the earth underneath turning eastward one revolution every 24 hours, or 15 degrees of longitude per orbit. While the Space Shuttle was only within range at the northernmost travel of its orbit for a matter of minutes, it was back again 90 minutes later about 1,000 miles further west. Transmissions were indeed monitored from several sequential orbits at my station in New



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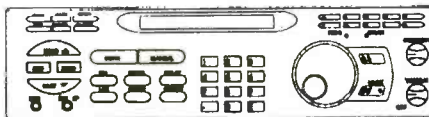
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Jersey (1,050 miles north of the ground track) and at a friend's station near Cape Cod in Massachusetts, several hundred miles further north.



## Equipping a "Space Station"

What is required in terms of equipment to catch Space Shuttle communications? At my station I used an ICOM R-7000 connected to an ICOM discone with 1/2 inch "hardline" low-loss coaxial cable. The receiver was controlled by my computer with a Terzon Systems SCAN-801 interface. The three UHF frequencies were scanned many times each second. When a signal appeared, the computer interface started the Radio Shack cassette recorder while the speech option in the R-7000 announced the frequency of the channel being taped. I also got good results from a CREATE log periodic beam pointed due south. The Grove ScannerBeam should be just as effective in providing directional "gain" toward the distant Space Shuttle.

Computer control and sophisticated receiving equipment is not necessary, however. As proved by my friend in Massachusetts, a Regency MX-series scanner and a discone connected to a voice-activated Radio Shack cassette recorder gave very similar results. The big secret in monitoring any communications in the 225-400 MHz band is to use a wideband antenna like a discone or a log periodic with the shortest possible length of the lowest loss coaxial cable that you can afford.

While I had demonstrated that it is possible to pick up the low power Space Shuttle transmissions from over a thousand miles away from its ground track, this is obviously not an ideal monitoring situation. The bulk of the material that I taped (about 55 minutes worth for five spacewalks) was noisy and either unintelligible



Photo courtesy NASA

*Two mission specialist-EVA participants share a repair task at the "captured" Solar Maximum Mission Satellite (SMMS) in the aft end of the Challenger's cargo bay.*

or only unmodulated carrier. Voices and fragments of sentences, however, could be made out for three of the spacewalks and it was possible to easily differentiate between male and female astronauts. In a few sections it was possible to understand the actual voice communications word for word, like the quote at the beginning of this article. (At one point on the tape an astronaut could be clearly heard blowing into his microphone several times!)

If I had been significantly closer to the ground track, however, the signals would have been many times stronger and the quality would have been much, much better. The amount of recovered communications would have also been significantly greater. During previous missions I have taped UHF air-to-ground transmissions from the Space Shuttle while it was over Cape Canaveral with the same signal strength as an aircraft flying in my immediate vicinity. The attitude of the spacecraft and weather conditions seem to play big roles in how well these signals are received.

Future Space Shuttle missions are planned in which there will again be a large amount of EVA activity. The Space Station project and a number of scheduled satellite repair missions are good examples. There is a good chance that some of these missions may operate with a higher inclination angle, giving everyone a chance

to monitor solid UHF voice communications from space.

A couple of interesting footnotes came up during my research for this article. For one thing, the quality of the UHF voice communications between the Space Shuttle and the spacewalkers that I had captured on tape is excellent. It almost bears no resemblance to the garbled and distorted versions of these communications that one hears on the evening TV news.

Apparently the repeated processing of the audio through the digitizing/undigitizing and multiplexing/demultiplexing systems involved creates an amazing amount of distortion. (The local New York City news featured part of the spacewalk and the newscasters had a good laugh over the fact that NASA was apparently using a speaker borrowed from a drive-through fast food restaurant!)

The second interesting item concerns the classified Department of Defense Space Shuttle missions where the astronauts deploy military surveillance satellites after reaching orbit. During these missions the public is not given access to the communications feeds usually provided by NASA from the S-band link because of the need for secrecy. The EVA communications system described in this article, however, has no provision for scrambling!



## For Future Reference

While tapping directly into the Space Shuttle EVA communications is an interesting and rewarding technical challenge, you can get the same information a lot more easily by either tuning into cable TV sources such as NASA Select on Educational Access or CNN, who routinely provide live coverage of the spacewalks, or by monitoring the WA3NAN Amateur Radio outlet from NASA's Goddard Space Flight Center in Greenbelt, MD. They provide the Space Shuttle communications on the HF frequencies 3860, 7185, 14295, 21390 (or 21395) and 28650 kHz using single sideband modulation. Many Amateur repeaters around the country rebroadcast this feed on their systems, so almost anyone with a TV, scanner or HF radio can tune in to the Space Shuttle.

Close monitoring of this feed prior to launch will also give you valuable mission information such as orbital inclination, altitude, number and times scheduled for EVAs, etc. NASA also retransmits Space Shuttle communications on some of its numerous HF circuits. Check the references in the Bibliography for additional frequencies.

Monitoring orbiting satellites in general and the Space Shuttle in particular is a fascinating and educational facet of the radio monitoring hobby. Good luck and good listening! *MT*

## Bibliography and Suggested Further Reading

"The Flight of Columbia and Ron Parise - WA4SIR," by Larry Van Horn. *MT*, April 1990.

"We Have Liftoff," by Larry Van Horn. *MT*, September 1988.

*Weather Satellite Handbook*, by Ralph E. Taggart. Good introduction to tracking and receiving satellites. Available from Grove Enterprises.

*Aviation Week and Space Technology (AW&ST)*. This magazine, published by McGraw-Hill, is available both by subscription and through most public libraries. It has frequent articles on the Space Shuttle and other satellite programs of interest to monitoring enthusiasts.

"Flight to Fix Hubble Pays Off," *AW&ST*, December 13, 1993.

*Directory of North American Military Aviation Communications (HF/VHF/UHF) - Second Edition*. Each of the four regional editions gives all of the frequencies for current military satellites and for the Space Shuttle, including the location of many ground stations. Covers NASA's HF network as well. Also available from Grove Enterprises.

A NASA public affairs recorded message lists scheduled launches from the Cape by dialing 407-867-4636.





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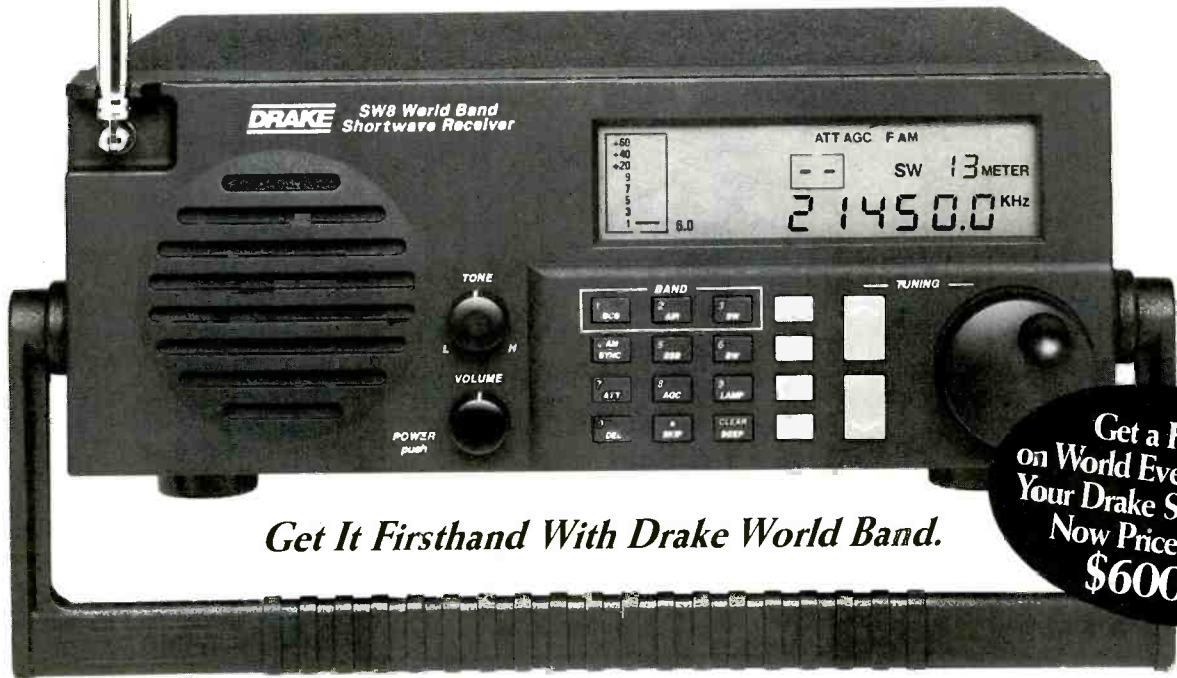
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# Rádio Nacional Do Brasil

*Broadcasting From the Heart of South America*

By Valter Aguiar

**Which is the city with the largest green area average per inhabitant in the world? Further, which is the youngest city according to UNESCO?**

One single reply for both questions: Brasilia! A Brazilian dream for more than a hundred years, the country's capital was inaugurated back in 1960 by the late President Juscelino Kubitschek. Its highly modern architecture surprises every visitor, from Brazil and abroad. Now with about 1,600,000 inhabitants, Brasilia is successfully confronting the problems that always appear in big cities and is indeed a very interesting town in all its aspects—unique in Latin America.

It is from Brasilia that an international broadcaster transmits its daily programs in English, Spanish, German and Portuguese: Rádio Nacional do Brasil, the international service of Radiobrás.

There is some confusion among foreign shortwave listeners between these two names. Let us explain it by looking at a little history.

Brazil is a vast country. Nowadays, the whole country is covered by radio and television net-

Broadcast Schedules		
All times UTC; all frequencies in kHz		
<b>Rádio Nacional do Brasil</b>		
Language	Time	Freq
English	1200-1250	15445
	1800-1850	15265
Spanish	1000-1050	9745
German	1930-2020	15265
Portuguese	1630-1720	15265
	1800-1850	17750
<b>Rádio Nacional da Amazônia</b>		
Language	Time	Freq
Portuguese	0900-0200	6180, 11780

Radiobrás also rents its transmitters to the BBC, Deutsche Welle and Swiss Radio International for their broadcasts to Latin America.

works, broadcasting locally or via satellite. About twenty years ago, however, the situation was different. Not too many radio stations reached the Amazon region, due to its distance from

larger centers and to propagation conditions. There was much better reception from stations in neighboring countries (e.g., Peru and Venezuela) and from international broadcasters over shortwave than from Brazil's own radio stations.

Brazil was then ruled by the military, who became worried about this situation. Their fear was that people in those distant regions might become estranged and feel like they were not a part of Brazil.

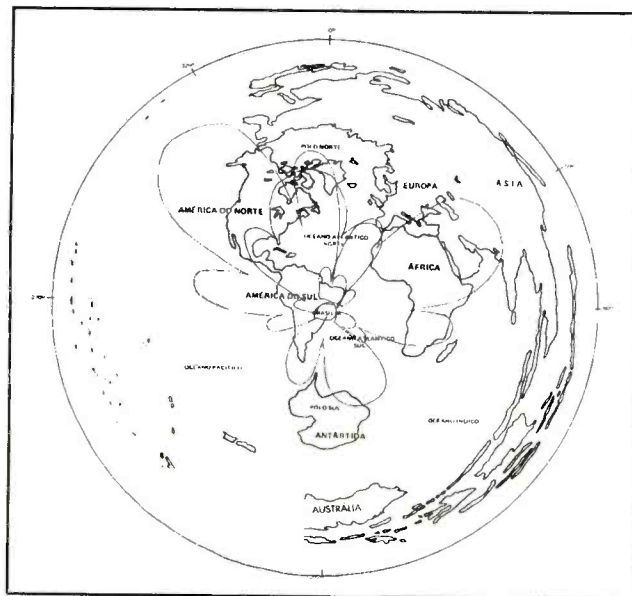
To correct this situation, on December 15, 1975, the government founded the Brazilian Broadcasting Company, under the name *Radiobrás*. Its main purposes were to unite all existing state-owned broadcasting stations and to create new radio and TV services to reach those strategic areas in the Amazon region.

The most important state-owned radio station in Brazil until Brasilia's foundation was located at Rio de Janeiro and was called Rádio Nacional. This was the most popular station during the golden age of radio in the 40's and 50's. When the Brazilian capital was moved from Rio de Janeiro to Brasilia, the government installed a radio station in the new capital and also named it Rádio Nacional, just like the one in Rio. Both stations are now controlled by Radiobrás, as well as TV Nacional de Brasilia.

Shortly after its foundation, Radiobrás started installing many radio and TV stations all over the Amazon region, all named Rádio Nacional. By 1986, there were six tropical wave stations, twelve on FM, ten on medium wave, eight TV stations and a shortwave station in Brasilia (called Rádio Nacional da Amazônia), broadcasting to the Amazon region. Most of those local stations were sold to private companies by former president José Sarney, but Rádio Nacional da Amazônia is still on the air and can be well heard outside Brazil.

In 1988, Radiobrás and the official Brazilian News Agency became a single organization, under the name Brazilian Communications Company. The abbreviation Radiobrás was, however, kept, due to its tradition within the country. Since then, Radiobrás has also been

*Radiobrás' transmitters almost achieve worldwide coverage.*





responsible for the production of the official radio program "A Voz do Brasil" (The Voice of Brazil), broadcast by all radio stations in the country from Monday to Friday between 2200 and 2300 UTC (one hour earlier from October to February).

Today, Radiobrás stations can be heard all over the country and abroad. Its television programs are also retransmitted throughout the country by "Rede Brasil," a TV network composed of educational TV stations in most states and many local broadcasters in the UHF band. This job is conducted by the educational TVE in Rio de Janeiro.

Besides all these services, in 1979 Radiobrás created a shortwave service with programs intended for the international audience, called *Rádio Nacional do Brasil*.

Rádio Nacional do Brasil can still be considered a small international broadcaster. In fact, less than twenty people are responsible for the production and presentation of the shortwave programs. Of course, many more are involved in the technical aspects of radio broadcasting. However, even with such a small production team, Rádio Nacional do Brasil has managed to maintain very attractive programs for the international shortwave audience.

News for the broadcasts is produced by the Radiobrás' central newsroom, which is the same for all radio services within the company. News stories are then selected and translated for broadcasting by the international service. However, news coverage makes up only a small part of the programs available from Rádio Nacional do Brasil. Most of them present Brazilian music of all rhythms and eras. New and old songs are mixed together to form varied programs to meet every taste, drawing the audience's attention to Brazilian popular music.

Broadcasts also include spots on the daily life in Brazil, folklore, tourism, sports and so on. There is space for listener's letters and a news review over the weekend. Despite not having the same infra-structure as the bigger international broadcasters, such as the BBC and VOA, Rádio Nacional do Brasil has obtained a considerable audience within the shortwave community throughout the world.

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Letters come in from every corner on Earth. Radiobrás' transmitters use 250 kW power, assuring good reception even in the most distant countries such as Japan, Australia, New Zealand and others. In fact, although programs are beamed to the Americas, Europe, Africa, part of Asia and the Middle East, they can be heard elsewhere without too many problems.

Rádio Nacional do Brasil does verify reception reports with beautiful QSL cards showing pictures from various towns in the country for listeners's collections. People at the station pay attention to listeners letters and personal replies are not rare. IRCs from listeners are welcome, but not indispensable for you to get a reply. Their address is:



Radiobrás—Empresa Brasileira  
de Comunicação  
Rádio Nacional do Brasil/  
Rádio Nacional de Amazônia

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Santos - SP - Brazil

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Cordially yours,  
Renée Veloso

caster can maintain a professional standard without many resources. As a testimony to this, two members from Radiobrás' staff have already been employed by foreign SW broadcasters, namely Radio Korea and the VOA. Radiobrás is really quite an interesting international broadcaster, in quite an interesting country.



## Configuring to Receive INMARSAT

By John Wilson, W4UVV

The International Marine Satellite Organization (INMARSAT) was established in the 1970s to provide reliable maritime communications. However, as we learned last month in Part I of this article, this system is being utilized for communications by an enormous variety of mobile and remote sites. Part I also discussed the worldwide INMARSAT geostationary satellite locations, how the system works, where to listen and what types of transmissions can be received. Part II will now describe, step-by-step, one very workable way to receive INMARSAT satellites.

### What System Components Are Needed?

A parabolic reflector (satellite dish antenna) and mount, waveguide feed (feedhorn), microwave RF amplifier, IF line amplifier, 12 VDC power supply, RF connectors, coax cable, insulated wire, weatherproof cover, and a receiver or scanner capable of FM reception from 1530.000-1545.000 MHz are the system requirements as shown in Figure 1.

Let's begin with a brief discussion of each system component . . .

**Receive Antenna:** Signals *can* be received on a 4 ft. diameter satellite antenna, but you can expect noisy reception on many transmissions. Minimally, a 6 ft. diameter antenna is recommended. In general, the bigger the antenna that can be used for reception, the better the signal gain. The antenna may be installed either on a portable mount, such as a ring type or custom-made tripod mount, or on a permanent ground-mounted pipe.

Listeners with geographic locations where one or more INMARSATS can be "seen" and who presently have a satellite TVRO system may use the antenna by mounting the INMARSAT feedhorn on one of four sides of the C and/or C/Ku feedhorn.

In some cases receiving more than one INMARSAT using a satellite TVRO system may require a horizon-to-horizon coverage mount. For satellite TVRO systems using a polar mount, a physical modification involving a reattachment of the antenna positioner jack to the antenna/mount at a different location will be required. Therefore, if possible, it is recommended that a dedicated antenna be used for INMARSAT reception only.

**A Homebrewed Feedhorn:** Theoretically, the optimum right-hand circularly polarized feedhorn parameters are 10 inches in length, a feedhorn opening of 3.5 inches, and the antenna probe located 3.3 inches from the rear. You can make your own feedhorn using a 2 lb. coffee can. Here's how:

Mark a point on the side of the coffee can 3.3 inches above the bottom. Drill a hole which is large enough to allow the insulated center of a female SMA or "N" chassis connector to clear without the flange part of the chassis connector passing through the hole. Paint the can inside and out with any type of white paint to resist oxidizing effects when exposed to the elements.

Next, scrape all paint from approximately 1.5 inches around the exterior of the hole circumference. To make the antenna probe, use a straight piece of brass tubing or #12 copper wire

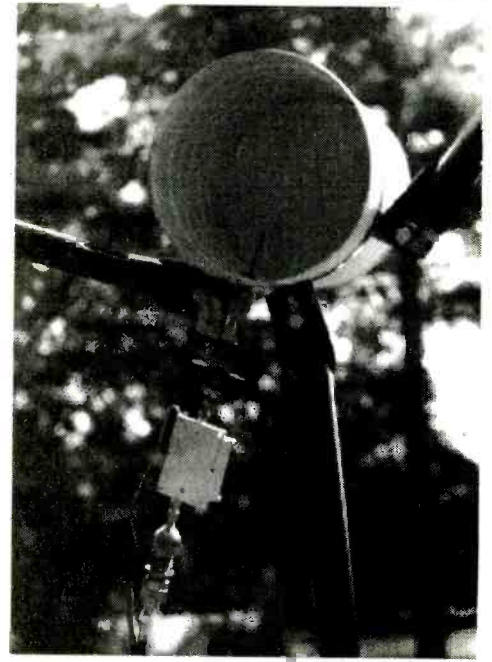


Photo 1

1.5 inches long and solder it to the center connector of the SMA or "N" chassis connector. Insert the SMA or "N" connector through the hole and solder as flush as possible to the outside can surface. A propane bottle flame may have to be used to get an even solder bonding. Solder generously to form an airtight seal around the hole. Ensure that the antenna probe is straight and not angled after soldering.

If the coffee can has a plastic top cover, replace it unpainted over the "mouth" of the feedhorn to keep out moisture and insects. Even though the feedhorn does not fully meet the theoretical standards, it works very well (Figure 2 & Photo 1).

**RF and In-Line Microwave Amplifiers:** The author used two 1500 MHz amplifiers: one RF preamp, and one IF in-line amplifier (which is optional). If you have difficulty finding a source for these, a source list is available for \$2 from the author. If you have a GOES WEFAX low noise amplifier optimized at 1691 MHz, it

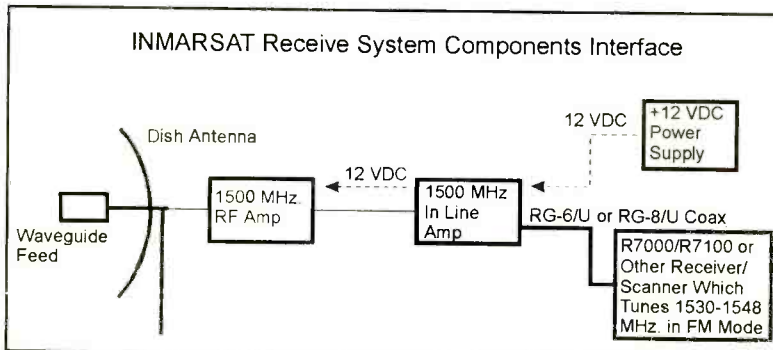


Figure 1

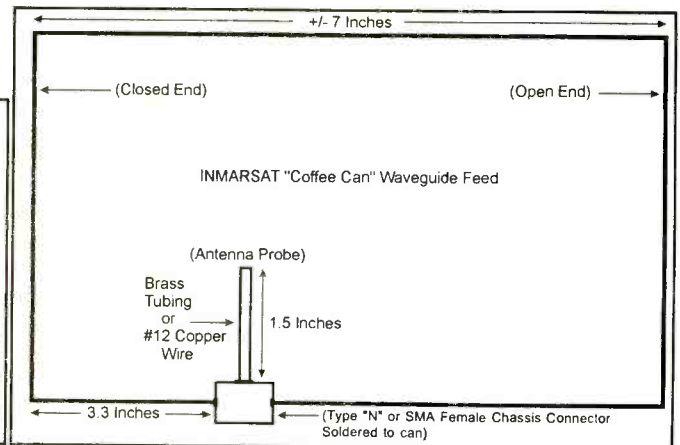


Figure 2



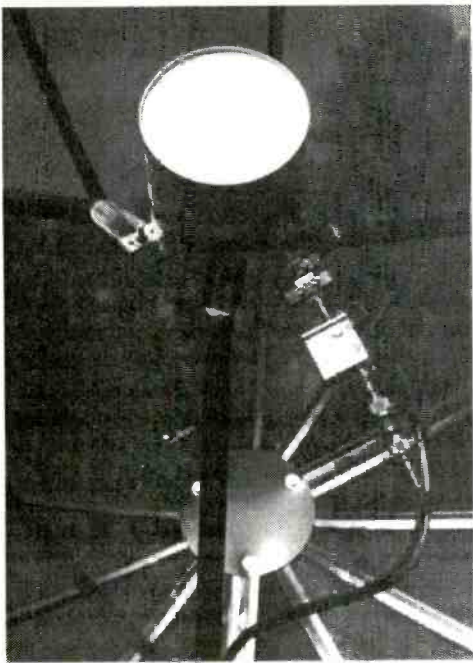


Photo 2

should work in the 1500 MHz INMARSAT frequency range, though with reduced efficiency (Photo 2).

The RF amplifier may get quite warm in operation. If it does, two heat sinks should be attached to each side of the RF amplifier to help in dissipating the heat and providing longer operating life. You may make your own heat sinks by using small pieces of aluminum or copper strap. Depending on the RF amplifier used, it may be possible to enlarge the manufacturer's pre-drilled case cover holes for attaching the heat sink pieces. A trip to the hardware store may be required to obtain correct size small screw/nut sizes. Drill matching holes in the four heat sink pieces and attach two on each side of the RF amplifier case. The in-line amplifier will not need modification for heat sinks.

**Power Supply:** A 115 VAC to 12 VDC power supply rated at 500 milliamps or greater is required to provide power to the in-line amplifier which passes voltage to the microwave RF amplifier.

**RF Connectors:** For the system configuration described in this article, one female "N"

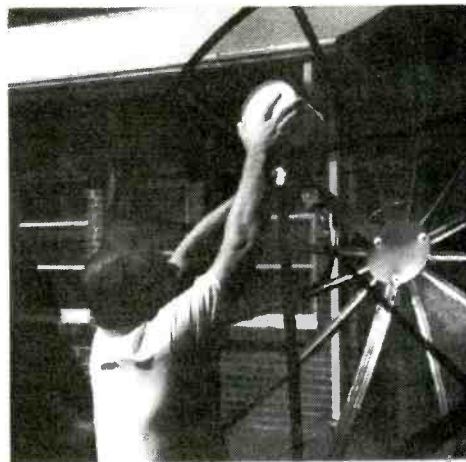


Photo 3

chassis connector, one double female "N" connector, two male "N" to female SMA connectors, three double male SMA connectors, two male "N" to female "F", and two "F" male connectors were used. Your exact needs will depend upon what type of connections are required by the specific components you obtain.

**Cable:** Impedance is not an issue and lengths of several hundred feet of RG-6/U (75 ohm) cable were used without adverse signal deterioration. RG-58/U or RG-8/U cabling with connectors could be used in lieu of RG-6/U. One or more sections of SMA cabling may be required if double male SMA connectors are not used.

**Weatherproof Cover:** The RF and in-line amplifiers are weather resistant but not weatherproof. Plastic ice cream or candy containers afford good protection against moisture. The appropriate hole size to pass an SMA connector can be reamed out with a pocket knife or drilled.

**Wiring:** Insulated #20 gauge copper wiring is recommended for providing 12 VDC power voltage to the in-line and RF amplifiers. Thermostat wiring works well for this purpose.

**Receivers:** Use an ICOM R7000/R7100 or other receiver/scanner capable of tuning the 1530-1545 MHz range in the FM mode.

### Putting It All Together

**Mounting the Feedhorn:** Assuming a satellite antenna dedicated to INMARSAT reception is to be used, you will have to customize the feedhorn support which was supplied with the antenna. The antenna used for this article had three struts mounted equidistant on the antenna edge. Each strut terminated at the center of the antenna with a flat end containing an approximately 2-inch slotted hole. Photo 2 illustrates how the feedhorn was mounted using the following method.

Unscrew and series-connect two 6-inch stainless steel hose clamps to form one large strap which is wrapped snugly around

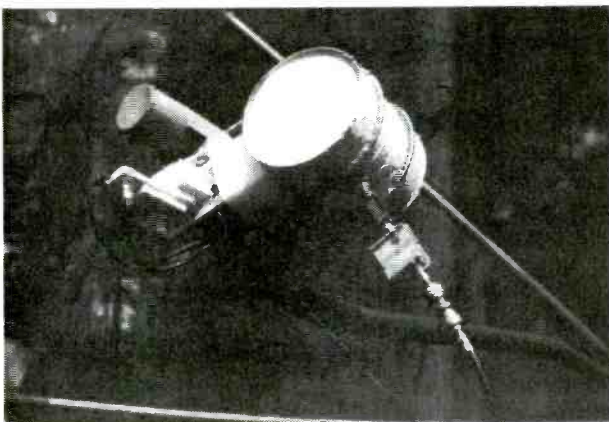


Photo 4

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the open end of the feedhorn can edge. Cut three 4-inch lengths of metal hardware strap and bend each one approximately 90 degrees. Secure one end of the metal strapping to each of the three struts with a small nut and bolt. The bent end of each piece of metal strapping is then forced under the hose clamp ring for a friction fit (with the open end of the can facing the antenna dish). Tighten the strap to the point that the feedhorn can be moved by a slight hand pressure.

Sight the feedhorn from the rear (closed) end to the center of the antenna, orient the antenna probe to approximately 128 degrees (about the 5 o'clock position). Force the feedhorn slowly by hand slightly left/right and up/down until the focal point is positioned in line with the center of the antenna (Photo 3). When centered, tighten all nuts/bolts and clamps securely.

If you are attempting to use your present satellite TVRO antenna, mount the INMARSAT feedhorn next to the C and/or C/Ku feedhorn by anchoring it to a strut support or to the C feedhorn. Try to maintain the 5 o'clock antenna probe position and angle the center of the open end of the feed to the center of the dish antenna. Secure the feedhorn with electrical tape, elastic tie straps, stainless steel hose clamps, ... whatever works (Photo 4). After the INMARSAT signal is acquired, then the feedhorn can be fine tuned and mounted more securely if desired.

**From the Feedhorn to the Receiver:** Look at Figure 3a or 3b for the order of component and

connector assembly, depending upon your particular configuration. The connector which joins the preamplifier to the feedhorn goes through the reamed hole in the plastic weatherproof cover before making the connection. Follow the illustration to complete the connections between the preamplifier and in-line amp.

RG-6/U coax cable runs from the IF amp output to the 12VDC block located at the rear of the R7100 receiver. The DC block was connected to the R7100 receiver RF input jack using a male "N" connector. A male "N" to female "F" adaptor provided the interface to the other end of the RG-6/U cable with a male "F" connector.

Another testing configuration by the author used a separate IF amp requiring separate +12VDC powering. In this case two separate insulated wires from a stand-alone +12 VDC power supply were connected to the in-line amplifier +12 VDC power and ground connection points respectively. RTV sealant was applied to the +12VDC connection point for weather-proofing.

The purpose of this article is to show at least one way to receive INMARSATs that works, and to provide you with a frame of reference from which to experiment. The configuration which uses SMA connectors (3a) was built by the author from components and RF connectors/cabling that the author had on hand. Figure 3b shows a somewhat simpler alternative.

## Peak It and Tweak It

The portable antenna configuration was placed in a location with a relatively clear line of sight to the Atlantic Ocean Region (AOR) East and West INMARSAT satellites. The following approximate azimuth (az: horizontal)

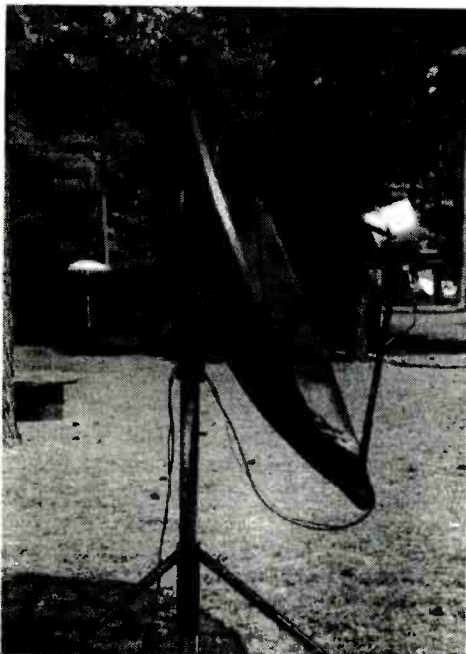


Photo 5

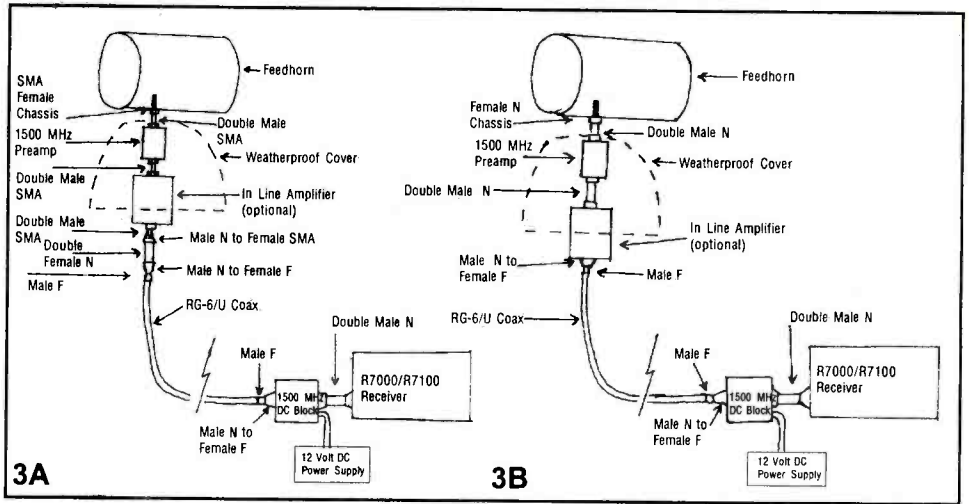


Figure 3

and elevation (el: vertical) degree settings may be used as a setup reference guide for US reception of INMARSAT satellite signals:

Listener's Location	AOR - East	AOR - West	Pacific OR	Indian OR
Eastern US	15.5° W az = 115 el = 13	55.0° W az = 150 el = 40	192.0° W Cannot See	295.0° W Cannot See
Central US	az = 112 el = 1	az = 132 el = 30	Cannot See	Cannot See
Western US	Cannot See	az = 110 el = 10	az = 262 el = 7	Cannot See

Power up the electronics. Tune the receiver to 1537 MHz FM on the ICOM R7100 and WBFM on the R7000 or other receiver capable of receiving the 1500 MHz range in the FM mode. A protractor for setting the antenna elevation angles and compass for azimuth headings is helpful, but not required. Antenna tuning is not super sharp. If antenna tuning is within 5 to 10 degrees either side of the target INMARSAT satellite, then AFRTS audio should be heard.

Using the signal strength meter on the ICOM R7000/R7100 or other receiver/scanner, peak the azimuth and elevation for maximum readings and then tighten all antenna mount bolts. If you have no signal strength meter, tune for the center of the noise free audio or the least noisiest audio.

If using a horizon-to-horizon coverage satellite TVRO antenna, power up and tune the receiver as described above and move the antenna using the antenna positioner's manual east/west controls. Enter each received INMARSAT's location in the antenna positioner's memory for future recall. The INMARSAT satellites have very little inclination and no north/south drift should be noticeable. A prominent drift would be reflected in the satellite's signal being stronger/weaker during a 24 hour period.

## Look At What I've Been Missing!

You now have a whole new world of monitoring to enjoy and are realizing a fuller benefit

of your wide frequency range receiver/scanner's capability. My enjoyment of INMARSAT listening has been so pleasurable and interesting that I have dedicated an equipment configuration only for INMARSAT reception (Photo 5).

Unknowingly, while you were configuring for INMARSAT, you also created a neat GOES geostationary weather fax monitoring station. If you used a broad band RF preamp, tune to 1691 MHz FM mode and listen. Two active WEFAX geostationary satellites can be received in the US. They are the European Meteor satellite on loan to the US and GOES West. Using the below table, "peak and tweak" the appropriate signal. WEFAX audio is now available for input to a GOES WEFAX demodulator.

Be aware that the receiver audio bandwidth signal is narrow and not optimized for GOES reception. However, the performance trade-off may be acceptable. Be patient in tuning as there are pauses between transmissions and not every transmission is fax. Some are wide band digital. Approximate look angles for the two aforementioned WEFAX satellites are:

Listener's Location	METEOR GOES-E (74.3° W)	METEOR GOES-W (137.0° W)
Eastern US	az = 180 el = 45	az = 255 el = 17
Central US	az = 155 el = 40	az = 238 el = 29
Western US	az = 125 el = 23	az = 205 el = 44

## Additional Assistance

If you have any questions or need help in obtaining components needed for the system, a supplier's source list is available for \$2.00 from the author. Customized look angle printouts for all satellites for the listener's location are available for \$5.00 each. Contact John Wilson, W4UVV, 6413 Bull Hill Road, Prince George, Virginia, 23875, Tel: 804-862-1262 (Answering machine after fourth ring). **M**

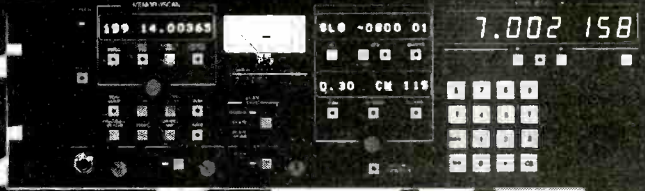


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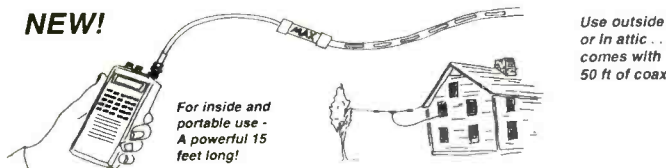
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# TOPGUN

## MONITORING THE PILOTS OF THE US NAVY'S FIGHTER WEAPONS SCHOOL

By Laura Quarantiello

There is no trophy awarded at Topgun. There is no "winners trophy" because there is no game. The young tigers that come to the Navy Fighter Weapons School come to experience the most realistic air combat training they will ever encounter this side of real war. They come to learn how to beat a tight-turning enemy in the high-speed arena of the Southern California skies.

They come to fly and fight with the Best of the Best, where trophies mean nothing and survival in the air means everything.

### Beginnings

Air to air warfare was a close and real thing for United States Navy F-4 pilots in the Vietnam



*Anyone who lands at NAS Miramar will have no doubt where they are.*

skies of 1968. At subsonic speeds (where most dogfights take place), the North Vietnamese MiG-17 was a serpent in the air, out-turning and out-foxing the F-4 Phantom. Phantom fighters, so ill-suited to the turning aerial engagement, were lost in staggering numbers. Kill ratios between 1965 and 1968 were 2.3:1. Compare this to Korea, where ratios were 10:1. The level

of air superiority was shifting quickly away from the United States and pilots were dying.

Captain Frank Ault, serving with Naval Air Systems Command, saw the numbers and knew what they represented. Navy pilots were losing because of inadequate training. Ault recommended the formation of a special school—a graduate level course in air combat maneuvering and

weapons systems employment. He proposed to train a nucleus of F-4 fighter crews and send them back to their front-line squadrons as Training Officers, where they would pass on their new knowledge to other operational squadron pilots.

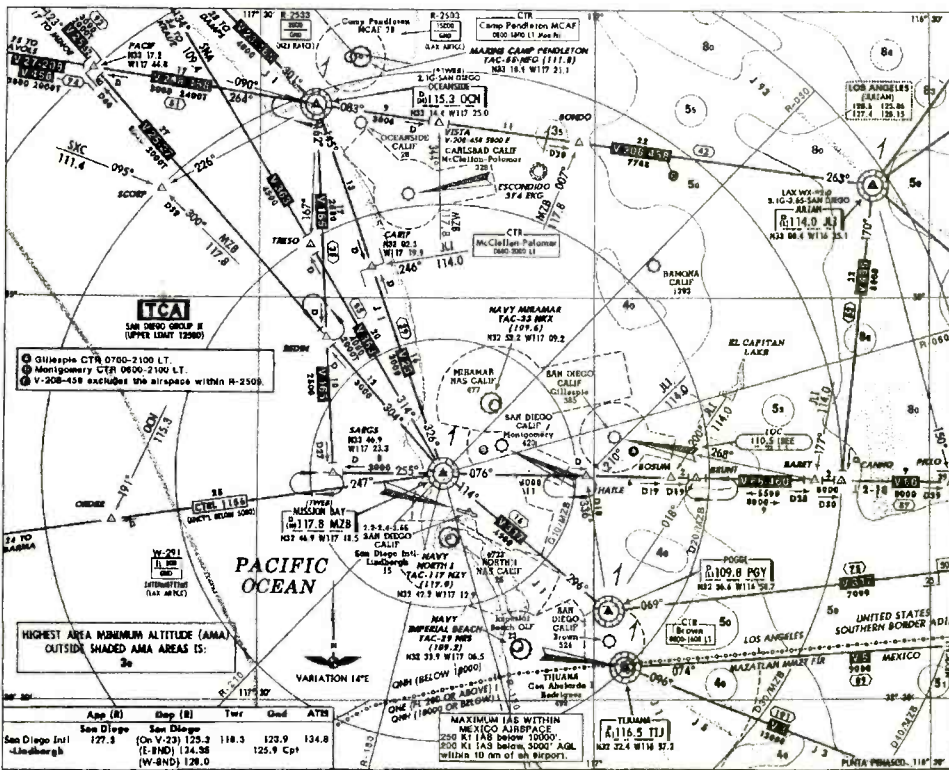
The first class was convened in March 1969, and by July 1972 Topgun was officially commissioned as a separate command. After this new Topgun training was instituted, Vietnam kill ratios improved dramatically to 12:1.

### Topgun Today

The specialized training that began in 1969 and changed the course of air warfare in Vietnam continues today at NAS Miramar, California. The West Coast master jet air station serves as base of operations for the US Navy's world-famous instruction course. Nicknamed Topgun, the Navy Fighter Weapons School is the primary authority for Navy and Marine Corps fighter tactics development and training.

Twelve fleet fighter and strike fighter aircrews arrive at Topgun five times each year to attend Power Projection classes lasting up to six weeks in length. Aircrews are selected to attend by their squadron commanding officer after meeting the prerequisites of five hundred flight hours and one deployment with a Carrier Battle Group. Only the best crews in each squadron are selected for Topgun. Students bring airplanes and maintenance crews from their own squadrons to support them during their stay.

The Power Projection course is given to experienced fighter aircrews at the graduate



Area chart depicting NAS Miramar and the San Diego area.





The "front office" for the pilot and RIO (Radar Intercept Officer) in a Topgun Tomcat.

level, teaching all aspects of fighter aircraft employment, including tactics, hardware, technique and information on the current world threat. Power Projection includes eighty hours of lectures and a demanding flight syllabus that puts student aircrews up against Topgun instructors flying the F-16N Falcon, A-4 Skyhawk and F-14 Tomcat. This course forms the basis of what Topgun is all about, and is the most well known, but it is not the only course offered.

Concurrent with each class on Power Projection, Topgun conducts an Adversary Training Course, which teaches aircrews from each Navy and Marine Corps adversary squadron how to effectively simulate current aerial threats, threat presentation and adversary tactics. These adversary squadrons conduct Air Combat Mission (ACM) Readiness Programs for F-14 and F/A-18 pilots on each coast. Four Air Intercept Controllers (AIC) are trained in coordination, communication and display interpretation skills along with each adversary class.

In addition, prior to each carrier deployment, all Navy and Marine Corps fighter and strike fighter aircrews undergo Fleet Air Superiority Training (FAST) and Hornet Fleet Air Superiority Training (HFAST), conducted by Topgun instructors. These programs consist of academics, simulator time and flight training to update crews on the current world threat, with emphasis on achieving Maritime Air Superiority within the carrier group. Each Carrier Air Wing also participates in Topgun conducted large-scale exercises designed for Integrated and Advanced Training Phases at NAS Fallon, Nevada.

Dedicated Training Officer Ground School (TOGS) courses are offered six times per year and Senior Officer Refresher Courses (SORC) are given four times per year, all designed to keep personnel in critical training billets prepared.

## Training Arena

Topgun pilots train for war primarily within the confines of special Warning Areas located over international waters off the coast of California and Mexico. The principal Warning Area, Whiskey-291, is overseen by Navy controllers at the Fleet Area Control and Surveillance Facility (FACSFAC), NAS North Island, California.

"BEAVER"—the radio callsign of the FACSFAC controllers—is charged with regulating the airspace within Whiskey, allocating areas for preassigned aerial missions, and assuring that aircraft do not stray into areas where hazardous air-to-air or air-to-ground gunnery is taking place. The large scope of the Warning



Nose-to-nose with a Topgun F-14.

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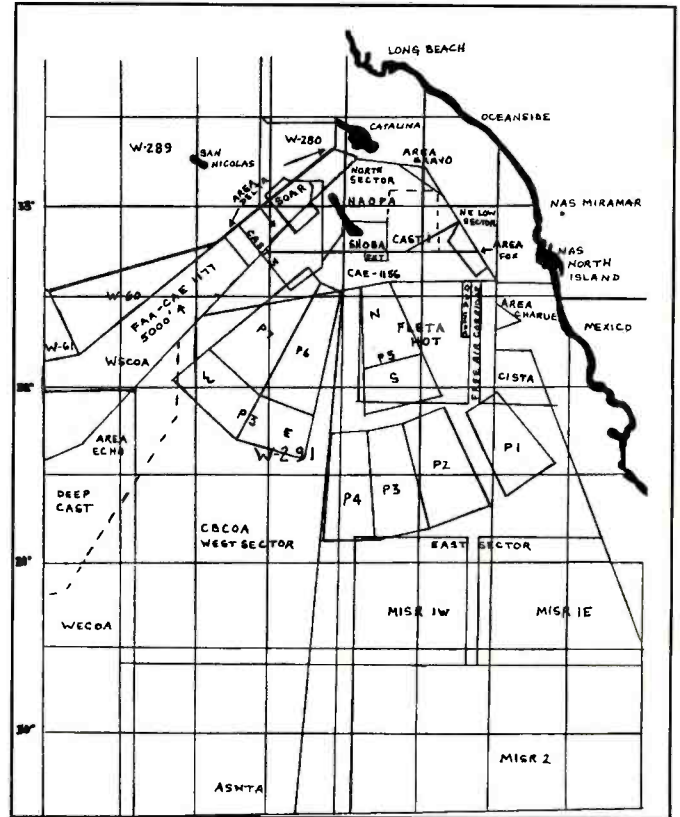
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Area requires multiple controllers, a firm hand and a quick eye to keep high-Mach jet jocks safely separated.

The Whiskey-291 airspace is home to dozens of special working areas devoted solely to Navy operations (see chart.) Some, such as the Shoba and Naopa areas, are allocated for Naval gunnery exercises by ships and aircraft. Large southern sectors are used for Anti-Submarine Warfare missions. Others, such as the Papa Areas (P1 through P8 on the chart) are reserved for the craft and practice of Air Combat Maneuvering (ACM).

*Whiskey operating areas used by Topgun aircraft.*



### Communications

Aircraft entering Whiskey-291 are handed off from Air Traffic Control to the BEAVER controllers on one of two main "Check-In" frequencies. BEAVER vectors aircraft to their appropriate working area and assigns a discrete frequency. While aircraft continue to monitor BEAVER's ATC frequency, their tactical air-to-air communications occur on discrete or on prebriefed squadron tacticals.

### NAVAL AIR STATION MIRAMAR San Diego, California

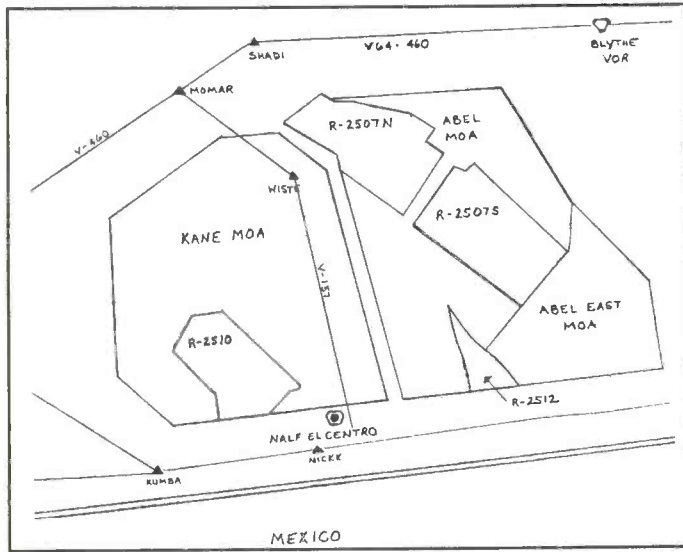
**Freqs. MHz. AM Mode**

120.050	San Diego Approach Control	284.500	VF-51 Squadron Base "SCREAMING EAGLES"	328.400	Radar Controllers
132.200	San Diego Approach Control	284.600	Radar Controllers	332.350	"Topgun" Tactical Air to Air
140.220	Tower*	285.200	San Diego Approach Control - Area C	339.500	VF-302 Squadron Base "STALLION"
141.100	Crash and Rescue Crews*	289.800	Radar Controllers	340.200	Tower
150.200	EOD/NUC "Delta"	289.900	"BEAVER" FACSFAC Control	344.300	NAS Miramar
150.550	Pacific Fighter Wing, "Echo"	290.400	San Diego Approach / Departure Control	344.400	VF-301 Squadron Base "INFERNO"
235.400	NAS Miramar	291.300	VF-2 Squadron Base "BULLET"	346.000	Radar Controllers
249.800	NAS Miramar	299.700	VAW-110 E-2 Squadron Base "CYCLONE"	350.800	Radar Controllers
250.200	VF-111 Squadron Base "OLD NICK"	299.700	VAW-114 E-2 Squadron Base "AARDVARK"	354.700	VC-13 Squadron Base "SAINT"
250.200	VF-213 Squadron Base "BLACK LION"	300.200	NAS Miramar	355.600	Radar Controllers
250.800	NAS Miramar	300.400	San Diego Approach Departure Control (ENE)	355.700	NAS Miramar
253.100	VF-124 Squadron Base "GUNSLINGER"	301.300	Clearance Delivery	360.800	Radar Controllers
253.300	NAS Miramar	304.100	NAS Miramar	360.800	Radar Controllers
253.800	NAS Miramar	305.100	Data	361.900	VF-211 Squadron Base "NICKEL"
255.000	NAS Miramar	306.000	NAS Miramar	362.100	Metro
262.700	Navy Fighter Weapons School, "Topgun" Base	306.700	San Diego Approach Area A	362.500	NAS Miramar
263.500	NAS Miramar	310.800	Radar Controllers	362.600	NAS Miramar
263.700	VF-1 Squadron Base "WICHITA"	311.800	"HASSLE" Base	363.100	San Diego Approach / Departure Control
265.250	NAS Miramar	313.000	NAS Miramar	363.600	Radar Controllers
266.800	Radar Controllers	313.200	Radar Controllers	374.900	Radar Controllers
267.700	NAS Miramar	314.900	NAS Miramar	376.800	"BEAVER" FACSFAC Control
269.100	San Diego Approach / Departure Control - Area H	315.600	Tower	380.300	Radar Controllers
275.500	VF-126 Adversary Squadron Base "BANDIT"	318.800	San Diego Approach Departure Control	380.800	Ground Control
280.400	ATIS	322.000	VF-24 Squadron Base "RENEGADE"	381.500	San Diego Approach / Departure Control
281.800	San Diego Approach / Departure Control - Area G	323.000	San Diego Approach / Departure Control	382.000	Radar Controllers
283.300	NAS Miramar	325.200	Radar Controllers	383.700	NAS Miramar
		328.300	NAS Miramar	384.500	"Topgun" Tactical Air to Air
				385.500	Radar Controllers

\*FM mode



*Kane and Abel MOAs near the Salton Sea.*



As aircraft drift around their working areas, they are advised by BEAVER anytime they approach the boundaries of the areas and anytime significant airborne traffic is seen on radar. Radar and radio are all-important within Whiskey: lack of either one is dangerous and will send aircraft back to base immediately.

Once aircraft complete their operations, they will RTB (return to base) via two main BEAVER RTB or "Check-Out" frequencies. Once clearing the Whiskey area, BEAVER controllers hand the aircraft off to San Diego Approach or Coast Approach controllers for the flight home.

Flight operations within Whiskey-291 are intense and occur at all hours of the day and night. Weekends are generally quiet, although Saturday and rarer Sunday hops are not uncommon. Topgun pilots, in addition to ACM, are also heard performing postmaintenance check-out flights and familiarization (FAM) flights.

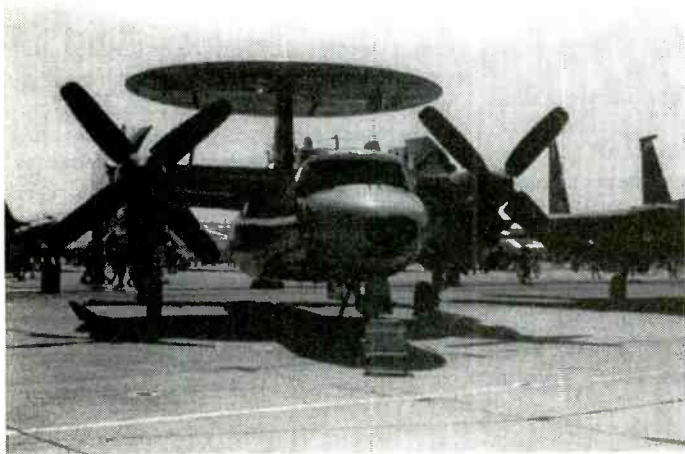
Topgun students and instructors may also use a variety of Restricted Areas over land for training missions. The most common are R-2507 North and R-2507 South, known as the Choco-

late Mountains Aerial Gunnery Range. (See chart and table for frequencies.) These Restricted Areas are just east of the Salton Sea near Imperial, California, where you will also find the KANE and ABEL MOAs (Military Operating Areas). These areas serve as the "feet dry" or over-land training territories.

Non-Topgun related activities that keep the warning area busy include carrier qualifications (CQs or CARQUALS) in conjunction with a Navy carrier offshore; GCAs (Ground Controlled Approaches) into one of the two islands offshore, NALF San Clemente and OLF San Nicolas; and aircraft towing targets, conducting firing runs or radar tracking runs in concert with Navy or Coast Guard ships.

**Monitoring the Action**

Tracking Topgun pilots is as easy as punching up NAS Miramar's Tower frequency and listening for departures. Radio handoffs from frequency to frequency are easy to follow. Those monitors farther away from Miramar and unable



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Beaver Discrete	273.1
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Plead Check-in/RTB	338.0
Plead Discrete	341.3
Plead Discrete	268.8
Plead Discrete	326.8
Plead Discrete	263.8
Plead Discrete	273.3

Starburst	264.0
Starburst	267.4

Happy Hunter	255.3
Happy Hunter Discrete	284.9
Happy Hunter Discrete	285.8
Happy Hunter Discrete	318.7

Fleet Common	277.8
Fleet Common	255.3
Fleet Common	280.2

Air to Air	279.1
Air to Air	380.5
Air to Air	342.9
Air to Air	233.9
Air to Air	302.6
Air to Air	255.2
Air to Air	348.1
Air to Air	253.05
Air to Air	265.0
Air to Air	354.9
Air to Air	364.8
Air to Air	384.5
Air to Air	270.5
Air to Air	309.3
Air to Air	315.3
Air to Air	259.2
Air to Air	238.05

**Related Frequencies**

Warning Area W-291 Aerial Refueling Track	276.5
"Desert Control" NAS Fallon, Nevada Range	263.6
Chocolate Mountains Aerial Gunnery Range	272.9
Chocolate Mountains Aerial Gunnery Range	310.65
"Longrifle" MCAS Camp Pendleton	360.3
"Longrifle" MCAS Camp Pendleton	301.9



*The Hornet's Sting—a snout full of 20 mm M61 Vulcan gun.*

to receive Tower communications may wish to keep a listening watch on BEAVER Check-In frequencies of 289.9 MHz or its VHF equivalent 120.85 MHz. BEAVER controllers routinely assign aircraft to discrete frequencies which are given over the air. Simply follow the frequency switch to listen to air to air transmissions.

Check the callsign list for help with the aircraft IDs you will hear while listening. "Topgun" is used often and usually refers to student's aircraft (F-14's or F/A-18's.) Adversary aircraft are used to simulate the characteristics of the enemy (A-4's imitate the MiG-17, F-16's imitate the MiG-29 and 31) and go by callsigns such as SAINT or BANDIT.

AIC (Air Intercept Control) missions that run in concert with other aircraft or surface vessels often take place under the aegis of HAPPY HUNTER controllers (see freq list.) AIC uses a Navy controller (often aboard an E-2 Hawkeye) to set up engagements by vectoring fighters toward their targets.

Most warning area communications are audible for good distances from the transmitters at NAS North Island. Air to air transmissions between aircraft are heard at greater distances because of the high altitudes of the jets. In both cases your antenna is the critical factor in how well you receive these communications. An outdoor mounted antenna will improve your chances dramatically.

**Speed is Life**

"Train like you'll fight, fight like you train." You'll find these words in the long hallway that leads from the entrance of the NAS Miramar Commissioned Officer's Mess to the pilots "ready room." You'll find history on the walls of this Naval Air Station that trains young Navy fighter pilots to do the world's most dangerous job.

"A pilot lives to shoot down another airplane. That's what he trains for..." So says Commander Randy "Duke" Cunningham, Vietnam jet ace with five victories, former Topgun

**ACRONYMS**

TOP GUN:	US Navy Fighter Weapons School, NAS Miramar, CA
BEAVER:	W-291 Warning Area Controller
PLEAD:	Pacific Missile Firing Range Controller
HAPPY HUNTER:	Airborne Intercept Control Controller
STARBURST:	Antisubmarine Warfare Range Controller
LONGRIFLE:	MCAS Camp Pendleton Range Controller
FACSFAC:	Fleet Area Control and Surveillance Facility

**COMMON AIRCRAFT  
CALLSIGNS**

BANDIT	A-4
BAT	F/A-18
BLACK EAGLE	E-2
BOSS	F-18
CAT	AV-8
CHARLIE TANGO	P-3
COMBAT	F/A-18
COWBOY	C-130
DRAGON	CH-46
EAGLE	F/A-18
FLIGHT INT'L	Learjetor MU-2
HOG	E-2
IRISHSMITH	S-3
KNIGHT	F/A-18
LION	F-15
GRIZZLY	F-4
GUNSLINGER	F-14
OSCAR JULIET	F-14
PASSWORD	C-2
PRIMO	KC-10
SENTRY	E-3
SHOOTER	F/A-18
SMOKE	F-18
STALLION	F-14
STARBUCK	S-3
STINGER	S-3
RAIDER	C-130
SAINTE	A-4
SNAKE	F/A-18
VIKING	F/A-18
WAKE	AV-8

instructor and VF-126 Adversary Squadron commanding officer. "It is the aggressiveness and ability of the pilot that keeps him alive."

There are no trophies given out at the end of a Topgun course, contrary to what was portrayed in the popular movie of the same name. What happens at NAS Miramar isn't about winning trophies. When a pilot walks away from the Navy Fighter Weapons School, he carries with him something every fighter pilot wishes for, and only a few receive .... the finest air combat training in the world. **MT**



Most amateur radio operators know and admire a few individual hams they look up to as role models. Next month at the Dayton Hamvention a new "Ham of the Year" will be named, but in Ken Reitz's book, Harry Dannals will always be the personification of ham radio.

# A Guiding Force in Amateur Radio

## Harry Dannals, W2HD

By Ken Reitz, KC4GQA

**P**eddling east on U.S. 250, I check the rear-view mirror again for traffic. Not a thing all the way back to the Ferncliff Market, a little store at the cross-roads of 250 and 208. The road ahead is clear, too, as I push my way up the long grade. At the top of the hill I make my turn off 250 and onto the near solitude of a small county road in central Virginia.

By this time I'm usually winded and looking forward to the relative flat stretch of road. This extra height also gives me excellent coverage from the 2 meter transceiver I have on board the bicycle, and a nearly straight shot into the repeater on Carter's Mountain some 25 miles away. Picking up the microphone from its perch on the handlebars I summon the Genie. "W2HD from KC4GQA." Within seconds the speaker on my rig comes to life, "This is W2HD, how can I help you?"

It's the same question Harry Dannals asks dozens of times a week talking to old friends, radio club members and the steady stream of tourist/hams traveling this area to visit Thomas Jefferson's Monticello or meandering the pic-

turesque highways into the Blue Ridge Mountains, our gateway to the ancient Appalachians. It's a question that has been the main theme of his 48 years in amateur radio.

You'll never hear Harry Dannals brag about his connections, accomplishments or position in the amateur community. But, if you ever get a chance to visit his ham shack, the walls do all the talking. Virtually ringing the room are framed certificates, polished plaques and other testimony to the years of service he has given. Not the least of these is his most recent: The Dayton Hamvention "Ham Of The Year" for 1993, citing his efforts in promoting the "No-Code" license.

Harry Dannals received his call, W2HD, in 1976 in a special program by the FCC for Amateur Extra Class operators. In doing so he relinquished his original call W2TUK issued in 1946 when Dannals was a teenager. In those days he shared rig space in the shack with his father W2GG (later K2GG and now a silent key).

His life-long love of radio was nurtured in the family as his father "Dan" Dannals was a "Chief Radio Electrician" in the Navy and was involved in many early experiments with ship-board wireless.

When Harry was ten years old he says he remembers playing outside with a couple of his friends. "We had an old rope swing which hung down from a tree, the idea was to swing over to a flat roofed garage and leap. Well, one time I didn't quite make it."

The resulting injury caused his Dad to declare him "confined to quarters" for two weeks. The irrepressible young Dannals convinced his best friend, Warren Lueck (W2VKS), to learn Morse code together during those two weeks. They did and, though it was to be a few more years before either would earn his ham ticket, Dannals was well on his way to a long time affection for code.

The life of a service family kept the Dannals' moving from Long Island to Pennsylvania to Virginia and later the Panama Canal Zone, where Harry graduated from Balboa High School and enlisted in the Navy. After his discharge as Radioman Second Class, he attended the Polytechnic Institute of Brooklyn. During his first two years there he passed his Class "B" and "A" amateur license exams, becoming one of the first hams to take the Extra Class license in New York City.

After graduating with a degree in Electrical Engineering, Dannals found work at ERCO Radio Labs on Long Island. He also accepted a commission as an Ensign in the Naval Reserve in which he served until he retired as a Commander in 1987. After a short work stint at ERCO he landed a job at Sperry, now known as Unisys, where he worked for the next 38 years.

Here Harry met Kay, his wife of more than forty years and together they raised two sons and two daughters. It was at this time that Dannals began his earnest involvement with amateur radio. From 1955 until 1972 Harry Dannals held many American Radio Relay League (ARRL) offices in the Hudson Division including Director and Vice Director. In 1972 he was elected



Photo courtesy Harry Dannals

Harry Dannals, W2TUK, second row, second from left, at age 20 on his first Field Day with the Nassau Radio Club, NY, 1947.

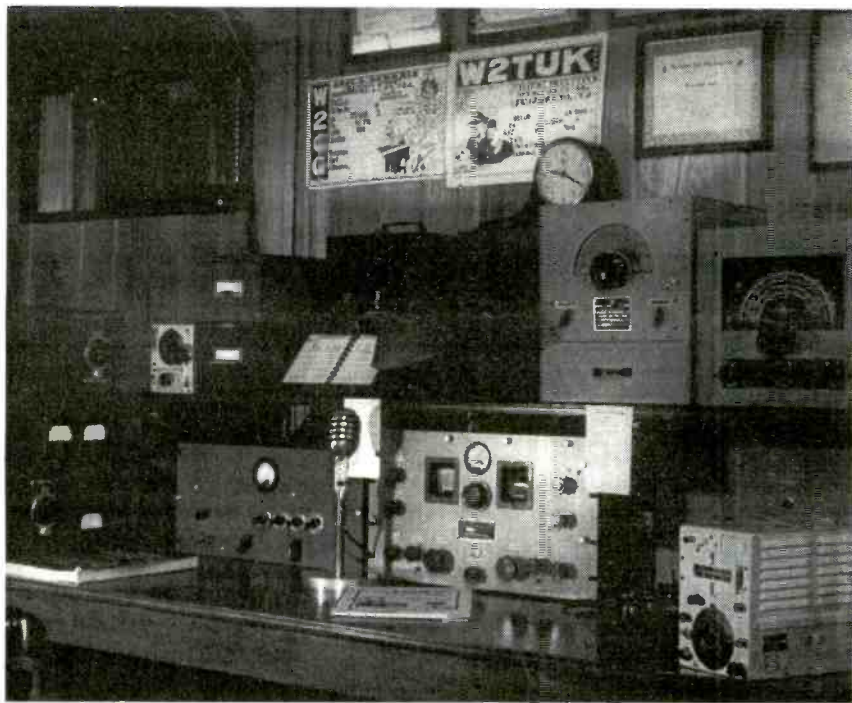


Photo courtesy Harry Dannals

*Dannal's 1947 ham shack shared with his father W2GG, features military gear converted to the ham bands; an Electro-Voice mike; the one inch thick book on the left is the 1947 Call Book which included all amateur calls in the world. The current Call Book is .4 inches thick in two volumes. QSL posters on the wall are blow-ups of their actual cards. Artwork is by Otto Eppers W2EA, well known cartoonist of the day.*

President of the ARRL, an office he held for the next ten years.

Looking back on his tenure as League President Dannals says, "Probably the most satisfying result...was the success achieved by the WARC-79 Team." That team was the group that represented the ARRL at the World Administrative Radio Conference in 1979 garnering the 30, 17 and 12 meter bands for amateur operators. While all three bands are relatively small,

Dannals maintains that it is an important foot in the door. He believes that subsequent WARC's will expand these bands giving all hams considerably more HF operating room.

As to the No-Code license (which allows people to earn an amateur radio license without demonstrating any proficiency in Morse Code) Dannals believes it to be the best way to insure the continual growth of the amateur community. Technician Class licensees, as the No-Code

hams are called, are not allowed any privileges in the High Frequency (HF) portion of the bands. The lure of HF privileges, he says, will entice these hams into up-grading their licenses which requires a code proficiency. It will be several years before meaningful statistical analysis can bear him out.

From 1983 to 1985 Dannals served as National Director for the Quarter Century Wireless Association (QCWA) and is currently in his second term as QCWA National President, a term which will end this year.

Upon his retirement four years ago, Harry and Kay decided to move to Charlottesville, Virginia, a town he had visited many times throughout the previous years in his job with Sperry. They bought a beautiful new home in Albemarle County with a sweeping view of the rolling Virginia Piedmont seen from any window.

Behind the house Harry has planted a well designed antenna farm. On a single tower he has no fewer than eight antennas which cover 80 meters through 440 MHz. Included are a Mosely Pro 57A seven element five bander as well as numerous horizontal and verticle antennas for 2 meters and 440 MHz. The tower also serves as a center support for an 80 and 40 meter ladder line fed dipole. A twelve foot Paraclipse satellite TV antenna sits not far from the tower. On the ground are uplink and downlink antennas for his new AMSAT installation.

There isn't a transmission mode Harry can't copy inside his ham shack. He enjoys monitoring everything from HF to satellite in a room full of receivers and transceivers which would delight any radio enthusiast. Looking at his operating position jammed with top grade rigs it's difficult not to actually drool.

Among the radios lined up are a Kenwood TS 850S all band HF; Kenwood TS 690 which he uses for 6 meters; Kenwood SM-230 Station Monitor; Kenwood Dual Band 440/2 meter transceiver; Yaesu FT 736R VHF/UHF all-mode transceiver; TenTec Argonaut II QRP; and its exact opposite, TenTec Centurion amplifier with 1,200 watts PEP (peak envelope power). Scanning the VHF and UHF bands are Realistic 2004 and 2022 radios. In one corner of the shack is a dedicated 2 meter packet station monitoring a local packet repeater.

Though he is retired from his working career, his ham radio career is far from over. When he's not traveling around the country in his capacity as QCWA President or giving talks to schools and clubs about ham radio, or holding forth at the weekly informal ham foodfest at the local Bonanza Steak House, or talking on radio talk shows, or giving interviews to the local media, or on the Sperry 20 Meter Net, or chatting

*Dannals at the key for K2US, the official amateur radio station for the 1964 New York World's Fair. Will Lierheimer K2MJO, station manager, on the left, the other ham is unidentified.*



Photo courtesy Harry Dannals



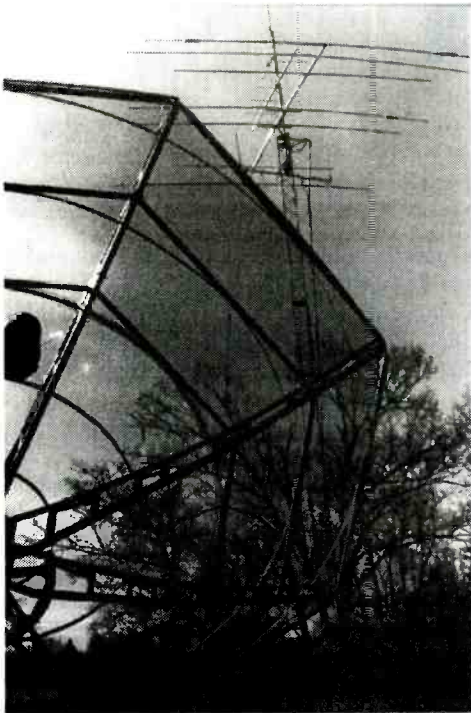


Photo courtesy Jensen Montambault

Monitoring HF through satellite is easily done from W2HD's antenna farm behind his house. Tower features eight antennas including the dominating Mosely Pro 57A five bander. Dish is a Paracclipse 12 footer feeding a Chaparral receiver.

with his brother W2DRL in Florida, he's putting up new antennas, monitoring the local 2 meter packet BBS, listening to the 220, 440 and three 2 meter repeaters, answering the phone, the mail, and the door and all the while he is never out of reach of a mike or CW key.

Throughout the years Harry Dannals has met or talked with virtually every ham/celebrity alive. As trustee of K2US, the official amateur radio station of the 1964 World's Fair in New York City, Harry played host to a steady flow of famous hams. Today, he's the unofficial host of the 146.76 machine in Charlottesville. Anyone who brings up the repeater is more than likely to be greeted by his friendly, familiar voice.

"So, I take it from the mike noise and your irregular breathing that you're bicycle mobile today," Harry says. Two dogs materialize from nowhere. They're racing neck and neck to see which one gets the privilege of ripping off my right shoe. "That's right," I wheeze into the mike and hold it down toward the dogs so that Harry can hear their snarling barks. "Look, I've gotta use both hands here Harry, I'd better call you later!" "OK, Ken, W2HD clear." MT

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### Please Be Patient!

Please wait until the 10th of the month before contacting *Monitoring Times* if you haven't received that month's issue. The Postal Service requests replacements not be mailed before the 10th, to allow for any postal delivery delay.

# Utility World

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

## "EARTHQUAKE!"

No other word in the English language strikes greater fear in the hearts of California residents than those ten letters of the English language—earthquake.

In January the Los Angeles basin was hit with a massive 6.6 magnitude earthquake centered in the San Fernando Valley. This act of nature did considerable damage to the area. A large number of roads, buildings and homes were destroyed in the initial jolt. Rebuilding of that infra-structure began even as after-shocks continued to rumble over the southland of California.

Almost immediately, emergency services from local, state and federal government agencies went into action handling vital services and information. The Utility World spectrum came alive with traffic relating to the quake from some of those agencies.

But this wasn't the "big one" that scientists say is coming. Someday California is going to be hit with a magnitude 8.0 or bigger quake. That one will do major damage with greater loss of life.

As a Utility World monitor, you can learn a lot about emergency communications in situations like this and be prepared in the future to monitor the next major emergency like the "big one." One of the best places to hang out in a major disaster is on US Government frequencies during a crisis.

The President of the United States issued Executive Order 12742 in April of 1984 establishing inter-operability objectives for all Federal departments and agencies. In response to this order, the National Communications System (NCS) established a program to identify Federal HF assets. NCS also developed procedures to enable these resources to be used to pass National Security Emergency Preparedness (NSEP) traffic.

This program is known as Shared Resources (SHARES). The program became fully operational in 1990. SHARES is a confederation of over 1000 stations from 36 federal departments, agencies and federal affiliated organizations.

The concept of operation for Shares is really quite simple. Federal entities rely on the public telephone system to conduct the government's day-to-day business. In emergency situations requiring coordinated Federal response, the telephone system is expected to experience disruption and traffic congestion. Contingency communications must be available in such circumstances. Agencies participating in the SHARES program have agreed to use their existing HF radio systems to pass emergency traffic for other agencies on a non-interference basis with their own missions.

The concept of operation of SHARES is the key to understanding this HF program. SHARES does not have its own frequencies assigned. The frequencies come from each of the federal agencies themselves.

The Federal HF frequencies used to support SHARES are also used daily by Federal agencies to support essential government operations. In this unusual arrangement, you can, during SHARES tests and exercises, hear radio checks being conducted by government agencies on frequencies which are not assigned to them.

During times of crisis and emergency, such as the LA earthquake, it would appear that NCS does assign certain frequencies from the federal pool that are set aside for interagency communications during that emergency or crisis. These frequencies come from the large pool of HF frequencies assigned to each of the government agencies.

Mike Schulsinger was one of our first reporters to check in with some government quake-related frequencies. Mike monitored the Civil Air Patrol (CAP) National Command Nets on 7635.0 (USB) at 1600 UTC and 14902.0 (USB) at 1630 UTC and heard the participants pass the following frequencies that would be handling quake related traffic:  
5236.0 10586.5 14396.5 18392.5 kHz

Other government agency systems to monitor on HF during natural disasters would include: Federal Highway Administration (FHWA), Federal Aviation Administration (FAA), Department of Transportation (DOT), Civil Air Patrol (CAP), FEMA (Federal Emergency Management Agency), and the military services MARS (Military Affiliate Radio System) frequencies. Complete coverage on all of these federal radio systems are contained in the pages of the *Grove Shortwave Directory*, 8th edition, available from several MT advertisers or Grove Enterprises.

Another set of frequencies to watch during emergencies is the Operation SECURE (State Emergency Capability Using Radio Effectively) channels. Several years ago, the FCC set aside some HF frequencies for each of the states to use for disaster communications. Stations in the 48 states are authorized to use one kilowatt maximum power and USB mode. Fixed, base and mobile operation can be found on the following frequencies (California frequencies marked with an asterisks, all freqs kHz):

2326.0*	2463.0	2535.0	5135.0	7802.0*
2411.0	2466.0	2569.0	5140.0*	7805.0*
2414.0	2471.0	2587.0	5192.0	7932.0
2419.0*	2474.0	2801.0	5195.0*	7935.0
2422.0*	2484.0	2804.0*	7477.0	
2439.0	2511.0	2812.0*	7480.0*	

Even military frequencies can be productive during a crisis such as the LA quake. President Clinton immediately dispatched members of his cabinet to the disaster scene. While enroute to California, several monitors reported hearing quake related traffic from the White House staff on US Air Force Mystic Star channels. Jeff Woodward in Eureka, CA, and James Lunan in Tiffin, OH, both have logs in this month's logging section in this regard.

One should not overlook the amateur HF frequencies as sources of information in a disaster. The LA quake has been no exception to this rule. Robert Thomas reported that the following frequencies have been active with quake related traffic (all communications in USB, MHz):

14.186	14.245	14.268	14.275	14.287	14.290	14.295
14.3025	14.300	14.3003 (Maritime Net)		14.305		

I am sure that other nets exist throughout the amateur HF spectrum especially during the evenings on 40 and 80 meters.

One agency that is sometimes overlooked in disasters is the International Red Cross, especially during foreign disasters. Ute monitors equipped with digital decoding equipment can monitor Red Cross SITOR-A broadcast on some of the following frequencies in kHz:

3801.5	3815.5	6998.5	13569.5	13915.0	13950.0	13965.0
13973.0	13998.5	14375.0	20753.0	20800.0	20815.0	20942.0
20998.0	27998.0					



People in the affected area should also check the following frequencies on their scanners for Red Cross activity: 47.42 (Nationwide), 47.46, 47.50, and 47.66 MHz

Not only can you hear Red Cross activity on your scanner, but you should also check the rest of the VHF/UHF spectrum covered by your scanner. Monitoring the on scene communications will provide the best information on what is actually going on in the local area. You should develop a comprehensive list of local, state and federal frequencies to monitor for your area when a disaster strikes.

On a final note, to the people of southern California who have suffered the loss of loved ones and property, you have our deepest sympathy. To the thousands of volunteers and public safety officials working to restore the affected area, our deepest thanks for a job well done. Bravo Zulu.

### Tension on Korean Peninsula

For the last several months, a crisis has been developing on the Korean peninsula between the US, North Korea and the International Atomic Energy Agency. As this column was being written, press reports indicate that the US government was considering a request by the US military commander in South Korea, to send Patriot (Scud Busters) missiles to South Korea.

The Korean Central News Agency might be an excellent place to gauge North Korea's reaction to this and future actions by the US. Here is the latest schedule copied by Richard Crisp and forwarded via Internet by Richard Baker.

DIRECTION	LANGUAGE	TIME	NUMBER OF FREQUENCIES	FREQUENCIES
ASIA	ENGLISH	0400-0600	HMF 32/46	14568/14580
		1000-1100	HMF 46/86	10580/8152
		1500-1730	HMF 46/85	10580/8020
	FRENCH	1145-1430	HMF 45/86	10524/8152
		PHOTO	2330-0000	HMF 36/52
EUROPE	ENGLISH	0030-0100	HMF 36/52	13580/11476
		0400-0530	HMF 26/55	15633/11476
		1000-1200	HMF 26/55	15633/11430
	RUSSIAN	1500-1730	HMF 35/84	13780/9395
		0600-0830	HMF 26/35	15633/13780
		1230-1430	HMF 26/55	15633/11430
		2130-0000	HMF 55/84	11430/9395
AMERICA	ENGLISH	0400-0730	HMF 36/52	13580/11476
		2130-2300	HMF 36/52	13580/11476
AFRICA	ENGLISH	0800-1030	HMF 57/49	14452/11536
		1800-2100	HMF 52/85	11476/8020
	FRENCH	1145-1430	MMF 57/49	14452/11536
		1800-2100	HMF 49/84	11536/9395

I highly recommend to all utility monitors to keep an ear cocked towards Korea for the next few months as things look like they might heat up there at any time. Thanks to both Richards for the KCNA input.

### New FAA Frequencies

Longtime Ute World reporter, Jack Metcalfe in Kentucky, forwarded some new frequencies and channel designators for the Federal Aviation Administration (FAA) Selscan system. The FAA is one of many federal agencies that appear to have converted to the newer Selscan radios. Here is Jack's FAA list:

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

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

P.O. Box 98, Brasstown, NC 28902-0098. Many thanks, Jack, for the starter list.

### Bayonne Global

Yes, as you will see mentioned in the logging section this month, we have a new player on the USAF Global HF System scene: Bayonne, NJ. Needless to say, I thought my ears were playing tricks on me when I recently heard Bayonne Global working military aircraft with phone patch traffic on 11176 kHz. I was so convinced that I might be wrong that I posted an immediate message to the Grove BBS relating my intercept and asking about the prices for new hearing aids.

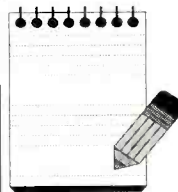
I received an immediate post back from UW regular Jeff Haverlah down in Texas. Jeff had also heard transmissions to and from Bayonne Global. (At least I wasn't hearing things.)

Well, to make a long story short, Bayonne Global is a real station on the Global HF System. The station operates under the unified command called the US Transportation Command. Under the US Transportation Command comes the Air Mobility Command (AMC), Military Sealift Command (MSC), and Military Traffic Management Command (MTMC).

The last of these three is the specific command that operates Bayonne Global. Part of the MTMC mission is to support the Air Mobility Command (AMC). For this reason, Bayonne Global was created. A communications center has been established at the Marine Operating Terminal in Bayonne across the river from New York City.

Bayonne Global has been monitored on the following frequencies: 8993, 11176, and 15015 kHz. I am sure they will be heard on various other GHFS house and discrete frequencies as well.

Now the next time you hear Bayonne Global on HF, you won't have to have your hearing aid checked like I did; they really are on HF.



### Ute World Pot Luck Frequencies

- NORAD Charlie channels: ?(C1) 4735 (C32) ?(C33) 6735.0(C2) 6750.0(C3) ?(C4) 9023.0(C5) 11214.0(C6) 13207(C7) 18027(C8)

- 8723.0 SITOR-B Sending DE HJN2 HJN2. Does anybody know if HJN2 is Buenaventure Radio or whoizit? (From Richard baker via Internet)

11334.7 Boustane Lome, Togo, working Khargia Cairo with record 647 5-letter groups using SITOR-A.

11443.7 Boustane Brussels, Belgium, working Khargia Cairo via Paris with 5-letter SITOR-A groups. (Are 11334.7 and 11443.7 Egyptian Embassy channels?)

- Additional FT Net frequencies (See Jan 94 Ute World): 4395.0, 8190.0, 8188.5, 6780.0, and 6788.0

- 8100.0 Thunderbolt working Alphanumeric call signs (Customs)
- 8910.0 Offutt AFB Global discrete
- 5713.0 Royal Australian Air Force - Sydney
- Cobra thanks and good to go from 1.6-30.

That's it for this month. If you hate sending stuff through the mail and have a computer and modem, you can send your logs and contributions directly to me via the Grove BBS or our fax line. I will also except material via Internet E-mail at the following address: grove@rock.concert.net.

Thanks to all for making Utility World the best around, and special thanks to our record 29 contributors to the logging section which follows!

# Utility World

## Utility Loggings

### Abbreviations used in this column

AF1	Air Force One		Distribution System
AFB	Air Force Base	LSB	Lower Side Band
AM	Amplitude Modulation	MAP	Maghreb Arabe Presse
ARQ	Automatic Repetition on Request	MARS	Military Affiliate Radio System
ARQ-E	Single channel ARQ teleprinter system	Meteo	Meteorology
ARQ-E3	Single channel ARQ ITA3 teleprinter system	MFA	Ministry of Foreign Affairs
ARQ-M2	Multiplex ARQ teleprinter system	Mv	Motor Vessel
ASCII	American Standard Code II for a standard computer format	MWARA	Major World Air Route Areas
ASECNA	Agence pour la Securite de la Navigation Aerienn en Afrique et a Madagascar	NARACS	National Radio Communications System
ATC	Air Traffic Control	NAT	North Atlantic
AWACS	Airborne Warning and Control System	NAV	Navigation
CAR	Caribbean	NORAD	North American Air Defense Command
CIS	Commonwealth of Independent States	PACTOR	Teleprinter system combining certain characteristics of Packet Radio and SITOR
COMSTA	Communications Station	POL-ARQ	Polish Diplomatic ARQ teleprinter system
CQ	General call for any station	RTTY	Radioteletype
CW	Continuous Wave (Morse Code)	SAM	Special Air Mission
EAM	Emergency Action Message	SITOR-A	Simplex teleprinting over radio system, Mode A
FAA	Federal Aviation Administration	SITOR-B	Simplex teleprinting over radio system, Mode B
FAF	French Air Force	SWBC	Shortwave Broadcast
Fax	Facsimile	Unid	Unidentified
FEC-A	One-way traffic FEC teleprinter system	UNPROFOR	United Nations Protection Forces
FHWA	Federal Highway Administration	USB	Upper Side Band
ID	Identification	USCG	United States Coast Guard
JTIDS	Joint Tactical Information	USCGC	USCG Cutter
		USN	United States Navy

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

- 436.0 WCC-Chatham Radio, MA, with CW traffic list at 2252. (Robin Hood-UK)
- 518.0 ZSC-Capetown Radio, RSA, with NAVTEX broadcast using SITOR-B at 1630. (Robert Hall-Capetown, RSA)
- 2182.0 GFZH-m/v *Grampian Protector* working Wick Radio in USB at 2005. ZCAP2-m/v *Atlantic Guardian* calling Wick Radio in USB at 2149. Porto Torres Radio, Italy, with weather broadcast at 2150 in USB. LFO-Orlandet Radio, Norway, with USB traffic at 2155. (Ary Boender-HR Spykenisse, The Netherlands)
- 2525.0 UHNL-m/v *Ojas Vacietis* working Riga Radio in SITOR-A at 1847. (Hood-UK)
- 2556.6 Alligator Link 11 transmissions noted here at 0345. (Jeff Haverlah-Humble, TX)
- 2598.0 VCM-Canadian CG St. Anthony, NF, with USB weather broadcast at 0195. (Bill Fernandez-MA)
- 2605.0 UIK-Vladivostok Radio, Russia, with coded weather info in CW at 1511. (J.S.McDonald-Port Coquitlam, BC Canada)
- 2719.0 IZN-Porto Torres Radio, Italy, with gale warning in USB at 2220. (Hood-UK)
- 2760.0 9VG5-Singapore Radio with CW traffic list at 1611. (McDonald-BC)
- 2832.7 GNK1-Wick Radio, England, with CW ID/SITOR idler at 0654. (McDonald-BC)
- 2869.0 San Francisco ATC working several flights in USB at 0529. (Gordon Levine-Anaheim, CA)
- 2887.0 Speedbird 262 working New York ATC in USB at 0534. (Halstead-WV)
- 3016.0 Viasa 708 heard in USB at 0604 working Shanwick. (Halstead-WV)
- 3032.0 Cathedral working Blackcap, WAR46 in USB at 0410 on Whiskey 100. (Haverlah-TX)
- 3037.0 FW working Spangle 716 and FT net also here in USB at 0341. (Haverlah-TX)
- 3039.1 Juliet working various single letter call in USB at 0259. (Haverlah-TX)
- 3048.0 WAR46 (Mezmorize) working Racetrack on X-206. (David Howden

- via Grove BBS) *Thanks, Dave, nice catch and a new designator-Larry.*
- 3109.0 Seagull control working Curtis Wilbur test Seagull launch times and F-14 codes in USB at 2336. (Larry Fowler-Falmouth, MA)
- 3130.0 L6J working T2E with USN traffic in USB at 0132. (Neal Perdue-Madison, AL)
- 3151.0 USN tracking net with AWACS support in USB from 2300-0900 for several nights. (Fernandez-MA)
- 3417.0 ART-Israeli Mossad number station with 5-letters groups in AM at 0201. (Fernandez-MA)
- 3455.0 Aeroflot 356-B heard in USB at 0641 working New York with position over LEARS and estimate for DEENO preparing to overfly Bermuda. (Halstead-WV) 3618.0 RFFZ-Unid French Forces station with ARQ-E Controle de Voie at 1842. (Hood-UK)
- 3641.0 BMB-Taipei Meteo, Taiwan, with CW weather broadcast at 1556. (McDonald-BC)
- 3795.0 FFM-Marseille Radio, France, with nav warnings in USB at 1913. (Hood-UK)
- 4088.5 FM working single letter calls in USB at 0205. (Pettengill-OK)
- 4090.0 Spangle 716 calling FW then back to 7741 in USB at 0337. (Haverlah-TX)
- 4444.4 Commercial fisherman relaying message from fellow fisherman to shore via cellular phone in USB at 0425. (Jeffery L. Jones-Tracy, CA)
- 4445.6 Commercial fishing net passing code in LSB at 1655. (Jones-CA)
- 4570.3 HZN46-Jeddah Meteo, Saudi Arabia, with weather codes using 100 baud RTTY at 0251. (Hall-RSA)
- 4666.3 Crossbow calling Black Board then went green in USB at 2219. (Howden)
- 4725.0 Thule AB, Greenland, with CANFORCE 85 in USB at 1536, sent him to 6738. (McDonald-BC)
- 4930.5 SPW-Warsaw Radio, Poland, with DE CW marker at 2201. (Jack Dix-Yonkers, NY)
- 4996.0 RVN-Time Station Moscow, Russia, with time ticks. (Norm Pihale-Northfield, MN)
- 5160.0 5UA-ASECNA Niamey, Nigeria, with ARQ-M2 idling at 0306. (Hall-RSA)
- 5160.5 NNN0NIK HF mailbox-Mayport, FL, idling in SITOR-A at 0305. (Richard Baker-Austintown, OH, via Internet)
- 5277.0 Panther calling C93/33 on channel A. Also tried channels E-10076 and D-9497. (Howden via Grove BBS)
- 5301.0 OLV-Prague Radio with V CW marker at 2058. (Dix-NY)
- 5310.0 UNPROFOR Stanaformed working various units using tactical calls in USB from 2153 - 2210. (Boender-Netherlands) *Ary, what does the acronym Stanaformed mean?-Larry.*
- 5371.0 Fishermen talking about their catches in USB at 0038. (Pettengill-OK)
- 5526.0 Florida West 9345 in USB at 0559 working Maiquetia ATC. (Halstead-WV)
- 5598.0 Gander ATC working N8226M in USB at 0507. (Levine-CA)
- 5604.0 Saudi 035 in USB at 0619 with a read back of a company message from New York regarding the fuel situation and the possible re-dispatch to JFK. (Halstead-WV) *Gary, I show JFK gate check on 5603 but nothing on 5604-Larry.*
- 5732.0 Omaha 53 calling Slingshot in USB at 2219. (Howden via Grove BBS)
- 5762.0 Spanish female 5-digit number station in AM at 0403. (Jones-CA)
- 5777.5 LRO26-Buenos Aires, Argentina, with press fax parallel LRO64 on 9241.5 at 2330. (George Zeller-Cleveland, OH) *Welcome to Ute World, George, visit often-Larry.*
- 5861.7 LYNX-MFA Abuja, Nigeria, with usual CW ID and nothing more at 0338. (Hall-RSA)
- 5868.0 FDE2-Unid FAF station with CW call at 1648. (Hood-UK) *Any ideas?-Larry.*
- 6371.0 GYU-Royal Navy Gibraltar with 75 RTTY at 1814. (Hood-UK)
- 6380.0 UCW4-St. Petersburg Radio, Russia, with traffic for UFIT-Mv *Ladoga 6* in CW at 1616. Also uses 8505.0 for CW and appears to carry a lot of traffic for sea-river cargo vessels. (Hood-UK)
- 6477.5 USU-Mariupol Radio with traffic list in CW at 0802. (Hood-UK)
- 6712.0 King 65 working Charlie flight in USB at 0505. (Haverlah-TX)
- 6730.0 Air Force 2 working Andy with LA quake related comms in USB at 2304. (James Luman-Tiffin, OK)
- 6761.0 Remy 41 calling Exxon 63 for refueling location moved to 309.6 in USB at 2231. (Howden via Grove BBS)
- 6776.0 Scorpion 1 working Scorpion Control in USB at 2324. (Howden via Grove BBS)



6778.0	OJX with EAM to unid station in USB at 0255. (Perdue-AL)	11176.0	Shadow 91 working Andrews AFB regarding engine problems in USB at 1718. (Bob Kalal-Columbus, OH) <i>Bayonne Global</i> , (yep, as in New Jersey) monitored here several times, only heard during daylight hours, working various aircraft for phone patch traffic with the rest of the Global High Frequency bunch in USB. Several aircraft have been surprised by the station. See this month's column for the real scoop. (Larry Van Horn-Brasstown, NC)
6812.0	Andrews AFB working Air Force 2 in USB at 2310. (Don Storck-Hemlock, MI) SAM 31683 working Andrews in USB at 2234. (Pihale-MN)	11186.0	Halifax military working Rescue 103 (Search and Rescue mission) in USB at 1756. (Howden via Grove BBS)
6815.0	Apple Festival calling any station in net, USB at 1626. (J. Metcalfe-KY)	11191.0	Pipeline (Air Navigation School) working Gonzo 5 at various times using USB. Also heard Winnipeg Wing Operations. (N Holm-Winnipeg, MB Canada)
6830.6	Louisiana shrimpers chatting about their catch in USB at 0157. (Bob Lewallyn-The Woodlands, TX)	11214.0	Night Rider working FT on Charlie 6 in USB at 1523. (Haverlah-TX)
6911.5	E3N with 5-letter groups in CW at 1520. (Metcalfe-KY)	11226.0	Andrews AFB working Air Force One on F-141. Requesting AF1 go to F-888 (6812.0) for signal check in USB at 2200. (Jones-CA)
6933.0	Spanish female 4-digit number station in AM at 0425. (Jones-CA)	11229.0	MacDill AFB working Viper 51 in USB at 1318. (Fowler-MA)
6961.0	CIW8103 (Vessel) running phone patch with CFH-Halifax in USB at 0125. (Lewallyn-TX)	11249.0	UN459 working Vancouver in USB at 0025. (Haverlah-TX)
6968.5	Nightstalker trying to send fax to Beetlejuice then Workhorse, mentioned Saratoga in USB at 0425. (Bob Pettengill-Blanchard, OK)	11282.0	San Francisco ATC working Reach 70170 in USB at 1828. (Levine-CA)
6993.0	Andrews AFB working SAM 205 with signal check on F-452 in USB at 0236. (Jones-CA)	11407.0	SAM 26000 working Andrews in USB at 1850. (Fernandez-MA)
7421.7	WWJ82 FHWA Grand Isle with PACTOR messages in USB at 1757. (Metcalfe-KY)	11598.0	Allegory with numerous EAMs in USB from 1619-1900. Also heard 9017.0. (Metcalfe-KY)
7477.2	KEM80 FAA Washington, DC, sending NARACS exercise messages in 75 baud ASCII at 1743. (Metcalfe-KY)	12563.0	YLAP-m/v Pavel Shternbergs working HPP-Panama Intelmar Radio in CW at 1155. (Hood-UK)
7741.0	USCGC <i>Thetis</i> and <i>Mohawk</i> taking guard for aircraft involved with Haiti blockade in USB at 2130. (Perdue-AL)	12688.0	UQK-Riga Radio, Estonia, with DE CW marker at 1451. (Dix-NY)
8040.0	Chainkey working American Horse testing data comms. Also heard Chainkey one and Chainkey two in USB at 0045. (Jones-CA)	13161.0	Sydney Radio, Australia, working Fairstar (P&O lines) about a dead crew member on board in USB at 1015. (Bob Bell-Georges Hall, Australia)
8176.0	Sydney Radio, Australia, asking for calls and passed the following frequencies: 2201.0 4134.0 6206.0 at various times in USB. (Jones-CA)	13201.0	Bangor working Rammer, Gogle passing attack reports in USB at 1645. This stuff is periodically common on 13204 and 15048. (Haverlah-TX) <i>Jeff</i> , These are JTIDS Battlefield Air Interdiction nets-Larry.
8441.4	5ZF2-Mombasa Radio, Kenya, with CW marker at 1826. (Hood-UK)	13207.0	Echo 92 working Romeo 31 in USB at 0022. (Bunn-NC)
8442.0	TCR-Istanbul Radio, Turkey, with CQ CW marker at 2000. (Dix-NY)	13247.0	Albrook here with all frequency request for Shark 86/87 in USB at 2142. (Haverlah-TX)
8445.0	A4M-Muscat Radio with DE CW marker at 1302. (Dix-NY)	13630.0	November One enroute LAX working Washington regarding LA earthquake with multiple phone patches in USB at 2240-0030. Also heard on 11401 and 7611. (Jeff Woodward-Eureka, CA)
8554.0	3BM-Mauritius Radio with CQ CW marker at 1852. (Dix-NY)	14452.5	CFARS CIW610 working various stations at 1700 in USB. CIW202 also confirmed CIL/CIU as being from former Yugoslavia. (Holm-MB)
8569.0	RIW-CIS Naval calling RMEU in CW at 1536 and 1626. (Hood-UK)	14639.0	MFA Warsaw, Poland, with 5-figure groups using POL-ARQ at 1036. (Hood-UK)
8661.0	XSQ-Guangzhou Radio, PRC, with CW marker at 1527. (Hood-UK)	14956.0	MFA Ankara, Turkey, with Turkish messages using FEC-A at 1049. (Hood-UK)
8675.0	UQB-Kholmsk Radio, Russia, with V CW marker at 2100. (Dix-NY)	15647.9	RFTJV using ARQ-E3 sending "FM Air Detparisis Port Bovet to Air Parisis RFFVF" at 1741. (Hall-RSA)
8843.0	San Francisco ATC working UPS 901 in USB at 1836. (Levine-CA)	16173.6	NNN0CUX with USN MARS traffic via N0GBU/NNN0NHA using SITOR-A at 1701. (Hall-RSA)
8903.0	Speedbird 56 in USB at 0059 working Niamey ATC (Halstead-WV)	16270.0	9VF207-Kyodo Singapore with Japanese newspaper using fax at 1650. (Hall-RSA)
8984.0	USCG COMSTA Portsmouth working CG Rescue 1711 in USB at 2100. (David Chapchuk-Scranton, PA)	16706.0	EEQJ4-Ves <i>Tol Runner</i> with SITOR-A message via WLO at 1859. (Baker-OH)
8993.0	Essay 03 (AMC C-130 a/c tail # 84403) working MacDill Global with phone patch traffic in USB at 1703. (Lewallyn-TX)	16711.0	UHIY-TR <i>Amurskij Bereg</i> with 50 baud RTTY messages at 1637. (Baker-OH)
9006.0	Gonzo 04 Alpha working Edmonton military in USB at 0130. Also used 6705 and 11233. (Lonnie Bunn-Raleigh, NC, via Grove Enterprises Fax machine)	16806.5	NMF-USCG Boston, MA, USA, with NAVTEX/NAVAREA/Ice Warning transmit times in SITOR-B at 1645. (Hall-RSA)
9014.0	Gemini 81/84/87 noted here during aerial refueling in USB at 1635. Gemini is now a common call sign on 9014 for past few months. (Haverlah-TX)	16818.0	UUI-Odessa Radio, Ukraine, with CWSITOR-A marker at 0930. (Hood-UK)
9023.0	Blue Crab (NORAD Net Control) working Okie Sam, Huntress, Deer Hunter and Guardian. Moved to 4721 at 0210 in USB. (Lewallyn-TX)	17170.0	PPL-Belem Radio, Brazil, with V CW marker at 1634. (Hall-RSA)
	Trenton military working Sidecar and Dragnet Tango in USB at 0404. Also used 6750, 8967, 6732 and Charlie 32-4735. (Bunn-NC)	18000.0	VOA Greenville, NC, SWBC feeder with English news in USB at 1915, unlisted. (Hall-RSA)
	Andersen working ?01 with phone patch to Dover in USB at 0650. (Haverlah-TX) <i>This is interesting-Larry</i> .	18254.3	Cairo Meteo, Egypt, with 75 baud RTTY weather codes at 1114. (Hall-RSA)
9057.0	Gallant 32 working Andrews in USB at 1727. (Lewallyn-TX)	18275.0	VOA Greenville, NC, USA, SWBC feeder in LSB with funny language at 1908. (Hall-RSA) <i>That funny language is Azerbaijani-Larry</i> .
9074.0	Spanish female 4-digit number station in AM until 0310. Checked known parallels 7533 11532 13452, no joy. (Lewallyn-TX)	18317.0	Andrews working Venus 70 on F-18 from F-118 (6683) in USB at various times. (Fowler-MA)
9082.2	KO2XBK with call sign and encryption in PACTOR at 1556. (Metcalfe-KY) <i>Jack</i> , this is KO2XBK, <i>Scientific Radio System, Rochester, NY</i> . They are licensed on the following frequencies: 1650, 3157, 4622, 6108, 9080, 10566, 12052, 15105, 16455, 19482, 20968, 22725, 23943, 25426, 26912, and 29985-Larry.	18385.0	LOR-Argentine Naval Radio, Puerto Belgrano, with 96 baud RTTY 5-letter groups at 1058. (Hall-RSA)
9320.0	M/v <i>Eliot</i> working unid shipyard to confirm tugs and pilot vessel meeting at the mouth of the river. Operators had southern accents. In USB at 2357. (Jones-CA)	18496.2	CNM80-MAP Rabat, Morocco, with RTTY 50 baud Arabic news at 0950. (Hall-RSA)
9831.0	English 3/2-digit number station in AM at 1430. (Barry Williams-Enterprise, AL)	19016.7	MFA Cairo, Egypt, with SITOR-A traffic at 1150. (Hall-RSA)
10298.8	HSW62-Bangkok Meteo, Thailand, with 50 baud RTTY weather codes at 1949. (Hall-RSA)	22304.5	3ERQ7-m/v <i>Radnes</i> with position report at 1811 to Maritex Operation Center using SITOR-A. (Baker-OH via Internet)
10359.0	English female 3/2-digit number station in AM at 1805. (Fernandez-MA)		
10980.0	RDD79-Moscow Meteo, Russia, CIS, with fax charts at 1912. (Hall-RSA)		
11052.0	Andrews working SAM 26000 in USB at 1805. (Fowler-MA)		
11158.5	HNS company passing message to Charlie company; "We are shutting down the net at this time, I'll give you a call on land line to explain why." In USB at 1618. (Jones-CA)		

# The Scanning Report

**Bob Kay**

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



## Scanning the Forbidden Frequencies

Cordless phones, cellular phones and conventional mobile radiophones, have one thing in common—they utilize an antenna to transmit private phone conversations. Some folks believe that phone conversations, transmitted via an antenna, should be as private as wire connected communications. Two of our most powerful and controversial anti-scanning laws (Electronic Communications Privacy Act and Telephone Disclosure and Dispute Resolution Act), were designed to discourage third party monitoring.

Opponents of the laws claim that hobbyists should be free to intercept any and all radio communications. If voice privacy is desired, then some form of encryption should be utilized. Regardless of your personal convictions, one thing is certain: Cordless phone, cellular phone and conventional mobile phone conversations are in the air and they can easily be captured. In fact, it would be very easy to accidentally monitor a forbidden group of frequencies and unknowingly break the law. Here is a brief synopsis of the radio communications that should be avoided.

### Cordless Phones

It is estimated that one in every five households has a cordless phone. If you live in a major city, hundreds of cordless phone conversations may be within monitoring range of your scanner radio. As you probably know, the cordless phone is nothing more than a hand held walkie-talkie. Sure, the technology is advanced, but the basic concept hasn't changed. An antenna is utilized to send a radio signal between the base and handset.

The low power signal and marginal sensitivity of cordless phones limits their operating range. Since most cordless phones wouldn't work beyond the consumer's back yard, third party monitoring wasn't considered to be a problem. The scanner radio, however, with its super sensitivity, can detect low power cordless signals from a considerable distance. The cordless phone frequencies to avoid are: 46.61; 46.63; 46.67; 46.71; 46.73; 46.77; 46.83; 46.87; 46.93 and 46.97 MHz. These are the cordless base frequencies from which both sides of the conversation can be heard. If you monitor the following cordless handset frequencies, you'll only hear one side of the conversation: 49.67; 49.845; 49.86; 49.77; 49.875; 49.83; 49.89; 49.93; 49.99; 49.97 MHz.

Later this year, the number of frequencies available to cordless phone users may increase by another 15 pairs if an FCC proposal is accepted. To relieve the congestion experienced by users in highly populated areas, the addition of these frequencies would provide more alternative channels. These are the proposed frequencies, as reported by the All Ohio Scanner Club:

Base	Handset	Base	Handset	Base	Handset
43.72	48.76	43.96	49.08	44.32	49.28
43.74	48.84	44.12	49.10	44.36	49.36
43.82	48.86	44.16	49.16	44.40	49.40
43.84	48.92	44.18	49.20	44.46	49.46
43.92	49.02	44.20	49.24	44.48	49.50

As cordless phone monitoring has gained in popularity, anti-cordless phone monitoring laws have emerged. In California, for example, it is illegal to monitor cordless phones. Since new laws are introduced on a

daily basis, don't monitor the cordless frequencies without reviewing your local and state laws.

### Cellular Phones

The ECPA has made it illegal to monitor cellular phones. The frequency range to avoid is between 870.0 and 890.0 megahertz. In each coverage area, there are two licensed systems. A "wireline" system is a conventional phone company that also provides land line telephone service. A "non-wireline" system is licensed to a private owner. Non-wireline systems operate between 870 and 880 MHz. Wireline systems operate between 880 and 890 MHz.

It is important to remember that the cellular bands can be monitored for "experimental purposes." If you want to check the performance of a newly installed 800 megahertz antenna, for example, it's okay to briefly monitor the cellular frequencies.

### Conventional Mobile Car Phones

Prior to the cellular revolution, vehicle communications were limited to the VHF and UHF bands. Mobile two-way radios accessed a repeater that was patched into a land line. One party talked and the other listened. By today's standards, it was a crude set-up, but it was the only technology that could link a vehicle with a telephone. The system was very popular, and it is still in limited use today. The frequencies (illegal to monitor) are as follows: 152.030 to 152.210; 152.510 to 152.810 and 454.025 to 454.650 MHz.

The ECPA has also made it illegal to listen to voice paging frequencies, certain satellite communications, broadcast studio links and remote broadcast pickup stations. The majority of these frequencies are well above 1 Gigahertz, except for a small band of frequencies between 928.0 to 929.0 MHz and 944 to 960 MHz. Aero phone calls from jetliners, (894.0 to 896.0, AM mode, 6 kHz apart) should also be avoided.

In addition to the new anti-scanning laws, there is one additional monitoring law, long on the books, that seems to have been forgotten. The 1934 Communications Act prohibits third party listeners from divulging the nature of a monitored transmission. It is also illegal to use the intercepted information for personal gain. The law allows the listener to monitor any radio transmission. However, the listener is not permitted to discuss or repeat the contents of the transmission. If you obey the Communications Act, it will be impossible for anyone to determine the frequencies that you've been monitoring, unless they're standing behind you...



### Treasure Hunt

The 800 megahertz frequencies are "line of sight" communications. They usually travel in a straight line and rarely exhibit skip. If your antenna isn't specifically tuned to receive the 800 megahertz band, you're probably missing a large portion of the action. To solve the problem, MAX system antennas has provided an 800.00 to 900.00 MHz Yagi beam antenna for the treasure hunt.

The loop Yagi is an 11 element antenna that provides 15dB of signal gain. The antenna is approximately 36" long x 7" wide. It can be mounted in a fixed position or rotated with a standard TV antenna rotor. If you're



thinking about seriously monitoring the 800 megahertz frequencies, the loop Yagi will provide professional results. Here are the clues:

1. Check out the Dec 93 issue of *MT* and provide the name of the company that provides free cellular and cordless frequency charts with your order.
2. Since you already have the Dec 93 issue in your hand, what is a "Junghans Mega?"
3. The Realistic Pro-2028 has 800 MHz capability. True or False?
4. What did Al Lovell invent in 1966?
5. What is the formula used to calculate the length of a half wave dipole antenna?

The loop Yagi retails for \$75 dollars, plus \$4 dollars shipping. The toll free order number is 1-800-487-7539. For more information contact MAX System Antennas, 4 Gerring Rd. Suite 30, Gloucester, MA 01930, or call (508)-281-8892.

### Frequency Exchange

A military air buff who refers to himself as "Rex," sent in the following confirmed frequencies that are used by the **Birmingham, Alabama**, Air National Guard.

255.400 Flight service	360.700 Nashville Approach
261.500 Atlanta Center	377.150 Birmingham Approach
297.400 Atlanta Center	380.800 Nashville Approach
354.100 Huntsville Approach	385.600 Birmingham Approach
338.200 Birmingham Approach	

Our second invitation is also from an Alabama resident. Jeff Gray, lives near **Greenville, Alabama**, and he has sent in the following:

30.100 Fort Rucker
141.075 Anniston Army Depot
141.225 Anniston Army Depot
141.125 Anniston Army Depot
148.035 Dannelly Field Air National Guard
148.325 Dannelly Field Air National Guard
149.325 Dannelly Field Air National Guard
163.4875 Gunter Air Force Station
163.5125 Fort McClellan
163.5625 Redstone Arsenal
164.9875 Marshall Space Flight Center
165.0875 Fort McClellan
165.1625 Fort McClellan
167.875 Marshall Space Flight Center
173.6625 Marshall Space Flight Center

Our next invitation is from Lex Miller. Lex lives across the state line in **Little Rock, Arkansas**.

37.20 Police	453.15 Police	460.525 Police
37.25 Police	453.20 Police	453.75 Port Authority
453.1125 Police		

The following public safety trunked frequencies are also active in Little Rock:

811.2125	811.7125	812.7125	813.7125	815.7125
811.2625	812.2125	813.2125	814.2125	856.2125
811.4375	812.2625	813.2625	815.4375	856.2625
811.4875	812.4875	813.4875	815.4875	856.4375

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

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856.7125	857.7125	858.4875	859.4875	860.4875
857.2125	858.2125	858.7125	859.7125	860.7125
857.2625				

If you've been enjoying our trip to the southern part of the country, don't miss our next stop. Welcome to **Houston, Texas**. John Atwood lives nearby and here are the frequencies that he would like to share.

45.15	University of Houston Police	458.90	Police
155.34	Houston General Hospital	460.025	Police
453.55	Police	460.50	Police
453.60	Police	460.375	Police
453.65	Police	460.40	Detectives
453.90	Police	460.425	Wants & Warrants
458.65	Police	460.45	Detectives
458.70	Police	460.525	Police
458.85	Police		

Since Texas is such a large state, let's stop and visit with Bob Nugent. Bob lives in **Corpus Christi, Texas**.

Police: 155.70	155.95	156.15
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### Trunked System

811.2125	814.4875	858.4875
812.2125	815.2125	859.2125
812.4875	815.4875	859.4875
813.2125	856.2125	860.2125
813.4875	856.4875	860.4875
814.2125	857.2125	

We have been enjoying the warm weather, but it's time to grab your coat. Kathryn Harper, lives in *Westport, Connecticut*, and she has provided the State Police frequencies.

**State Police**

39.46	42.35	45.85	
42.05	42.50	47.30	Highway Dept.
42.15	42.55	47.35	Highway Dept.
42.20	42.60	154.85	Dept. of Corrections
42.25	42.65		Radar unit
42.30	42.70		Radar unit

Our next stop is the home of Ron Smith. Ron lives in *New York City, New York*, and he claims that the following frequencies are always active.

151.1450 Parks	153.80	Fire
151.175 Parks	453.65	Airport police
151.20 Parks	458.400	Laguardia Airport
151.295 Parks	470.3875	Transit Authority
153.75 Fire	470.4375	Transit Command Center

Your favorite frequencies can also be featured in the Frequency Exchange. Handwritten, typed lists, and/or computer disks are welcomed. Here's the address: Frequency Exchange, P.O. 98, Brasstown, NC 28902.

**Paging All Criminals**



The telephone pagers of two car theft suspects led police to a third suspect who was arrested at a pay phone. The pagers of the two apprehended criminals were sitting on the desk of a city police chief in Arkansas. One beeper went off and displayed the calling number. The number's prefix indicated that it was a pay phone.

When police officer's were dispatched to the original arrest site, they arrested the third suspect who was standing near the pay phone, apparently waiting for his partners to return his call. (News clipping from Arkansas *Gazette*.)

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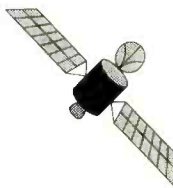
*Sammy the Scanner*

NESN  
LOU CAMPAGNA

Northeast Scanning News, P.O. Box 62, Gibbstown, NJ 08027

**Scanner Tips**

When a North Carolina robbery suspect stopped at a convenience store not far from Brasstown, someone in the store realized that the man fit the police description that had been heard on a police scanner. That person called the Cherokee County Sheriff's department and the suspect was arrested without incident. (News clipping from the *Cherokee Scout*.)



**GPS for Police**

The California Highway Patrol will initially equip 40 patrol cars and 25 motorcycles with Global Positioning Satellite Tracking Technology.

Through signals bounced off satellites, police dispatchers will be able to see exactly where cars are located during emergencies. With GPS, the police officer's hand held radio can be equipped with a digitalized, automatic response switch that signals the dispatcher if the officer is down. Protective vests can also be equipped with a digitalized electronic sensor that instantly alerts the dispatcher if the officer has been shot.

GPS technology within the police force will prevent situations like the killing of San Diego police officer, Thomas Riggs; he lay dying on the pavement for 44 minutes before he was located.

**Hands Free Cellular**

According to a nationwide auto club, drivers who use cellular phones on the road are 20 percent less attentive. American Honda Motor Company, however, is integrating a hands-free cellular phone into the vehicle's dash area. When a call is received, the sound system is automatically muted. The incoming caller's voice is played through the stereo system and the driver can answer the call without removing his or her hands from the steering wheel.

**Four Million in the Hole**



Boat owners are often quoted as saying, "A boat is a hole in the water that money is thrown into." At least two Wisconsin County municipalities have realized that radio technology, like boats, also has the unique ability to gobble up cash.

The Cedarsburg and Crafton, Wisconsin, police abandoned their new, 4 million dollar, 800 MHz radio system and have been using the old system. The police officers complained that radio transmissions were cut-off in mid sentence, sound quality was poor and the department could not communicate with agencies outside the county.

The police department sent 13 pages of complaints to the installer of the system and threatened to completely pull out if the system can't be corrected. (News clipping from John Kaestner.)

**Two Million and Counting**

The city of Savannah, Georgia, is expected to purchase a new 800 megahertz system. Law enforcement officials want the system operational for the 1994 summer olympics. The cost of the new radio network has been estimated between 2 million and 7 million dollars.

Anyone willing to negotiate the sale of Wisconsin's 800 megahertz system to Savannah, Georgia?

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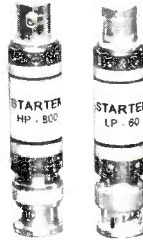
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# The Beginner's Corner

**"Uncle Skip" Arey, WB2GHA**

*Genie T.AREYI*

## **If It Ain't Broke Don't Fix It!**

*But What If It Is Broke?*

The radio monitoring hobby business is one of the friendliest industries in the world. There aren't too many marketplaces left where you can pick up the phone talk directly to the manufacturer of a product or the owner of a service. Publisher Bob Grove frequently points out that monitoring is a "niche" industry. Well it's a great little niche! The folks who provide us with the equipment that allows us to enjoy our hobby are often dedicated monitors themselves.

Even though the radio monitoring industry is by and large a fair and friendly place, things do happen. In any marketplace, the possibility always exists that a manufacturer's intent and the owner's expectation don't match up. We have all purchased products that either didn't work as we expected or didn't work at all. We have also, at one time or another, met with resistance to our complaints. The radio monitoring industry is no exception.

As a beginner, you would probably rather spend your time twisting dials than trying to wrestle with a manufacturer when one of those dials falls off. If you pay attention to the next few paragraphs, you will learn all the skills necessary to seek reasonable redress as a consumer. You will also learn how to do this without needing to put on the gorilla suit.

## **UNCLE SKIP'S GUIDE TO CONSUMER COMPLAINTS**

First the good news. Most businesses will bend over backwards to work with you to resolve your complaint or concern. Folks who don't pay attention to their customers usually don't stay in business very long. You will find that contacting a company to resolve a problem will often result in the kind of assurances that will turn you into a lifelong customer.

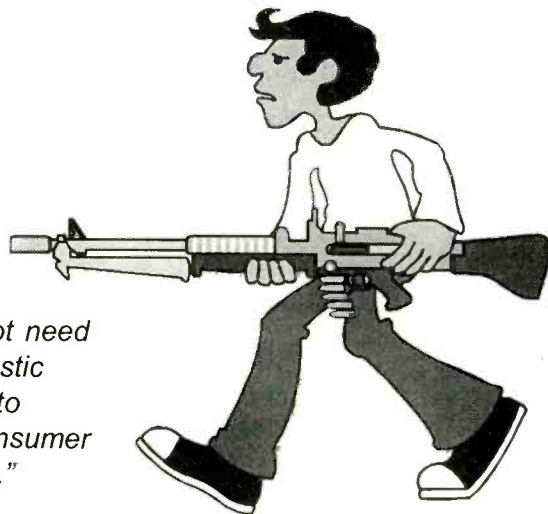
Now the not so good news. Because the radio monitoring hobby is a niche industry, this means a lot of small, first time businesses pop up. These folks are new to the business and are often also new to the art of resolving consumer concerns. Getting your needs met might be a learning process for both you and the manufacturer. That's okay; all the more reason to learn how to get what you need without frothing at the mouth.

### **Pre-Preparation**

Keep a file with all of the information from your radio hobby purchases. Keep names, phone numbers, mailing addresses, copies of receipts, warranty information and a copy of your equipment's model and serial numbers. Such a file comes in handy for all sorts of reasons, including resolving future problems with your equipment. I recently dug out a dusty old file on my Drake TR-33C 2 meter transceiver. I've had this rig longer than I've had my family! Even though the TR-33C has been out of production for many years, I located a name and number that allowed me to get some questions answered on setting this fine old rig up for packet radio.

### **Make Sure You Really Have a Problem**

The first question I always ask someone who approaches me with a radio problem is "Did you read the manual?" Sadly, I get more blank stares than I ought to. Folks, even the most saintly supplier needs you



*"You do not need to take drastic measures to resolve consumer complaints."*

to work with them at least this far! Even if you did read the manual, take the time to read it again if a problem pops up.

Case in point: Did you know that the Kenwood TS-520 has a little switch on the back that allows you to turn off the screen grid voltage? Neither did I until I reread the manual. The fact that I had screamed myself hoarse calling "CQ" before I checked the manual only further points out that such things can be a learning experience that need not include a phone call to the manufacturer.

Okay, let's say you have read the manual and there still is a little stream of smoke rising from the rear of your rig. Break out the notebook, Bunky. I have just three words for you: DOCUMENT, DOCUMENT, DOCUMENT! Document every detail of the problem in as much detail as you can muster. Note the control settings at the time the problem began. List any equipment connected to your receiver or accessories you may have been using and their respective settings as well. Perhaps most importantly, document any efforts you may have made to correct or eliminate the problem. Note any changes in control settings you may have made in an effort to get things back on track.

What should be evident from the above paragraph is that it is important to keep your head when things start to go wrong. It's hard not to get angry when a piece of equipment that you bought with your hard earned dollars goes south. Drop back and count to ten, then start writing things down. This information will help the manufacturer sort out your difficulties much faster than if he or she has to blindly troubleshoot the problem.

### **Service Support is Your First Stop**

Check in your equipment information file and in your manual to see if the manufacturer has a technical support number. Tech support services have been popularized by the computer industry but have become staple services throughout the electronics industry. Grove Enterprises has a technical help line for its customers (704) 837-7081 as does Universal Radio (614) 866-4267.

It's usually a good idea to start with the company that you bought the equipment from. A call placed to a company's tech support service may help you clear up the problem "on site." Be sure to have your notes handy when you call to let the technician know what happened. If your



equipment requires warranty service, repair or replacement, the tech support staff should be able to direct you to the right people, address and procedure. Make note of the date and time of any conversations you have with tech support or anyone else involved in helping you resolve your problem. Also, take down the names of the people you spoke with. Put these notes in your information file for future reference. This isn't just useful in conflict resolution; it also gives you some folks you can ask for by name for any future contacts you may have with the manufacturer or supplier.

### Still No Joy

Okay, tech support either wasn't helpful or didn't exist. It's time to place a call to the company's Customer Service Representative. If no one in particular is listed in your documentation, simply call the company and spell out your problem and ask to speak to someone about it. Again, take notes and names, paying attention to the job titles that go along with those names.

Accept the fact that you may get put on hold and shuffled around to a few different desks at this point. Telephone receptionists aren't always schooled in the details of technical problems or customer service. No one is playing games with you. I can't think of any company that can afford to take the time to play phone tag with a customer as an indoor sport. If anything, moving you on is more than likely an attempt to get you the help you really need. A reasonable amount of what appears to be run-around can be expected in this world of complicated corporate structures and even more complicated phone systems. It's a burden we often have to shoulder to get what we want.

You should be eventually connected to an individual who can tell you exactly how the company intends to respond to your problem. Don't be afraid to express what your desires are at this point. Most companies are more than willing to work with you within the limits of the warranty. Remember the warranty? That's that piece of paper you threw in your information file a while back. Before you go asking a company to send you the keys to the C.E.O.'s car, you really should read the warranty to see what you rightfully deserve.

At the end of this conversation you will either be completely satisfied, madder than a wet hen or someplace in between. Copy down the gist of your conversation and any agreement reached, promises made or unresolved issues. Type up a letter summarizing this conversation to the company. Be sure to include the names of whom you talked to and when.

If you can locate the name of a head honcho, direct the original to him or her with a copy to the person you talked to on the phone. If the name of the person in charge is not clear to you, head for the public library and check through *Standard and Poor's Register of Corporations*. When in doubt a letter addressed to the Chief Executive Officer will usually land on the right desk. Don't forget to keep a copy of the letter for yourself. Be courteous in both your telephone conversations and letters. It has been my experience that when people start getting nasty, things start to move really slowly. Politeness costs nothing, and may even grease the skids to get your problem resolved with extra service and alacrity.

### Still Not Happy, Huh?

You are now well out of the realm of most businesses that I have dealt with in and out of the radio hobby. But all is not lost. There are two organizations that may be of service in your cause.

Check the address and phone number of the company. Use this information to determine the company's local chapter of the Better Business Bureau. You can get the BBB's number by calling your telephone company's information service. The BBB can often help resolve problems between consumers and companies registered with the Bureau to everyone's satisfaction.

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On a more local level, break out your telephone book and find your nearest office of consumer affairs. These are usually organized on the county or state level; however, larger municipalities and cities may have their own agencies. You can enlist the consumer advocate to review the steps you have taken so far and perhaps have them place a few calls on your behalf. Consumer advocates are skilled in conflict resolution and complaint mediation.

### What If Things Are Really Bad?

In the seventies, there was an amateur radio equipment outfit that made it their business to take folk's money. However, they neglected to send anybody any merchandise. Fortunately they are out of business. Such activities constitute mail fraud which is a federal offense. If you're in this deep with a company it is time to contact your local postmaster to advise you on how to file a mail fraud complaint. Again, your local consumer affairs organization will be able to advise you on how to proceed further.

### Let the Buyer Beware... But...

As I said at the outset, the majority of companies will never treat you wrong. Common sense should tell you to deal with established companies when making significant purchases. When dealing with a small newcomer, it may be wise to start small to see if they prove reliable.

The radio hobby is still a place where you can call folks up and get your problems resolved with little hassle for either party. I am sure you will find that your relationships with most of the radio hobby companies you deal with will be constructive and long lasting. And that is one of the many reasons why this is such a great hobby!



# Shortwave Broadcasting

**Glenn Hauser**

P.O. Box 1684-MT

Enid, OK 73702

**ARGENTINA** R. Nacional Mendoza, from \*1000 or \*1045, sometimes with local programming, other times relaying LRA 6060; sometimes on 6179.0, others 6180.0 (Emilio Pedro Povrzenic, Argentina, LA-DX)

**BAHREIN** R. Bahrein, 9745, audible again, 2100 time signal, Arabic ID and news to 2106\* with anthem; frequency drifts  $\pm 0.5$  kHz continually (Bob Padula, Victoria)

**BELARUS** Belarussian R. First Program, Minsk, 0300-1700 on 6150, 0300-2300 on 11985, 7210, 7145, 7140, 6115, 6080, 3384-LSB, 3296; 1600-2300 on 11670; 1700-2300 on 13645; includes relays of regional and Russian programs. Second Program "Krynica," 0500-1600 on 6115. Grodno Oblast Radio on 7140 at 0440-0500, 1600-1640, 1820-1900 daily; also in Polish Tuesdays 2030-2105 on 7140, 5945. Moghilev Oblast Radio, Mon.-Fri. 0430-0500 and 1600-1640 on 5965. Programs one hour earlier during summer time (BBCM)

**BHUTAN** BBS back on old frequency 5025.0, Jan. 8 in English 1420 news, 1430 Deutsche Welle program to 1500\*, fair. Back to 5030.0 Jan. 15 at 1431 with program by R. Nepal (Ron Howard, Carmel, CA)

**BOLIVIA** Radio Pio 12, Siglo 20, uses two frequencies: morning on 5945.7, evening on 5953.5. R. Perla del Acre, Cobija, audible on 4600.0 at 0900 or 0930, blocked by R. Villamontes, 4599.7 from 0930, 0945 or 1000. R. El Mundo, Santa Cruz de la Sierra, 6014.9, reactivated in December, having been off since July (Emilio Pedro Povrzenic, Argentina, Latinoamérica DX)

**BOSNIA-HERCEGOVINA** R. B-H, Sarajevo, on 7059.25 USB ex-6220 at +0010 all night (BBCM)

**BRAZIL** R. Gazeta, São Paulo, plans separate SW programming on 5955 and 9685 from MW 890; and to use 15325 with 10 kW from January. R. Educadora da Bahia, 6020, has given use of 6020 to R. Gaúcha, also authorized on that frequency; Gaúcha carries an Educadora program with folk music, IDs in French at 2300-2330 but only when Gaúcha has no special sports program then. R. Inconfidência has 5 kW on 6010 but plans 25 kW, presently only at 1200-1600 and 1800-2000, and 15190 is inactive while they wait for a new tube (Dario Monferini, visiting Brazil, Play-DX)

**BULGARIA** R. Bulgaria Calling, the DX program, announced this schedule: Fri. 1630, 1945; Sat. 0000, 0645, 1245, 1445; Sun. 2145; Mon. 0145, 2145; Tue. 0145 (Dave Jeffery, NY, World of Radio)

**CANADA** By popular request, RCI has resumed carrying *Double Exposure* and *Royal Canadian Air Farce*, UT Suns. 0300-0400 on 9755, 9725, 6000. Replacing *Open House*, Mons. 1315 on 17820 and 11855 are RCI *Mailbag* and *Innovation Canada* (Bob Girolami, RCI) RCI switches from French to Creole for news weekdays 2250 on certain frequencies, 5960, 9755, 11885 (Bill Westenhaver, PQ) Watch out for disruptive time shifts Mar. 27 and April 3 (gh) CFRX 6070 has old-time radio drama and comedy, Sat. 1000-1200 (Diane Mauer, WI)

**CHAD** (non?) R. Tchad Libre, 5902v, at 0504 music, ID, French and other language (Ron Kaneko, Toronto, DX Ontario)

**COLOMBIA** R. El Sol, Tuquerres, Nariño, weak on 5873.6 from 2130, wiped out by BBC 2342 (Henrik Klemetz, Bogotá, Play-DX) R. Católica, 3580, San Jerónimo de la Barca, 0259-0343\* (Fernando Viloria, Venezuela, HCJB DXPL) Not in WRTH

**COSTA RICA** Several RFPI programs besides *WORLD OF RADIO* often deal with broadcasting, the media, in addition to those mentioned last month: *Alternative Radio*, Mon. 2000, Thu. 1900; *Voices of Our World*, Mon. 1930, Wed. 2030; *Vietnam Veterans Radio Network*, Wed. 2130, Sat. 2230; *Food for the Thoughtful*, Sun. 1800—all repeated 8 and some also 16 hours later. With WEWN registered to

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.

expand usage of 9370 from March 6, RFPI may move from 9375. (gh) 9375 is 5 kW USB due north at all times except: AM to S. America in Spanish 1400-1700 at least weekdays; AM to Haiti in Creole Sat. 2000-2100, both 3 kW; USB to NW at 0400-1200. 7375 AM expanded to daily \*2100-0800\* (RFPI *Mailbag*)

R. Reloj reactivated 6006, good with slight het at 1130 with news, ID (Don Moore, IA)

R Universidad de Costa Rica, active on 6105 around Xmas with classical music until 0403\* (Rich D'Angelo, PA, *Fine Tuning*)

**CROATIA** (& non) Croatian Radio, Zagreb, went on hiatus from WHRI relays at end of 1993, but might return; announced was then going on Scola satellite TV network at 7 pm "North American time" (*World of Radio*) Resumed 100 kW transmitter direct at 0600-1900 on 13640, 1900-0600 on 5920 (BBCM) Soon shifted latter to 5895; mostly music, ID at 0400 after time signal of two longs, one extra-long (gh) Also on new 4770 at 0130 // 1125 first program (Julius Hermanns, Holland, Radio Netherlands *Media Network*)

**CUBA** Manolo de la Rosa has resumed his *Para los Diexistas* program now on R. Rebelde, Sats. 0600; write with news and support of show to Apartado 6277, Ciudad de La Habana 6, 10600 Cuba (Eliesel Perdomo Candelaria, Placetas VC, Cuba) R. Rebelde, 710 has major problems with harmonics audible from the 2nd to the 11th, 7810 all / 5025 (Brandon Jordan, TN, *FIDONET SW Echo* via George Thurman) Also heard on 4800 instead of 5025 at 1023 (Hans Johnson, MD, HCJB *DX Partyline*) RHC SSB on 13775 instead of 13715, Spanish at 2230-2245 (Bob Padula, *Australian DX News*)

Big huge blobs centered on 9495, 9940 and 7340 in the daytime here, certainly Cuban jammers (Tim Hendel, Miami) Also nights here, blotting out WHRI on 9495 even when carrying *World of Radio* rather than Cuban clandestine shows; they seem to leave it on continually. How dare you, Arnie? I'd never jam you; of course, RHC's own transmitters often emit self-jamming buzzes (gh) Horrific jamming also on 9525, 9540, 9590, 9850, 9965 (Ernie Behr, Ont.) (non) R. Martí considered replacing 9525 with 7340 after 2300 for winter, but held off (John Vodenik, OH) La Voz del CID is active there! (Tim Hendel, FL)

**CZECHIA** With 1994, R. Prague ceased broadcasts to Slovakia, as funding cut from \$3 to \$1.6 million, staff from 124 to 65; 19.5 to 16.5 hours of programs a day, still in English, French, German, Spanish, Czech; director of foreign broadcasts Karel Wichs also said R. Prague received about 1000 letters a month from listeners (CTK via BBCM) English for us now: 0000 and 0300 on 5930, 7345; 0100 on 7345; 0430 on 5930, 7345, 9440 (Bob Thomas, CT, *W.O.R.*) Last replaces 0400 (gh) It's now the Czech Republic. Update your heading (R.C. Cinert, IN) Lots of countries are republics, including U.S.A. without it being in the name.

RFE/RL have been invited to move from Munich to Prague (BBCM) Pres. Havel offered a rent-free building in Prague. Board for International Broadcasting likes the idea, but not William Marsh, president of the stations, who resigned saying the cost of moving would exceed the 1994 and 1995 budgets (RNMN)

**DNESTROVIA** (non) R. Dnestr International, 25th October St. 45, Tiraspol, Prodnestrovye via C.I.S. is the address, 0330-0400 broadcast on 7105 is repeated two days running (BBCM) Only lasted a few weeks in December (gh) Replaced from Jan. 1 by Moscow programs (Brian Alexander, PA)

**ECUADOR** HCJB often has Latin American news items you don't hear elsewhere. On the anniversary of the U.S. entrance into Panamá, they described it several times as the "U.S. invasion of Panamá." Can you imagine the USA Radio Network reporting it that



way? (Tim Hendel, FL) HCJB's commitment to news can be judged from its absence on Dec. 25 and Jan. 1 (gh) Theme for QSLs in 1994, six of them, is people of Ecuador (*DXPL*)

**EQUATORIAL GUINEA** Government has banned broadcasts by R. Africa 2000, cultural station sponsored by Spain since 1989; but Spain says they were planning to close it anyway since aid had been cut (RNE Radio 1 via BBCM) Was on 6910

**ERITREA** V. of Broad Masses, Asmera, 7020, strong in Amharic at 1530, regional songs 1545-1600, no sign of 7380 (Bob Padula, Victoria)

**ESTONIA** 5925 reactivated Jan. 4, with Finnish and Swedish as previously scheduled (YLO Mets, Tallinn via Ben Krepp, *FT*) Moscow domestic on 5925 at 2200, from here or QRM? (Krepp)

**ETHIOPIA** (non) Free V. of Ethiopian Unity (*Amharic: Yenetsa Radio Yeethiopia Andinet Dimts New*), hostile to Ethiopian and Eritrean governments, via Moscow with U.S. address—see last month—Sun. and Wed. 1600-1700 on 15205, 11695, 11666v (BBCM)

**FRANCE** Alpine ski resort cable car backup communication transmitters are audible in the 1315-1600 period, at least 5 of the 20 sites heard, some with live satellite feed from R. Nostalgie in Paris, others with taped programming IDing as Nostalgie-Neige, Radio Neige. 25710 has both, 25900 has both, 26070 heard with satellite service only. Nominal power is 20 watts each, but 50 to 150 watts used out of necessity at Les Deux Alpes, Val d'Isère and Tignes to scatter off mountain tops (Alan Roberts, PQ)

**GERMANY** RIAS merged with DS-Kultur, now IDs on 6005 as DeutschlandRadio, Berlin (BBCM)

**GREECE** VOG at 0000-0350 to us on 5970 via VCA Kavala 355<sup>o</sup>, ex-11645 (Demetri Vafeas, ERT, via John Babbis) Hardly audible with BBC on 5975 (Babbis) Macedonia station on 11595 at 0500-1950, 9935 at 0500-2300, 7430 at 0500-0600, 1800-2300 (BBCM)

**HAWAII WORLD OF RADIO** is scheduled on KWHR: Sat. and Sun. 0600, Sat. also 0900, all on 9930. Main foreign-language block is in Asian prime time, 1200-1400: 1200 Mandarin, 1215 Cantonese, 1230 Nepali (actually consecutive translation of English sermons), 1300 Korean, weekdays. Plans to add more Chinese, Japanese, Indian dialects, Laotian (*WHRI DX Radio Show*) Korean also 2300 on 17510 (gh)

**HONDURAS** R. Copán Internacional, 15675, replaced 100 watt transmitter with 1000, heard like a local in Miami (Jeff White, Venezuela, *RNMN*) Better modulation, too (Tim Hendel) And often audible here, mostly elevator music, but Sun. 2245 anti-Castro show *La Voz del Caribe* and R. *Roquero*, Sat. 2203 (gh)

**HUNGARY** From March 27, R. Budapest changes English from hours to half-hours: Europe 1900 and 2100 on 6110, 7220, 9835, 11910; N. America 0100 and 0230 on 5970, 9835, 11910, 15220 (Edwin Southwell, UK, and Joe Hanlon, PA) Sat. feature is *Gateway* until Mar. 5, *Jubilate Europa* from Mar. 12; Tue., Mar. 22, *Hungarian Resistance* to Nazis; Sun., Mar 27 (on new schedule), *The Holocaust in Hungary* (via John Carson)

**INDONESIA** RRI Jakarta, 9679.92, very strong at 1255 ending English program the Tuesday after Xmas, probably half-hour weekly (David Clark, Ont., *FT*) RRI Sibolga reactivated on 5256.5, 1300-1700+, sounds like at least 25 kW replacing listed 1 kW (Victor Goonetilleke, Sri Lanka, *RNMN*) RRI Palangkaraya on new 9545 1018-1212\* overriding Solomons (Ralph Famularo, Japan, *SPEEDX*)

**IRAN** (non) V. of Human Rights and Freedom for Iran (Persian: *Seda-ye Hoquq-e Rashar va Azadiha-ye Iran*), believed via Egypt, in Persian daily: 0230-0425 on 15145, 11470, 9350; 0600-0645 on 11470, 9350; 1545-1630 on 11650, 9350; 1630-1825 on 15620, 11470, 9350. Address R. Farhadi, P.O. Box 19740-187, Irvine, CA 92714 (BBCM)

**ISRAEL** Kol Israel announced program changes: *And God Is With Them*—images of Jerusalem in modern English literature; and *The Cutting Edge*—science, technology and ecology, both on the Sun. 2230,

Mon. 1400, Thu. 2000. *Weekly Press Review* is back, Fris. 2000 and 2230 (Diane Mauer, WI, *W.O.R.*)

**KAZAKHSTAN** R. Roks, Almaty, 4050 at 0600-1900, rock and pop music, unknown if related to other stations of same name in Moscow, Minsk (Perm *DX Trap* and Y. Kato, R. *Japan Media Roundup*)

**KURDISTAN** (non?) V. of the People of Kurdistan on 6290 ex-6300 at 0425 Arabic, 0430 Kurdish (Hans Johnson, MD, *FT*) V. of the Islamic Movement in Iraqi Kurdistan (*Sawt al-Harakah al-Islamiyah fi Kurdistan al-'Iraq*) testing 4110 at 1434-1550\*, not heard the next day. V. of Iraqi Kurdistan, Salah al-Din, 1400-1615, repeated 0400-0615 on 4180v (BBCM)

**LITHUANIA** R. Vilnius announced it got a reprieve and English to N. America would continue another year, the winter schedule continuing at 0000 Tue.-Sat. on 7150 via Russia (Steven Cline, IN) Said got government help to continue with Krasnodar relay, but price is not fixed and approaching world levels; establishing own transmitter would consume entire \$5 million budget (gh) Joint project with Latvia rejected (BBCM) Hoping to get Swiss aid for own transmitter near Kaunas (Richard Measham, BBCM via *RNMN*)

**MEXICO** R. Lobo, Chihuahua, 2 x 1010 harmonic on 2020, good to excellent 0000-0300+ and from 1200 or earlier, mostly rock (Don Moore, IA) It's XELO, as late as 1333, American dance music (Steve Schmidt, AZ) Quite strong morning and evening here; before 2400 had a report on the Tarahumaras (gh, OK)

**MONGOLIA** R. Station Tsagaan Shonkhor is new independent commercial outlet via Mongolian Radio transmitters 209, 227, 4080, 4850 kHz, 1400-1500 three days a week but heard only on Wed., including 5-minute world news in English (with American accent). Name means white hawk (Hironau Oguma and Yoshinori Kato, *RJMR*)

**NETHERLANDS** Pete Myers, RN *Happy Station* host, says he tries to be irritating, but many traditional listeners would rather hear about clogs and windmills than sex, drugs and Ray Charles. He plans to retire this year (Sara Henley, Reuter) RN budget remains the same but how it is spent is changing, with reassessment required in competition with domestic networks (Robert Brunwin de Jong via Daniel Say, FIDONET *SWEcho* via George Thurman) RN documentaries in March on Weds., some repeats Fris., Sat., highlight African immigrants' contribution to European parliament, religious sects (via Gigi Lytle, Will Martin, Diane Mauer, Frank Orcutt)

**NEW ZEALAND** Tony King replaced as host of RNZI *Mailbox* by Myra Oh, from Fiji, helped by frequency manager Adrian Sainsbury, and still with Arthur Cushen (Linden Clark, RNZI Manager, via Sainsbury) Is bi-weekly Mons. 0430 on 15115, Thurs. 0830 on 9700, but started at 0805 instead causing us to miss most of it (gh)

**NORWAY** J-94 frequency schedule is being recalculated, using more long route than before, including mornings to western N. America (Olav Grimdalen, NRK, via Joe Hanlon)

**PALAU** With two transmitters, KHBN revised W/M 94 schedule: 9830 at 0700-1600, 2000-0100; 9965 at 1200-1900, 2100-2400; 15395 at 0800-1200; 17630 at 0000-0800 (George Jacobs via George Thurman)

**PHILIPPINES** FEBC in Mandarin on new 9400 at 1545, English

## DX Listening Digest

— Much more info in the style of Hauser's column.

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

ID at 1600\* (Edwin Southwell, England) tentatively same at 2220-2400\*, very weak on 9400.06 (Brian Alexander, PA)

**RUSSIA** R. Alef, Jewish program mostly in Russian, some Hebrew, Sun., Tue., Thu. 1700-1735 on 17890, 12075, 4055; summer on 7305, winter on 5905, one hour earlier in summer; address P.O. Box 72, Moscow 123154 (BBCM) Green Music Radio (*Zelenoye Muzikalnoye Radio*) at \*0100 on 6989.3 announcing it is weekly from Sat. \*2300 on 6990, Sun. 0000 on 3020, 0100-0155\* on 6990; Box 65, Moscow 125581 (BBCM) Pirate?

**SAHARA** (non?) National R. of the Democratic Arab Sarahan Republic on new 11320 from as early as 1930 in Arabic, many IDs; 0000-0100\* in Spanish. Last spring had been on 11520 until 0000\*, no Spanish. Maybe from Tindouf, Algeria, or Polisario-controlled area of Western Sahara (Tony Orr, and Hans Johnson, PA, HCJB *DXPL*)

**SA'UDI ARABIA** BSKSA at \*0255-1759\* with General Programme on 10990 USB including *Call of Islam* 1500-1700; 2nd Programme \*0255-2100\* on 10990 LSB; from Riyadh, Mecca, Jiddah, respectively (BBCM)

**SOMALIA** UN's R. Manta, Mogadishu, in Somali for 45 minutes on USB plus carrier at 1000 on 9540, repeated 1100, 1300; on 6170 at 1600, 1700, 1900; 9540 next day 0415. R. Manta reported that UNOSOM promises to set up a national station. R. of the Republic of Somalia, or R. Somalia (BBCM)

**SWEDEN** R. Sweden changed all frequencies for four English broadcasts: Asia 1230 on 15120, 13765; S. America 0030 on 6065, 9850; N. America 0230 and 0330 on 6195, 9850 (Edwin Southwell, UKOGBANI) Remains much better at 1330 and 1430 on 15240, 17870 (gh) Weekdays, *Sixty Degrees North* includes: Mon., sports; Tue., media; Wed., money; Thu., *Green Scan* and *Horizon*; Fri., review of newsweek. Sat. alternating are *Spectrum*—arts, *Sweden Today*, *Upstream*—dissidents, Sun., *In Touch with Stockholm* or *Sounds Nordic* (via Diane Mauer)

**TAJIKISTAN** (non) V. of Free Tajikistan (*Sado-i Tajikistan-i Ozod*, with program *Payk-i Khorasan*), 7088-7090v around 0300-0330, 0600-0630, 0900-0930, 1400-1430 (BBCM)

**THAILAND** Despite R. Thailand's long usage of 9655, VOA in English, Tibetan on same at 1420-1445\*, perhaps from Udorn (Nicholas Vaughan-Baker and John Stewart, BDXC *Communication*) BBC has started engineering site surveys for new relay station at Nakhon Sawan, 250 km N of Bangkok, but awaiting funds to be allocated by Treasury for construction; hopes to start work in second quarter of 1994, completed in 2-1/2 to 3 years with four transmitters covering most of China, India, etc. (*Ariel* via Jack Fitzsimmons, World DX Club *Contact*) Bangkok Meteorological R., 6764.9 USB, \*1155 sweet-sounding IS, ID and weather in English and Thai, repeated at 1215 and 1230 (George, MA, SPEEDX)

**TURKEY** Izmir school station, 7100 verified with partial-data letter even though I have never heard even a carrier, and was only writing for info (Harald Kuhl, DSWCI *SW News*)

**USA** Voice of the Organization of American States (*La Voz de la OEA*) closed down its 36-year-long SW service Jan. 2 in favor of satellite feeds for relay by local stations; but Jan. 10 resumed SW without announcing any SW frequencies, at least until mid-April, on different schedule: Spanish daily 2330-2400, Portuguese Sat. and Sun. 2315; and English revived after long absence, Mon.-Fri. 2245-2300, all on 15160-Greenville, 11835-Bethany, and 9535-Bethany ex-9565 (John Vodenik, OH, *W.O.R.*) But 9535 conflicts with RCI (gh)

World Voice of Historic Adventism is name used by Prophecy Countdown for broadcasts via WCSN, Maine, starting Jan. 17: weekdays 1500-1700 on 15665, 0100-0300 on 7465; Sundays each half an hour longer; Sat. = Sabbath, 1300-1545 on 11745, 1545-1800 on 15665; info from 1-800-HIS-LOVE; announced address, P.O. Box 1844, Mt. Dora, FL 32757 (*World of Radio*) Evening broadcast special after Xmas made

clear schism with mainstream Seventh Day Adventism, accusing it of trying to prevent P.C.'s acquisition of WCSN (Tim Hendel, FL)

WINB, Red Lion, PA, changed decades-old frequencies Jan. 3 to 15715 at 1600-2400, 11950 at 0000-1100, 62° rhombic to Europe on first transmission, reversed to Mexico 242° on second (George Thurman, IL) Old transmitter probably strains to go as low as top side of 11 MHz band; winter fade-out by 0100, useless thereafter (gh, OK) Never finished converting second MW transmitter but no plan to continue it now. Still owned by John Norris, not Pastor Peters (Fred Wise, WINB C.E., RNMM) Brother Stair on WINB weekdays 2100-2200 (Diane Mauer, WI) Peters at 0200 simulcasting WHRI 7315 (Don Thornton, NJ) Using WHRI satellite feed (Joe Hill)

KCBI, Dallas, is no longer a client of George Jacobs Associates, contract not fulfilled (Jacobs via George Thurman) But a second transmitter is still planned this year.

KVOH survived quake, lost only two days during power outage (George Thurman, *W.O.R.*)

WJCR, Upton, KY, began official use of 13595 Jan. 1 including 12 hours per day in Mandarin to China; has rhombics, four 50 kW RCA transmitters, two paired on each frequency; 7490 also 24 h (Ted Haney, HCJB *DXPL*) Hardly ideal site to reach China effectively (gh)

WRMI, Miami, 9955, tone testing Jan. 14 from 2030 past 2300, presumably high-power (Ed Rausch, NJ) Still not active Jan. 25 (gh)

WWCR expanded *Worldwide Country*, bumping Aussie music show *The Big Backyard* to Sat. 0630 on 5810 (Adam Lock, WWCR) *Spectrum*, UT Sun. 0300-0400 on 5810, got repeat UT Mon. 0400-0500 on 7435 (gh) WWCR spurs 0620-0635 on 6212.3v, 6227.7v, weak, wobbly, variable from 5810 which was rock stable (Brian Alexander, PA) 0655-0718 on 5763.6, probably from 5810 (Kirk Allen, OK, *FT*) Basic problem is rhombic antennas are too close to each other, interactions hard to avoid (gh)

*WORLD OF RADIO* changes to last month's listing: delete Sat. and Sun. 0130, 9495 Sat. at 0600; and 2130; add Hawaii (gh) From April 3, WWCR times shift one UT hour earlier; WHRI, KWHR and RFPI do not.

Specific frequencies in Australian complaint to FCC about U.S. broadcasters: 5850, 5935, 7315, 7355, 7395, 7425, 7435, 7465, 7490

WEWN pressured by WWV to move 9985 further from 10000 due to hissy transmitter, to 9980 or even 9975, but no move by presstime as Continental trying to figure out what's wrong (George Thurman, IL) Would set precedent to force WEWN further from other neighbors to 7425 and 15695 outlets (gh)

Another hateful ministry is *Herald of Truth*, UT Sun. 0230-0245 on WRNO 7355, which puts down "Niggers" and extols "Aryans" (Tim Hendel, FL)

Radio Free Europe began combined Serbo-Croat service Jan. 17: 1630-1800 on 5985, 7115, 11815, 15370, and from 1700 also 9695; 2200-2300 on 5985, 7115, 7145, 9695; has staff of 8 (RNMM) See also CZECHIA

KGON, 92.3, Portland, OR, classic rock programming heard on a Sun. around 2230 on 25950 AM (gh, OK) is 20 watts, testing coverage of Portland area for remotes, talkback and cuing, but will QSL skip reports (Mike Everhart, KGON)

KOTV, ch. 6, Tulsa, OK, news audio at 1800 heard on 26150, cuing included; another day at same time, news capsule in Spanish from WSCV, ch. 51, Fort Lauderdale, on 26350 NBFM (Alan Roberts, PQ)

**VATICAN** VR testing various 75 mb frequencies, including 4000 local evenings (RNMM)

**VIETNAM** VOV heard poorly on 12020 at 1900 and 2030, announcing that "what you know about Vietnam" contest deadline extended to Mar. 31, winners to be announced on Liberation Day in April—30th? (Tom Kuca, NY, *W.O.R.*) Crave those megadong!

*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.

## 0001 UTC on 17555

UNITED STATES: KWHR. "Aloha from Hawaii" greeting. Address and fax number quote with ID. Beautiful Hawaiian rendition of *How Great Thou Art*. Religious teachings. (Brian Bagwell, St. Louis, MO) Additional loggings for KWHR; 0230 on 17510 kHz (Jerry Witham, Keauu, HI) 1230 on 9930 kHz (Ed Rausch, Cedar Grove, NJ) 1847 on 13625, 2210 on 17510 kHz (Harold Frodge, Midland, MI) 2250 on 17510 kHz. (Randy Stewart, Springfield, MO; Don Taylor, Green Cove Springs, FL)

## 0002 UTC on 15130

NORTH KOREA: Radio Pyongyang. Nat'l news on leader Kim Il Sung and his international impact. Feature on the Worker's Party noting the "happy life" under socialism. (John Sedlacek, Omaha, NE) 2300-2345 broadcast on 11700 kHz (LeRoy Long, Edmond, OK) Pyongyang's Korean service on 7250 kHz at 0805 newscast to mournful music. (Witham, HI) Tentative logging on North Korea's Voice of National Salvation on 3481.2 kHz at 2240. (Maywoods DX Team, KY; Loy Lee, Ed Shaw, James McClure, Jerry Johnston, Charles Everman-KD4VYI, Dr. Joel Roitman, Jerry Lineback) *Thanks, guys! GVH-MT*

## 0027 UTC on 7150

LITHUANIA: Radio Vilnius. National news to station ID. Schedule quote on English broadcast to North America. Lithuanian newscast 0030. (Sedlacek, NE) Feature on national political parties noted on 7150 kHz at 0110. (William McGuire, Cheverly, MD; Charlie Patterson, Mobile, AL)

## 0047 UTC on 11915

BRAZIL: Radio Gaucha. Portuguese. Station ID at tune-in. 1993 *Sports Review* on Brazil's Formula 1 car racer Ayrton Senna. (Patrick J. Barry, Mission Viejo, CA) Additional Brazilian stations noted; Radio Clube Paranaense on 9725 kHz at 0815, Radio Educacao Rural on 4755 kHz at 0830. (Witham, HI; Thomas Banks, Dallas, TX)

## 0100 UTC on 6175

UNITED KINGDOM: BBC. *Play of the Week, Dr. Strangelove*. Noted on // 5975, 7325, 9590, 9915, 11750 (weak), 15260 kHz. (Dan Smith-N2PTF, Morrisville, NY) *Composer of the Month* featuring Leonard Bernstein on 15070 kHz at 1715. (Bob Fraser, Cohasset, MA; Garland J. Thomas, Cleveland, OH)

## 0102 UTC on 7455

BULGARIA: Radio Bulgaria. Discussion on Russia's political scene. *Sunday* to *Sunday* with news events of the week. *Weekly Spotlight* at 0115 on // 9700 kHz. (Smith, NY) *Current Events* news and commentaries heard on 9700 kHz at 2300. (Fraser, MA; Patterson, AL; Maywoods DX Team, KY)

## 0103 UTC on 6724

PERU: Radio Satelite. Spanish. Local programming with station ID, signal peaking by 0300. Additional Peruvians monitored; Radio Tarma on 4775 kHz at 0321, and Radio Mundo on 5082 kHz at 2355 with community news past 0100. (Maywoods DX Team, KY)

## 0201 UTC on 6116.5

COLOMBIA: La Voz del Llano. Spanish. Station ID at tune-in. Super Radio network news relay. Good signal albeit interferences from co-channel Radio Canada Intl. (Stewart, MO)

## 0241 UTC on 9570

PORTUGAL: Radio Portugal International. Sports roundup of national scores. Regional weathercast to station ID and frequency quote. Pop music vocals to *DX Mailbag* program. (Bagwell, MO)

## 0300 UTC on 5930

CZECH REP.: Radio Prague. National news with severe utility interference. Heard on // 7345, 5915 kHz. (Smith, NY) News and Czech folk music on 7345 kHz at 1950. (Maywoods DX Team, KY)

## 0330 UTC on 7105

MOLDAVA: Radio Dnestr International. Interval signal, sign-on station identification into program schedule quote. *Press Review* show. (Rausch, NJ; Maywoods DX Team, KY) New station, Radio Dnestr Intl is the external-service arm of Radio Pridnestrovye, the broadcasting station of the Russian-separatists in the Pridnestrovye region of Moldova. Station address: Radio Dnestr International, 25th October Street 45, Tiraspol, Moldavian Rep. of Pridnestrovye 278000 via C.I.S. (BBC SWB/GVH-MT)

## 0350 UTC on 9520

SOUTH AFRICA: Channel Africa. French. African vocal tunes to Spanish ballads by Julio Iglesias. Station ID, DJ talk. (Barry, CA) Station audible on 9730 kHz at 0453-0455 with news from Ghana, Libya, Gabon, and Zimbabwe. (Stephen R. Hunter, Drexel Hills, PA; John C. Hall, Cumming, GA) SABC noted on 3230 kHz at 0308 with music program. (Maywoods DX Team, KY)

## 0403 UTC on 6105

COSTA RICA: Radio Universidad de Costa Rica. Spanish. Caught during sign-off with national anthem and IDs. Extreme interference from Radio Canada Intl on 6120 kHz. (Stewart, MO)

## 0407 UTC on 6115

PERU: Radio Union. Spanish. Station ID mentioning "para todo el Peru y el

peru." Pop vocal music program to frequent "Radio Union" IDs. (Stewart, MO) Peru's Radio Oriente heard on 6190 kHz at 0010. Peruvian vocals to time check and ID. (Banks, TX)

## 0415 UTC on 5935

UNITED STATES: WWCN. Dr. Gene Scott's religious teachings. Parallel on 9815 kHz on KCBI Dallas, Texas. Dr. Scott broadcasting "live" at 0535 recheck and on satellite (G3 13). Interesting to hear him mention one call-in from listener in Brasstown, NC, as "just wanted to let you know I'm hearing you on 690 AM and 1610 AM from the Caribbean Beacon." (Frank Hillton, Charleston, SC) *Hmmm ... wonder who that was that called in?! GVH-MT*

## 0455 UTC on 9375

COSTA RICA: Radio for Peace International. Creole. *Mailbag* program to station ID. Program service to Haiti. Discussion on human rights on 15030 kHz at 1700. (Smith, NY; Bill Newberry, Bakersfield, CA)

## 0600 UTC on 4915

GHANA: GBC-Radio One. World news to national education report. Station ID 0617 and update on treatments for cholera. Sports update on national soccer matches. (Hunter, PA) GBC heard 3366 kHz at 2146, 4915 kHz at 2215. (Maywoods DX Team, KY)

## 0855 UTC on 5039.8

CHINA: Fujian Peoples BS. Chinese. Regional music to English vocal "Baby I'm Right Here Waiting For You." Male announcer to time pips and ID at 0900. (Witham, HI) China's Yunnan Peoples BS heard on 4759.78 kHz at 1114 with Chinese talk to 1200 time pips. (Maywoods DX Team, KY)

## 1200 UTC on 6025

UZBEKISTAN: Radio Tashkent. English programming to Asia on // 9540 kHz. Station interval signal to ID. International newscast to Middle Eastern music program. Sign-off 1230. (Rausch, NJ)

## 1200 UTC on 9675

PAPUA NEW GUINEA: NBC (Papua). Great signal for local news, IDs and pop music. (Ed Savage, Mt. Home, AR; Bagwell, MO) PNG Radio East New Britain heard on 3385 kHz at 1130 in Pidgin language. (Rausch, NJ)

## 1452 UTC on 15020

INDIA: All India Radio. (Delhi) Hindi religious programming, fair to poor signal. (Maywoods DX Team, KY) AIR-Delhi heard on 9565 kHz at 1715. Music to ID and English/Hindi news at 1730. Sign-off 1740. (Witham, HI)

## 1615 UTC on 9730

SAUDI ARABIA: BSKSA. Arabic. Talk and Holy Koran recitations. (Thomas S. Barnes, Marietta, GA) Tentative ID on Saudi clandestine, Voice of the Iraqi People on 9569 kHz at 1740. Arabic monologue to Middle Eastern music at 1745. Buried by Radio Moscow's co-channel sign-on at 1800. (Witham, HI)

## 1700 UTC on 9560

JORDAN: Radio Jordan. Ten minute English newscast to *Press Review* program. Feature program on 70's musical team Captain and Tenille. Station sign-off 1730. (Barry, CA) Radio Jordan heard this frequency at 1500. Station ID. (Banks, TX)

## 1700 UTC on 13620

KUWAIT: Radio Kuwait. Arabic. Regional and international newscast. (Maywoods DX Team, KY) English service noted this frequency at 1930. *Album of the Week* program. Feature on Desert Storm at 2002. (Frodge, MI; Patterson, AL)

## 1725 UTC on 9840

VIETNAM: Voice of Vietnam. Vietnamese. Regional music to English tune "I Love to Have a Beer." Music format continued to ID and English newscast. Station covered by Radio Kuwait at 1800. (Witham, HI)

## 1720 UTC on 6870

SOMALIA: Voice of the Great Somali People. Somali. Extended speech with noisy crowd response. Children's chorus to regional music to 1748. Announcer's monologue to prayers, anthem and sign-off at 1800. (Witham, HI)

## 1810 UTC on 5035

KAZAKHSTAN: Radio Almaty. News headline reviews from Russia and Kazakhstan. Letter request for their English listeners. Waltz tune to interval signal and ID at 1830. (Witham, HI)

## 2117 UTC on 9780

YEMEN: Yemen Radio. Closing English newscast into Arabic music. Travelogue program on attractions in Sana'a and Aden. Station ID "this is Yemen the English service from Sana'a." (Stewart, MO; Frodge, MI) Arabic programming on 5970 kHz at 0345. (Witham, HI)

## 2140 UTC on 15674.5

HONDURAS: Radio Copan International. Spanish. Good signal for tropical music, and frequent ID. Request for reception reports. (Stewart, MO) *Send reports to: c/o Jeff White, P.O. Box 526852, Miami, FL 33152. (GVH-MT)* Honduran Sani Radio monitored on 6300 kHz at 0103 with IDs and *Sani Radio Musicale* program. (Frodge, MI; Patterson, AL) LV Evang. de la Mosquitia noted on 4910 kHz at 0100, guitar ballads. (Maywoods DX Team, KY)

## 2330 UTC on 9770

UNITED ARAB EMIRATES: UAE Radio. *Press Review* to regional Arabic music. Station ID to cultural feature on Islam. (McGuire, MD)

## 2337 UTC on 9425

GREECE: Voice of Greece. News and commentary on Cyprus. (Sedlacek, NE) Station noted with Greek folk music and talk on 7450 kHz at 2006. (Maywoods DX Team, KY)

This month brings another excellent crop of QSLs from the broadcast and utility bands. When contributing to the column, why not include your QSL card? All cards will be copied for future use, and returned to you. Here is a fine opportunity to share your "catch" with all our readers.

To avoid duplicating efforts, please send all pirate or clandestine QSL and logging information to George Zeller's "Outer Limits" logging section. We'll take all the rest!

## ARGENTINA

RAE, 11710 kHz. Full data station logo card signed by Tony Middleton-Head of English Dept. Personal note and program schedule enclosed. Received in 80 days for an English report and 2 IRCs. Station address: 555 Correo Central, 1000-Buenos Aires, Argentina. (Randy Stewart, Springfield, MO; LeRoy Long, Edmond, OK; Sam Wright, Biloxi, MS; Tom Banks, Dallas, TX)

## BOTSWANA

Radio Botswana, 4830 kHz. Full data postcard QSL unsigned. Received in 192 days for an English report and souvenir postcard. Station address: c/o Information & Broadcasting Services, Private Bag 0060, Gaborone, Botswana. (Bradley C. Bohrer, Berea, OH)

Voice of America Relay, 7265 kHz. Full data Botswana Relay Verification card verified. Received in 55 days for an English report. Station address: 330 Independence Ave., S.W. Washington, DC 20540. (Stewart, MO; Don Taylor, Green Cove Springs, FL)

## CANADA

CFCX Montreal, 6005 kHz. Partial data station card, unsigned. Personal letter received from Kim Bickerdike-Engineering Director. Received in 159 days for an English report. Station address: 1200 McGill College Ave., Suite 300, H3B467 Montreal, Canada. (Mark Spat, W. Swanzey, NH; Banks, TX)

## CHINA

China Radio International, 9440/11715 kHz. Full data color QSL card. Station souvenirs of paper cutouts, 94 calendar, personal note and program schedule enclosed. Received in 48 days for an English report. Station address: Beijing 100866, People's Rep. of China. (Long, OK; Hardester, NC; Rich McClouskey, Chicago, IL)

## ECUADOR

Radio Bahai, 4950 kHz. Full data card and personal letter signed by William Rodriguez. Received in 30 days for a Spanish report and mint stamps. Station address: Apartado 14, Otavalo, Imbabura, Ecuador. (Ed Rausch, Cedar Grove, NJ)

## FRANCE

Radio France International, 15365 kHz. Full data *Place des Vosges* card unsigned. Received in 73 days for an English report. Station address: Boite Postal 9516, Paris, France. (Charlie Washburn, Robbinston, ME; Wright, MS; Brian Bagwell, St. Louis, MO)

## GALAPAGOS ISLANDS

La Voz de Galapagos, 4810.5 kHz. "Returned my prepared QSL card (with incorrect data). Postcard enclosed from Edgar Vallejo-Gerente. Map of Archipiélago de Colon Galapagos enclosed. Received after MANY followups from 1976! Original report copies sent with mint stamps, one U.S. dollar, and a BUNCH of souvenir 'goodies'." Station address: Mision Franciscana, Puerto Baquerizo Moreno, Isla San Cristobal, Galapagos Islands, Province of Ecuador. (Mike Hardester, Jacksonville, NC) *Way to go Mike!*

## GUATEMALA

Radio Buenas Nuevas, 4800 kHz. Full data prepared card signed by Israel Rodan. Station photo and personal letter enclosed. Received in 1.5 months for a Spanish report and mint stamps. Station address: 13020 San Sebastian, Huehuetenango, Guatemala. (Rausch, NJ; McClouskey, IL)

## LIBERIA

Radio ELWA, 4760 kHz. Full data paper card unsigned. Received in 2 months for an English report and 2 IRCs. Station address: P.O. Box 10-0192, 1000 Monrovia 10, Liberia. (Rausch, NJ)



*Gigi Lytle, Lubbock, TX, received this Radio Educacion QSL.*

## MEXICO

Radio Educacion, 6185 kHz. Date only "Certificado de Sintonia" QSL card signed by Lic. Luis Ernesto Pi Orozco-Director General. Program schedule, sticker and brochure enclosed. Received in 52 days for an English report and 3 IRCs. Station address: Angel Urraza 622, Col. Del Valle, Mexico D.F. 03100 Mexico. (Spat, NH)

## MONACO

Trans World Radio, 9480 kHz. Full data station card signed by Jeanne Olson. Received in 18 days for an English report and souvenir postcard. Station address: Boite Postal 349, Monte Carlo, 98007 Monaco. (Bohrer, OH; Frank Hillton, Charleston, SC)

## SHIP TRAFFIC

COLUMBUS OLIVOS-ELMW9, 156.65 MHz (Container Vessel). Full data verification letter. Received in 53 days for an English utility report and one U.S. dollar. Ship address: c/o DEBEG GmbH, Funkverkehrsabrechnung, Postfach 50 03 29, 2000 Hamburg 50, Germany. (Hank Holbrook, Dunkirk, MD)

MAYVIEW MAERSK-OWEB2, 156.65 MHz (Container vessel). Full data prepared QSL card verified. Received in 18 days for an English utility report and one U.S. dollar. Ship address: A.P. Moller, Esplanaden 50, DK 1098 Copenhagen, Denmark. (Holbrook, MD)

SEALAND QUALITY-KRNJ, 156.8 MHz (Container Vessel). Full data prepared QSL card verified. Received in 28 days for an English utility report and U.S. mint stamps. Ship address: Sealand Service Inc., 10 Parsonage Rd., P.O. Box 800, Iselin, NJ 08830. (Holbrook, MD)

## UNITED STATES

WZZD, 990-AM. Frequency only letter signed by Stuart Engelke-Chief Engineer. Sticker, coverage map and program schedule enclosed. Received in 8 days for an English AM report. Station address: 117 Ridge Pike, Lafayette Hill, PA 19444. (Hardester, NC)

KXLY, 920-AM. Full data station letter signed by Daniel Beamer-Engineer. Coverage map enclosed. Received in 75 days for an English AM report. Station address: 500 W. Boone Ave., Spokane, WA 99201-2497. (Steve McDonald, Port Coquitlam, B.C. Canada)

KFRE, 940-AM. Partial data letter signed by Bob Souza-Chief Engineer. Received in 10 days for an English AM report. Station address: 999 North Van Ness Ave., Fresno, CA 93728. (McDonald, Canada)

KREW, 1210-AM. Full data letter signed by Don Bennet W7IVE. Broadcast verified for IRCA DX Test. Received in 14 days for an English AM report. Station address: P.O. Box 149, 638 Decatur Ave., Sunnyside, WA 98944. (McDonald, Canada)

WBOW, 640-AM. Full data letter signed by Kevin Lange-N9NFT Production Manager. Station magnet and personal note enclosed. Received in 8 days for an English AM report, and an SASE (not used). Station address: 1341 Ohio St., Terre Haute, IN 47807. (Harold Frodge, Midland, MI)

WBV, 1110-AM. Full data station logo card signed by Wm. R. White. Stickers and Hornets basketball schedule enclosed. Received in 20 days for an English AM report and an SASE. Station address: 1 Julian Price Place, Charlotte, NC 28208. (Frodge, MI)

Radio Miami International (WRMI), 9955/7395 kHz. Full data WRMI card signed by Jeff White. Received in 11 for an English report, mint stamps, and address label (used). Station address: P.O. Box 526852, Miami, FL 33152. (Hardester, NC; Spat, NH; Washburn, ME)

## VENEZUELA

Ecos del Torbes, 4980 kHz. No data station logo/map card signed by Albertina. Received in 70 days for a Spanish report and mint stamps. Station address: Apartado 152, San Cristobal 15001, Tachira, Venezuela. (Stewart, MO)



## How to Use the Shortwave Guide

### 1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 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 "Newslines" 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

### The Search for Success

Shortwave broadcasters are constantly striving to maintain their audiences and cut their budgets. Take the Voice of America, for example:

Last September the VOA and Radio Finland began conducting a series of experiments utilizing single sideband (SSB) as opposed to the full carrier AM transmission (DSB) currently used by the majority of broadcasters. The test transmissions emanated from Radio Finland facilities, and were directed toward Munich, Germany, on 15120 (DSB) and 15240 kHz SSB, according to an item in *RF Design*. A few broadcasters already use SSB on selected frequencies, which sometimes helps to cut through poor listening conditions.

The VOA is reshuffling mediumwave transmissions in Europe and elsewhere. It has put the mediumwave outlet in Belize up for sale or lease. Sale of the facility, however, does not include the land itself, nor does it guarantee a license to broadcast from that location. The VOA actually has a mediumwave presence in the U.S., we discovered in a recent edition of *Radio World*. WUST, "New World Radio," which broadcasts with 20 kW at 1120 on the AM dial from Falls Church, VA, airs foreign-language programs not only from foreign broadcasters, but also from our own VOA. The target audience is the ethnic population of the Baltimore/Washington area.

Pete Myers, host of the venerable *Happy Station* program from Radio Netherlands,

has turned the previous mix of "clogs, windmills, that kind of Dutch stuff" to "sex, drugs and rock 'n roll" in search of a younger audience used to interactive and multi-media. He himself, however, will probably retire this year. "I feel too old for it all," he said in an article from Reuters news service. "I can't relate to the music."

Meanwhile, Jonathan Marks of R. Netherlands' *Media Network* program, had a somewhat different view of listeners in his season's greetings posted on Internet. Out of 74,000 responses received by the English department in 1993, "I have been amazed at the quality of response. In 1980, when I joined the station, a lot of the mail was 'gimme, gimme' reaction...mainly stickers and pennants. Now, the number of letters has vastly increased, but people clearly have something to tell us."

### Looking for Broadcast Experience?

There's no pay, but it's an experience. The VOA accepts applications on a year-round basis for voluntary student internships. Students attending colleges and universities in the Washington, D.C. area are the most frequent participants. The most common occupations for interns within the VOA are news assistant, international radio broadcaster, electronics engineer, and radio broadcast technician. For further information, contact the Voice of America, Office of Personnel, 330 Independence Ave. SW, Room 1543, Washington, D.C. 20547.

A note via Internet advises that the Seventh Day Adventist church which is purchasing

the WCSN shortwave facilities is looking for translators "from English to any and all other languages." Give them a call at 1-800-HIS-LOVE.

### Virus Alert

Another note posted on Internet conveys a warning from Bob Zanotti of Swiss Radio International that the computer diskette containing the latest *International Listening Guide* database produced by Bernd Friedewald in Germany contained a ParB virus. The first posting we saw was dated just before Christmas.

Others found the information that a form of the *ILG* was back in production as much of interest as the notice of the virus, since Friedewald apparently had a publication by that name a few years ago. When it went out of business, it left many subscribers high and dry. They want to know if he will now fulfill his first duty of repaying his debts or honoring unexpired subscriptions?

### The Time is Now

In a note passed along by Glenn Hauser, Bob Thomas of Connecticut says that now is a good time for any SWL who listens to Radio Cairo to complain about the modulation problems that have long plagued reception. Tell them that they should do something about it on the 0200-0330 English broadcast on 9475 and 11600 kHz. Send to Radio Cairo, P.O. Box 566, Cairo, Arab Republic of Egypt.

## MT Monitoring Team

Gayle Van Horn, Frequency Manager  
North Carolina

Next Reporting Deadline  
March 21, 1994

Jim Frimmel, Program Manager  
Texas

Dave Datko      B.W. Battin  
California      New Mexico

Jacques d'Avignon  
Propagation Forecasts  
Ontario, Canada

## newsline

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

### 0000 UTC (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 [T-S]  
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)  
WWCR #3 [S-M]  
**0003**  
Radio Pyongyang  
**0008**  
China Radio Int'l\*  
**0010**  
Radio Havana Cuba [S-F]\*  
Voice of America (ca) [T-A]\*  
**0015**  
Radio Vilnius [H]\*  
**0027**  
Radio Vilnius [W]  
**0030**  
HCJB  
Radio Havana Cuba [T-A]  
Radio Moscow  
Radio Nacional de Venezuela [T-S]  
Radio Netherlands Int'l  
Radio Sweden [T-A]  
Voice of America (am) (Special English)  
Voice of America (ca) [S-M] (Special English)  
**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)  
Voice of Indonesia  
WWCR #3 [S]  
**0103**  
Radio Bulgaria  
**0110**  
Radio Australia [M-F]\*  
Radio Havana Cuba [S-F]\*  
**0120**  
Radio Sweden [T]  
**0130**  
Radio Austria Int'l  
Radio Havana Cuba [T-A]  
Radio Moscow  
Radio Netherlands Int'l  
Radio Sweden [T-A]  
Radio Tirana  
Voice of Greece [M-A]  
**0145**  
BBC (as) [M-A]\*  
BBC (ca) [T-A]\*  
**0155**  
Vatican Radio [S-W-F]  
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 [T-S]  
Radio Moscow  
Radio New Zealand Int'l [M-A]  
Radio Norway Int'l [M]  
Radio Romania Int'l  
Radio Thailand  
Radio Yugoslavia  
Voice of America (am) [T-A]  
Voice of America (as)  
Voice of Myanmar (Burma)  
WWCR #3 [F]  
**0203**  
Voice of Free China  
**0210**  
Radio Havana Cuba [S-F]\*  
**0215**  
Radio Cairo

Radio Nepal  
**0230**  
HCJB [M]  
Radio Havana Cuba [T-A]  
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 [S-F]  
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 [S]  
WWCR #3 [T-A]  
**0303**  
Voice of Free China  
**0308**  
China Radio Int'l\*  
**0309**  
BBC\*  
**0310**  
Radio Havana Cuba [S-F]\*  
**0315**  
BBC (as) [S]\*  
Radio Cairo  
**0320**  
Radio Philipinas [M-A]  
**0330**  
BBC (af)\*  
Radio Austria Int'l  
Radio Dubai  
Radio Moscow  
Radio Nacional de Venezuela [T-S]  
Radio Netherlands Int'l  
Radio Sweden [T-A]

**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 [T-S]  
Radio Moscow  
Radio New Zealand Int'l [M-F]  
Radio Romania Int'l  
Radio Thailand  
Swiss Radio Int'l  
Voice of America (af)  
Voice of Turkey  
WHRI #2 [T-A]  
WWCR #1 [T-A]  
WWCR #3 [T-A]  
**0403**  
Radio Pyongyang  
**0408**  
China Radio Int'l\*  
**0410**  
Radio Havana Cuba [S-F]\*  
**0411**  
Channel Africa [T]  
**0415**  
RAI Italy  
**0430**  
Channel Africa [A]  
Radio Havana Cuba [T-A]  
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  
Christian Science Sentinel [A]  
Deutsche Welle  
HCJB  
Monitor Radio Int'l [T-F]  
Radio Australia  
Radio Japan  
Radio Moscow

Radio New Zealand Int'l [A-S]  
Radio New Zealand Int'l [M-F]\*  
Radio Thailand  
Spanish National Radio  
Swiss Radio Int'l (eu)  
Vatican Radio [A]  
Voice of America (af)  
Voice of Israel  
WWCR #1 [T-F]  
WWCR #3 [M/H]  
**0501**  
Channel Africa [A-S]  
**0503**  
Radio Bulgaria  
**0510**  
Radio Australia [M-F]\*  
Radio Havana Cuba [S-F]\*  
**0530**  
Channel Africa [F-M/W]  
Radio Austria Int'l  
Radio Dubai  
Radio Finland [M-A]  
Radio Havana Cuba [T-F]  
Radio Moscow  
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) [A-S]\*  
BBC (af) [M-F]  
Channel Africa  
Deutsche Welle  
Monitor Radio Int'l [T-F]  
Radio Australia  
Radio Canada Int'l [M-F]  
Radio Havana Cuba  
Radio Korea  
Radio Moscow  
Radio New Zealand Int'l [M-F]\*  
Swiss Radio Int'l  
Voice of America (eu)  
Voice of Kenya  
Voice of Malaysia  
WWCR #1 [F]  
**0603**  
Radio Pyongyang  
**0609**  
BBC\*  
**0610**  
Radio Havana Cuba [S-F]\*



**0627**  
**BBC (af) [M-F]\***  
**0630**  
 Channel Africa [W]  
 Radio Austria Int'l [T-S]  
 Radio Moscow  
 Vatican Radio [H]  
 Voice of Nigeria [M-F]  
**0632**  
 Radio Romania Int'l  
**0640**  
 Vatican Radio [T]  
**0645**  
 Radio Romania Int'l  
 Voice of Nigeria [M-F]\*  
**0650**  
 Radio New Zealand Int'l [M-F]\*  
 Voice of Med. (Malta)  
**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 New Zealand Int'l [M-F]\*  
 Radio New Zealand Int'l [S]  
 Swiss Radio Int'l (eu)  
 Voice of Myanmar (Burma)  
 WWCR #1 [S]  
**0703**  
 Radio Pyongyang  
 Voice of Free China  
**0710**  
 Radio Australia [W]\*  
**0730**  
 BBC (af) [A]\*  
 HCJB  
 Radio Moscow  
 Radio Netherlands Int'l  
 Radio Vlaanderen Int'l  
 Vatican Radio [M-A]  
**0740**  
 Voice of Greece  
**0745**  
 Radio Finland [M-A]  
**0755**  
 Radio Japan [M-F]

**0800 UTC**  
(3:00 AM EST, 12:00 AM PST)  
 BBC  
 Christian Science Sentinel [T/F]  
 KNLS  
 Monitor Radio Int'l [T-F]  
 Radio Australia  
 Radio Korea  
 Radio Moscow  
 Radio New Zealand Int'l [M-F]\*  
 Radio New Zealand Int'l [S]  
 Radio Norway Int'l [S]  
 Voice of Indonesia [A-H]  
 Voice of Malaysia  
 WWCR #1 [A]  
**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 [T/F]  
 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**  
 Deutsche Welle [M-F]\*  
 Radio Yerevan [S]  
**0955**  
 Radio Japan [M-W]

**1000 UTC**  
(5:00 AM EST, 2:00 AM PST)  
 BBC  
 China Radio Int'l  
 Christian Science Sentinel [A-S]  
 FEBC (Philippines) [M-F]\*  
 HCJB  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Moscow  
 Radio New Zealand Int'l [M-F]\*  
 Radio New Zealand Int'l [S]  
 Radio Norway Int'l [S]  
 Radio Vlaanderen Int'l [T-A]  
 Voice of America (as)  
 Voice of Kenya  
**1005**  
 Radio New Zealand Int'l [M-F]\*  
**1008**  
 China Radio Int'l\*  
**1030**  
 Radio Austria Int'l [M-A]  
 Radio Dubai  
 Radio Moscow  
 Radio Netherlands Int'l  
 Radio New Zealand Int'l [M-F]\*  
 Voice of Nigeria  
**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  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Ghana [A-S]  
 Radio Japan  
 Radio Moscow  
 Radio Mozambique  
 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)  
 Voice of Israel  
 WYFR (Satellite Network) [M-A]  
**1103**  
 Radio Pyongyang  
**1110**  
 Radio Australia\*  
**1115**  
 Korean World News Service  
**1130**  
 Czech Republic  
 Radio Korea  
 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\*  
**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]  
**1240**  
 Voice of Greece  
**1254**  
 Radio France Int'l

**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**  
 Radiobrás [M-F]  
**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) (Special English)  
 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  
 BBC (as) [M-F]\*  
 China Radio Int'l  
 Christian Science Sentinel [A]  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Canada Int'l [S-F]  
 Radio France Int'l  
 Radio Ghana  
 Radio Japan  
 Radio Moscow  
 Radio Vlaanderen Int'l [M-A]  
 Voice of America (as)  
 Voice of Israel [S-H]  
 WWCR #1 [M-F]  
 WYFR (Satellite Network) [M-A]  
**1403**  
 Radio Korea  
**1408**  
 China Radio Int'l\*  
**1423**  
 Voice of Israel [S-H]  
**1424**  
 HCJB [M-F]  
**1430**  
 FEBC (Philippines)  
 Radio Canada Int'l [S]

Radio Finland  
 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 France Int'l [T]\*  
 Radio Romania Int'l [M]  
**1435**  
 Voice of Greece  
**1440**  
 FEBC (Philippines) [S-F]\*  
**1445**  
 BBC (as) [M-F] (Special English)  
 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  
 Radio Canada Int'l [S]  
 Radio Japan  
 Radio Jordan [A]  
 Radio Moscow  
 Radio Omdurman  
 Swiss Radio Int'l  
 Voice of America (as)  
 WHRI #2 [A]  
 WWCR #1 [M-F]  
**1503**  
 Radio Pyongyang  
**1505**  
 Radio Algiers [M]  
**1508**  
 China Radio Int'l\*  
**1525**  
 BBC (af) [S]\*  
 Radio Veritas [T-F]  
**1530**  
 All India Radio  
 Deutsche Welle [M-F]\*  
 FEBC (Philippines)  
 Radio Austria Int'l  
 Radio Moscow  
 Radio Netherlands Int'l  
 Radio Portugal Int'l [M-F]  
 Radio Tirana  
 Voice of Greece [M-A]  
 Voice of Nigeria [M-H]  
 WYFR (Satellite Network) [M-A]  
**1540**  
 Radio Veritas [A-M]  
**1545**  
 Korean World News Service  
**1555**  
 Radio Japan [M-T]  
 Radio Veritas [A-M]  
 Vatican Radio [S-W/A]

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

BBC  
 Channel Africa  
 China Radio Int'l  
 Christian Science Sentinel [A]  
 Czech Republic  
 Deutsche Welle  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Canada Int'l [S]  
 Radio France Int'l  
 Radio Jordan  
 Radio Korea  
 Radio Moscow  
 Radio Pakistan  
 Radio Tanzania  
 Voice of America (af) [A-S]  
 Voice of America (as)  
 Voice of Kenya  
 Voice of Nigeria [M-F]  
 WHRI #2 [A]  
 WWCR #3 [A]  
**1605**  
 Radio Yemen  
**1608**  
 China Radio Int'l\*  
**1609**  
 BBC\*  
**1611**  
 Radio France Int'l [T]\*  
**1630**  
 Radio Austria Int'l  
 Radio Canada Int'l  
 Radio Dubai  
 Radio Finland [M-F]  
 Radio Moscow  
 Voice of America (af) [S-F]  
 Voice of America (as) (Special English)  
**1652**  
 Radio France Int'l [M-F]

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

BBC  
 BBC (af)  
 BBC (as)\*  
 Channel Africa  
 China Radio Int'l  
 HCJB [M-F]  
 Monitor Radio Int'l [M-F]

Radio Australia  
 Radio Japan  
 Radio Jordan  
 Radio Moscow  
 Radio New Zealand Int'l [M-F]\*  
 Radio Pakistan  
 RTM Morocco [A]  
 Swiss Radio Int'l  
 Voice of America (af)  
 WRNO [M-F]  
**1703**  
 Radio Pyongyang  
**1708**  
 China Radio Int'l\*  
**1710**  
 Radio Australia\*  
**1715**  
 Korean World News Service  
 Radio Sweden [M-F]  
**1725**  
 Radio New Zealand Int'l [M-F]\*  
**1730**  
 Radio Moscow [S-F]  
 Radio Netherlands Int'l  
 Vatican Radio [F]  
 Voice of America (af) [A-S]  
**1740**  
 BBC (af)\*  
**1745**  
 All India Radio

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

All India Radio  
 BBC ("Newsdesk")  
 Christian Science Sentinel [A]  
 Monitor Radio Int'l [M-F]  
 Polish Radio  
 Radio Australia  
 Radio Moscow  
 Radio Mozambique  
 Radio New Zealand Int'l [M-F]\*  
 Radio Norway Int'l [S]  
 Radio Omdurman  
 Radio Tanzania  
 Voice of America (af)  
 Voice of Israel  
 Voice of Kenya  
 WWCR #1 [M-F]  
 WWCR #3 [M-F]  
**1805**  
 Radio New Zealand Int'l [M-F]\*  
**1830**  
 Radio Kuwait [M/H/A]  
 Radio Moscow

Radio Nacional de Venezuela [M-A]  
 Radio Netherlands Int'l  
 Radio Sweden [M-F]  
 Voice of America (af) [A-S] (Special English)  
 Voice of America (eu) (Special English)  
**1833**  
 Radio Bulgaria  
**1835**  
 Radio New Zealand Int'l [F]\*  
**1840**  
 Voice of Greece [M-A]  
**1855**  
 Radio New Zealand Int'l [M-H]\*  
**1857**  
 BBC (af) [M-F]\*

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

All India Radio [W]  
 BBC  
 China Radio Int'l  
 Christian Science Sentinel [A]  
 Deutsche Welle  
 HCJB  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Japan  
 Radio Moscow  
 Radio New Zealand Int'l [S-F]  
 Radio Portugal Int'l [M-F]  
 Radio Romania Int'l [T-S]  
 Radio Vlaanderen Int'l  
 Spanish National Radio  
 Voice of America (af) [S-F]  
 Voice of America (as)  
 Voice of Greece [M-A]  
 WHRI #1 [M-F]  
 WWCR #1 [M-F]  
 WWCR #3 [M-F]  
**1901**  
 Radio Romania Int'l [M]  
**1908**  
 China Radio Int'l\*  
**1910**  
 All India Radio [W]  
 Radio Australia [M-F]\*  
**1930**  
 BBC (af) [S]\*  
 Deutsche Welle [M-F]\*  
 R Slovakia Int'l  
 Radio Austria Int'l  
 Radio Finland [S-F]  
 Radio Moscow  
 Radio Netherlands Int'l  
 Radio Romania Int'l  
 Radio Yugoslavia  
 Voice of America (af) [S]  
**1935**  
 RAI Italy  
**1945**  
 Radio Yerevan  
**1955**  
 Radio Japan [M-W]

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

BBC  
 China Radio Int'l  
 Deutsche Welle  
 KVOH [A-S]  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Moscow  
 Radio New Zealand Int'l [S-F]  
 Radio Norway Int'l [S]  
 Radio Portugal Int'l [M-F]  
 Radio Riga Int'l [A-S]  
 Swiss Radio Int'l

Swiss Radio Int'l (eu)  
 Vatican Radio []  
 Voice of America (af)  
 Voice of Indonesia  
 Voice of Israel  
 Voice of Nigeria [M-F]  
 WHRI #1 [M-W/F]  
 WWCR #3 [M-A]  
**2003**  
 Radio Pyongyang  
**2008**  
 China Radio Int'l\*  
**2010**  
 Radio New Zealand Int'l [S-H]\*  
**2011**  
 Voice of Israel [W]\*  
**2024**  
 Voice of Israel [T]  
**2025**  
 RAI Italy  
**2028**  
 Voice of Israel [M]  
**2030**  
 HCJB [M-A]  
 Polish Radio  
 Radio Korea  
 Radio Moscow [A-S]  
**2031**  
 HCJB [S]  
**2045**  
 All India Radio [A]  
 Korean World News Service  
**2055**  
 Voice of Indonesia [M]

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

All India Radio  
 BBC ("Newshour")  
 China Radio Int'l  
 Deutsche Welle  
 KVOH [S]  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Damascus [F]  
 Radio Havana Cuba [M-A]  
 Radio Japan  
 Radio Moscow  
 Radio New Zealand Int'l [S-H]  
 Radio Romania Int'l  
 Spanish National Radio  
 Voice of America (as)  
 Voice of Turkey  
 WWCR #3 [M-A]  
**2103**  
 Radio Bulgaria  
**2105**  
 Radio Yemen  
**2108**  
 China Radio Int'l\*  
**2110**  
 Radio Damascus [S-M]  
 Radio New Zealand Int'l [S-W]\*  
**2112**  
 Radio Damascus [F]  
**2115**  
 BBC (ca) [M-F]\*  
**2120**  
 Radio Cairo  
**2130**  
 Radio Cairo  
 Radio Canada Int'l  
 Radio Havana Cuba [T]\*  
 Radio Moscow  
 Radio Nacional de Venezuela [M-A]  
 Radio Riga Int'l [M-F]  
 Radio Sweden [M-F]  
**2131**  
 Radio Havana Cuba [M/W/F]

**2145**

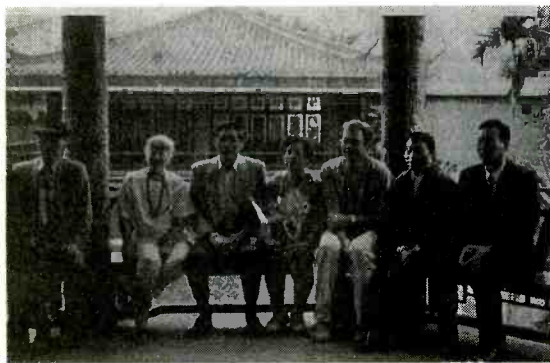
Radio Damascus [W]  
 Radio Korea

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

All India Radio [F-W]  
 BBC  
 China Radio Int'l  
 Christian Science Sentinel [A]  
 Czech Republic  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Budapest Int'l  
 Radio Canada Int'l  
 Radio Havana Cuba [M-A]  
 Radio Korea  
 Radio Moscow  
 Radio New Zealand Int'l  
 Radio Ukraine Int'l  
 Radio Vlaanderen Int'l [M-F]  
 Radio Yugoslavia  
 RAI Italy  
 Voice of America (as)  
 WWCR #3 [M-F]  
**2203**  
 Voice of Free China  
**2208**  
 China Radio Int'l\*  
**2209**  
 BBC\*  
**2215**  
 All India Radio [M/F]  
 Radio Cairo  
**2230**  
 Radio Finland [S-F]  
 Radio Havana Cuba [M-H]\*  
 Radio Moscow [S-F]  
 Radio Sweden [M-F]  
 Voice of America (as) (Special English)  
 Voice of Israel  
**2240**  
 Radio Cairo  
 Voice of Greece [S-F]  
**2242**  
 Voice of Israel [H]\*  
**2245**  
 Radio Yerevan  
**2248**  
 Radio Bulgaria

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

BBC  
 Christian Science Sentinel [A]  
 Monitor Radio Int'l [M-F]  
 Radio Australia  
 Radio Canada Int'l  
 Radio Japan  
 Radio Moscow  
 Radio New Zealand Int'l  
 Radio Norway Int'l [S]  
 Radio Tirana  
 Voice of America (as)  
 Voice of Turkey  
 WWCR #3 [M-A]  
**2303**  
 Radio Pyongyang  
**2330**  
 Radio Austria Int'l  
 Radio Moscow  
 Radio Netherlands Int'l  
 Radio New Zealand Int'l [S-H]  
 Radio Sweden [M-F]  
 SLBC (Sri Lanka) [M]  
**2335**  
 Voice of Greece [S-F]  
**2345**  
 Radio Yerevan  
**2355**  
 Radio Japan [M-W]



Gigi Lytle, Lubbock, TX, sent us this photo of the 1993 China Radio Int'l Hainan Cup Winners on their trip to China (l-r): Hiroji Hirai, Japan; Gigi Lytle, USA; Suchart Hirankanokkul, Thailand; Leung King Ying, Hong Kong; Fritz Andorff, Germany; Zhang Zhenhua, New Director of CRI; Chen Min Ying, Asst. Director (not pictured is the winner from Morocco)



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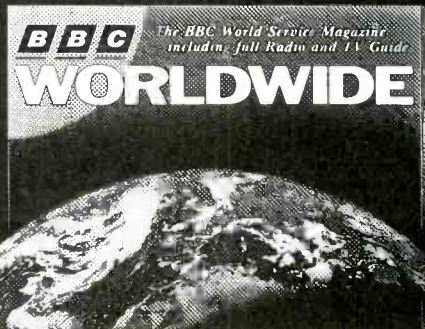
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 Memory: 70 Channels  
 Banks: 7 (10 channels each)  
 Clock: Dual mode 24 hour with timer  
 Audio Output Power: 2 W @ 5% THD into 4 ohms  
 Conversion Scheme: Double up-conversion  
 Sensitivity: 0.5 uV or better  
 Selectable Attenuator: 20 dB  
 Image Rejection: 70 dB or better  
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**BBC WORLD SERVICE**

**FREQUENCIES**

0000-0100	Australia, Radio	13605as	15320pa	15365pa	15510as
0000-0100 vl	Australia, VL8A Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T 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, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	Canada, RCI Montreal	5960na	5995eu	7250eu	9755na
0000-0100	China, China Radio Intl	9780na	11715na		
0000-0100	Costa Rica, AWR Alajuela	9725ca	11870ca		
0000-0100	Cuba, Radio Havana Cuba	6010na	9815na		
0000-0027	Czech Rep., Radio Prague	5930na	7345na		
0000-0045	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
0000-0100	Lebanon, King of Hope	6280me			
0000-0100	Lebanon, Wings of Hope	11530me			
0000-0100 vl	Malaysia, RTM Kota Kinaba	5980do			
0000-0100 vl	Malaysia, RTM Sarawak	4950do	7160do		
0000-0030	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15115pa			
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 vl	Papua New Guinea, NBC	9675do			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100	Russia, Radio Moscow Intl	7165na	7180af	7195am	9860na
		9885am	11675am	11790am	11970as
		12050na	15425am	17570as	17610as
		17690na	17890as	21480na	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	17775am			
0000-0100	USA, KWHR Naalehu HI	17555as			
0000-0100	USA, Monitor Radio Intl	5850na	9430ca		
0000-0100	USA, VOA Washington DC	5995am	6130ca	7215as	7405am
		9455ca	9770as	9775am	11580am
		11695ca	11760as	15120am	15185as
		15205am	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	13845am	
0000-0100	USA, WYFR Okeechobee FL	6085na			
0030-0100	Australia, Radio	11720pa	11880pa	13605as	15240pa
		15365pa	15510as	17795pa	17880as
		21740pa			
0030-0055	Belgium, R Vlaanderen Int	5900na	9930sa		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	9022na	11790na	15260na	
0030-0100	Netherlands, Radio	6020na	6165na	7305as	9840na
		9860as	11655na		
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	Sweden, Radio	6065sa	9850sa		

**SELECTED PROGRAMS**

**Sundays**

- 0000 BBC: Newsdesk. World News and dispatches from over seas and UK correspondents.
- 0000 WEWN: Catholic Beliefs and Practices.
- 0010 Radio Havana Cuba: National News. News about Cuba.
- 0015 Radio Havana Cuba: Latin America Newslines. News from the countries of Central and South America.
- 0030 BBC: Play of the Week. Exchange (20th, 90 min). Translation of a Russian play first produced in 1976 about life in a one-room flat in Moscow.
- 0030 BBC: The John Dunn Show (6th, 13th, 27th). A melodic mix of songs old and new.
- 0030 Radio Havana Cuba: The World of Stamps. Philatelic news for collectors.
- 0030 Radio Sweden: People and Ideas. A magazine program about the Swedish people and the arts.
- 0030 WEWN: Fr. Ray Shares His Love.
- 0038 Radio Havana Cuba: Feature Report. In-depth coverage of a news item from another country of the hemisphere.

**Mondays**

- 0000 BBC: Newsdesk. See S 0000.
- 0000 WEWN: Life in the Holy Spirit.
- 0006 Radio Havana Cuba: Cuba Today. A slice of life in Havana.

- 0015 BBC: Music Feature The Dance Selection (28th). See S 0445.
- 0017 Radio Havana Cuba: Mailbag Show. Listener letters and E-mail are reviewed and answered.
- 0028 WEWN: Christ in My Life.
- 0030 BBC: In Praise of God. Weekly programme of worship and meditation.
- 0030 Radio Havana Cuba: Breakthrough. See S 2330.
- 0030 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
- 0030 Radio Sweden: Sounds Nordic (biweekly). See S 1230.

**Tuesdays**

- 0000 BBC: Newsdesk. See S 0000.
- 0000 WEWN: Truth of Salvation.
- 0010 Radio Havana Cuba: National News. See S 0010.
- 0015 BBC: Commemorative Series. Alexis Korner's Rhythm 'N Blues (29th). See S 0415.
- 0015 Radio Havana Cuba: Spotlight on the Americas. Comments by the RHC editorial desk.
- 0028 WEWN: Old Testament Prophets.
- 0035 Radio Havana Cuba: Feature Report. See S 0038.

**Wednesdays**

- 0000 BBC: Newsdesk. See S 0000.
- 0000 WEWN: The Ministry of Angels.
- 0010 Radio Havana Cuba: National News. See S 0010.
- 0015 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0028 WEWN: Profiles in Greatness.
- 0030 BBC: Omnibus. Each week a half-hour programme on practically any topic under the sun.
- 0035 Radio Havana Cuba: DXers Unlimited. Arnie Coro discusses the technical aspects of shortwave listening.
- 0044 Radio Sweden: Media Scan. See T 1244.
- 0050 Radio Havana Cuba: Feature Report. See S 0038.

**Thursdays**

- 0000 BBC: Newsdesk. See S 0000.
- 0000 WEWN: God Bless.
- 0010 Radio Havana Cuba: National News. See S 0010.
- 0015 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0028 WEWN: Mercy Our Mission.
- 0030 BBC: Special Feature. Accidents Will Happen (10th, 17th, 24th). See W 1530.
- 0035 Radio Havana Cuba: Feature Report. See S 0038.

**Fridays**

- 0000 BBC: Newsdesk. See S 0000.
- 0000 WEWN: The Apostles Creed.
- 0010 Radio Havana Cuba: National News. See S 0010.
- 0028 WEWN: Basic Steps in the Christian Journey.
- 0030 BBC: Music Feature. Conductors at Work. NEW! Five conductors, specializing in different areas of music, attempt to answer questions about their profession.
- 0035 Radio Havana Cuba: Feature Report. See S 0038.

**Saturdays**

- 0000 BBC: Newsdesk. See S 0000.
- 0000 WEWN: Seed of Abraham.
- 0013 Radio Havana Cuba: Spotlight on Latin America. Editorial comments on events in the region.
- 0015 Radio Havana Cuba: Cuba Today. See M 0006.
- 0028 WEWN: Windows on Heaven.
- 0030 BBC: From The Weeklies. Review of the British weekly press.
- 0035 Radio Havana Cuba: The Way We See It. Survey of editorial opinion.
- 0040 Radio Havana Cuba: Kaleidoscope. See T 0142.
- 0045 BBC: The Learning World. See M 0615.

**Thank You...**

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

**John Babbis, Silver Springs, MD; Patrick Barry, Mission Viejo, CA; Bob Fraser, Cohasset, MA; Clyde Harmon, Anniston, AL; Stephen Hunter, Drexel Hill, PA; LeRoy Long, Edmond, OK; Gigi Lytle, Lubbock, TX; Roy Rogers, Vancouver BC, Canada; Ed Savage, Mt. Home, AR; John Sedlacek, Omaha, NE; Dan Smith-N2PTF, Morrisonville, NY; Robert E. Thomas, Bridgeport, CT; Errol Urbelis, Kings Park, NY; Russell F. Walker, McMurray, PA; NASWA Journal, BBC Summary of World Broadcasts, Grove BBS, Internet via Larry Van Horn.**



## FREQUENCIES

0100-0200	Australia, AAF Radio	13525af			
0100-0200	Australia, Radio	11720pa	11800pa	15240pa	15320pa
		15365pa	15510as	17530as	17715pa
		17750as	17795pa	17980as	21595as
		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, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
0100-0200	Cuba, Radio Havana Cuba	6010na	9815na		
0100-0127	Czech Rep, Radio Prague	7345na			
0100-0200	Ecuador, HCBJ Quito	9745am	15155am	17490am	21455am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6120na	6145na
		965na	9670na	9700na	
0100-0200 mwf	Guam, KSDA AWR Agat	15610as			
0100-0200	Indonesia, Voice of	9675as	11752as		
0100-0130	Iran, VOIRI Tehran	9022na	11790na	15260na	
0100-0120	Italy, RAI Rome	6005na	7275na	11800na	
0100-0200	Japan, NHK/Radio	11860as	15195as	17775as	17810as
		17845as			
0100-0130	Laos, National Radio of	7116as			
0100-0200	Lebanon, King of Hope	6280me			
0100-0200	Netherlands, Radio	7305as	9860as		
0100-0125	Netherlands, Radio	6020na	6165na	9840na	11655na
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0200 vl	Papua New Guinea, NBC	9675do			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200	Russia, Radio Moscow Intl	7150na	7165na	7180na	9620na
		9675me	9685au	9725me	9755me
		9775me	9885me	11675am	11875as
		12050na	15425na	17570na	17890as
		21480na			
0100-0130	Serbia, Radio Yugoslavia	6190na			

0100-0200	Singapore, SBC Radio One	5010do	5052do	11940do	
0100-0200	South Korea, Radio Korea	7550na	15575na		
0100-0200	Spain, Spanish Natl Radio	9540na			
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0100-0200	Sweden, Radio	11695as	9695au		
0100-0130	Switzerland, Swiss R Intl	6135am	9885am	17740am	
0100-0200	Thailand, Radio	4830as	9655as	11905as	
0100-0200	Ukraine, R Ukraine Intl	4825na	6010na	7195eu	7205eu
		7240eu	9505na	9685na	9745na
		9860na	10344na		
0100-0200	United Kingdom, BBC London	5975na	6175na	6180na	7325na
		9590na	9915sa	11750sa	11955sa
		15260sa	15280as	15310as	15360as
		17790as	21715na		
0100-0200	USA, KCBI Dallas TX	13740na			
0100-0200	USA, KTVB Salt Lk City UT	7510na			
0100-0200	USA, KVOH Los Angeles CA	17775am			
0100-0200	USA, KWHR Naalehu HI	17555as			
0100-0200	USA, Monitor Radio Intl	5850na	9430ca		
0100-0200	USA, VOA Washington DC	5995am	6130am	7115as	7205as
		7405am	9455am	9740as	9775am
		11580am	11705as	15120am	15205as
		17740as	21550as		
0100-0200	USA, WEWN Birmingham AL	7425na	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, WWCR Nashville TN	5810am	5935am	7435am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na	15440na	
0100-0130	Uzbekistan, R Tashkent	9540as	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	5970na	9380na	9420na	
0130-0200	Netherlands, Radio	9845as	9860as	11655as	
0130-0200	USA, WHRI Noblesville IN	7315am			
0145-0200	Vatican State, Vatican R	5975as	9650as		

## SELECTED PROGRAMS

### Sundays

- 0100 BBC: News Summary. One minute news update.
- 0100 WEWN: Mother Angelica Live (encore).
- 0101 BBC: Play of the Week. A Wing and a Prayer (13th). A woman reassesses her comfortable life after a tragic death and an unexpected phone call. The Pipsqueak (27th). A science fiction tale which was nominated by the Writers' Guild as one of the best radio plays of 1993. You May Leave, The Show is Over (6th). A repeat of last year's winner of the BBC's playwriting competition.
- 0110 Radio Havana Cuba: National News. See S 0010.
- 0115 Radio Havana Cuba: Latin America Newline. See S 0015.
- 0130 Radio Sweden: People and Ideas. See S 0030.

### Mondays

- 0100 BBC: News Summary. See S 0100.
- 0100 WEWN: The Kingdom.
- 0101 BBC: Special Feature. An Ice Cream Sundae (28th). NEW! The truth behind the story of ice cream and who is winning the marketing war today.
- 0101 BBC: Special Feature. Music to Measure (14th). NEW. The evolution of the technology of the recording of music. The Dammed (21st). NEW. Tracing the history of the superdams. Writing the Life (7th). NEW! The story behind the popularity of biographical Books.
- 0128 WEWN: Praise the Lord with Fr. McDonagh.
- 0130 Radio Havana Cuba: Breakthrough. See S 2330.
- 0130 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
- 0130 Radio Sweden: Sounds Nordic (biweekly). See S 1230.
- 0135 Radio Havana Cuba: From Havana. A Sunday cultural showcase.
- 0145 BBC (as): South Asia Report. See S 0315.
- 0145 BBC: Music Feature. Top Scores. Concluding a series on arrangers/conductors with Nelson Riddle (7th), Conrad Salinger (14th), Andrew Lloyd Weber/David Cullen (21st), and Quincy Jones (28th).

### Tuesdays

- 0100 BBC: World News. See S 0300.
- 0100 WEWN: Mother Angelica Live (encore).

- 0105 BBC: Outlook. See M 1405.
- 0110 Radio Havana Cuba: National News. See S 0010.
- 0115 Radio Havana Cuba: Latin America Newline. See S 0015.
- 0130 BBC: Folk Routes. Ian Anderson extends the range of folk music to include country, cajun and blues.
- 0142 Radio Havana Cuba: Kaleidoscope. An arts magazine program.
- 0145 BBC (as): South Asia Report. See S 0315.
- 0145 BBC: Health Matters. Keeps track of new developments in the world of medical science, as well as ways of keeping fit.

### Wednesdays

- 0100 BBC: World News. See S 0300.
- 0100 WEWN: Mother Angelica Live.
- 0105 BBC: Outlook. See M 1405.
- 0110 Radio Havana Cuba: National News. See S 0010.
- 0115 Radio Havana Cuba: Latin America Newline. See S 0015.
- 0130 BBC: Special Feature. What's News?. Sarah Ward and the crew unravel major news stories and tackle the issues behind the headlines.
- 0140 Radio Havana Cuba: Be My Guest. Interviewing a visitor to Cuba.

- 0144 Radio Sweden: Media Scan. See T 1244.
- 0145 BBC (as): South Asia Report. See S 0315.
- 0145 BBC: Country Style. With David Allan.

### Thursdays

- 0100 BBC: World News. See S 0300.
- 0100 WEWN: Mother Angelica Live.
- 0105 BBC: Outlook. See M 1405.
- 0110 Radio Havana Cuba: National News. See S 0010.
- 0115 Radio Havana Cuba: Latin America Newline. See S 0015.
- 0130 BBC: Waveguide. See W 0415.
- 0140 BBC: Book Choice. See W 0425.
- 0140 Radio Havana Cuba: Feature Report. See S 0038.
- 0145 BBC (as): South Asia Report. See S 0315.
- 0145 BBC: The Farming World. Reports on new developments from around the world.

### Fridays

- 0100 BBC: World News. See S 0300.
- 0100 WEWN: Mother Angelica Live (encore).
- 0105 BBC: Outlook. See M 1405.
- 0110 Radio Havana Cuba: National News. See S 0010.
- 0115 Radio Havana Cuba: Latin America Newline. See S 0015.
- 0130 BBC: On the Move. A weekly program about travel and transport with Malcolm Billings.
- 0140 Radio Havana Cuba: Feature Report. See S 0038.
- 0145 BBC (as): South Asia Report. See S 0315.
- 0145 BBC: Global Concerns. Update on environmental issues.

### Saturdays

- 0100 BBC: World News. See S 0300.
- 0100 WEWN: Mother Angelica Live (encore).
- 0105 BBC: Outlook. See M 1405.
- 0130 BBC: Feature. Seeing Stars. (5th). See S 0430.
- 0130 BBC: Short Stories (12th, 19th, 26th). See S 0430.
- 0135 Radio Havana Cuba: Feature Report. See S 0038.
- 0145 BBC (as): South Asia Report. See S 0315.
- 0145 BBC: Jazz Now and Then. George Reid presents a mixture of jazz for all ages.



## FREQUENCIES

0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, Radio	11880pa	15320pa	15365pa	15510as
		17630as	17715pa	17750as	17795pa
		17880as	21525as	21595as	21740pa
0200-0300 vl	Australia, VL8A Alice Spg	4835do			
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6120na	9535am	9755na	11845na
		11940am			
0200-0300	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
0200-0300	Cuba, Radio Havana Cuba	6010na	9510na		
0200-0300	Ecuador, HCBJ Quito	9745am	15155am	17490am	21455am
0200-0300	Egypt, Radio Cairo	9475na	11600na		
0200-0250	Germany, Deutsche Welle	6035as	6130as	7265as	7285as
		7355as	9615as	9690as	9815as
		11865as	11945as		
0200-0300 as	Guam, KSDA AWR Agat	13720as			
0200-0300	Guam, KSDA AWR Agat	9835as			
0200-0300	Hungary, Radio Budapest	5970na	9835na	11910na	15220na
0200-0230 mtwhfa	Kenya, Kenya BC Corp	4935do			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0230	Myanmar, Radio	7185do			
0200-0300	Netherlands, Radio	9845as	9860as	11655as	
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0230 m	Norway, Radio Norway Intl	6120na	7165as		
0200-0300 vl	Papua New Guinea, NBC	9675do			
0200-0230 mtwtf	Philippines, FEBC Manila	15420as			
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0200-0300	Russia, Radio Moscow Intl	5940am	7150na	7165na	7180na
		9620na	9775af	11875as	12050na
		15425na	17570as	17610as	17655au
		17780af	17890as	21480na	21770au
0200-0230	Serbia, Radio Yugoslavia	6190na			
0200-0300	Singapore, SBC Radio One	5010do	5052do	11940do	
0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0200-0300	Taiwan, VO Free China	5950na	9680na	9765au	11740ca
		11860as	15345na		
0200-0300	Thailand, Radio	4830as	9655as	11905as	
0200-0300	United Kingdom, BBC London	5975na	6175na	6195me	7135me
		7155me	7325me	9410eu	9590na
		9630af	9915am	11705sa	11730af
		11750sa	11955me	15260sa	17790as
0200-0230	USA, KCBI Dallas TX	13740am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0230	USA, KVOH Los Angeles CA	17775am			
0200-0300	USA, KWHR Naalehu HI	17510as			
0200-0300	USA, Monitor Radio Intl	5850na	9430ca		
0200-0230 twhfa	USA, VOA Washington DC	5995sa	7115as	7405sa	9775ca
		11580sa	15120sa	15205sa	
0200-0300	USA, VOA Washington DC	7205as	11705as	15160sa	15250as
		17740as	21550sa		
			9825me		
0200-0300	USA, WEWN Birmingham AL	7425na			
0200-0300	USA, WHRI Noblesville IN	7315na			
0200-0300	USA, WINB Red Lion PA	15145eu			
0200-0300	USA, WJCR Upton KY	7490na		13595na	
0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300	USA, WWCR Nashville TN	5810am	5935am	7435am	
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na	15440na	
0215-0255	Nepal, Radio	3230do	5005do	7165do	
0230-0245	Albania, R Tirana Intl	9580na	11840na		
0230-0300 s	Kenya, Kenya BC Corp	4935do			
0230-0245	Pakistan, Radio	9515as	15190as	17705as	21730as
0230-0300	Philippines, R Pilipinas	17760as	17840as	21580as	
0230-0300 mtwhf	Portugal, Radio	9555na	9570na	9600na	9705na
0230-0300	Sweden, Radio	6195na	9850na		
0245-0300	United Kingdom, BBC London	6110sa	9515sa	9895sa	11965sa
		15390sa			
0250-0300	Vatican State, Vatican R	6095na	7305na		

## SELECTED PROGRAMS

### Sundays

- 0200 BBC: Newsdesk. See S 0000.
- 0200 WEWN: Mariology.
- 0210 Radio Havana Cuba: National News. See S 0010.
- 0215 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0216 Voice of Free China: Main Roads and Byways. Hop a tour bus to a Taiwan attraction.
- 0228 WEWN: The Church and Society.
- 0230 BBC: Special Feature. The Art of Travel (6th,13th). Talks with two travellers: driving an old car through Russia in 1980; taking a survey in the mountains of Nyasaland in 1949.
- 0230 BBC: Special Feature. Feature. Black Pearls"(27th). NEW! Threats to the world's most highly priced food: caviar.
- 0230 BBC: Special Feature. Feature. Iceman (20th). NEW! Story of the Discovery of the 5,300 year old body of a man frozen in a glacier.
- 0230 Radio Havana Cuba: The World of Stamps. See S 0030.
- 0230 Radio Sweden: People and Ideas. See S 0030.
- 0231 Voice of Free China: Mailbag Time. Letters from listeners and music requests.
- 0238 Radio Havana Cuba: Feature Report. See S 0038.
- 0248 Voice of Free China: Let's Learn Chinese. Chinese lessons with commentary and translation in English.

### Mondays

- 0200 BBC: Newsdesk. See S 0000.
- 0206 Radio Havana Cuba: Cuba Today. See M 0006.
- 0216 Voice of Free China: Jade Bells and Bamboo Pipes. Chinese folk and temple music.
- 0217 Radio Havana Cuba: Mailbag Show. See M 0017.
- 0228 WEWN: Holy Hour.
- 0230 BBC: Composer of the Month. Gustav Holtz (of The Planets fame) is featured during March.
- 0230 Radio Havana Cuba: Breakthrough. See S 2330.
- 0230 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
- 0230 Radio Sweden: Sounds Nordic (biweekly). See S 1230.
- 0247 Voice of Free China: Let's Learn Chinese. See S 0248.

### Tuesdays

- 0200 BBC: Newsdesk. See S 0000.
- 0200 WEWN: The Truth Will Set You Free.
- 0210 Radio Havana Cuba: National News. See S 0010.
- 0215 Radio Havana Cuba: Spotlight on the Americas. See T 0015.
- 0216 Voice of Free China: Kaleidoscope. Spotlight on life in Taiwan.
- 0228 WEWN: Mary's Offspring.
- 0230 BBC: Quiz. See M 1215.
- 0232 Voice of Free China: Taiwan Economic Journal. Focus on a topic dealing with business
- 0235 Radio Havana Cuba: Feature Report. See S 0038.
- 0246 Radio Portugal: Visitors' Notebook. See M 1546.
- 0247 Voice of Free China: Let's Learn Chinese. See S 0248.

### Wednesdays

- 0200 BBC: Newsdesk. See S 0000.
- 0200 WEWN: Tree of Life.
- 0210 Radio Havana Cuba: National News. See S 0010.
- 0215 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0216 Voice of Free China: Music Box. Some of the popular music of Taiwan.
- 0228 WEWN: Faith Makes You Whole.
- 0230 BBC: Development '94. Aid and development issues.
- 0235 Radio Havana Cuba: DXers Unlimited. See W 0035.
- 0244 Radio Sweden: Media Scan. See T 1244.
- 0246 Radio Portugal: Musical Kaleidoscope. See T 1546.
- 0247 Voice of Free China: Let's Learn Chinese. See S 0248.
- 0250 Radio Havana Cuba: Feature Report. See S 0038.

### Thursdays

- 0200 BBC: Newsdesk. See S 0000.
- 0200 WEWN: Proverbs: A Blueprint for Living.
- 0210 Radio Havana Cuba: National News. See S 0010.
- 0215 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0215 Voice of Free China: Perspectives. Issues facing the lives and conversations of Taiwanese people.
- 0228 WEWN: Friends with Jesus.
- 0230 BBC: Sports International. Live commentaries and inter

views, features and discussions.

- 0230 Voice of Free China: Journey into Chinese Culture. Conversation about a particular cultural activity in Taiwan.
- 0235 Radio Havana Cuba: Feature Report. See S 0038.
- 0245 Radio Sweden: Money Matters. See W 1249.
- 0246 Radio Portugal: Challenge of the '90s. See W 1546.
- 0249 Voice of Free China: Let's Learn Chinese. See S 0248.

### Fridays

- 0200 BBC: Newsdesk. See S 0000.
- 0200 WEWN: Winners for Christ.
- 0210 Radio Havana Cuba: National News. See S 0010.
- 0216 Voice of Free China: People. Biographical sketch of a typical Taiwanese.
- 0228 WEWN: University in the Sky.
- 0230 BBC: Thirty-Minute Drama.
- 0232 Radio Portugal: Spotlight on Portugal. See H 1542.
- 0235 Radio Havana Cuba: Feature Report. See S 0038.
- 0235 Voice of Free China: New Record Time. The latest releases of the popular music of Taiwan.
- 0247 Voice of Free China: Let's Learn Chinese. See S 0248.

### Saturdays

- 0200 BBC: Newsdesk. See S 0000.
- 0200 WEWN: La Verité Vous Libereira.
- 0210 Radio Havana Cuba: Spotlight on Latin America. See A 0013.
- 0215 Radio Havana Cuba: Cuba Today. See M 0006.
- 0216 Voice of Free China: Reflections. See S 0316.
- 0230 BBC: People and Politics. Background to the British political scene.
- 0232 Voice of Free China: Jade's Kitchen. See S 0332.
- 0235 Radio Havana Cuba: The Way We See It. See A 0035.
- 0236 Radio Portugal: Mailbag (triweekly). See F 1536.
- 0240 Radio Havana Cuba: Kaleidoscope. See T 0142.
- 0248 Radio Portugal: Collector's Corner (triweekly). See F 1548.
- 0248 Radio Portugal: Radio Portugal DX (triweekly). See F 1548.
- 0249 Voice of Free China: Let's Learn Chinese. See S 0248.



## FREQUENCIES

0300-0400	Australia, Radio	11720pa 15365pa 17795pa 21740pa	11880pa 15510as 17880as	15240pa 17715pa 21525as	15320pa 17750as 21595as	0300-0400	S Africa, Channel Africa	9755me 17655as 5960af	9760me 17780af 9730af	12050na 21480na	15425na 21690as
0300-0400 vl	Australia, VL8A Alice Spg	4835do				0300-0400	Singapore, SBC Radio One	5010do	5052do	11940do	
0300-0400 vl	Australia, VL8K Katherine	5025do				0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Australia, VL8T Tent Crk	4910do				0300-0400	Taiwan, VO Free China	5950na 15345na	9680na	9765au	11740as
0300-0400	Bahrain, Radio	6010do				0300-0400	Thailand, Radio	9655as	11905as		
0300-0330 mtwtf	Canada, CanForce Network	6000eu	9725eu			0300-0400 vl	Uganda, Radio	4976do			
0300-0400	Canada, CFCX Montreal	6005do				0300-0330	United Kingdom, BBC London	7155me 15380as	11750sa	15260sa	15310as
0300-0400	Canada, CFRX Toronto	6070do				0300-0400	United Kingdom, BBC London	3255af	5975na	6005af	6175na
0300-0400	Canada, CFPV Calgary	6030do						6180eu	6195eu	7230eu	7325na
0300-0400	Canada, CHNX Halifax	6130do						9410eu	9600af	9630af	9915am
0300-0400	Canada, CKZN St John's	6160do						11730af	11760me	11955me	12095ca
0300-0400	Canada, CKZU Vancouver	6160do						15310me	15420af	21715as	
0300-0400	Canada, RC1 Montreal	6010am	9725am	9755am		0300-0400	USA, KCBI Dallas TX	9815am			
0300-0400	China, China Radio Intl	9690na	9780na	11715na		0300-0400	USA, KTNB Salt Lk City UT	7510am			
0300-0400	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am	0300-0400	USA, KVOH Los Angeles CA	9785am			
0300-0400	Costa Rica, Faro del Carib	5055do				0300-0400	USA, KWHR Naalehu HI	17510as			
0300-0400	Cuba, Radio Havana Cuba	6010na	9510na			0300-0400	USA, Monitor Radio Intl	5850na			
0300-0327	Czech Rep, Radio Prague	5930na	7345na			0300-0400	USA, VOA Washington DC	7105af 9575af	7265af	7280af	7405af
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am			9885af	11965af		
0300-0330	Egypt, Radio Cairo	9475na	11600na			0300-0400	USA, WEWN Birmingham AL	7425am			
0300-0350	Germany, Deutsche Welle	6045na 9545na	6085na 9640na	6120na	9535na	0300-0400	USA, WHRI Noblesville IN	7315na			
		3300do				0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	Guatemala, Radio Cultural	5970am	9835am	11910am	15220am	0300-0400	USA, WRNO New Orleans LA	7355am			
0300-0400	Hungary, Radio Budapest	5960am	11875na	11385am	15210am	0300-0400	USA, WWCR Nashville TN	5810am	5935am	7435am	
0300-0400	Japan, NHK/Radio	15230am	15325am	17810am	21610am	0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
		4935do				0300-0315	Vatican State, Vatican R	6095na	7305na		
0300-0400	Kenya, Kenya BC Corp	11530me				0315-0330 sh	Greece, Voice of	5970na	9380na	9420na	
0300-0400 mtwhf	Lebanon, Wings of Hope	7295do				0315-0345	Vatican State, Vatican R	9695af	11625af		
0300-0400 smtwh	Malaysia, RTM Radio 4	7105am	9860as	11655as		0330-0400	Austria, R Austria Intl	9870sa	13730sa		
0300-0400 smtwt s	Moldova, R Dnestr Intl	9845as				0330-0357	Czech Rep, Radio Prague	5930eu	7345eu	9440eu	
0300-0325	Netherlands, Radio	15115pa				0330-0400	Netherlands, Radio	6165na	9590na		
0300-0400	New Zealand, R NZ Intl	6115na				0330-0400	Sweden, Radio	6195na	9850na		
0300-0330 m	Norway, Radio Norway Intl	9675do				0330-0400	UAE, Radio Dubai	11945na 21485na	13675na	15400eu	17890eu
0300-0400 vl	Papua New Guinea, NBC	17760as	17840as	21580as				5970na	9380na	9420na	
0300-0330	Philippines, R Pilipinas	5940am	7150na	7165na	7180na	0340-0350	Greece, Voice of	7105na	10344na	17605na	17690na
0300-0400	Russia, Radio Moscow Intl					0345-0400	Armenia, Radio Yerevan	7245as			
						0345-0400	Tajikistan, Radio				

## SELECTED PROGRAMS

### Sundays

- 0300 BBC: World News. Broadcast on the hour.
- 0300 Radio Budapest Intl: News.
- 0309 BBC: British News. Also during Newsdesk (:20) and Newshour (:40).
- 0310 Radio Havana Cuba: National News. See S 0010.
- 0315 BBC (af): South Asia Report. Regional daily current affairs program.
- 0315 BBC: Sports Roundup. The latest sports news.
- 0315 Radio Budapest Intl: Jubilate Europa (13th, 20th, 27th). Featured events from the Budapest Spring Festival.
- 0315 Radio Budapest Intl: Gateway (6th).
- 0315 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0316 Voice of Free China: Reflections. The best of Chinese literature.
- 0330 BBC (af): African News. Five minutes of news about Africa.
- 0330 BBC: From Our Own Correspondent. See W 2315.
- 0330 Radio Sweden: People and Ideas. See S 0030.
- 0332 Voice of Free China: Jade's Kitchen. Jade Lim presents the secrets to good Chinese cooking.
- 0335 BBC (af): Postmark Africa. Expert answers to any question under the sun.
- 0347 Voice of Free China: Let's Learn Chinese. See S 0248.
- 0350 BBC: Write On. Air your views about World Service: write to PO Box 76, Bush House, Strand, London WC2B 4PH.
- 0351 Radio Budapest Intl: DX News.

### Mondays

- 0300 BBC: World News. See S 0300.
- 0300 Radio Budapest Intl: News.
- 0309 BBC: British News. See S 0309.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 Radio Budapest Intl: Behind the Legend (21st). The Kossuth Centenary.
- 0315 Radio Budapest Intl: The Holocaust in Hungary (28th). This program marks the 50th anniversary of the occupation of Hungary by Nazi Germany and the beginning of the deportation to Nazi concentration camps of Hungarian Jews.
- 0316 Voice of Free China: Main Roads and Byways. See S 0216.
- 0330 BBC (af): African News. See S 0330.
- 0330 BBC: Anything Goes. See S 1430.
- 0330 Radio Budapest Intl: Bookshelf. The works of Hungarian authors are reviewed.
- 0330 Radio Havana Cuba: Breakthrough. See S 2330.
- 0330 Radio Sweden: In Touch with Stockholm (biweekly). Sounds Nordic (biweekly). See S 1230.
- 0332 Voice of Free China: Mailbag Time. See S 0231.
- 0333 BBC (af): Network Africa. Breakfast show of news, sport, personalities, music, and listener's comments.

- 0335 Radio Havana Cuba: From Havana. See M 0135.
- 0347 Voice of Free China: Let's Learn Chinese. See S 0248.

### Tuesdays

- 0300 BBC: World News. See S 0300.
- 0300 Radio Budapest Intl: Newsroom.
- 0309 BBC: British News. See S 0309.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 Radio Budapest Intl: Sports.
- 0316 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0316 Voice of Free China: Jade Bells and Bamboo Pipes. See M 0216.
- 0330 BBC (af): African News. See S 0330.
- 0330 BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.
- 0330 Radio Budapest Intl: Concert Hall.
- 0333 BBC (af): Network Africa. See M 0333.
- 0342 Radio Havana Cuba: Kaleidoscope. See T 0142.
- 0348 Voice of Free China: Let's Learn Chinese. See S 0248.

### Wednesdays

- 0300 BBC: World News. See S 0300.
- 0300 Radio Budapest Intl: News, Comment, Press Review.
- 0309 BBC: British News. See S 0309.
- 0310 Radio Havana Cuba: National News. See S 0010.
- 0311 Radio Budapest Intl: Expo (2nd). News and developments related to Budapest Expo '96. Poems of 1848 (16th). Sciences (9th); The Hungarian Resistance (23rd). The men and women who chose to fight the Nazi Occupation.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0316 Voice of Free China: Kaleidoscope. See T 0216.
- 0330 BBC (af): African News. See S 0330.
- 0330 BBC: Discovery. In-depth look at scientific research.
- 0330 Radio Budapest Intl: Hit List.
- 0332 V of Free China: Taiwan Economic Journal. See T 0232.
- 0333 BBC (af): Network Africa. See M 0333.
- 0340 Radio Havana Cuba: Be My Guest. See W 0140.
- 0344 Radio Sweden: Media Scan. See T 1244.
- 0347 Voice of Free China: Let's Learn Chinese. See S 0248.
- 0351 Radio Budapest Intl: DX News.

### Thursdays

- 0300 BBC: World News. See S 0300.
- 0300 Radio Budapest Intl: Newsroom.
- 0309 BBC: British News. See S 0309.
- 0310 Radio Havana Cuba: National News. See S 0010.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 Radio Budapest Intl: The Weeklies.

- 0315 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0316 Voice of Free China: Music Box. See W 0216.
- 0330 BBC (af): African News. See S 0330.
- 0330 BBC: Assignment. A weekly examination of a topical issue.
- 0330 Radio Budapest Intl: Schooltime in Hungary. Education in Hungary from the viewpoint of a foreigner.
- 0333 BBC (af): Network Africa. See M 0333.
- 0340 Radio Havana Cuba: Feature Report. See S 0038.
- 0345 Radio Sweden: Money Matters. See W 1249.
- 0347 Voice of Free China: Let's Learn Chinese. See S 0248.
- 0353 Radio Budapest Intl: DX World.

### Fridays

- 0300 BBC: World News. See S 0300.
- 0300 Radio Budapest Intl: News, Comment, Press Review.
- 0309 BBC: British News. See S 0309.
- 0310 Radio Havana Cuba: National News. See S 0010.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 Radio Budapest Intl: As We See It. Political parties in Hungary.
- 0315 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0316 Voice of Free China: Perspectives. See H 0215.
- 0330 BBC (af): African News. See S 0330.
- 0330 BBC: Focus on Faith. Comment and discussion on the major issues in the worlds of faith.
- 0333 BBC (af): Network Africa. See M 0333.
- 0333 Voice of Free China: Journey into Chinese Culture. See H 0230.
- 0340 Radio Havana Cuba: Feature Report. See S 0038.
- 0347 Voice of Free China: Let's Learn Chinese. See S 0248.

### Saturdays

- 0300 BBC: World News. See S 0300.
- 0300 Radio Budapest Intl: Newsroom.
- 0309 BBC: British News. See S 0309.
- 0311 Radio Havana Cuba: Time Out. Five minutes of Cuban sports coverage.
- 0315 BBC: Sports Roundup. See S 0315.
- 0315 Radio Budapest Intl: Business Partners (12th).
- 0315 Radio Budapest Intl: Magazine 90 (19th). Money Monthly (26th). What You Say (5th). Mailbag program.
- 0316 Voice of Free China: People. See F 0216.
- 0330 BBC (af): African News. See S 0330.
- 0330 BBC: The Vintage Chart Show. Each week a classic Top 20 from the past with Paul Burnett.
- 0332 Voice of Free China: New Record Time. See F 0235.
- 0335 Radio Havana Cuba: Feature Report. See S 0038.
- 0347 Voice of Free China: Let's Learn Chinese. See S 0248.
- 0351 Radio Budapest Intl: DX News.

## FREQUENCIES

0400-0500	Australia, Radio	11720pa	11800pa	15240pa	15320pa	0400-0455	S Africa, Channel Africa	5955af	9585af		
		15365pa	17630pa	17715pa	17750as	0400-0500	Singapore, SBC Radio One	5010do	5052do	11940do	
		17795pa	21525as	21595as	21740pa	0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0500 vl	Australia, VL8A Alice Spg	4835do				0400-0500	Swaziland, Swazi Radio	6155af			
0400-0500 vl	Australia, VL8K Katherine	5025do				0400-0430	Switzerland, Swiss R Intl	6135na	9860na	9885na	12035na
0400-0500 vl	Australia, VL8T Tent Crk	4910do				0400-0430	Thailand, Radio	4830as	9655as	11905as	
0400-0500	Bahrain, Radio	6010do				0400-0500	Turkey, Voice of	9445na			
0400-0500	Canada, CFCX Montreal	6005do				0400-0500 vl	Uganda, Radio	4976do			
0400-0500	Canada, CFRX Toronto	6070do				0400-0430	United Kingdom, BBC London	6175na	6180eu	7325na	9630af
0400-0500	Canada, CFVP Calgary	6030do						9915am	11760me	11955me	12095eu
0400-0500	Canada, CHNX Halifax	6130do						15310as	15575me	21725as	
0400-0500	Canada, CKZN St John's	6160do				0400-0500	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
0400-0500	Canada, CKZU Vancouver	6160do						6190af	6195eu	9410af	9600af
0400-0430	Canada, RCI Montreal	6150me	9505me	9670me				11730af	11820af	21470af	21715as
0400-0500	China, China Radio Intl	11680na	11840na			0400-0500	USA, KCBI Dallas TX	9815am			
0400-0500	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am	0400-0500	USA, KTVB Salt Lk City UT	7510am			
0400-0500	Cuba, Radio Havana Cuba	6010na	6180na	9510na		0400-0500	USA, KVOH Los Angeles CA	9785am			
0400-0430	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am	0400-0500	USA, KWHR Naalehu HI	17510as			
0400-0450	Germany, Deutsche Welle	6015af	6065af	7150af	7225af	0400-0500	USA, Monitor Radio Intl	7465na	9840af		
		7275af	9565af	9765af		0400-0500	USA, VOA Washington DC	5995me	6040me	6140me	6873me
0400-0500	Guatemala, Radio Cultural	3300do						7170eu	7265af	7280af	7405af
0400-0500	Kenya, Kenya BC Corp	4935do						9575af			
0400-0500 mtwhf	Lebanon, Wings of Hope	11530me				0400-0500	USA, WEWN Birmingham AL	7425am			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do				0400-0500	USA, WHRI Noblesville IN	7315na			
0400-0425	Netherlands, Radio	6165na	9590na			0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0500 vl	New Zealand, R NZ Intl	15115pa				0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as		0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500 vl	Papua New Guinea, NBC	9675do				0400-0500	USA, WWCR Nashville TN	5810am	5935am	7435am	
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na	0400-0500	USA, WYFR Okeechobee FL	6065na	9505na	11825eu	
		11940na				0415-0440	Italy, RAI Rome	7275eu	9575eu		
0400-0500	Russia, Radio Moscow Intl	5950eu	6165eu	7105na	7150eu	0430-0500	Australia, AAF Radio	13525as			
		7165eu	7180eu	7270na	7330eu	0430-0457	Czech Rep, Radio Prague	5930na	7345af	9440me	
		7370eu	9665eu	11690eu	11880eu	0430-0500	Nigeria, Radio	3326do			
		15320me	17625af	17655af	17675me	0430-0500	Swaziland, Trans World R	5055af	7200af	7215af	
		17735af				0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na		
						0455-0500	Nigeria, Voice of	7255af			

## SELECTED PROGRAMS

### Sundays

- 0400 BBC: World News. See S 0300.
- 0400 WEWN: The Holy Rosary with Father Scanlon.
- 0410 Radio Havana Cuba: National News. See S 0010.
- 0415 BBC (af): African Perspective. Feature or discussion analyzing a major issue.
- 0415 BBC: Commemorative Series. Alexis Korner's Rhythm 'N Blues (6th, 13th, 20th). More great tracks by this BBC artist marking the 10th anniversary of his death.
- 0415 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0428 WEWN: The Chaplet of Divine Mercy.
- 0430 BBC: Feature. Seeing Stars (6th). More star-gazing tips by Heather Couper and Nigel Henbest.
- 0430 BBC: Short Stories. Eitan's Watch (13th), A Walk in the Evening (20th), What's in a Name? (23rd). These are stories written by listeners.
- 0430 Radio Havana Cuba: The World of Stamps. See S 0030.
- 0438 Radio Havana Cuba: Feature Report. See S 0038.
- 0445 BBC: Music Feature. The Dance Selection. British DJ Steve Edwards continues his series on new dance music releases.
- 0447 WEWN: Profiles in Greatness.

### Mondays

- 0400 BBC: World News. See S 0300.
- 0400 WEWN: The Holy Rosary with Father Scanlon.
- 0406 Radio Havana Cuba: Cuba Today. See M 0006.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: Special Feature. Animals of Power (7th, 14th, 21st). Myths and legends about how animals have contributed to the human quest for meaning in life.
- 0417 Radio Havana Cuba: Mailbag Show. See M 0017.
- 0428 WEWN: The Chaplet of Divine Mercy.
- 0430 BBC: Off the Shelf. Daily readings from the best of world literature.
- 0430 Radio Havana Cuba: Breakthrough. See S 2330.
- 0445 BBC: Andy Kershaw's World of Music (7th, 14th, 21st). Recordings of diverse music from around the world.
- 0445 BBC: Special Feature. Animals of Power (28th). See M 0415.
- 0447 WEWN: Profiles in Greatness.

### Tuesdays

- 0400 BBC: World News. See S 0300.

- 0400 WEWN: The Holy Rosary with Father Scanlon.
- 0410 Radio Havana Cuba: National News. See S 0010.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: Health Matters. See T 0145.
- 0415 Radio Havana Cuba: Spotlight on the Americas. See T 0015.
- 0428 WEWN: The Chaplet of Divine Mercy.
- 0430 BBC: Off the Shelf. See M 0430.
- 0435 Radio Havana Cuba: Feature Report. See S 0038.
- 0445 BBC (af): African News. See S 0330.
- 0445 BBC: On Screen. Film reviews and movie news from around the world.
- 0447 WEWN: Profiles in Greatness.

### Wednesdays

- 0400 BBC: World News. See S 0300.
- 0400 WEWN: The Holy Rosary with Father Scanlon.
- 0410 Radio Havana Cuba: National News. See S 0010.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: Waveguide. Hear World Service better.
- 0415 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0425 BBC: Book Choice. Short book reviews every week.
- 0428 WEWN: The Chaplet of Divine Mercy.
- 0430 BBC: Off the Shelf. See M 0430.
- 0435 Radio Havana Cuba: DXers Unlimited. See W 0035.
- 0445 BBC (af): African News. See S 0330.
- 0445 BBC: Country Style. See W 0145.
- 0447 WEWN: Profiles in Greatness.
- 0450 Radio Havana Cuba: Feature Report. See S 0038.

### Thursdays

- 0400 BBC: World News. See S 0300.
- 0400 WEWN: The Holy Rosary with Father Scanlon.
- 0410 Radio Havana Cuba: National News. See S 0010.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: The Farming World. See H 0145.
- 0415 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0428 WEWN: The Chaplet of Divine Mercy.
- 0430 BBC: Off the Shelf. See M 0430.
- 0435 Radio Havana Cuba: Feature Report. See S 0038.
- 0445 BBC (af): African News. See S 0330.
- 0445 BBC: From Our Own Correspondent. See W 2315.
- 0447 WEWN: Profiles in Greatness.

### Fridays

- 0400 BBC: World News. See S 0300.
- 0400 WEWN: The Holy Rosary with Father Scanlon.
- 0400 WEWN: Tomism.
- 0410 Radio Havana Cuba: National News. See S 0010.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: Music Feature. Top Scores. See M 0145.
- 0428 WEWN: Prisoners of Hope.
- 0428 WEWN: The Chaplet of Divine Mercy.
- 0430 BBC: Off the Shelf. See M 0430.
- 0435 Radio Havana Cuba: Feature Report. See S 0038.
- 0445 BBC (af): African News. See S 0330.
- 0445 BBC: Folk Routes. See T 0130.
- 0447 WEWN: Profiles in Greatness.

### Saturdays

- 0400 BBC: World News. See S 0300.
- 0400 WEWN: The Holy Rosary with Father Scanlon.
- 0413 Radio Havana Cuba: Spotlight on Latin America. See A 0013.
- 0415 BBC (af): Talk About Africa. Telephone conversations with BBC correspondents on late-breaking African events.
- 0415 BBC: Good Books. See W 1445.
- 0415 Radio Havana Cuba: Cuba Today. See M 0006.
- 0428 WEWN: The Chaplet of Divine Mercy.
- 0430 BBC: Jazz Now and Then. See A 0145.
- 0435 Radio Havana Cuba: The Way We See It. See A 0035.
- 0440 Radio Havana Cuba: Kaleidoscope. See T 0142.
- 0445 BBC: Worldbrief. See F 2315.
- 0447 WEWN: Profiles in Greatness.

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## FREQUENCIES

0500-0530	Australia, Radio	17750as			
0500-0600	Australia, Radio	11720pa	11800pa	15240pa	15320pa
		15365pa	17630pa	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	9375am	15030am	21465am
0500-0600	Cuba, Radio Havana Cuba	9510na			
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0600 as	Eq Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	6185na
0500-0600	Guatemala, Radio Cultural	3300do			
0500-0515	Israel, Kol Israel	7465eu	9435na	11605na	17545na
0500-0600	Japan, NHK/Radio	6025na	6085me	7230eu	9610as
		11740as	15410as	17810as	
0500-0600	Kenya, Kenya BC Corp	4935do			
0500-0600 mtwhf	Lebanon, Wings of Hope	11530me			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600	New Zealand, R NZ Intl	15115pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0600 vl	Papua New Guinea, NBC	9675do			
0500-0600	Russia, Radio Moscow Intl	5905eu	5930eu	6185eu	7105na
		7130af	7150na	7165na	7180na
		7295af	7370eu	9685eu	9890eu
		12050me	15465af	17725af	17835af
		21690af			
0500-0600	S Africa, Channel Africa	7275af	11745af	11900af	
0500-0553 f	Seychelles, FEBA Radio	17750me			
0500-0600	Singapore, SBC Radio One	5052do	11940do		
0500-0600	Spain, Spanish Natl Radio	9540na			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		

0500-0600	Swaziland, Swazi Radio	6155af			
0500-0530	Swaziland, Trans World R	5055af	7200af	7215af	
0500-0530 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	6005af	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, KWHR Naalehu HI	17510as			
0500-0600	USA, Monitor Radio Intl	7465eu	9840af		
0500-0600	USA, VOA Washington DC	3980eu	5995me	6035af	6040me
		6140eu	6873eu	7170me	7405af
		9530me	9665af	9700me	11825af
		12080af	15205af	15600af	
0500-0600	USA, WEWN Birmingham AL	7425am			
0500-0530	USA, WHRI Noblesville IN	7315na	9495na		
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	Botswana, Radio	3356af	4830af	7255af	
0525-0600	Ghana, GBC Radio 2	3366do			
0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0540	Finland, YLE/Radio	9635me	11755af		
0530-0600	Romania, R Romania Intl	15340af	15380af	17720af	17745af
		17790af			
0530-0600	Swaziland, Trans World R	6070af	11740af		
0530-0600	UAE, Radio Dubai	15435as	17830as	21700as	

## SELECTED PROGRAMS

### Sundays

- 0500 BBC: Newshour. A comprehensive look at the major topics of the day, plus up-to-the-minute international and British News.
- 0500 WEWN: Retreat Teaching.
- 0510 Radio Havana Cuba: National News. See S 0010.
- 0515 Radio Havana Cuba: Latin America Newslin. See S 0015.
- 0528 WEWN: The Kingdom.
- 0530 Radio Finland: Focus. A documentary of an event in world history or of Finland's post World War II legacy.
- 0530 Radio Havana Cuba: The World of Stamps. See S 0030.
- 0538 Radio Havana Cuba: Feature Report. See S 0038.

### Mondays

- 0500 BBC: Newshour. See S 0500.
- 0500 WEWN: The Spanish Mass (encore).
- 0506 Radio Havana Cuba: Cuba Today. See M 0006.
- 0517 Radio Havana Cuba: Mailbag Show. See M 0017.
- 0530 BBC (eu): Europe Today. News, features, profiles and trends for the new Europe.
- 0530 Radio Finland: Compass North. World and Finnish news, commentary and background reports.
- 0530 Radio Havana Cuba: Breakthrough. See S 2330.

### Tuesdays

- 0500 BBC: Newshour. See S 0500.
- 0500 WEWN: Late Have I Loved Thee.
- 0510 Radio Havana Cuba: National News. See S 0010.
- 0515 Radio Havana Cuba: Spotlight on the Americas. See T 0015.
- 0528 WEWN: This is Our Faith.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio Finland: Compass North. See M 0530.
- 0535 Radio Havana Cuba: Feature Report. See S 0038.



*Voice of Asia announcer  
Wisu Wattanawong.*

### Wednesdays

- 0500 BBC: Newshour. See S 0500.
- 0500 WEWN: Living the Scripture.
- 0510 Radio Havana Cuba: National News. See S 0010.
- 0515 Radio Havana Cuba: Latin America Newslin. See S 0015.
- 0528 WEWN: Drama of Jesus.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio Finland: Compass North. See M 0530.
- 0535 Radio Havana Cuba: DXers Unlimited. See W 0035.
- 0550 Radio Havana Cuba: Feature Report. See S 0038.

### Thursdays

- 0500 BBC: Newshour. See S 0500.
- 0500 WEWN: Gospel of Luke.
- 0510 Radio Havana Cuba: National News. See S 0010.
- 0515 Radio Havana Cuba: Latin America Newslin. See S 0015.
- 0528 WEWN: Journey of Faith.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio Finland: Compass North. See M 0530.
- 0535 Radio Havana Cuba: Feature Report. See S 0038.

### Fridays

- 0500 BBC: Newshour. See S 0500.
- 0510 Radio Havana Cuba: National News. See S 0010.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio Finland: Compass North. See M 0530.
- 0535 Radio Havana Cuba: Feature Report. See S 0038.

### Saturdays

- 0500 BBC: Newshour. See S 0500.
- 0500 WEWN: The Vineyard.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio Finland: Compass North. See M 0530.
- 0530 WEWN: You Better Believe It.

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## FREQUENCIES

0600-0700	Australia, Radio	6020pa	11720pa	11800pa	15240pa
		15320pa	15365pa	17630pa	17670as
		17715pa	17880as	21525as	21595as
		21740pa			
0600-0700 vl	Australia, VL8A Alice Spg	4835do			
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0700	Bahrain, Radio	6010do			
0600-0630	Bulgaria, Radio	9700na	11720eu		
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZV Vancouver	6160do			
0600-0630 mtwtf	Canada, RCI Montreal	6050eu	6150eu	7155af	9740af
		9760af	11905af		
0600-0700	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
0600-0700	Cuba, Radio Havana Cuba	9510na			
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am	
0600-0700 as	Eqt Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	5965af	9565af	11765af	13790af
		15185af			
0600-0630	Ghana, GBC Radio 1	4915do			
0600-0615	Ghana, GBC Radio 2	3366do			
0600-0700 vl	Italy, IRRS Milano	7125eu			
0600-0700	Japan, NHK/Radio	11860as	21610as		
0600-0625	Kenya, Kenya BC Corp	4935do			
0600-0700 vl	Kiribati, Radio	9825do			
0600-0630	Laos, National Radio of	7116as			
0600-0700	Lebanon, Wings of Hope	11530me			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765me			
0600-0630	New Zealand, R NZ Intl	15115pa			
0600-0700	Nigeria, Radio	3970do	4770do		
0600-0700	Nigeria, Voice of	7255af			
0600-0650	North Korea, R Pyongyang	15180as	15230as		
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0630	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu

0600-0700	Russia, Radio Moscow Intl	5905eu	5930eu	7150eu	7165eu
		7180eu	7330eu	9890eu	13650eu
		15190eu	15480me	15550me	17805me
		21610af			
0600-0700	S Africa, Channel Africa	7230af	17710af		
0600-0700	Singapore, SBC Radio One	5010do	5052do	11940do	
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, Radio Korea	7275na	11945na	15155as	
0600-0700	Swaziland, Swazi Radio	6155af			
0600-0700	Swaziland, Trans World R	5055af	6070af	11740af	
0600-0630	Switzerland, Swiss R Intl	9885af	13635af	15430af	
0600-0615 mtwtf	Switzerland, Swiss R Intl	3985eu	6165eu		
0600-0700 as	Thailand, Radio	4830as	9655as	11905as	
0600-0700 as	United Kingdom, BBC London	3955eu	5975ca	6190af	6195af
		7150pa	9410eu	9600af	9640na
		11780eu	11820af	11940af	12095af
		15360as	15420af	15575eu	17790as
		17830as	17885af	21470me	
0600-0700	USA, KCBI Dallas TX	9815am			
0600-0700	USA, KTVN Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	9785am			
0600-0700	USA, KWHR Naalehu HI	9930as			
0600-0700	USA, Monitor Radio Intl	5850eu	7465eu	7535eu	
0600-0700	USA, VOA Washington DC	3980af	5995af	6035af	6040af
		6060af	6140af	6873eu	7170af
		7325eu	7405af	9530af	9665af
		11805af	11925af	12080af	15205eu
0600-0700	USA, WHRI Noblesville IN	7315eu	9495am		
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WWCR Nashville TN	5810am	5935am	7435am	
0600-0700	USA, WYFR Okeechobee FL	5985na	7355eu	9680am	11580af
0600-0620	Vatican State, Vatican R	6245eu	7250eu		
0625-0700	Kenya, Kenya BC Corp	4935do			
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	New Zealand, R NZ Intl	9700pa			
0630-0700	Vatican State, Vatican R	9625af	11625af	15090af	
0632-0641	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu
0645-0700	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			

## SELECTED PROGRAMS

### Sundays

- 0600 BBC (af): African News. See S 0330.
- 0600 BBC: World News. See S 0300.
- 0605 BBC (af): Postmark Africa. See S 0335.
- 0609 BBC: British News. See S 0309.
- 0610 Radio Havana Cuba: National News. See S 0010.
- 0615 BBC: Letter from America. Alistair Cooke shares his inimitable view of contemporary American life.
- 0615 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0630 BBC (af): African Perspective. See S 0415.
- 0630 BBC: Jazz for the Asking. Record requests with Malcolm Laylock.

### Mondays

- 0600 BBC: World News. See S 0300.
- 0602 BBC (af): Network Africa. See M 0333.
- 0609 BBC: British News. See S 0309.
- 0615 BBC: The Learning World. News and views about world-wide education.
- 0627 BBC (af): African News. See S 0330.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC (eu): Europe Today. See M 0530.
- 0630 BBC: Special Feature. Hunting Mr. Homer (28th). See S 2330. This Is Your Sport (7th). See S 1401. You Are What You Eat Phone-In (14th)(21st). See S 1401.
- 0630 Radio Havana Cuba: Breakthrough. See S 2330.
- 0635 Radio Havana Cuba: From Havana. See M 0135.

### Tuesdays

- 0600 BBC: World News. See S 0300.
- 0602 BBC (af): Network Africa. See M 0333.
- 0609 BBC: British News. See S 0309.
- 0610 Radio Havana Cuba: National News. See S 0010.
- 0615 BBC: The World Today. See M 1645.
- 0616 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0627 BBC (af): African News. See S 0330.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC (eu): Europe Today. See M 0530.

- 0630 BBC: Music Feature. World Ranking. Miss P plays some of the most popular tracks in black music.
- 0642 Radio Havana Cuba: Kaleidoscope. See T 0142.

### Wednesdays

- 0600 BBC: World News. See S 0300.
- 0602 BBC (af): Network Africa. See M 0333.
- 0609 BBC: British News. See S 0309.
- 0610 Radio Havana Cuba: National News. See S 0010.
- 0615 BBC: The World Today. See M 1645.
- 0615 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0627 BBC (af): African News. See S 0330.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC (eu): Europe Today. See M 0530.
- 0630 BBC: Meridian Documentary. One of three topical programs weekly about the world of the arts.
- 0640 Radio Havana Cuba: Be My Guest. See W 0140.

### Thursdays

- 0600 BBC: World News. See S 0300.
- 0602 BBC (af): Network Africa. See M 0333.

- 0609 BBC: British News. See S 0309.
- 0610 Radio Havana Cuba: National News. See S 0010.
- 0615 BBC: The World Today. See M 1645.
- 0615 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0627 BBC (af): African News. See S 0330.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC (eu): Europe Today. See M 0530.
- 0630 BBC: Sports International. See H 0230.
- 0640 Radio Havana Cuba: Feature Report. See S 0038.

### Fridays

- 0600 BBC: World News. See S 0300.
- 0602 BBC (af): Network Africa. See M 0333.
- 0609 BBC: British News. See S 0309.
- 0610 Radio Havana Cuba: National News. See S 0010.
- 0615 BBC: The World Today. See M 1645.
- 0615 Radio Havana Cuba: Latin America Newslines. See S 0015.
- 0627 BBC (af): African News. See S 0330.
- 0630 BBC (af): Network Africa. See M 0333.
- 0630 BBC (eu): Europe Today. See M 0530.
- 0630 BBC: Meridian Books. See W 0630.
- 0640 Radio Havana Cuba: Feature Report. See S 0038.

### Saturdays

- 0600 BBC (af): African News. See S 0330.
- 0600 BBC: World News. See S 0300.
- 0609 BBC: British News. See S 0309.
- 0613 Radio Havana Cuba: Spotlight on Latin America. See A 0013.
- 0615 BBC: The World Today. See M 1645.
- 0615 Radio Havana Cuba: Cuba Today. See M 0006.
- 0630 BBC (af): Spice Taxi. A sideways look at African culture, from presidential style to cult films.
- 0630 BBC (eu): Europe Today. See M 0530.
- 0630 BBC: Meridian Reports. See W 0630.
- 0635 Radio Havana Cuba: The Way We See It. See A 0035.
- 0640 Radio Havana Cuba: Kaleidoscope. See T 0142.

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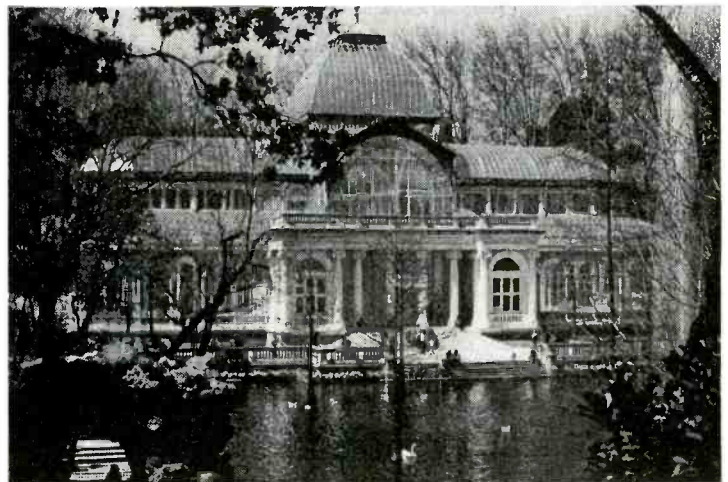
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0700-0730	Australia, Radio	15320pa	17715pa	21740pa	
0700-0800	Australia, Radio	6020pa	9710pa	11720pa	11880pa
		11910pa	15240pa	15365pa	17695as
		17790as	21525as	21595as	
0700-0800 vl	Australia, VL8A Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio	6010do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
0700-0727	Czech Rep, Radio Prague	5930do	7345do	9505do	
0700-0800	Ecuador, HCJB Quito	6205eu	9600eu	9745au	11835au
		21455eu			
0700-0800 as	Eqf Guinea, R East Africa	9585af			
0700-0715	Ghana, GBC Radio 1	4915do			
0700-0715	Ghana, GBC Radio 2	3366do			
0700-0800	Italy, AWR Europe	7230eu			
0700-0800 vl	Italy, IRRS Milano	7125eu			
0700-0800	Japan, NHK/Radio	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	Liberia, Radio ELWA	4760do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0730	Myanmar, Radio	9730do			
0700-0800	New Zealand, R NZ Intl	9700pa			
0700-0800	Nigeria, Radio	3326do	4990do		
0700-0750	North Korea, R Pyongyang	15340as	17765as		
0700-0800 vl	Papua New Guinea, NBC	9675do			
0700-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			
0700-0800	Russia, Radio Moscow Intl	5905eu	5930eu	7130af	7165eu
		7270na	7345na	7370eu	9890eu
		11765me	13650eu	15190eu	15480me
		15550me	17725af	17835af	21610af
		3316do			
0700-0715 vl	Sierra Leone, SLBS	5010do	5052do	11940do	
0700-0800	Singapore, SBC Radio One	5020do	9545do		
0700-0800 vl	Solomon Islands, SIBC	6155af			
0700-0800	Swaziland, Swazi Radio	6070af	11740af		
0700-0800	Swaziland, Trans World R	3985eu	6165eu		
0700-0715 as	Switzerland, Swiss R Intl	5950na			
0700-0800	Taiwan, VO Free China	4830as	9655as	11905as	
0700-0800 as	Thailand, Radio	3955eu	5975ca	6190af	6195eu
0700-0800	United Kingdom, BBC London	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	9785am			
0700-0800	USA, KWHR Naalehu HI	9930as			
0700-0800	USA, Monitor Radio Intl	7465eu			
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, WWCR Nashville TN	5810am	5935am	7435am	
0700-0800	USA, WYFR Okeechobee FL	7355eu	9680am	11580af	
0700-0710 mtwfta	Vatican State, Vatican R	3950eu	6245eu	7250eu	9645eu
		11740eu	15210eu		
0730-0800	Australia, Radio	9580pa	17750as		
0730-0755	Belgium, R Vlaanderen Int	5910eu	9925au		
0730-0757	Czech Rep, Radio Prague	17535as	21705af		
0730-0800	Georgia, Georgian Radio	11805eu			
0730-0745 sh	Greece, Voice of	9425eu	11645eu	15650eu	
0730-0745 mtwhf	Iceland, Natl BC Service	9265am			
0730-0800	Netherlands, Radio	9630pa	9720pa		
0740-0800	Monaco, Trans World Radio	7385eu			
0745-0800	Finland, YLE/Radio	6120eu	9560eu	11755eu	
0745-0800	Guam, KTRW Agana	15200as			

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	7375am	9375am	15030am	21465am
0800-0830	Ecuador, HCJB Quito	6205eu	9600eu	9745pa	11835eu
		11925pa	17490au	21455eu	
0800-0900 as	Eqf Guinea, R East Africa	9585af			
0800-0805 s	Ghana, GBC Radio 1	4915do			
0800-0805 s	Ghana, GBC Radio 2	3366do			
0800-0900	Guam, KTRW Agana	15200as			
0800-0900	Indonesia, Voice of	9675as	11752as		
0800-0900 vl	Italy, IRRS Milano	7125eu			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0830	Liberia, Radio ELWA	4760do			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0900	Monaco, Trans World Radio	7385eu			
0800-0825	Netherlands, Radio	9630pa	9720pa		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0830 s	Norway, Radio Norway Intl	15175as	17740pa		
0800-0900	Pakistan, Radio	17900eu	21520eu		
0800-0900 vl	Papua New Guinea, NBC	9675do			
0800-0900	Russia, Radio Moscow Intl	7130af	7165eu	9680eu	11690eu
		12010eu	12055af	12070eu	13650eu
		15190eu	15210eu	15485eu	15540eu
		17595eu	21515eu		
0800-0815 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	13670me	15155eu	
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, KWHR Naalehu HI	9930as			
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, WWCR Nashville TN	5810am	5935am	7435am	
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	6155eu	13730eu	15450as	17870au
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Netherlands, Radio	9720pa			



Kevin Gooch of Kirksville, MO, received this picturesque QSL from Radio Exterior de Espana. If you have received a unique QSL, send it along to Monitoring Times and we'll use it as space permits; it will be returned to you.

0800-0900	Australia, Radio	6020pa	6080pa	7240pa	9580pa
		9710pa	11720pa	11910pa	15240pa
		17695as	17750as	21525as	21595as
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			

0900-1000	Australia, Radio	6020pa	9510as	9580pa	9710pa
		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	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	9375am	15030am	21465am
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-1000 as	Eq Guinea, R East Africa	9585af			
0900-0930	Finland, YLE/Radio	15330as	17800au		
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	12055as
		15410af	17780as	17800af	17820as
		21600af	21650as	21680as	21705af
0900-0915 mtwtf	Ghana, GBC Radio 1	4915do			
0900-0915	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWR Agana	11805au			
0900-0915	Guam, KTWR Agana	15200as			
0900-0915 vl	Italy, IRRS Milano	7125eu			
0900-1000	Japan, NHK/Radio	9610as	9750as	11740as	11815as
		15190as			
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			
0900-0930	Netherlands, Radio	9720pa			
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000 mtwtf	Palau, KHBN Voice of Hope	9830as			
0900-1000 vl	Papua New Guinea, NBC	9675do			
0900-1000	Russia, Radio Moscow Intl	9680eu	12070eu	13650eu	15190eu
		15210eu	15345eu	15380eu	15440eu
		15495eu	15540eu	17595eu	17605eu
		17760eu	21515eu	21540eu	
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	7180as	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, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	9840pa	13615au	17555as
0900-1000	USA, WEWN Birmingham AL	7425am	7465am	9350am	
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		
0920-0935 sh	Greece, Voice of	15650au	17525au		
0930-1000	Australia, AAF Radio	11465as			
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	7260as	9720pa	9810as	9865pa
0930-1000	Philippines, FEBC Manila	11690as			

0940-0950	Greece, Voice of	15650au	17525au		
0945-1000 s	Armenia, Radio Yerevan	15455eu	15485eu	15510eu	
1000-1100	Australia, Radio	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 mtwtf	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, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	8450au	11755pa	15440pa	17710pa
1000-1100	Costa Rica, AWR Alajuela	9725ca			
1000-1100	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100 as	Eq Guinea, R East Africa	9585af			
1000-1100	Ghana, GBC Radio 2	6130do	7295do		
1000-1100	India, All India Radio	15050as	17387au	17895as	21735au
1000-1100	Italy, AWR Europe	7230eu			
1000-1100 vl	Italy, IRRS Milano	7125eu			
1000-1100 vl	Malaysia, RTM Kota Kinaba	5980do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	Netherlands, Radio	7260as	9810as		
1000-1030	Netherlands, Radio	9720pa	9865pa		
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 mtwhf	Palau, KHBN Voice of Hope	9830as			
1000-1100 vl	Papua New Guinea, NBC	9675do			
1000-1100	Philippines, FEBC Manila	11690as			
1000-1100	Russia, Radio Moscow Intl	9680eu	12010eu	12020eu	12070eu
		13650eu	15210eu	15345eu	15380eu
		15440eu	15455eu	17605eu	17760eu
		21515eu	21540eu		
1000-1100	S Africa, Channel Africa	17810af			
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, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	9930as			
1000-1100	USA, Monitor Radio Intl	7395am	7465am	9430as	13625pa
1000-1100	USA, VOA Washington DC	5985as	7405ca	9590ca	11720as
		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			
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1030-1100 mtwtf	Austria, R Austria Intl	6155eu	13730eu	15450au	17870as
1030-1100 vl	Malaysia, RTM Sarawak	4950do	7160do		
1030-1100	Sri Lanka, SLBC Colombo	11835au	15120as	17850as	
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605eu
1040-1050	Greece, Voice of	15650as	17525as		

*BRTN (Belgium) broadcasters (clockwise): Mark Oschinsky, Marie-Laure Steisel, and Maryse Jacob.*





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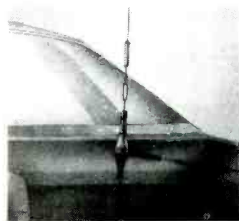
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## FREQUENCIES

1100-1200	Australia, Radio	6020pa 9580pa 17910as	6080as 9710as	7240pa 13605as	9510as 15170as	1100-1200	S Africa, Channel Africa	9730af			
1100-1200 vl	Australia, VL8A Alice Spg	2310do				1100-1200	Singapore, SBC Radio One	5010do	5052do	11940do	
1100-1200 vl	Australia, VL8K Katherine	2485do				1100-1130	Sri Lanka, SLBC Colombo	11835au	15120as	17850as	
1100-1200 vl	Australia, VL8T Tent Crk	2325do				1100-1145	Switzerland, Swiss R Intl	9535as	9885as	13635as	15505as
1100-1200	Bahrain, Radio	6010do				1100-1200	United Kingdom, BBC London	5965na	5975na	6190af	6195na
1100-1200	Canada, CFCX Montreal	6005do						9410eu	9515na	9660eu	9740na
1100-1200	Canada, CFRX Toronto	6070do						9750eu	9760eu	11760me	11940af
1100-1200	Canada, CFVP Calgary	6030do						12095eu	15070eu	15220na	15310as
1100-1200	Canada, CHNX Halifax	6130do						15400af	17640af	17705eu	17790sa
1100-1200	Canada, CKZN St John's	6160do				1100-1200	USA, KCBI Dallas TX	9815am			
1100-1200	Canada, CKZU Vancouver	6160do				1100-1200	USA, KTBN Salt Lk City UT	7510na			
1100-1200	Costa Rica, AWR Alajuela	9725ca	11870ca			1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am	1100-1200	USA, Monitor Radio Intl	7395am	7465am	9430au	
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa		1100-1200	USA, VOA Washington DC	5985as	6110as	9590ca	9760as
1100-1150	Germany, Deutsche Welle	15370af	15410af	17765af	17800af			11720as	11915ca	15120ca	15160as
		21600af						15425as			
1100-1115	Ghana, GBC Radio 1	4915do				1100-1200	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1100-1130	Israel, Kol Israel	15640eu	15650as	17575eu		1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200 vl	Italy, IRRS Milano	7125eu				1100-1200	USA, WWCN Nashville TN	5935am	15685am		
1100-1200	Japan, NHK/Radio	6120na	9610as	15445as		1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1100-1200 vl	Malaysia, RTM Kota Kinaba	5980do				1100-1115 mtwhfa	Vatican State, Vatican R	6245eu	11740eu	15210eu	21665eu
1100-1200	Malaysia, RTM Radio 4	4950do	7295do			1130-1200	Bulgaria, Radio	11645na	13645me		
1100-1200 vl	Malaysia, RTM Sarawak	4950do	7160do			1130-1157	Czech Rep, Radio Prague	7345eu	11990eu	15355eu	
1100-1200	New Zealand, R NZ Intl	9700pa				1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na		1130-1200	Iran, VOIRI Tehran	9525me	11715me	11790as	11910as
1100-1200 mtwhf	Palau, KHBN Voice of Hope	9830as						11930as			
1100-1200 vl	Papua New Guinea, NBC	9675do				1130-1200	Netherlands, Radio	5955eu	9850eu		
1100-1200	Russia, Radio Moscow Intl	9830af	12020eu	12070eu	13650eu	1130-1200	South Korea, Radio Korea	11715na			
		15210eu	15345eu	15380eu	15440eu	1130-1200	Thailand, Radio	4830as	9655as	11905as	
		15585eu	17605eu	17760eu	17880eu	1130-1200	Vietnam, Voice of	6115as	10059as	12025as	15010as
		21515eu	21540eu								

## SELECTED PROGRAMS

### Sundays

- 1100 BBC: Newsdesk. See S 0000.
- 1100 Israel Radio Int'l: Israel News Magazine. The latest world and Israel and regional news.
- 1110 Voice of America (ca): Critic's Choice. News from the world of the arts.
- 1115 Israel Radio Int'l: You're on the Air. Phone-in program.
- 1115 Radio Japan: Hello From Tokyo.
- 1130 BBC: Play of the Week (20th, 90 min). See S 0030.
- 1130 BBC: The John Dunn Show (6th, 13th, 27th). See S 0030.
- 1130 Voice of America (ca): Studio One. Dramatized, semi-dramatized, and narrative documentaries. Subjects range from personality profiles to reviews of historic events.
- 1155 Radio Japan: Viewpoint.

### Mondays

- 1100 BBC: Newsdesk. See S 0000.
- 1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1100 Radio Japan: Radio Japan News Round.
- 1110 Voice of America (ca): Focus. The major figures and issues that shape our world.

- 1115 Israel Radio Int'l: Israel Mosaic. A weekly magazine of life in Israel.
- 1130 BBC: Composer of the Month. See M 0230.
- 1130 Radio Japan: Radio Japan Magazine Hour.
- 1130 Voice of America (ca): VOA Monday Morning. News closeups in a magazine format.
- 1150 Radio Japan: Commentary.

### Tuesdays

- 1100 BBC: Newsdesk. See S 0000.
- 1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1100 Radio Japan: Radio Japan News Round.
- 1110 Voice of America (ca): Focus. See M 1110.
- 1115 Israel Radio Int'l: Talking Point. A weekly discussion program.
- 1130 BBC: Megamix. Compendium of music, sport, fashion, health, travel, news and views for young people.
- 1130 Radio Japan: Radio Japan Magazine Hour.
- 1130 Voice of America (ca): VOA Tuesday Morning. See M 1130.
- 1150 Radio Japan: Commentary.

### Wednesdays

- 1100 BBC: Newsdesk. See S 0000.
- 1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1100 Radio Japan: Radio Japan News Round.
- 1110 Voice of America (ca): Focus. See M 1110.
- 1115 Israel Radio Int'l: This Land. Travel magazine.
- 1130 BBC: Meridian Documentary. See W 0630.
- 1130 Radio Japan: Radio Japan Magazine Hour.
- 1130 Voice of America (ca): VOA Wednesday Morning. See M 1130.
- 1150 Radio Japan: Commentary.

### Thursdays

- 1100 BBC: Newsdesk. See S 0000.
- 1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1100 Radio Japan: Radio Japan News Round.
- 1110 Voice of America (ca): Focus. See M 1110.
- 1115 Israel Radio Int'l: Studio Three. Israeli arts magazine program.
- 1130 BBC: Thirty-Minute Drama.
- 1130 Radio Japan: Radio Japan Magazine Hour.
- 1130 Voice of America (ca): VOA Thursday Morning. See M 1130.
- 1150 Radio Japan: Commentary.

### Fridays

- 1100 BBC: Newsdesk. See S 0000.
- 1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1100 Radio Japan: Radio Japan News Round.
- 1110 Israel Radio Int'l: Letter from Jerusalem. Arie Haskell reviews the past week's current affairs.
- 1110 Voice of America (ca): Focus. See M 1110.
- 1115 Israel Radio Int'l: Thank Goodness It's Friday. A program for the Sabbath eve.
- 1130 BBC: Meridian Books. See W 0630.
- 1130 Radio Japan: Radio Japan Magazine Hour.
- 1130 Voice of America (ca): VOA Friday Morning. See M 1130.
- 1150 Radio Japan: Commentary.

### Saturdays

- 1100 BBC: Newsdesk. See S 0000.
- 1106 Israel Radio Int'l: Spotlight. People and issues in the news.
- 1110 Voice of America (ca): Agriculture Today. See S 0010.
- 1115 Radio Japan: This Week.
- 1130 BBC: Meridian Reports. See W 0630.
- 1130 Voice of America (ca): Music U.S.A. (Standards). See T 0030.

China Radio International's Xia Jixuan interviewing 79-year-old Ren Zhenying, chief engineer of Lanzhou urban construction.







## FREQUENCIES

1300-1400	Australia, Radio	7240pa	9580pa	11800pa	1300-1400	United Kingdom, BBC London	6190af	6195am	7180as	9410eu
1300-1400 vl	Australia, VLBA Alice Spg	2310do					9515na	9660eu	9740na	9750eu
1300-1400 vl	Australia, VLBK Katherine	2485do					9760eu	11750as	11760me	11820na
1300-1400 vl	Australia, VLBT Tent Crk	2325do					11940af	12095eu	15070eu	15220na
1300-1400	Bahrain, Radio	6010do					15310as	15400af	15420af	15575me
1300-1320	Brazil, Radiobras	15445na					17640eu	17705eu	17790af	17885af
1300-1400	Canada, CFCX Montreal	6005do					21470af	21660af		
1300-1400	Canada, CFRX Toronto	6070do			1300-1400	USA, KJES Mesquite NM	11715am			
1300-1400	Canada, CFVP Calgary	6030do			1300-1400 vl	USA, KNLS Anchor Point AK	7355as			
1300-1400	Canada, CHNX Halifax	6130do			1300-1400	USA, KTVN Salt Lk City UT	7510am			
1300-1400	Canada, CKZN St John's	6160do			1300-1400	USA, KWHR Naalehu HI	9930as			
1300-1400	Canada, CKZU Vancouver	6160do			1300-1400	USA, Monitor Radio Intl	7465am	13625as		
1300-1400	Canada, RCI Montreal	11855na	17820am		1300-1400	USA, VOA Washington DC	6110as	9560as	9760as	11715as
1300-1400	China, China Radio Intl	9715as	11660as	15440pa			15160as	15425as		
1300-1400 vl	Costa Rica, R Peace Intl	7375am	9375am	15030am	1300-1400	USA, WEWN Birmingham AL	9350am			
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am	1300-1400	USA, WHRI Noblesville IN	9465na	15105na	
		21455am			1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1330	Egypt, Radio Cairo	17595as			1300-1400	USA, WWCR Nashville TN	5935am	15685am		
1300-1330	Ghana, GBC Radio 1	4915do			1300-1400	USA, WYFR Okeechobee FL	5950na	9705na	11550as	11830na
1300-1400 vl	Italy, IRRS Milano	7125eu					11970na	13695na		
1300-1400 vl	Malaysia, RTM Kota Kinaba	5980do			1300-1330	Vietnam, Voice of	6115as	10059as	12025as	15010as
1300-1400	Malaysia, RTM Radio 4	7295do			1330-1400	Austria, R Austria Intl	15450as			
1300-1400 ocasnal	New Zealand, R NZ Intl	9655pa			1330-1355 mtwfta	Belgium, R Vlaanderen Int	17555na	21810na		
1300-1400	Nigeria, Radio	4990do	7285do		1330-1400	Bulgaria, Radio	11630as			
1300-1350	North Korea, R Pyongyang	13760as	15230as		1330-1400	Canada, RCI Montreal	6150as	9535as		
1300-1400 mtwhf	Palau, KHBN Voice of Hope	9830as			1330-1400 mtwhfa	Finland, YLE/Radio	15400na	17740na		
1300-1400 vl	Papua New Guinea, NBC	9675do			1330-1400 tw	Ghana, GBC Radio 1	4915do			
1300-1400	Philippines, FEBC Manila	11995as			1330-1400	India, All India Radio	11760as	15120as		
1300-1355	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	9525eu	1330-1400	Laos, National Radio of	7116as		
		11815eu				1330-1400	Netherlands, Radio	9895as	13700as	15150as
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	17850eu	1330-1400	Sweden, Radio	15240na	17870na	15530as
1300-1400	Russia, Radio Moscow Intl	7195af	7295as	9830af	9890eu	1330-1400	Turkey, Voice of	9675as		
		11980eu	15210eu	15320na	15345eu	1330-1400	UAE, Radio Dubai	13675eu	15320eu	15435as
		15380eu	15440eu	15480me	15495eu	1330-1400	Uzbekhistan, R Tashkent	7285as	9540as	9715as
		15540eu	17595eu	17725me	17760eu			17815as		
		17780as	17880eu	21540eu	21785af	1345-1400 vl	Myanmar, Radio	7185do		
1300-1400	Singapore, SBC Radio One	5010do	5052do	11940do		1345-1400	Vatican State, Vatican R	15090as	17525au	
1300-1330	South Korea, Radio Korea	9570as	13670as							
1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as	15425as						
1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as					

## SELECTED PROGRAMS

### Sundays

- 1300 BBC: Newshour. See S 0500.
- 1300 WEWN: California Mass.
- 1328 WEWN: Stations of the Cross.
- 1330 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
- 1330 Radio Sweden: Sounds Nordic (biweekly). See S 1230.

### Mondays

- 1300 BBC: Newshour. See S 0500.
- 1300 WEWN: Daily Mass Live.
- 1330 Radio Finland: Compass North. See M 0530.
- 1347 Radio Finland: Business Monday. See M 1247.

### Tuesdays

- 1300 BBC: Newshour. See S 0500.
- 1300 WEWN: Daily Mass Live.
- 1330 Radio Finland: Compass North. See M 0530.

- 1344 Radio Finland: Sports Fare. See T 1244.
- 1349 Radio Finland: Finnish Press Review. See T 1249.
- 1354 Radio Finland: Closeup. See T 1254.

### Wednesdays

- 1300 BBC: Newshour. See S 0500.
- 1300 WEWN: Daily Mass Live.
- 1330 Radio Finland: Compass North. See M 0530.
- 1344 Radio Finland: Environmental Scene. See W 1244.
- 1349 Radio Finland: Finnish Press Review. See T 1249.
- 1349 Radio Sweden: Money Matters. See W 1249.
- 1354 Radio Finland: Closeup. See T 1254.

### Thursdays

- 1300 BBC: Newshour. See S 0500.
- 1300 WEWN: Daily Mass Live.
- 1330 Radio Finland: Compass North. See M 0530.
- 1344 Radio Finland: Finnish History. See H 1244.

- 1350 Radio Finland: Finnish Press Review. See T 1249.
- 1354 Radio Finland: Closeup. See T 1254.

### Fridays

- 1300 BBC: Newshour. See S 0500.
- 1300 WEWN: Daily Mass Live.
- 1330 Radio Finland: Compass North. See M 0530.
- 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 BBC: Newshour. See S 0500.
- 1300 WEWN: New York Mass.
- 1328 WEWN: Stations of the Cross.
- 1330 Radio Sweden: People and Ideas. See S 0030.
- 1343 Radio Finland: Starting Finnish. See A 1243.
- 1353 Radio Finland: Perspectives. Editorial opinions.

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## FREQUENCIES

1400-1500	Australia, Radio	7240pa	9580pa	11800pa	1400-1500 vl	Rwanda, Radio Rwanda	9890eu	15210na	15345af	15380na
1400-1500 vl	Australia, VL8A Alice Spg	2310do			1400-1500	Singapore, SBC Radio One	15440eu	15540eu	17595eu	17760eu
1400-1500 vl	Australia, VL8K Katherine	2485do			1400-1500	South Korea, Radio Korea	21540eu			
1400-1500 vl	Australia, VL8T Tent Crk	2325do			1400-1500	Sri Lanka, SLBC Colombo	9610do			
1400-1500	Bahrain, Radio	6010do			1400-1500	United Kingdom, BBC London	5010do	5052do	11940do	
1400-1425 mtwhfa	Belgium, R Vlaanderen Int	17555na	21810as		1400-1500	USA, KJES Mesquite NM	5975as	6135as		
1400-1500	Bulgaria, Radio	11630as			1400-1500	USA, KWBX Salt Lk City UT	6075as	9720as	15425as	
1400-1500	Canada, CFCX Montreal	6005do			1400-1500	USA, KWHR Naalehu HI	6195as	7180as	9410eu	9515na
1400-1500	Canada, CFRX Toronto	6070do			1400-1500	USA, Monitor Radio Intl	9660eu	9740as	9750eu	11750as
1400-1500	Canada, CFVP Calgary	6030do			1400-1500	USA, VOA Washington DC	12095eu	15070eu	15260af	15310me
1400-1500	Canada, CHNX Halifax	6130do			1400-1500		15400af	15575me	17640af	17705eu
1400-1500	Canada, CKZN St John's	6160do			1400-1500		17790af	17880af	17880af	21660af
1400-1500	Canada, CKZU Vancouver	6160do			1400-1500		15725am			
1400-1500	Canada, RCI Montreal	11955na	17820am		1400-1500		11715na			
1400-1500	China, China Radio Intl	7405na	9785na	11815as	1400-1500		7510na			
1400-1500 vl	Costa Rica, R Peace Intl	7375am	9375am	15030am	1400-1500		9930as			
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17490am	1400-1500		9355as	9455am		
		21455am			1400-1500		6110as	7125as	9645as	9760as
1400-1500	France, Radio France Intl	11910as	12035as	17650me	1400-1500		11705as	15160as	15205as	15395as
1400-1420	Ghana, GBC Radio 1	4915do			1400-1500		15425as			
1400-1500	Ghana, GBC Radio 2	6130do	7295do		1400-1500		9350am			
1400-1500	India, All India Radio	11760as	15120as		1400-1500		9465na	15105na		
1400-1500	Iraq, Radio Iraq Intl	15250as			1400-1500		7490na	13595na		
1400-1425 mtwh	Israel, Kol Israel	15640na	15650as		1400-1500		13845am	15685am		
1400-1500 vl	Italy, IRRS Milano	7125eu			1400-1500		9705na	11550na	11830na	17760na
1400-1500	Japan, NHK/Radio	9535na	9750as	11705as	1400-1415		15090as	17525au		
		11815as	11865am		1415-1425		3230do	5005do	7165do	
1400-1500 vl	Malaysia, RTM Kota Kinaba	5980do			1430-1500		6060pa	6080as	7260as	9510as
1400-1500	Malaysia, RTM Radio 4	7295do					9580pa	11660pa	11680as	11695pa
1400-1500 vl	Malaysia, RTM Sarawak	4950do					11800pa			
1400-1500	Malta, V of Mediterranean	11925eu			1430-1500		9555eu	11915af	11935me	15315eu
1400-1500 mtwhf	Morocco, RTV Marocaine	17595af			1430-1500		15325me	17820af		
1400-1500 vl	Myanmar, Radio	7185do			1430-1500		11925am	17490am	17890am	21455am
1400-1500	Netherlands, Radio	9895as	13700as	15530as	1430-1500		15400na	17740na		
1400-1500 ocasnal	New Zealand, R NZ Intl	9655pa			1430-1500		5990do			
1400-1430 mtwhf	Palau, KHBN Voice of Hope	9830as			1430-1500		15150as			
1400-1500	Philippines, FEBC Manila	11995as			1430-1500		15175as	15335as	17720as	
1400-1500	Russia, Radio Moscow Intl	5930as	6055eu	7105na	1430-1500		15240na	17870na		
		7195af	7205as	9505as	1435-1445		15630na	17535na		
				9560as	1445-1500		15610as			
					1445-1500 smha		7260as	7780as		

## SELECTED PROGRAMS

### Sundays

- 1400 BBC: News Summary. See S 0100.
- 1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1400 WEWN: The Holy Rosary (Glorious).
- 1401 BBC: Special Feature: This Is Your Sport (6th). A look at the evolution of olympic running and jumping. You Are What You Eat Phone-In (20th). NEW! Listeners can call the experts on nutrition (call London 44 71 379 7444). You Are What You Eat (13th). NEW! Traditional eating habits and health.
- 1407 Israel Radio Int'l: Calling All Listeners. Israel Radio's weekly mailbag program.
- 1418 Radio France Int'l: Spotlight on Africa. See S 1218.
- 1419 Israel Radio Int'l: Israel DX Corner. See S 1100.
- 1428 WEWN: The Chaplet of Divine Mercy.
- 1430 BBC: Anything Goes (6th, 13th, 27th). A variety of music and much more with Bob Holness.
- 1432 Radio France Int'l: Club 9516. See S 1232.
- 1434 Radio Finland: Focus. See S 0530.
- 1447 WEWN: Profiles in Greatness.

### Mondays

- 1400 BBC (as): Dateline East Asia. Magazine program dealing with political and economic affairs of SE/NE Asia.
- 1400 BBC: World News. See S 0300.
- 1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1400 WEWN: The Holy Rosary (Joyful).
- 1405 BBC: Outlook. An up-to-the-minute mix of conversation, controversy and color from around the world.
- 1406 Israel Radio Int'l: The Israel Sound. The latest in Israeli popular music.
- 1428 WEWN: The Chaplet of Divine Mercy.
- 1430 BBC (as): Special Programs for Asia. English-teaching followed by World News at slow speed.
- 1430 BBC: Off the Shelf. See M 0430.
- 1430 Radio Finland: Compass North. See M 0530.
- 1431 Radio France Int'l: RFI Europe. See M 1231.
- 1438 Radio France Int'l: Sports. See M 1238.
- 1445 BBC: Music Feature. The Dance Selection. See S 0015.
- 1446 Radio France Int'l: North/South (biweekly). See M 1246.
- 1446 Radio France Int'l: Planet Earth (biweekly). See M 1246.
- 1447 Radio Finland: Business Monday. See M 1247.
- 1447 WEWN: Profiles in Greatness.

### Tuesdays

- 1400 BBC (as): Dateline East Asia. See M 1400.
- 1400 BBC: World News. See S 0300.

- 1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1400 WEWN: The Holy Rosary (Sorrowful).
- 1405 BBC: Outlook. See M 1405.
- 1407 Israel Radio Int'l: Israel Mosaic. See M 1115.
- 1421 Israel Radio Int'l: New from Israel. The latest Israel exports are discussed.
- 1428 WEWN: The Chaplet of Divine Mercy.
- 1430 BBC (as): Special Programs for Asia. See M 1430.
- 1430 BBC: Off the Shelf. See M 0430.
- 1430 Radio Finland: Compass North. See M 0530.
- 1433 Radio France Int'l: RFI Europe. See M 1231.
- 1440 Radio France Int'l: Books. See T 1240.
- 1444 Radio Finland: Sports Fare. See T 1244.
- 1445 BBC: Music Feature. Top Scores. See M 0145.
- 1447 Radio France Int'l: Science Notes. See T 1249.
- 1447 WEWN: Profiles in Greatness.
- 1449 Radio Finland: Finnish Press Review. See T 1249.
- 1454 Radio Finland: Closeup. See T 1254.

### Wednesdays

- 1400 BBC (as): Dateline East Asia. See M 1400.
- 1400 BBC: World News. See S 0300.
- 1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1400 WEWN: The Holy Rosary (Glorious).
- 1405 BBC: Outlook. See M 1405.
- 1405 Israel Radio Int'l: Talking Point. See T 1115.
- 1418 Israel Radio Int'l: Eco Alert. Environmental issues in Israel.
- 1428 WEWN: The Chaplet of Divine Mercy.
- 1430 BBC: Off the Shelf. See M 0430.
- 1430 Radio Finland: Compass North. See M 0530.
- 1431 Radio France Int'l: RFI Europe. See M 1231.
- 1439 Radio France Int'l: Counterpoint. See W 1238.
- 1444 Radio Finland: Environmental Scene. See W 1244.
- 1445 BBC: Good Books. Recommendation of a book to read.
- 1446 Radio France Int'l: Land of France. See W 1246.
- 1447 WEWN: Profiles in Greatness.
- 1449 Radio Finland: Finnish Press Review. See T 1249.
- 1449 Radio Sweden: Money Matters. See W 1249.
- 1454 Radio Finland: Closeup. See T 1254.

### Thursdays

- 1400 BBC (as): Dateline East Asia. See M 1400.
- 1400 BBC: World News. See S 0300.
- 1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
- 1400 WEWN: The Holy Rosary (Joyful).
- 1405 BBC: Outlook. See M 1405.
- 1411 Israel Radio Int'l: Studio Three. See H 1115.
- 1428 WEWN: The Chaplet of Divine Mercy.

- 1430 BBC (as): Special Programs for Asia. See M 1430.
- 1430 BBC: Off the Shelf. See M 0430.
- 1430 Radio Finland: Compass North. See M 0530.
- 1431 Radio France Int'l: Sports. See M 1238.
- 1433 Radio France Int'l: RFI Europe. See M 1231.
- 1441 Radio France Int'l: Arts in France. See H 1248.
- 1444 Radio Finland: Finnish History. See H 1244.
- 1445 BBC: The Learning World. See M 0615.
- 1447 Radio France Int'l: Made in France. A review of something very French.
- 1447 WEWN: Profiles in Greatness.
- 1450 Radio Finland: Finnish Press Review. See T 1249.
- 1454 Radio Finland: Closeup. See T 1254.

### Fridays

- 1400 BBC (as): Dateline East Asia. See M 1400.
- 1400 BBC: World News. See S 0300.
- 1400 WEWN: The Holy Rosary (Sorrowful).
- 1405 BBC: Outlook. See M 1405.
- 1428 WEWN: The Chaplet of Divine Mercy.
- 1430 BBC (as): Special Programs for Asia. See M 1430.
- 1430 BBC: Off the Shelf. See M 0430.
- 1430 Radio Finland: Compass North. See M 0530.
- 1431 Radio France Int'l: RFI Europe. See M 1231.
- 1439 Radio France Int'l: Film Reel. See F 1245.
- 1445 BBC: Global Concerns. See F 0145.
- 1445 Radio Finland: Highlights. See F 1245.
- 1446 Radio France Int'l: Drumbeat (biweekly). See T 1647.
- 1446 Radio France Int'l: Silk Roads (biweekly). See T 1647.
- 1447 WEWN: Profiles in Greatness.
- 1450 Radio Finland: Finnish Press Review. See T 1249.
- 1453 Radio France Int'l: News Headlines.
- 1454 Radio Finland: Closeup. See T 1254.

### Saturdays

- 1400 BBC: News Summary. See S 0100.
- 1400 WEWN: The Holy Rosary (Glorious).
- 1401 BBC: John Peel. See T 0330.
- 1423 Radio France Int'l: Focus on France. Zooming in on a French news item.
- 1428 WEWN: The Chaplet of Divine Mercy.
- 1430 BBC: Sportsworld. The weekly sports magazine.
- 1430 Radio France Int'l: Report on Asia. See S 1618.
- 1430 Radio Sweden: People and Ideas. See S 0030.
- 1441 Radio France Int'l: French Lesson. See A 1242.
- 1443 Radio Finland: Starting Finnish. See A 1243.
- 1447 WEWN: Profiles in Greatness.
- 1453 Radio Finland: Perspectives. See A 1353.

## FREQUENCIES

1500-1600	Algeria, R Algiers Intl	11715af	15205me	17745eu	
1500-1600	Australia, Radio	6060pa	6080pa	7240pa	7260as
		9510as	9580pa	9770as	11660as
		11680as	11695pa	11800pa	
1500-1600 vl	Australia, VL8A Alice Spg	2310do			
1500-1600 vl	Australia, VL8K Katherine	2485do			
1500-1600 vl	Australia, VL8T Tent Crk	2325do			
1500-1600	Bahrain, Radio	6010do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZU St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955na			
1500-1600	China, China Radio Intl	7405na	9785na	11815as	15165as
1500-1600 vl	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
1500-1600	Ecuador, HCJB Quito	11925am	17490am	17890am	21455am
1500-1600	Ethiopia, Voice of	7165do	9560do		
1500-1550	Germany, Deutsche Welle	7195af	9735af	11965af	15145af
		17765af			
1500-1600	Guam, KTWR Agana	15610as			
1500-1600	Iraq, Radio Iraq Intl	15250as			
1500-1600 vl	Italy, IRRS Milano	7125eu			
1500-1600	Japan, NHK/Radio	9535na	9750as	11915na	15355af
1500-1600	Jordan, Radio	9560eu			
1500-1600 vl	Malaysia, RTM Kota Kinaba	5980do			
1500-1600	Malaysia, RTM Radio 4	7295do			
1500-1600 vl	Malaysia, RTM Sarawak	4950do	7160do		
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1513 smha	Mongolia, R Ulaanbaatar	13780as			
1500-1600	Netherlands, Radio	9895as	13700as	15150as	
1500-1600 ocasnal	New Zealand, R NZ Intl	9655pa			
1500-1600	Nigeria, Radio	4990do	7285do		
1500-1600	Nigeria, Voice of	7255af			
1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu
1500-1600	Philippines, FEBC Manila	11995as			
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as	

1500-1600	Russia, Radio Moscow Intl	5905eu	6055eu	7105na	7135eu
		7250eu	7260na	7330eu	7345na
		7380eu	9505eu	9890eu	15210eu
		15345eu	15380eu	15440eu	15540eu
		17760eu			
1500-1600 vl	Rwanda, Radio Rwanda	9610do			
1500-1600	S Africa, Channel Africa	7270af	15240af		
1500-1600 mtwhfa	Seychelles, FEBA Radio	9810as	15330as		
1500-1600	Singapore, SBC Radio One	5010do	5052do	11940do	
1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1500-1530	Switzerland, Swiss R Intl	9420af	9455as	13635as	15505as
1500-1600	United Kingdom, BBC London	6190af	6195eu	7180as	9410eu
		9515na	9660na	9740me	9750eu
		9760eu	11750as	11940af	12095eu
		15070af	15260na	15310as	15420af
		17640af	17705eu	17760na	17840na
		17880af	21470af	21490af	21660af
1500-1600	USA, KCBI Dallas TX	15725am			
1500-1600	USA, KTVN Salt Lk City UT	7510na			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, VOA Washington DC	6110as	7125as	9645as	9690as
		9700eu	9760as	11705as	11920af
		11995af	15205as	15255eu	15395as
		19379me			
1500-1600	USA, WEWN Birmingham AL	9350am	17510me		
1500-1600	USA, WHRI Noblesville IN	9465sa	15105na		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WRNO New Orleans LA	15420na			
1500-1600	USA, WWCR Nashville TN	13845am	15685am		
1500-1600	USA, WYFR Okeechobee FL	11830na	15215na	17760na	
1515-1600	Bulgaria, Radio	12085as			
1530-1600	Albania, R Tirana Intl	7155eu	9760eu		
1530-1600	Austria, R Austria Intl	6155eu	9880me	11780as	13730eu
1530-1545	India, All India Radio	7412as	9910as	11740as	
1530-1600 mtwhf	Portugal, Radio	21515me			
1545-1600	Vatican State, Vatican R	11640as	15090au		

## SELECTED PROGRAMS

### Sundays

- 1500 BBC (af): Postmark Africa. See S 0335.
- 1500 BBC: World News. See S 0300.
- 1500 WEWN: The Kingdom.
- 1515 BBC: Concert Hall. Classical music concerts.
- 1525 BBC (af): African News. See S 0330.
- 1528 WEWN: Praise the Lord.

### Mondays

- 1500 BBC: World News. See S 0300.
- 1500 WEWN: Late How I Loved Thee.
- 1515 BBC (af): Focus on Africa. Up-to-the-minute reports on the day's events from all over the continent.
- 1515 BBC: Commonwealth Day Observance (14th). Live transmission from Westminster Abbey.
- 1515 BBC: Special Feature. An Ice Cream Sundae (28th). See M 0101. The Dammed (21st). See M 0101. Writing the Life (7th). See M 0101.
- 1528 WEWN: This is Our Faith.
- 1546 Radio Portugal: Visitors' Notebook. Tourist attractions and events in Portugal.

### Tuesdays

- 1500 BBC: World News. See S 0300.
- 1500 WEWN: Living the Scripture.
- 1515 BBC (af): Focus on Africa. See M 1515.
- 1515 BBC: A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way.
- 1528 WEWN: Drama of Jesus.
- 1546 Radio Portugal: Musical Kaleidoscope. A variety of music for listening.

### Wednesdays

- 1500 BBC: World News. See S 0300.
- 1500 WEWN: Gospel of Luke.
- 1515 BBC (af): Focus on Africa. See M 1515.
- 1515 BBC: Special Feature. Animals of Power (2nd, 9th, 16th, 23rd). See M 0415.



The BBC's "Outlook" host, Barbara Myers.

- 1528 WEWN: Journey of Faith.
- 1530 BBC: Special Feature. Accidents Will Happen. George Barber investigates the subject of chance: Coincidences (9th), Luck (16th), and Lightning (23rd).
- 1546 Radio Portugal: Challenge of the '90s. The past, present, and future of Portugal.

### Thursdays

- 1500 BBC: World News. See S 0300.
- 1500 WEWN: Thomism.
- 1515 BBC (af): Focus on Africa. See M 1515.
- 1515 BBC: Ray on Record. See S 2315.
- 1528 WEWN: Prisoner of Love.
- 1542 Radio Portugal: Spotlight on Portugal. Focus on the cities, towns, and regions of Portugal.

### Fridays

- 1500 BBC: World News. See S 0300.
- 1500 WEWN: The Vineyard.
- 1515 BBC (af): Focus on Africa. See M 1515.
- 1515 BBC: Music Review. See H 2315.
- 1528 WEWN: You Better Believe It.
- 1536 Radio Portugal: Mailbag (triweekly). Listener letters are read and questions answered.
- 1548 Radio Portugal: Collector's Corner (triweekly). At look at stamps and other collectibles.
- 1548 Radio Portugal: Radio Portugal DX (triweekly). Shortwave radio listening tips.

### Saturdays

- 1500 BBC (af): Spice Taxi. See A 0630.
- 1500 BBC: World News. See S 0300.
- 1500 WEWN: Retreat Teaching.
- 1515 BBC: Sportsworld. See A 1430.



## FREQUENCIES

1600-1700	Australia, Radio	7240pa	7260as	9510as	9580pa	1600-1700 vl	Rwanda, Radio Rwanda	9610do	
		9770as	11660pa	11695pa	11880pa	1600-1700	S Africa, Channel Africa	7270af	15240af
1600-1700 vl	Australia, VL8A Alice Spg	2310do				1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu
1600-1700 vl	Australia, VL8K Katherine	2485do				1600-1605	Singapore, SBC Radio One	5010do	11940do
1600-1700 vl	Australia, VL8T Tent Crk	2325do				1600-1700	South Korea, Radio Korea	5975as	
1600-1700	Bahrain, Radio	6010do				1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as 15425as
1600-1645	Bulgaria, Radio	12085as				1600-1700	Swaziland, Trans World R	9500af	
1600-1700	Canada, CFCX Montreal	6005do				1600-1645	UAE, Radio Dubai	11795af	13675eu 15435eu 21605eu
1600-1700	Canada, CFRX Toronto	6070do				1600-1700	United Kingdom, BBC London	6190af	6195eu 7180as 9410eu
1600-1700	Canada, CFVP Calgary	6030do						9515na	9630af 9740me 9750eu
1600-1700	Canada, CHNX Halifax	6130do						9760eu	11750as 11940af 12095eu
1600-1700	Canada, CKZN St John's	6160do						15070af	15260na 15420af 17640af
1600-1700	Canada, CKZU Vancouver	6160do						17840na	17860af 17880af 21470af
1600-1700 s	Canada, RCI Montreal	11955na	17820am					21660af	
1600-1700	China, China Radio Intl	11575af	15110af	15130af		1600-1700	USA, KCBI Dallas TX	15725am	
1600-1700 vl	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am	1600-1700	USA, KTBN Salt Lk City UT	15590am	
1600-1627	Czech Rep, Radio Prague	5930as	7345me	11630eu		1600-1700	USA, KWHR Naalehu HI	7425as	
1600-1700	Ecuador, HCJB Quito	21455am				1600-1700	USA, Monitor Radio Intl	13625af	
1600-1630 vl	Estonia, Estonian Radio	5925eu				1600-1700	USA, VOA Washington DC	6110as	6160as 6180eu 7125as
1600-1700	France, Radio France Intl	6175eu	11705af	11975me	12015af			9700as	9760eu 11705as 11855af
		15530me	17620af	17795af	17850af			11920af	11995af 12040af 13710af
1600-1650	Germany, Deutsche Welle	6170as	7225as	7305as	9585as			15205af	15225af 15245af 15320af
		9815as	13680as	15105as				15395as	15410af 15445af 17790af
		7455as						19379me	
1600-1700	Guam, KSDA AWR Agat	7455as				1600-1700	USA, WEWN Birmingham AL	13615am	17510am
1600-1700	Guam, KTWR Agana	15610as				1600-1700	USA, WJCR Upton KY	7490na	13595na
1600-1627	Iran, VOIRI Tehran	11790eu				1600-1700	USA, WRNO New Orleans LA	15420am	
1600-1700	Iraq, Radio Iraq Intl	15250as				1600-1700	USA, WWCR Nashville TN	13845am	15610am 15685am
1600-1700 vl	Italy, IRRS Milano	7125eu				1600-1700	USA, WYFR Okeechobee FL	11830na	15215na 15355eu 17760na
1600-1700	Jordan, Radio	9560eu						21525af	21615af
1600-1700 s	Lebanon, King of Hope	6280me						11640af	15090af
1600-1615 mha	Mongolia, R Ulaanbaatar	7560as	7780as			1600-1630	Vatican State, Vatican R	9840af	12020af 15010af
1600-1700	Netherlands, Radio	9895as	13700as	15150as		1600-1630	Vietnam, Voice of	6060pa	11880pa
1600-1649 ocasnal	New Zealand, R NZ Intl	9655pa				1630-1700	Australia, Radio	6060pa	11880pa
1600-1700	Nigeria, Radio	4990do				1630-1700	Austria, R Austria Intl	11780as	
1600-1700	Nigeria, Voice of	7255af				1630-1700	Canada, RCI Montreal	7150as	9550as
1600-1630	Pakistan, Radio	9470me	11570me	13590me	15515af	1630-1700	Egypt, Radio Cairo	15255af	
		15675me	17725af			1630-1700	Liberia, Radio ELWA	4760do	
1600-1655	Poland, Polish R Warsaw	7285eu	9525eu			1645-1700	Tajikistan, Radio	7245as	
1600-1700	Russia, Radio Moscow Intl	6165na	7105na	7115eu	7135eu	1650-1700 mtwtf	New Zealand, R NZ Intl	9655pa	
		7150eu	7170na	7185eu	7205eu				
		7250na	7260na	7345na	9540na				
		9550na	9865eu	9890eu	15380eu				
		17760eu							

## SELECTED PROGRAMS

### Sundays

- 1600 BBC: World News. See S 0300.
- 1609 BBC: British News. See S 0309.
- 1615 BBC: Special Features. See S 0230.
- 1618 Radio France Int'l: Report on Asia. Correspondent reports and interviews on Asian affairs.
- 1632 Radio France Int'l: Club 9516. See S 1232.
- 1645 BBC: Letter from America. See S 0615.

### Mondays

- 1600 BBC: World News. See S 0300.
- 1600 WEWN: The Truth of Salvation.
- 1609 BBC: British News. See S 0309.
- 1615 BBC: New Ideas. Window on the world of technology, innovation and new products.
- 1631 Radio France Int'l: RFI Europe. See M 1231.
- 1635 BBC: Special Feature. Give Us Our Daily Bread. Conversations about the different types of bread available across the world.
- 1638 Radio France Int'l: Sports. See M 1238.
- 1645 BBC: The World Today. Examines thoroughly a topical aspect of the international scene.
- 1646 Radio France Int'l: North/South (biweekly). See M 1246.
- 1646 Radio France Int'l: Planet Earth (biweekly). See M 1246.

### Tuesdays

- 1600 BBC: World News. See S 0300.
- 1600 WEWN: Living the Scripture (Mother Angelica).
- 1609 BBC: British News. See S 0309.
- 1615 BBC: Megamix. See T 1130.
- 1628 WEWN: The Drama of Jesus.
- 1631 Radio France Int'l: RFI Europe. See M 1231.
- 1641 Radio France Int'l: Books. See T 1240.
- 1645 BBC: The World Today. See M 1645.
- 1647 Radio France Int'l: Drumbat (biweekly). African feature.
- 1647 Radio France Int'l: Silk Roads (biweekly). Focus on South Asia.

### Wednesdays

- 1600 BBC: World News. See S 0300.
- 1600 WEWN: God Bless.
- 1609 BBC: British News. See S 0309.

That all... of the... know that... is God, and... there is none else...  
KINGS 8:20

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Studios • Oakland, California  
Transmitters • Okeechobee, Florida  
United States of America

*This WYFR QSL comes to us from Richard Ashley of Salt Lake City, UT.*

- 1615 BBC: Music Feature. World Ranking. See T 0630.
- 1631 Radio France Int'l: RFI Europe. See M 1231.
- 1639 Radio France Int'l: Counterpoint. See W 1238.
- 1645 BBC: The World Today. See M 1645.
- 1646 Radio France Int'l: Land of France. See W 1246.

### Thursdays

- 1600 BBC: World News. See S 0300.
- 1609 BBC: British News. See S 0309.
- 1615 BBC: Network UK. Issues and events affecting the lives of people throughout the UK.
- 1631 Radio France Int'l: Sports. See M 1238.
- 1633 Radio France Int'l: RFI Europe. See M 1231.
- 1641 Radio France Int'l: Science Notes. See T 1249.
- 1645 BBC: The World Today. See M 1645.
- 1647 Radio France Int'l: Arts in France. See H 1248.

### Fridays

- 1600 BBC: World News. See S 0300.
- 1600 WEWN: Miracles of the Eucharist.
- 1609 BBC: British News. See S 0309.
- 1615 BBC: Science in Action. The latest in science and technology.
- 1628 WEWN: Occult Awareness.
- 1631 Radio France Int'l: RFI Europe. See M 1231.
- 1638 Radio France Int'l: Made in France. See H 1447.
- 1645 BBC: The World Today. See M 1645.
- 1645 Radio France Int'l: Film Reel. See F 1245.

### Saturdays

- 1600 BBC: World News. See S 0300.
- 1600 WEWN: Mariology.
- 1609 BBC: British News. See S 0309.
- 1615 BBC: Sportsworld. See A 1430.
- 1624 Radio France Int'l: Focus on France. See A 1423.
- 1627 Radio France Int'l: Spotlight on Africa. See S 1218.
- 1628 WEWN: The Church and Society.
- 1640 Radio France Int'l: French Lesson. See A 1242.

1700-1800	Algeria, R Algiers Intl	7155eu			
1700-1800	Australia, Radio	5995pa	6060pa	6080as	7240pa
		7260as	9510as	9580pa	11660pa
		11695pa	11880pa		
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800	Bahrain, Radio	6010do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	7405af	9570af	11575af	
1700-1800	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 vl	Eqt Guinea, Radio Africa	7200af			
1700-1800 as	Guam, KSDA AWR Agat	13720as			
1700-1800 vl	Italy, IRRS Milano	7125eu			
1700-1800	Japan, NHK/Radio	9535na	9750as	11915as	17870af
1700-1730	Jordan, Radio	9560eu			
1700-1800 s	Lebanon, King of Hope	6280me			
1700-1713 mtwhfa	Lebanon, Voice of	6550eu			
1700-1800	Liberia, Radio ELWA	4760do			
1700-1800 a	Morocco, RTV Marocaine	17815af			
1700-1800 mtwtf	New Zealand, R NZ Intl	9655pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785af
1700-1800	Pakistan, Radio	7355eu	9855eu		
1700-1800	Russia, Radio Moscow Intl	7105na	7170eu	7205eu	7260na
		7330eu	7340eu	7345na	9540na
		9890eu	13670eu	15380eu	17760eu
1700-1800 vl	Rwanda, Radio Rwanda	9610do			
1700-1800	S Africa, Channel Africa	7270af	15240af		
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1700-1715	Swaziland, Trans World R	9520af			
1700-1730	Switzerland, Swiss R Intl	9885af	13635me	17635af	
1700-1730	United Kingdom, BBC London	6005af	17860af		
1700-1800	United Kingdom, BBC London	3955eu	6180eu	6190af	6195eu
		7160me	9410eu	9515eu	9630af
		9740me	11940af	12095af	15070af
		15260af	15400af	15420af	17880af
		21470af	21660af		
1700-1800	USA, KCBI Dallas TX	15725am			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	7425as			
1700-1800	USA, Monitor Radio Intl	13625af			

1700-1800	USA, VOA Washington DC	6040eu	6110as	7215as	9645as
		9700eu	9760eu	11855as	11920af
		12040af	13710af	15205as	15320af
		15395as	15410af	15445af	17790af
		19379me			
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 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WWCR Nashville TN	13845am	15685am		
1700-1800	USA, WYFR Okeechobee FL	21500af			
1715-1730 mtwhf	Swaziland, Trans World R	9520af			
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	Vatican State, Vatican R	9645af	11625af	15090af	
1745-1800	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		

1800-1900	Argentina, RAE	15345eu			
1800-1900	Australia, Radio	5960as	5995pa	6060pa	6080as
		7240pa	7260as	9580pa	11660pa
		11695pa	11855as	11880pa	
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, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
1800-1827	Czech Rep, Radio Prague	5930af	7345me	9420eu	
1800-1900	Ecuador, HCJB Quito	21455am			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900 vl	Eqt Guinea, Radio Africa	7200af			
1800-1815	Ghana, GBC Radio 1	4915do			
1800-1815	Ghana, GBC Radio 2	3316do			
1800-1900 as	Guam, KSDA AWR Agat	13720as			
1800-1900	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1800-1815	Israel, Kol Israel	7465eu	11587na	11675na	
1800-1900 vl	Italy, IRRS Milano	7125eu			
1800-1900	Kuwait, Radio	9840na	13620na		
1800-1900	Lebanon, King of Hope	6280me			
1800-1900	Liberia, Radio ELWA	4760do			
1800-1900	Netherlands, Radio	6020af	9605af	21515af	21590af
1800-1900 mtwtf	New Zealand, R NZ Intl	9655pa			
1800-1830 s	Norway, Radio Norway Intl	9590eu	11860af		
1800-1855	Poland, Polish R Warsaw	5995eu	7270eu	7285eu	
1800-1830 mtwhf	Portugal, Radio	9780eu			
1800-1900	Russia, Radio Moscow Intl	6165na	7105eu	7170na	7250na
		7260na	9540eu	9890eu	12050na
		13670eu	15380eu	17760eu	
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900	Swaziland, Trans World R	3200af	9500af		
1800-1900	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	9410eu
		9630af	9740me	11940af	11955as
		12095af	15070af	15400af	15420af
		17880af			
1800-1900	USA, KCBI Dallas TX	15725am			
1800-1900	USA, KJES Mesquite NM	9510na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625as			
1800-1900	USA, Monitor Radio Intl	9355pa	21640af		
1800-1900	USA, VOA Washington DC	6040eu	9700eu	11920af	12040af
		13675af	13710af	15205me	15320af
		15410af	15580af	17800af	19379me
1800-1900	USA, WEWN Birmingham AL	13740am			
1800-1900	USA, WHRI Noblesville IN	9485na	13760na		
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WWCR Nashville TN	13845am	15610am	15685am	
1800-1900	USA, WYFR Okeechobee FL	21500eu			
1800-1830	Vietnam, Voice of	9840eu	12020eu		
1815-1900	Bangladesh, Radio	9570me	12030eu		
1830-1900	Bulgaria, Radio	7455eu	9700na		
1840-1850 mtwhfa	Greece, Voice of	15630af	15650af	17525af	
1845-1900 irreg s	Mali, RDTV 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.**

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

1-800-872-1717





1900-2000	Australia, Radio	5960as 7240pa 11695pa	5995pa 7260as 11720pa	6060pa 9580pa 11880pa	6080as 11680pa	2000-2100	Australia, Radio	5960as 7260as 11880pa	6060pa 9580pa 11695pa	6080as 11720pa	7240pa
1900-2000 vl	Australia, VL8A Alice Spg	2310do				2000-2100 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do				2000-2100 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do				2000-2100 vl	Australia, VL8T Tent Crk	2325do			
1900-2000	Bahrain, Radio	6010do				2000-2100	Bahrain, Radio	6010do			
1900-1925	Belgium, R Vlaanderen Int	5910eu	13685af			2000-2100	Canada, CFCX Montreal	6005do			
1900-1918	Brazil, Radiobras	15268eu				2000-2100	Canada, CFRX Toronto	6070do			
1900-2000	Bulgaria, Radio	7455eu	9700na			2000-2100	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CFCX Montreal	6005do				2000-2100	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CFRX Toronto	6070do				2000-2100	Canada, CKZN St John's	6160do			
1900-2000	Canada, CFVP Calgary	6030do				2000-2100	Canada, CKZU Vancouver	6160do			
1900-2000	Canada, CHNX Halifax	6130do				2000-2100	China, China Radio Intl	9440af 15110af	9920eu	11500eu	11715af
1900-2000	Canada, CKZN St John's	6160do				2000-2100	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
1900-2000	Canada, CKZU Vancouver	6160do				2000-2100	Ecuador, HCJB Quito	21455am			
1900-2000	China, China Radio Intl	9440af	11515af			2000-2100 vl	Eq Guinea, Radio Africa	7200af			
1900-2000	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am	2000-2050	Germany, Deutsche Welle	5960eu	7285eu		
1900-2000	Ecuador, HCJB Quito	15270eu	17490eu	17790eu	21455eu	2000-2030	Ghana, GBC Radio 1	4915do			
1900-2000 vl	Eq Guinea, Radio Africa	7200af				2000-2030	Ghana, GBC Radio 2	3366do			
1900-1950	Germany, Deutsche Welle	9665af 11785af 15425af	9765af 13610af	11740af 13790af	11785af 15145af	2000-2100	Indonesia, Voice of	9675as	11752as		
1900-1910 mtwhfa	Greece, Voice of	7450eu	9380eu			2000-2030	Iran, VOIRI Tehran	9022me	15260eu		
1900-1945	India, All India Radio	7412eu 11935af	9950me 15080af	11620eu	11860eu	2000-2030	Israel, Kol Israel	7465eu 11675na	11585na	11603na	
1900-2000 vl	Italy, IRRS Milano	7125eu				2000-2100 vl	Italy, IRRS Milano	7125eu			
1900-2000	Japan, NHK/Radio	6150as 11815pa	9535as 11865pa	9640am 11875pa	9750as 11915pa	2000-2010 mtwhf	Kenya, Kenya BC Corp	4935do			
1900-2000	Kuwait, Radio	9840na	13620na			2000-2100	Kuwait, Radio	9840na	13620na		
1900-2000	Lebanon, King of Hope	6280me				2000-2030 as	Latvia, Radio	5935eu			
1900-2000	Liberia, Radio ELWA	4760do				2000-2100	Lebanon, King of Hope	6280me			
1900-2000 s	Morocco, RTV Marocaine	11920as				2000-2100	Liberia, Radio ELWA	4760do			
1900-1925	Netherlands, Radio	6020af	9605af	21515af	21590af	2000-2030	Lithuania, Radio Vilnius	9400na	9675na	9710na	
1900-2000	New Zealand, R NZ Intl	9655pa				2000-2010 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
1900-2000 as	New Zealand, R NZ Intl	11735pa				2000-2025	Netherlands, Radio	17605af	21590af		
1900-2000	Nigeria, Radio	3326do	4990do			2000-2100	New Zealand, R NZ Intl	9655pa			
1900-2000	Nigeria, Voice of	7255af				2000-2100 as	New Zealand, R NZ Intl	11735pa			
1900-2000 vl	Papua New Guinea, NBC	9675do				2000-2100	Nigeria, Radio	3326do	4990do		
1900-1930 mtwhf	Portugal, Radio	15515af				2000-2100	Nigeria, Voice of	7255af			
1900-2000	Romania, R Romania Intl	9750eu	11810eu	11940eu	15365eu	2000-2030 s	North Korea, R Pyongyang	6576eu	9345eu	9640af	9977af
1900-2000	Russia, Radio Moscow Intl	7105na 9685eu 17710na	7170na 12050na 17760eu	7205eu 13670eu	7260na 15580af	2000-2100 vl	Norway, Radio Norway Intl	9590eu			
1900-2000	Saipan, KFBS Marpi	9465as				2000-2100	Papua New Guinea, NBC	9675do			
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu			2000-2100	Portugal, Radio	15515af			
1900-2000	Spain, Spanish Natl Radio	11775af				2000-2100	Romania, R Romania Intl	9750eu	11810eu	11940eu	15365eu
1900-2000	Swaziland, Trans World R	3200af	3240af	9500af		2000-2100	Russia, Radio Moscow Intl	7105na 9685eu 17710na	7170na 12050na 17760eu	7205eu 13670eu	7260na 15580af
1900-2000 vl	Uganda, Radio	4976do				2000-2100 vl	Saudi Arabia, BSKSA	9705eu	9720eu		
1900-2000	United Kingdom, BBC London	3255af 6190af 9630af 15400af	3955eu 6195eu 9740me 17880af	6005af 7160me 12095af	6180eu 9410eu 15070af	2000-2030	Solomon Islands, SIBC	5020do	9545do		
1900-2000	USA, KCBI Dallas TX	15725am				2000-2045	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1900-2000	USA, KTN Salt Lk City UT	15590am				2000-2030	Swaziland, Trans World R	3200af	3240af		
1900-2000	USA, KWHR Naalehu HI	13625as				2000-2100 vl	Switzerland, Swiss R Intl	6110af 15505af 4976do	9885af	12035af	13635af
1900-2000	USA, Monitor Radio Intl	9355eu	9930pa	21640af		2000-2100 vl	Uganda, Radio	4976do			
1900-2000	USA, VOA Washington DC	3980eu 9700eu 12040af 15320af 19379me	6040eu 9760eu 13710af 15410af	7415af 11870as 15180as 15580af	9525as 11920af 15205af 17800af	2000-2030	United Kingdom, BBC London	6190af 9740me 3255af 6005af 15260sa	6195eu 15070af 3955eu 6180eu 15400af	7160me 17880af 4570af 7325eu	9630af 5975am 9410eu
1900-2000	USA, WEWN Birmingham AL	9985am	13740am			2000-2100	USA, KCBI Dallas TX	15725am			
1900-2000	USA, WHRI Noblesville IN	9485na	9590na	13760na		2000-2100	USA, KJES Mesquite NM	15545am			
1900-2000	USA, WINB Red Lion PA	15715eu				2000-2100	USA, KTN Salt Lk City UT	15590am			
1900-2000	USA, WJCR Upton KY	7490na	13595na			2000-2100 as	USA, KVOH Los Angeles CA	17775am			
1900-2000	USA, WMLK Bethel PA	9465eu				2000-2100	USA, KWHR Naalehu HI	13710as			
1900-2000	USA, WRNO New Orleans LA	15420am				2000-2100	USA, Monitor Radio Intl	9355eu	13770af		
1900-2000	USA, WWCR Nashville TN	13845am	15610am	15685am		2000-2100	USA, VOA Washington DC	3980eu 11760me 15320af 19379me	6040eu 7415af 15410af 15580af	9760eu 15205me 17800af	
1900-2000	USA, WYFR Okeechobee FL	15355af	21615af			2000-2100	USA, WEWN Birmingham AL	13740eu			
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu		2000-2100	USA, WHRI Noblesville IN	9485na	13760am		
1910-1920	Botswana, Radio	3356af	4830af	7255af		2000-2100	USA, WINB Red Lion PA	15715eu			
1930-2000	Austria, R Austria Intl	5945eu	6155eu	9880eu	13730af	2000-2100	USA, WJCR Upton KY	7490na	13595na		
1930-2000	Finland, YLE/Radio	6120eu	9730eu	11755af		2000-2100	USA, WMLK Bethel PA	9465eu			
1930-2000	Iran, VOIRI Tehran	9022me	15260eu			2000-2100	USA, WRNO New Orleans LA	15420am			
1930-2000	Netherlands, Radio	17605af	21590af			2000-2100	USA, WWCR Nashville TN	13845am	15610eu	15685am	
1930-2000	Slovakia, R Slovakia Intl	5915eu	7345eu	9440eu		2000-2100	USA, WYFR Okeechobee FL	15355af	21615af		
1935-1955	Italy, RAI Rome	7275eu	11800eu			2000-2030	Vatican State, Vatican R	9645af	11625af	15090af	
1940-2000 mha	Mongolia, R Ulaanbaatar	11790eu	11850eu			2005-2100	Syria, Radio Damascus	12085eu	15095eu		
1945-2000	Armenia, Radio Yerevan	4810me	4990me	6065me		2010-2100 sa	Kenya, Kenya BC Corp	4935do			
						2015-2045 s	Swaziland, Trans World R	3200af			
						2025-2045	Italy, RAI Rome	7235me	9575me	11800me	
						2030-2100	Egypt, Radio Cairo	15375af			
						2030-2100 vl	Estonia, Estonian Radio	5925eu			
						2030-2100 mtwhfa	Palau, KHBN Voice of Hope	11980as			
						2030-2100	Poland, Polish R Warsaw	5995eu	6135eu	7285eu	
						2030-2100	South Korea, Radio Korea	5975as	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	3950eu	5885eu		

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, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	China, China Radio Intl	9920eu	11500eu		
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
2100-2200	Cuba, Radio Havana Cuba	15165eu			
2100-2127	Czech Rep, Radio Prague	5930na	7345na	9420au	
2100-2130	Ecuador, HCJB Quito	21455am			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2130 vl	Estonia, Estonian Radio	5925eu			
2100-2150	Germany, Deutsche Welle	6185as	9670as	9690af	9715af
		9765as	11785as	15425af	
		7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		
2100-2200	India, All India Radio	7125eu			
2100-2115 mtwtf	Italy, IRRS Milano	6035as	6185as	9640pa	9660as
2100-2200	Japan, NHK/Radio	11915as	11925eu		
2100-2200	Lebanon, King of Hope	6280me			
2100-2200 mtwtf	Lebanon, Wings of Hope	11530me			
2100-2200	Liberia, Radio ELWA	4760do			
2100-2137	New Zealand, R NZ Intl	9655pa			
2100-2137 as	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, Radio	3326do	4990do		
2100-2200 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2100-2200 vl	Papua New Guinea, NBC	9675do			
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 Moscow Intl	4795eu	4860eu	5950eu	6055eu
		7115eu	7150na	7170eu	7205eu
		7330eu	9550eu	9620eu	9685eu
		9750na	9795eu	9890eu	12050na
		13670eu	15425na	17605na	
2100-2115 vl	Sierra Leone, SLBS	3316do			
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2200	Spain, Spanish Natl Radio	6125eu			
2100-2130	Sri Lanka, SLBC Colombo	9720eu	15120eu		
2100-2105	Syria, Radio Damascus	12085eu	15095eu		
2100-2200	Turkey, Voice of	9445eu	11895		
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, KWHR Naalehu HI	13720as			
2100-2200	USA, Monitor Radio Intl	7510eu	9355eu	13840au	
2100-2200	USA, VOA Washington DC	6040eu	6095eu	6125me	7415af
		9760eu	11760eu	11870as	13710af
		15185as	15205me	15290af	15320af
		15410af	15445af	15580af	17735as
		17800af	19379me	21485af	
2100-2200	USA, WEWN Birmingham AL	13740am			
2100-2200	USA, WHRI Noblesville IN	13760am	17830am		
2100-2200	USA, WINB Red Lion PA	15715eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNQ New Orleans LA	15420am			
2100-2200	USA, WWCR 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 as	Yemen, Rep of Yemen Radio	9780eu			
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom, BBC Carib	6110am	15390am	17715am	
2130-2200	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	15325af	17820af
2130-2200	Ecuador, HCJB Quito	15270eu	17490eu	21455eu	
2130-2140 mtwhf	Latvia, Radio	5935eu			
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, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5995eu	7260eu	11945eu	13650eu
		13690af	15140af	15325af	17820af
2200-2300	China, China Radio Intl	7170eu			
2200-2230	China, China Radio Intl	3985eu			
2200-2300	Costa Rica, R Peace Intl	7375am	9375am	15030am	21465am
2200-2300	Cuba, Radio Havana Cuba	6180na			
2200-2230	Czech Rep, Radio Prague	5930na	7345af	9420eu	
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300 vl	Eq Guinea, Radio Africa	7200af			
2200-2300	Hungary, Radio Budapest	6110eu	7220eu	9835eu	11910eu
2200-2300	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265eu		
2200-2225	Italy, RAI Rome	5990as	9710as	11800as	
2200-2300	Lebanon, King of Hope	6280me			
2200-2300 mtwtf	Lebanon, Wings of Hope	11530me			
2200-2300 vl	Malaysia, RTM Kota Kinaba	5980do			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, R NZ Intl	15115pa			
2200-2300	Nigeria, Radio	3326do	4990do		
2200-2300 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2200-2300 vl	Papua New Guinea, NBC	9675do			
2200-2300	Russia, Radio Moscow Intl	4795eu	4860eu	5950eu	5965eu
		5975eu	6005eu	7115eu	7150eu
		7180eu	7185eu	7300eu	7380eu
		9505eu	9505eu	9620na	9750na
		9890eu	17605na	17655na	
2200-2215 vl	Sierra Leone, SLBS	3316do			
2200-2300	Singapore, SBC Radio Dne	5010do	5052do	11940do	
2200-2235 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2245	South Korea, Radio Korea	6480eu	15575eu		
2200-2230	South Korea, Radio Korea	7275as	9640as		
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	9850eu	11915eu		
2200-2300	UAE, Radio Abu Dhabi	9605na	9770na	11885na	
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, KWHR Naalehu HI	17510as			
2200-2300	USA, Monitor Radio Intl	7510am	9430as	13625as	17555sa
2200-2300	USA, VOA Washington DC	6070as	7215as	9770as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2200-2300	USA, WEWN Birmingham AL	13740am			
2200-2300	USA, WHRI Noblesville IN	13760am			
2200-2245	USA, WINB Red Lion PA	15715eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRND New Orleans LA	15420am			
2200-2300	USA, WWCR Nashville TN	12160am	13845am	15685am	
2200-2300	USA, WYFR Okeechobee FL	17750eu	21525af		
2200-2230 s	USA, KGEI San Francisco CA	15280sa			
2230-2300	Finland, YLE/Radio	9615na			
2230-2300	Israel, Kol Israel	7465eu	9435eu	11585na	11603na
		11675na	17575sa		
2230-2300	Lithuania, Radio Vilnius	9400na	9675na	9710na	
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Armenia, Radio Yerevan	7440eu	9480eu	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	9600au	11830as		

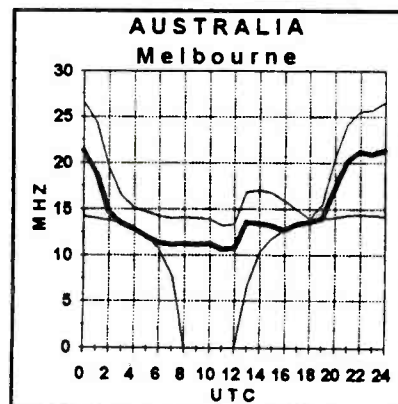
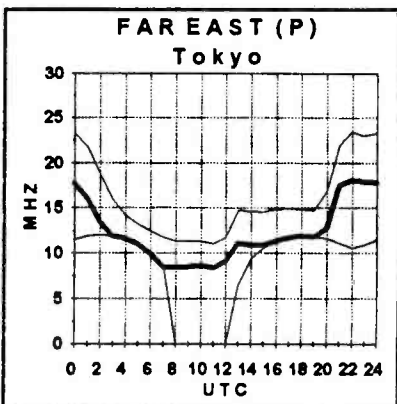
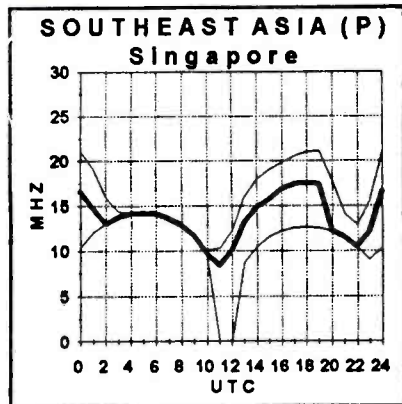
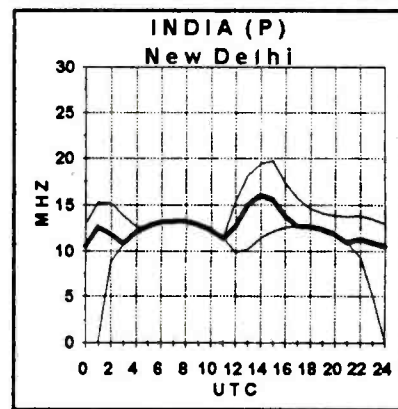
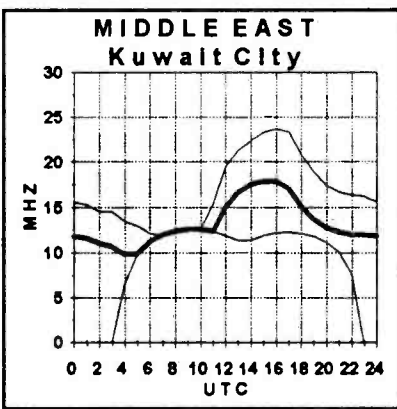
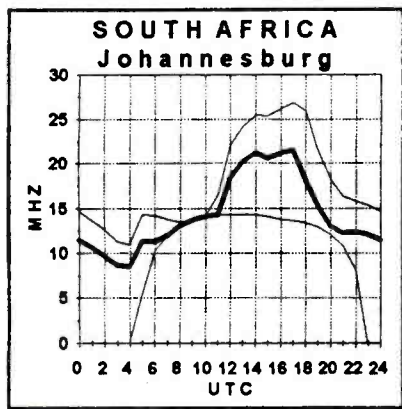
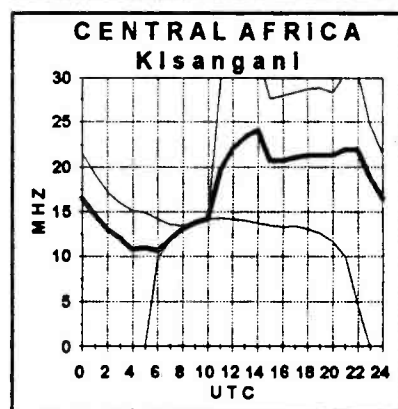
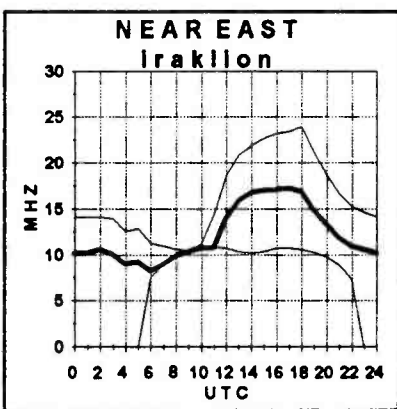
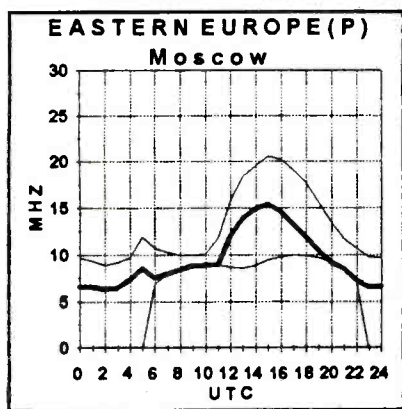
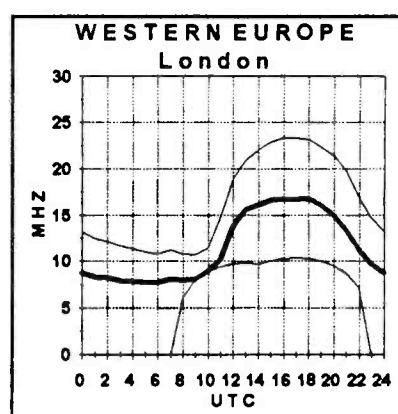
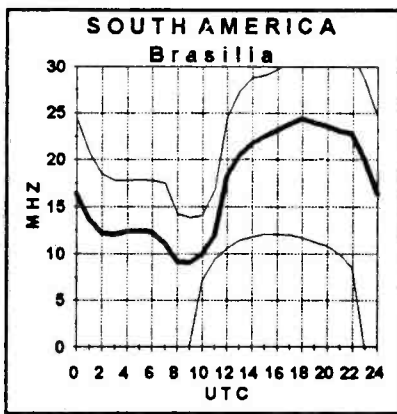
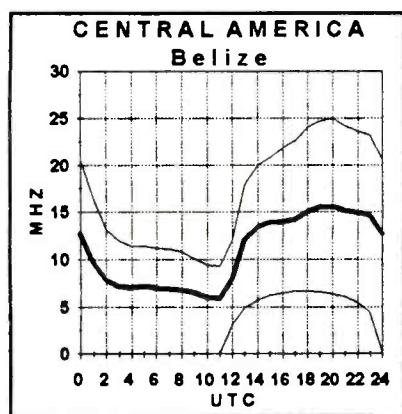




# Propagation conditions: Eastern United States

**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.

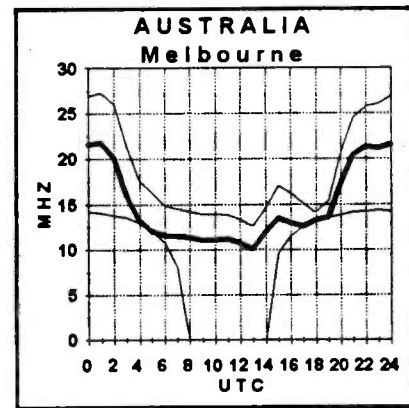
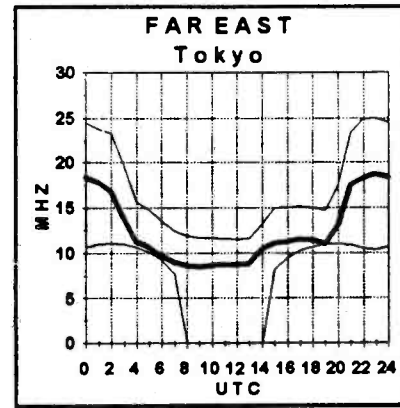
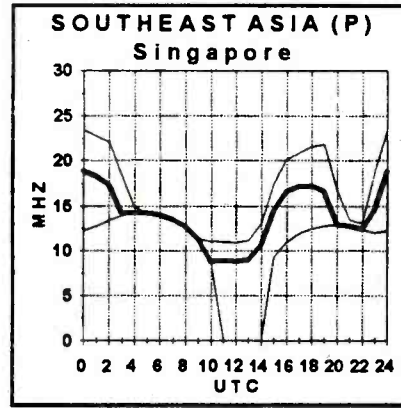
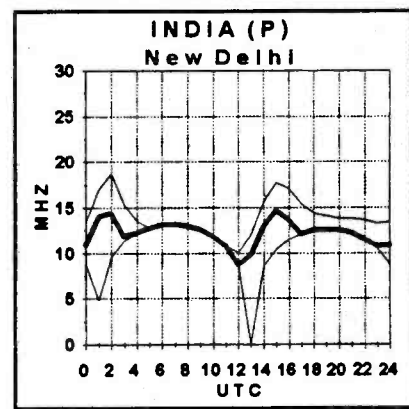
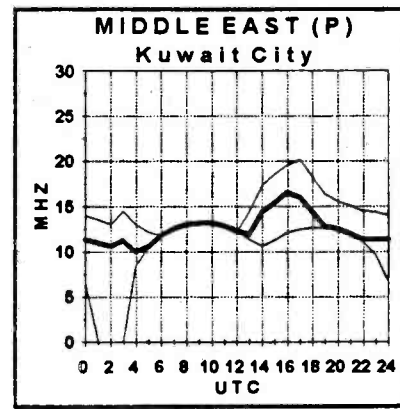
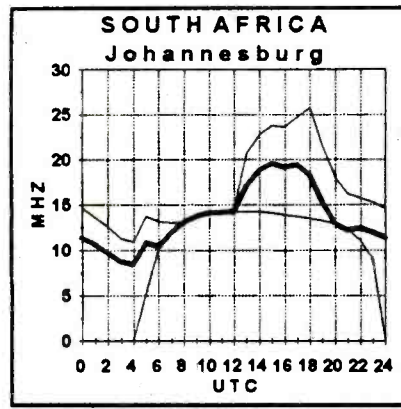
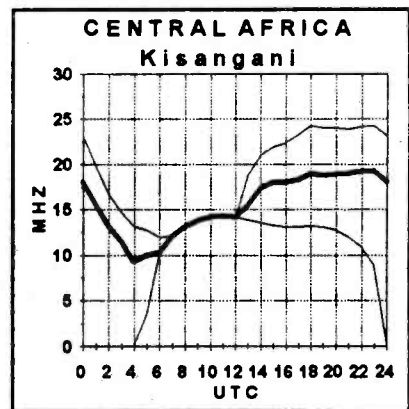
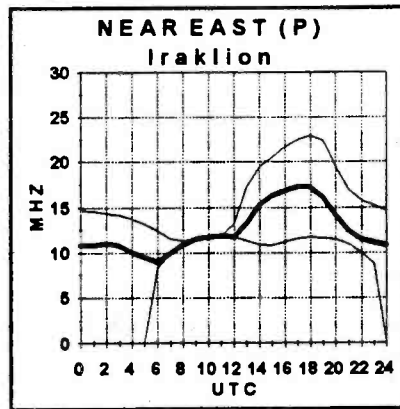
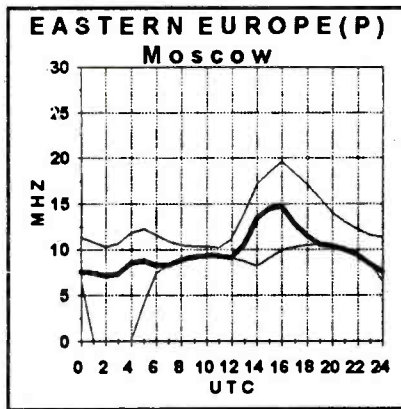
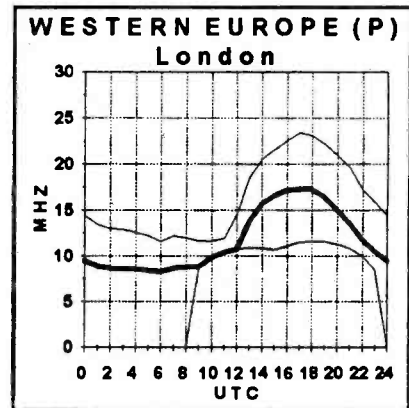
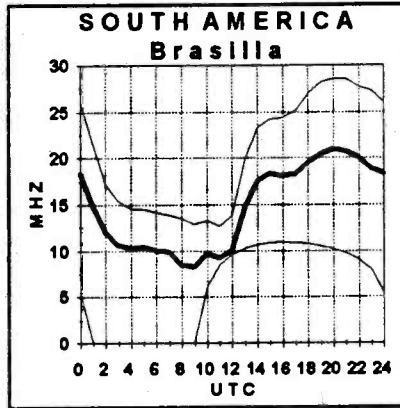
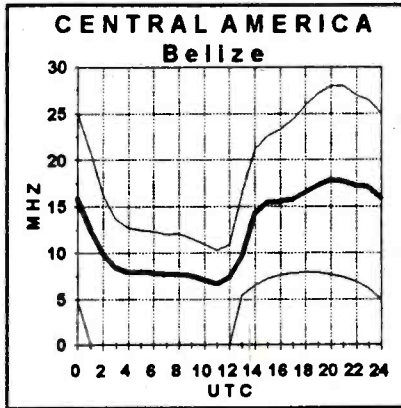
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the





# Propagation Conditions: Western United States

graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances. 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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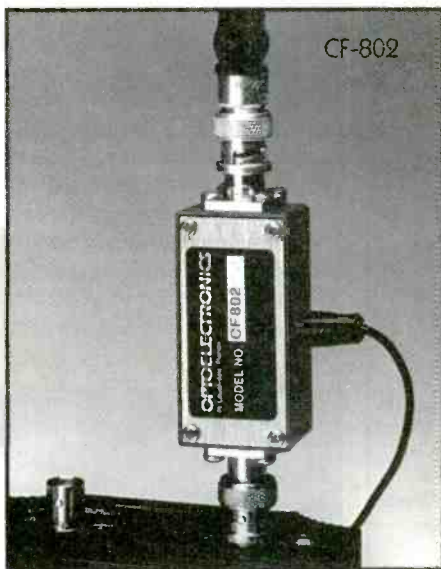
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**OPTOELECTRONICS**

## Travel and Tourism

By Ron Tamburello

Phileas Fogg and his companions traveled *Around the World in 80 Days*, with a little help from Jules Verne's 19th century classic by that name, all the while enduring the risky business of soaring in a hot air balloon.

Thanks to the modern convenience of short-wave receivers, a glimpse of the world around us can be enjoyed from a much less precarious easy chair in the radio room. And what better way to get a contemporary and up to date view of possible destinations for this season's leisure travel? Even if you are not planning a trip, you may still enjoy the sights and sounds of faraway places thanks to a wide range of programming from international broadcasters.

The technology that brings foreign lands to our headsets would surely have fascinated even the visionary Jules Verne, not to mention his

intrepid adventurers. For us, the mere spinning of the radio dial enables our travels to begin.

The Far East is well represented with regular travel programming from several countries. Among them is **Radio Japan's** *Travel and Book Beat*, a weekly program that reveals lesser known places quietly hidden away among more popular tourist attractions. A recent broadcast profiled the historic city of Yokosuka, at the mouth of Tokyo Bay, and featured various points of interest including a local shrine, a parade, and the military base located there. The *Japan Travelogue* segment of the program can be heard Thursday at 0515, 1415, 1715 and 2115, and Friday at 0115. (Time is listed in Universal Coordinated Time, UTC, and broadcast frequencies can be found in the "Shortwave Guide" beginning on page 43 of this issue.)



From mainland China comes a feature along traditional lines in the short weekly segment from **China Radio International**, *Travel Talk*. This program will take you to some well known destinations, as well as lesser traveled and enchanting back roads of the massive Asian continent. A recent series toured the 10,000 mile length of China's coast, visiting numerous resort and port cities along the way. *Travel Talk* is beamed to North America each Saturday at 1220, 1320 and 1420, and Sunday at 0020, 0320, 0420, and 0520, with many additional broadcasts to other locations around the globe.

Other programs from the Far East include *Main Roads and Byways* (of Taiwan) from the **Voice of Free China**, on Sunday at 0215 and Monday at 0315; and *Discovering Korea* from **Radio Korea** on Saturday at 0615, 1215, 1315, 1415 and 1615, and Sunday at 0115.

### Additional Travelogue Programs Supplied by Jim Frimmel, MT Program Manager Recommended UTC listening times in N.A.

- Belgium.** *Tourism* (Sun 0049, Mon 0049/1420, Sat 1420). Take an audio tour of the sights and sounds of Belgium. *Radio Vlaanderen Int'l.*
- Bulgaria.** *Across the Map of Bulgaria* (Sun 2340, Mon 1425, Wed 1930/2345). Historical sites and interesting places and people. *Discovering Bulgaria* (Mon 1930). The tourist attractions which may be found in Bulgaria. *Sports and Tourism* (Fri 1900/2315). Sports news, village tours and sports-related products. *Radio Bulgaria Int'l.*
- Egypt.** *Tourism in Egypt* (Tue 0235). The title said it all. *Radio Cairo.*
- Israel.** *This Land* (Wed 1115/2015). Travel magazine program. *Voice of Israel. Israel Magazine* (Tue 2145). Fifteen minutes of news and analysis about Israel followed by fifteen minutes of tourist information for visitors. (WWCR #1).
- Great Britain.** *Megamix* (Tue 1130/1615/2215). Compendium of music, sport, fashion, health, travel, news and views for young people. *On the Move.* A weekly program about travel and transport. *BBC World Service.*
- New Zealand.** *Oceania* (Tue 1040). Focus on the attractions of a South Pacific island and travel info. *Travel Pacific* (Mon 0430, Thu 0830). A trip to New Zealand through the eyes and ears of a tourist. This is a wonderful program that puts you right on the scene in a very original way. Highly recommended. *Travel South (biweekly)* (Tue 0630/1010). Susan Buckland on visiting the South Pacific. *Radio New Zealand Int'l.*
- Nigeria.** *African Safari* (Sat 0500). A musical journey around the countries of Africa with country profiles and current happenings. *Images of Nigeria* (Fri 0615). Tourist attractions in Nigeria such as the country's natural beauty, the wildlife parks, and cultural festivals. *Voice of Nigeria.*
- Portugal.** *Spotlight on Portugal* (Fri 0232). Scenic spots and attractions are described. *Visitor's Notebook* (Mon 1516/1916/2016 Tue 0246). Historical and interesting locations are reviewed. *Radio Portugal.*
- Romania.** *Romanian Itineraries* (Tue 0242). Tourist attractions in Romania. *Radio Romania Int'l.*
- Spain.** *Grass Roots* (Mon 0011/111/0511). A tour of the different Spanish regions as seen through their folk music. *Spanish National Radio.*
- Taiwan.** *Main Roads and Byways* (Sun 0216, Mon 0316). Hop a tour bus to a Taiwan attraction. *Voice of Free China.*
- Turkey.** *Another Spot in Turkey* (Sun 2309, Mon 0409). A different location in Turkey is featured in each program. *Turkish Shopping Centers and Malls* (Sat 0428). The melding of the old and new lifestyles in modern Turkey. *From the Seas to the Mountains* (Sun 0430). Last but not least. *Voice of Turkey.*

Many shortwave programs in the magazine format contain travel segments (such as Radio Japan), but are presented in a more random fashion. The Voice of America's many magazine shows fall into this category. VOA also produces programs in Special English such as *American Mosaic* (Fri 1645) and *This is America* (Mon/Tue 0045).



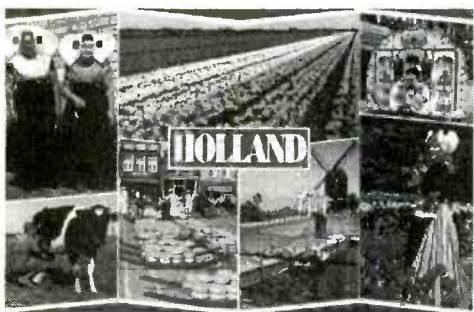
Not all travel related programming is strictly tourism. Some programs, which might better be described as an inside look at a country and its people, are still a valuable resource for information and insight to prospective travelers. A number of productions from Europe fall into this category, though some will occasionally stray from the Continent and travel.

**Deutsche Welle's** *Living in Germany* travels around the country visiting selected cities and focusing on modern German society. One memorable feature profiled what it is like to travel among the affluent on the "Hotel Express," a luxury train that includes a restaurant, bistro, and apartments for two, complete with



toilets and showers. (But do they have short-wave receivers?) Listen on Monday just after the 0100, 0300 and 0500 newscasts (Sunday evening in North America).

Also from Europe is **Swiss Radio International's Roundabout Switzerland**. This program focuses on specific regions or towns in the country and offers a view of a typical day in the life of a local community. Listen on Monday at 0100 and 0400 on the second North American Sunday evening of the month. Somewhat more diverse is the companion program, *Sunday Supplement*, which can be heard at the same hour on the first and third North American Sunday evenings of the month. Topics here often depart from Swiss social and cultural themes. Both features begin immediately after the short newscast on the hour.



Finally from the Continent is The Netherlands. In a program billed by the station as "profiling the sights and sounds of Holland," **Radio Netherlands** presents *Sounds Interesting*. During this 30 minute broadcast, you will be treated to a potpourri of vignettes of the everyday lives of people in Holland, including highlights of their individual and often fascinating pursuits. Some of these encounters are quite colorful and others most intriguing, but all will give you an unblurred insight of what to expect should you visit Holland. Listen on Saturday at 1150, 1350, 1550 and 1850, and Sunday at 0050 and 0350.

Many other international stations profile their own as well as surrounding countries. One example, for a view "south of the border," is **HCJB** in Ecuador. Listen on Saturday at 0040, 0310 and 0540 for *Travel Latin America*, a segment from the *Studio 9* broadcast that includes travel, in addition to regional current events.

If you are not thoroughly worn out from these adventures, you might consider adding a final touch with a few momentos of your wanderings. Not only can you glide around the globe with shortwave radio, you can obtain souvenirs of your sojourns by requesting QSL cards. Often in the form of scenic postcards, these "reception confirmation" cards are provided by a good many international stations in return for consid-

ered, descriptive reception reports of their broadcasts sent in by listeners. Several articles have been written on this interesting and enjoyable hobby, the most recent being the Jan. '94 "Beginner's Corner."

International travel broadcasts via shortwave are, in the end, a treasured gift. One can be

assured that listening experiences will be always be informative, often entertaining, and occasionally put a smile on your face, as well as add to your world view of life on this planet ... and, though often from lands far away, from people not a lot unlike the folks at home.



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## His Ministry Lives On

"It's a boy!" It was 1837, and the Moody family was thrilled about their new arrival, but they did not realize a legacy in broadcasting had been born. After all, what was broadcasting? Dwight Lyman Moody grew up and became a boot salesman who enjoyed teaching Sunday school. Word of his skillful presentations of the gospel gained the attention of President-elect Abraham Lincoln, who attended one of Moody's classes just days before his inaugural. In 1860, Moody began his own Bible school.

Thirteen decades later, The Moody Broadcasting Network continues his work, preaching the gospel all around the world on the radio. Broadcasting is a relatively new facet of The Moody Bible Institute, based in Chicago, Illinois. "It was an outgrowth of things that were already going on," explains David Woodworth, the Administrator of Affiliate Development at MBN. "Moody Bible Institute's broadcasting department began distributing radio programs on tape dating back to 1954, so over the years more and more Christian stations would inquire. We were feeding tapes to a number of stations when The Institute built its first owned and operated station (outside of Chicago) WCRF-FM in Cleveland, Ohio, in the late 1950s."

In 1982, their non-commercial religious programming service progressed into the world of satellite distribution. "MBN was born as a satellite network delivering a full service variety format of religious teaching, preaching, music, drama, news and information, public affairs programs, and programs for specialty audience groups like children's programming and women's issues. The original concept was to be able to cut



David Woodworth, administrator of Affiliate Development—Moody Broadcasting Network.

some costs and deliver our programming better and faster to our owned and operated stations."

The Moody Broadcasting Network grew rapidly using every avenue available to increase the penetration of their signals nationwide. Some very ingenious methods of delivering programming are used! Besides conventional over-the-air broadcast stations, MBN expands the coverage of some of their stations by using low-power FM translators. A translator station receives an FM broadcast station and rebroadcasts it, usually on a different frequency, so listeners in weak signal areas can enjoy better reception.

Translators perform well only if they are close enough to a full-power station to receive the broadcast. However, building full power FM radio stations in sparsely populated areas is not practical or cost-effective. A sensible way needed to be found to serve these areas. MBN's innovative solution required a variance in federal regulations. "Moody initiated a rulemaking in the early 80s," says David. "It was rejected the first time around, but was finally adopted in 1988, opening the door for educational FMs to become quasi-superstations, as long as their translators were owned and operated by the mother educational FM facility."

The rulemaking proposal became law, and non-commercial FM stations were granted a new way to broadcast: via "satellator" (a satellite-fed translator). For a fraction of the cost of a full-powered MBN FM station, local church groups raise the money (around \$25,000) to construct the satellator and put it on the air. After a satellator mini-station is built, MBN will maintain it and provide 24-hour programming. MBN's 25 satellators rebroadcast the programming of superstation WJSO in Pikeville, Kentucky, which carries The Moody Broadcasting Network in its entirety.

You can also catch MBN on cable FM in a variety of cities, and via FM subcarrier in five locations. "Today, MBN services a base of 282 radio station affiliates across the United States, Puerto Rico, The U.S. Virgin Islands, and two international affiliates: ZGBC at Roseau Dominica in the Caribbean, and HRGS, Roatan City, Honduras. In addition, MBN satellite programming is heard on 47 cable systems, 40 FM translators, 25 satellators, and 5 FM SCA subcarriers. In total, MBN services 399 satellite outlets across North America, with a potential population reach of over 183 million people."

Impressive figures! The Moody Bible Institute also operates four AM and eleven FM owned and operated stations across the country which are programmed independently of their network. MBN's engineering staff has utilized every outlet they feed to its maximum!

Along with the Christian programming that dominates Moody Broadcasting's daily schedule, the network also feeds USA Radio Network News to its affiliates and many other commercial and non-commercial stations around the country. Independently owned and operated in Dallas, Texas, The USA Radio Network provides MBN stations with a 4-1/2 minute newscast at 5 minutes before the hour, 24 hours a day. One minute news updates are broadcast on the half hour, and sports and business news are offered several times each weekday.

Many radio stations are now partially or fully automated, but federal regulations demand broadcast transmitters be constantly monitored. Moody Broadcasting's latest innovation provides a low-cost alternative to the prohibitive cost of hiring an engineer or technician. Any station can be monitored with Accuwatch, an interactive data system based at The Moody Bible Institute in Chicago.

Subscribers to this service are provided with a transmitter interface which will automatically keep the transmitter operating within prescribed parameters. The Accuwatch system will alert the owners of the station about any aberration or malfunction. This high-tech system can even turn the client's transmitter off, directly from Chicago, to prevent illegal or dangerous operation. Accuwatch uses data streams fed via Moody Broadcasting's satellite transponder and standard telephone lines.

Satellite audio buffs can look for The Moody Broadcasting Network on Spacenet IIIR at 87 degrees West longitude, transponder 13, in stereo, using 1.77 and 4.29 MHz subcarriers, encoded in the Panda 1 (FM-squared) companding scheme. Affiliates in Alaska and Canada's Northwest Territories receive MBN via a mono SCPC feed on the Alaskcom bird at 143 West longitude, transponder 24, 7.92 MHz subcarrier.

The Moody Broadcasting Network continues to be a leader in religious programming, and for good reason! Through innovation and ingenuity, they get their message to the people. The spirit of D.L. Moody's ministry continues at his Bible institute in Chicago, and, through modern broadcasting, across America. The medium may be electronic, but the message is divine!

### Wake Up With a Wave

If you are looking for the ultimate clock radio for casual FM listening, this could be it! Along with its stunning ability to produce sound, Bose Corporation's new Wave Radio includes the most humane alarm you can find! It will awaken you to music or to a series of soft tones that slowly fades up instead of blasting you out of your bed.



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You control the volume of the alarm, and there are two alarm presets. A battery back-up system ensures the alarm will wake you in the event of a power failure, and the clock can be quickly changed from a 12 to a 24 hour format. The blue fluorescent display on the front panel can also be varied in intensity, and will automatically dim in low-light conditions.

The radio section of The Wave is electronically similar to an average modern car radio. An assortment of keys on the top panel provide six station presets for both AM and FM stations. You can manually change frequency by tapping an up or down tuning bar that moves you from channel to channel as allocated in North America. No split channel or fine tuning is available. The FM band covers 87.5 to 107.9 MHz, which includes television channel six audio at 87.7; and AM reception is possible from 530 to 1620 kHz in 10 kHz steps, which does not cover new expansion band frequencies fully to 1700 kHz. You can use its "seek" function to automatically find strong stations in your area; and all top panel controls can be operated via a hand-held remote control.



FM listening on The Wave is remarkable, given its superior stereo separation and above average sensitivity. Using the built-in FM antenna, reception is good from any local station. An F-connector input is provided for an outdoor or cable FM hookup, but unless you live in an extreme fringe area, an outdoor antenna could easily overpower its front-end, as the tuning is quite broad.

The FM section uses two crystal filters that could be easily modified, by a skilled hobbyist, to a tighter bandpass to improve DX potential. Stereo reception requires a fairly good signal. The radio quickly defaults to mono to avoid noisy two-channel audio from weak signals; no provision is made to turn stereo decoding off manually.

The one serious flaw of The Wave is the omnipresence of multiprocessor noise underlying

ing reception on both FM and AM. Even in strong signal areas, the whine of the onboard computer can be

heard across the FM dial, although it is not a serious distraction. Good shielding would work wonders to improve this current design.

AM reception was not a serious design consideration. Poor sensitivity, combined with CPU noise blanketing the entire band, renders the radio useless for AM, except for only the strongest of stations. The Wave requires the use of an outboard loop antenna that must be plugged into the rear of the unit. Without the antenna, no reception is possible at all.

Many people probably will not bother installing the AM loop. This is unfortunate because when The Wave could grasp a good AM signal (we connected it directly to a Beverage antenna!), the fidelity was wonderful and the selectivity was adequate for casual high-fidelity AM listening. If it weren't so insensitive, it could be the best sounding AM radio on the market today. By adding an RF amplifier stage to the AM section, and providing an internal AM loop and good CPU shielding, this radio could be a remarkable way to listen to medium wave.

Inside the chassis you'll find a huge power transformer central to two circuit boards. A heavy duty heat sink is employed in the rear for the power regulator and audio output chips. The Wave's tuner is a PLL design using a sealed tuner module. A smaller circuit board, mounted vertically beside the power transformer, contains the stereo preamp stages.

The secret of its sonic success is Bose's Acoustic Wave technology, using a precisely formed waveguide to create its trademark sound. The speakers are connected to 34 inches of internal ductwork that provides delightful bass down to 40 cycles! Never have you heard such full bodied sound out of something so small and compact! The Wave measures 4-1/2 inches high, 14 inches wide, and 8 inches deep; and weighs about 7 pounds.

Bose markets The Wave directly from the factory, and it is not available in stores. Their sales brochure confidently promises satisfaction within a 14 day trial period, or you may return it for a complete refund. Available only in ivory, it is price fixed at \$349, and can be ordered by calling 1-800-358-BOSE. If you primarily listen to FM for entertainment, this can be a pleasant addition to your home, but it is certainly not a DX machine. Take one home for a test drive!

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**THE ANTENNA HANDBOOK** is available from Grove Enterprises, P.O. Box 98, Brasstown, NC, 28902 for \$12.95 plus \$2.00 book rate postage (\$4.50 UPS).

**International Bandscan**

The Swiss Broadcasting Corporation has revived its wide-area medium wave transmissions on 1566 kHz using a new directional antenna system and 300 kilowatts of power. The service reappeared late last year with daily broadcasts of test tapes featuring waltzes during the middle of the afternoon local time. Norsk Rikskringkasting of Norway has added the *UK Dance Chart Show* in English on 1314 kHz, Saturday evenings from 2100 to 2300 UTC.

The Voice of America has beefed up its coverage of Europe and the Middle East recently. You won't have to strain to hear a one megawatt relay of their Arabic service on 1314 kHz via Yerevan, Armenia from 2000 to 2100 UTC. Albanian transmitters now relay the VOA on 1395 and 1458 kHz in Croatian and Serbian at 0445, 0530, 0630 and 1700 UTC, and simulcast via a 400 kilowatt relay in Lugoj, Romania on 756 kHz. Serbian programming is also available through a one megawatt relay in Vidin, Bulgaria, from 2300 to 2323 UTC daily.

Should you find yourself in sunny Kuwait, check out the VOA's new 100 kilowatt outlet on 1548 kHz, featuring English and Arabic programming 24 hours a day. And until next month, happy trails!



## We Want More Freqs!

Many of you will recall the *Federal File Questionnaire* that ran in this column in January. The response has been very gratifying, with the majority of opinions being overwhelmingly positive. From the results it looks like we are serving most of your federal monitoring needs. However many of you had the same request, "We want more frequency listings!"

Ask and you shall receive. This month's column will be filled with frequencies that are monitorable from any location in the nation. We will start with the most requested frequencies—HF military—shown in Table 1. Many thanks to Larry for that nice list of HF military targets.

*Site of a drug drop on the U.S./Mexican border (radar in the distance?)*



Harry Baughn

### Department of Justice

One of the more popular departments of the US Government to listen to is the Justice Department. This month, Fed File will look at the

main three agencies within Justice and their HF/VHF/UHF radio frequencies. Remember, these frequencies are from many areas in the country

and they may or may not be active in your area. We would like to see some specific reports and you can send them to Brasstown care of this column.

**Table 1: Top 125 Military Shortwave Frequencies**

*By Larry Van Horn, MT Utility World Editor*

2716	US Navy Harbor Common	6712	USAF Air Rescue	11234	RAF UK
3032	US Air Force (USAF) W-100	6720	US Navy HICOM Atl	11243	USSTRATCOM Discrete
3048	USAF X-206	6730	USAF X-903	11252	US Navy FACSAC Jacksonville
3060	USAF Air Combat Command (ACC)	6735	NORAD Charlie 2/Navy FT Nets	11255	US Navy HICOM Atl
3092	Canadian Forces (CANFORCE) Air/Ground	6738	USAF GHFS/RAF UK	11260	US Navy Tactical
3104	US Navy Tactical	6742	US Navy FACSAC Jacksonville	11267	US Navy HICOM - Atl/Car
3113	USAF S-301	6750	NORAD Charlie 3/Navy FT Nets	11408	USAF P-382
3130	US Navy FACSAC Jacksonville	6753	CANFORCE A/G-Weather	11440	USAF Air Rescue
3132	USCG A/G	6757	USAF W-103	11494	USAF S-311
3295	USAF S-303	6761	USSTRATCOM Discrete	12070	USAF W-108
4426	US Coast Guard (USCG)	6776	US Military Tactical	13089	USCG
4495	USAF S-304	6785	US Army COE	13201	USAF GHFS
4520	US Army National Guard	6812	USAF Mystic Star	13207	NORAD Charlie 7/Royal Australian AF
4540	Royal Air Force (RAF) United Kingdom	6969	USAF Tactical	13211	USAF S-312
4700	US Navy Tactical	7330	USAF S-307	13217	USAF X-906
4704	CANFORCE A/G	7475	USAF W-104	13231	CANFORCE A/G
4725	US Strategic Command (USSTRATCOM) Discrete	7635	USAF Civil Air Patrol (CAP) Nationwide	13241	USSTRATCOM Discrete
4732	US Navy FACSAC Virginia	7831	USAF W-105	13247	USAF W-109
4725	USAF Global High Frequency System (GHFS)	8190	RAF UK	13257	CANFORCE A/G/RAF UK
4735	NORAD Charlie 32	8764	USCG	14902	USAF CAP Nationwide
4742	RAF UK	8967	USAF GHFS/Navy FT Nets	15015	USAF GHFS
5015	US Army Corps of Engineers (COE)	8972	US Navy Safety of Flight Atl	15031	CANFORCE A/G
5670	USAF Tactical	8973.5	US Navy Tactical	15035	CANFORCE A/G-Weather
5690	CANFORCE A/G-Weather	8976	Royal Australian Air Force	15038	USAF X-211
5696	USCG A/G	8984	USCG A/G	15044	USAF P-383
5700	USAF P-381	8993	USAF GHFS	15962	USAF S-315
5715	US Navy Tactical	9001	US Navy Tactical	17314	USCG
5718	CANFORCE A/G	9006	CANFORCE A/G	17972	USAF W-111
5728	US Navy Tactical	9014	USAF ACC	17975	USAF GHFS
5729	RAF UK	9017	USAF ACC/X-904	17992	USAF X-908
5800	USAF W-101	9023	NORAD Charlie 5/Navt FT Nets/USAF W-106/CANFORCE A/G	18012	CANFORCE A/G-Weather
6388	US Navy Tactical	9027	USSTRATCOM Discrete	18018	RAF UK
6501	USCG	9032	RAF UK	18023	USAF Tactical
6513	Canadian CG	9057	USAF S-309	18046	NORAD Charlie 8
6683	USAF W-102	9806	USAF W-107	18397	USAF W-112
6693	CANFORCE A/G-Weather	10246	US Navy Tactical	20124	USAF W-115
6697	US Navy HICOM Atl/Car	11176	USAF GHFS	20167	USAF W-116
6703	US Navy Tactical	11201	USCG A/G	20407	USAF W-117
6705	CANFORCE A/G	11204	RAF UK	23220	RAF UK
		11214	NORAD Charlie 6/Navy FT Nets	23250	CANFORCE A/G
		11220	USAF S-310	23265	USAF X-909
		11226	USAF X-905	23287	US Navy HICOM - Atl/Car
		11233	CANFORCE A/G		



### Federal Bureau of Investigation (FBI)

The FBI is the principle investigative arm of the Justice Department. This agency investigates all violations of federal law except those that have been assigned to other federal agencies. Recently, the FBI has been working to get their entire radio system in compliance with their new national radio plan. In a nutshell, the FBI is switching the old 163 MHz repeater outputs and the 167 MHz repeater inputs/simplex frequencies. The new frequency plan calls for repeater inputs in the 162 and 163 MHz ranges. All repeater output and simplex frequencies will be in the 164, 165, and 167 to 173 MHz ranges.

Here is a list of known FBI frequencies in the HF/VHF/UHF spectrum.

#### HF (All USB)

2810	4030	4617.5	4992.5	5014
5060	5390	5913	6594	6800
6954	7905	9015	9185	9240
9311.5	9313	10500	10550	10915
11075	11210	11490	13660	14460
14495	14453	15955	16376	17405
17602.5	18173	18668	22345	23402
23675	23875	27740		

The FBI tests their communications system on Monday mornings in USB and RTTY. Try 5060, 7905, and 14495 kHz.

#### UHF/VHF

162.6375	162.7375	162.7625	162.7875	163.8375
163.8500	163.8625	163.8750	163.8875	163.9000
163.9125	163.9250	163.9375	163.9500	163.9625
163.9750	163.9875	164.0500	164.1625	164.2500



164.3500	164.4250	165.5875	165.7125	165.8375
165.9000	165.9250	167.1500	167.2125	167.2375
167.2500	167.2625	167.2750	167.2875	167.3000
167.3125	167.3250	167.3375	167.3500	167.3625
167.3750	167.3875	167.4000	167.4125	167.4250
167.4375	167.4500	167.4625	167.4750	167.4875
167.5000	167.5125	167.5250	167.5375	167.5500
167.5625	167.5750	167.5875	167.6000	167.6125
167.6250	167.6375	167.6500	167.6625	167.6750
167.6875	167.7000	167.7125	167.7250	167.7375
167.7500	167.7625	167.7750	167.7875	167.8250
170.9000	411.0000	411.0500	411.1500	412.3500
412.4250	412.4500	412.4750	412.5000	412.5500
412.5750	412.6750	414.0000	414.0250	414.0500
414.0625	414.0750	414.0875	414.1000	414.1250
414.1500	414.1750	414.2000	414.2250	414.2500
414.2750	414.3000	414.3250	414.3500	414.3750
414.4000	414.4250	414.4375	414.4750	414.5000
414.5250	414.5500	414.5750	414.6000	414.7000
414.7500	417.1000	417.1500	417.3250	419.0750
419.1750	419.2000	419.2250	419.2500	419.2750
419.3000	419.3250	419.3500	419.3750	419.4000
419.4250	419.4500	419.4750	419.5000	419.5250
419.5500	419.5750	419.6000		
167.5625	Nationwide common			
165.5375	Input 163.8625 Output - FBI SWAT teams			

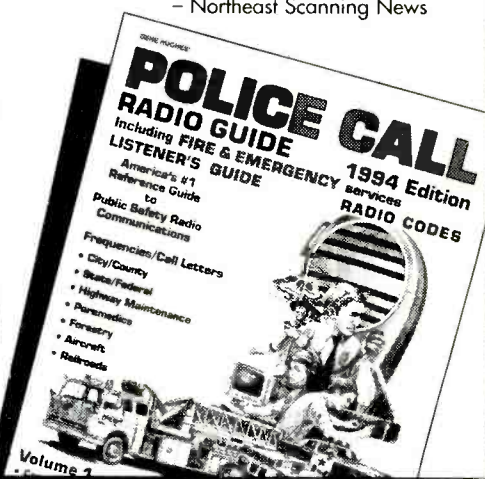
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### Drug Enforcement Agency (DEA)

The DEA is the lead federal agency in charge of enforcing narcotics law in the US. The DEA shares jurisdiction with the FBI over drug offenses and the director of this agency reports to the Attorney General through the director of the FBI.

HF				
5227	5841	7300	7657	9497
11076	14350	14686	14690	18171
18666	19131	23402.5	23675	

VHF/UHF				
171.4500	171.6500	172.0000	172.1000	172.2000
172.3000	413.9750	414.0000	415.6000	416.0500
416.2000	416.3250	416.3750	417.0250	417.0750
417.1500	417.2000	417.2750	417.3250	417.4000
417.4500	417.5000	417.5500	417.5750	417.7500
418.0500	418.0750	418.1000	418.1750	418.5000
418.5750	418.6250	418.6750	418.7000	418.7500
418.7750	418.8000	418.8250	418.8750	418.9000
418.9500	418.9750	419.0000	419.2250	

### Immigration and Naturalization Service (INS)

The main job of the INS is to control access to the borders of the United States. This agency operates an extensive VHF repeater system in areas along the US borders. No reports have been seen in recent years regarding activity on the INS HF frequencies.

HF				
4617	5915	9435	11650	14585
14577				

VHF/UHF				
162.8250	162.8500	162.8750	162.9000	162.9250
162.9500	162.9750	163.0500	163.1000	163.3750
163.5500	163.6000	163.6250	163.6500	163.6625
163.6750	163.7000	163.7350	163.7500	163.7750
165.8250	165.8500	165.8750	165.9000	165.9250
165.9750	168.3500	168.8250	168.8500	168.8750
168.9000	168.9250	168.9500	168.9750	170.6750
170.7000	170.7500	413.5500	413.6000	413.6250
413.6500	413.6750	417.0500	418.8500	418.8750
418.9750				

### MAILBAG

#### President in the Clear

In the October 93 Federal File we reported that many monitors noticed extensive use of DVP in conjunction with Air Force One/Two communications on Nationwide (415.700/407.850 MHz). However one monitor, Allen H. from Boston notes that he has monitored many high-level communications from AF-1, AF-2 and SAM flights in the clear and unscrambled. Allen writes: *I have had many opportunities to monitor the new administration in the clear on both Echo/Fox, orderwire and a number of satellite frequencies in the past few months. Not even once have I encountered the use of DVP!*

To prove it, Allen sent along some examples of Air Force One communications. The most fascinating was one concerning the answers to the New York Times crossword puzzle. It seems President Clinton was using his aides last fall to help him cheat on the crossword puzzle! An aide tried to (unsuccessfully) place a phone patch to a 1-900 number that gave clues to the answers. When "CROWN" advised that a phone patch to a "900" number couldn't be done, the aide then called a friend and asked her for the number. Allen's catch just goes to show you that you can still hear AF-1 in the clear, so don't lock them out of your scanner.



MT

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## Florida on 4 MHz

Here in Montreal, winter has been colder than usual this year. Cabin fever and below zero temperatures are making sunny Florida

look pretty good, so let's warm up and take look at what can be heard there.

One of the frequencies commonly used for calling and some working (communications) is

the upper side band (USB) frequency of 4125 kHz. Here is a look at the wide variety of licensees that this frequency has to offer from the Sunshine State.

### Florida Licensees on 4125 kHz

Apalachicola	Wester Inc.	WHU306	Lynn Haven	Conmar Electronics Inc.	WRV4	Panama City	Maritime Computer App.	WHG546
Apopka	Marcona Ocean Industries	WXF645	Lynn Haven	Niquet, Bartholomew O.	WHG971	Pembroke Pines	Clare, Lewis C.	WHW747
Belleair	Lee III, Charles R.	WHX287	Marathon	Frances Anne Inc.	WHU285	Pensacola	McKenzie Service Co. Inc.	WLK
Boca Raton	Core International Inc.	KYN541	Merritt Island	Sea Ray Boats Inc.	KBP351	Pinellas Park	Harris, Gerald C.	WHU532
Boca Raton	Core International Inc.	KYH541	Miami	Laudicina Enterprises Inc.	WXZ464	Plantation	Terra Firma Adventures	WHX763
Bradenton	Davis, Arnold W.	KZV742	Miami	Bobran Corp.	WQZ389	Ponce Inlet	Greater Daytona Bch. Triking	KVY569
Brandon	McNab Jr, Delmar	WHX806	Miami	Habraham, Babun	WEJ	Ponce Inlet	Harper, Dixon P.	WQA846
Brandon	Offshore Marine Safety Inc.	KTD496	Miami Beach	King Ocean Svc. de Venezuela	WHG999	Ponce Inlet	HKE Inc.	WQZ358
Callaway	Fish Hunters Inc.	WQZ367	Miami	Coastal Tug & Barge Inc.	WJK	Port Orange	Maritime Electronics	WXZ340
Cape Canaver	Seatronics Inc.	KUF852	Miami	Rich Electronics Inc.	WLG	Port Everglade	Continental Cement Co.	KFT297
Clearwater	Becker, Mark F.	KPB550	Miami	River Marine Terminal Inc.	WXZ211	Port Canaver	Morton Salt Co.	WPK
Coral Gables	Exxon Comm. Company	KCE224	Miami	Rossi International Inc.	WQZ247	Port Orange	Gulfstream Technical Svcs.	WHW363
Coral Gables	LW Divers Inc.	WOB516	Miami	Universal Shipping Agency	KZG294	Port Orange	MLB Inc.	KUZ529
Coral Gables	Cocoplum Yacht Club Inc.	WQA218	Miami	Carnival Cruise Lines Inc.	KMD254	Port Orange	Gulfstream Technical Svcs.	WHW424
Dania	Alco Marine Agents Inc.	WQX708	Miami	Searock Inc.	KGA455	Riviera Beach	Inn of the Sun	KIZ451
Dania	Y II Agency Inc.	WHV312	Miami	Tradewind Charters Inc.	WXZ319	Riviera Beach	Gold Coast Diesel	KEB335
Davie	Layne Dredging Co.	WHG648	Miami	Johnson Elect. & Machiner	WHX942	Riviera Beach	Fishermans Center	WXZ297
Destin	Gulf Raider of Destin Inc.	KJA482	Miami	Banana Supply Co. Inc.	WHX879	Riviera Beach	Rich Electronics Inc.	KXJ718
Fort Pierce	Marcona Ocean Industries	WHV242	Miami	Inagua Lines Inc.	WRV466	Riviera Beach	Sportfishing Industries Inc.	WHG668
Fort Lauderdale	Sealand Services Inc.	WHW310	Miami	Dan Ship Line USA	KUF643	Riviera Beach	Crown Cruise Line Inc.	WXZ280
Fort Lauderdale	Yacht Electronic Specialists	WHF725	Miami	Dockside Marine Electronics	WHW617	Riviera Beach	Larry Smith Electronics	KTR925
Fort Pierce	Summerlins Seven Seas Inc.	WQX685	Miami	Lee, Jae W.	KEB628	Riviera Beach	Rybovich Diesel and Marine	WHU262
Fort Pierce	Harbor Branch Oceanogrph.	KXE307	Miami	Atlantic Radiotelephone	KPB536	Saint Petersburg	Daniels, Kenneth L	WHU572
Fort Lauderdale	MAR Incorporated	WRS911	Miami	Nelson & Assoc. Inc.	KVY548	Saint Petersburg	Self Reliant Inc.	WHV908
Fort Lauderdale	High Seas Technology	WQB529	Miami	Matalon, Phil	KZV719	Saint Petersburg	Eckerd College Inc.	WXZ316
Fort Lauderdale	Resolve Tow & Salvage Inc.	KSK395	Miami	Island Properties Inc.	WHG636	Saint Petersburg	H&O Incorporated	WRD616
Fort Lauderdale	Henderson, A Douglas	WHV702	Miami	Antares Shipping Inc.	KYG229	Saint Petersburg	Florida Deep Sea Fishing Inc.	WHG937
Fort Pierce	Harbor Electronics	KMD217	Miami	Valenti, John C.	KIY682	Sarasota	Sarasota Power Squadron	WHU440
Fort Pierce	Baham Star Ltd. Inc.	KIZ840	Miami	Etkins, Estelle	KRI	Sarasota	Tradyne Inc.	KEA996
Fort Lauderdale	High Seas Technology	WQB396	Miami	Bernuth Marine Shipping	WXZ232	St. Petersburg	Sea Applied Technology	WHH315
Fort Lauderdale	Green Cove Maritime Inc.	WHV881	Miami	Safe Divers Inc.	KBK493	Stuart	Coral Reef Electronics Inc.	WHU997
Fort Lauderdale	Chester, Jeremy	KIZ355	Miami	Mackay Communications Inc.	WQB884	Stuart	Stuart Sailfish Club Inc.	WHU773
Fort Pierce	Proud Mary Fishing Fleets	WXZ296	Miami Lakes	Florida Fuels Inc.	WHW582	Stuart	Taynton, Ralph/Lucy	KPB651
Fort Lauderdale	Custom Navigation South	WQZ242	Miami	East River Terminal Inc.	KCE283	Sunrise	Seaboard Ship Mgmt. Inc.	KUC393
Green Cove South	Moody Brothers of Jacksonville	WHF941	Miami	Hyde Shipping	KCE255	Tampa	Versaggi Shrimp Co.	WDT545
			Miami	Cari Freight	WHV876	Tampa	Hendry Corporation	WNC
Gulfstream	NB Charters Limited	KYV265	Miami Beach	Seaward Services Inc.	WHV580	Tampa	WE Warren Ent. Inc.	WDT556
Havana	Mangham Construction Co.	KYU668	Miami Beach	Sunset Harbor Marina	KZT299	Tampa	International Ship Repair	KIL878
Hialeah	Merrren, Foch B.	KZV691	New Pt. Richmond	Hichman, Marvin	WHG938	Tampa	Superior Seafoods Inc.	WHF881
Hollywood	Koutsofios, Demetrios E.	KYI544	Niceville	Hicks, James W.	KVL930	Tampa	Tugs & Salvage Inc.	KYO684
Indian Rocks	Erwin, Biff	WXZ283	North Reding	Hurlbut, Wayne H.	KMB871	Tampa	Thomas, Timothy M.	WDJ309
Islamorada	Charles D. Owen Mfg.	WHH343	North Miami	Maritime Enterprises	KCE270	Tampa	Dreadnaught Ocean Towing	WHX880
Jacksonville	New England Petroleum	WXZ545	North Miami	Inter Caribe Ship Trade Agy.	WOB848	Tampa	Bay Transportation Corp.	WJD
Jacksonville	Green Cove Maritime Inc.	KZJ374	Ocala	Maxiran Corporation	WDK	Tampa	Gallar, Melvin M.	WHW406
Jacksonville	Moran Towing of Florida Inc.	KMC978	Palm Beach So	Sailfish Marina Corp.	KZB929	Tampa	Diversified Marine Tech.	KUZ488
Jacksonville	Ring Power Corporation	KXC715	Palm Beach	Peltz, Nelson	WXZ317	Tarpon Springs	Duckworth Steel Boats Inc.	KGA483
Lake Worth	Rukin, James B.	WHX682	Palm Beach	Sailfish Club of Florida	KTA429	Tarpon Springs	Christmas Jr., John T.	WHW382
Lake Worth	Teeters Brothers Contracting	WXZ230	Panama City	Ralboray Inc.	WDT547	Tarpon Springs	Top Flight Enterprises Inc.	WHU871
Lake Mary	S&H Fabricating & Eng.	WRS960	Panama	Dixie Fish Co.	WHW841	Tarpon Springs	Saroukos, Margaret J.	WHW903
Lake Park	Sea & Dee Marine Services	KBK368	Panama City	GT Bodiford Seafoods Inc.	KPB539	Tarpon Springs	Island Belle Ventures Inc.	WQZ261
Lantana	Burger Boat Company Inc.	WXY910	Panama City	Marine Electronics Co	KCE392	Tarpon Springs	Reis, Joseph O.	WHX896
Largo	Pruitt Marine Enterprises Inc.	WHX747	Panama City	Archer, Billy: Archer, HL	WXY926	Titusville	Harbor Towne of Titusville	WHX8
Light House	Lucky Lade Enterprises Inc.	KDZ350	Panama City	Marine Transportation Svce.	WHX575	West Palm Beach	Vassilev Enterprises Inc.	KIZ518
Loxahatchee	Pretty Patti Sportfishing Inc.	KMB897	Panama City	H&R Fisheries Inc.	WHW446	West Palm Beach	Rybovich Diesel and Marine	WHU288



Obviously, wherever one lives more will be heard than just the stations from Florida; however, the list offers a sample of how much is available on 4125 alone. Especially for those near the ocean, 4125 can be a very active and interesting frequency. Give it a try and see what you hear. In the future I will try to offer a selection of what other bands and frequencies have to offer, as well.



## Direct Dial

As this column was being put to bed, some interesting information arrived from Thomas Traydon and George Koren of "WOM" in Ft. Lauderdale, Florida. Among the material was the notice that AT&T Maritime Services is working on a new service to allow direct dialing of telephone calls over its high frequencies facilities. This will, of course, make using the radio much more convenient, especially for passengers aboard cruise ships.

Another feature which will appeal to many shippers, but which will be greeted with some dismay by maritime listeners, is the "scramble" feature. This will encode the conversation over the radio channel until it reaches the AT&T network.

Other "regular telephone" features will also be available with the equipment for the High Seas Direct service. A ten number dialer and last number redial as well as incoming paging and paging memory will be included.

While inexpensive to operate at \$3.50 per minute, the \$1499 price for the handset and modem which are required may give many potential users pause for thought.

That's all for this month; I hope you all have a good winter and good listening 'til we meet again in May. As always, keep the letters coming. I try to incorporate as much information and as many suggestions as I can into this column.

*M*

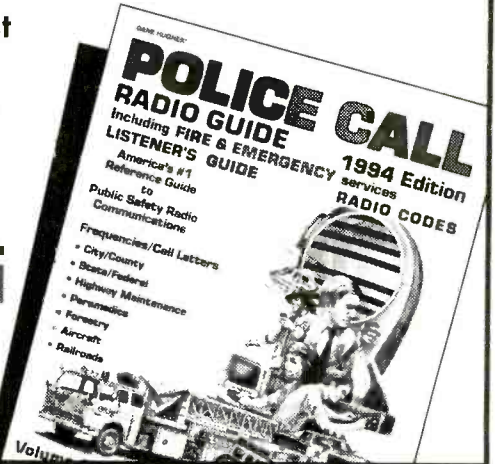
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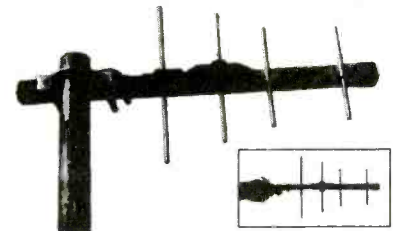
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# TVRO News Update

January is traditionally a time of great change in the satellite industry for a couple of reasons. Entrepreneurs planning a grand venture such as launching a new entertainment channel like to target the first of the year as their starting point. Additionally, when services make changes such as satellite location, format or content, it's a very convenient time to announce such a development. So it is that TVRO viewers have come to anticipate the excitement of the channel changing around the first of the year.

## New Birds On The Horizon

For the third year in a row major changes are taking place in our little portion of the Clarke Belt. Old generation satellites are being replaced with more powerful, innovative, and versatile satellites. Available orbital slots are rapidly being filled and long awaited promises of Direct Broadcast Satellites are about to become a reality. First, let's find out who the new kids on the block are:

### Solidaridad 1

Solidaridad 1 is the name of the satellite to replace Mexico's Morelos 1. Launched in mid-November, Solidaridad 1 shows the versatility of this new generation of satellites. To begin with, it will serve a much bigger area than Morelos 1. It should be visible to viewers in the southern U.S., the Caribbean, Central America, and Northern South America.

In addition, this C/Ku bird features 12 channels at 37.5 watts and six at 40.5 watts. These latter can be split into two separate channels, each with 20 watts. The Ku side has sixteen 47 watt channels. This marks a huge improvement over its predecessor. Its final orbital slot is 109.2 degrees West. Solidaridad 2 should have launched at the end of February and will reside at 113 degrees West. Because Solidaridad 1 is wedged so closely between the two Canadian Anik satellites, transponder center frequencies will be shifted plus or minus 20 MHz.

### Telstar 401

Telstar 401 was launched in mid-December last year and went into service on the first of February. It is the much needed replacement for Telstar 301 and resides at 97 degrees West. T401 features 24 C band channels with variable power of 12 to 23 watts per channel. The Ku side of this satellite has 16 channels variable between 60 and 120 watts. Eight of these Ku channels can be divided into two for a complete complement of 24 Ku and 24 C band. This is a major increase in channel capacity and represents a common theme among the new birds. With video compression these satellites could feature at least 150 channels apiece.

As has been noted here before, T401 becomes the new home of PBS occupying four Ku channels which will eventually be expanded, using video compression, into considerably more. PBS' one C band channel will remain in the traditional analog format for the home dish market. A second Telstar satellite T402 will be launched around the middle of April and will replace T302 with final orbit at 89 degrees West.

### DBS 1 and 2

The biggest noise, if not the biggest news, in the launch department belonged to Hughes Communications' launch of its DBS 1 satellite. This bird features sixteen 120 watt channels and will be the first American satellite to broadcast in the DBS band (12.2 - 12.7 GHz). Launching next month will be DBS 2. The two DBS satellites will be located so close together as to appear to Earth stations as being one bird. To do this, DBS 1 will have right hand circular polarity to its channels and DBS 2 will have left hand circular polarity. This will appear to the receivers as one 32 channel satellite. With an expected video compression of as little as 3:1, nearly a hundred channels can be realized.

Already dozens of cable channels have signed up to be carried on the channels leased to Hughes' DirecTV. Using 18 inch diameter dishes and proprietary encryption software with digital compression, subscribers will watch essentially what the TVRO market has been watching for the past 10 years. The advantage will be tiny dishes with no moving parts. This should finally bury opposition to satellite TV from restrictive covenants and zoning codes which for years have plagued citizens' rights to access to information and entertainment.

Also on DBS 1 will be Hubbard Broadcasting's United States Satellite Broadcasting (USSB). With virtual duplication of services there will be a battle for the viewer's dollars which should prove beneficial to the consumer. Time will tell which company will win.

### Galaxy 1R

Also to have been launched by the time you read this is Galaxy 1R will replace the old Galaxy 1 at 133 degrees West. The new G1 will be identical to similar new Galaxy birds such as G5 and G7 with regard to number of channels and power output.

You may notice that with the addition of all of these new satellites and their assigned orbital positions that there will have to be some changes made in existing locations. This will be done as things heat up and we are all going to have to continue to change our receivers' memories accordingly.

## Channel Changes

Not only are new satellites appearing but new channels on old satellites are appearing as well. A few have disappeared, too. Galaxy 7 is one of the new satellites which has seen a lot of activity. Here are some of the changes which have occurred there:

- National Empowerment Television (NET) is found on channel 20 featuring commercially sponsored conservative talk shows.
- Playboy TV is feeding a VCII encrypted channel intended for the hotel market on channel 22. It is unavailable to home viewers.
- Emerites Dubai TV (EBTV) is transmitting Arabic programming direct from Dubai on channel 17.
- The Fox Network should be up and running by the time you read this with its new cable channel FX TV on channels 4 and 5 for East and West feeds.
- La Carpa, a Spanish language cable channel from Puerto Rico is found on channel 11.

## To Earth With Love

A rash of erotica has spread via several satellites. Already noted was Playboy TV. In addition, The Playboy Channel continues its night-time only cable service (available to home dish owners as well) on G5 channel 2. Spice, which maintains a 24 hour a day channel on T303 (96 degrees West) adds Spice 2 on T303 channel 19. Also started up in time for Valentine's Day is Adam & Eve Channel on T303 channel 17. A triple X service started up in mid-December called Exxtasy TV. As of this writing it was available only to the hotel industry. All of the above are encrypted via the VCII/RS system.

Additional erotic channels which are apparently in the works but have not been confirmed are Secrets, which is said to be a triple X service, and TV Erotica, which one source says will be found on Telstar 302. Spring fever could become a critical problem this year! As Mae West said, "Too much of a good thing is wonderful!"

And one final entrant in this category is the bewildering channel on Satcom C1 (137 degrees W) called Network 1 (channel 11). It's in the clear, has an abundance of late 70s and early 80s "jiggle" movies and bikini contests sponsored by endless pitches for 800 and 900 number sex/chat lines. These are all mixed in with children's programming such as "Klassic Kartoons," and "selfhelp" infomercial shows like "Hypnotherapy: Change Your Mind, Change Your Life."

## Musical Chairs

For reasons to which only boards of directors are privy, channels have a way of migrating from



satellite to satellite with annoying regularity. NASA Select is now located on Spacenet 2 Channel 9 (69 degrees West) and its contract channel moves to channel 5 of Spacenet 2. Americana Television is now full time on Satcom C1 channel 9 (137 degrees West).

## Amateur Radio Space Activities

### Phase 3-D Update

The Radio Amateur Satellite Corporation (AMSAT) North America announces that progress on the Phase 3-D amateur radio satellite (See *MT* Oct. '93) "...is moving forward at an accelerated pace." According to a recent press release, Dr. Tom Clark, W3IWI, AMSAT-NA's President Emeritus, says that "...thanks to the work of our European, South African and Japanese friends, it now looks like we'll have some superb cameras, some really 'hot' receivers and some very powerful transmitters on Phase 3-D when it's launched in 1996."

"Other major contributions by AMSAT-NA to the project this year will include the purchase of the spacecraft's heat pipes, solar panels and flight batteries, as well as final construction of the spacecraft's GPS positioning experiment, antennas and propellant flow hardware. In addition, yet another group of some 15 dedicated volunteers have now been assembled in the Orlando, Florida area. These people are already in the process of both securing and preparing the spacecraft's final integration facility."

DOVE (Digital Orbital Voice Encoder) is now up and running with a good signal. According to the *AMSAT Journal* "...It is now actively sending telemetry and short text messages on 145.825 MHz. The signals are strong and can generally be received with a handheld radio...DOVE telemetry can be successfully copied on a garden variety 1200 baud packet system with a 2 meter FM receiver...Most outdoor antennas work satisfactorily, but horizontal polarization generally works better than vertical. A directional antenna is not necessary. When receiving on a handheld radio, best results can be obtained by holding the antenna parallel to the ground... You can obtain a DOVE QSL card by sending a reception report to py2bjo@amsat.org on Internet or to Junior DeCastro, PY2BJO, 119 Macaubal, Sao Paulo, Brazil 91254.

### MAILBAG

• Robert Thompson, KC8MI, from Tornado, WV, wanted the address for Westsat Communications' *Satellite Channel Chart*. He couldn't find it through extensive library searching. For some reason Westsat Communications has no ISBN or ISSN number so will be unknown to reference librarians. I periodically list their



Joe Bernard's homebrew satellite dish.

address, phone number and subscription information for *MT* readers. So, here it is again: Westsat Communications, P.O. Box 434, Pleasanton, CA 94566 Phone: 510-846-7200. Subscriptions are \$75 per year for this bi-monthly journal.

• Milo Hurley followed up on our January suggestion of improving audio with the Maspro SSP-1 stereo processor, only to find that the entire stock has been bought by Universal Electronics. Universal is selling the SSP-1 for \$200 plus shipping. The T-1 translator is in production and should sell for "about \$90 plus shipping." This means that the SSP-1 and T-1 as reviewed in the column are now \$290, not \$150.

For those readers who are turned away by the increased price, I would advise they contact satellite dealers in their area and ask for used, stand-alone stereo processors such as the SSP-1 or one made by Janeil. There were a number of such units in the days before fancy IRDs which should be available for \$25-75 each. Then, if you like, order the translator from Universal Electronics (800-241-8171) if you want the stereo services which are below the frequency capability of your current receiver.

• Joe Bernard, N5EB, from Keithville, LA, sent a picture of the satellite dish he built more than ten years ago. He built the entire thing from the junk box and the local hardware store. Even his actuator was "homebrew." He writes, "...an electric motor turned a right angle gearbox, which drove an all-thread bolt which threaded into a hollow shaft connected to the dish. This was a lot of complicated rigging but it worked and was made from junk box goodies. A few years ago, I replaced all this rigging with a Houston Tracker actuator."

Do you have a picture of your dish? Let's hear from you. Even if you didn't build it yourself, let *MT* readers take a peek at your "dish farm." What kind of receivers, SCPC, audio, data, etc. are you using and what have you seen, *MT* heard or read?

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## The 1 Watt Challenge

Imagine these odds for getting a signal out: a 1 Watt transmitter, a 50 foot antenna and a sliver of spectrum between 160 and 190 kHz. Sound challenging? You bet. Still, a small group of experimenters known as LOWFERS (short for Low Frequency Experimental Radio Stations) are getting out quite well—and they're doing it without licenses!

Lower beacons operate legally under a provision in Part 15.217 of the FCC rules. The rules permit operation from 160 to 190 kHz (1750 meters) as long as:

- Total input power to the final RF stage does not exceed one watt.
- Total length of the transmission line, antenna, and ground lead (if used) does not exceed 15 meters (49.21 feet).
- All emissions below 160 kHz and above 190 kHz are attenuated at least 20 dB below the level of the fundamental carrier.

Since there is no FCC licensing, lowfers create their own identifiers, often using their initials or the suffix of a ham call. The ID is sent out repeatedly (beacon style) with the help of an automatic keyer. The keyed message frequently includes a mailing address that can be used for sending a reception report. In addition to beacon style transmissions, you may also hear live two-way contacts from time to time.

### Tuning In

Hunting for lowfers can be almost as exciting as running your own transmitter. It's a perfect change of pace from the high power beacon game, and with over 50 active stations, there's plenty to hear. (See Table 1 for a sample listing.)

Virtually any transmission mode is allowed, but most lowfers use old fashion CW (Morse Code). It's the same type of CW used on the ham bands, so you'll need your receiver's BFO turned on for proper reception.

Here are some ways to improve your chances of hearing a lowfer:

- \* *Use a good set of headphones.* They will help block out household noise and let you concentrate on the signals at hand.
- \* *Tune slowly.* At 1 Watt, most lowfer signals are quite weak. You could spin right past a station by tuning too fast.
- \* *Use a low noise antenna.* Directional loops and active antennas almost always give better results than a common "long wire" antenna.
- \* *If possible, shut off static sources.* There are several household items that can cause enough noise to wipe out signals on the LF band. Some notorious offenders are: light dimmers,

fluorescent lights, TV sets, electric motors and computers.

- \* *Use a narrow bandwidth setting.* This helps reject signals on nearby frequencies that could wipe out a weak signal.
- \* *Choose your listening times carefully.* As with other beacons, the best time to hunt for lowfers tends to be at night, and during the cooler months. But there are always those exceptional days when the rules don't apply.

### Confirming Your Catch

Lowfers are always happy to receive reception reports from listeners. In return for sending an accurate report, you can expect to receive an acknowledgment letter and/or QSL card from the station. For many longwave DXers, a lowfer QSL is the most prized verie.

If you hear a lowfer but don't have the station's address, you can send me the reception details along with two stamped envelopes. I'll be glad to forward your report to the station operator.

Want to know more about lowfers? One of the best sources of information is *The Lowdown*, the monthly publication of the Longwave Club of America. A one year subscription to *The Lowdown* is \$18.00 in the USA, \$19.00 in Canada, and \$26.00 by airmail overseas. All remittances must be in U.S. funds. The club's address is 45 Wildflower Road, Dept. MT, Levittown, PA 19057.



A QSL from Ohio Lowfer Joe Saloka (KRY, 175.388 kHz)

### Bits 'N Pieces

- \* Dennis Moriarty (K8AGB) forwarded a story from *The Lima News* (Ohio) on the Air Force GWEN system. Some lawmakers are attempting to cut further funding for new GWEN sites, one of which is planned for nearby Delaware, OH. According to the story, the Air Force already has 54 sites but wants to build 29 more. If you'd like to hear GWEN transmissions, try tuning from 150 to 175 kHz. Their signals sound like raw bursts of noise.

Table 1. Selected Lower Stations

FREQ	ID	LOCATION
166.667	SE	Warm Springs, GA
175.000	D	Des Moines, IA
175.250	X	Wheatland, WY
175.388	KRY	Chardon, OH
178.600	ZWI	Baldwinsville, NY
181.167	IZJ	San Gabriel, CA
182.520	NR	Riverside, CA
183.544	MEL	San Jose, CA
184.50±	PLI	Burbank, CA
184.514	TEXAS	Haslet, TX
184.520	XA	Smith Mtn. Lake, VA
184.877	1SUN	Durant, OK
185.140	K	Warner Robins, GA
185.700	JPH	Riverdale, MD
186.250	AL	St. Louis, MO
186.375	BA	Lancaster, IL
187.260	CAT	Cincinnati, OH
187.335	DCH	Berlin, MD
187.500	TAL	Tacoma Bay, WA
187.500	Y	New Orleans, LA
188.480	9HDQ	Daleville, IN
188.500	QVY	Donora, PA
188.840	GSR	Frederick, MD
188.888	GG	Middleburg, FL
188.900	WI	Pickens, SC
189.360	TH	Colts Neck, NJ
189.730	8LXJ	Cincinnati, OH
189.800	RM	Duluth, MN

- \* The Local Notice to Mariners reported that the Australian government intends to end their participation in the 10 to 14 kHz Omega navigation program. The governments of the United States and Australia are currently negotiating new terms for Australia's continued participation.

The Omega system consists of eight transmitter sites scattered around the globe. Because of the evolving GPS navigation system, the need for Omega is apparently being re-evaluated by some host countries. In its notice, the Coast Guard stresses that Omega remains the only internationally accepted radionavigation system for ocean enroute navigation. Moreover, at this writing, the GPS system is not fully operational and is not approved for civil aviation.

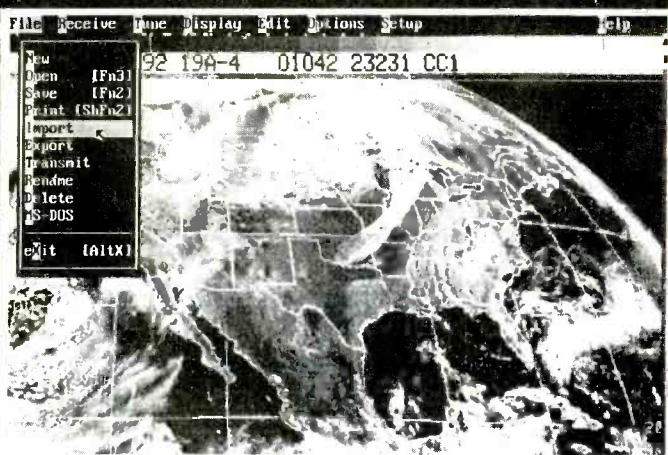
- \* If you like to roam the 1600-1800 kHz range (yes, thousands of kilohertz!), *The Lowdown* has a new column that may be for you. It deals with the mysterious driftnet radio-buoys that we've mentioned here from time to time. The editor of the driftnet column is Al Underwood, who has been researching the origin, purpose and legality of these signals.

If you have any loggings or DF bearings of buoys that you wish to pass along, you may reach Mr. Underwood at 3892 Silver Springs Rd., Silver Springs, NY 14550.

See you next month!



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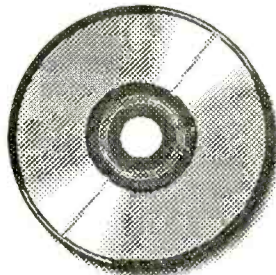
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## Something Different

Over the years I have stressed the need for us as hams to do something different to keep from getting stuck in a rut. Often, "doing something different" requires a large expenditure of money, but there are a heck of a lot of fun things to do that don't.

One of the things I like to do is to travel to different locations to either provide a new county or grid square to other hams or to see what I can do with my QRP gear and some exotic antenna which I would not be able to install at my home QTH. What for? you may ask.

### County Hunting

*CQ* magazine issues an award called USA-CA. It is issued in seven levels for working specified numbers of counties; the basic award is for working 500 counties. Full info on the award is in the ARRL's *Operating Manual* (225 Newington St., Newington, CT 06111) and is also available from *CQ* magazine (76 North Broadway, Hicksville, NY 11801-2953).

There are several nets for County Hunters. The main net is daily on 14,336 kHz SSB and a CW net is on 14,066.5 kHz CW; in the winter months there is an SSB net on 3866 kHz during the evening hours. These nets are just waiting for you to check in from a rare county. Surprisingly, it is possible for the average ham to be inside a rare county with only an hour of two of driving.

Some hams opt to simply operate mobile from county to county while others like to set up portable stations from a campground or other location in some out of the way place. (In this context, out-of-the-way means a county with a low ham population.) In any case, the nets will welcome you with open arms. You will be surprised how much activity can be generated from some very easy to reach locations. Join the County Hunter nets to find out which counties are in demand, and go there.

Be prepared to send out QSL cards, because cards are required for the award. Everyone who works you will want a card to confirm your rare DXpedition. Aside from getting a lot of QSL cards (a lot of them are really different, too), you will soon be eligible for a very handsome award (USA-CA) and make a lot of friends along the way.

### Grid Squares

Most VHF operators work for an award based on working 100 grid squares. Grid square designations are based on the Maidenhead system. Complete information on the grid square system can be obtained in either the ARRL *Operating*

*Manual* or by sending a dollar for a grid locator map of North America to the ARRL. (Maps are usually available at the larger hamfests, too.)

To really stir up interest in your grid square operation, SSB and CW gear is required. Use any VHF band from 6 meters up. Most states are divided into several grid squares. For example, Pennsylvania has six grid squares in it and three of the six are fairly rare. Choose your location (as high as possible), set up your SSB/CW station, use a good beam antenna and have fun.

Generally speaking, you will not stir up as much activity as a county expedition, but there are a lot of VHF operators who will be happy to work you. Be sure to get advance publicity by letting all the local repeaters know you are going on a grid expedition and perhaps informing the various ham magazines, too. (Write the VHF editor.)

The best time for grid square work is during the June VHF contest. When the rest of the gang finds out you are in a rare grid, look out; they will come calling with great enthusiasm!

### Natural Places DXpedition

Meet on the airwaves on the first day of spring for a special QSL!

### Just for Fun

Most of us simply cannot put up large or different antenna arrays at home. Traveling out in the country will often provide a place where you can stretch up a thousand feet or more of long wire or exotic phased array—no need for fancy systems, just try big antennas. One of the set-ups I have tried was a 2500 foot long wire strung along a dirt road at an average height of 20 feet. The wire was several spools of 22 gauge plastic insulated wire simply tied together and end fed (use electric fence wire or whatever you can lay your hands on). With it tied to my HW-9, I had a blast and worked DX with super results.

Another antenna expedition (actually several over the years) was with a kite-supported antenna. Kites are not expensive, they can be built from strips of wood and covered with almost any paper (even newspaper). Box kites work well, as does a modified box kite called a "French War Kite," which is a box kite with wings. Of course, the modern delta wing kites work best; however, even a small kite from the five and dime store will get you into the kite antenna business.

Find a good open location (away from all power lines). A breeze of at least five miles per hour is required for the high performance kites and a bit more for the average dime store variety. You can simply tie some 30 to 26 gauge enamel wire to the belly band of the kite and run it along with the kite line and feed the end. If you have a large kite, another idea is to use the kite to pull up a super large loop antenna. With a modern kite at a good location, it is often possible to keep the antenna aloft for many hours.

One kite expedition from a Pennsylvania location netted stations on the West Coast, seven European countries and four in South America, while running 50 watts on 160 meters, in a single evening of operation. The kite used was a five foot box kite built using fiberglass supports and some very inexpensive rip stop nylon. (Sorry to say, the kite was lost later in a high wind.) The antenna was about 700 feet of thin wire (about 28 gauge) simply running down the kite line and fed against a 230 foot counterpoise.

If this sounds like fun to you, *be sure you are not in an area of high aircraft traffic*. This is no joke, as kites can easily get high enough to endanger aircraft, especially near airfields!

It is possible to use a balloon to do the same thing; however, I find the problems of hauling gas to the site and messing around with a balloon to be more than I care to bother with. If you have easy access to balloon gear and are interested in such an operation, by all means give it a try.

Next month we'll look at some additional unusual activities that may pique your interest.

### Spring Exodus to Places of Natural Beauty

Sunday, March 20th, will be the first day of spring. Last summer we talked about heading out to various locations on the first day of spring, summer, fall and winter to operate from places of natural beauty or interest.

I will start the expeditions off with a spring expedition to **The Lehigh Gap State Park** in Carbon County, Pennsylvania. Listen for N3IK/3 on 3695, 7045, and 14060 kHz CW (all frequencies + or - 10 kHz). No phone operation is planned for this expedition. Hours of operation will be from 1500 hrs UTC until about 0200 UTC (depending on weather) on March 21.

The QSL card will be a photo card of the Gap and a several paragraph explanation of the park's location and importance. Join me and get a neat QSL! SWL reports are welcome.

I encourage you to form your own Natural Places expedition for March 20th, and let's all



*Rob Leonard's*

## Ham DX Tips

March has always been considered a windy month, so let's embark on the radio jet stream and see where the winds of DX take us:

**BRITISH VIRGIN ISLANDS** Here until 17 March is VP2V/W2GUP (Ben Pinz, 44 Murray Hill Terrace, Marlboro, NJ 07746). He principally operates on CW either 5 or 25 kHz from the bottom of each band (all bands) 10 to 80 meters. Ben is trying to take care of those CW DXers who need this country on the bands. **CANADA** Here are two tips for VHF DXers. First, VE1MQ (Michael Smith, 131 Smith Rd., Geary, New Brunswick, E2V 2G3) operates a six meter CW beacon on the frequency of 50073 kHz. The beacon sends his callsign, his grid and some info about the equipment used. If you copy the beacon Mike would appreciate knowing the signal strength and quality from your location. VE3KRP (Ed Kuchel, 2048 Victoria Ave., Thunder Bay, Ontario P7A 1M4) also operates a VHF beacon. Ed's CW beacon is on 144.280 MHz and sends 25 watts into two 14 element horizontally polarized two meter beams pointed Southeast. I am sure that Ed would like to know where his beacon is being heard as well. **CROATIA** 9A/K4XU (Dick Frey, 2927 Curtis Creek Rd., Quincy, IL 62301) will be active daily from 1800 to 0200 UTC on either 7025 or on 14025 kHz, both CW, until the end of April. **DXCC NEWS** The ARRL DX Awards Committee voted 6 to 1 in favor of a DX Advisory recommendation for RTTY DXCC Honor Roll of 319 current countries (no deleted ones) for contacts made using RTTY, Baudot, ASCII, Amtor and other digital non CW "protocols." **GHANA** 9G1WJ is N9PRC who checks into the 14226 kHz SSB net at 2200 UTC daily. Send your QSL requests to: William De Lage, 8597 Burlington Ct., Manassas, VA 22110. **INDIA** VU2DVP is on 14180 kHz SSB at 0100 UTC most days. His address is D Vidyaprakash, 33 Race Course Rd., Coimbatore, 641018, India (A tip: remember when sending the QSLs from Indian amateurs, use only IRCs or mint stamps for return postage!) **ISRAEL** Celebrating the 85th anniversary of the founding of Tel Aviv is special events station 4Z85TA. This station will be on the air on as many different bands (CW, RTTY, SSB) as possible until April 30th. If you are fortunate enough to add this station to your logs, send your QSL requests to: Shlomo Mussali, 4X6LM, P.O. Box 8225, Tel Aviv 61081, Israel. **MOLDAVIA** The new QSL bureau here is: Moldavian Amateur Radio League, QSL Bureau, P.O. Box 6637, Kishinev 277050, Republic of Moldova. **NICARAGUA** YN/SM00IG is on 21027 kHz at 1430 UTC most days. His QSL manager is: SM0KCR, Robert Gunnar Ronndalen, Box 1441, S-18314 Teby, Sweden. **TOGO** 5V7JB (James Brilhart, B.P. 8 Anie, Togo) offers this African country to those who tune into 21220 kHz SSB at 1700 to 1730 UTC and 14175 kHz SSB at 2100 UTC when propagation is in for those frequencies. **USA** This is the time of year when the VHF/UHF DXing season begins. A good way for DXers in the Southern and Ohio Valley states to DX and keep up with VHF/UHF DX is via the following nets, all of which begin at 9pm Eastern time (no difference is given to either Standard or Daylight time, with exception given to its effects on the propagation conditions). On Sunday nights, look for Net Control station WZ8D and WA8WZG from Ohio on 144.263 kHz SSB. Mondays the net is on HF but VHF activity is the subject, as WA8MZQ (in Ohio) and KC4YO (South Central Tennessee) are net controls on 3843 kHz SSB. Tuesdays the action switches back to UHF as N8TLZ hosts the 222.110 MHz SSB net from West Virginia. On Wednesdays, look for WB4MBK from the Atlanta area which is the net control for the 432.090 MHz SSB net. If you live within 400 to 600 miles of any of these areas, you may be able to check into the nets or hear them regularly, though all report longer distance check-ins when conditions are favorable. **ZAMBIA** 9J2BO is on 24900 kHz CW starting at 1530 UTC. His QSL manager is W6ORD, Norman Friedman, P.O. Box 19055, Encino, CA 91416.

Good luck and good DX; join us again next month for a trip on the DX winds! 73 de Rob

meet on the above listed frequencies. If you operate portable, provide photo QSL cards and work at least 25 stations plus N3IK, you will receive a special QSL/award. Note: photo QSL need only be a photo post card or photograph with all QSO info on the back.

Send your list of stations worked and QSL to me c/o Monitoring Times, P.O. Box 98, Brasstown, NC 28902.

*Let's see how many states we can get active from places of natural beauty!*

See ya 3-20-94! 73 de Ike, N3IK

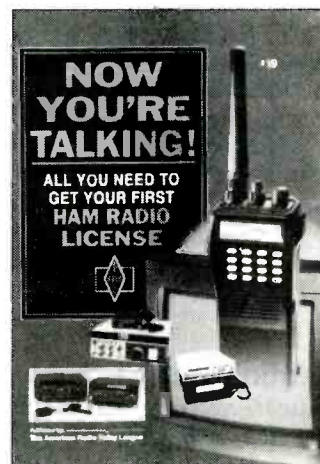
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MONITORING TIMES

# NOW YOU'RE TALKING!

## The Code-Free Ham License is Here

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March 1994

## Clandestine Confidential Newsletter Closes Down

In the January *Outer Limits* we provided a listing of the best North American sources of information about unlicensed political clandestine broadcasters. Among the best of these was Gerry Dexter's *Clandestine Confidential* newsletter. The ink was hardly dry on your copy of the January *MT* when *CCN* announced that it is ceasing publication.

Dexter said that the decision to terminate *CCN* was made reluctantly. He cited multiple factors, including expansion of his Tiare Publications business, declining reader input and "a downturn in clandestine broadcasting activity."

In *CCN's* last issue, Gerry said that he will continue to write his clandestine column in *Popular Communications* magazine. In addition, he recommends *Monitoring Times*, *ACE*, and *NASWA*, which continue their clandestine coverage. Dexter says that Tiare has future plans for clandestine books.

*CCN* was published for eleven years. It was always an excellent summary of worldwide short-wave clandestine developments. All serious clandestine DXers are very sorry to see its end.

### Clandestine Logs

Regular *MT* contributor Rob Ross of London, Ontario, sends in loggings of two Kurdish clandestines. Both operate just above the 80 meter ham band. He heard the **Voice of the Kurdish People** on 4095 kHz between 0421-0436 UTC. Just before that he snagged the **Voice of Iranian Kurdistan** on 4300 kHz between 0406-0420 UTC. The latter gave a clear identification of "Aira Dangi Kurdistan Irana."

Both stations repeatedly mentioned Iraq and Iran during their programming. Rob had fair to good signals from them. If you try to repeat Rob's success, remember that many clandestines use frequencies that vary slightly from day to day.

Rob reports that he has been hearing weak unidentified signals under WWV on 5000 kHz at 2140 UTC. At first he wondered hopefully if we might have a repeat of last year's extremely rare reception of the **Voice of Independent Kashmir** by two Canadian DXers. But, as reported by Hans Johnson of Columbia, MD, in *Numero Uno* #1252, it now is clear that Rob was probably hearing the new upper sideband service of **Sudan National Broadcasting Corporation**. Although this is not a clandestine, the unusual SWBC frequency will be interesting enough to check out.

### Radio Pirana

*MT* reader Charles Crawford of Henderson, KY, is pleased to say that he received a QSL for a fall transmission by Europirate **Radio Pirana International**. He's justifiably proud of his first Europirate verie. He heard the station on his

Realistic® DX-440, once again proving that you don't need a \$5,000 receiver to hear good pirate DX.

In the past the station has tested to North America on the last Sunday of every month at 2000 UTC on 13950 kHz. They report that their shows are no longer monthly, but they expect to be active in 1994. They accurately claim to be one of the few pirates that feature a Latin and South American format. If you hear them, their maildrop address is via PO Box 220342, D-42373 Wuppertal, Germany.

### Pirate Battles

In the December *MT* "Communications" column, Larry Miller discussed the unfortunate demise of the Mediterranean semi-pirate **Voice of Peace**. Derek Buchler has checked in to Brasstown via the Internet with follow-up news. Abie Nathan, former operator of this station, deliberately sank the transmitter's ship off the coast of Ashdad, Israel. Derek truthfully says that the station "will be missed" by many DXers.

An unrelated battle played itself out late last year in US 9th Circuit Court. William Dougan of Phoenix, AZ, and Tom Reveille of Los Angeles, CA, challenged FCC regulations that prohibit licensed broadcasting in the USA with a transmitter of less than 100 watts. Reveille operates pirate station **Radio Free Venice**. Dougan's similar Phoenix FM micropirate led to a \$17,500 fine from the FCC.

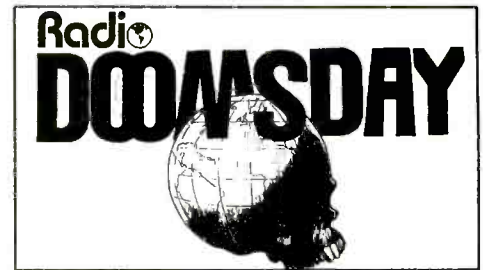
Both Dougan and Reveille argued that their low powered transmitters interfered with no one, but the FCC argued that they could interfere with "police radio, aviation frequencies, and national defense broadcasts." The decision of the 9th Circuit Court in this case was not available by this month's column deadline. Thanks go to our reader Bill Pasternak, who forwarded a *Newsline Radio* account of the trial.

### Freeband

I rarely mention eleven meter bootleg station DX, but here is one exception. The J.B. Radio Group promotes bootleg DXing in Europe. They offer information for one International Reply COupon (IRC). You can write them via PO Box 2496, Dublin 13, Ireland. Propagation has been poor on the high bands lately, so don't expect the intense levels of station activity on 27 MHz that we saw a couple of years ago.

### Pirate News

This year's DX season has been eventful on the North American pirate scene, mainly because of greatly increased usage of traditional 41 meter pirate frequencies by licensed shortwave broadcasters. Both Alan Masyga of Winona, MN, and



### Radio Doomsday's new QSL.

Ed Silvia of Taunton, MA, noticed one of the latest examples. WCSN from Maine is now operating extensively in the evening on 7465 kHz.

Almost no 41 meter frequency is completely free of SWBC interference to pirates. But the pirates have been moving to whatever channels may be open at any particular time. If you tune around the band, the pirates are still there to find. It might pay to study a month's loggings for recent frequency and time tendencies.

"Nemesis" from **Radio Doomsday** wrote in to report that 7445 kHz is still free of licensed broadcaster activity. He encourages the use of this frequency by pirates. The longtime occupant of this channel has been the Israeli Mossad "Kilo Papa Alpha Two" numbers station. Licensed broadcasters may not wish to offend the Israeli intelligence agency by broadcasting on this frequency, so Nemesis may have a point.

During the current low phase in the sunspot cycle, propagation has often been erratic on 41 meters during late night hours as the maximum usable frequency plunges. Thus, a few pirates are using 49 meters more consistently, particularly 6295 kHz. A search of 90 meters (3400-3500 kHz) or medium wave (1620 kHz) could produce a North American pirate log, at least until summer static returns.

Scott Krauss of Cleveland, OH, says that he received QSL's from two stations that were not reported in this month's loggings. He Man of **He Man Radio** and Eddie Egghead Johnson of the **Voice of Stench** replied to Scott's reports. Both use the Blue Ridge Summit address, and require three mint USA first class stamps for a response. He Man enclosed a brochure for the Pro Football Hall of Fame in Canton, OH.

### What We Are Hearing

Despite unpredictable propagation and the aforementioned interference, our readers sent in plenty of pirate logs again this month. Why not join them? You can send your information to Brasstown, and we will all appreciate it!

Maildrop addresses used by pirates 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 111, Wadsworth, IL 60083; PO Box 293, Merlin, Ontario N0P 1W0; and PO Box 963, London, England SW208XL. WPIG announced a local address that may be unstable, but a report to Blue Ridge Summit should result in proper forwarding to them.

**Altered States Radio-** 7413 at 2230. Rock music dominates this station. It can usually be ID'ed by music from the old "Outer Limits" television show that is played at the start and end of broadcasts. Addr: Merlin (Scott Gentry, Mattesom, IL; Masyga)

**CSIC-** 7413 at 2330. Pirate Rambo's entertaining shows are sometimes educational. For example, in the event of a nuclear holocaust he recommends that you do not use the elevator. Addr: Blue Ridge Summit (William T. Hassig, Mt. Prospect, IL; Donald Kidder, Ashland, ME; Silvia; Gentry)

**East Coast Beer Drinker-** 7465 at 0315. In contrast to several pro-marijuana pirates logged this month, here's a station that promotes legal intoxicants. His shows mix rock music, country music, and comedy. Addr: Blue Ridge Summit (Ross)

**Happy Hannukah-** 6295 at 0130. This one emerged in December a couple of years ago to promote Hannukah, but it can be heard at other times. The announcer, who has a thick eastern Jewish accent, plays songs with Jewish content. Addr: Merlin (Yolanda Lewis, Elgin, IL via Gentry; Hassig; Silvia)

**KNBS-** 7420 at 2015. Phil Muzik's veteran pro-marijuana programs (note the call letters) always include his "Fruit of the Loom News Briefs" segment which ridicules silly and obsolete local laws that have never been repealed. The California Marijuana Cooperative operates the station. Addr: Wellsville. (Gentry)

**Liberty-** 7416 at 1500. Many pirates aired holiday shows at Christmas, and this one was no exception. I had never heard of the station before this logging, but its maildrop confirms that the station is genuine. Addr: Wellsville (Gentry)

**North American Pirate Relay Service-** 7435 at 1545. NAPRS often relays full shows from other pirates. But, Cathy heard them with NAPRS' own production of brief highlights from many stations. Addr: Wellsville (Cathy Zyka, North Tonawanda, NY)

**Pirate Radio Insanity-** 7445 at 2300. So far the nature of this station is puzzling. It may be a new pirate, or it may be a relay transmitter for other stations such as Radio Doomsday and Radio Airplane. Stay tuned. Addr: None yet (Hassig)

**Radio Airplane-** 7445 at 0030. Pirate Captain Eddy discusses his airplane flights between rock music and comedy selections. At times he plays classical music, such as "Ride of Valkyrie" by Wagner. Addr: Wellsville (Masyga, Gentry, Hassig)

**Radio Azteca-** 7415 at 2245. Bram Stoker's biting parodies of DXers and DXing are very clever. You'll be entertained if you hear this one. Look for their interval signal music from the old Rocky and Bullwinkle cartoons. Addr: Wellsville (Silvia)

**Radio Caroline-** 6295 at 0200. This is the most famous offshore pirate of all time. Its format has always been rock music with mostly British announcers. Ed's log here was apparently a North American pirate relay of their programming. Addr: London (Silvia)

**Radio Cyclops-** 7425 at 2230. Mike and Mel's new station features heavy metal rock and parody newscasts. Their wit is generally hilarious. Maildrop information has not materialized. Addr: None (Gentry; Hassig)

**Radio Doomsday-** 7445 at 2315. Nemesis' New Years broadcast took place as advertised during earlier tests. Programming consists of comedy mixed with diverse musical selections. Their new QSL logo is pictured here. Addr: Wellsville (Michael Prindle, New Suffolk, NY; Hassig; Gentry; Masyga; Silvia; and direct from the station)

**Radio Free Euphoria-** 7413 at 2245. During one of their recent pro-marijuana productions, host Captain Ganja was assisted by a new announcer, the Laughing Maharishi. William notes adjacent channel "hash" QRM from WEWN on 7425. Addr: Wellsville (Prindle, Hassig)

**Radio Garbanzo-** 7420 at 2000. Fearless Fred has been on the air for a decade with rock music and well produced amusing commentary. Station activity is typically intermittent but FF has resurfaced with shows this year. Addr: Wellsville (Gentry)

**RFM-** 7415 at 0230. Donald is pleased to report that he received his first pirate QSL verification from H. V. Short. Congratulations! Addr: Wellsville (Kidder)

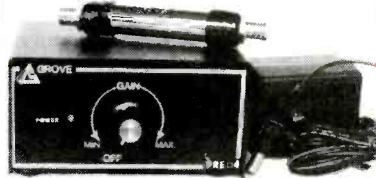
**Solid Rock Radio-** 7465 at 1930. As the station name implies, rock music dominates the entertainment. They have some slick station jingles. Addr: Wellsville. (Max Syko, Gaylord, MI)

**The Great Southland-** 7414 at 2245. Announcer John Quigley, who has a definite Australian accent plays various Australian music on this new pirate. Although signal reports have been erratic, we certainly are hearing this from a North American transmitter. Addr: Merlin. (Silvia)

**UNID-** 7445 at 0415. This abbreviation is commonly used in radio bulletins for "unidentified" stations. However, a mid-1980's pirate used the call letters to permanently refer to his station. An apparently different operation has done it again, using a slogan of "The Unidentified Pirate." Addr: None (Hassig)

**WBBD-** 7465 at 2330. We mentioned this new rock station last month. It is still not clear if their announced maildrop works, but reception reports were not returned to sender. Addr: Wadsworth. (Ross, Gentry)

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**WEED-** 7465 at 0730. The highly elaborate productions from this station are often heard late at night. Their audio collages are mixed with recorded speeches and rock music. Like **KNBS**, they promote marijuana. Addr: Huntsville. (Prindle, Silvia)

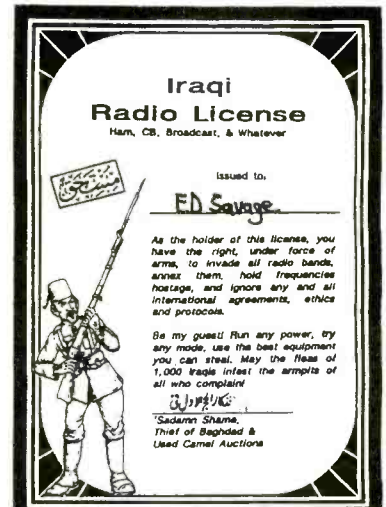
**WJLR-** 7407 at 2230. This one continues its rock music format. The news here is that they have been experimenting with an FM pirate simulcast over sister station **WJLX**. Addr: Blue Ridge Summit (Hassig, Gentry)

**WLIS-** 7461 at 2315. Jack Boggan's transmissions always feature a collection of genuine interval signals from international shortwave broadcasters. Some shows add rock music. Their call letters stand for "We Love Interval Signals." Addr: Blue Ridge Summit. (Ross, Gentry, Masyga, Silvia)

**WPIG-** 6270 at 0030. Using a slogan of "Radio Pig International," this new one burst upon the scene in 1994 with almost a dozen short broadcasts on one weekend. Some were right on top of the **VOA** on 7415 kHz! Pig noises, pig news, pig weather, and other items of interest to pigs are featured. Addr: Try Blue Ridge Summit (George Zeller, Cleveland, OH)

**WREC-** Although nobody logged them this month, the station is still active. Ed received the Iraqi Radio License QSL from them that we picture here. Addr: Wellsville (Ed Savage, Mountain Home, AR; Ross)

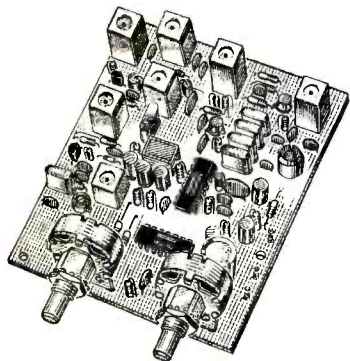
**Witch City Radio-** We don't expect to see them again until October, but Mark joined the growing list of DXers who QSL'ed the 1993 Halloween broadcast. Rob got one too. Addr: Wellsville. (Mark Henning, Hamburg, NY)



Ed Savage now has his  
license from WREC.

# what's new?

Larry Miller



## Scanner Kit

Hamtronics has introduced the R76-M, a low-cost VHF receiver. Designed for the 28, 50, 73, 144, 150 and 220 MHz bands, it's available as a kit (the manufacturer bills it as "a good starting kit"). At \$59.00 it's also a pretty amazing bargain, too. The illustration shows an easy layout with plenty of room for the fumbling fingers of the less experienced. Quality should be good, too, since this is essentially the same receiver as the popular R76, only with slightly decreased sensitivity.

The R76-M is especially suited for monitoring police/fire frequencies, commercial two-way radio, monitoring repeaters, amateur calling frequencies or packet radio. Owner Jerry Vogt will be sending along a kit for us to test. Meanwhile, we'd appreciate feedback from readers who order the unit.

One other thing. Old timers will probably remember Hamtronics not only as one of *MT's* original advertisers, but as the manufacturer of a number of excellent scanner converters. They were, if my memory is correct, also the first company to introduce a converter for the then nearly unheard of 800 MHz band.

But enough reminiscing; I should tell you that the R76 VHF Monitor Receiver kit is \$59.00 plus \$5.00 shipping from Hamtronics, 65-M Moul Road, Hilton, NY 14468-9535 or call 716-392-9430. Be sure to mention that *MT* sent you.



## Uniden Drops and Adds

Uniden Corporation has announced the discontinuation of several popular scanner models in light of the looming anti-cellular-scanner deadline (April 26, 1994).

The popular BC100XLT and BC200XLT handhelds have been replaced by the non cellular-restorable BC120XLT and BC220XLT. Introduced as well is the new Sportcat SC 150Y/B (yellow or black) for racing fans, which was mentioned last month.

Gone are the two longest-running models in Bearcat history, the BC210XLT and the BC800XLT which received cellular telephones without modification.

## Not Giving Up on CB

Who is the world's largest manufacturer of Citizen Band radios? It's Uniden, not surprisingly. Is CB dead? Not to hear the big guns in Ft. Worth tell it. In fact, Uniden has just introduced yet another 11 meter rig called the Pro 340XL.

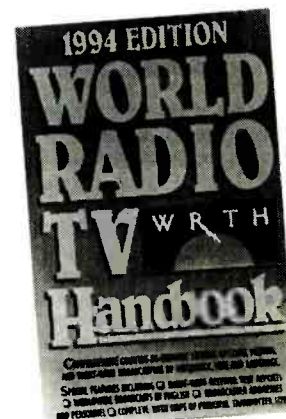
A portable handheld, the Pro 340XL is designed for outdoor use and is compact enough to fit just about anywhere. As a travel portable, the unit comes complete with a 12v DC power cord, a flexible rubber antenna, built-in belt clip and rechargeable battery. Other features of the Pro 340XL include a built-in mike, up/down electronic channel selectors, volume and squelch control, high/low power selector and LED transmitter indicator.

The '340 is available at your favorite department or radio store. Retail price is set at \$99.95.

## Radio Shack PRO-2027

Radio Shack continues to "pour it on" with yet another scanner hitting the streets. The PRO-2027 is a sleek looking, 100 channel programmable scanner that retails for \$189.95. It's another solid entry into the field with 30-54, 108-174, 380-512 and 806-960 MHz (less cellular—restorable) coverage. Bob Grove says that, "the '2027 measured

signal-to-signal against a popular—and sensitive—competitor, the PRO came through with flying colors." Check out his full hands-on review on page 92 of this issue.



## 1994 WRTH

The new *World Radio TV Handbook* is out. This would be, if my counting is correct, the venerable book's 48th edition.

This year's *Handbook* contains no surprises, just page after page of information on long, medium, shortwave and satellite broadcasters, TV and FM.

The information is arranged by region and then by country. Hardcore shortwave DXers will find the Andean information to be a bright spot; the Russian domestic information above 5900 MHz, somewhat disappointing. Still, the cover claim that the *Handbook* is "The world's number one information source" is vacuous, amusingly so.

There were only five portables tested in the equipment section and the one tabletop model — the American Electrola model 8A — was dismissed as not worthy of a formal lab test. Abound-in card reminds you that the *WRTH* now has a separate equipment buyer's guide for sale, only \$19.95.

Still, it's hard to find a collection of so much radio information — 600 pages of



frequencies, station data and other information sorted this way and that — for a mere \$19.95. Almost every radio bookseller carries this stand-by, Grove Enterprises among them.

## Radio Recorder

If you're looking for a way to keep track of what's on the airwaves when you're away from your receiver, and you're looking for a really rugged recording device, go where the pros go. Omnicron Electronics produce voice logging devices for the public safety and business market where the object is precise documentation. Not surprisingly, these units are built like brick doghouses, designed to take day-in-and-day-out use.

The VLR-4 is a quarter-speed unit that can record eight hours worth of activity on a single, standard cassette tape without rewinding. Other features include automatic voice activation, a fail-safe alarm that monitors tape movement and immediate tape review. The price of the VLR-4 is \$350.00. Those who really want to go first class can order the optional time and date stamp that labels each transmission so you know when it occurred. The price for that is somewhat hefty, however, ringing in at \$490.00.

The Omnicron Electronics VLR-4 can be ordered at 203-928-0377. They'll also be happy to send you a brochure from 581 Liberty Highway, Dept. MT, Putnam, CT 06260-0623.

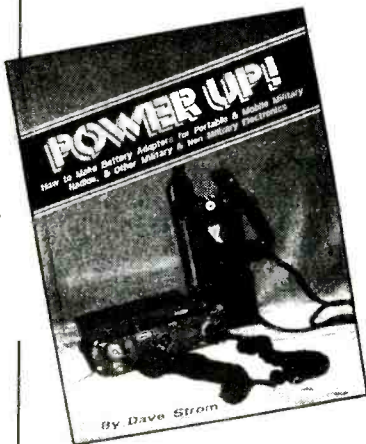
## Noise Reduction

If noise is giving you a problem, you may need headphones. Noise Cancellation Technologies, Inc., is a Connecticut-based firm that's promising to remove unwanted noise, not only from your radio listening but apparently from life in general. The brochure's not really too

clear, but here's the beef as we understand it.

You put on the sleek, modern-looking headphones which have a microphone in each earcup. Hitherto unavailable technology "listens" for offensive noise, feeds that information to a small, lightweight controller (which you wear on your belt) where it is analyzed and an anti-noise wave is generated. When the anti-noise wave meets the offensive noise, the noise is reduced. According to the manufacturer, the user is likely to experience a 50% to 95% reduction in noise within a 30 to 1,500 Hz frequency bandwidth.

If you need this kind of peace and quiet in your life and are willing to pay \$149 for it, get in contact with Noise Cancellation Technologies, 800 Summer St., Stamford, CT 06901. Be sure to mention *MT* when you write.



## Power Up!

Military radios are rugged, versatile, well-designed and easy to operate. When they enter the surplus market, they are snapped up by hobbyists, hams, experimenters, emergency and survival groups, quasi-military organizations — even other federal agencies. But they always come with one thing — a power problem.

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Author Dave Strom offers detailed instructions on how to make adapters using Eveready, Duracell and other relatively inexpensive batteries that you can pick up at the local store. The 96-page book has detailed instructions and LARGE wiring diagrams to help you along. Write the publisher to see what radios are covered. *Power Up!* is \$13.95 plus \$4.00 shipping from CRB Research, P.O. Box 56-MT, Commack, NY 11725.

## The Offbeat... The Incredible

"The 10 GHz band is not normally of interest to radio hobbyists," postulates Bill Cole. "I am willing to speculate, however, that a substantial number of [hobbyists] do carry a 10 GHz receiver as part of their mobile rigs." The 10 GHz band

covers what is commonly referred to as "X-Band Radar" and if you have a radar detector, you probably have a 10 GHz receiver. Anyway, Cole, during a trip down South, came across a product called "The Zapper." We enjoyed Bill's review so much that we're reprinting it verbatim, with the always generous permission of scanning's humorist, *NESN* editor Les Mattson.

"The Zapper manual describes the product thusly, 'The Electronic Rainbow, AXT-10, Amateur X-Band transmitter is a 10.525 GHz CW oscillator.' When the Zapper is turned on, it emits the same radiation as when Smokey takes your picture and activates your Cincinnati Microwave. The implications of the device now become clear. The so-and-so in the 18-wheeler that just passed you at 90 miles per hour is at your mercy. Just point the zapper at him and watch the taillights come on.

"On the way home from Virginia Beach [Virginia], my zapper got its first work out. While traveling north on Route 13 I heard the melodious roar of diesels that were really cranked up. Around the bend came a convoy, two of 'em southbound, pedal to the metal. I hosed the first one with the Zapper and was amazed at the reaction. The first 18-wheeler laid on his brakes so hard that he was almost rear-ended by the second.

"The following week found me riding the Garden State Parkway while all the Yuppies were on their way to work in Atlantic City. I wasn't having much luck with the Zapper; just a probable on a Beemer that immediately moved out of the passing lane when zapped, but no taillights came on. Then a little Ford Fiesta went buzzing by. I wasn't going to even bother, but what the heck. Cowabunga, it was like Mr. Sulu dropped the Star Ship Enterprise out of warp drive! On came the brake lights and he seemed to fly backwards!

"My friends and family think I'm crazy. I think I'm doing a public service." You can get your 10.525 GHz CW oscillator ("The Zapper") from Electronic Rainbow, 6254 LasPas Trail, Indianapolis, IN 46268. Their phone number is 317-291-7262. Assembled units are \$49.95; kits are \$39.95. There is a \$4.00 shipping charge. Tell em' *MT* sent you.

## Connecticut Scanning

We just got a copy of the new *Official Connecticut Scanner Guide*. While we aren't near enough to Connecticut to personally check this one out, we did notice some very tantalizing numbers. First, the book is completely revised and second, there's an interesting emphasis on new 800 MHz licenses — like the new state police frequencies. There are also what appear to be new statewide correctional frequencies, too.

The *Official Connecticut Scanner Guide* is edited by Keith Victor, a career firefighter of 25 years. Victor, who at one time published the *Alarm Room News*, has a set of public safety radio credentials that will knock your socks off. This is like getting your frequency information from an "inside source."

You can get a copy of this 400 page monster for \$21.95 plus \$3.05 shipping from Official Scanner Guides, P.O. Box 712-MT, Londonderry, NH 03053.



## Miscellaneous

David Wolf sent along a copy of his newsletter, *Packet Power*. The issue we received is eight pages long and contains an interesting, eclectic mix of information. For more information, write to Packet Power, P.O. Box 189, Burleson, TX 76097-0189. The price of a monthly subscription is \$24.00.

The company that is probably the hobby's biggest seller of GE Superadio IIIs (it's where we got our AM/FM DX rig) is **Chilton Pacific Ltd.** They have a catalog of AM/FM, shortwave receivers, antennas, and accessories. You can get a copy if you write and ask. Their address is 5632 Van Nuys Blvd, #222, Van Nuys, CA 91401. The orderline is 800-717-7780. Tell them that *MT* sent you.

**Old Colony Sound Lab** — the retail arm of Audio Amateur Publications (Audio Amateur, Speaker Builder, Voice Coil,



Glass Audio, etc.) — has a catalog of kits for audiophiles that may interest you. You'll find a copy in your mailbox next week if you write to them at P.O. Box 243, Peterborough, NH 03458.

You can also get a free sample copy of *National Scanning* magazine this month for a mere twenty-five cents (coin or stamp only). Offer ends March 31st and is for non-subscribers only. The address is Box 360, Wagontown, PA 19376.

A company called **Scanventure** is offering a printout of all FCC licensed frequencies for any county in New York state (except those which make up New York City). The price is \$5.00 postpaid. Also on the block is owner Don Edwards' personal list of Hot 100 military frequencies. The price there is \$3.99. Send your order to Scanventure, P.O. Box 61, Northville, New York 12134.

**FBenterprises** has little maps of your state showing where all of the amateur radio repeaters are located. The map is in color and covers 220 MHz to 1.2 GHz. You can get yours for \$3.95 plus shipping. For more information write to 23801 NW 1st Ave., Ridgefield, WA 98642-8830.

Anyone who has been interested in getting a "Weather Wizard" weather instrument for their monitoring shack but who was put off by the rather extravagant price tag might want to get a copy of **Davis Instrument's** latest catalog. It's got "new models, lower prices." Call them for a copy of the catalog at 1-800-678-3669.

Tab Books (1-800-822-8138) is touting a new 4th edition of the venerable [The Complete] *Shortwave Listener's Handbook*. Originally written by shortwave dean emeritus Hank Bennett, it has endured a number of "updates" during its 20 year life. The latest rewrite is by the excellent Andrew Yoder, whose own pirate book was held up for a seemingly interminable period of time. Keeping with tradition, we noticed that the yet-to-be-available 4th edition was originally scheduled for release in September of '93.



## Ham Radio CD

A new edition of the World of Ham Radio CD-ROM has been released by AmSoft. Over 7000 files include many programs of interest to radio monitors as well as amateur radio operators. Subjects covered include antennas, engineering, satellites, shortwave listening, logging programs, propagation, weather tracking, controllers, radio modifications ... the list goes on and on.

While the 1994 edition includes CALLSIGN — an FCC amateur radio license database with easy retrieval of any licensed operator — the real attraction of this CD, in the opinion of John Catalano, is the addition of CDVIEW. As he points out in this month's "Computers and Radio" column (p. 38), this feature allows you to view and even run most of the programs directly from the CD, without eating up valuable time and hard-drive space for decompression and operation.

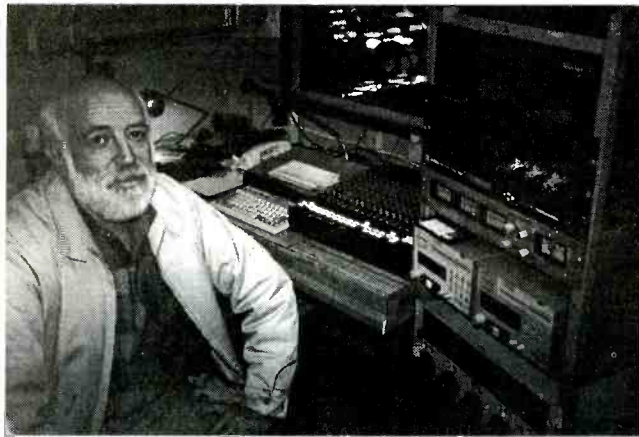
The World of Ham Radio CD is an ISO-9660 IBM-compatible CD-ROM, available for \$40 plus \$3 shipping in the U.S. (\$5 foreign) from AmSoft, P.O. Box 666, New Cumberland, PA 17070-0666; 717-938-8249.



## The Fury Bust

Continued from page 7

Brother R.G. Stair's Overcomer Ministry had bankrolled the current project.



Joe Eisenberg

handled in a perfectly legal manner. The raid was a "tragedy," "hitting a fly with an anvil," cutting and hacking away the equipment, he said.

Weiner maintains there was no pirate broadcast, since generators and transmitter were inoperable; he was trying to get them in working order, which may have taken another month. He says no broadcast took place when he was aboard, but the FCC claims to have heard the *Fury* on the frequency of 7415 kHz. An ACE club member, Kirk Trummel of Springfield, MO, reported hearing a number of pirate broadcasts on 7415 kHz in late December in which "Johnny Lightning" gave a station ID of WJPL. Johnny Lightning is the name of an announcer for Weiner's old Radio New York International. Could there be a connection?

Brother R.G. Stair's Overcomer Ministry, Voice of the Last Days Prophet of God, had bankrolled the current project. Stair soon began talking about the raid in broadcasts on WRNO, WWCR and WINB, and also in a guest appearance on *Scriptures for America* with Pete Peters. "God's will be done": he almost seemed to welcome it as proof that the wicked Clinton government was persecuting a Man of God, and he blamed Attorney General Janet Reno in particular, repeatedly accusing her of being a lesbian (as if that should disqualify her from being a cabinet officer, even if true). He also said one of the agents hated to obstruct the ministry, but had to carry out his orders.

Stair maintained the arrest of the equipment was excessive; normally a citation and/or fine would be issued. He contradicted himself on the crucial point of whether there had been any illegal broadcasts—seeming to admit there could have been "minor" leakage from dummy load tests for a few minutes in which the signal may have reached as far as Alaska.

Stair put the value of the equipment, not including all the time put into it, at \$75,000, contrary to a newspaper story guessing \$500,000. At presstime it was uncertain whether the *Fury* would be scrapped or another effort made to equip it, but another "brother" was going to

Belize, the *Fury's* presumed destination, to investigate purchasing the VOA site for sale near Punta Gorda—perhaps unaware that it is mediumwave, not shortwave.

John England and Genie Baskir, partners in Yesterworld (USA) and MPLX, were elated at the raid. During the previous few weeks they had been making every effort to bring the *Fury* project to the attention of U.S. agencies. In a very complicated series of events, they accuse Weiner of fraud in selling the previous vessel *Sarah* to them for use in a theme park or for Chinese dissident broadcasts. Although \$10,000 and additional expenses were paid to Weiner, he never turned over clear title with vendor's lien, as required (Weiner tells us that he provided adequate other documentation, and that when payments ceased he repossessed the ship).

England and Baskir maintain that Weiner never actually owned the *Sarah*, yet sold it to them and to other parties, including MGM to be blown up (see Jan. *MT*, p. 24). Further, England maintains that the AM and FM transmitters and studio equipment, such as the control console, as well as an antenna tower, but not the shortwave transmitters, were moved from the *Sarah* to the *Fury* and thus were stolen property. Weiner admits only to the antenna tower, part of which broke off in the transfer.

The *Sarah* under its original name *Litchfield I* is still in the Merchant Marine of Panama, owing that government \$10,000 in fines for drug trafficking and \$67,000 in taxes. England has urged the government of Belize not to be a party to "pirate" broadcasting, and is working on multiple civil and criminal suits against Weiner in states where he has done business—Maine, Massachusetts and New York. Weiner says he welcomes such action, since it will give him the chance to regain the \$35,000 he says they owe him. Stay tuned; this story is far from being over!

Story based on monitoring and transcripts by Diane Mauer, John Carson, Ed Rausch, Glenn Hauser, interviews by Glenn Hauser, report in the *Charleston Courier*, background and documentation from John England, and ACE BBS via George Zeller.

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## PRO-2027 Scanner



The Realistic® model PRO-2027 is a sleek, low-profile, desktop scanner with 100 memory channels and rapid scan/search capability.

Frequency coverage and corresponding search step/keyboard entry increments are: 30-54 MHz (5 kHz), 108-137 MHz (25 kHz), 137-174 MHz (5 kHz), 380-512 MHz (12.5 kHz) and 806-960 MHz (12.5 kHz, less cellular, restorable; see below). No memory backup battery is required for the non-volatile RAM.

If a non-standard frequency for the bandplan is entered, the system will default to the nearest legitimate (assignable) frequency; for example, 132.560 would actually enter into memory (and be displayed) as 132.550 MHz. Any channel(s) may be chosen for two-second delay before resuming scan.

The 100 memory channels may be entered into ten 10-channel banks; an additional ten monitor channels allow temporary storage and recall of frequencies discovered during the automatic search function. Arrow keys direct the search upward or downward in frequency.

"Direct search" allows the up/down arrow keys to step-tune above and below the displayed memory channel. If a new frequency is so discovered, it may be temporarily stored in one of the 10 monitor

channels, and/or entered directly into permanent memory.

Any one channel may be selected as a priority channel; when so selected, the channel will be sampled every two seconds for activity, overriding any other function when a signal is present.

Tandy's "Hyperscan", like Uniden's "TurboScan", is a company trademark for rapid scan and search rate; in the PRO-2027's case, it's 25-50 channels per second. Slow speed of eight channels per second is selectable as well. Any channel(s) may be selectively locked out of the scanning sequence.

Claimed sensitivity is 0.5  $\mu\text{V}$  @ 30-54 MHz, 1.0  $\mu\text{V}$  @ 137-512 MHz, and 2.0  $\mu\text{V}$  at 108-137 and 806-960 MHz. While this may seem unusually poor when compared to the specified sensitivities of competitors, it is measured at 20 dB SINAD. Using the more familiar—and more widely accepted—10 or 12 dB SINAD, the sensitivity becomes a more acceptable 0.7-0.8  $\mu\text{V}$ .

Just to be sure that the 2027 comes up to snuff in the sensitivity department, we measured it signal-for-signal against a popular—and sensitive—competitor; the PRO came through with flying colors.

Spurious signal rejection (unwanted images, harmonics, etc.) are suppressed by 50 dB below 174 MHz (unspecified above).

Selectivity (6 and 50 dB down) is 20 and 40 kHz, quite standard among most scanners. The circuitry scheme is dual conversion (10.7 MHz and 455 kHz).

Audio output power is 1.2 watts (nominal) into an 8 ohm load such as the 3" internal speaker; a front-mounted 3.5 mm (1/8" mini) jack is provided for earphones or an external speaker.

Power required is 120 VAC at 13 watts; since the power supply is internal, there is no provision for 12 volt operation. A rear-mounted BNC connector can be attached to an external antenna cable, or a telescoping antenna (included) may be screwed into a top hole on the cabinet.

The PRO-2027 weighs approximately 2-1/2 pounds and measures 10"W x 2-1/2"H x 7"D. The LCD display is crisp and contrasty; its edge lighting makes it easily viewable at night, and the sloped cabinet enhances the viewing angle.

The accompanying owner's manual is well written and easy to read on glossy print stock.

The Realistic® PRO-2027 is available from Grove Enterprises for \$209.95 plus \$7.50 UPS shipping; also available from Radio Shack outlets nationwide.

MT



## PRO-2027 Cellular Frequency Restoration

Although cellular frequency coverage is factory deleted, continuous 806-960 MHz coverage may be restored by a straightforward procedure. (NOTE: It is lawful for an owner to modify his scanner to receive cellular frequencies, but it is not lawful to monitor the contents of a cellular telephone call. *Monitoring Times* assumes no liability resulting from attempting to perform the following procedure.)

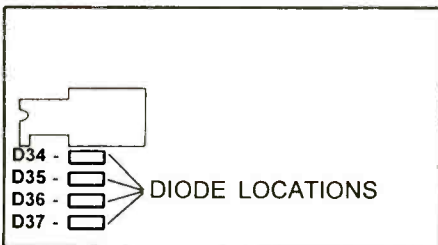
Tools required will be a small Philips screwdriver, fine-tip soldering pencil, thin gauge solder, and a small-signal diode (chip or tiny 1N914 or 1N4148).

After unplugging the radio and turning it upside-down, front panel toward you, remove the four screws and the bottom plate. Locate the four diode positions (D34-D37) in the lower left-hand corner.

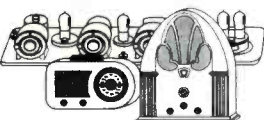
Cellular coverage (in 12.5, not 30, kHz steps) is restored when a diode is soldered in position D34, noting the same polarity as the other diodes. It is possible to move D35 to the new position; its removal has no observable effect on performance.

By way of note, removing D36 deletes the entire 806-960 MHz range, and adding D37 will change low band coverage from 30-54 MHz to 68-88 MHz for European applications.

(Thanks to intrepid scanner enthusiast Larry Wiland for this procedure and information).



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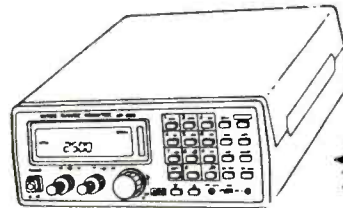
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# Grundig Yacht Boy 500 With RDS

Few things have generated quite so much mail to *Passport to World Band Radio* as the Grundig Yacht Boy 500, which came out too late to be included in the 1994 edition. When it finally did emerge, there were reports of difficulties with some of the units. Grundig indicated to us that they were keenly aware of these, and would remedy them before continuing production.

Now that the "shakedown cruise" is out of the way — it's always a good idea to purchase a sophisticated new model only after it has been out for several months — we've put this unusual compact-to-midsized portable through our range of test hurdles. In a nutshell, what we've found is a one-of-a-kind radio with abundant sales appeal, and good, if uninspiring, performance.

## Unusual from Head to Tail

It's obvious right off that the 500 is not your grandfather's shortwave radio. It hails the eye with panache, featuring a sleek vertical format, like a handheld ham transceiver.

Its gently rounded face reveals nary a knob. Rather, there are fully 29 keys and sliders on the front panel, along with the usual LCD — visible from below and head-on, but not from above. Added to this are three controls, including one knurled potentiometer, tucked into the right and top sides.

Even the telescopic antenna is different. Because of the radio's vertical format, there's no room for it at the top, where antennas customarily reside. So it roosts on the right side, emerging from the radio's bottom like a tail.

## Station Data Displayed by RDS

Also on the front panel is a logo for an "RDS" system. This state-of-the-art feature, for FM only, gives station-emitted data — call sign, music format, network or whathaveyou — right on the LCD. For example, in Philadelphia we find two stations emitting RDS data which read "WFLN" and "JAZZ FM." Two stations out of dozens isn't much, but that is expected to change as RDS becomes established as a norm, much as FM stereo did some thirty years ago.

It's a nice feature, though the 500 does not appear to have facilities to select a station by

listener-chosen musical format, the main attraction of RDS, according to industry journals. However, if you're in Europe, where national radio networks are common, you'll appreciate the RDS' related nominal ability to ferret out other FM channels within a chosen network.

For non-RDS stations you place into presets, you can assign an alphanumeric tag of your own choosing. This appears on the LCD in addition to the usual frequency readout, and is handy for the large numbers of world band listeners who don't keep "this-frequency-equals-that-station" information in their heads. The only complexity is in generating alphabetic characters from the numeric keypad.

## Pre-Loaded with Frequencies for Nine Broadcasters

Also unusual is a ROM of 90 preassigned channels for nine of the larger international broadcasters, such as the BBC and Deutsche Welle. It's a nice idea, although for newcomers it is poorly explained in the manual and somewhat complicated to operate, defeating the main purpose of such an arrangement. Experienced listeners are likely to ignore this feature, anyway, as the preassigned frequencies are also shared with other stations and tend to change over time.

## Worldwide AC Adaptor

The 500 operates off four "AA" batteries or a worldwide dual-voltage/dual-plug AC adaptor (its output is 9 VDC, not the expected 6 volts). It tunes longwave: AM in 9 or 10 kHz increments through 1710 kHz; FM; and shortwave from where the AM band leaves off through 30,000 kHz. This is excellent for all parts of the world — only the lower portion of the Japanese FM band is missed.

A worldwide AC adaptor is an important plus. However, the 500's adaptor, made in China, has no UL seal. UL approval is designed mainly to help prevent fires, so prudent users will unplug the adaptor when the radio is not in use. Too, the adaptor's itsy plug fits into any of the other sockets on the radio, all of which are located above the socket for the adaptor. Insert with care!

Our adaptor's plug fit snugly into its proper socket, but *Passport* reader Bob Longsdorf advises us that his falls out very easily. Presum-

ably this is a production defect, so if you encounter this problem consider having your radio exchanged or repaired under warranty.

However, if your set's antenna works loose, as ours did, don't bother to return it. Just push it hard back into its hole, then keep pushing and turn it a few times to clear up the problem.

## Ergonomics only Fair

The controls work as they should, although their sameness of appearance can result in annoying mis-pushes. For example, the AM-mode key is right above the often-used "up" slew key; a mis-push causes the radio to switch from shortwave to longwave. Too, the numerical keypad is not in the familiar telephone format. The fine-tuning control is useful not only to produce lifelike audio in single sideband, but also because it has a handy center "default" detent.

All this would earn the 500 an ergonomic "B+" — even if the volume slider is somewhat fussy to operate — except for one characteristic: placement of the antenna. Because it sprouts from the set's bottom, rather than the top, it can get in the way of right-handed operators. True, it can be pushed out of the way, but this sometimes compromises shortwave and FM reception.

## Other Features Generally Useful

Tuning, aside from the special preassigned frequencies, is via 40 presets, numerical keypad, up/down slewing, meter band selection and frequency scanning. The slew rate is in 5 kHz increments within the broadcasting (world band) segments of the shortwave spectrum. Otherwise, it's in 1 kHz increments elsewhere — utility and ham bands — within the shortwave spectrum. That 5 kHz world band increment makes sense, as tapping the small slew key often can be uncomfortable on the fingertip.

Scanning the shortwave spectrum is more flexible. You can choose 1 kHz increments (touch the key briefly) or 5 kHz segments (hold it down longer). However, the scanner works by going up one increment at a time, stopping for exactly one second, then moving on. Unlike that on the Yacht Boy 400, this is not a "signal-seek" circuit except on FM, the search is appropriate for DX bandscanning, but less handy for those who wish the radio to automatically find the next listenable station.

Additional features include a power lock for traveling, a lock for the controls, a three-level



signal-strength indicator of limited use, a weak-battery indicator, high-low tone switch, sleep timer, snooze delay, a high-quality carrying case and FM stereo through earphones.

Grundig had its thinking cap on with that stereo circuit. When you're listening in mono through the speaker — the most common situation — you can adjust a slider so that the power from both audio channels is coupled together to boost audio output. It's a real plus if you're listening in a noisy environment, such as in a moving vehicle, noisy room or outdoors. On, of course, a yacht.

Other sensible features include two 24-hour clocks. Okay, one should be in the 12-hour format for local time, but we all have watches, so why quibble. Any one of these clocks, as you choose, displays full time, which is a far cry from the "frequency or clock" format of so many other models.

Also handy is LCD illumination. With the AC adaptor, it's on full time. With batteries, there's an automatic 15-second delay. If that's too long, simply press the light button again and it extinguishes.

Handy, too, is the flip-out elevation panel to place the radio at a comfortable operating angle. However, it tends to fall apart if you place much weight on the radio. Fortunately, it's easy to reassemble.

### Precisely Tuned Single-Sideband

Portables sell by the boatload to folks who listen to world band stations and have virtually no interest in ham signals and utility stations. However, *MT* readers gravitate to all sorts of radio signals, and in this regard there is generally good news. Not only is there single-sideband reception with a genuine LSB/USB control, there is also a fine-tuning control. All worthy world band radios today use frequency synthesis which, while generally a plus, has drawbacks. Among these is that unless the synthesizer tunes in increments of 1 Hz or perhaps 10 Hz (that's Hz, not kHz), single-sideband signals often sound unnatural. The 500's fine-tuning control takes perfect care of this.

Alas, that control has to be used for a purpose for which it shouldn't be: adjusting the beat frequency in USB. Ideally, in a modern receiver you should be able to tune to a center frequency in the AM or ISB modes, then flip back and forth between LSB and USB without having to re-adjust for a proper beat note.

### Finding It: The Operating Manual

The 500, not to mention shortwave listening as a whole, is complex enough that it warrants a good, solid operating manual. You'd think that the lapful of literature that comes with the radio

would teach you everything known about radio, but it's not so.

To begin with, much of the material is in non-English languages. That which is in English is written in a dense Teutonic style. Somewhere, whatever it is you need is to be found buried within these pages, but figuring it out is a challenge and time-waster. Most people don't bother to read manuals, and these are a sterling example of why!

There is one important feature missing: synchronous selectable sideband. The Sony ICF-2010 has it, and its street price is not all that much higher than the 500's.

### Ample Overall Performance

For starters, it neither chugs nor mutes excessively during tuning — partly because of sensible engineering; partly because there's no tuning knob, which has the most potential to generate such problems.

Its sensitivity to weak signals with battery power is good, improving when the AC adaptor is used. However, the radio's relatively high level of "white" circuit noise diminishes this benefit somewhat. Of course, the AC adaptor, like any other, sometimes increases intrusion from local electrical noises, as well.

Adjacent-channel rejection is better than that of most portables. But because there's only one snug bandwidth, this comes at the price of fidelity when a station is not jammed up with competing stations on adjacent channels. The cheaper Yacht Boy 400 has two bandwidths, both well chosen, and your ears can really tell the difference.

Shortwave dynamic range and image rejection are both good for a portable in this price class, although a few image signals pop up here and there. However, the 500 has more than its fair share of "birdies" and related spurious signals. Some roar, some are silent, and some cause microphonic feedback.

Virtually every exact Megahertz suffers from birdie intrusion, which doesn't help with reception of WWV on 5000 kHz, for example. A host of other spurious signals are scattered about on such frequencies (on our set) as 7207, 7336, 9418, 11511, 11611, 15057, 15257-8-9/15261-2-3, 17517 and 17716 kHz. That's the bad news. The good news is that many of these don't show up on world band channels, and nearly all that do can be eliminated by detuning the receiver one kHz.

The 500's single and somewhat narrow bandwidth, along with the absence of synchronous detection, limits the radio's ability to excel with good sound. Still, this set sounds pleasant

**Continued on page 107**



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## The World of Ham Radio CD ROM; SCANCAT Version 5.0; New SCANPRO Teaser

Although we have reviewed lots of excellent software over the years together, many of these are now being released in a newer version. Such upgrades can incorporate fixing bugs in the program, making the program more user-friendly, or just plain making it better by expanding its functions. This month we'll look at new versions of previously reviewed programs.



### World of Ham Radio

In mid-1993 we discussed radio related CD roms. AmSoft's World of Ham Radio (WHR) CD rom, which is one of the CDs we looked at in some detail and liked a lot, has now released their January 1994 version. What's new in this version? Well to start with, as we found with most CD roms, finding out what the CD contains can be a time consuming chore. Lots of programs are packed on the CD, usually in a compressed form. The programs must be decompressed before they can be run and evaluated. I spent literally weeks performing these procedures for that CD rom column. But if you want all that programming power you have to pay—or do you?

The January 1994 version of WHR includes many of the same 7,000 programs and files, with two major exceptions; CDVIEW and CALLSIGN. Typing CDVIEW starts a program which is the slickest CD rom program retrieval utility I've ever used! Not only does CDVIEW let you see what's on the rom by program categories; such as SWL, but it does much more. No more copying, decompressing and then reading the instruction files with a word processor before you can decide what the program does and its usefulness.

Using CDVIEW all you do is highlight the program title and hit "I" for information. Any Readme or instruction text files are decompressed and brought to the screen in a readable mini-word processor. It can be sent to your printer, or if you like what you see, pressing "D" automatically decompresses the files and copies them to the disk of your choice. In many cases, without even copying or decompressing the programs, they can be started directly from the CD rom! People, for me this is heaven sent!

Just to give you an idea of the great difference CDVIEW makes, last time we reviewed WHR it took me almost 12 hours to find out what was on the CD, read/skim most of the text files and actually run ones that looked interesting. With CDVIEW this process was reduced to less than TWO HOURS! Praise the programmer that giveth me more time to monitor.

CALLSIGN, the other major new addition, is similar to other programs we have reviewed which allow the listener/computer user to look up the exact location and identity of US Ham operators. Although similar to other ham call programs, I thought the screen layout, titles and colors of WHR added a feeling of completeness without sacrificing speed or data. The methods of searching the database are limited to call and ham's name. This is more limited than BUCKMASTER's HamCall which allows a full relational search of all database info such as street address, or even birth date.

The January 94 version of World of Ham Radio actually has an SWL section that includes radio databases such as RAC, Scanner Buff v3.73 and loads of frequency files for both HF and scanners. But don't stop with the SWL section. The CAT section contains computer aided tuning programs such as an operational demo program of SCANCAT and other radio software manufacturers. Listed by radio manufacturer, a number of public domain CAT programs are also in the CAT section. They're simple but useful.

Check out the ANTENNA, LOG, MISC, MODS, MUF (propagation programs), RTTY, SAT (satellite tracking) and WEATHER sections for monitoring related programs. Remember, most of the software is either public domain, shareware or demos of commercially available programs, but all radio related.

Some files have been left out from the previous version, such as a large clip art section. But, in my opinion, I didn't miss any of it. What's happened to the price on this new version with this CDVIEW feature...gone sky high—right? WRONG!! AmSoft has cut the price in half to \$40.00, plus \$3 shipping in the USA.

World of Ham Radio/January 94 Callsign is available from AmSoft at Fairview Park, 408 Hillside Ave, New Cumberland, PA 17070-3036; and mention you saw it here in "Computers & Radio." One last comment. If you remember the last time we looked at World of Ham Radio, I only questioned two factors; the price and the on CD data retrieval method. AmSoft has addressed both and brought the market a product better than I even imagined.

### SCANCAT

Another manufacturer of radio software we've been talking about for a good number of years is the company which



makes SCANCAT. Originally called J&J, the name has changed to Computer Aided Software and they have a new version of what I consider to be the oldest and still one of the best total monitoring environment programs. Originally written 'way back in the eighties for the Yaesu FRG-9600 VHF/UHF receiver, today's SCANCAT supports almost every popular HF receiver, many ham transceivers, and the most popular VHF/UHF scanners with RS-232 control capability. The list is constantly growing.

If you recall from previous columns, SCANCAT gives the user control of receiver functions, decoder (such as PK-232) control, display of decoded data, storage of all data in disk files, retrieval of data from disk, automatic receiver scanning and logging, selected scanning by frequency, description or time, and much more.

The original SCANCAT version, which I looked at almost four years ago, hooked me with its simple start-up and use. Because of its logical setup, its commands and basic operation were almost intuitive, and did not require more than a glance at the instruction manual. But SCANCAT has come a long way from those days with added features, radios, new graphic screens and operational methods. Has version 5.0 kept the original's operational simplicity with greatly expanded capabilities?

SCANCAT 5.0's start up screen looks just like the last version's, if you are in DOS. However, version 5.0 can now be run under Microsoft Windows. I found it to be very well behaved with no running problems. The familiar Main Menu screen looks the same as it did four years ago. But closer inspection shows it is no longer the same animal. In previous versions all of the important commands were listed on this menu. In version 5.0 this information is spread over three menus. They are easily accessed, but require a slight modification in habits since the sequence of keystrokes are not listed on the first menu.

The "F" or function screen has grown up to take its proper place on the main menu instead of being the secret knowledge of the initiated who read the manual cover to cover. Speaking of the manual, ALL topics are indexed, which makes looking through it for your exact needs very easy. On the down side, this manual is also used for the new SCANPRO program, which is an expanded SCANCAT. Sometimes these "SCANPRO ONLY" paragraphs get a bit confusing.



OK, John! We've read the SCANCAT 5.0 ad in *MT* and know it now supports Yaesu's FRG-100 HF receiver and ICOM's R-7100 as well as just about every other radio. We know that cables which connect between the computer's joystick ports and the radio's "signal detect" jack are available from these guys and turn even the old R-71 into a real scanning and automatic logging receiver. You can even display the scanning results in a spectrum graph form. The QUICKTERM communications section, which accesses your data decoder, now has programmable, single stroke function keys. SCANPORT, a utility which reads almost any text or database file and converts it into SCANCAT-speak, is included. But how does it feel? Is it worth buying the new version if you own an older version?

Stop! I'll confess! To me the feel is a bit more awkward than before, but only in the main menu. The rest of the program still pulls together very well! Accessing all the functions—especially the database editing—is still one of the easiest and best I've used. Since the list of SCANCAT supported radios is constantly growing, you probably won't get stuck with useless software if you trade up or buy a second radio.

In summary, SCANCAT has now grown to the point where it can be used in its most basic form within fifteen minutes of it being installed. OR...you can dig into the manual and make the thing sing with all the features. They exist, but they don't get in the way of the basic user. That alone is a nifty trick.

As you know, an important factor to all of us is value for money. SCANCAT 5.0, with shipping and handling is \$49.95 plus \$5.00 S&H in the USA—an increase of only \$5.00 over the original price years (and features) ago. It's still excellent value for money. But would I spend the money to upgrade if I owned a previous version? If it is prior to 4.5 - yes, no question. The boys at Computer Aided Technologies had a special up-grade offer going a few months ago. Check and see if the offer is still available.

## SCANPRO

Now how about the big CAT by the by the same folks—SCANPRO? I have used the program for a number of weeks and have narrowed its advantages over SCANCAT down to three areas. The most significant to me is the scanning speed. With SCANPRO you will have to hold it back, since on a 386-33MHz computer, it scans faster than the automatic gain control (AGC) reacts in an R-71: it really moves! In my opinion SCANCAT's speed, or lack of it, started to become noticeable around version 3.x. With SCANPRO this is no longer a consideration.

The second area of advantage is in maximum entries per disk file. Although you could always

have as many entries as you had disk space (either floppy or hard), each file could only hold around 300 entries before you risked your data going into Wonderland! SCANPRO uses a method which as far as I understand, scans and holds data on disks as well as in memory. Therefore it removes the maximum entries limitation. Finally, as with SCANCAT 5.0 with which it shares a written manual, the indexing of the manual is excellent.

## How Easy is it to Handle a Big Cat?

Weeell, it ain't a fifteen minute learning session any more! In order to use and understand its powerful features it takes time, understanding and practice. Better set aside a few hours for this one. The setting up of the new file method is a bit ambiguous, in my opinion. It takes a different way of thinking and operating the program. Once again, for beginners, you can use SCANPRO in its basic form, an emulation of SCANCAT 5.0, without even knowing about the advanced features.

A program like this takes more time to evaluate, and we'll be doing just that over the next few months. As usual, we'd like to hear your comments. SCANPRO at \$79.95 plus \$5.00 S&H, and SCANCAT 5.0, are available from Computer Aided Technologies, PO Box 18292, Shreveport, LA 71138 (318) 636-1234.

'Til next month, this is one CAT (alano that is), that you will not find on a CD rom.

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## How to Cut Antenna Material Costs

Although commercially made shortwave and amateur antennas are well engineered and durable, some of them are beyond the economic means of the hobbyist. What is the point in stating this truism? It is being used to lay the groundwork for a collection of ideas and recommendations that can save you money if you're willing to construct your own antennas. A large number of readily available, ordinary items can be garnered for use in creating antennas for the spectrum from 100 kHz to 500 MHz. Furthermore, a great deal of personal satisfaction comes from making an antenna that performs effectively. Not only that, it's fun to construct antennas!

### What Kind of Wire Can I Use?

I have been asked many times about antenna wire. The question "Which kind of wire is best?" is a common one. Some experimenters believe that the classic no. 14 stranded-copper antenna wire sold at electronics stores is mandatory. This is not true, since almost any type of copper or aluminum wire is satisfactory for constructing dipoles, loops or end-fed wires.

Another question I have answered many times is "Can I use wire that has insulation?" Some SWL and amateurs think that signals cannot pass through a layer of insulation. Again, not true. Another common query is, "Is the wire size or gauge critical?" No, it is not. The exception is, of course, when the antenna is so long that small diameter wire is apt to break from the weight of the antenna.

Concerning the question of insulation, it makes little difference whether or not the wire is bare. Ordinary plastic covered hookup wire may be used for a wire antenna; so may enameled magnet wire, door-bell wire or vinyl jacketed no. 12 or 14 house-wiring conductor. I favor insulated wire because it helps prevent the copper conductor from corroding in the presence of airborne pollutants.

One of my favorite cost-saving antenna wires is made from no. 18 or 22 speaker wire. This is the kind that has a clear plastic type of insulation. The cost per foot is modest and the conductors

(this wire has two insulated wires in parallel) can be pulled apart easily to provide twice as many feet of wire per dollar investment. Also, the plastic insulating material is strong and quite immune to UV radiation and chemical pollutants in the air.

Old TV deflection yokes and power transformers are good sources for enameled copper magnet wire. This is usually small gauge wire (no. 22 to 26, typically), which makes it suitable primarily for shorter wire antennas. Also, look for large, low voltage dc relays at radio flea markets. The field coils generally contain magnet wire that may be used for antennas.

Still another inexpensive source for antenna wire is your farm equipment store or feed mill. Aluminum electric-fence wire comes in 1/4-mile rolls and is very cheap per foot. You will encounter the principal problem with this wire when you try to solder the feed line to it. I use small cable clamps for my connections. The completed electrical junctions are then treated with a coating of epoxy cement to prevent corrosion between the dissimilar metals.

An alternative method is to make a small insulated junction block that contains nuts and screws (terminals) for joining the feed line to the antenna wire. These terminals are also protected from the weather by means of epoxy cement or the putty-like Coax Seal product.

### Larger Conductors for Beams and Verticals

Perhaps you are thinking about constructing a ground-plane vertical or Yagi beam antenna for VHF reception. This is where the high cost of manufactured antennas hits your pocketbook! Plain language information about how to design these antennas is available in *The ARRL Antenna Book* and *W1FB's Antenna Notebook* (both available from The ARRL, Inc., Newington, CT 06111), so I won't go into the theory of design here.

Most commercial VHF and UHF verticals and beams are made from hard aluminum tubing. The booms for Yagis are frequently fashioned from extruded rectangular aluminum stock. Neither of the foregoing materials are mandatory. You can use aluminum electrical conduit for beam antennas designed for the 40-60 MHz range.

VHF antennas for use above 100 MHz need not be so rugged, which allows you to employ such materials as brazing rod for the elements. The boom can be constructed from 3/4- or 1-inch OD hard copper pipe. This makes it easy to solder the elements to the boom. I have also used treated 2 X 2 inch lumber for Yagi booms. PVC tubing is suitable also for small VHF beam-antenna booms.



Ike Kerschner





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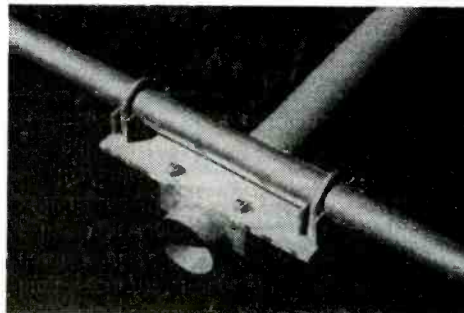
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I have constructed 2-meter (144 MHz) multielement Yagis from coat-hanger wire and a broom handle. I don't recommend this type of construction for long-term outdoor use because the wire will rust. For attic or other indoor applications it's great. Needless to say, all of the aforementioned materials are fine for building vertical antennas as well.

### Antenna Insulators

Almost any strong insulating material may be used for antenna hardware. The insulators for dipoles and end-fed wires can be made from plastic hair rollers, ball-point pen bodies, pieces of PVC tubing or even the polyethylene ring retainers on six-packs of soda pop. Another inexpensive source for antenna-insulator stock is low cost plastic coat hangers. These may be cut into 2-inch-long pieces with a hacksaw, then drilled at each end to accommodate the antenna wire.

It was common practice for radio amateurs years ago to use wooden dowel rod for antenna insulators. Likewise for dipole center blocks. The wood was boiled in canning wax for 30 minutes to impregnate it against moisture. Insulators made in that manner would last for many years and had good insulating quality.



*Aluminum pipe and muffer clamps construct a beam antenna from the ARRL Antenna Handbook.*

If you plan to build a large ground-mounted vertical antenna, say, for 10 MHz reception, you will want to consider using metal downspout material. If this is done it is wise to ensure electrical integrity at the joints by installing four sheet-metal screws where the sections fit together. Better still, solder the joints in addition to using screws. An inexpensive base insulator can be a one-gallon glass jug that has been set into the ground about 6 inches. Nylon guy lines may be used to keep the antenna erect.

If your vertical antenna has a loading coil, you can protect the coil from the weather by placing

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  - YAESU FT-757GX, FRG-100, FRG-9600
  - REALISTIC PRO-2004/5/6 for HB-232 Interface
- Most ICOM and Kenwood radios - consult your radio's owners manual.



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a one-quart plastic soda-pop bottle over it. You may need to cut off the top of the bottle so that it will fit snugly around the vertical element of the antenna. Caulking compound is suitable for sealing the area where the bottle comes in contact with the vertical element of the antenna.

The radial wires for this style of vertical antenna may be laid on the ground, buried a few inches in the soil or insulated at the outer ends and erected above ground. Small diameter wire (no. 14 to 22) is entirely adequate for the radials. The more radials you lay on the ground, or bury, the better the antenna performance. Conversely, only four radial wires are needed if they are erected above ground.

### Summary Remarks

Your imagination and willingness to innovate will suggest a number of alternatives to selecting the materials we have considered here. The important thought is that you "make do" with antenna materials that are near at hand and priced reasonably. Pulling in a weak DX signal with an antenna you built yourself will be your reward for collecting materials, using your hand tools and heating that soldering iron!

MT

## DC Power Supplies for Experimenters and Hobbyists

DC power supplies are among the most fundamental building blocks of electronics. Virtually everything electronic runs on Direct Current (DC) and almost nothing runs on Alternating Current (AC) other than electric motors, heating elements, lamps and such. Direct current, as the name implies, is an electric current that flows only in *one direction*. AC, on the other hand, flows first one way, and then the other.

In the United States, AC flows one way for 1/120 of a second and then the other way for 1/120 of a second, which equals 1/60 of a second for one complete cycle. US electric power is, therefore, 60 cycles per second or 60 Hz. Europe and some parts of the world generate 50 Hz AC power. Standard household AC voltages in the USA are 117 and 234 volts (sometimes referred to as "110" and "220". Japan generates 100 and

200-v at 50 Hz. The important thing to grasp is that the world generates and transmits AC power, but electronic equipment runs on DC power.

You *think* your radio runs on AC just because it plugs into the wall, right? Hah! That radio may draw AC power from the wall jack, but inside the case is a circuit that converts dangerous 117-volts AC down to safe, stable, DC levels. Electronic equipment is powered from one or more standard DC voltages, including 3, 5, 6, 8, 9, 12, 13.8 and 15 volts, provided by DC power supplies and DC adapters. Casual experimenters will discover one exceptionally useful bench tool to have at hand is a **variable power supply**. Fortunately, you can make a fantastic one for very low cost and very little skill, thanks to modern technology.

First, we need a brief look at different kinds of DC power supplies, because some are better

than others and the casual experimenter's power supply should be designed and constructed to meet a variety of needs. Beware the term, **"filtered" DC power supply**. You really don't want one, and you certainly don't want to pay good money for one. A "filtered" power supply consists of little more than an AC power cord, transformer; full or half wave rectifier, and a filter capacitor. Depending on the design and specs of the transformer, the output of a filtered DC supply can range from 3 volts to 24 volts.

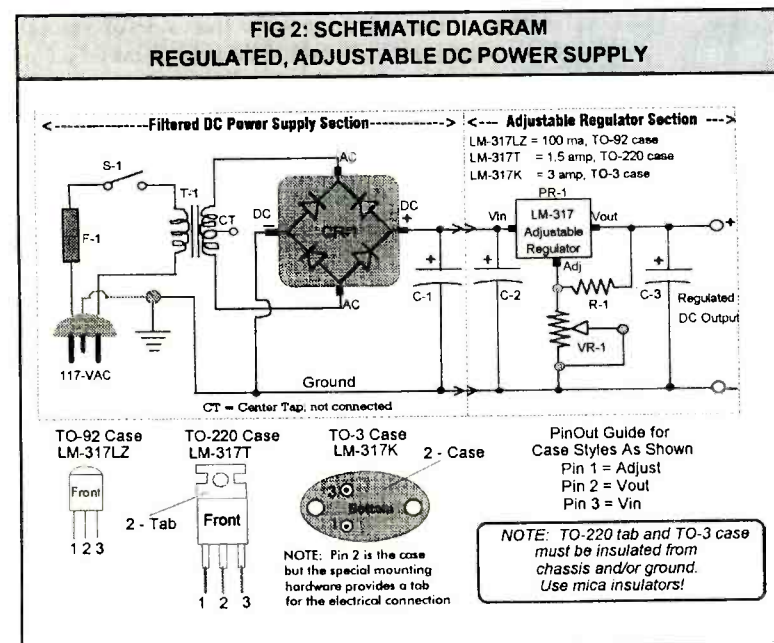
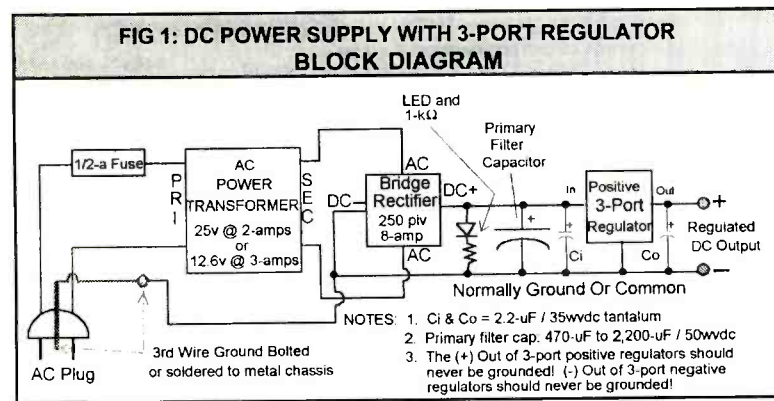
drawn from the filtered DC supply, *the lower its voltage will drop*. Here's a real world example: it is common practice to power a mobile CB radio at a base location by means of a 12-volt filtered DC power supply. When the CB rig is receiving, the 1-amp of current through the power supply leaves 11.5-volts for the radio. When the CB transmits, 2-amps are drawn leaving 11.0 volts to the CB rig. As the operator speaks into the microphone, even more current is drawn in momentary spurts, which results in even greater voltage losses to the transmitter. A nasty side effect is that transmitted power can fluctuate in a downward direction as the operator speaks; an effect CB'ers sometimes call "backwards" or "reverse" modulation!

Some electronic equipment requires very stable voltages in order to perform at optimum levels. Amateur and CB radios are examples, but there are many more, including almost all digital electronics. Although filtered DC power supplies (which also includes most types of DC adapters) have their uses, the moral is to minimize their use in your shack.

Another type of DC power supply attracts hobbyists because of low prices: **switching power supplies** like those used in computers. Stay away from them! *They are downright dangerous* and do not deserve a place out in the open where a chance accident could happen. Switching power supplies are best suited for specific applications where they can be contained inside a chassis, out of sight and out of mind.

Now comes the most desirable type of power supply for the hobbyist and experimenter: **regulated**! The term "regulated" refers to what are now very inexpensive, and very simple electronic components, the purpose of which is to enhance ordinary "filtered" DC power supplies in such a way that wide ranges of current demands, not to mention fluctuations of INPUT DC voltage, will **have no effect on the output voltage**. In a word, a "regulated" 13.8-volt DC power supply can be expected to produce a stable 13.8-volts, regardless of current demands, over its range of specification and design.

There are bona-fide uses for DC Adapters and other filtered DC supplies. Most electronic equipment (not all) have voltage regulators built in to their electronics so that no matter whether powered from household AC, automotive 12-volts, or a 12-volt power supply, the critical internal circuits always receive regulated power. An example of this technology is the Realistic® PRO-2004/5/6 series of scanner receivers. These and most other scanners work on as many as three different voltages: +5, +8 and +12 volts. In fact, virtually everything in these scanners runs from





## PARTS LIST

Ckt	Description	Radio Shack Catalog #
F-1	Fuse, 1 amp/250v	270-1005
F-1x	Fuse Holder	270-364
S-1	Switch, SPST, lighted	275-676
T-1	Transformer, 25v/2-amp	273-1512
CR-1	Bridge Rectifier; 8-amp/250-v	276-1181
C-1	Capacitor, electr, 1000-µf/35v	272-1032
C-2,3	Capacitor, tantalum; 2.2-µf/35v	272-1435
PR-1	Regulator, Adj; LM-317T	276-1778
PR-x	TO-220 Mtg Hdwe for PR-1	276-1373
PR-y	Heat Sink Grease for PRx	276-1372
VR-1	Potentiometer; 5-kΩ	271-1714
R-1	Resistor, 270Ω/¼-w	271-1314
Misc1	Metal cabinet	270-253
Misc2	Perf Board	276-1395
Misc3	AC line cord; 3-wire	278-1258
Misc4	Output terminal posts	274-662
Misc5	Interconnect wire, 18ga, stranded	278-1220

**NOTES:** Most items in this list can be substituted with other parts or materials to suit preference & taste. Do not substitute values of R-1 & VR-1, nor type and values of C2-3.

*not make direct contact with circuit ground.* Special heat-sinking kits with insulators are available for these devices and must be used. (See Parts List).

8. A fuse should be installed in one of the AC feedlines to the transformer for protection against fire should a problem develop. The AC line fuse should be rated at 0.50-amp for DC ratings up to 1-amp; 1.0-amp for DC ratings to 2-amperes and 2-amperes for DC ratings to 4 amperes. In other words, the AC fuse should be rated at about half the current intended to be drawn from the DC side of the power supply.

9. The 5-k potentiometer for adjustable power supplies (Fig 2) will offer superior stability and accuracy of adjustment if a precision 10-turn "helipot" is used in lieu of a conventional ¼-turn pot. If frequent adjustments are not anticipated, a tiny trimmer pot can be used.

10. If a pilot lamp or LED indicator is desired, connect as shown in Fig-1. Do not connect it to the Output side of the 3-port regulator.

11. Soldered connections are highly desirable over wirewrap or mechanical bonds. Layout is not critical but use safety precautions when working with the AC side of the power supply.

Incidentally, when making miniature circuits (like tiny listening devices) the LM-317LZ can be used with a mini trim pot to provide a stable, regulated power source. Suppose a circuit required regulated +5v at less than 100-mA; then the adjustable regulator section of the circuit in Fig-2 powered by a 9-v battery will do very well! The circuit will operate just fine until the battery drops to about 7.5-volts, at which point it's dead anyway.

You can also enhance your 13.8-volt/20-40 amp bench power supplies by adding a selection of 78xx regulators to the power supply's 13.8-v output lead and then running the 78xx regulator's output to a separate terminal jack! In this manner, standard 13.8-v power supplies can be configured for a number of regulated outputs, say +5v and +8v along with an adjustable output of something like 2.1-v to 11-v or so. This is clearly a plus for the budget-minded experimenter.

If your current requirements are greater than the 1-1½ amps limit of the LM-317T or the 3 amps of the LM-317K, please send me a card, letter, or computer conference message. If enough interest is expressed, I'll show you a way to use the circuit in Figure 2 with some other parts to get current capabilities of 4-amperes on up. Most experimenter needs are for less than 2-amperes, though, and high current requirements will have to be the fodder for another article sometime.

Now review Figures 1 and 2 and the Parts List and get to work. I'll join you again next month.

**MT**

either the +5v regulators or +8v regulators built into the units. The only circuit that uses unregulated power in these scanners is the audio power amplifier chip that gets +12v or whatever is fed to it; (not critical), which is why there's no 12-v regulator for that voltage line. The audio chip is designed to run with good performance over a range of 8 to 16 volts, so it doesn't care.

Lots of electronic equipment is built that way, but you still have to be careful and use common sense. Higher powered stuff, like CB and ham radios and stereo amplifiers, do not contain internal regulators for the power circuits, so you need to provide external regulated power unless a loss of performance is not important to you. Now let's dig in.....

**Electronic regulators** once upon a time consisted of a massive array of tubes, transistors, and hundreds of other parts to make precise voltage regulation either very expensive or impractical for the hobby experimenter. Thanks to large scale integration (LSI), we now have that massive array of electronics embedded into little, inexpensive, 3-leaded chips that look like transistors and which require only two to maybe a dozen external parts. Nothing could be easier, folks!

More appropriately called **3-port regulators**, we're talking about an INPUT lead, an OUTPUT lead and a ground or common lead. 3-port regulators come in several distinctive type/styles as follows: positive fixed regulators, negative fixed regulators, positive adjustable regulators, and negative adjustable regulators. These type/styles come in three common sizes with respect to power handling capability: TO-3 (high current, 3-amperes or more); TO-220 (medium current, 1.5 amperes); and TO-92 (low current, 100-mA).

A standard part numbering system indicates the polarity and voltage rating of fixed 3-port regulators: 78xx and 79xx. The 78-series are positive (and the most common) regulators while the 79-series are negative regulators. Examples of each include: 7805 (+5v); 7905 (-5v); 7812 (+12v) and 7912 (-12v). As you can see, the last two digits indicate the voltage rating. The low power, TO-92, versions use the same system, but with an "L" in the number to indicate low power: 78L05, 78L09, 79L012, etc.

Adjustable regulators use a numbering system from which you can't tell much about the specs; an example is the LM-317T in TO-220 style, that's capable of +1.2v to +27v at up to 1.5 amperes. The LM-317LZ is the low power, TO-92 version, while the LM-317K is the 3-amp, TO-3 style. The LM-317(x) device will be the heart of this month's adjustable power supply: pick one of the three.

Before we build, there are a few things you need to know about standard 3-port regulators. For instance, these devices consume about 2.5 volts for internal operations, which has to be taken into account in a design. For example, if

you need a regulated +12.0v, the device will have to be fed with a minimum of +14.5 volts. Now the neat thing about a 3-port regulator is that any voltage *above* the minimum required will not affect the output voltage, so your 7812 regulator could be fed with anywhere between 14.5-v to 35v and the output would remain a constant 12 volts. Therefore, you have a wide latitude between minimum and maximum ratings to achieve a desired regulated output. That means you can use a cheap, sleazo "filtered" DC power supply or a DC adapter to feed an inexpensive 3-port regulator, to make a **fineregulated power supply!**

Here are the fundamental considerations for designing and building regulated power supplies.

1. The power transformer must be rated at several volts above the desired maximum voltage.

2. The power transformer must have a current rating at least 25% to 50% higher than the highest anticipated current requirements. Do not expect to draw a continuous 1-amp from a transformer that's rated at 1-amp, max.

3. The bridge rectifier or rectifier diodes must have a Peak Inverse Voltage (PIV) rating of about four times the highest DC voltage in the circuit or two times the highest AC voltage.

4. The bridge rectifier or rectifier diodes must have a current rating at least double the highest anticipated current drain, and preferably 300% to 400% higher!

5. The filter and bypass capacitors must have a Working Voltage (WVDC) rating that's 10% to 50% greater than the highest DC voltage in the circuit.

6. The Input voltage to a 3-port regulator must be at least 2.5 volts higher than the highest required output voltage. (16.5 volts in for 14.0 volts out, etc.)

7. A 3-port regulator should be "heat sunk" (mounted) to a metal chassis surface or finned radiator if appreciable current is to be drawn from it. The tab or metal case of a 3-port regulator **must**

## Radio Noise Debunking Antenna Resonance and Making the Real McCoy

What your antenna “plucks from the air” and sends to your receiver is a combination of desired signals—those which you want to hear, and undesired signals called noise. If the noise signals which your antenna receives are stronger than the signal which you desire to monitor, then the desired signal will be difficult, or perhaps impossible, to hear above the received noise. But if the desired signal is decidedly stronger than the noise then the desired signal will be a listenable signal. In this latter case we say that the signal-to-noise ratio is high enough for good listening.

### Frequency is Important

Although radio-noise sources emit signals across a very wide portion of the radio spectrum they tend to produce more signals at lower frequencies. This means more noise on HF and the lower frequencies than on VHF, UHF or higher frequencies. Also, HF noise signals will propagate by skywaves just as the desired HF signals do; VHF and higher frequencies don’t propagate well by skywaves. These factors contribute to the presence of more and stronger noise signals on HF than are found at VHF and higher.

### Noise Inside the Receiver

The listenability of an HF signal is essentially determined by the signal-to-noise ratio discussed

above; that is, the level of the desired signal compared to the received noise level. And, on HF, the received noise is usually much higher than any noise generated within the receiver’s circuits. Thus noise generated within the HF receiver itself is masked over by the higher level of received noise.

What this means is that the effect of receiver-generated noise in a reasonably well-designed HF receiver is essentially of no consequence to signal listenability; it is the ratio of received noise to received signal that determines signal listenability. That ratio is fixed by how much noise and how much desired signal is received at the antenna. In contrast, at VHF and higher frequencies the received-noise level is usually so low that it is the noise generated within the receiver that determines the size of the signal-to-noise ratio

### Tuning to Resonance

Once you have a wire HF antenna high enough and long enough that you can hear a noticeable increase in noise level when you connect that antenna to the receiver’s antenna input, then tuning the antenna to produce greater output through making it resonant, or by adding an antenna tuner, doesn’t usually improve signal listenability. This is because tuning the antenna or antenna system increases received noise-level

output to the same degree that it increases the desired signal output; it doesn’t materially affect signal-to-noise ratio.

Thus, for HF reception, turning up the volume control will usually accomplish much the same thing as tuning the antenna. Tuning an HF antenna for greater output in hopes of getting the weaker signals to appear above the noise level is generally a vain hope.

It sometimes happens that some locations experience very low received HF noise. In these relatively rare situations tuning an HF antenna to resonance or using an antenna tuner may actually improve signal listenability. This exception will most often be found on the higher end of the band.

Another exception is that beam HF antennas often do profit from tuning. This is in part because, when compared to non-beam antennas, they reduce the received-noise level in relation to the desired signal level. But generally speaking, tuning a non-beam HF antenna does not lead to better reception.

### So Why the Tradition of Resonant Receiving Antennas?

In the past, most of the antenna literature readily available to SWLs has been amateur radio and CB publications. Amateur radio operators and CBers use their antennas to transmit as well as to receive. Tuning an antenna to resonance can make a significant difference in how well an antenna accepts a signal fed to it by the transmitter. Also, a resonant HF antenna will sometimes have a significantly different radiation-reception pattern from an antenna which is far off resonance.

Although antenna resonance is much less important for receive-only applications than for those using the antenna to transmit, the literature which SWLs have had available to them has led to the belief that making their receive-only antennas resonant is much more important than is actually the case.

### The Real McCoy

Lew McCoy has reported\* convincingly on using dipole antennas with lengths far from their resonant lengths. He found that dipoles much longer or shorter than their resonant lengths

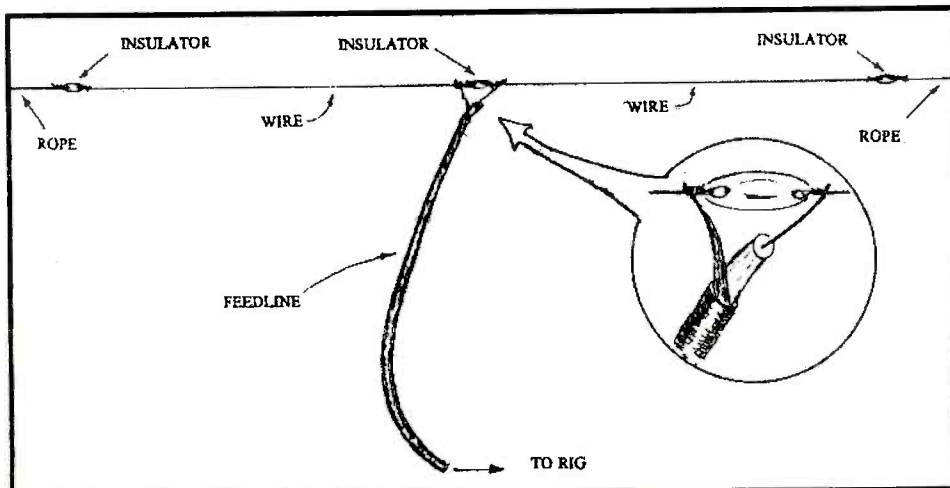


Figure 1: A random length, non-resonant “McCoy” dipole.

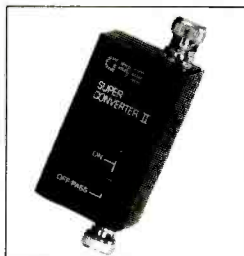


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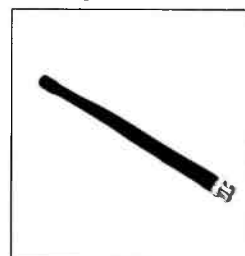
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could still work "very well." He recommends making them as long as possible, and staying away from "very, very short lengths." I might add that McCoy labels as "another load of hogwash" the claims that trap dipoles and off-center fed dipoles give a good match on "all bands and all frequencies" (for which they are designed).

### Let's Make a Real McCoy

1. Decide the longest run you can use to put up your antenna.
2. Divide that length in half.
3. Cut two lengths of wire to the length obtained in step 2.
4. Connect these two wires with one center-insulator as shown in fig. 1. Scrape and solder wires where they wrap around each other in this and the next step.
5. Put end insulators on the wire-ends as shown in fig. 1.
6. For receiving, add either coax feedline, twin lead or open-wire feeder (see fig. 1) and connect to your receiver. If the antenna is also to be used for transmitting use twinlead or open-wire, not coax, and use some form of matching (i.e., a balun or transmatch) between transmitter and feedline. Solder the feedline connections to the antenna as shown

in fig. 1. Seal the open end of any coax used with coax sealer.

7. If you live in lightning country be sure to use some form of protection against lightning-induced damage. The minimum here is to never use the antenna during weather likely to produce lightning and to disconnect and ground the antenna feedline when it is not in use.

When you finish tying this antenna as high in the air as you can practically achieve, you'll have what McCoy calls "the finest multiband skywire one can use." And remember, we haven't taken any pains to make it resonant.

### RADIO RIDDLES

#### Last Month

Last month I asked the name of the famous radio pioneer who when, he was a teenager, used to frighten his neighbors by swinging high above the ground in a bosun's chair from his own, tall, experimental antenna-mast just for the fun of it. I also mentioned that "later, to the delight of the public and the chagrin of RCA officials, he swung from an element of a large RCA TV transmitting antenna high atop a skyscraper."

The riddle also asked, what do you suppose "that his mother told a neighbor who complained that it frightened her to watch this teenage radio- nut swing from his tall antenna?"

Well, this daredevil was the same man who invented the regenerative detector, the superregenerative detector, and the superheterodyne radio receiver, and who almost single-handedly brought FM to the attention of the listening public. Without his efforts there is no doubt that FM broadcasting would be decades behind its present state. His name was Edwin Armstrong, the most influential innovator in the history of the development of radio technology.

What did his mother tell the complaining neighbor? "If it frightens you, don't watch."

#### This Month

If you were inside a radio tower which was essentially a tall, vertical metal tube, and the tower was being used as an antenna for a 100 kilowatt broadcast transmitter, what effect would the radio-frequency current flowing on the antenna likely have on your body?

We'll have the answer to this month's riddle in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73. **MT**

\*McCoy, Lew, *CQ*, June 1992, pgs 11-17.

**Q.** *Is there an easy way to connect an inexpensive fax machine to my general coverage shortwave receiver to receive weather fax? (Mike Larson, Carrington, WV)*

**A.** Great idea, Mike, but I'm afraid it won't work. WEFAX is sent too slow to follow the 9600 baud rate of an office fax machine. Not only that, but WEFAX is an analog signal, and the fax machine is digital; you would need a D/A converter and supporting circuitry and software.

**Q.** *In general terms, what are the shortwave DXing seasons, and when are the best times of day for DXing various frequency ranges? (Herbert D. Fisher, Ronks, PA)*

**A.** Winter is the overall winner for long DX, especially at night. Summertime is usually accompanied by widely-distributed electrical storms which affect reception especially at night, but there may also be solar enhancement which allows daytime DX.

10 MHz is the day/night divider; use higher frequencies during the day and lower frequencies at night. Naturally, there is some crossover at this somewhat arbitrary baseline; 0-15 MHz (night) and 9-30 MHz (day) is more representative.

**Q.** *Today while driving through a snowstorm with my BNC connector disconnected from my scanner, I heard a "popping" noise and observed sparks jumping across the connector. What caused this? Could it be destructive to the scanner? (Carter David Lambert, Las Cruces, NM)*

**A.** Precipitation static discharge is a well documented phenomenon associated with electrical storms. Low temperatures result in low humidity, so there are no moisture droplets to help neutralize the voltage gradient buildup between the earth and atmosphere. Electric potentials can become quite large; if you saw the discharge, it was already many thousands of volts.

Since solid-state devices (transistors, ICs and diodes) can blow with just a few tens of volts present, such high voltage running amuck through a radio can, indeed, cause problems!

Fortunately, most manufacturers build in intentional resistor, inductor or diode leakage paths to continually drain static charge buildup.

## More on Dual-Diversity FM Reception

In a recent column, we noted an apparent absence of dual-diversity FM car radios. Not so, says reader Les Butler, a member of Nissan's radio group. He says that Nissan has offered dual-diversity FM receivers for years, citing the Ford radio used in the Nissan Quest mini-van. Les also says that Mazda offers dual diversity as well.

We appreciate feedback which can be shared with other readers.

**Q.** *The Sony ICF2010 has an excellent reputation. Why should I spend \$1000 or more for a shortwave receiver? (Tim Rapps, Springfield, IL)*

**A.** Any receiver can provide decent strong-signal reception with its whip, and the 2010 is arguably the best \$350 on the market. But when you attach an external antenna to a low cost receiver, or try to weed out weak signals between the powerhouses, that's when you begin to question your radio's effectiveness.

The most important specifications in a receiver are sensitivity, dynamic range, IF selectivity, and fine tuning ability. Virtually all competitive models have good sensitivity, but the portables lack the other features which allow satisfactory single-signal reception under adverse monitoring conditions.

**Q.** *I have been told that the FCC is moving everyone up to the 800 MHz band so that there won't be any more 150 MHz transmissions. Is this true? (Alan Grick, Montrose, PA)*

**A.** Absolutely not. "Refarming," as it is called by the FCC, is simply a way of reducing channel spacing in order to cram more users into the existing spectrum. Licensees are not being removed from anywhere.

**Q.** *I have seen disc capacitors marked with such symbols as "N150," "X5F" and other cryptic combinations, but can't seem to find out what they mean. Can you help? (Richard A. Lipari, Chicago, IL)*

**A.** Capacitors have many physical characteristics besides their voltage ratings and capacitance. Their capacitance, for example, varies with temperature. N150 indicates a negative (downward) capacitance change of 150 parts per million each Celsius degree.

Manufacturers usually publish in their catalogs graphs showing how these changes vary over wide temperature excursions; X5F is a typical curve for one type of inexpensive, general purpose capacitor.

**Q.** *I have been told that if tornado weather is present and I hear a steady static roar on 550 kHz that I should take cover. Is this correct? (Graham Rankin, England)*

**A.** Only if the static roar came up suddenly, accompanied by blackening skies. The fact is that there is much electrical activity in tornadic storms; their sum provides strong, continuous crashes which propagate at lower frequencies.

A similar effect was described for TV sets decades ago. The so-called Taylor effect is the video equivalent. Turn the TV set to channel 2 and turn the brightness down until the raster just disappears. The broadband electrical activity of an approaching tornado will sometimes cause the "sparklies" to become visible on the screen.

Note that the key word in both of these tornado detection methods is "sometimes"!

**Q.** *I notice that the Burbank (CA) Neighborhood Watch is listed as operating on 155.385 MHz, but the FCC rules and regulations show that to be a medical channel. What gives? (Todd Stevens, Irvine, CA)*

**A.** The frequency 155.385 MHz is available under the FCC Part 90 Special Emergency Radio services to certain organizations who can show that other means of communications are not feasible for safety of life and property.



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.

## Bob's Tips of the Month

### Cleaning Corroded Connectors

Afraid to scrape clean a tarnished connector? Paul Evans Mitchell has a better idea. Audio Accessories (Mill St., Marlow, NH) offers a very soft emery cloth that buffs clean without undue abrasion. Check with high-end audio shops for the product or its equivalent.

### More On "Autotalk"

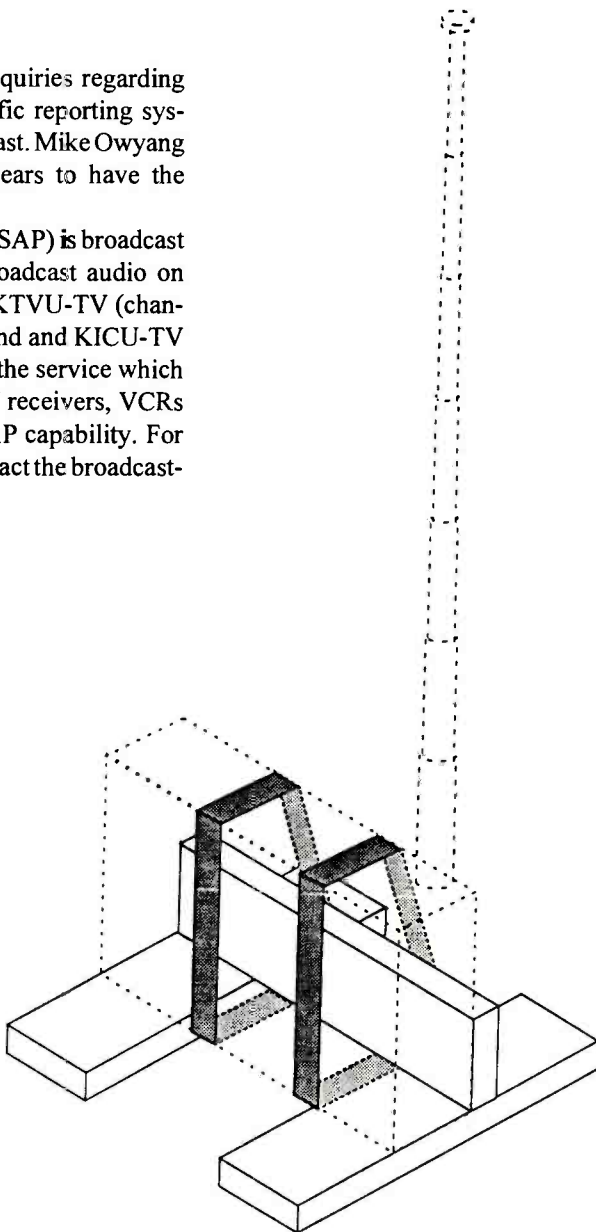
Recently we received inquiries regarding how the San Francisco traffic reporting system, "Autotalk", was broadcast. Mike Owyang of Benicia, California, appears to have the definitive answer.

Second Audio Program (SAP) is broadcast along with standard TV broadcast audio on stations suitably equipped. KTVU-TV (channel 2), San Francisco/Oakland and KICU-TV (channel 36) San Jose offer the service which may be heard on special TV receivers, VCRs and other receivers with SAP capability. For sources of these devices contact the broadcasters directly.

### SW Antenna Base

This cheap and easy project was sent in by Otto Muller of Hamilton, NY. It is a base for any inexpensive radio having an antenna which does not swivel.

Constructed from three scraps of wood, of any convenient size, and attached with rubber bands, this stand permits you to set the radio on a lawn, sloping roof, etc., so you can listen while you work without worrying about the radio tipping over. Stick the pieces of wood together with staples, nails, screws, or glue, or any other adhesive.



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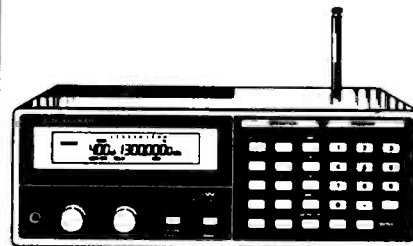
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There are not many receivers yet equipped to receive RBDS or radiotext; Delco is beginning to offer car radios with RBDS, and Onkyo and Grundig have RBDS receivers, although the Grundig receivers don't utilize the full service.

Magne adds, "Here is where you can help, if you have an RDS or RBDS radio. Many people complain that stations don't reply to their requests for QSLs, but that's usually because the listener's feedback is of no real use to the station. Here's a chance to do it like it was done in the old days, when QSLs were first offered by grateful engineers. Many engineers are now trying to figure out how well RBDS comes through under weak-signal or multipath conditions, so they should be more than willing to give you a verification in the same pioneering spirit that otherwise most of us have only been able to read about. (Philadelphia area readers are especially invited to send their technical feedback on WFLN's RBDS service to Jim Perry, Director of Engineering, WFLN, 8200 Ridge Avenue, Philadelphia, PA 19128; fax 215-482-3777.)"

Coincidentally, Kevin Klein of Appleton, WI, forwarded a summary sheet of RBDS stations, services, and manufacturers, published quarterly by *Radio World*. See the sidebar for their list of RBDS stations across the U.S.

## HF/UHF/VHF Nets

"Does anyone know of a scanner/swl net in Central Mass? Am I the only radio buff in this area? It sure seems that way! Maybe a bunch can get together on GMRS or on 2m," requests Rob Bellville via the Grove BBS.

A list of SWL nets "would be quite useful, considering the number of scanners out there," adds Mike Agner, also on the BBS. "I have had many comments about how people have decided to get their (amateur licenses) because of nets like mine, so there's a way to do a little (ham) recruitment. I am sure there are many that we don't hear about simply because they are local nets, unlike the ANARC net. For the record, my net is called the 'Listening Post' and is on the W3DID repeater system (147.03/224.96/448.975) every Sunday evening at 8 pm local time," says Mike, who is from Glen Burnie, MD.

*Monitoring Times* would be interested in compiling for distribution a directory of nets dedicated to radio listening. Send details of your local or regional net to the editor or to Bob Grove.

## Double Standard

Daryll Symington of Holland, OH, cautions against "jumping off and criticizing another person for something we know very little about."

One letter in January's *MT* "questioned the ethics of an East Providence PD officer after he heard a cellular telephone conversation of a thief

in a car ahead of his patrol car. The issue seems to be how the officer heard the cellular conversation on his scanner. I had a similar incident while on duty in my patrol car, which is equipped with an inexpensive Uniden 560 scanner. One night as I was patrolling in an apartment complex parking lot, a cellular conversation came in loud and clear! It was on 453.450 MHz, which is a local fire department frequency. I recognized the voice as belonging to the security guard in that apartment complex. During the conversation, he identified himself as a Toledo Police officer, which he is not. I located him about 300 feet away from me in a car.

"Why this conversation came over my patrol car scanner, I cannot explain. Perhaps his proximity created some type of electronic interaction that caused it. If the East Providence officer was violating the ECPA by purposefully listening to cellular conversations, then there are appropriate remedies." But, says Daryll, we should give him the benefit of the doubt until we know differently.

## What Would You Do?

Ron Bruckman, of the Radio Monitors of Maryland, comments on the case of Chris Boyer, KC6UQG, the ham radio operator in California who got in trouble with the FCC for using his receiver on a local sheriff's frequency to call for help for an injured friend.

"Let's set the scenario... Since I spend time hiking and camping along the Appalachian Trail, what if I was to come up on a National Park Ranger along the trail, which in some areas of the trail is very secluded, and the ranger was injured and needed help desperately. Would I do the logical thing and remove the ranger's radio transceiver and call for help? Sure, I would. But the way the FCC and that local sheriff's department sees it, I should just let the ranger lay there injured. I hope the FCC wakes up, and gives Chris what he deserves, some honor for what he did to help his friend."

We know of no new developments in Boyer's case; we'll let you know if the FCC makes a formal ruling.

## Short Subjects

In all the discussions of how to find UTC, "it seems to me an important, handy help was omitted. Given that the reader will have a shortwave receiver, all he needs to do is to tune WWV on one of their several frequencies. The exact UTC is announced every minute, around the clock. One can also tune BBC. Their six pips (beginning with 55 and ending with 00 seconds) permit chronometer check or synchronization, and the hour is announced in flawless British tones.

"Failing those, CHU can be tuned on 7335 and 14670 (USB) and 3330, if you are near

enough, or at night. CHU offers the novelty of the voice time announcement in both French and English. One minute, the English time is said first, the next minute, the time is said first in French. Politically correct, I suppose.

*A.W. (Bill) Edwards, Corpus Christi, TX*

"When I saw the cover of the January issue, I was very pleased, but then I looked at Mr. Sullivan's article and found out he is all Boeing about the V-22. He sure didn't do his homework; the V-22 is a Bell Helicopter Textron aircraft all the way. Boeing will be Bell's partner in some development of this aircraft. But Bell has had a machine of this type (the XV-15) for years. Boeing had nothing to do with the V-22 tilt rotor concept. If it is ever produced, Bell & Boeing will build the components. I worked on the XV-15 and others for 35 years at Bell.

*C. Hoa, Ft. Worth, TX*

*Did we read the same article? Jack Sullivan's article was about listening to experimental and flight test frequencies. He overheard tests of the V-22 Osprey being conducted at a nearby airport. Boeing was given credit for providing the picture of the V-22. Your information is of interest, but your charges against the author are misplaced. If the cover photo caption is incorrect in identifying the aircraft as the Boeing V-22 Osprey—the only such mention—blame me.*

"A visually impaired acquaintance of mine used a label embossing machine to add Braille to the keypads of several pieces of equipment. Unfortunately, he couldn't do this to his PRO 43 scanner because of the small size of the buttons. I was wondering why manufacturers don't include Braille on keypads as a standard item? The cost would be negligible and Braille and print fortunately can occupy the same space without interfering with each other.

"At the high end of the market, why not receivers that speak to you as you punch the keypad? And there could be a button that I could press whenever I wanted an announcement reminding me what frequency I am on. Are any manufacturers out there listening?"

*William Mewes, Oakville, Ontario*

*Amazing things are being done with computer controlled receivers, sound boards, and voice synthesizers. If we have a reader who feels qualified to write a definitive article on the creative monitoring solutions being used by persons with various types of disabilities (but especially visual), and including a comprehensive list of resources, please contact me regarding an assignment.*

We have covered a lot in a short space this month. Your letters comprise one of our readers' favorite columns, so write and let others know about your exceptional monitoring times.

*Rachel Baughn, Editor*



for a portable that's not large, especially since the AM-mode distortion that plagued some early production units has been cleared up.

FM is pleasing through earphones. Overall FM performance is quite good, although there is some overloading in high-signal areas. The capture ratio is okay, but could be a bit better. Too, the antenna can't be swiveled to the left, which sometimes degrades FM reception.

Thus, while the 500's overall performance is quite respectable, in every variable of performance the Yacht Boy 400 does slightly better.

### The Bottom Line

In all, Grundig's new Yacht Boy 500 is a novel and nice radio for the price. It should do especially well among those who wish to show the radio off to others.

As compared with the Grundig Yacht Boy 400, however, it's mostly more gimmicky and visually enticing. The 400 is a more practical radio and a slightly better performer, especially with its two bandwidths. It costs less, too, even if you factor in the price of an AC adaptor, which the 400 doesn't have.

### Limited Dealer Network in N.A.

Currently, the Yacht Boy 500 is available in the United States only through Willabee & Ward (800/367-4534), a mail-order outlet that is rumored to be tied into Grundig's North American facility. (Grundig did not comment when we raised this question.) However, in due course that model is supposed to be made available through the usual nationwide network of Grundig dealers. Until then, the price, including shipping, is \$308.50.

In Canada, the only two shortwave specialty outlets we've found to be carrying it are Atlantic Ham Radio (CAN\$399.00, tel. 416/636-3636) and Dubberley's on Davie (CAN\$429.95, tel. 604/684-5981). Other Canadian shortwave dealers tell us that they may obtain it in due course, but one indicated that a price increase is imminent.

### Sangean Portable Tuning Range

The Sangean ATS 202, reviewed recently in *MT*, can be made to tune more of the shortwave spectrum if a "speedy the scan" (*sic*) DIP switch nestled within the battery cavity is altered from its factory setting. (Do this carefully with a ball-point pen.) This adds to out-of-band cov-

erage as compared with the way the radio is set up at the factory.

Unfortunately, this still leaves the important 7305-7595 and 9020-9495 kHz ranges uncovered, making this model somewhat less attractive as compared with the similarly priced Sony ICF-SW30 and Realistic DX-375.

### Reason for Realistic® DX-375's Hangups?

When we tested Radio Shack's Realistic® DX-375 late last year, we found that its micro-processor could get "hung up" temporarily. It appears that the only cure is to remove the batteries for a couple of days.

One possible culprit is static electricity. So, for several weeks we've operated one of the offending radios in such a way as to ensure it does not receive static discharges. Since that time, we've encountered no further difficulties. While this is not ironclad proof that static charges are the cause of the problem, it at least points in that direction. *MT*

*This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.*

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# Club Circuit

## Welcome to ...

### A.S.W.L.C.

The American Shortwave Listener's Club, which celebrates its 35th anniversary this year, is dedicated to the principle of "World Friendship through Shortwave." Members primarily share information through the newsbulletin, *SWL*, which contains regular sections dealing with specific fields of interest. Sample bulletins are available for \$1 in NA or \$2US airmail worldwide.

There is a monthly club meeting for those who can make it to Huntington Beach, CA. Guests are always welcome. Contact Stewart MacKenzie WDX6AA, at 16182 Ballard Lane, Huntington Beach, CA 92649-2272; (714) 846-1685. Annual dues to ASWLC are \$20 in the U.S., \$22 Canada and Mexico, or \$20US for worldwide surface mail.

### A\*C\*E

The Association of Clandestine radio Enthusiasts is a club whose purpose centers around the monitoring and logging of pirate, clandestine, covert, numbers and other unexplained or unlicensed broadcasts. ACE as an organization does not encourage, support or condone any illegal activity, but seeks to understand the nature and reasoning behind such broadcasts as a way of furthering the enjoyment of the radio listening hobby. Its monthly publication, *The Ace*, includes loggings, commentary, profiles, and background articles.

A sample newsbulletin is \$2 (\$3 overseas). Annual dues are \$18 in the U.S., \$19 Canada and Mexico, US\$25 World Air Mail. Write to Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207-0201.

### 28th EDXC Conference

Want an excuse to visit Paris, France? That's the location of the 1994 European DX Council conference Friday, May 20 to Monday, May 23rd. The conference is being sponsored by the club Amitie Radio, and attendance averages 150 people from 20 countries. For registration and agenda information, contact Amitie president Roland Paget (phone during evening) 33-(1)43393841 (fax) 33-(1)49803305, or write Amitie Radio, BC 56, F-94002 Creteil Cedex, France.

Don't see your club listed?  
Write in for a listing form  
today, and let yourselves  
be known!

## 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 Ballard 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 11201, 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:** Bruce Ames, P.A.O., 105 Serra Way #363, Milpitas, CA 95035, (408)267-3244. Western U.S.; 25+ MHz. *Listening Post*

**Bayonne Emergency Radio Network (BERN):** Ray Baron, P.O. Box 1203, Bayonne, NJ 07002, 800-286-2876. Metro NJ, NY; Fire/disaster, pub safety.

**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 01810-1408, (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) 296-2055. 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*.

**Central VA Radio Enthusiasts:** Richard Rowland, POB 34832, Richmond, VA 23234-0832. Metro Richmond and vicinity. VHF/UHF. SASE. No newsletter, no dues.

**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, 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, (908)591-2522. Worldwide AM, FM and collecting radio related items.

**Drake SPR4 Int'l Club:** Bill Swiger, Route 1, Box 142A, 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 Paulista:** Marcelo Toniolo Dos Anjos, C. Postal 592, Sao Carlos - SP (Brasil), 13560-970. South America. Shortwave, including utilities. *Actividade DX* (in Portuguese).

**Finnish DX Association:** Mr. Arto Mujunen, Suomen DX-Liitto, P.O. Box 454, FIN-00101 Helsinki, Finland; +38-0-8512410. Finland and worldwide. SW and BCB. *Radiomaailma*.

**Fire Net:** Tom Kravitz, Box 1307, Culver City, CA 90232, 310-838-1436. All of California; fire, EMS, tied in with nationwide notification net.

**Friendship DXers Club:** Ing. Santiago San Gil Gonzalez, C.D.X.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:** Glen Dingley, 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW.

**Hudson Valley Monitors Association (HVMA):** Patrick Libretti, P.O. Box 706, Highland, NY 12528; (914)831-6600 x220. Mid-Hudson valley and surrounding counties; VHF/UHF, public safety, etc. *The Hudson Valley Monitor*.

**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 92513-0223. 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*.



## SPECIAL EVENT CALENDAR

<u>Date</u>	<u>Location</u>	<u>Club/Contact Person</u>
Mar 4-6	Tucson, AZ	Tucson APR Annual Meeting/Keith Justice 602-461-8687. Location: Best Western Inn at the Airport, 7060 S. Tucson Blvd., Tucson, AZ 85706, 602-746-0271. Registration Friday, meeting begins Saturday and continues through Sunday. \$34 pregristration/ \$39 late registration (includes dinner).
Mar 5	Twin Mtn, NH	North Country ARC Hamfest and Fleamarket/Richard C. Force, WB1ASL, 12 Cottage St., Lancaster, NH 03584; 603-788-2202. Location: Town Hall near intersections of US Routes 3 and 302; 8am to 3pm, \$2 admission, talk-in on 146.55 MHz simplex.
Mar 5	Absecon, NJ	Shore Points ARC Springfest '94 Hamfest/SPARC, P.O. Box 142, Absecon, NJ 08201. Location: Holy Spirit HS, Route 9, approx. 1/2 mile south of Route 30. Doors open 9 am, \$4 admission, talk-in on 146.385/985.
Mar 12-13	Charlotte, NC	Hamfest & Computer Fair/ARRL, W. Reed Whitten, AB4W, Roanoke Div., 1208 Oxford, Place, Cary, NC 27511. Location: Charlotte Merchandise Mart, 9am-5pm Sat., 9am-2pm Sun., \$8 admission, talk-in on 144.69-145.29.
Mar 20	Maumee, OH	TMRA Hamfest/Computer Fair/Jim Old, WD8DCT, 6632 Santo Lane, Maumee, OH 43537. Location: Lucas County Recreation Center, Key Street, \$5 admission.
Mar 20	Yonkers, NY	WECAFEST '94/Westchester Emergency Comms. Assoc. Tom (WB2NHC) and Jean (N2NQY) Raffaelli, 544 Manhattan Ave., Thornwood, NY 10594. Location: Yonkers Raceway, intersection of I-87, Central and Yonkers Aves., 9 am to 2 pm \$5 admission, talk-in on 147.060.
Mar 25-26	Columbus, GA	Columbus ARC Hamfest/Buzz Cornwell, KN4VUE, 706-689-0225. Location: Columbus Municipal Auditorium, Intersection of US 280 and US 27, \$5 admission, talk-in on 146.61.
Mar 26	Ontario, Canada	Ontario DX Assoc. SWL Fleamarket/John Grimley, 416-444-4771. Location: Trinity Presbyterian Church Hall, Willowdale, Ontario, \$5 admission, 9 am to 12 noon.
Mar 27	Madison, OH	Lake County ARA Hamfest/6899 Melridge, Concord, OH 44060; 216-352-6756. Location: Madison HS, \$5 admission, 8 am to 3 pm, talk-in on 147.1 and 224.50.
Mar 27	Grayslake, IL	LAMARS Fest 1994/650 Green Bay Rd., Lake Bluff, IL 60044. Location: Lake County Fairgrounds, Doors open 8 am, \$5 admission, talk-in on 146.52, 147.945-345.
Mar 27	Charleston, WV	Hamfest and Computer Show/Paul Ennis, KB81WY P.O. Box 916, St. Albans, WV 25177 Location: Charleston Civic Center, 9 am to 3 pm, \$5 donation, talk-in on 146.82 and 146.52.
April 10	New Castle, DE	Penn-Del Hamfest/P.O. Box 1964, Boothwyn, PA 19061, 302-798-7270 Location: Nur Temple on Route 13, 8am-2pm, \$5 admission, talk-in on 147.225 (+) and 224.220/R
April 17	Rockford, IL	Rockford Hamfest/Joe, P.O. Box 6931, Rockford, IL 61125 815-399-6995. Location: Metro Center, 8 am to ??, \$5.50 admission, talk-in on 146.61.
April 23-24	Abilene, TX	Key City ARC Hamfest/Peg Richard, KA4UPA, P.O. Box 2722, Abilene, TX 79604, 915-672-8889.
April 29- May 1	Dayton, OH	Dayton Hamvention/Dayton Amateur Radio Assoc., Dave Grubb, KC8CF, Chairman, PO Box 964, Dayton, OH 45401, 513-276-6930.
April 29-30	Dayton, OH	Special Event Station W8BI/8 operating from Dayton Hamvention flea market. Open to the public and operating during flea market hours: 1200-2200z 29 April; 1000-2100z 30 April; 1000-1600z April 1994. Usually be operating in the general and novice phone and CW portions. QSL to: W8BI/8, PO Box 44, Dayton, OH 45401. For further info contact chairman, Charles Cotterman, KA8OQF, 26 Mello Ave., Dayton, OH 45410.

**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

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# STOCK EXCHANGE

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**YUPITERU MVT-7100 WIDEBAND SCANNER, case. New, \$550. Greer, AA5HN, (915)581-5680 evenings.**

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## DX RADIO TESTS and DX NEWS

Information on more tests such as these can be found in *DX Monitor*, the publication of the International Radio Club of America (IRCA) and *DX News*, the publication of the National Radio Club. Both clubs are devoted to the hobby of hearing distant stations on the standard AM broadcast band.

For a sample copy of *DX Monitor*, send one 29 cent stamp (\$1 US or 1 IRC overseas) to: IRCA, P.O. Box 70223-MT, Riverside, CA 92505, USA.

For a sample copy of *DX News*, send one 29 cent stamp to: NRC, P.O. Box 5711, Topeka, KS 66605-0711.

This month's tests were arranged by J.D. Stephens, Tom Bryant and Lynn Hollerman for the IRCA.

**Monday, March 7, 1994: KBMR-1130**, 3500 East Rosser Ave., Bismarck, ND 58501-3398, will conduct a DX test between 1:00 and 1:30 am EST. The test will include country music, voice IDs and Morse code IDs. Power will be 50 kW. Reception Reports may be sent to: Mr. Andy Anderson, Chief Engineer.

**Monday, March 7, 1994: CKX-1150**, 2940 Victoria Ave., Brandon, Manitoba, R7A 6A5, Canada, will conduct a repeat of their December DX test between 3:00 and 3:30 am EST. The test will include country music, test tones and Morse code IDs. Power will be 50 kW. From 3:00 to 3:15, CKX will operate on day pattern. The last 15 minutes will be run on their night pattern. Reception reports may be sent to: Mr. Ron Thompson, TV Meteorologist.

**Monday, March 7, 1994: WIWO-1580**, 1129 N. Hickory Road, South Bend, IN 46615 will conduct a DX test between 4:00 and 5:00 am EST. The test will include test tones, Christmas music, TV and movie theme music, and Morse code IDs. Reception reports may be sent to: Mr. Michael Shannon, Operations Manager.

**Monday, March 14, 1994: WJIC-1510**, P.O. Box 132, Salem, NJ 08079-0132, will conduct a DX test between 12:00 and 12:30 am EST. The test will include test tones, voice IDs and Morse code IDs. Reception reports may be sent to: Mr. Ben Ferguson, N2GK, Chief Engineer.

**Monday, March 21, 1994: WTIV-1230**, 150 West Central Avenue, Titusville, PA 16354-1729, will conduct a DX test between 12:30 and 1:00 am EST. The test will include test tones and Morse code IDs. Reception reports may be sent to: Mr. Robert H. Sauber, Chief Engineer.

**Monday, March 21, 1994: KPSO-1260**, 304 East Rice, Falfurrias, TX 78335-3624, will conduct a DX test between 1:00 and 1:30 am EST. The test will include test tones and march music. Reception reports may be sent to: Mr. Raymond J. Greely, Manager.

**Monday, March 28, 1994: KCVR-1570**, 7808 Kelly Drive, Stockton, CA 95207, will conduct a DX test between 3:00 and 3:30 am EST. The test will include test tones, voice IDs and Morse code IDs. Reception reports may be sent to: Mr. Damien Thorn, Assistant Engineer.

**Monday, March 28, 1994: KOAC-550**, 239 Covell Hall, Corvallis, OR 97331 will conduct a DX test between 3:30 and 4:00 am EST. The test will include test tones, Morse code IDs, march music and polka music. Reception reports may be sent to: Mr. Roger Domingues, Chief Engineer.

This space could be yours!

Contact our advertising manager, Beth Leinbach, at 704-389-4007

### Join The Club!

Open to hobbyists worldwide, the **CANADIAN INTERNATIONAL DX CLUB** is an active promoter of the radio hobby through its monthly newsletter and local chapters.

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## *In the Public Interest* *The Public Safety Agency as "Broadcaster"*

A recent letter from long-time *MT* contributor Mike Hardester brings up a good question regarding the availability of information in the public interest when conventional broadcasters fail in this respect. But let's hear this directly from Mike:

"During the 'storm of the century' (March 1993)...local TV stations were off more than on, and local radio (stations) were...worthless (for) current information. (On my scanner) NOAA was either inaudible or off the air; local police...rarely commented on anything, except routine calls; local fire (reported) no action; utilities (referred) to...'sector grids' — not much help; and the Camp LeJeune disaster net was basically dead.

"This area was basically without information for (more than) two days. Later, damage was reported, though nothing was aired to assist residents in avoiding flooding, (downed) trees, and (collapsed) buildings. Here I sat with full AM, FM, shortwave, and scanner capability, and knew virtually nothing about what was going on. Public agencies...DO have an obligation to keep residents informed."

Mike is absolutely right. "To serve and to protect" is a motto not only of the LAPD, but adopted as well by other public safety agencies across the country. Keeping their citizens informed of life-threatening conditions such as floods, tornadoes and hurricanes, toxic spills, earthquake hazards and other disasters is — or should be — their responsibility.

But the Federal Communications Commission (FCC) is very clear about broadcasting; it is reserved for broadcasters! Last month icy winds brought record cold to the midwest and east. As usual, many local broadcasters aired nothing but vague forecasts.

Not all broadcasters are so incompetent. During Hurricane Andrew, many responsible broadcasters like WWL (New Orleans), WOAI (San Antonio), KRLD (Dallas), and KMOX (St. Louis) abandoned

their regular program format in the public interest, conveying life-saving and morale information to their listeners. This is laudable.

Closer to home, local mountain residents were grateful when one of our county sheriff's dispatchers made a broadcast to scanner listeners, advising them of last month's approaching ice storm.

But was it legal? The FCC considers public safety agencies nothing more than two-way licensees in the land mobile service; they are authorized for inter-communications among their units, not broadcasting.

While an FCC spokesman cites Part 90.405 of their Rules and Regulations allowing "Any communication related directly to the imminent safety-of-life or property," a licensed ham who did just that is now awaiting a possible fine and prison sentencing after having his radio confiscated (see *MT*, January 1994, p. 112).

One possible solution to this dilemma might be to arrange for the dispatchers to make routine broadcasts to their fleets; obviously, scanner listeners would benefit as well by the information.

But this logical answer is complicated by the fact that for 60 years the FCC has held that it is unlawful to divulge or personally gain from any information overheard in a communication not intended for them (except amateur radio). I would suppose saving a life would be considered a gain!

Many areas of our country are not served by enlightened, motivated broadcasters who are intellectually or physically equipped to acquire such information. It is here in heartland America that an alternative notification system is urgently needed during emergency situations.

*Bob Grove*  
*Publisher*







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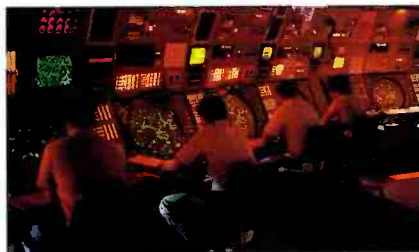
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