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A Publication of
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Monitoring Times™

Vol. 13, No. 9 September 1994

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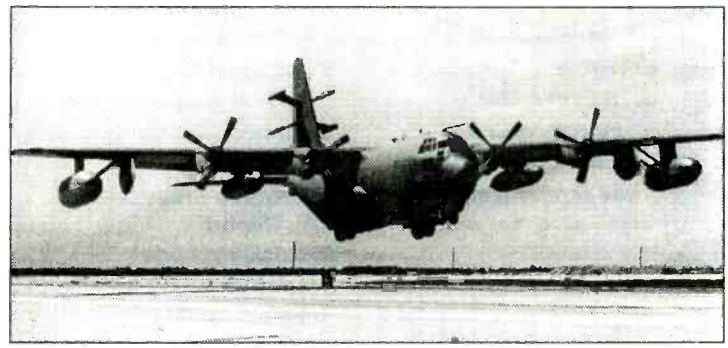

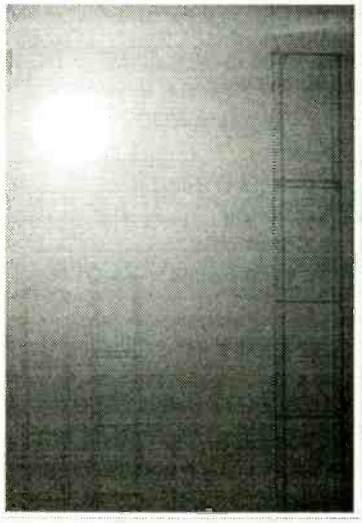

Cover Story

The Restructuring of the VOA, Radio Free Europe/ Radio Liberty

By Jeff Chanowitz

A bill passed by the U.S. Congress is redefining the structure of the government's international broadcasting services. While the bill has been in the works for some time, working out the details has been a slow process. Some significant decisions have at last been made, especially regarding the fate of Radio Free Europe and Radio Liberty, now salvaged and moving to new headquarters. Photos courtesy Voice of America. *See page 10.*

The Sophisticated Scanner

AOR's newest scanner, the AR8000, is not for the easily-intimidated. Bob Grove calls it "impressive ... a definite substitute for the former leader of the pack."

Shortwave receiver reviewer Larry Magne is well taken with the ICF-SW7600G, which puts some of Sony's most successful features into an inexpensive package.

Peruse the departments at the right for schedules, news, projects, reviews, and more!

DEPARTMENTS

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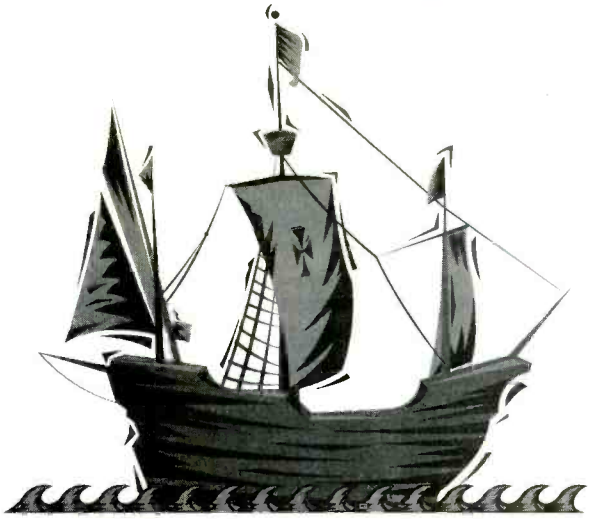
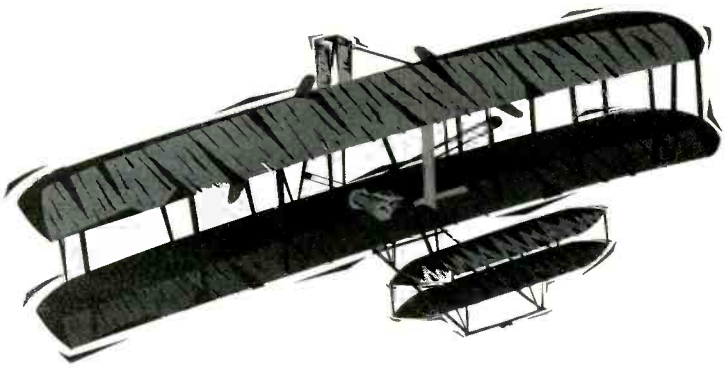


"THE WORLD IS FLAT"



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The reason you get such a big performance in a small package is the efficiency of the IsoLoop 10-30 HF; it's 72% on 20m, rising to 96% on 10m. The main loop serves as an inductor, tuned with a 10,000 volt variable capacitor. Frequency range is 10 MHz to 30 MHz with continuous coverage. The unique compact design is also ideal if you're facing space limitations—mount it in your attic, on a balcony, or go mobile.

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

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

AEA

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LETTERS

Communications in a Troubled World

Communications, more than ever before, is bringing our world closer together. Ironically, the very technology that informs us and allows us to respond to human tragedy on the other side of the world, can also be a factor in its creation. It has been speculated, for example, that without modern communications, the death toll in Rwanda might not have assumed such gigantic proportions.

On the other hand, the U.S. and President Aristide are attempting to use radio to quell such dangerous panic from spreading in Haiti (see "Radio Democracy" feature in this issue). UNESCO is planning to help set up a station to broadcast humanitarian messages into Rwanda to counter broadcasts by a Hutu-run station which was encouraging ethnic massacres and casting slurs upon UN peacekeepers. As you'll see in this month's "Utility World," the situation for UN peacekeeping in Bosnia-Hercegovina is also critical, and communications there are vital as well.

Although radio hobbyists all across the spectrum share a belief that radio listening leads to understanding, and understanding breeds tolerance, sadly, it does not always work that way. Our society seems increasingly polarized, and radio programs which encourage such extremes add more heat than they do light.

While *Monitoring Times* attempts to keep its contents radio-related (providing more light than heat), the one place where expressions of opinion *are* welcomed is in "Letters to the Editor." Judging by our mail over the past two months, such opinions are abundant.

CB Radio

David Gale of Newland, NC, directed a great deal of heat toward July's CB feature author Jock Elliott. Gale says, "Cruise through 80 meters, 40 meters, 20 meters and see these so-called professional radio operators in action. If CB is a ghetto, what are the above ham bands—radio sewers? Cussing, using massive power, and illegal operations are far more common and severe than on CB! There are many, many hams using 27.415 through 27.995 SSB and 26.000-26.500 AM/SSB. If hams are so revolted by CB, why do they continue to use 11 meters?"

Apparently Gale was so incensed by the fact that Elliott is a ham that he missed Elliott's professed love for CB. In fact, Jock Elliott was pleased to see the amount of interest (pro and con) the article received. "Contrary to what some readers believe," he said, "I love both CB and ham radio. I don't hold that one is superior to the other. They are different radio services with different requirements and different advantages, and I abhor bad behavior, no matter on what band it occurs."

Jock forwarded a letter from Don House of Lancaster, PA, who has enjoyed CB radio since 1961. He says, "I get a little flack from some of my amateur friends, but I know there have to be a lot of amateurs on the CB band ... I think it would be nice to have something about CB in *MT*, if not every month, maybe a few times throughout the year."

Rob Bellville, N1NTE, agreed that ham and citizens band radio have a great deal in common and should not be at each other's throats. After all, CB is where many potential hams get their start. His suggestion to improve both services is for hams to get involved in CB.

Well, if Bellville feels amateur participation and modeling would "improve" CB, maybe it would also work in reverse: Perhaps some offended CBers should get their ham tickets and "model" proper behavior to the hams! Courteous operation is courteous operation, regardless of the frequency on which is it held. Too many amateurs label unacceptable behavior on the air as "CB-type activity"; it's high time such labels were dropped, especially by those who claim to be trying to raise the level of communications.

Jay Harris of Tamarac, FL, and Dale Bredon of Oceanside, CA, were the first two to correct the Citizens Band channel listing on page 18 of the July issue. They pointed out that channels 23, 24, and 25 do not follow the same frequency order as the rest of the 40 channels. They are as follows:

23 ..... 27.255
24 ..... 27.235
25 ..... 27.245

Objective Review or Self-Promotion?

Rarely have we received so many thoughtful, well-expressed responses to any topic as we did to publisher Bob Grove's "Closing Comments" on reviews in *MT* of Grove products (July). The objectivity and courtesy of the letters we received from well-known author Harry Helms, journalist John T. Ward, and Radio Monitors of MD president Ron Bruckman (among others) were in total agreement, and their arguments indisputable. Not one of them doubted Bob Grove's "honesty, integrity, or good intentions," as Helms stated it, but none of them felt it was wise, for a myriad reasons, to attempt an objective review of one's own work.

Such kind as well as honest assessments are of enormous interest to us, and we are taking them to heart. Thank you for taking the question as it was meant: in what way can we improve our credibility and best serve our readers? In the future you can expect to see Grove product announcements for timeliness, followed by independent reviews for objectivity!

"I enjoyed the July article on "Broadcasting History in Haiti. Here is a 1953 verie from Radio 4VEH. Apparently they increased their power on shortwave from 400 watts to 3 kW when the new studio building in Vaudreuil was inaugurated in 1953. The station was one of my prize catches on a 'new' Hallicrafters S-38B." **Ken Loh, Portland, Oregon**

The Sun Rises and Sets

Bob Elston of Columbus, OH, who admits to a fascination with formulas, found several errors in the calculation for sunrise and sunset submitted on page 114 of the June issue. First is its source: though it did appear in the October 84 issue of *73 Magazine*, it was not by the author and title quoted but, rather, in an article called "When Darkness Calls" by Bob Eldridge VE7BS.

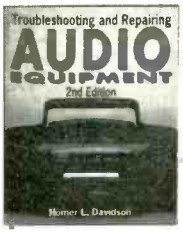
Bob Elston put a lot of effort into "figuring out how good/bad the formula presented really is. The formula would be better stated, I believe, if it read:

$$\text{SUNRISE} = \frac{\text{longitude W}}{15} + \frac{\text{ARC-COSINE OF A (tan a*tan latitude N)}}{15} = \text{UTC}$$

"The mention of the ARC-COSINE will probably make life easier for most of us amateur mathematicians. The matter of mentioning the tangent *twice* is absolutely a must."

Bob adds some slight corrections to the angle table: "The values table for August should be 17 and 13 (not 23). Minus (-) means "slightly less than." These values are the sun declinations for the various months. The

Continued on page 114



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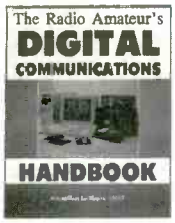

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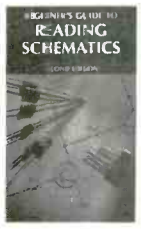

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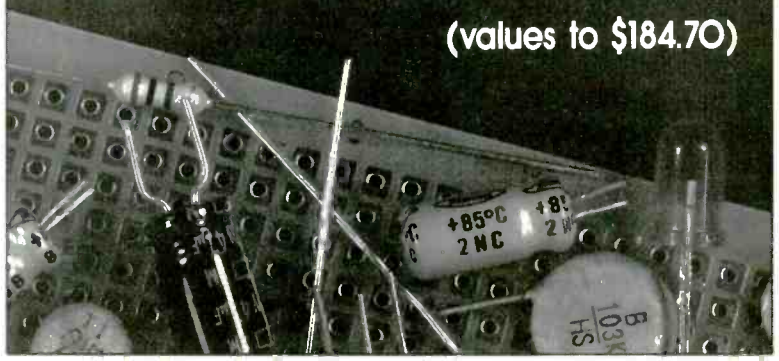

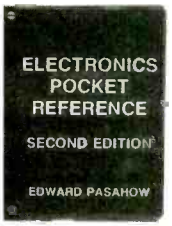

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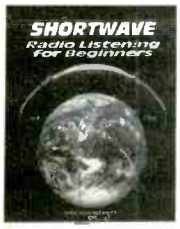

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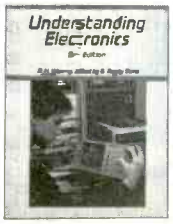

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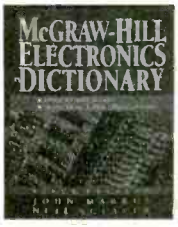

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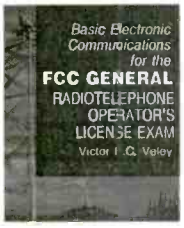

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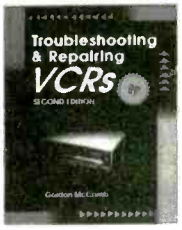

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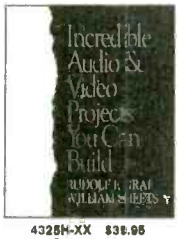

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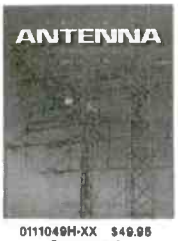

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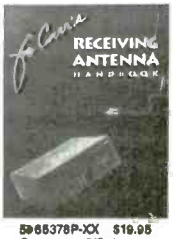

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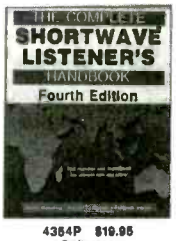

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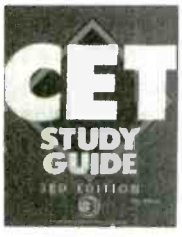

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MT994

War of the Worlds

It sounded, to Springdale, Arkansas, scanner listener Doug Walker, like all hell had broken out in town. Down on Emma Avenue, the scanner said that a robber had stormed into the local bank and held up a teller. Overhead, police reported that a small plane full of passengers was being hijacked. Moments later, said the dispatcher, a body had been discovered—unattended death. Shivers went up and down the spines of scanner listeners throughout the town and people remained glued to their radios.

The chaos began getting a little too close for comfort when Walker heard a report that, just down the street, a man had taken a woman hostage. Shots had been fired and the woman was wounded in the chest. According to the dispatcher, family members could be heard screaming in the background.

Racing to his window, Walker expected to witness a sea of flashing red and blue lights, perhaps even black-clad SWAT Team members taking up positions. But there was nothing. It was as if nothing was going on.

Indeed, there was nothing going on. It turns out that the Springdale Police Department was training four new dispatchers on "F2," the department's secondary radio channel. But scanner listeners weren't the only ones who were fooled. According to local newspaper reports, at least one other agency copied the robbery but didn't get as far as sending out officers before finding the call was a training exercise.

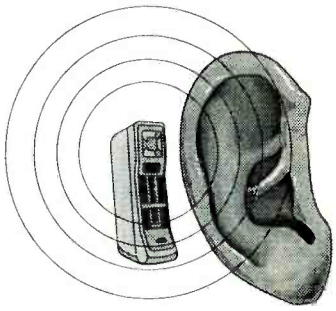
"The radio broadcasts were not only very convincing to other agencies, they were convincing to a scanner listener of 5 years," says Walker. "It says something for the new dispatchers," adds Lt. Steve Clark.

Livin' Slow and Easy

People in Craighead County, Arkansas, just can't seem to get excited about their new 911system. Implementation has been postponed three times because residents have been so slow returning address cards. It was originally set to begin last summer, then was moved to September, then reset for last February. Now, with only 55 percent of the cards back, program coordinator Charlie Wood says no new date has been set.

The Cell Story

Princess Diana coos into her cellular telephone to a male friend and pays a very public price. Colombian drug boss Pablo Escobar is shot dead by police after they trace his mobile telephone's radio signal. Former Virginia Gov. L. Douglas Wilder bad-mouths political rival Chuck Robb on his car phone and it makes all



the papers. And now, of course, there's O.J. Simpson.

The list of famous people undone, arrested or otherwise embarrassed by using their cellular phones has gotten longer. It confirms not only that privacy is often elusive on the phones, but that police now rank them among their most valued crime-fighting weapons. Roughly one-third of the 920 wiretap warrants obtained by law enforcement officers nationwide last year were for cellular phones, according to the FBI.

The phones...make great homing devices, whether or not the suspect is making a call. When a cell phone is switched to the "on" position, it periodically sends a low-power signal to the network to announce which "cell" it is in. Cellular phones can point police not only to where a suspect is going, but also to where he has been.

Meanwhile, law enforcement agencies are complaining that new [presumably digital] technology is hampering their ability to eavesdrop on...today's 17 million cellular phones. In response, the Clinton Administration has proposed, through the [ironically named] "Digital Telephony and Privacy Improvement Act of 1994," to limit encryption so that law enforcement agencies can listen in on any communications. — *The Washington Post*

CB Days are Here Again

CB radio is making a comeback, says one reporter in Detroit. They provide the security of a cellular without the monthly bill for folks on the road late at night. "Prices are so cheap now, people don't even steal them anymore," says Nick Nicholson of the Troy Sound Center. CB's now offer 40 channels with improved reception. Gone also is the jargon of early CBers. Most users today use plain English. This year, U.S. consumers are expected to buy three million CB radios.

Scanner Unveils Sex Suspect

A man charged with bringing a 13-year-old girl to Massachusetts for sex was discovered by accident when his cordless telephone conversations were picked up by a police officer's scanner. The revelation came at a detention hearing for 45 year old James Plaisted, a former Texas psychologist. Plaisted has been charged by federal prosecutors with interstate transportation of a minor for sexual purposes.

FBI Special Agent Thomas Terhaar testified that a Southboro Police officer patrolling near the suspect's home heard an "adult male and a young female talking in a sexual manner" on his scanner. Plaisted was arrested when the mother and girl arrived in Massachusetts.

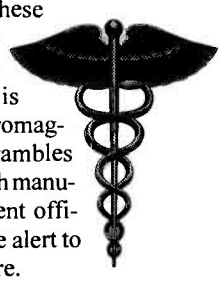
According to police, Plaisted, a Boston University Law School student, also faces charges of sexually molesting three girls in Texas from 1990 to 1992. He was found innocent of previous charges of indecency involving a 6-year-old boy. Plaisted is currently undergoing treatment for a "problem" with pedophilia, according to his attorney.

Phones vs. Medicine

A cellular phone may be a bad prescription for people who are dependent on sophisticated medical equipment. According to a report in the *Wall Street Journal*, evidence has begun to pile up that these instruments are vulnerable to electromagnetic interference given off not only by cell phones, but other radios and even TV sets.

The consequences can be frightening. Reporter Tom Knudson cites the following examples: a ventilator malfunctions while the child using it is riding in a car and the problem is traced to the car's cellular phone. Another: A doctor installs a pacemaker after electrocardiogram equipment shows a patient's heart isn't working right. Nurses later trace similar—inaccurate—readings on the machine to TV signals. Again: A woman dies inside an ambulance as paramedics try to revive her heart with a defibrillator—which doesn't work because of interference from the vehicle's two-way radio.

Government safeguards are spotty, but concern began growing at the Food and Drug Administration after reports came in that radio waves were affecting motorized wheelchairs. In one instance, radio waves zapped a wheelchair, sending its passenger over a cliff in Colorado. Experts say that the problem is the microprocessor, the silicon chip that processes and stores data and acts as the device's brain. The problem is that these chips operate on a string of pulses. If you apply a random pulse—which is what happens with electromagnetic interference, it scrambles the microprocessor. Both manufacturers and government officials promise to be more alert to the problem in the future.



Shock Jock Gets Cut

When co-called "shock jock" Howard Stern came to Ohio to celebrate his #1 spot atop Cleveland's radio ratings, things got weird—even weirder than usual. First, Stern's live broadcast on WNCX-FM/98.5 from the Rock 'n Roll Hall of Fame was jammed. According to station officials, a more powerful, obscenity-laced signal, knocked out the transmission. Stern switched over to a cellular telephone to complete that portion of the broadcast.

Heading for a local strip joint where he was to continue the broadcast before some ten thousand cheering—some bare breasted—fans, the show was disrupted again when a man, identified as a technician for a competing station, allegedly cut a transmitter cable. Once again, Stern managed to return to the air, this time dressed in a general's uniform and declaring, "This is war!"

The show continued with singing by President Clinton's brother Roger, as well as a man who mooned the audience, dancing strippers and an appearance by celebrity adulterer Joey Buttafuoco. Meanwhile, police arrested WMMS assistant engineer William Alford, and charged him with, among other things, "disrupting a *public service!*" (emphasis ours). He is free on $10,000 bond.

Auf Wiedersehen, AFN

July 15th marked the end of 49 years of broadcasting by the U.S. American Forces Network from Berlin, Germany. "This station became a friend and without a doubt one of the best ambassadors our nation ever had," said Col. Robert E. Gayloard, director of AFN in Europe, in the three-hour send-off broadcast.

"This is where I got my English," said Hans-Peter Krueger, an economist who, in East Germany in the late 1960s, thought it was the voice of the enemy.

AFN signed on Aug 5, 1945, playing George Gershwin's "Rhapsody in Blue" from an improvised hut on the back of a truck. It went on to influence the very culture and language of Germany. If people are indeed a product of their media culture, "then AFN Americanized West Berlin," said Rik DeLisle, a former popular disc jockey at AFN Berlin. DeLisle is now program director at one of the many German stations that was converted to the fast-paced American style of radio.

The last American troops leave the once-divided city of Berlin in October.

"Communications" is written by Larry Miller from material supplied by the following reporters: David R. Alpert, NY, NY; Don Bishop, Overland Park, KS; Dick Dillman, San Francisco, CA; Ron Johanson, North Andover, MA; Michael Kuentz, Auburn, AL; Mark Lefler, Knoxville, TN; Robert Madorin, Overland Park, KS; Bob Mills, San Diego, CA; Ira Paul, Oak Park, MI; R.A. Sklar, Seattle, WA; James Steitmatter, Elkhart, IN; Thanks, too, to Rachel Baughn for the copies of Dispatch Monthly, from which the Craighead County story was taken. Other publications consulted include The BBC and National Scanning. You, too, can join the "Communications" team by watching your local newspaper for stories about radio. Send them to Larry Miller, Communications, P.O. Box 98, Brasstown, NC 28902.

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→Join your fellow monitors at a ***professional listening post*** featuring the Grove SDU-100 Spectrum Display Unit and SP200 Sound Enhancer as well as other products designed to enhance your radio monitoring.
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→Saturday evening's banquet will feature ***international broadcaster Ian McFarland.***
→Get your scanner charged and ready for the Saturday night ***"Bug Hunt"***--a convention highlight.
→Visit ***Delta Airline's Communication Center*** and ***Delta's Maintenance and Flight Operations Division.*** Tours will be conducted on Friday.
→See the ***Portable Satellite System*** set up for the convention.

PRELIMINARY 1994 MONITORING TIMES CONVENTION SCHEDULE

FRIDAY

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

SATURDAY

8AM - 2:30	Registration open			
8:45 - 3	Exhibits open			
9AM - 9:30	Welcome by Bob Grove			
	● *SEMINARS* ●			
9:45-10:45	Future of Satellite Broadcasting ***Ken Reitz***	What Do Those S/W Specs Mean? ***Larry Magne***	Federal Monitoring ***John Fulford***	Scanning for Beginners ***Skip Arey***
11-12	Rumblings in the Basement (Below 500kHz) ***Kevin Carey***	Digital Monitoring Modes & Equipment ***Bob Evans***	Antennas: Fact and Fiction ***Bob Grove***	Shortwave for Beginners ***Skip Arey***
3-4	TVRO, the Ideal Set-up -***Ken Reitz***	Pirates & More! ***George Zeller***	Shortwave Intrigue ***Larry Van Horn***	
4:15-5:15	Home Reception of INMARSAT ***John Wilson***	AM/FM/TV Broadcast DXing ***Joe Eisenberg***	Monitoring the Military ***Larry Van Horn***	
7-9	Banquet - guest speaker IAN MC FARLAND			
9:30 - ?	Bug Hunt - John Fulford and Friends			

SUNDAY

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

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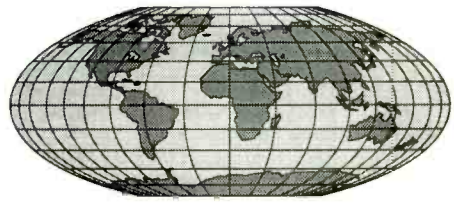
International Broadcasting in the Post Cold War Era



New Bill Restructures the Voice of America, Radio Free Europe/ Radio Liberty

By Jeff Chanowitz

On April 29, 1994, with little fanfare, President Clinton signed an appropriations bill containing the United States International Broadcasting Act of 1994. With the bill's passage, the U.S. Government's international broadcasting resources will be drastically reorganized, resulting in budget cuts for the Voice of America and Radio Liberty/Radio Free Europe, the development of a new Asian broadcasting service, and the establishment of a new congressional mandate for the U.S. Government's international broadcasting activities in the post-Cold War era.

Citing that the "political realities of the post Cold War order necessitate a complete and thorough review of the U.S. Broadcasting operations," the bill passed by the U.S. Congress will redefine the U.S. government's international services. Broadcasting services will be largely consolidated with the object of achieving "important economies and strengthening the capability of the United States to use broadcasting to support freedom and democracy in a rapidly changing international environment." Under the provisions of the bill, the Voice of America and Radio Free Europe/Radio Liberty will combine some of their operations and eliminate overlapping transmitters and administrative staffs, reaping savings of an estimated 262 million dollars over the next four years, and more than a billion dollars over the next nine years.

Radio Free Europe/Radio Liberty broadcast on FM and medium wave in 23 different languages to Afghanistan, Eastern Europe, Southeastern Europe, and the former Soviet Union from transmitter facilities in Spain, Portugal, and Germany (1993 Stat.). Under the bill, the current budget of $210 million dollars would be reduced by 64% in 1996 to 76 million dollars. As part of efforts to cut costs, the service is planning to move its headquarters, upon congressional approval, from one of Europe's most expensive cities—Munich, Germany—to Prague, capitol of the Czech Republic. In addition, the service has already started to downsize through the elimination of its Czech and Polish services.

Ultimately, the future for the RFE/RL as outlined by the U.S. Congress is to privatize the service. According to the bill, the goal for the privatization of Radio Free Europe/Radio Liberty is projected for December 31, 1999, with the stipulation that funding of "Radio Free Europe and Radio Liberty Research In-

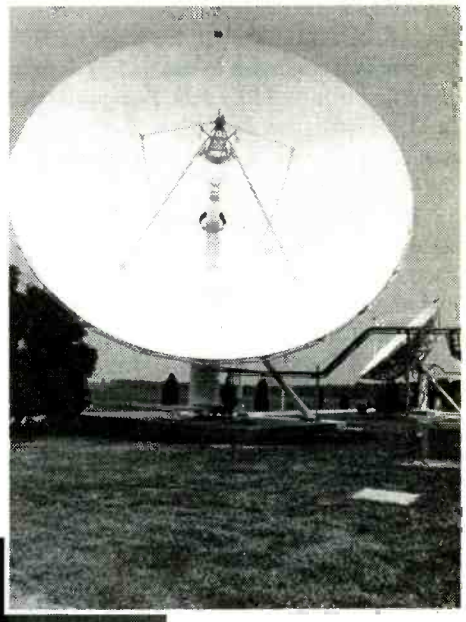
stitute should be assumed by the private sector at the earliest possible time."

Actually, the process of privatization has already begun, as George Soros, a Hungarian-born financier, has negotiated a multimillion-dollar agreement to take over the research and archive operations of the RFE/RL, which is believed to contain the world's most extensive collection of works published clandestinely and circulated underground during the days of Communism in Europe. Soros will be integrating the research and archive operations of the service into the Central Europe University in Prague and Budapest, which he finances.

As for the broadcast operations and transmitters, the future of the service seems quite gloomy as Congressional leaders, such as Senator Russell Feingold (D) from Wisconsin, have criticized the service, charging employees of RFE/RL with fiscal abuses spanning two decades and criticizing the fact that the top 15 employees of the service collect an average of $240,000 in salary and benefits. The Senator has also questioned the usefulness of the role played by the service after the collapse of communism. Only support from Senator Jesse Helms (R) from North Carolina, Senator Joseph Biden (D) from Delaware, and the Clinton administration saved the service from elimination in 1994, but it seems likely that the plug will be pulled from federal funding of Radio Liberty/Radio Free Europe by the end of the decade.

While the future of Radio Free Europe/Radio Liberty is uncertain, the role of the Voice of America, which broadcasts in 47 different languages in over 1013 hours each week and has a budget of 220 million dollars, has a more optimistic outlook. Recently, the service even moved to increase its broadcasts in Mandarin Chinese. Currently, there are studies being carried out by a task force from the Board for International Broadcasting to assess the effectiveness of the VOA's operations, but it's too early to project the potential impact of cost cutting measures.

In addition to the changes occurring at Radio Free Europe/Radio Liberty and the Voice of America, the governing structure of the United States government's international broadcasting activities will also be changed in order to bring all of the U.S. Government's broadcasting operations under one roof. The bill will abolish the old governing board, known as the BIB (Bureau of International Broadcasting), and would replace it with a new nine-member, presidentially appointed board which will administer all broadcasting operations. Called the Broadcasting Board of Governors, the new bipartisan board would be housed under the United States Information Agency. The Voice of America has traditionally been an independent service, and reservations have been voiced that placing the Service under the administration of a U.S. Government Agency might threaten the journalistic freedom and, ultimately, the credibility of the service. To allay such fears, the bill would give the head of the United States Information Agency only one vote as a member of the board.



The VOA English LanguageBubble (left) is the contact point for correspondents, stringers and other reporters in the field.

Radio Free Asia

While the bill emphasizes cutbacks and cost saving measures for the U.S. Government's international broadcasting activities, the news that could cause most excitement to shortwave listeners is the development of a new service to broadcast news and information to the Asian region.

Called Radio Free Asia, the service would be modeled on Radio Free Europe/Radio Liberty broadcasts to Eastern Europe and the Soviet Union. The target is the population of Tibet (occupied by the People's Republic of China), Vietnam, North Korea, Cambodia, Myanmar (formerly Burma), and the People's Republic of China. The mandated role given the service by Congress is to provide "accurate and timely information, news, and commentary about events in the respective countries of Asia and elsewhere, and to provide a forum for a variety of opinions."

With Congress having allocated 30-million dollars for the service, the bill calls for the headquarters and the technical staff of Radio Free Asia to be tentatively located inWashington D.C. area. Pending Congressional approval, the service is to be relayed to Asia using the transmitters of the Voice of America. Due to the fact that many of the VOA's transmitters are located overseas, however, it will be necessary to obtain permission from foreign governments where the U.S. government transmitters are located. This could be problematic, due to the People's Republic of China's opposition to Radio Free Asia.

The bill also requires a thorough three year review of service in order to insure its effectiveness and objectivity. More details along with the proposal relating to the development of Radio Free Asia are expected to be presented before the U.S. Congress and the American public in September.

While the mandate for Radio Free Asia has been firmly established in the bill, the service is quite controversial. Many critics have charged that its programming is redundant, since the Voice of America already broadcasts into closed societies, particularly China. Senator Feingold of Wisconsin is typi-

cal of the service's critics, questioning whether the U.S. can afford the service while the U.S. government continues to run budget deficits and a four trillion dollar debt. Feingold stated in *The Washington Post*, "It would be a very nice thing if we could just have it, if we had all the money in the world."

In contrast, supporters see the need for RFA due to the jamming of VOA's broadcasts conducted by the Chinese government, and argue it is needed to support democracy throughout the world. This view is typified by an aide to Senator Joseph Biden who was reported in *The Washington Post* to have remarked that if the United States wants democracy in China "it is essential that people living in China get facts and information."

Despite the controversy, the Radio Free Asia service is set to go forward in its development. However, with many conflicting views on the need for Radio Free Asia, it seems likely that the new service will be closely monitored by both sides of the debate for its effectiveness.

Radio/TV Marti

The bill will continue to fund the controversial Radio and TV Marti services, but would move the services under the jurisdiction of the director of the Voice of America.

Radio Marti—the news and entertainment service which has been broadcasting on medium wave 24-hours a day since 1985 and claims a listening audience of over 70% of the Cuban public—was granted 19 million dollars under the bill. The service has been financed despite past criticisms for being staffed largely by Cuban exiles, and for producing programming characterized as hard-line anti-Castro, in spite of its mandate from the Radio Broadcasting in Cuba Act to be accurate, objective, comprehensive, and balanced.

The conflict has been personified by Jorge Mas Canosa, the Chairman of the President's Advisory Board for Cuba Broadcasting and a leader within the Cuban exile community. Critics of Mas Canosa have accused him being a virtual law unto himself and fostering a climate of fear and retaliation among employees of the station who oppose his open hostility toward Castro in the station's broadcasts. However, a recent advisory commission that has studied the service has sidestepped such issues and recommended funding the service because the broadcasts are effective and necessary in the wake of a rapidly deteriorating Cuban economy and the continuing repressive tactics of the Cuban government towards the human rights of its citizens.

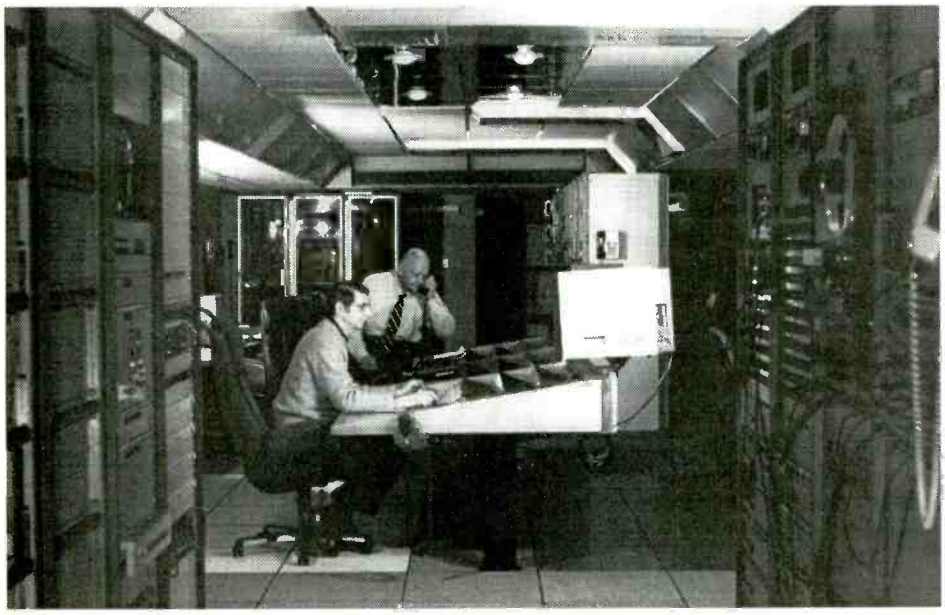
Perhaps even more controversial than *Radio* Marti is the decision by the U.S. Congress to continue funding of *TV* Marti in the bill. Costing American tax payers an estimated $60,000 dollars a day, the service broadcasts news and entertainment to Cuba from 3 am to 6 am. The audience for the service in Cuba is very low, if it exists at all, due to jamming by the Cuban government and the time period in which the station broadcasts (which can't be changed, due to international communications regulations). Successive reviews of the service have called for moving the station from VHF to the UHF band, which could give the service multi-channel capability and make it harder for the Cuban government to jam, or even for the outright closing of the station; however, lobbying by Cuban Americans and continued congressional support has kept the station on the air and funded in the 1994 bill.

VOA Director Geoffrey Cowan

The Future

When asked to assess the overall outcome of the changes in the U.S. Government's international broadcasting activities, John Doolittle, a professor of Communications at American University in Washington D.C., was very realistic. "The process is very hard in the wake of political considerations." He judged the process as having been "moderately successful so far," but added that it is too early to tell the overall outcome.

For the future, despite the mandate by Congress to devote smaller resources toward international broadcasting, Doolittle was quite optimistic, remarking that "We are moving away from the political pressure of the Cold War era to informing people about the United States in a less political way." So, for shortwave listeners, perhaps the greatest benefit of the ending of the Cold War will be a less ideological, but smaller and more cost-effective, U.S. government voice, broadcasting the news and views of the United States of America to the world.



VOA's Network Control Center provides centralized operational management of VOA program distribution.

Head of the U.S. Information Agency Talks about the Changes Put Forth by the U.S. Congress

Before passage of the U.S. International Broadcasting Act of 1994, *MT* had a chance to talk with Joseph Duffey, who was giving a speech at a Smithsonian Institution Forum. Duffey has headed the United States Information Agency since last May and will play a key role in the reorganization of the United States' international broadcasting activities.

During our conversation about the changes taking place in the U.S. government's international broadcasting activities, Duffey emphasized his and the Clinton administration's commitment to cost cutting. "We expect to spend close to a half a billion dollars on international broadcasting next year, and if I leave nothing else as my heritage...I will at least spend a year trying to save a half a billion dollars to contribute to the reduction of the deficit." Yet, Duffey acknowledged that there will be gaps left by the reductions in the U.S. government's international broadcasting activities, adding, "It is an incredible irony to me that as communication spreads you have the continued feeling that the story of America cannot and is not fully told. There are great gaps and we are not sure that any agency of the (U.S.) government can fill them."

Discussing the consolidation of the VOA and RFE/RL, Duffey indicated that the Voice of America and Radio Free Europe/RL will continue to exist as separate entities, but that consolidating their transmitters, engineering, and technical support services will result in savings. As part of the budget cuts, Duffey clarified that money would be saved through "reducing the countries in which the two services in essence compete or duplicate each other." Explaining the plan, Duffey added, "There are some countries in which Radio Free Europe will close down and VOA will cede and there are other places where the VOA will close down and RFE will cede."

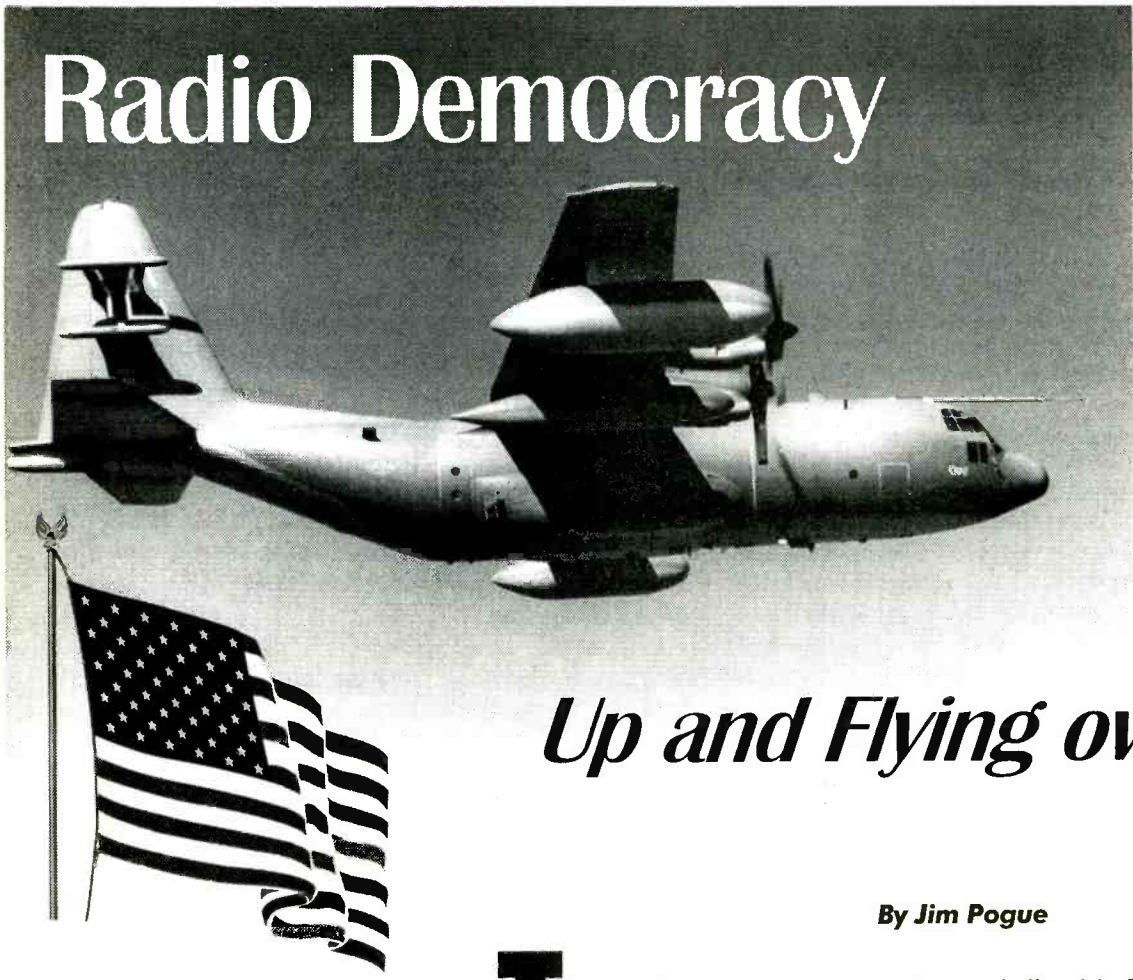
In addition to cost savings through consolidation, Duffey also indicated that additional savings would be gained through the "phase out of certain language services at Radio Liberty and Radio Free Europe." As for the future role of RFE/RL, Duffey remarked, "Our goal is to nurture and train the development of independent broadcasting (in Eastern Europe)."

With the fall of communism in Europe, the role of Radio Free Europe changed forever. Now, other major changes are on the horizon.

The future role of the U.S. Government's international broadcasting was also characterized by Duffey as presenting "accurate information about American policy and American life." Duffey indicated that international broadcasting by the U.S. Government in the future will be "more targeted and focused and there will be less of it."

Duffey was very positive about the new bipartisan committee which will be formed to govern the VOA and RFE/RL under the USIA. "We think this new freedom is good for broadcasting and the credibility of both the VOA and RFE/RL."

While discussing the changes taking place in the U.S. government's international broadcasting activities, Duffey, who started his interest in international broadcasting in his youth as a shortwave listener, acknowledged the role of shortwave broadcasting in an era of direct placement and satellite broadcasting. "There are changes taking place (in broadcasting) and I think radio will continue to be a factor.....there still is a very large market for shortwave."



The EC-130E Psyops aircraft is an airborne radio and television broadcasting station. During Desert Storm, its broadcasts were directly responsible for many of the 60,000 Iraqi surrenders. Photo courtesy 193rd Spec. Op. Group (SOG), PA Natl Guard.

Up and Flying over Haiti

By Jim Pogue

In the early 1960s, DXers were baffled by broadcasts they heard from a station identifying itself as the "Voice of the Blue Eagle." Opinions on the source of the transmissions ranged fromUFOs to Nibi Nibi. As it turned out, however, the broadcasts came from specially outfitted DC-6 aircraft flown by the U.S. Navy. Now a new breed of aircraft are carrying on the tradition of the Blue Eagles.

The volatile political situation in the Caribbean nation of Haiti took an interesting twist for DXers on July 15. On that date, Radio Democracy, a station backed jointly by the U.S. and ousted Haitian president Jean-Bertrand Aristide, "took to the air." Its mission was to broadcast programs aimed at bringing about the overthrow of Haiti's present de facto government, led by Army Chief Raoul Cedras.

The semi-clandestine nature of the station alone makes it interesting. Even more interesting, however, is the fact that the broadcasts are being beamed into Haiti from transmitters aboard U.S. Air Force aircraft.

This sounds like pretty wild stuff, but it certainly isn't the first time the U.S. government has taken to the airwaves *and* the air in response to a political situation.

In the early 1960s, DXers were baffled by broadcasts they heard from a station identifying itself as the "Voice of the Blue Eagle." Opinions on the source of the transmissions ranged fromUFOs to Nibi Nibi. As it turned out, however, the broadcasts came from specially outfitted DC-6 aircraft flown by the U.S. Navy.

The Blue Eagle aircraft saw their first operational use in late 1962 during the Cuban missile crisis. Two Navy cargo planes were gutted, then hurriedly crammed with an assortment of TV broadcasting equipment. Their destination: the dangerous skies around communist Cuba.

The Blue Eagles' mission was to play tricks on Cuban television broadcasts. From an altitude of 12,000 feet, Navy technicians fought a secretive battle for peoples' minds. They superimposed a made-in-America video signal on the Cuban TV channels, disrupting Mr. Castro's party-line message to the people.

Based upon feedback from Cuba, Washington policy-makers deemed the broadcasts highly successful. With the blessing of the U.S. Information Agency (USIA), the Navy reactivated the Blue Eagles in May 1965, during a political crisis in the Dominican Republic. This time their mission was not to interrupt government broadcasts, but to restore them.

A few bullet-sized ventilation holes had put Radio Televisión Dominicana's Santo Domingo channel 4 off the air. Washington believed American interests could best be served by picking up the slack, and this they did until Dominican TV was back on the air.

Continued on Page 16

Scanners/CB/Ham/Shortwave

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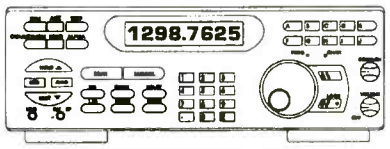

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List price $689.95/**CE price $368.95/SPECIAL**
500 Channels · 20 banks · Alphanumeric display
Turbo Scan · VFO Control · Priority channels
Auto Store · Auto Recording · Reception counter
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Frequency Coverage:
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The Weather Monitor II (7440-K) comes complete with anemometer with 40 feet of cable, external temperature sensor with 25 feet of cable, junction box with 8 feet of cable, AC-power adapter, detailed instruction booklet and one year limited factory warranty.

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Continued from Page 14

As America moved through the 1960s, the tempo of fighting in Southeast Asia picked up. As part of the struggle there, the U.S. government searched for ways to help win the "hearts and minds" of the Vietnamese people. No television broadcasting existed in Vietnam then, so the Blue Eagles were called into action once again.

On Jan. 9, 1966, a Blue Eagle aircraft simultaneously transmitted TV programming on two different channels during a test flight over Washington, D.C. The tests were declared an unqualified success. Just a few weeks later, three Blue Eagle aircraft, bristling with antennas, departed for the skies over Vietnam.

Blue Eagle I was primarily a military aircraft, loaded with AM, FM and short wave transmitters. It had originally been built to fly command and control missions.

Blue Eagles II and III were more sophisticated, and were equipped for simultaneous two-channel television broadcasting. Since there were no regular television broadcasting facilities anywhere in Vietnam, the Blue Eagles transmitted their broadcasts for Vietnamese civilians as well as U.S. service personnel.

A lack of television receivers on the ground was also a problem. The U.S. Agency for International Development (AID) stepped in to help. Through the local Vietnam office of the U.S. foreign aid mission, they distributed 1,000 televisions to groups of Vietnamese civilians and soldiers. U.S. Forces got an initial issue of about 500 TVs through military channels as well.

On board the Blue Eagles II and III (the TV platform aircraft), 10-man Navy crews handled the equipment. A field engineer from RCA, principal contractor for the Blue Eagles, also flew on each mission.

The 2 kW television transmitters may have seemed small for the task, but project director Capt. George C. Dixon knew better. "Altitude is power," he said, and at 20,000 feet the Blue Eagles could cover a reception radius of 50 miles for average receivers equipped with rabbit ears. For sets with better antennas, the range extended to 125-150 miles.

Blue Eagles II and III also had a 10 kW AM voice transmitter and a 10 kW transmitter that could be operated on AM, FM or SSB. The underbellies of the aircraft reportedly looked like pin cushions. They sprouted no less than seven VHF TV antennas, with more antennas on the top of the aircraft. Each plane was also equipped with a 1,000-foot trailing wire antenna for the AM and FM transmitters, two smaller wingtip trailing wires for the SSB

The side of each of the Blue Eagle aircraft, first used for broadcasting during the Cuban missile crisis, bore this insignia.

equipment and a variable-length tail-to-wingtip antenna.

Although they were fitted with film chain projectors and videotape decks, the Blue Eagles weren't just flying playback machines. The forward part of the aircraft, just behind the cockpit, was a miniature TV studio, complete with flood and spot lights, mikes, guest chairs and as much soundproofing as could be packed into the space available. A glass window gave a view into the studio from the master control console.

The Blue Eagles took on the task of providing television and some radio broadcasting in Vietnam until AFVN (American Forces Vietnam Network) and the South Vietnamese government got regular ground stations on the air.

Braving Haitian Airspace

Today's airborne broadcasts of Radio Democracy are in some ways similar, and in other ways very different from the Blue Eagles'. The platforms being used for the Radio Democracy flights are two U.S. Air Force EC-130E *Commando Solo* aircraft. These are specially modified Hercules four-engine turboprops, designed for psychological operations broadcasting. They are operated by the Pennsylvania Air National Guard's 193rd Special Operations Group, based at Harrisburg, PA. While participating in the Radio Democracy missions, the planes are assigned to the U.S. Atlantic Command, with Headquarters in Norfolk, VA.

This is not the first time the EC-130Es have been used for broadcasting purposes. According to Lt. Col. Stephanie Haney of the Secretary of Defense's Public Affairs Office, *Voice of the Gulf* broadcasts were made from these aircraft during Operation Desert Shield/Desert Storm. The broadcasts began Jan. 19, 1991, and continued 18 hours a day for 40 days.

Flights for the Radio Democracy broadcasts are being made from the Naval Station at Roosevelt Roads, near the northeastern tip of Puerto Rico. Each mission lasts approximately four hours, including transit and on-station time. The EC-130Es actually circle within Haitian airspace during the broadcasts.

"The *Commando Solo* aircraft are capable of transmitting on medium frequency, high frequency and VHF high band and low band," said George Grimes, spokesman for the U.S. Special Operations Command at Tampa, FL. "Their transmitters can operate from 100 watts to 10 kilowatts."

C-130 aircraft normally carry a crew of five (two pilots, a navigator, a flight engineer and a loadmaster). We can probably assume a couple of technicians are also flying on the Radio Democracy missions to operate the broadcast equipment.

According to Lt. Col. Haney, the Haitian military poses virtually no threat to the high-flying U.S. aircraft. The Haitian Air Force consist of about five T-260 propeller driven trainers, a few transports and no armed helicopters. There are no surface-to-air missiles in the Haitian military inventory. "They're (the Haitian military) more suited to Mafia activity than military operations," she added.

The first broadcasts of Radio Democracy were made July 15. The EC-130Es transmitted a 50-minute taped message from President Aristide. In his address, he promised the Haitian people a future of reconciliation and economic and social reform when he returns to power. "The day of return is not far. We will return to the National Palace," the ousted president promised in his first broadcast. "Will there be vengeance? Will there be any violence? No," he said, in an apparent attempt to quell persistent rumors of an impending U.S. invasion.

The broadcasts apparently got off to a somewhat disappointing start, however. Reports from within Haiti indicated few people on the ground knew the broadcasts were scheduled to begin, and reception proved to be rather poor. Radio Democracy transmitted an FM signal on 91.9 MHz. However, Radio Lumière, playing easy listening music on 92.1 MHz, reportedly made reception tough. Even personnel monitoring the inaugural broadcast at the U.S. Embassy in Port-au-Prince had difficulty tuning in both the FM signal, and the AM signal on 1035 kHz.

Stan Schrager, U.S. Embassy spokesman in Port-au-Prince said, "I think the message was well received by those who were able to hear it. President Aristide spoke about the need for reconciliation. His message was really quite moderate. It's my understanding that DOD (Department of Defense) is working on resolving the technical problems. One solution might be to use multiple or different frequencies, but I don't have any information about future plans at this time."

Some listeners may recall that the 1035

kHz frequency was the same one used for years by U.S. missionary station 4VEF, sister station of well-known shortwaver 4VEH.

Although Haiti's de facto government claimed the Radio Democracy broadcasts were having, " ... no impact at all," Information Minister Jacques Saint-Louis loudly protested what he termed as unauthorized overflights of his country by the U.S. aircraft.

The United States, on the other hand, does not recognize the army-backed Cedras regime. They say permission for the flights was granted by President Aristide, who although in exile, is still Haiti's legitimate leader.

The first broadcasts from Radio Democracy consisted of the 50-minute taped address from President Aristide, repeated several times. Later in the week of July 18, another message was broadcast from President Aristide. Beginning July 22, the broadcasts were scheduled to include a mix of programming from President Aristide and U.S.-supplied programs.

The messages from the U.S. will be words of hope to the Haitian people. "We want them(the Haitians) to know that they have not been abandoned by the Western powers, and that we are concerned about their suffering," said Lt. Col. Haney.

According to Josie Shumake of the State Department's Latin American Press Office, all programming will be in Creole. The present schedule calls for two transmissions each day. The first is from 6:30 to 7:30 p.m. local Haitian time (the same as EDT), and the second from 8:00 to 9:00 p.m. Frequencies being used are 1035 kHz AM and 91.1 MHz FM.

Listeners on the east coast of the United States may have a chance at hearing some of the Radio Democracy programs, but the further west you go on the North American continent, the tougher it will be.

When asked about reception reports to Radio Democracy, officials indicated they didn't know if the station would be replying. As a matter of fact, they didn't even know where listeners could write.

One idea might be to try the Haitian Embassy in Washington. Their address is 2311 Massachusetts Ave., N.W., Washington, D.C. 20008.

Is Radio Democracy paving the way for an invasion of Haiti by U.S. forces? Or are the broadcasts just another straw aimed at breaking the back of Raoul Cedras and his thugs? Perhaps these questions will have already been answered by the time you read this. In any case, radio proves once again that it remains an important tool in foreign policy.

Scanning
for Action
on the Military

L·O·W BAND

Photo by Brian Webb

Military low band communications take many forms. Listeners can eavesdrop on everything from idle chatter to serious communications between a wide variety of air and ground forces. Shown above is a Grumman A-10 Thunderbolt II. At left, National Guardsmen patrol the Northridge, California, area to prevent looting following the January earthquake.

By Jack Sullivan

War-games with massive tank battles...forward air controllers directing air strikes against simulated enemy convoys...National Guard helicopters involved in harrowing rescues and marijuana interdiction all across the United States...the frank, idle and sometimes very informative chatter between military jet and helicopter pilots during cross-country flights...

These are some of the communications that are frequently heard across the United States in the so-called military "low-band." It's not difficult to tune in to this sometimes exciting and always fascinating area of military communications.

A Little History

Utilizing the VHF spectrum between 30 and 88 MHz, military low-band communications were born prior to World War II through the pioneering work of Major Edward Armstrong, the "Father of Frequency Modulation." Being virtually immune from static and more resistant to the impulse "noise" of vehicle electrical systems than AM (amplitude modulation), FM was the modulation mode of choice for the short range tactical radios that equipped tanks, jeeps and infantry units both during the War and in Korea.

By the mid-1950s a basic FM radio system had been developed for common use by all of the armed services and was standardized internationally through NATO (North Atlantic Treaty Organization). Any NATO-aligned military unit anywhere could now communicate with any other.

As originally laid out, the military low-band used 920 channels, spaced every 50 kHz starting at 30.00 MHz and extending up to 75.95 MHz. Transmissions are encoded with a continuous 150 Hertz "subaudible" tone. Receiver squelch opens only when this tone is present on the signal being received, thus eliminating interference from non-military radio systems and other sources.

The current NATO standard uses 25 kHz channel spacing between 30.000 and 87.975 MHz.

Who Uses Low-Band?

Originally designed for communications between ground units, the military low-band system (called FOX MIKE by the military) today is still used primarily for communications between infantry, combat vehicles and ground stations such as command posts and artillery batteries. It is also used for communications between ground units and supporting aircraft such as helicopters like the UH-1 Huey, transports like the C-130 and ground attack planes like the A-10 Warthog.

Users include the Army, Army Reserve, Marine Corps, Marine Corps Reserve, Marine Corps Air Reserve, the Air Force, Air National Guard and Army National Guard. Manufacturers of aircraft containing low-band radios use them during flight tests. The low-band system is also used worldwide by the Navy and Coast Guard for ship-to-ship, ship-to-aircraft and other communications.

It will be apparent to scanner users that the military low-band shares the same spectrum as the long-established commercial and public safety low-band between 30 and 50 MHz. In the United States the military primarily uses the following "government only" frequency segments:

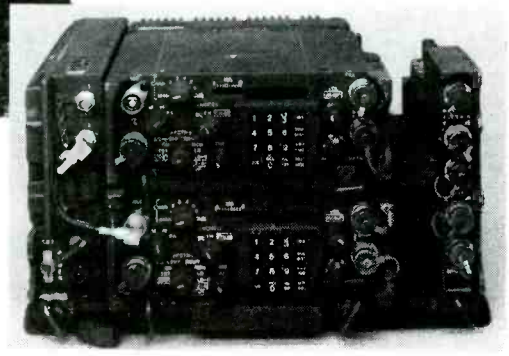
30.00 - 30.55 MHz
32.00 - 33.00
34.00 - 35.00
36.00 - 37.00
38.30 - 39.00
40.00 - 42.00
46.65 - 47.00
49.65 - 49.975

In addition, military stations can be found on "non-government" channels such as 44.00, 45.00, 49.00 MHz and others. The military also uses the Amateur Radio "6-meter" band between50 and 54 MHz, as well as the spectrum between 54 and 72 MHz that is used for television channels 2, 3 and 4 in the United States and Canada. In addition, the military low-band radios can operate on the frequencies between 72 and 76 MHz that are assigned to fixed (point-to-point) services and radio control, and on TV channels 5 and 6 between 76 and 88 MHz.

It will be apparent that the very large number of possible channels available (2,320) over such a wide band of frequencies provides a certain built-in security for users of this communications system. Besides giving the military a (generally false) sense of privacy, it does make it very difficult for a potential enemy force to jam all of these channels effectively at the same time.

Major Army and Marine Corps bases and training facilities have hundreds of low-band channels assigned to them for use as needed during exercises and deployments. An Air National Guard flying unit may have ten to fifteen channels assigned for use in plane-to-plane and plane-to-command post communications.

Frequencies are usually chosen from widely different parts of the military low-band spectrum on a seemingly random basis (see Table 1) By picking channels from different parts of the spectrum, pilots or radio operators can switch from one to another in order to avoid interference, which is common.



If your primary listening interest is listening to local or skip communications, you can avoid interference by purchasing a military radio such as the AN/PRC-25 or AN/PRC-77 manpack transceiver. Below is a vehicular version of the still-current AN/VRC series.

The channels in the 46 and 49 MHz segments are especially prone to interference, due to the operation of millions of cordless phones, walkie talkies and baby monitors around the country. These devices operate on frequencies sandwiched between a number of the FOX MIKE military channels. Pilots of aircraft operating on these channels are frequently overheard complaining about the "noise" and then switching to alternate channels. The signal from a single 49 MHz baby monitor can be picked up in a car from over a half mile away. The combined effect of thousands of these devices from 5 or 10 thousand feet up must be overwhelming!

Who uses which channels is determined by the Pentagon and the command structures of the different armed services. For the United States, the allocation of low-band frequencies to various units has been fixed for quite a few years, with changes occurring only when needed to correct interference and usage conflicts. Some channels are used only by the Army or Air Force, while others are used by different armed services.

Even with this large number of channels to choose from, conflicts still occur. Finding these channels and monitoring them can make for some interesting listening. For example, Army helicopters from Stewart International Airport near West Point in Newburgh, New York, operate frequent parachute jumping operations over central New Jersey on their assigned channel of 49.75 MHz. This also happens to be the channel used by the command post of the Pennsylvania Air National Guard's 111th Fighter Group at Willow Grove Naval Air Station near Philadelphia, as well as one of the tactical channels assigned to the Connecticut Air National Guard A-10s operating from Bradley International Airport near Hartford.

It's not unusual to hear both units' A-10 Warthogs flying at the same time as the Army UH-1 Hueys are operating—all within a few miles of each other and all tuned to this channel! I have heard requests from the command post for the Bradley A-10s to change channels, which they have done.

Monitoring Fox Mike

Military low-band FM signals employ wide-band modulation. Conventional scanners capable of receiving in the 30-50 or 30-54 MHz band segments usually are designed to receive the narrower bandwidth signals put out by non-military commercial radio transmitters. This is usually not a problem, though some military signals are somewhat distorted because their bandwidth is too great to be demodulated correctly by the scanner.

If you have a receiver like the ICOM R-7000 or Radio Shack PRO-2006, a wideband FM receiving mode can be selected. If you are having trouble receiving a military low-band signal, try switching to this mode. You will notice that the signal is now very clear. In fact, the audio quality of military low-band signals is similar to the high-fidelity quality of commercial FM broadcast stations.

Another way to see the effect of receiver bandwidth on audio quality is to tune in one of the TV audio carrier frequencies listed on page 18. In narrowband mode these signals are completely garbled. In wideband mode they are perfectly clear.

While a scanner or a receiver like the models mentioned is a good way to get started monitoring low-band military communications, one difficulty is the frequent occurrence of natural and man made interference, includ-

TABLE 1

Typical Air National Guard FOX MIKE Frequency Assignments

175th Fighter Grp. Baltimore, MD (A-10s)	111th Fighter Grp. Bradley Airport, CT (A-10s)
Channel No.	**Channel No.**
1 - 41.95	1 - 34.15
2 - 34.40	2 - 40.50
3 - 34.60	3 - 40.65
4 - 36.80	4 - 46.65
5 - 40.15	5 - 49.75
6 - 41.45	6 - 49.85

ing "skip." Baby monitors and cordless telephones can make monitoring of 46 and 49 MHz channels for military traffic almost impossible in many areas. The degree of this problem will vary with your location and proximity to non-military radio transmitters, as well as with the weather.

One way to reduce interference is to use military surplus radio equipment. Receivers like those found in the familiar AN/PRC-25 and AN/PRC-77 Vietnam-era manpack transceivers and in the R-442/VRC command radio are nearly ideal for monitoring military low-band communications between 30 and 75.95 MHz when only a few channels are of interest. For example, a military surplus receiver would be the perfect solution for the hobbyist only interested in monitoring the local National Guard helicopter channel. See the adjacent table for frequently used National Guard channels for selected states.

A nearly ideal receiving setup is the Uniden BC-760XLT scanner equipped with the optional subaudible tone squelch decoder (CTCSS) option. While 150 Hertz is not one of the standard tones available for programming into this scanner, 151.4 Hertz is. In my experience this setup allows you to scan up to 100 military low-band channels between 30 and 54 MHz and successfully decode only authentic military signals. You would need more than one 760XLT to cover all of the military low-band channels in this frequency range, but it's not really necessary. Which channels will be active to monitor in your area can be determined by checking the sources listed in the Bibliography at the end of this article.

The ultimate receiver setup for monitoring nearly all of the original (and most frequently used) 920 FOX MIKE channels would probably include either the ICOM R-7100 receiver (with a 900 channel memory capacity) or a computer control package like Tone Scan used with any of the numerous receivers with which it interfaces and an Optoelectronics DCS440 CTCSS tone decoder (all advertised in *MT*.) The receiver could then be programmed to scan from 30 to 87.975 MHz in 25 kHz steps and to unsquelch only when a 150 or 151.4 Hertz subaudible tone is heard on a signal.

Antennas for monitoring military low-band are an important part of the successful monitoring station. A good antenna system for receiving these communications should be omnidirectional, vertically polarized and resonant at either 30 MHz or at the lowest frequency you intend to receive. These full sized antennas tend to be quite large, but they do provide the best performance. Smaller, multiband scanner antennas usually result in compromised performance but should be adequate for getting started.

Photo by Brian Webb

National Guardsmen unload a generator during their operation to prevent looting in Northridge.

I use a late model military surplus collapsible low-band discone in my attic connected to my receivers via Belden 9913 low-loss coaxial cable. This antenna was obtained at a Amateur Radio "hamfest" fleamarket a few years ago, but I haven't seen any since. Fair Radio Sales in Lima, Ohio (419-223-2196) offers a variety of military surplus ground plane-type antennas. The original military ground plane is called an RC292. (The company also sells the AN/PRC-25 and R-442/VRC radio units mentioned earlier.)

A "homebrew" ground plane can also be constructed from copper wire and a female SO-239 coaxial cable panel connector. The center vertical element and the four radial elements should each be cut to equal a quarter wavelength at 30 MHz (about 7.5 feet.)

Enjoying Low-Band

My current low-band receiving setup (the 760XLT with the CTCSS option) is always turned on when I am in my listening post, with 100 selected channels between 30 and 54 MHz programmed into its memory, all with 151.4 Hertz tone decode. Not a day passes without activity popping up on several channels, some expected, some unexpected. Several of the channels have either constant or sporadic interference of unknown origin on them, but this is not a problem with the tone decoder.

Here are some of the highlights of what can be expected from monitoring FOX MIKE:

30.10	Army crash channel
30.45	Fort Hood, TX, range control (frequently heard via skip)
30.50	Army Silver Eagles demonstration team channel
32.30	Golden Knights parachute team channel
34.15	Frequently used by Army/Air Guard
34.90	Civil emergency channel
36.90	Flight test channel
38.10	My local New Jersey Army National Guard armory
40.10	Frequently used Army/National Guard helo (helicopter) channel
40.15	Frequently used Air National Guard channel
40.50	Army aircraft emergency channel
41.00	Frequently used Army/National Guard helo channel
41.50	Frequently used Army/National Guard helo channel

41.95	Navy/Marine Corps emergency approach/control tower
49.95	Flight test channel
53.70	Civil emergency initial contact channel
55.15	Air/sea rescue common
59.75	TV Channel 2 audio carrier
63.30	Air/sea rescue (also weather at Camp Drum, NY)
65.75	TV Channel 3 audio carrier
69.00	Air/sea rescue
71.75	TV Channel 4 audio carrier

Low-band military is especially interesting during "skip" propagation conditions. Signals from thousands of miles away are received as strong as local signals. Skip is frequently heard when weather fronts with violent storms exist between your location and the originating transmitter. Even though the current sunspot cycle is on the decline, skip can still be frequently found on the FOX MIKE channels just above 30 MHz.

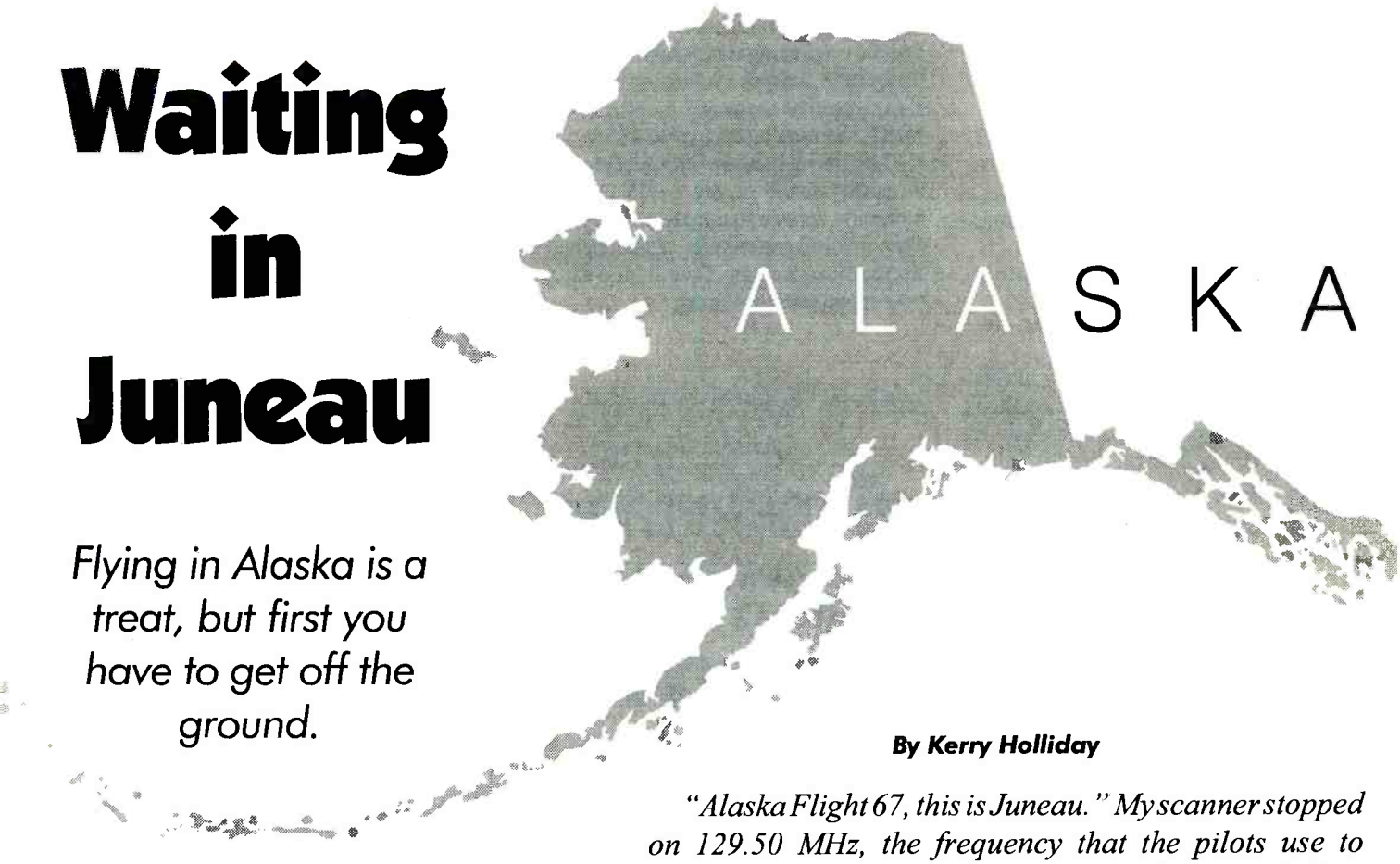
The greatest activity on military low-band is usually found during weekdays and on Saturdays, though National Guard night exercises involving a number of helicopters are frequent happenings. Tune in and discover year-round good listening!

TABLE 2

Frequently Used National Guard Channels in Selected States (MHz)

AL	38.20, 38.70, 41.05
CA	40.95, 49.00, 65.05
CT	40.90, 41.90
DE	46.90
FL	40.90
GA	44.00
IA	36.10, 36.70
IL	32.30, 47.00
IN	41.50
ID	41.50
KS	41.70, 49.95
LA	40.90
MA	38.70, 51.15
ME	41.20
MI	41.90
MN	41.40, 49.65
MO	41.00, 41.65, 41.90
MS	49.85
MT	40.65
NC	49.95
ND	49.80
NE	38.80
NH	32.10
NJ	38.10, 40.10, 41.05
NM	34.90
NY	41.00, 45.00
NV	32.30
OH	41.00, 46.80
OK	46.90
OR	40.90
PA	30.50
RI	47.00
SC	41.30
SD	41.50
TN	49.80
TX	36.80, 41.00, 46.80
UT	49.65
VA	40.20, 40.40, 52.75
VT	41.20
WA	36.55, 38.75
WI	40.80, 40.90, 46.70

Waiting in Juneau



Flying in Alaska is a treat, but first you have to get off the ground.

By Kerry Holliday

"Alaska Flight 67, this is Juneau." My scanner stopped on 129.50 MHz, the frequency that the pilots use to communicate with the airline people on the ground. "Say your fuel on board."

"Juneau, Flight 67, we have 17,000 pounds."

"OK, Flight 66, this is Juneau, same question."

"Juneau, Flight 66, we have 17,500. 1 think we only have enough fuel for one approach."

"OK, standby."

Photos by Harry Baughn

Flying in Alaska is always a treat, but first you have to get off the ground. I was scheduled to fly from Juneau to Seattle on Alaska Airlines Flight 66 on a Friday evening in January. The typical Southeast Alaska weather had been bad all day and only one other jet had managed to get in. Right now the last two Alaska Airlines jets of the day were in a holding pattern near Juneau at the Sisters Island VOR, one enroute to Seattle and the other to Anchorage. I had my Realistic PRO-44 scanner with me, and I was keeping both camps informed of the progress of their flights. Even the ticket agents were getting their information from me.

Continued on page 24

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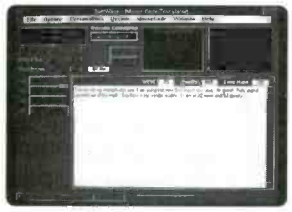

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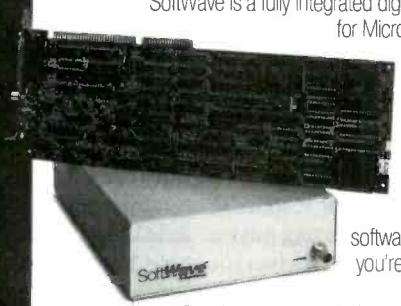

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Continued from page 22

Juneau International Airport isn't your usual airport. The terrain around the facility is steep and a ridge to the west of the runway makes an instrument landing system almost impossible. The airport has a localizer beacon to tell the pilots when they're lined up on the center of the runway, but on this Friday evening the localizer was out of service. The pilots had to make an approach using a non-directional beacon; a lot less exact than the localizer approach.

I went over to the counter and told the agent what I had heard on the radio. "It looks like both planes only have enough fuel for one try each."

The crowd gathered around. I told the crowd.

"Flight 66, Juneau," the airline channel again, "we show your bingo at 15,500 to make Seattle with Vancouver as an alternate."

"Roger."

"What's going on?" someone asked me.

"Well, each plane has enough fuel for one approach. If they don't make it, they'll just go right on and won't land in Juneau."

"Wonderful," said a woman who was trying to get to Baltimore.

"Welcome to Juneau," I said.

"Anchorage Center, this is Alaska 67," my scanner stopped on the control center frequency, 133.20 MHz. "We'd like to try Juneau."

"Roger, Alaska 67, your're cleared for published non-directional beacon approach," the controller at Anchorage Center said, "Report Sisters VOR inbound and then contact Juneau Radio on 118.7."

"Roger," said Flight 67.

"Good luck," said Anchorage.

"Here comes 67," I told the agent. The crowd moved to the window. I stopped my scanner on the Juneau Radio frequency.

"I can't see anything," someone said.

Of course he couldn't. It was foggy and dark and trying to rain and trying to snow. "It's 10 minutes from Sisters VOR to touchdown," I said.

"What will you hear?" a woman asked.

"Well, first, the pilot will report that he's at Sisters, then he'll report Barlow, then you'll hear one of two things next. If he says to turn down the lights, he made it, and he's going to land. If he says that he missed the approach, he'll go on to Anchorage."

The pilot called Juneau and got a special weather report. It didn't sound promising. A few minutes later the scanner squawked.

"Juneau Radio, Alaska 67, we're inbound at Barlow."

"Roger, call us when you're on the ground. I have the lights all the way up."

A de-icing operation in progress.

The crowd moved back to the window to look.

"I can't see anything," someone else said.

A few minutes later we heard the pilot call Juneau Radio. "Turn the lights down, please," said the pilot. I set the PRO-44 to scan again.

"He made it," I told the agent. She started the announcement just seconds after the plane touched down. Her announcement was drowned out by the cheers from the Anchorage camp as the people heard the plane using reverse thrust on the runway. Juneau is a small airport.

"Anchorage Center, Alaska 66, we had a company plane just land at Juneau, we'd like to try it."

"Roger 66, go ahead and begin your approach, I'll give you clearance just as soon as we get their time on the ground."

The mood in the Seattle camp became definitely upbeat.

"We might get out of here," I said.

"I'll believe it when I'm sitting in a seat on the plane and the wheels come up," said a lawyer.

"Where's 66?" the agent asked me.

"He's just starting his approach to see if he can make it while the window is open. He's not at Sisters, yet."

Now the Seattle camp really wanted to hear the radio. We listened to the pilot get the latest weather.

"Juneau Radio, Alaska 66 is at Sisters VOR inbound," said the pilot.

"Roger."

People crowded around the window to look.

"I can't see anything."

"Where is he?" someone else asked.

"He's over a radio beacon at Sisters Island, around 30 miles northwest of the airport," I said.

Minutes passed.

"Juneau Radio, Alaska 66 we're inbound at Barlow."

"Roger, report when you're on the ground," said Juneau. "I have the lights all the way up."

People pressed their noses to the cold glass.

"I can't see anything."

Minutes passed. Some people crossed their fingers.

"Alaska 66, we're on a missed approach," said the scanner.

We listened as the Boeing 737 flew over the airport in the clouds.

"Anchorage Center, this is Alaska 66," said my scanner. "Requesting clearance to Seattle."

I heard a few swear words as the crowd melted off. People tried to get tickets on other flights; many made phone calls to cancel rides at Seattle. The woman who needed to get to Baltimore decided to try the flight to Anchorage. The agent said that the Anchorage to Seattle flight was full. I decided to go home. The next flight to Seattle was at nine o'clock in the morning.

I didn't make it out the next day. I finally made it out of Juneau a week later. The airport was closed because of fog from Friday until Wednesday. That may not seem like big deal, but you can't drive to Juneau. The airlines can't bus you to another airport. The nearest jet-capable airport is 90 miles and 16 hours away by ferry in Sitka. And the weather can always be a problem in Juneau. Even the following Friday, the first flight I was scheduled to be on was canceled. But that's the way we like it in Juneau.

You need to remember when your scanner is flying with you that many airlines do not permit you to turn it on while you are in flight. Your receiver can interfere with the aircraft communications and navigation equipment. Yes, it can. Observe the restrictions where they apply.

I always travel with my scanner and my 2-meter Amateur Radio transceiver. I take the battery packs off both radios and put the batteries in plastic bags. I use plastic bags to keep anything from shorting the battery terminals and causing a fire. With the batteries safely off the radios and in their bags, I know I won't be causing any problems on the plane.

What about frequencies? You can always use a published list, but don't be shy. Ask the pilot as you get off the plane. I've always found them to be helpful. Also, look out the window as the plane taxis. Sometimes the ground control frequency is posted on signs along the taxiways. What about weather? Big airports have an Automatic Terminal Information Service that broadcasts the current weather for the pilots. You can easily find it by setting your scanner to search.

For my parting advice: Juneau is a great place to visit, but when you come, be prepared to stay awhile ... and bring your scanner!

FM Subcarriers

Tuning in a Hidden Resource

By Bruce F. Elving, Ph.D.

A form of FM broadcasting you may not have considered tuning in, either because of a lack of proper equipment or knowledge of the stations, is FM subcarrier radio. Known in the U.S. as SCS (secondary communications services) and in Canada as SCMO (subsidiary communications multiplex operations), the SCS signals are hidden in the sidebands of many FM radio stations. Sometimes you can hear the subcarrier by tuning carefully to the side of a strong nearby station, but usually you will need a special radio or adapter device connected to your radio to detect these hidden programs.

SCS stations have been around since the 1950s when the Federal Communications Commission decided to give the struggling FM medium a shot in the arm by permitting stations to add background music to stores and selling subscriptions. Later, talking books for the blind were added as the FCC moved to deregulate SCS. Now, in certain cities, you will find Haitian French, Korean, Iranian, Russian, Greek and other foreign languages, as well as the relaying of programs and data to computers—all on FM subcarriers. One Christian service—the Children's Sonshine Network based in Grand Rapids, Michigan—is uplinked to a satellite to be sent out exclusively on FM subcarriers.

Other uses for SCS include other types of music such as light rock, paging, and station telemetry. Some stations use SCS for sports and special events relaying. WMBI-FM 90.1 Chicago, owned by the Moody Bible Institute, has an SCS subcarrier with an alternative religious format.

Listening in, you may catch informal comments by announcers when they are otherwise "off mike." One listener complained about a Tampa, Florida, station: "You hear the station announcers when they are not on the air and sometimes they're swearing."

A Neglected Resource

I have been "somewhat" interested in FM subcarriers for a few years, perhaps to the point of being a one-man pressure group to promote its easy availability by the general public! With advances in electronics, such as use of the integrated circuit, small circuit boards can be produced to make FM-SCS incorporation possible in all but the smallest FM or FM-AM radios.

Only about 20 percent of the 6000 FM stations in the U.S. make use of an SCS. Were broadcasters and the public better informed about this energy-efficient resource, which could provide unique programming without having to create more radio stations, I believe the percentage of SCS usage by stations would be much higher. It might also mean a slowdown in the creation of superfluous radio stations. With SCS and a public widely able to tune it in, an FM stereo station could offer an alternative talk or mono music source on its sideband.

Quotrek hand-held FM/SCS receiver (left) and early FM/SCA installation featuring an outboard adapter on a Blaupunkt FM-AM car radio.

Only a few companies in the U.S. now make SCS radios, including Compol in New Hampshire and Dayton Radio in Florida, while SCS Radio Technologies in Missouri (800) 944-0630, and my FM Atlas Electronics make modified radios and adapters to tune in subcarriers. Data Broadcasting Service in California provides a small hand-held receiver, (called QuoTrek; pictured) into which you can punch up certain stocks and see the latest updates as the station sends out encoded information. The receiver can be purchased or leased, in addition to a monthly fee for the service.

DXing FM SCS

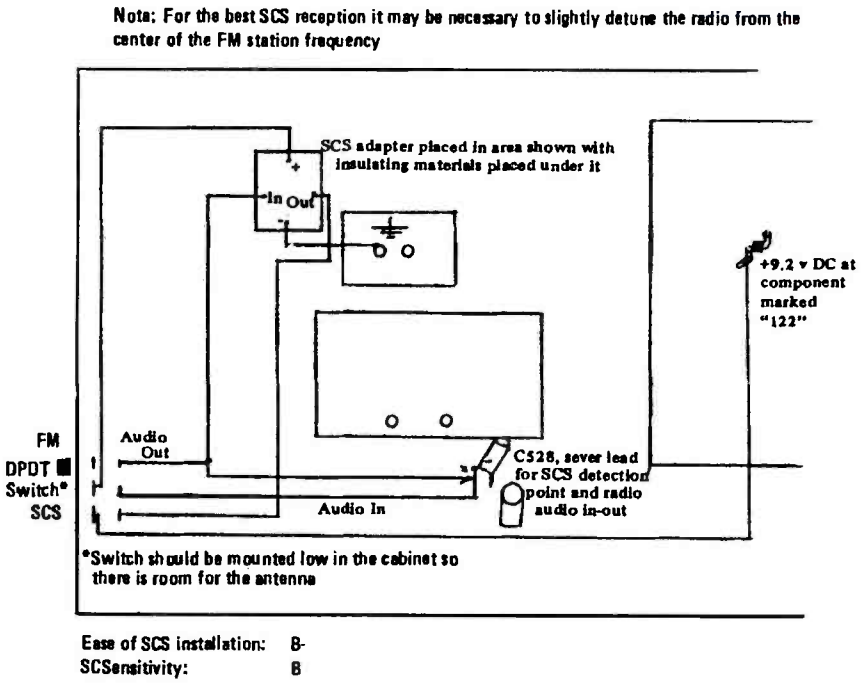
The FM subcarrier signal has only about 10 percent of the effective power of the main station. That means a 50 kW (effective radiated power) FM station that covers 52 km with a strong primary signal, would be only 5 kW on its subcarrier, and serve only about 32 km with an equivalent signal. That's not an earth-shaking difference at all during a DX "opening," when unusual propagation conditions exist.

Just like listening for distant main channel FM stations, you can likewise expect to hear FM subcarrier signals conducted by skip, tropo ducting or extended ground wave. I once DXed, from Duluth, Minnesota, a station in Harlingen, Texas, with its Muzak subcarrier. I have the station verification to prove it!

Enabling Your Receiver

Folks who are technically inclined and who have experience soldering in small places might enjoy modifying their own FM radio to receive subcarriers. I always install a DPDT to switch both audio and power to the adapter when I modify a radio. That permits instant flipping from the regular

FIGURE 1: *Grundig Satellite 500FM/SCS Installation*



program to the subcarrier. Figure 1 is just one of the over 100 SCS modifications available for many models of car, home, portable radios (notably the GE Superadios), clock radios and FM tuners. Scanners like the Realistic® Pro-2006 or shortwave radios, such as the Sangean ATS-803A and ATS-818CS, can also be modified. The illustrations show where on the radio circuit board to make the connections for audio in and out, SCS detection point, voltage point and ground, as well as locations for mounting the adapter and switch.

Most SCS stations use the time-honored 67 kHz frequency (measured from the center of the FM station channel), but more and more are using the newer 92 kHz channel. A few make use of 57 kHz for Cue tone paging and Seiko data, which will merge with the national RBDS standard. RBDS stands for "Radio Broadcast Data System," which exists in Europe and is being introduced here for such things as digital display of station call letters or slogans, traffic alertings, and automatic selection of stations or formats. The 57 kHz data channel is devoid of talk or music, and is of interest to the casual user of a modified radio only to tell that it exists. If you use a tunable adapter, you can hear the carrier or the buzzes that may indicate the presence of data.

FM/SCS installations using a fixed adapter for either 67 or 92 kHz result in the best sound quality. It's locked in, and when you flip the switch you know which SCS band you are exploring. The radio remains fully tunable, from 88 to 108, so you can sample what SCS stations there are. A more versatile method is with a tunable adapter having a control to enable you to get any subcarrier a station may have—from 57 through 92 kHz. The newest tunable adapter is one with an LED (light emitting diode) that glows brilliantly when listening to an SCS emission. The drawback to the tunable adapter is its tendency to have a hissier sound quality, and operating the separation control to get 67 or 92 kHz takes some getting used to.

TV-SAP or "secondary audio program," is found on many TV stations' subcarriers. In markets like LosAngeles, you will find Spanish translations of popular TV shows, as well as some Russian and Korean, on SAP. Some stations use it for relaying of NOAA weather, and a growing number of public TV stations use the SAP for DVS—descriptive video service. DVS permits a blind person to hear an off-camera announcer describe, for example, who might be entering or leaving a room during a dramatic scene, and what the costumes look like.

TV-SAP is at 78.67 kHz, so if your local channel 6 station (found at 87.75 MHz and receivable on many FM radios) has an SAP, or you're using a radio that also gets TV audio, you can tune in the SAP range as well.

You may recall that in the April 1993 *Monitoring Times* I offered a modified GE Superadio. I'm currently offering the GE Superadio III (model 7-2887A), factory refurbished and/or in damaged boxes, with either a tunable adapter or fixed adapter for either 67 or 92 kHz, as well as a new radios and electronics catalog. The catalog is free from "FM Atlas," PO Box 336, Esko MN 55733-0336, but the radios, of course, I have to charge for! Prices for the modified GE SR III range from $83 with a fixed 67 kHz adapter or $98 with a tunable adapter and LED, to $149 with two fixed adapters—one for 67 and one for 92 kHz. Add $5.50 per radio shipping to the U.S. Or call (218) 879-7676 and place your order on VISA or MasterCard.

The *FM Atlas*, which I publish, lists stations known to have an FM subcarrier and what they use their subcarriers for. It mentions whether a station has a 67 or 92 kHz SCS or both. The new 15th edition is available now and is in the Grove catalog for $14.95. The data on the utilization of SCS subcarriers in North America comes from individual monitors and hobbyists, broadcasters, and SCS equipment suppliers.

Is it Legal to Listen?

There is an honest difference of opinion about the legality of tuning in FM SCS. I am not advocating piracy, and urge you to tune in SCS signals in the privacy of your home or vehicle, and not in any store you may own. It's best to get a letter of permission from your local broadcaster by visiting the station and asking a sympathetic employee to sign a simple statement, such as "This authorizes you to listen to our subcarriers for private enjoyment and not for commercial purposes."

SCS Radio Technology says in its promotions, "Find out how the pleasant medium of SCS music and special programs can motivate you and move you into a new dimension of radio listening." Only a small percentage of this under-used resource has been tapped.

Any way you do it—whether by a modified radio; by using an adapter kit, which (if you're technically competent) you can install in your existing radio; or by having somebody modify the radio for you—you're in good company. You'll be joining the many other DXers and electronics enthusiasts who are ready to help make subcarrier listening an important part of your tuning-in activities.

Bruce Elving has been an FM listener and DXer since 1948, has a Ph.D. in instructional communications from Syracuse University, and publishes the FM Atlas and FMedia! newsletter. He's has written for the Worldwide TV-FM DX Association, the Newark News Radio Club in the 1950s, and "DXing Horizons" magazine in the 1960s.

READING, 'RITING, AND RADIO

Carole Perry WB2MGP

Ham Radio Class is a required course for middle schoolers in one Staten Island school. But the kids don't mind—largely due to the enthusiasm of their teacher, Carole Perry, and the fact that this is no ordinary class. This is no "Mickey Mouse" course; there is a lot of learning going on amidst the fun. Students assemble their own Morse code trainers, and learn concentration as they pick out the tone being emitted by their partner's key in a roomful of simultaneous signals. They learn science as they study radio waves; geography, as they prepare for a specific contact, and learn enough about an area's geography, history, and culture to carry on an educated conversation. They draw maps, prepare reports to the class, keep logs, calculate propagation, and, of course, get to talk on the radio. Because Carole Perry is so adept at helping every student find something in which they can be successful, they also learn respect for themselves and each other.

As most of us who are radio nuts will agree, we are addicts not merely because radio is fun, but because we, too, learn a lot about life in the process. Isn't it about time you shared this great resource with a youngster?

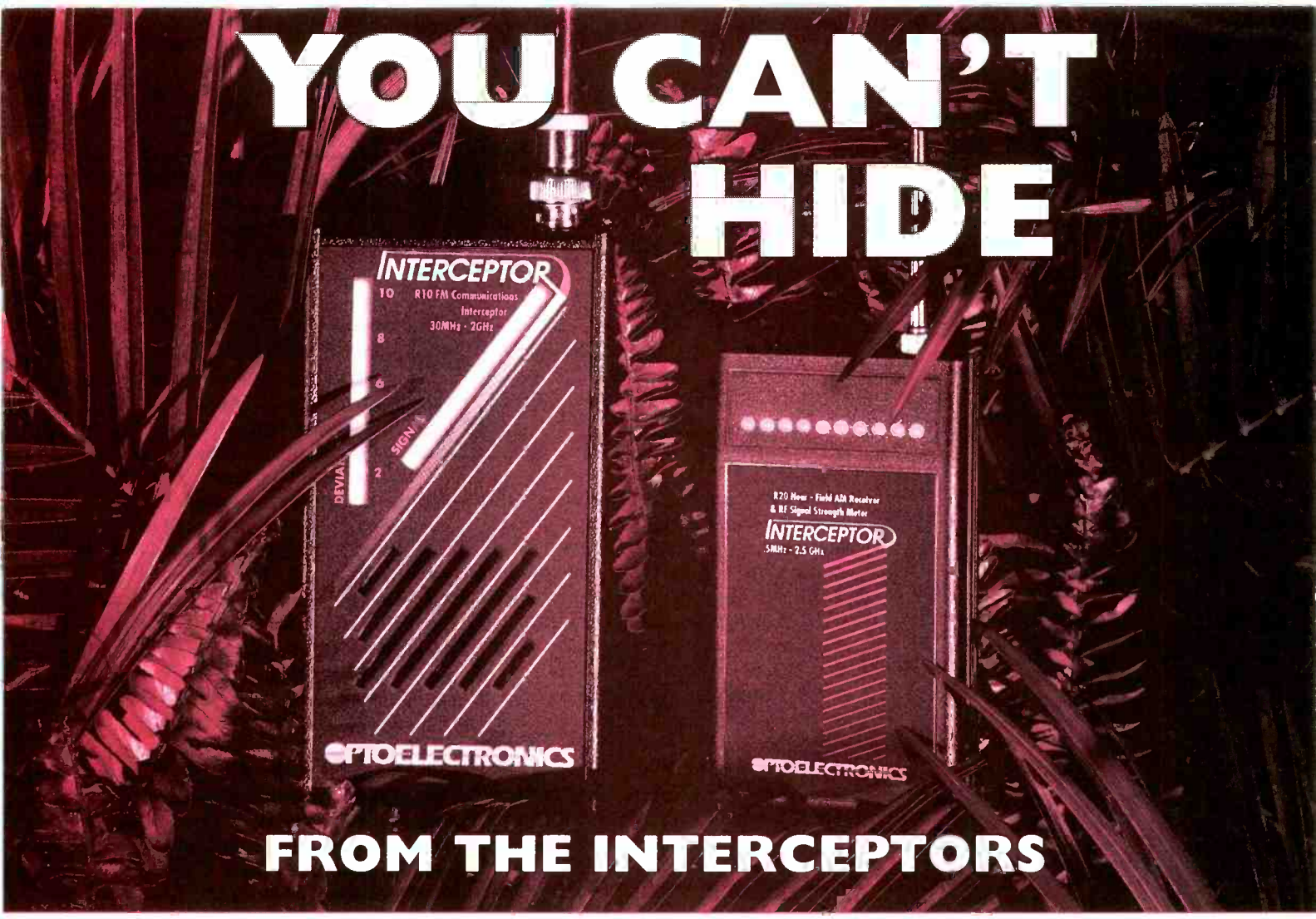
It was my great honor to be the featured banquet speaker and one of the forum presenters at The Fourth Annual Monitoring Times Convention in Atlanta, Georgia, last October. I expected it to be a well organized event, because Bob Grove WA4PYQ and his excellent staff were in charge. I wasn't prepared, however, for the warmth and receptivity of the attendees of this convention.

I was pleasantly surprised to discover the large number of ham radio operators in attendance. Hams always seem to share a special affinity for each other, and I was delighted to meet with many of them who came forward to introduce themselves.

Skip Arey WB2GHA introduced me at the Beginner's Workshop on Saturday morning. I described my work with children and amateur radio to an audience that was eager to learn moreabout becoming licensed hams themselves. Others were interested in new ideas for introducing radio to young people. The value of bringing radio into a classroom cannot be overestimated, and I love what I'm doing with the kids so much that it's a great personal pleasure to share my experiences with others.

Continued on page 30

YOU CAN'T HIDE



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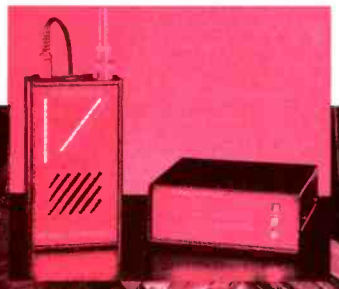

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Continued from page 28

Thirteen years ago, an innovative principal encouraged me to begin a pilot program called, "Introduction To Amateur Radio." Today I teach this program to 6th, 7th, and 8th graders at Intermediate School 72 in Staten Island, New York. I have 13 classes every term with a whopping enrollment of over 400 children. The key to the success of the course is that there's something in it for everyone.

The goal of the course is not to grind out novices; even though thousands of youngsters have become licensed through this program. The important thing is that the children are exposed to experiences they'll never have a chance to encounter in their other classes. Amateur radio in the classroom allows the teacher to introduce a myriad of skills for children of varying abilities and backgrounds to master.

The curriculum is stimulating for the gifted student, and challenging and interesting enough to even catch the imagination of the more "reluctant learners." Special education students with all kinds of disabilities, slow learners, non-English speaking students, and youngsters with physical handicaps have all excelled in ham radio class. Visits from handicapped hams to the classroom provide lessons that can't be taught from a book. No child in my program can tell me he or she can't do something, after they've heard stories of perserverance and determination from hams who have had all kinds of obstacles to overcome.

Another unique opportunity is provided when I invite retired ham radio operators to my classroom. The children enjoy hearing the stories of earlier days in radio. This provides enrichment that can't be beat. When I see a senior ham working with my students in our shack I know there's more going on there than just radio instruction. When you combine the eagerness and curiosity of youth with the wisdom and experience of age, you have a winning combination.

Ham radio in the hands of the right instructor will stimulate young minds. As an integral part of their work on the air, the children find they have to apply geography, math, science, and language arts skills! At the time, these applications may seem secondary to getting to talk on the radio, but they provide lessons that last a lifetime. Several former students have found theircareers through an interest or aptitude they discovered in ham class.

In my program, I always encourage the kids to participate in local community events with their radios. Providing communications for parades, marathons, and other local events are just a few of the ways licensed children can bring pride and service to their communities. I enjoy pointing out to grown-ups that youngsters who are busy "chasing DX" aren't being chased by the police.

One of the things I like best about radio in the classroom is that there's always something new going on. These days you can count on Mother Nature providing a natural disaster every year, which enables the class to get directly involved with current events in the world. The world is indeed getting smaller, and radio is the perfect tool to bring the world into the classroom. This applies to shortwave radio, as well as the amateur bands.

Also, you can never predict who will be getting back to you when you throw out "CQ." It's like going fishing. This surprise element in ham radio makes our "CQ All Schools Net" very popular with all my students. No one who was in my class the day astronaut Jay Apt N5QWL checked into our 10 meter net from the Johnson Space Center will ever forget the excitement in the air. The children felt so special that an astronaut who was shortly going up into space took the time to speak with them on the radio.

The opportunity for teachers to bring this kind of high motivational, extraordinary experience into the classroom is available through the SAREX (Shuttle Amateur Radio Experiment) program. You can write to the Education Activities Department at the ARRL in Newington, Connecticut to find out more about the SAREX program.

My students have even had the fun of speaking with operators from the Pentagon. We had such a good time with the contact that I took them up on their offer to visit at K4AF, the Pentagon amateur radio station (did you know there was one?). The youngsters back at my school went wild with excitement to be able to speak with their teacher operating from the Pentagon. Where else could the average child get to have these kinds of experiences? How often does the average student get to observe his or her teacher thoroughly enjoying the very thing she's encouraging them to participate in?

Contacts with children in other schools all over the world make for lively social studies lessons. We have "skeds" with students from other areas of the world, and have exchanged videosand pictures of what our respective schools look like. The children learn to respect the differences between the schools, and, most importantly, come to realize how much they have in common. School cafeterias tend to elicit the same responses from children, no matter where they may be located! The kids enjoy hearing that their counterparts on the west coast think that homework is unfair and that report cards should be abolished. I guess if I weren't standing right behind them at the radio, I'd find out what they really thought about their teachers, too.

The important thing is that the students come to believe, in a very painless way, that learning can be fun, and that school can be a non-threatening, exciting place. That's what amateur radio can do for a school.

Please join us on "The CQ All Schools Net" every Tuesday and Thursday at 17:30 UTC on 28.303 MHz. For further information about amateur radio in the classroom, contact Carole Perry WB2MGP at P.O.Box 131646, Staten Island, N.Y. 10313-0006.

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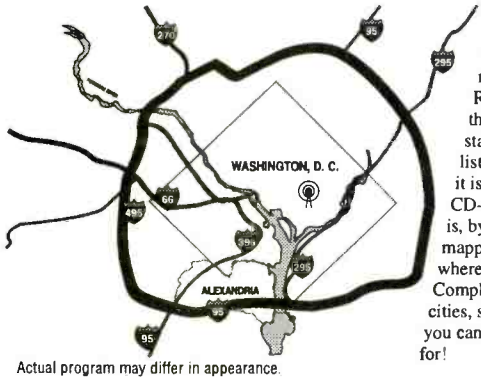

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GROVE ENTERPRISES

Larry Van Horn, N5FPW

Monitoring Utilities in Bosnia, Part "Deux"!

Listening in to the civil war in the former Yugoslavia is something *we have* been covering for over a year now (See "DXing the Land of Wars," June 1993 and "Utility World," Nov. 1993), but as the conflict drags on, new information is constantly being reported about HF communications from the region.

Photo courtesy of Canadian armed forces

At presstime, Serb forces had started a new offensive in the area, surrounding the Bosnian capital of Sarajevo and firing on UN troops stationed in the city. This military action could lead to another breakdown of the tenuous ceasefire between the warring parties and an unrestricted resumption of the bloody conflict.

The following new information will enable you to listen in on military operations associated with the civil war in Bosnia. This background information was sent in by the Dutch radio club,*ScanSearch Military Aircraft Communications (SC-MAC, ATTN Gerbrand Diebels, Roer 29, 5751 TJ DEURNE, Netherlands)*. Gerbrand Diebels, an official of the club, translated this update from the club's Dutch language magazine,*Airlift*. Times are in UTC, frequencies in kHz, and all transmissions are in USB, unless otherwise noted.

Operation Deny Flight

On April 12, 1993, NATO and United Nation countries began enforcing UN resolution 816 which established a "No-Fly zone" over Bosnia, Croatia, Serbia and the Adriatic Sea. Air forces participating in the enforcement of that resolution include: US Air Force (USAF), British Royal Air Force (RAF), Royal New Zealand Air Force (RNAF), and the French Air Force (FAF). Radar sites operated by UN and NATO troops based on land, sea and air help enforce compliance of the "No-Fly zone."

On land:

- Italian radar sites, callsigns: 'Pioppo', 'Bracco', and 'Fungo'.
- US Air Forces in Europe (USAFE) radar site in Italy, callsign: 'Maroon' (until December 1993), 'Morpha'(until March 1994), and 'Galley' (from March 1994).
- Hungarian radar site at Vesperem, callsign unknown
- Several radar sites in Bosnia, additional details unknown.

At Sea:

- NATO warships

In the Air:

- NATO and RAF AWACS aircraft, callsigns: 'Magic 5#' and 'Magic 7#'.
- FAF AWACS aircraft, callsign: 'Cyrano ##'.

These various radar sites use Link 11 (Alligator) data transmissions to exchange radar tracks and build up a total radar picture of the region. This information is then sent to sector operation centers (SOC) in Italy and Zagreb for further coordination of the enforcement effort.

Voice coordination frequencies for the Link 11 data transmissions have been monitored on 3303.5 and 3275.5 kHz. Callsigns monitored include 'Sasso' and 'Ruppe.' The United Nations protection force (UNPROFOR) monitoring coordination and control center (MCCC) located in Zagreb is believed to be part of this network, callsign unknown. Voice off-shore coordination nets between Italian radar sites and Italian naval vessels have been monitored on the following frequencies:

4660.0 ..... SOC 'Ruppe' (secondary) Monte-Verda, Italy
6262.0 ..... SOC 'Ruppe'
6997.0 ..... SOC 'Sasso' (primary) in Southern Italy

NATO has its own voice coordination nets. Allied Air Weapons Controllers (AAWC) station on 'MW' pass reports about friendly air activity and TOI's (Tracks of Interest) to other stations in the net. 'AW' is another AAWC callsign heard on voice nets which has been associated with a US Navy warship. The callsigns 'MW' and 'AW' have been heard working an unknown station using the callsign, 'Redcrown'.

Other frequencies used by NATO units for voice coordination include:

4066.0... Warning frequency linked with 121.5 and 243.0 MHz.
5131.0... Link 11 voice coordination
6723.0... Link 11 coordination between AWACS aircraft and USAF ground radar sites. Also UN Navy/Air Force link coordination frequency.
11175.0... Link 11 voice coordination

A USAFE radar site in Germany was moved to Italy to support Operation Deny Flight. That station, callsign 'Maroon' was heard on a variety of frequencies in the weeks prior to April 13, 1993. Communications from 'Maroon' have been reported on: 3940.0, 4500.0, 5182.0 and 5703.0.

NATO AWACS aircraft are being used to support military operations in Bosnia. These aircraft have been reported on a variety of HF, VHF and UHF frequencies. AWACS HF tactical channels have been identified with 'N' channel designators on these frequencies:

NF	3225.0	
NG	4758.0	
NH	5706.0	
NI	6762.5	Daytime Secondary
NJ	8965.0	
NK	11270.5	Daytime Primary (75 baud RTTY has also been noted on this frequency between AWACS aircraft and ground stations)
NL	15015.0	
NM	17996.5	

One NATO flight crew frequency has been monitored that does not appear to have an 'N' designator: 11228.0 kHz. This channel seems to be less tactical in nature. An entry by Ary Boender in this month's loggings could indicate a possible change in the N-letter

AWACS designator. Ary intercepted a German Navy or NATO intercept on 4631 that mentioned a channel N11 on 6731.0 kHz. Further monitoring will show if the N-designators are being changed.

French AWACS air crews are part of the operation as well and have been monitored in French and English on 4704.0, 5701.5, and 11215.0 kHz.

Offensive and Close Air Support Communications

To provide UNPROFOR forces in Bosnia with air support and to secure the "Safe Havens," NATO has been authorized to use limited air power. UNPROFOR has to request this support from the Air Operations Coordination Center (AOCC) in Kiseljak (near Saravejo), callsign 'Lombo.' This station coordinates close air support (CAS) missions working closely with EC-130 aircraft using the callsign 'Bookshelf'. Another flying command post associated with these operations is an EC-135 aircraft using the callsign 'Cricket'.

'Bookshelf' and 'Cricket' coordinate CAS missions between AOCC and the UN's forward air controllers (FAC) on the scene. These forward air controllers can talk combat mission aircraft to the targets via radio or point to the targets using laser technology. Voice coordination with combat mission aircraft use one of five HF frequencies, but only four have been confirmed: 3178.0 (also used by Oostende Radio in Belgium), 4789.0, 5788.0 and 11173.0 in both USB and LSB modes. FAC callsigns monitored include: 'Disney', 'Rocky', 'Fortune' and 'Bullfighter'.

Fighters on CAS missions are controlled by an AWACS aircraft into Bosnian airspace. Once in Bosnian airspace the strike section aboard 'Bookshelf' or 'Cricket' will transfer control of the mission to the forward air controllers on the ground.

'Bookshelf' has separate communication channels with their operational headquarters (7th ACCS) at Aviano AB or HQ 5 ATAF in Viscenze, Italy. The 7th ACCS normally uses the callsign 'Chariot', but when talking with the EC-130 they use the callsign 'Tracker'. Most of the communications use secure RTTY or scrambled voice comms, but sometimes you'll pick up some information in the clear. Try the following frequencies in both LSB and USB:

4450.0 ... Push 82 designator	8083.0 ... Push 154 designator
5103.5 ... Designator unknown	9118.5 ... Push 155 designator
6717.0 ... Push 153 designator	11161.0 ... Designator unknown

Airbridge Saravejo

Relief flights into Saravejo airport (LYSA) use 5462.0 to report to the military at the airport their estimated time of arrival (ETA) and cargo on board. In turn, military personnel on the ground, callsign 'Airbridge' supply the incoming flights with weather, and any reports of shelling or snipers around the airfield. Another station heard on this frequency is 'Reddog', which is believed to be a radar site monitoring the airway into Saravejo.

Relief flights from the various participating air forces are also heard on their own communication networks.

German Air Force, DHM91-Munster, Germany:
3144.0, 5591.0, 5688.0, 5691.0, 6692.0, 6718.0, 6762.0, 8965.0 (Kilo ch), 9000.0, 1187.0, 11217.0, 11226.0, 11272.0, 13203.0, 13245.0, 13248.0 (Oscar ch), 13342.0, 17992.0 (Whiskey ch), and 18006.0

Belgium Air Force, ONY77-Brussels, Belgium
8989.0, 11168.0, 11275.0, 18002.0, and 23275.0

French Air Force, FDY-Orleans, France
9080.0, 9135.0, 10308.0, 10420.0, 11415.0, 11518.0, 13239.0, 13901.0, and 23249.0

Italian Air Force
5270.0, 6747.0, 11234.0 and 13220.0
Primary long distance channels: 6715.0, 11357.0, and 23134.0
Additional air to ground frequencies: 6743.0, 6760.0, 8991.0, and 13220.0

Royal Netherland Navy, PBV-Valkenburg, Netherlands
3117.0, 5695.0, 5703.0, 6689.0, 6727.0, 8970.0, and 11182.0
(Frequencies are sometimes used by Orion aircraft and F27 aircraft of the Dutch Air Force inbound to Italy, Croatia and Bosnia.)

Other frequencies to monitor

With US/UK aircraft involved in CAS missions for UN troops on the ground in Bosnia and airlifts of cargo, listeners should keep a close watch on USAF GHFS frequencies and the RAF STCICS channels.

USAF Global HF System (GHFS)
4725.0, 6738.0, 6750.0, 8967.0, 8993.0, 11176.0, 13201.0, 15015.0, and 17975.0

RAF Strike Command Integrated Communications System (STCICS)

-- ..... Sierra Tango (ST)	8190.0 .. Romeo Alpha (RA)
4540.0 .. Uniform Tango (UT)	8965.0 .. Romeo Echo (RE)
4707.0 .. Delta (D)	9032.0 .. Delta Whiskey (DW)
4742.0 .. Foxtrot Sierra (FS)	11204.0 .. Alpha (A)
5713.0 .. Designator Unknown	11224.0 .. Designator Unknown
5729.0 .. Romeo Delta (RD)	11234.0 .. Hotel Whiskey (HW)
6738.0 .. Bravo (B)	13257.0 .. Foxtrot (F)
	18018.0 .. Designator Unknown

Naval Frequencies

NAVSOUTH voice coordination frequencies are used to exchange radar tracks of vessels in the Adriatic Sea and the visual investigation of those radar tracks by NATO ships. NATO naval blockade frequencies recently monitored include: 4711.0, 4930.5, 5310.0 and 7904.0. One NAVSOUTH data link, voice coordination frequency has been reported on 4763.0.

US Navy tactical frequencies, used by the fleet in the Adriatic Sea include: 4702.0, 4711.0, 6693.0, 6720.0, 6770.0, 6804.0, 8972.0, and 11267.0. Italian warships supporting Adriatic operations have been heard on: 3647.0, 4082.5, 4721.0, 4724.5, 6747.0, 8272.0, and 8302.5

Ground Forces

UNPROFOR is using 3830.0 and 6260.0 (LSB/USB) to coordinate land convoys, report delays, snipers and roadblocks. Units use number callsigns such as '1093'. Troops from various nations have been monitored on the following frequencies:

(Dutch Troops): 2838.5, 3203.5, 3250.5, 3258.5, 3273.5, 3520.5, 4110.0, 4445.5, 4500.5, 4514.5, 4558.5, 4688.6, 5061.5, 5175.5, 5383.5 and 6778.5

(British Troops): 4686.0, 5095.0, 5725.0, and 6773.0

(Belgium Troops): 10159.5, 10232.5, and 10403.0

The International Committee of the Red Cross (ICRC) has an active communications net in Bosnia, USB/LSB: 6990.0, 6992.0, 6996.0, and 6998.0

The United Nations High Commission for Refugees (UNHCR) has one reported frequency: 6957.0 kHz.

Only time will tell what the future holds for the wartorn lands of the former Yugoslavia. Monitors, especially those in Europe, can have a ringside seat to these events by turning on their radios and listening to the frequencies from the Utility World.

Utility Loggings

UTILITY WORLD

Larry Van Horn

Abbreviations used in this column

AF	Air Force	MHz	Megahertz
AIG	Address Info Group	NATO	North Atlantic Treaty Organization
AM	Amplitude Modulation		
ARQ	Synchronous transmission and automatic repetition teleprinter	NAVTEX	Navigation and meteorological warnings and urgent information for ships
ARQ-E3	Single channel ARQ teleprinter system	NMCC	National Military Command Center
ATCC	Air Traffic Control Centers	NOAA	National Oceanographic and Atmospheric Administration
AWACS	Airborne Warning And Control System	NORAD	North American Air Defense Command
CAP	Civil Air Patrol		
CCG	Canadian Coast Guard	PACTOR	Teleprinter system combining certain characteristics of packet radio and SITOR.
CAMSLANT	Communication Area Master Station - Atlantic (USCG)		
COMSTA	Communications Station	RTTY	Radioteletype
CW	Continuous Wave	SAM	Special Air Mission
FCC	Federal Communications Commission	SANA	Syrian Arab News Agency
		SITOR	Simplex teleprinting over radio
FEMA	Federal Emergency Management Agency	SITOR-A	Simplex teleprinting over radio, mode A
FHWA	Federal Highway Administration	SITOR-B	Simplex teleprinting over radio, mode B
ID	Identification	STRATCOM	Strategic Command
IFSS	International Flight Service Stations	UN	United Nations
		Unid	Unidentified
MARS	Military Affiliate Radio System	U.S.	United States
		USAF	U.S. Air Force
Meteo	Meteorology	USB	Upper Sideband
MFA	Ministry of Foreign Affairs	USCG	U.S. Coast Guard
		UTC	Coordinated Universal Time

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

478.0 VON-St. John's, NF, Canada, with International Ice Patrol bulletin in CW at 0050. (Robin Hood-UK)

514.5 IFB-Bari Radio, Italy, with traffic list in CW at 0100. (Hood-UK)

518.0 GNI-Niton Radio, England, with NAVTEX broadcast including navigation warnings and oil rig moves at 1638. ESA-Tallin Radio, Estonia, with NAVTEX broadcast at 1630. OST-Oostende Radio, Belgium, with NAVTEX broadcast at 0653. All the above NAVTEX broadcast used SITOR-B mode. (Ary Boender-The Netherlands)

525.0 DAN-Norddeich Radio, Germany, with CW traffic list at 1530. (Boender-Netherlands)

2182.0 The following station were heard on this international emergency and calling channel at various times in USB: DAO-Kiel Radio, Germany; EJM-Malin Head Radio, Ireland; FFB-Boulogne Radio, France; FFC-Arcachon Radio, France; FFM-Marseille Radio, France; GHD-Hebrides Radio, England; GLD-Land's End, England; LGQ-Rogaland Radio, Norway; LGT-Tjome Radio, Norway; OXB-Blaavard Radio, Denmark; OXJ-Thorshavn Radio, Denmark (Fareor Islands); SAG-Goteborg, Sweden; VCP-CCG St. Lawrence, PQ, Canada; Cagliari Radio, Spain; and Chipiona Radio, Spain. (Boender-Netherlands)

2680.0 IDC-Cagliari Radio, Italy, working m/v *Ambassadir* (P3EY5) in USB at 2130. Ship was transmitting on 2056. (Hood-UK)

3086.5 3 Oscar Hotel calling unid station in USB at 0325. (Fernandez-MA)

3275.0 Unid German military stations: 2HME and F455 in German using USB at 1545. (Boender-Netherlands)

3303.5 UN 'Deny Flight' station MW working E, D, F, BR, OQ, EW and ME in USB at 1940. (Boender-Netherlands)

4028.0 Spanish female 5-digit number station in AM at 0600 (Monday UTC). (Kevin Hecht-Devon, PA)

4090.0 U.S. Navy Foxtrot Mike net noted here most evenings in USB. (Jeff Kane-Brooklyn, NY)

4295.0 HWN-French Naval Radio, Paris, France, with RY/SG test tape in 75 baud RTTY at 2224. (Hood-UK)

4381.0 WLC-Rodgers City Radio, MI, with ship and buoy observation report at 0147 in USB, (Allen Renner-Ambler, PA) *Radiotelephone channel 409-Larry.*

4600.0 MFA Warsaw, Poland, with POL-ARQ messages at 1855. (Boender-Netherlands)

4601.0 Unid station WAWY calling EJD5 and DOQ3 in CW at 2200. (Boender-Netherlands)

4610.0 MacDill AFB working SAM 203 on F-463 with signal checks. Also heard on F-267 and F-290 in USB at 0242. (Jeff Jones-Tracy, CA)

4631.0 German Navy or NATO communications: J980 working ZC41, GLR3 working ZC41, I741 working ZC41, DHJ59-German Navy Wilhelmshaven working GLR3 in USB at various times. GLR3 mentioned Channel N11 on 6731.0. (Boender-Netherlands)

5045.0 English female 5-digit number station in AM at 0030 (Wednesday UTC). (Hecht-PA)

5211.0 KCA35-FCC Belfast, ME, checking into the National Emergency Coordination Net (NECN) at 0316 using USB. Lot's of CAP and MARS stations involved. A few government/industry stations heard including WGY-NOAA, Duvall, WA; WWJ44-FHWA, Dahlonega, GA; and WNRE962 Unit 2, Bell Communications Research (Bellcore), Cleveland, OH. Also noted using FEMA frequency 10493.0. (J.L. Metcalfe-KY)

5416.0 Spanish female 5-digit number station at 0700 (Monday UTC) in AM. (Tom Mazanec-Maple Heights, OH)

5710.0 Lajes calling Nightwatch for a radio check, then went to 2035.0 in USB at 0315. (Jones-CA)

5732.0 Landbase working Shadow ## on 57 at 0140. Will remain in local area. Told aircraft to notify Hurlburt command post before starting low level exercise. Command post working Shadow 94 on 57 at 0041. Unid aircraft with phone patch through Ascension requesting weather for Hurlburt and Maxwell AFB at 0033. Omaha # working Slingshot saying they had copied all in the green at 0014. All comms in USB. (Jack NeSmith-Deltona, FL) *I like your wierd frequency, Jack. Readers, this is a good one to watch-Larry.*

5930.0 Spanish female 4-digit number station in AM at 0430, same broadcast as 6840 at 0230. (Anthony Jon Franz-New Port Richey, FL)

6227.0 KFC238-Newport, RI, (New England Marine Club) aksing for sailing vessel position reports in USB at 2204. (Renner-PA)

6535.0 IFSS Dakar, Senegal, working KLM 797 (selcal EHAF) and Lufthansa 7267 (selcal FMDJ) in USB at 0350. (Tom Hites-Colorado Springs, CO) *Welcome back, Tom; nice to see you in the Ute World pages again-Larry.*

6729.0 Magic 71 (female on AWACS aircraft) with "ODPI" (male, guess it was a French operator), asking for relay to another AWACS. Many radio checks foloowed in USB at 1235. (Denis Bonomo-France)

6731.0 Danish AF V50 working DHJ59-German Navy Wilhelmshaven, mentioned aircraft was also ZBZ5 at 2020. Dutch AF B6U working DHJ59 at 2055.

6770.0 Unid station 70 calling 04 for radio check in USB at 0606, no joy. (Boender-Netherlands)

6772.0 Unid station 'Ici La Vendeuse' working unid station with talks in French about hotel reservation in USB at 0627. (Boender-Netherlands)

6779.0 DHJ59-German Navy Wilhelmshaven working several vessels making ship-to-shore telephone calls in USB at 0032. (Fernandez-MA)

6913.0 AAR4MX-U.S. Army MARS station (north of Green Bay, WI), calling several stations in USB at 2320. Is this a new MARS frequency? (James T. Lee-St. Paul, MN) *No, it is listed in the Grove Shortwave Directory, 8th edition-Larry.*

7510.3 HZN-Jeddah Meteo, Saudi Arabia, with with codes and aero traffic using 100 baud RTTY at 1712. (Robert Hall-Capetown, South Africa)

7643.9 RFVI-French Forces Le Port, Reunion Island, with ARQ-E3 signal idling at 1720. (Hall-RSA)

7687.0 SAM 203 working Andrews for next day preflights (Pri F-251, Sec F-948, Back-up F-623) in USB at 0215. (Jones-CA)

7720.6 ABM6USA-U.S. Army MARS with PACTOR messages at 2048. (Metcalfe-KY) *That's Schofield Barricks, HI-Larry.*

7753.2 NMN-CAMSLANT Chesapeake, VA, using 75 baud RTTY in comms with cutter (callsign NELP) at 0230. (Metcalfe-KY) *NELP is not a coast guard cutter but the naval reserve training ship USS Joseph Hewes (FFT-1078)-Larry*

7763.0 English female 4-digit number station in AM at 0136, off by 0140. (Barry Williams-Enterprise, AL)

7888.0 Spanish female 5-digit number station at 0900 (Sunday UTC) in AM. (Mazanec-OH)

8026.0 Andrews working SAM 27000 on F-290. Checked three locations out of/near South America. ID'ed one as Rio de Janeiro. Andrews operator commented on how poor HF propagation was and said he thought the Panama site would be a good one to try, but Andrews no longer had access to the Panama site in USB at 0830. (Jones-CA) *Very interesting and a good one, Jeff-Larry.*

8433.0 XSG-Shanghai Radio, China, on 8 MHz channel 834, with SITOR ID

marker at 1535. (Hood-UK)

8915.0 ATCC Honolulu, HI, working United 809 with phone patch concerning engine problems in USB at 0552. (Hites-CO)

8967.0 White Ash working Offutt AFB with Flash priority phone patch to the NMCC regarding White Pinnacle exercise initiated by USSIGSTRAT (?), 3 minute response time was rated satisfactory, in USB at 0214. (Jones-CA)

9009.0 Brazilian Air Force (FAB)-Rio de Janeiro, Galeao base working FAB 2455 (C-130) at 1954. (Marcelo Toniolo dos Anjos-Osasco, SP, Brazil) *Welcome to the column, Marcelo; hope you check in often. Great FAB logs, new information here-Larry.*

9013.0 Aerolineas Argentinas-Buenos Aires, Argentina, LDOC working Argentina 881 in USB at 1920. (Anjos-Brazil)

9251.0 English female 5-digit number station in AM at 0530. (Franz-FL)

9320.0 Andrews working SAM 28000 on F-616 in USB at 2200. (Jones-CA)

9330.0 Number station, 5-digit in CW at 0231. (Franz-FL)

9610.0 Spanish female 5-digit number station in AM at 0400 (Friday UTC). (Hecht-PA) *That's an unusual frequency, Kevin; wonder if that might have been a second harmonic of 4805 kHz, given the poor transmission quality we've seen coming from Cuba lately?-Larry*

9965.0 English female alternating 3/2-digit and 5-digit number station in AM at 0410 (Monday UTC). (Hecht-PA)

10470.0 BLM23-Chengdu Meteo, China, with coded weather broadcast using 50 baud RTTY at 1912. (Boender-Netherlands)

10493.0 Nightwatch 03 (USAF E4B) working FEMA stations WGY908 and WGY912 in USB at 1611. Switched to 11957 (F-30) for data. Also using FEMA 10588.0 and USAF 15048.0 with Nightwatch 01 and WGY913. (Metcalfe-KY) *How do you known that Nightwatch 03 is a E-4B aircraft? I bet we will have a lot of controversy over these Nightwatch callsigns. How about our other readers' thoughts on who these callsigns are?-Larry*

10892.0 GXQ-British Army, London, England with VFT/RTTY test tape on several channels at 1715. (Hall-RSA)

10895.0 Sidecar calling 46 Quebec in USB at 2112. Is Sidecar a NORAD callsign? (Metcalfe-KY) *I have only seen this call on NORAD channels. The 46 Quebec is interesting, and my list doesn't show any previous mil activity on this frequency-Larry.*

11063.2 LZV2-Sofia Meteo, Bulgaria, with 50 baud RTTY weather codes at 1707. (Hall-RSA)

11080.2 SANA Damascus, Syria, with RY/ID's then French news using 50 Baud RTTY at 1700. (Hall-RSA)

11146.5 LOV3?, with possible coded weather at 2337, 100 baud RTTY. Weak signal caused callsign to be garbled. Also on 11068.5 at the same time, same mode. (Metcalfe-KY) *Possible is LOR-Puerto Belgrano, Argentina (Naval Radio)-Larry.*

11176.0 Lion 84 (USAF C-130) working Raymond 9-Howard AFB, Panama, with phone patch through Albrook in USB at 2350. Tiger 3 working Tiger Duty via phone patch through MacDill. No 4 engine out in USB at 1930. Later ID'ed as LC081. (Fernandez-MA) *Tiger 03 is a P-3C out of VP-8; the Tigers at NAS Brunswick, ME-Larry.*

11214.0 USAF aircraft working Raven, using the callsigns 01 and 24 with phone patch traffic in USB at 1850. (Williams-AL)

11217.0 669 (possible USAF refueling tanker) working Liberty (U.S. STRATCOM command post Beale AFB, CA) with tactical followed by informal communications in USB at 1920. (Fernandez-MA)

11223.0 French AF Biscarosse working V59 in USB at 1453. (Boender-Netherlands)

11234.0 Italian AF Aviano working unid aircraft in Italian using USB at 1621. (Boender-Netherlands)

11243.0 Teamwork w Normandy in USB at 1905. (Fernandez-MA)

11270.0 Magic 57 (AWACS) calling INY in USB at 1916. (Bonomo-France)

11408.0 Pockmark working Nightwatch on P-382 in USB at 1825. (Jones-CA)

11418.0 USAF stations Steelwork and Activated in USB at 2312. Mentioned frequencies 11675.0 and 12775.0 also. Returned to X-903 (6730.0) around 2330. (Metcalfe-KY)

11421.0 PAP Warsaw, Poland, with Polish news using POL-ARQ at 1923. (Boender-Netherlands)

11432.0 Brazilian Air Force (FAB)-Brasilia working other station code named "Cachimbo" in USB at 1226. (Anjos-Brazil)

11476.0 S4P calling COMSTA New Orleans in USB at 2304, no reply. (Fernandez-MA)

11484.0 Air Force 2 working Andrews on F-521 in USB at 1529. (Jones-CA)

12165.0 English female 5-digit number station in AM at 0130. (Hecht-PA)

12171.2 PWX33-Brazil Naval Radio, Rio de Janeiro, Brazil, with 75 baud RTTY test tape at 1255. (Hall-RSA)

12228.2 SNN299-MFA Warsaw, Poland, with 75 baud news at 1638. (Hall-RSA)

12458.0 Unid Latvian vessel (callsign YLAL) working a female operator. Ships in CW collecting messages for further transmission to Riga Radio. Vessels included *Davids Sikejros* (YLAX) and *Pols Robsons* (YLBS). YLAL then asked YLBS to move to 16800 where YLBS changed to SITOR-B to send several messages. These two worked crossband between 2225 and 2235. (Hood-UK)

12462.0 ULLA-*Petrozavodsk* (tug) working UJE (probably in Moscow?) passing telegram (in English!!) about ETA in Ventspils. In CW at 0705. (This frequency regularly used by vessels working UJE). (Hood-UK)

12486.5 LHXV-*Nordstar* (fishing vessel) working Rogaland Radio in SITOR-A at 1615. (Hood-UK)

13974.0 NNN0ICE and other stations in U.S. Navy MARS Antarctica net in USB from 2300-0100. (Renner-PA)

14421.0 Spanish female 3/2-digit number station in AM at 0028 (Wednesday UTC). (Jones-CA)

14467.3 DDH8-Hamburg Meteo, Germany, with 50 baud RY test tape at 1512. (Boender-Netherlands)

14481.8 RFFAAS-Guerre Dirmat Paris, France, with ARQ-E3 messages to AIG 1955 and others, traffic in French at 1131. (Hall-RSA)

14545.0 4XZ-Israeli Naval Radio, Haifa, Israel, with CW marker at 1514. (Hood-UK)

16090.0 Missionary working Awaken in USB at 1848, moved to channel 2 Lima. (Jones-CA)

16980.0 UGW-Novorossiysk Radio, Russia, CIS, (new call for former UNQ) working a fishing factory ship UBXV-*Novator* in CW at 1145. UGW is not the same station as UFN-Novorossiysk. (Hood-UK) *What's the difference, RH, and what are the frequency plans for each-Larry?*

18290.0 Andrews working SAM 203 in USB, checked out two more sites on this frequency. (Jones-CA)

18316.7 Egyptian Embassy, El Djara'ir, Algeria, with SITOR-A 5 letter groups at 1202. (Hall-RSA)

18380.4 RFFDCC-Burosernat Rennes, France, with French ARQ-E3 traffic to various French Forces bases at 1225. RFFABC-French Forces Paris, France, with 5 letter groups using ARQ-E3 for RFVIC-Reunion Island at 1220. (Hall-RSA) *Robert, my list shows RFFABC is Versailles-Larry.*

18393.0 Andrews working SAM 27000 on F-406 in USB at 2330. (Jones-CA)

20540.0 English female 3/2-digit number station in AM at 0320. (Jones-CA)

Bob Kay, c/o MT, P.O. Box 98, Brasstown, N.C. 28902

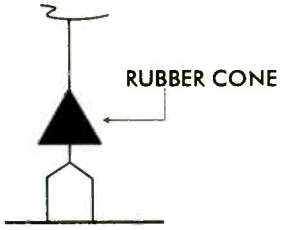
All Weather Scanning

Remember last winter? Here in the northeast, more than a dozen ice storms ravaged the area. When ice laden tree limbs began to break and fall onto power lines, there were widespread power outages that lasted for days. The severity of the winter ice storms was especially damaging to rooftop scanning antennas.

If you haven't already checked your antenna(s) for winter storm damage, the month of September may be your last opportunity. In many parts of the country, it's not uncommon for snow to fall in October. Readers who have already winterized their outside antennas should take note. The severity of last winter's snow and ice storms produced some very unusual problems. After reading the following paragraphs, you may decide that additional precautions are necessary.

The accumulation of heavy ice and strong winds damaged the horizontal elements of roof mounted ground plane antennas. If the icing problem reoccurs this winter, it may become necessary to use antennas that are less prone to ice and wind damage. In the future, hobbyists living in the snow belt may find themselves looking for an "all weather" scanning antenna.

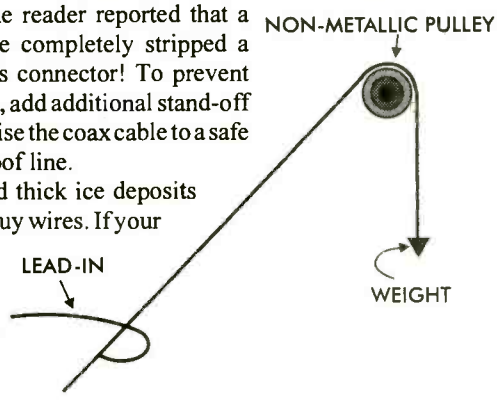
Win an Optoelectronics DC440 Decoder (see information below).



Several readers reported poor antenna performance as a direct result of ice build-up between the vertical element and metal base. The problem was corrected by utilizing a rubber cone (sketch at left). Similar to an umbrella, the cone prevented ice from grounding the vertical element to the antenna base.

Long wire antennas were especially prone to icing. The problem can be solved by utilizing a counterweight (sketch below). This type of set-up will allow the antenna to "flex" without breaking. Allowing the wire to flex in high winds may also help limit the amount of ice that forms on the wire.

After the storms had ended, scanner buffs discovered that their problems were just beginning. When rooftops were heated by the sun, large sheets of ice broke free and damaged coax cables, ground wires and guy wires. One reader reported that a sliding sheet of ice completely stripped a coax cable from its connector! To prevent this type of damage, add additional stand-off insulators and/or raise the coax cable to a safe height above the roof line.



High winds and thick ice deposits stretched antenna guy wires. If your guy wires were subjected to this type of strain, don't simply tighten the slack and expect the wire to survive another winter. If a wire has been excessively stretched, it will usually break after it is tightened and subjected to a load.

Guy wire anchor points on your roof should also be examined carefully. Hardware attached to the roof should be firmly fastened and weatherproofed. Don't simply screw or bolt hardware to your roof without applying a good quality sealer to the entry points of the fasteners.

In addition to roof top icing problems, there were indoor problems as well. As previously mentioned, power outages often lasted for days. A supply of batteries to power scanning gear, flashlights, and a broadcast band radio were absolutely essential. It's also important to note that most people were limited to the supplies on hand. Travel to the corner store by vehicle or on foot, was often impossible, even if the stores were open.

If you didn't experience the severe icing problems that plagued the northeast, placing a rubber cone on your antenna or raising your coax cable to avoid sliding ice may seem ridiculous. However, if you take your scanning seriously and if you live in the snow belt, there's nothing ridiculous about taking a few extra precautions.

Treasure Hunt

Scanner buffs throughout the nation have been enjoying the "DC440," from Optoelectronics. The DC440 displays CTCSS subaudible tones, DCS Codes and touch-tone (DTMF). As you probably already know, sub-audible tones are used by millions of business and government radio systems. With the DC440 connected to your scanner radio, you'll have the ability to instantly display tones and/or codes on a backlit, LCD display. Best of all, you can use the information displayed to identify specific users of a particular frequency.

The DC440 is a compact, professionally crafted unit that features convenient front panel controls. It also contains a serial interface for connecting the unit to your computer. Retail price is $259.00 dollars, but you can win the DC440 by answering the following clues:

1) **Provide the five words that are represented by "CTCSS."**
2) **How many CTCSS tones are utilized?**
3) **The DC440 can be used to decode the touch tones of a cordless phone. True or False?**
4) **Using the July issue of *MT*, provide three page numbers that contained ads by Optoelectronics.**
5) **What is the toll free number of Optoelectronics?**

Send your entries to the Treasure Hunt, P.O. Box 98, Brasstown, North Carolina 28902. All entries should be postmarked separately. Postcards are strongly recommended. Faxed entries will not be accepted. For more information on the DC440, don't hesitate to give Optoelectronics a call: (305) 771-2050.

Frequency Exchange

If you're looking forward to the cooler days of autumn, our first stop will be refreshing. Nicholas Gagnon lives in **Montreal, Canada**, and here are his favorite frequencies.

451.175 ..... Place Vertu	464.075 ..... Sears stores
451.70 ..... Bell Canada Tower	468.7375 ..... Rockland center
452.6625 ..... Plaza Alexi	862.8125 ..... McGill walk-safe
456.1625 ..... Eaton Center	863.0625 ..... McGill walk-safe
460.225 ..... Banque National Tower	863.2125 ..... McGill walk-safe
460.30 ..... Place Montreal Trust	863.5625 ..... McGill walk-safe

Since the weather in **Baltimore, Maryland**, remains warm during September, Rick Lampson has promised to keep the air conditioner running.

453.05 ..... Police	453.425 ..... Police
453.10 ..... Harbor Tunnel	453.525 ..... Police
453.20 ..... Police, citywide	453.575 ..... Ft. McHenry Tunnel
453.275 ..... Police	453.65 ..... Special operations
453.30 ..... Special operations	453.975 ..... Narcotics
453.35 ..... Admin	460.525 ..... Emergency response team
453.40 ..... Harbor medical	460.55 ..... Emergency response team

Baltimore News Media

450.0375 ..... WBAL TV-11	450.3125 ..... WMAR TV-2
450.1375 ..... WBAL TV-11	450.3625 ..... WBAL TV-11
450.1625 ..... WBAL TV-11	450.5375 ..... WBFF TV-45

Our next invitation is from D.L. Pardue in **Sanford, North Carolina.**

38.90	Ft. Bragg Range control
159.315	Game Warden
160.275	Atlantic & Western R/R
160.425	New Hope Valley R/R
161.10	CSX R/R
450.387	WRAL TV-5
451.525	Carolina power & light
460.175	Sanford City Police
460.475	Lee County Sheriff

Readers who wish to extend the summer season will really enjoy our next stop. Welcome to **Atlanta, Georgia.** Our contributor wishes to remain anonymous, so don't peek at the name on the mailbox.

46.42	Cobb County fire
131.10	Private plane instructor training
154.19	Atlanta fire
154.325	Fulton County fire
154.43	Marietta fire
155.04	Cobb County Sheriff
155.91	State Police

Anyone care to spend winter in **Punta Gorda, Florida?** Roger Cravens lives nearby and he has provided us with the following:

39.10	Bureau of Emergency
39.18	Bureau of Emergency
44.00	Marine dispatch
44.76	Recreation & Parks
44.90	Truck Weight enforcement
45.06	Highway Patrol
45.42	Highway Patrol
151.16	Fish & Game
151.31	Fish & Game
154.01	Punta Gorda fire
154.665	Highway Patrol
154.92	Highway Patrol emergency
155.37	Punta Gorda Police
172.275	Fish & Game

Since we're already in the Sunshine State, Alan Porterfield would be upset if we didn't stop to say hello. Alan lives in **Orlando, Florida,** and his invitation includes coffee and doughnuts.

153.275	Martin Marietta Aerospace
164.825	Ocala National Park
168.675	Ocala National Park
453.05	Orlando fire
453.15	Orlando fire ground
460.025	Orange County Sheriff
460.075	Orlando Police surveillance
460.125	Orange County Sheriff
460.375	Orange County Sheriff
460.425	Orlando Police Admin
462.275	Martin Marietta Security
462.325	Martin Marietta maintenance
462.40	Martin Marietta maintenance
462.50	Martin Marietta facilities
856.4375	Orange County fire
858.4375	Orange County fire
859.4375	Orange County fire
860.4375	Orange County fire
875.4375	Orange County fire

Our final stop is **Colorado Springs, Colorado.** Our anonymous contributor wants to remind everyone that winter isn't far away.

150.775	El Pasco County Search & Rescue
155.235	El Pasco County Search & Rescue
161.55	Pikes Peak Cog Railway
453.75	Police
453.85	Police
460.525	Police
462.975	Paramedic
464.075	Life flight

Send your invitations to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. Handwritten, typed or computer printouts are welcomed.

Scanner Tips

In Tacoma, Washington, a scanner buff heard a report of a stolen car on his mobile scanner radio. When he spotted the car in front of him, he used his cellular phone to call 911. A few minutes later, sheriff deputies and state police stopped the car and arrested the driver.

Area police in Kent County, Michigan, arrested and charged a man with eight counts of arson. The suspect set trash dumpsters on fire at various locations. The last fire destroyed a building and caused 40,000 dollars in damage. The suspect was finally apprehended when scanner listeners called the police and provided a tag number of a suspicious vehicle. (News clipping from *Grand Rapids Press.*)

Wash 'n Wear Radio

In past issues, readers have responded to "Wash and Wear Radio" with some very interesting anecdotes. Did you know, for example, that some folks wash electronic parts and hang them on the line to dry?

The folks at AT&T have their own unique way to clean sensitive electronic equipment. Dry Ice pellets are used to blast the surface to be cleaned. After the contaminant is removed, the pellets change into a gas and disappear. (News clipping from the *Detroit News.*)

High Tech Headaches

A lightning strike in Hartford, Connecticut, rendered the Hartford Police radio system virtually useless. The power failure activated the police station's 750 kilowatt generator, but the generator failed an hour later.

During the power loss, dispatchers could not issue case numbers, provide motor vehicle checks, or track the location of patrol cars.

Now police are looking for a way to prevent their back-up power system from breaking down during a crisis.

Absolute Power

In the earth moving business, the name Caterpillar represents power and muscle. With public safety's total reliance on computers (see "High Tech Headaches" above), Caterpillar is providing emergency power generators for back-up power.

According to Caterpillar, they'll deliver, connect and maintain the emergency generator. The owner supplies the fuel and oil. The World Trade Center used Caterpillar generators after the bombing and the Winter Olympics beefed up electrical capacity with Caterpillar generators. For more information call 800-732-3959.

Dispatcher Tests

Future California dispatcher candidates will be required to take a sophisticated written test that is designed to measure job related skills. The new test is expected to upgrade the quality of candidates that are selected.

The test will be composed of 15 parts, eight parts written and seven parts based on audio-tapes. The test focuses on determining the applicant's ability to recall, sort out and prioritize incoming and often simultaneous information, tests their oral comprehension, reasoning, communications skills, etc.

Essential Cellular

The County of Los Angeles has filed comments with the California Public Utilities Commission, saying that cellular telephones are an "essential service." The County is looking for cellular access during government emergencies. The County is also seeking to integrate 911 with cellular phones and for special cellular pricing for government use.

Cellular Advantage

Remember the incident in Brooklyn where shots were fired into a van full of Hasidic Jews? A passing motorist, who witnessed the event, used his cellular phone to call 911. The New York Police said that the call gave them an immediate advantage and provided an account of the crime as it happened.

Killer Cellular

A Canby, Oregon, woman was killed when her vehicle went out of control and slammed into a telephone pole. When rescue crews arrived, the woman was conscious and said when her phone rang, she reached down to answer it and the car went off the road.

A few minutes later, the victim lost consciousness. When efforts to revive her failed, she was pronounced dead at the scene. (News clipping from the *Oregonian.*)

Cellular Restoration

Several readers have requested the 800 megahertz band plan. To provide everyone with the latest update, we contacted the "Cellular Security Group," 4 Gerring Road, Gloucester Massachusetts 01930. As most of you know, the Cellular Security Group provides a variety of scanning products and services. Their most noted service is cellular restoration to 800 MHz capable scanner radios. For more information, call (508) 768-3410. In the meantime, here is the 800 MHz band plan from Cellular Security Group:

806-810 ... Business Mobile Input	866-869 ... Satellite Output
810-816 ... Public Safety Mobile Input	869-894 ... Cellular Base Output
816-821 ... Business Trunk Mobile Input	895-902 ... Private Mobile Input
821-824 ... Satellite Mobile Input	902-928 ... Amateur, Cordless
824-850 ... Cellular Mobile Input	928-930 ... Multi-Address Paging
850-851 ... Reserved	930-931 ... Advanced Tech Paging
851-855 ... Business Base Output	931-932 ... Common Carrier Paging
855-861 ... Public Safety Base Output	941-944 ... Government, Private
861-866 ... Business Trunk Base Output	944-947 ... Broadcast Studio Link

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Next Month: October will be the last month that you can win the DC440 from Optoelectronics.

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#TA-90-L	Telescope Elbow BNC antenna	16.
#RD-150	150 MHZ Rubber Duck antenna	16.
#RD-2750	27 & 50 MHZ Rubber Duck antenna	28.
#RD-450	450 MHZ Rubber Duck antenna	16.
#RD-800	Cellular phone band RD antenna	29.
#C/6A	**ABOVE 7 items, SAVE $30**	**99.**
#M-207-IC	Interface Cable MFJ ant. analyzers	10.
#P-110	200 MHZ 1X-10X probe	39.
#LP-22	Low Pass, Audio probe	25.
#DC-10	Direct, 50 OHM probe	20.

FEATURES

	ATH-10 $149 reg $179	ATH-15 $189 reg $235	ATH-30 $249 reg $299	ATH-50 $289 reg $339
FREQUENCY RANGE	1 MHZ - 1200 MHZ	1 MHZ - 1500 MHZ	1 MHZ - 2800 MHZ	5 HZ - 2800 MHZ
AUTO TRIGGER & HOLD	YES	YES	YES	YES
SIGNAL BAR GRAPH	NO	YES	YES	YES
LOW BATTERY IND.	NO	YES	YES	YES
ONE-SHOT & RESET	NO	OPTIONAL	YES	YES
HI-Z LOW RANGE	NO	NO	NO	YES

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#HP-400	400 - 1500 MHZ	#HP-800	800 - 2000 MHZ

#BP-4 All 4 Filters $189

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(No ATH or Bar Graph)....**$119.**

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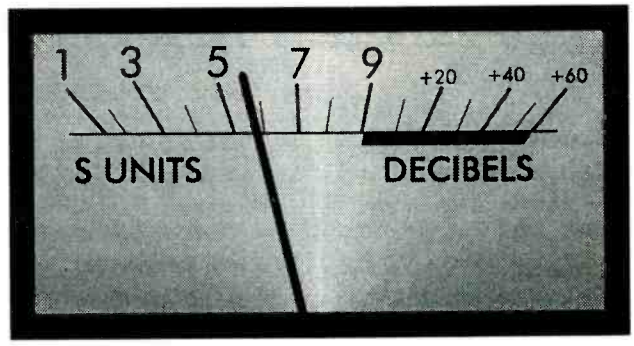
Skip Arey, WB2GHA
TJAREY@AOL.COM

Getting to Know SINPO

When most folks start out in the radio monitoring hobby, they get really excited about the quantity of signals they can hear. And why not? There are tons of great stations to get down onto the logbook. More than one entry level radio hobbyist has probably experienced the affliction of writers' cramp over the years.

It doesn't take long, however, for the beginners to realize that the quality of a station's signal is also important, especially when it comes down to writing those verification letters in search of QSL cards. Also, becoming savvy in the area of signal quality is essential to learning the ebbs and flows that go along with radio signal propagation. So keeping track of signal quality is a useful skill. Fortunately, it is also fairly easy to acquire.



Your receiver's signal strength meter is the starting point for meaningful SINPO loggings at your listening post.

Over the years, monitoring enthusiasts have congregated around a standard system for documenting a station's signal quality. This shorthand is useful for record keeping and sharing information with other radio hobbyists in club journals and magazines. Let's take a look at this system and how to get the best out of it.

Hi Ho SINPO

As you peruse through readers' loggings in various radio publications, you might see something like this: RADIO FREEDONIA 7415 kHz 00:30 UTC SINPO 43213.

Okay, you recognize the station name, its frequency, and you know that numbers followed by UTC is the time the station was logged in Universal Coordinated Time. But what is this SINPO thing? And what do those five numbers mean? Lean in close, Bunkey; all is about to be explained.

SINPO is a system of standards that lets you enter into your log book all the information necessary to record a station's signal quality. Once you get a handle on SINPO, when you read about other peoples loggings, you will not only know what they heard, but also how well they heard it also. When you get used to using the SINPO system in your own log book, you will have a more complete record of your monitoring experiences.

SINPO stands for the first letter of each of the words: **Strength, Interference, Noise, Propagation and Overall**. The system works on the basis of numbers from 1 through 5. A "5" indicates the highest quality signal conditions and "1" indicates the worst signal conditions. Let's take each letter one at a time and figure out what this all means.

S = Signal Strength

Many modern shortwave receivers are equipped with some form of signal strength indicator. This may take the form of a traditional analog type meter movement or it may be a series of LEDs that light in sequence to indicate signal strength. Some low cost receivers have a single LED that varies in brightness with signal strength.

The most common form of calibration for such meters is "S" units. These "S" units do NOT mean the same thing as the S in SINPO because they run from 0 through 9 plus, whereas SINPO only thinks in terms of 1 through 5. Theoretically an S meter reading of 9 is supposed to be equivalent to a received signal of 50 microvolts.

Don't stay up nights worrying about this, Compadre; standard and accurate calibration of S meters rests in the same realm as Elvis sightings. The gauge is only an aid to what your ears tell you. Pick out a signal that you know to be strong and loud. BBC is usually a good bet most evenings. You want to use a signal that sounds as strong as if it were a standard local AM broadcast station. Now take a look at your meter reading or that little row of lights. Pretty strong, huh? That's a 5 on the SINPO scale.

With this bit of knowledge you can extrapolate between an excellent or 5 strength level down through to a strength 1 which would be the strength of a signal that was barely audible and hardly moving the meter or the lights. A "1" would be a station that you know is there but can't hear well enough to monitor accurately. But remember: a strong signal does not always mean a clear signal. That is why we need the "INPO" in SINPO to get the whole picture.

I = Interference

When you began to monitor shortwave broadcasts, one of the first things you had to get used to was interference. Things just ain't the same as listening on your AM/FM car radio. Stations are not "channelized." They often get in each other's way in the shortwave spectrum. Keeping track of such occurrences can be important stuff in the monitoring hobby. Letting a broadcaster know about interference is one of the more useful facts you can share in your verification letters.

Interference can come in the form of another broadcaster firing up on or near the same frequency. It can also take the form RTTY or CW transmissions. The "I" in SINPO refers to any *humanly generated* gobbledygook that gets in the way of the signal you are monitoring.

Okay, you're listening to the world service of Radio Freedonia and you hear absolutely no interference of any kind from any other station. This would be indicated by a 5 in the "I" column of your SINPO log. Another time you may hear another signal in the background, but it is weak and does not significantly deter your listening to Radio Freedonia. In that case chalk up a 4 for Interference.

Let's say that the offending signal is such that you are missing out on some of the program information but can still hear enough to make a complete logging of Radio Freedonia. Call this a 3 in the "I" column. If the signal is splattering so much that you can only catch a few details

that assure you that you are listening to Radio Freedonia you are clearly deep into 2 land. A rating of 1 would indicate that the interference is so extreme that you may as well give up on logging Radio Freedonia and go after the interfering station instead.

N = Atmospheric Noise

I don't know about where you live, but September generates quite a few nasty thunderstorms in my neck of the woods. This atmospheric noise creates the kind of static crashes that can get in the way of listening enjoyment. Any bad weather with an electrical component to it between you and the station you are monitoring can create atmospheric noise that makes listening difficult.

The "N" is used to indicate any noise that is in the way of your signal that cannot be attributed to a human broadcast source.

Take another listen to Radio Freedonia. It's a clear night between you and Freedonia soyou have no sign of atmospheric noise on the signal. This is a rating of 5 for the "N" column of your SINPO log. Now think of a thunderstorm moving into your area. The first static crashes will be weak but noticeable. That would indicate a 4 for atmospheric noise. Now the storm is closing in and the crashes are showing peaks on your meter louder than Radio Freedonia's signal strength, but you can still make out the program. This would be a 3 in the "N" column.

Now the storm's noise is such that you can barely make out Radio Freedonia's programming. This would be a 2. It would also be a good warning to unplug your receiver and unhook your antenna. "1" would indicate noise so extreme that listening is rendered impossible if not dangerous.

Level 1 signals can also be generated by electrical noise not associated with thunderstorms. Some folks use the "N" column to indicate electrical noise from powerlines, transformers and appliances. It is okay to log these things, but such information is not useful to the station if you are sending a reception report.

P = Propagation

Propagation is the science of how radio signals travel over great distances by banking off the upper layers of the atmosphere. The conditions in the atmosphere change constantly. These changes are often experienced by the monitor in the form of signal fading. These changes can be heard or observed by noting the fluctuations in your "S" meter readings. If the fading is slow and has a rhythm to it, you may not even notice it unless you are paying attention to your meter. In the "P" column, you will be taking note of how the propagation fading affects your ability to hear a station's signal.

A rating of 5 would be an indication of no discernible fading. Your meter appears to be glued to its current setting. Given the nature of shortwave, you are not likely to see a 5 in this column all that frequently. Even the strongest signals will exhibit some fading. Watch your meter. If fading is noted on your meter but does not deter from your ability to hear the station, go with a rating of 4. If the fading causes some dropping out of the signal but you can still get the gist of the programming, the appropriate rating should be a 3. If the fading is so deep and frequent that you could only identify the station because you heard the station's identification on one of the few upswings in signal strength, you have a 2 rating going. If the fading is such that you cannot determine any program information or details, give it a rating of 1.

O = Overall Signal Merit

This rating column is the most often misunderstood by the beginning shortwave monitor. Some folks tend to think that Overall Merit applies to how much you enjoyed a station's programming. Not so, my friends. We're still talking about a station's signal.

The "O" is where you indicate your ability to monitor a station's signal more or less in spite of what you have documented in the S, I, N and P columns. If everything was smooth sailing in the signal department, all 5s across the board, obviously your "O" will be a 5 also. If you heard everything the signal had to offer in spite of a few lower numbers in the other columns, you're looking at a 4 rating. If you heard 'most everything, but really had to pay attention between the noise and fading, a rating of 3 would be appropriate. If you really had to dig to hear even a few details of the signal, give that station a 2 rating. If the signal was totally unusable it would have a rating of 1.

Some SINPO Thoughts

SINPO is usually recorded as SINPO followed by the five rating numbers (e.g.. SINPO 54123). This is how you will usually see it recorded in club journals and magazines. SINPO ratings can change during a broadcast.

Each letter in the SINPO rating system stands on its own. Rate each signal quality on its own merits and your SINPO rating will make more sense.

A station may be rated at 55555, but when radio Freedonia fires up its multi-megawatt transmitter on the same frequency, that rating is going to change to 52553 in short order. Make sure you leave room in your log book for such changes.

Don't use the SINPO system when writing a verification letter to a station. The person reading your letter may not have a clear understanding of the shortwave hobby. Instead, translate your SINPO rating from your log book into more verification-friendly sentences.

Some club bulletins have gone over to a simplified system called SIO. You guessed it. In this system uses the S, I and O parts of SINPO. You can report the information to your club in any way they choose, but you may want to keep your own logs using the full SINPO for greater information.

DON'T PANIC...

... If you haven't received your ***Monitoring Times*** by the beginning of the month. Postal delays due occur, and we must wait until the 10th of the month before sending replacements for lost issues.

Be patient and wait until the 10th; if you still don't have your ***MT***, call us at 1-800-438-8155 and we will be happy to send a replacement.

SHORTWAVE BROADCASTING

The Global Forum

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

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

ARGENTINA USB feeders on weekends, afternoons and evenings, around 1600-2100: 6622.5, R. El Mundo; 8965, LV1, R. Colón, San Juan; 10063, R. El Mundo; 15780, R. América, R. Continental, R. Rivadavia; 20276, R. Rivadavia and R. Del Plata. FM Total, Corrientes City is very good daily at 2130-2230 on 4588 (Marcelo Cornachioni, Buenos Aires, *Pampas DXing!*)

ARMENIA R. Intercontinental-R. Karanov has daily German religious program Mitternachtsruf 0530-0600 or so on 15400 embedded in local Armenian program (Dieter Leupold, DLR Berlin-DX via Büschel)

BENIN More Africans are missing from SW—ORTB not on 4870 at 2030 check (Ralph Famularo, Japan, *World of Radio*)

BOLIVIA New 4632v station is 97.5 Sonido Laser, Guayaramerín, to 0122v*, *0922v (Santiago San Gil, Venezuela, *Club Diexistas de la Amistad*) 4632.4, 1 kW, has unusual program in Portuguese for neighboring Brazil at 1100 (Henrik Klemetz, Colombia, HCJB *DX Partyline*)

BRAZIL RadioBrás, 1200-1320 in English to us, announced change July 1 from 15445 to 11745 (Aaron Pilchick, FL) Yes, announcing 11745, but in mid-July still booming in on 15445 from whence it should not move (gh) SRI relay 0030-0330 on 5910 ex-5905 (Joel Rubin, CA) Actually measured 5908.3 on other side of RTTY, matching previous 3+ kHz jumps by RNB transmitters so maybe unintentional. Moved to 5888.3 (Kevin Hecht, PA) Matches off-shift, nominally 5885 per Telecom (gh)

BULGARIA Varna site, former jammer aimed 15° to Russia, usually unstable on odd frequencies like 7259.4, 9774.5 QRMing Australia, Moscow (Wolfgang Büschel, Germany)

CANADA Senate hearings called for RCI budget to be restored to $50 million per year, but decision rests on three government departments and may take three years (Keith Perron, PQ, *W.O.R.*) To restore seven languages, re-target English and French, set up advisory council, Min. of Foreign Affairs must report progress next Feb. (Wojtek Gwiazda, PQ, *W.O.R.*) If you miss *David Brenner Show*, live weekdays 1907-2159 UT on a nearby outlet, he's repeated on CFRX, Toronto, 6070, starting at 0509 (gh)

CHILE R. Triunfal Evangélica, 5825, from Pentecostal Fundamentalist Mission in Talagante province, may shift schedule in winter to 2300-0200 because of WEWN (Gabriel Iván Barrera, *Onda Corta* via *Radio Nuevo Mundo*) northern winter?

RADIO TRIUNFAL EVANGELICA
MISION PENTECOSTAL FUNDAMENTALISTA
[FREQUENCIA] 5855 KHZ

CHINA V. of the Strait, to Taiwan: Pgm I, 0855-0959 on 11590, 7280, 6115; 0959-1230 add 5508, 4133, 2755; 1230-1700 on 6115, 5508, 5050, 4940, 4133, 2755. 2155-0200 on 6115, 5050, 4940. Pgm II, 0955-1500 & 0255-0600 on 9505, 6000 (BBCM) Program I mainly on 6115, others occasional (Suga & Yamanaka, ABI, RJ*MR*)

COLOMBIA R. Ondas del Porvenir, Samací, at 1128-1300+ on 4350 = 3 x 1450. The unID Satanic station on 7000 moved to 7380 LSB at 1030, 1730 reading from diabolic *Canda* books, ham-like check-ins. (Ing. Santiago San Gil, Venezuela).

COSTA RICA R. for Peace International's 7th-anniversary *Fiesta of the Air*, taking calls toll-free will be UT Sept. 17 at 0000-0400 plus repeat (RFPI *Mailbag*) 7375, 9400, 15030, 21465

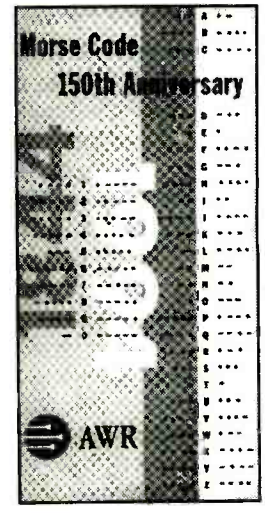
CUBA Keith Perron has been heard announcing on RHC; he planned to take with him much-needed supplies, arrange for printing of schedules in Canada, and maildrop there; plans to help modernize sound of RHC broadcasts. USB at 0000-0200 once tried 13705 instead of 13700 (gh) DX segments on R. Rebelde and R. Taíno have not materialized due to lack of interest by the management (Orlando Valderrama, La Habana) (non) After 2-month absence, La Voz del CID back in mid-July, days on 9941.6 (Kevin Hecht, PA; Ed Rausch, NJ; Tim Hendel, NY) And after 0400 on 6306, both R. Camilo Cienfuegos (gh)

ECUADOR From Sept. 1, HCJB offers a brand new program schedule, with more music, drama, magazine programs and a full 24-hour schedule (HCJB *Program Notes*) At 0030 settled on 12005 ex-11700 ex-11925 ex-15155, but kept announcing 11925 for weeks, never 12005. News obviously taped at 0300 UT July 10—it aired at half-speed (gh) Rich McVicar became Frequency Manager July 1 ex-*ANDEX* editor (*ANDEX* via Diane Mauer) HCJB SSB may replace 17490 by a new 19 MHz channel from Sep 4 (Wolfgang Brinkemann, HCJB German DX via Büschel) Military occupied Radio Latacunga, and on SW, Escuelas Radiofónicas Populares, Riobamba, June 21 (HCJB *DX Partyline* and BBCM) Due to indigenous people protesting new law governing agricultural development (AMARC via Don Moore, *FT*) ERP linked with Liberation Theology wing of Catholic church, not popular with those in power (Moore, *FT*) A week later, back to normal (DXPL) R. Federación Sucúa, 4785, 4860, 4960 and 5980, is trying to raise $1330 to buy pennants, cards, and a camera to take photos for listeners (via Nestor Rubio, *Play-DX*)

ESTONIA R. Estonia on air daily 1500-1530 on 1900-2000 on 5925 but must be low-power as reception poor even here in Finland. In crisis, but hope director wants to keep external service (Jorma Mantyla, Internet via Ben Krepp, NASWA *Journal*)

GERMANY If 8-weekly schedule holds, next *Stadtbummel* from DW in German will be Sept. 18, at 0532-0700 repeated at 1332 and 2132—100 prizes topped by a trip to Germany (*DW radio*)

GUAM New 100 kW Continental delivered to KSDA June 8; unannounced tests expected by August on 9370, 9495, 9650, 13720, 15225, 15310; specially endorsed QSL for these and "first week" endorsement when regular broadcasting begins, for reports to Box 7500, Agat, GU 96928. When in full service, KSDA-3 will operate: 2200-1200 on 15225, 1200-1300 on 9370, 1300-1400 on 9650, 1400-1700 on 13720, 2000-2100 on 9495, 2100-2200 on 15310, none in English. All AWR stations curently offer a QSL commemorating the sesquicentennial of Morse Code, showing old and new versions (Adrian Peterson, AWR) KTWR in English, 0855-1000 on 11840 ex-11805 (Don Rhodes, *ADXN*) and at 1500 on 11580 ex-12025 (Derek Houghton, BDXC)



GUIANA FRENCH Swiss R. International's Montsinéry relay inaugurated July 21: 0830-1045, 215° on 11640 to Australasia; 2000-2100, 115° 9770 Africa; 2215-2400, 175° 11650 to S. America replacing Gabon-12035; 0030-0315 on 13635 300° to C. America and N. America east; 0330-0530, 320° on 11620 to N. America west, including English half-hours at 0900, 2000, 0100, and a full hour at 0400 (Swiss Telecom) Putting features on SW to us at 0430, but no *Bobs* or *Grapevine*; no change in other N. American frequencies including half an hour at 0400. The 0430

features include *Business Show, Swiss Scene—People & Politics* (gh)

HAWAII From Sep 25, KWHR will be back on 9930 at 0600 during *World of Radio* Sat & Sun (George Jacobs & Assoc)

HONDURAS Another new SW station here! on 4960, Mon.-Sat. 1200-1500 and 0000-0200v, with religious programs and bible readings in Spanish, Miskito; ID as Radio HREC, Mision La Mosquitia, Puerto Lempira, Depto. de Gracias a Dios, 23101 (Santiago San Gil, Venezuela) On 4960.3, sounds to me like HRET, and postal code 33101 (Henrik Klemetz, Colombia, HCJB *DXPL*) HRJA, 15675, has exciting new show, *Radio Modern Rock*, alternative music for legions of fans bored with top-20, UT Weds. 0230, timed to precede John Peel on BBC. Bob Ferguson, host, originates in New Jersey (Kimberly Austin, *RMR*) But *Peel* is on UT *Tue.* at 0330 (gh) But correct time is UT Weds 0130-0230! (Jeff White, HRJA) *V. of the Free Cuban Educator* believed to be first exile program in English, Tue. and Fri. 1900 for 10 minutes, rest of hour in Spanish on 15675 (Jeff White, RMI) *Viva Miami* repeated a week later at 2000 on HRJA (White, WRMI) Maybe, but once heard ending at 2230 in Spanish (gh) *Viva Miami* in English also heard at 0141-0207* (Bruce MacGibbon, OR, RJ*MR*)

ICELAND Reykjavík in Icelandic on USB 13860 for all tansmissions, plus: 1215-1300, 1410-1440, 1935-2201o on 15770; 1855-1930 and 2300-2335 on 11402; to Europe except America at 1410, 1935, 2300 (BBCM)

INDONESIA RRI Ambon on 4835 ex-4864 at 1007 (John Kecskes, Australia via Tony Orr, *FT*)

INTERNATIONAL VACUUM *World of Radio* is added to the World Radio Network: to Europe on ASTRA, 19°E, MTV ch. 22, 7.38 MHz subcarrier, Sat. at 1600 UT (1700 winter); to America on ASC-1, 128°W, ch. 23, 6.2 MHz (moving to Galaxy 5, 125°W, Transponder 6, 6.8 MHz) UT Sun. 0230 (0330 winter); plus additional repeats on each.

IRAQ Our dear listeners have a new, unified programme cycle, the first and second programs merged into one on MW and SW (Republic of Iraq Radio via BBCM) R. Baghdad looking for new 22mb channel at 0900-1150 with Arabic music, English programs—13672v, 13740, 13650, then settled on 13780 (Jurgen Bast, DLR Berlin via Buschel)

ISRAEL As DST ends here, look for Israel Radio one hour later and on different frequencies starting Aug. 28

LIBYA R. Jamahiriyah not confirmed in English for some time, but V. of the Greater Arab Homeland in Arabic is: 1015-1215 and 1645-0400 on 15435, 15415, 15235. Occasional extra programming on SSB, such as in 1988: mornings on 18000, 13700, 13500; evenings on 4200, 4155 (BBCM)

LITHUANIA (non) R. Vilnius, via Russia at 2300-2330 on 9530 ex-11770, a little English weekdays, all English weekends (BBCM) Presumably back to 0000 on another frequency from Sept. 25, when many stations to and from Europe make time and frequency changes

MALAYSIA Indonesian at 1135 on 9767 proved not be a new RRI frequency, but spur of Kuala Lumpur 9750, with time checks for Indonesia (Craig Seager, NSW, *Australian DX News*)

MOROCCO RTM now has only one English broadcast on SW, Suns. 1400v-1500 on 17595; opening time depends on whether there is news in French; weekday 1000-1200 is not on SW (Derek Houghton, Portugal, BDXC *Communication*)

NEW ZEALAND Kiwi Radio has a new address: P O Box 3174, Onokawa, Napier, NZ. Next special broadcast Sept. 6 UT for 17th anniversary (Gigi Lytle)

NIGERIA Director of VON told visiting Info Ministry director that lack of funds prevented VON from importing spare parts, so only one of the eleven transmitters functioning (R. Nigeria via BBCM)

PERÚ New station on 4662.4v at *2300-0100+ is R. Soledad, Parcoy, Pataz, La Libertad, good modulation but drifting up to 4663.5. New on 4319.3 is R. Condorcanqui until 2400* from Santa María de Nieva, Amazonas, Mon.-Sat. 1400-1900, 2130-2400; no power on Suns.; good sig but low mod on mike (Henrik Klemetz, Colombia, *Play-DX*) R.Soledad later on 4647v, perhaps ex-R.Tayabamba transmitter. New on 5521.5 until 0300* is R.Sudamérica, Cutervo, weak. R.Satélite on new 4781, but for a while kept starting transmission on old 6724.3 advising listeners how to tune to 60 mb where they moved around 2335 (Klemetz, *WOR*) R. Oriente, Yurimaguas, has a 5 kW CCA transmitter on 6190 and plans to get another one by yearend for 3350. DX reports welcome to Gerente Técnico Pedro Capo Moragues, Calle Progreso 112, Yurimaguas, Loreto (*Pampas DXing*) Cusco stations have replaced national anthem with *Hymn of Tawantinsuyo*; listen at 0830 to R. Mundo, 5082; at 0900 to R. Tawantinsuyo, 6174 and R. Cusco, 6204; 1000 to R. La Hora, 4858 (Nobuyoshi Aoi, RJ*MR* via Mauer)

PHILIPPINES FEBC's media program *Communication*, 15 mins., retimed to: Thu. 1540 on 11995, Fri. 1015 on 11690, Sat. 1400 on 11995; *Mailbag* Sun. 1340 on 11995, Sat. 0945 on 11690, 1330 on 11995 (via Wolfgang Buschel, DSWCI *SW News*)

POLAND Radio Free Europe started broadcasting from Warsaw July 1, but with much reduced budget and staff, moved from Munich. Some consider it not the same station formerly run by Americans, and there is debate over whether what remains of archives should be turned over to Polish Radio, as Pres. Walesa wants. US Congress has funded it only until Sept. 1995 (PAP and TV Polonia via BBCM)

PORTUGAL R. Portugal's *DXers Program* had a new host in mid-July, Eric Burns, who said it would be heard every Friday, such as 0150 UT Sat. on 9570—but after following week, *Collectors Corner*—stamps as usual. Two other 31 mb transmitters, 9705 and 9555 mixed with RTTY to produce annoying spur on 9403 marring RFPI 9400, but off when 9555 closed at 0130 (gh, OK)

RUSSIA To celebrate its 65th anniversary, Radio Moscow is holding a forum; listeners are invited to write up to two pages about R. Moscow, how it has changed and why they still listen, until Sept. 15; the most interesting letters and special programs will be broadcast on Oct. 29 (R. Moscow World Service, via Bob Thomas, CT, and Will Martin) Sept. 4 seasonal changes to N. America bring new frequencies: 17760 at 1000-2000, 17605 at 1900-2200, 9540 at 1500-1700, 9505 at 1500-1800, 11750 at 2000-2300, 9665 at 2000-2200, 9685 at 2300-0200, 5940 at 0000-0500 (Alexander Ageenkov, USENET via Thurman) R. Ukraine World Service lost frequencies in January when transmitters in Ukraine, Kazakhstan and Russia were turned off because power bills had not been paid; in May, Far East transmitters were closed down for repairs, expected to be off four or five months (*Holos Ukrayiny* via BBCM) Dr. Gene Scott via Russia: 0400-0700 on 21670, 0700-1600 on 15500, 1600-

1500 on 11840 (Jürgen Bast, DLR Berlin DX via Büschel) Adygey Radio, Maykop, in Turkish, Arabic, and Bzadog dialect of Adygey, one of the Circassian languages, operates Mondays 1700-1800 on 7305, or alternates 7130, 5905; one hour later in winter (BBCM) Not to be confused with *Deep Space 9* bad-guys, Cardassians!

SOUTH AFRICA DW signed contract to use 500 kW Meyerton transmitters 30 hpd, better deal than other offers to replace Rwanda (DW *Mailbag* via DSWCI *SW News*) DW using 3995 at 1800-2200; 6015 at 0300-0700; 7185 at 1500-2200; 9565 at 0900-0950; 15410 at 1000-1050 and 1400-1450; 17800 at 1100-1150; 21695 at 1200-1350—English at 0400, 0900, 1100, 1500 (Dieter Lippman, DLR Berlin DX via Büschel) Maybe we should write SABC for a service to us; after all, they've a new government and the transmitters (Kevin Hecht, PA) And presumably the antennas, still some of the same beams for West Africa. Address is Channel Africa, PO Box 91313, Auckland Park 2006 (gh)

SPAIN Even in English, the external service must now be identified as Radio Exterior de Espana (*Distance Unknown* via John Norfolk) Immediately after which, I heard them still ID as Spanish National Radio! (gh) DX program retimed to about 0025, 0125, 0525 on 9540 UT Suns. (gh) Cut from 10 minutes to 8; repeats Mons. on Euro service (*Distance Unknown*) Now followed on UT Suns. by *Introduction to Spanish Light Opera.* Sunday features: *Visitors Book, Spain Step by Step, Radio Club* (via Diane Mauer)

SUDAN R. Omdurman replaced 9165 with 9730, announced sked: 7200 at 0300-0830 & 1900-2300, 9730 at 0300-0600, 1200-1900, 2100-2300 (Hans Johnson, NASWA *Journal*) It's 9370, excellent at *1330-1830+, stronger than BBC here (Victor Goonetilleke, Shri Lanka, RN*MN*)

SWITZERLAND Feature programs and their hosts give a station its particular flavour, heart and soul. By denying listeners features, SRI risks becoming just another soulless source of news and current affairs (Ian McFarland, *DX Ontario*) Bob Thomann says just 4% of its European listeners could receive SRI via ASTRA; the decision against SW a great mistake by SRI management (DSWCI *SW News*) Though SRI Portuguese supposedly cancelled, still on at 1030-1045 to Australasia on 9885, 13685, 17515, French Guiana 11640. Could this be Red Cross service to East Timor? (gh) See also BRAZIL, GUIANA FRENCH

TAIWAN VOFC added an hour in English, 1200 on 7130, 9610 (Ralph Famularo, Japan, *W.O.R.*)

THAILAND R. Thailand started using VOA transmitters, then found electricity and personnel expenses rose drastically forcing cut from 20½ to 10½ hpd on air. Using old 11905, 9655, 4830, English was tested at 0000, 0030, 0300, 1900 and 2030 (Tetsuya Kondo, RJ*MR* via Mauer) VOA, Udorn in English:7215 at 1400-1800; 11635 and 11725 at 0100-0300; 11805 at 1230-1400 (Alok Das Gupta, India, *Australian DX News*) Also 9645 at 1100-1200 (Arthur Cushen, RNZI)

TIMOR EAST 3304 ex-3306 confirmed as RRI Díli, Jak. news at 1200, ID at 1245; PNG absent from 3305 Daru back later on 3305 badly hetting 3304.2 (Craig Seager, NSW, *ADXN*) see also SWITZERLAND

TUNISIA RTT National Network in Arabic: 0359-0459 on 7475; 0459-0559 add 15450, 12005; 1559-1659 on 17500, 15450, 11730; 1659-2400 on 12005, 7475 (BBCM)

TURKEY VOT left 9900 due to Cairo clash at 1930-2150, replaced by 9480 in German at 1930, 9400 in Ehglish at 2000, 9730 in French at 2100 (RVI *Radio World* via Mauer, Cline, Buschel)

USA WSHB suddenly changed from 5850 to 7535 at 0000 and 0100 (Jim Moats, OH) Due to Australian complaints (George Thurman) MRI announced format changes for August. At 0900, Steve Delaney anchors one-hour magazine, updated hourly until 1600. Then David Brown anchors new program until 2200. Didn't say what would be on from 2200 to 0900, but asures us *Letterbox* will be retained (Moats) Changes scheduled for Aug. 30: WCSN at 0600 on 7535, 1800 & 1900 on 21640. WSHB-1 at 0600 & 0700 on 7520, 2200 & 2300 on 9355. KHBI-1 at 1600 & 1700 on 13625 (Stes Stessel, WCSN) WSCSM explained in 1989 that Scotts Corners is a crossroads with four houses, named for original settlers the Scott family in the 1800s (Leslie Edwards, PA) But is not to be found even in Rand McNally's *Commercial Marketing Atlas* (gh)

I don't believe claims that WEWN has a noisy transmitter can be substantiated. But if anyone can provide evidence we will fix it immediately (Adik Mina, Manager of High Power Broadcasting, Continental Electronics, Dallas) Next time you hear excessive splash, tape it, note exact frequency tuned, date, time, etc., and/or phone him while it's happening at 214-381-7161 or fax 214-381-4969. Copies of loggings since WEWN began, noting excessive interference would also be useful; post to him at Continental, P.O. Box 270879, Dallas, TX 75227; and please send gh copies of any past, present or future reports about this (gh) No hiss from 9985 here, 17-½ miles from site (David Williams, AL)

WRMI, 9955, gradually expanded weeknights to 0500, added Sat and Sun broadcasts around 1900, religion Suns 1100-1300 or later, and may start opening weeknights before 0100. See also HONDURAS (gh)

Willie Nelson & Friends found on WRNO, 15420, Sun. at 1800-1900 (Diane Mauer, WI) Not yet on WWCR, 12160, Sun. at 2200 (gh) *Rock the Universe*, by Rich Adcock, NY record collector, is new on WWCR, Sat. 2200-2300 on 12160 (David Hinckley, *NY Daily News* via Bob Thomas) Check. *Extraordinary Science Radio Hour* moved to UT Mons 0300-0400 on 7435. Sat at 0600 on 5810 on 5810, Sun 0430 on 7435, it's *The Old Record Shop*, not *Radio* (gh)

WORLD OF RADIO times on WWCR, WHRI and KWHR: Fri. 2115 on 15685, Sat. 0600 on 7315, 7435, 9495, 17780, Sun. 0130 on 7315, 0400 on 7435, 0600 on 5810, 17780, 2300 on 15685, Sun. 0100 on 9495, Tue. 1230 on 14585. On RFPI, Costa Rica, 7375, 9400, 15030, 21465: Fri. 2000, Sat. 0400, 1200, 1800, Sun. 0200, 1000, 2300, Mon. 0700, Tue. 1900, Wed. 0300, 1100. See also INTERNATIONAL VACUUM (gh)

The congressional charter that for 18 years protected integrity and objectivity of VOA was swept away in April. It was repealed when Congress enacted a new law consolidating government international broadcasting. Pres. Clinton signed the new statute, but regretted repeal of the charter. It protected VOA from government interference; it must be restored (ex-Sen. Charles H. Percy, *Washington Post* via Chet Copeland) Dipole arrays at Delano are being used not only for broadcasting but also for ionospheric heating experiments by USAF, using three 250 kW with an effective peak power of 3 MW at modulation crest; antenna gain 30 dBi, so ERP is 3 GigaWatts! (*International Broadcast Engineer* via *ADXN*) What schedule?? (gh) Contrary to last month's info, VOA retimed Spanish to 0100-0200 and made it daily on the usual frequencies. (John Vodenik, VOA Bethany) Aussie complaint led 7405 to be replaced by 9775 in English at 0100-0200 (Vodenik via Diane Mauer)

VENEZUELA R. Barquisimeto Internacional has been sold for 68 megabolívares to new owners who plan to refurbish the facility and resume SW 4990 and 9510. R. Nacional heard at 1830 on 7070, 1946 on 7075, not on announced 9450, 11695 and 11850 (Dr. Luis A. Guerra Brandt, Barquisimeto, *W.O.R.*)

VIETNAM VOV replaced single national domestic network with two: One on 5925, 10060, Two on 4960 and 12035, the latter formerly used for external service, both nets 2200-1700 daily (BBCM)

YEMEN Aden knocked off the air in late June by northern forces, not heard on 5970, 7190 for a while. Yemeni Republic Radio, Sana'a, which used to carry Aden-produced program in English now has own daily English at 1800-1900, repeated 0600-0700 on 9780, with news at beginning, middle and end (BBCM) Also try that spur on 9069, and beware of UAE, China/Mali also on 9780

ZAMBIA Xinhua confirmed that China will supply and install two sets of 150 kW SW transmitters at ZNBC, Lusaka (BBCM)

See p. 47 for "Hot Spots."

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

Broadcast Loggings

SHORTWAVE BROADCASTING

Gayle Van Horn

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

0000 UTC on 15115
NEW ZEALAND: Radio New Zealand Intl. Conflicts within national parliament. News on possible teachers strike. Update on inflation. (Brian Bagwell, St Louis, MO)

0004 UTC on 9485
CZECH REP: Radio Prague. Economic report on Europe. // 7345 slightly weaker, with economic editorial. Discussion on church/state relations. (Patterson, Mobile, AL)

0015 UTC on 9540
SPAIN: Spanish Natl Radio. International news on Israel and Gaza Strip. Spanish pop vocal, to editorial on Islamic fundamentalism. *Press Review* on domestic issues. (Ted Williamson, Santa Monica, CA)

0020 UTC on 9860
UKRAINE: Radio Ukraine Intl. News on Russian mafia and drug smuggling. //9685, 11720, 12030, 15180, 15580 kHz. Ukrainian crime groups discussed, and increase of "racketeering." (Williamson, CA) Report that the world's nations support Crimea as part of Ukraine. (Bob Fraser, Cohasset, MA)

0027 UTC on 17775
UNITED STATES: **KVOH** Los Angeles, CA. Religious text to "High Adventure Ministries" promotional. *Strength for the Day* program. "Doc" Scott's teachings on the purpose of the church, on 13740 at 0028 on **KCBI**. (John Guilky, Des Moines, IA)

0032 UTC on 7100
IRAN: VOIRI Tehran. Holy Koran recitations at tune-up. // 9022 weaker with audio hum. Lady announcer's verse interpretations, to Arabic instrumental. News on the Persian Gulf, Islamic Assembly meeting, and European topics. (Williamson, CA)

0035 UTC on 4765
BRAZIL: **Radio Rural**. Portuguese. Lively Brazilian vocals to "canned" ID/ frequency quote. Brazil's **Radio Amazonas** on 4805 kHz at 0920 with fair signal quality for regional announcements and vocals. (Frank Hillton, Charleston, SC)

0042 UTC on 9810
SWEDEN: Radio Sweden. *Report on Lapland*, their traditions and cultural reawakenings. // 6065 to South America, fair signal. Station ID to Swedish pop vocal. (Hillton, SC)

0048 UTC on 11800
ITALY: RAI Rome. Interval signal to sign-on ID, frequency quote. Pop vocal to national news. Report on tourism and Italian fashion designers. ID, soccer report, pop music. (Ralph Poindexter, Boone, NC)

0106 UTC on 17860
AUSTRALIA: Radio Australia. World and Australian news: coal miners union talks, national constitution, Aussie labor party, news from New South Wales. // 9580, 13755, 15365, 15510, 17750, 17795 kHz. (Williamson, CA) Additional national news on 9860 kHZ at 1110. (Fraser, MA)

0110 UTC on 13700 USB
CUBA: Radio Havana. Restoration of old Havana discussed. // 6010 good signal. Cuban cultural report to ID. Interesting special on noted Cuban poet. (Garland Thomas, Cleveland, OH) *Spotlight on the Americas* program at 2110 on 17760. (Fraser, MA)

0115 UTC on 11865
GERMANY: Deutsche Welle. News on Germany, Russia, Ukraine and Belarus. Parallel on 6040, 6085, 6145, 9700, 11740. *European Press Review* with good signal. (Tom Banks, Dallas, TX)

0122 UTC on 11910
HUNGARY: Radio Budapest. Mike Mitchell's *DX News* // 9835, 6025 with frequency schedule quote. Station address for DX tips, broadcast promotional. Closing comments to brass horn interval signal. (John D. Harrison, Chicago, IL)

0125 UTC on 4845
MAURITANIA: ORTM. French/Arabic. Announcers' news update to ID at 0130. Arabic vocals to program presentation. Station frequency drifting from 4828-4834 to 4845, 0640-0704 kHz. Holy Koran to Arabic vocals. (Banks, TX)

0127 UTC on 5960
CANADA: NHK/Radio Japan. Japanese/English language lesson program. Address for *Let's Learn Japanese* booklet, followed by Japanese pop music. (Guilky, IA; Banks, TX)

0135 UTC on 9580
ALBANIA: Radio Tirana Intl. News: Albanian museums increase security measures. // 9760 fair quality. Current affairs update to sports report. Sign-off at 0140, with ID and folk instrumental. (George E.Sibley, Concord, NH)

0140 UTC on 9870
AUSTRIA: Radio Austria Intl. // 9865, 13730 to North America. Austrian finance report, and talk on military supports of eastern Europe security. (Guilky, IA)

0220 UTC on 4915
PERU: Radio Cora. Spanish. Peruvian vocals to 0230 ID, followed by "canned" promotional as "Radio Cora del Peru," frequency and call letters quote. Commercial jingles to Latin ballads. (Banks, TX)

0250 UTC on 3356
BOTSWANA: **Radio Botswana**. Setswana. Station's "farm animal" interval signal to national anthem and sign-on. Newscast to pop vocals. Announcer's chat to regional music. (Sam Wright, Biloxi, MS) **VOA Botswana** relay on 15445 kHz at 1930. (Fraser, MA)

0415 UTC on 4825
BRAZIL: **Radio Educador**. Portuguese. News at tune-in. Musical ballads and regional news and chat. Brazil's **Radio Clube doPara**, audible on 4885 kHz at 0430. Canned ID and time check to Brazilian pop/rock tunes. (Wright, MS)

1005 UTC on 3245
PAPUA NEW GUINEA: (New Guinea) **Radio Gulf**. Pidgin. Announcer's newscast. Fair signal quality for station ID and chat. PNG's **Radio West New Britain** weak, but audible. Regional "island" music to announcers' regional update. Tentative ID on **Radio Western Highlands** at 1018 on 3375. (Banks, TX)

1008 UTC on 5020
SOLOMON ISLANDS: SIBC. Great signal despite the static! IDs, local commercials, sports update on soccer team. (Banks, TX)

1630 UTC on 9515
CANADA: BBC relay. *Letter From America* program, discussing the lessons of D-Day. Relay also on 5975 kHz at 2215, with program on Norwegian explorer Nansen. (Fraser, MA)

1715 UTC on 21465 USB
COSTA RICA: Radio Peace Intl. Story telling episode, life in a Costa Rican village. Fair signal. // 15030, very weak 9400. (Hillton, SC; Wright, MS)

1720 UTC on 17790
ECUADOR: HCJB. *Mystery of Mysteries:* Darwinian fossil interpretation and the missing links of evolution, discussed by Dr. Goul, Paleontologist. (Banks, TX)

1730 UTC on 15725
UNITED STATES: **KCBI** Dallas, TX. Dr. Gene Scott, archeology in the Nile valley. *Success Principles*, **KTBN** Salt Lake City, UT, on 15590 at 1735. Popularity of the Gregorian chant, **WEWN** Birmingham, AL, on 15695, 13615 kHz at 1740. (Harrison, IL; Sibley, NH)

1735 UTC on 17655
NETHERLANDS ANTILLES: Radio Netherlands Bonaire relay. *Happy Station*, with music program from the 1940's era. (Fraser, MA)

1745 UTC on 13760
UNITED STATES: **WHRI** Noblesville, IN. Text on spiritual rebirth, // 15105. Contemporary Christian vocals on 7490, 13595 on **WJCR** Upton, KY. (Banks, TX)

1745 UTC on 15420
UNITED STATES: WRNO. Rush Limbaugh's program with phone-in comments on Bill Clinton. "EIB Network" ID, Organic Plus product ad, parody of Reginald Denny's new restaurant. (J.P. Conrow, Ft. Payne, AL)

1746 UTC on 15610
UNITED STATES: WWCR Nashville, TN. Country tunes, "Country Radio WWCR" ID. Dr. Gene Scott on WWCR's 13845 and 15685 with sermon. (Hillton, SC)

1748 UTC on 9465
UNITED STATES: WMLK Bethel, PA. New Testament readings, discussions on missionary work by Elder Jacob. (Thomas, OH)

1840 UTC on 17655
NETHERLANDS: Radio Netherlands. Commentary on German foreign policy, relations with U.S. and Germany. // 21590, 9605. (Poindexter, NC; Conrow, AL)

1845 UTC on 15290
RUSSIA: Radio Moscow Intl. Symphonies featuring Russian composers. // 12050, 15105, 15190. (Hillton, SC) Adamov's *Mailbag* program on 11805 at 2150. (Fraser, MA)

1853 UTC on 17880
UNITED KINGDOM: BBC. *Pop Science* on comets and astronomy. "Boys and Girls" pop tune from British group. // on 9410, 9630, 11940, 12095, 15070, 15400. (Hillton, SC) *Seeing Stars* on 9915 at 2215. (Fraser, MA)

1900 UTC on 15440
FINLAND: YLE/Radio Finland. Environmental news on Finnish mine contract dispute. European news on // 11755. Editorial to daily Finnish market update. (Patterson, AL)

1905 UTC on 15640
ISRAEL: Kol Israel. Interview with Canadian ambassador. Newson Palestian agreement, and prime minister's coalition to expand. // 17575 fair. (Banks, TX) Heard on 15640 kHz at 1925, with *DX Corner*. (Fraser, MA)

1910 UTC on 11990
KUWAIT: Radio Kuwait. American blues tune into DJ format with additional rock and blues. (Banks, TX) *Positions of Youth in Islam* on 11990 at 2002, discussing religious rules for children's conduct. (Fraser, MA)

2310 UTC on 4915
GHANA: GBC. Indigenous/English. Announcer in unknown language. ID to feature. Fair signal for pop vocals and instrumental. ID, choral hymn, and national anthem to 0100 sign-off. (Wright, MS)

The QSL Report

SHORTWAVE BROADCASTING

Gayle Van Horn

A Look Back . . . At 1968

Six years ago in September, "QSL Report" premiered in the pages of *Monitoring Times*. The first column featured twenty-six QSLs from the broadcast, utility, medium-wave, and TV bands, plus the glossary of QSL terms featured below. Thank you to all the contributors who made all seventy-two columns a success!

Glossary of QSL Terms

Reception Report:
The listener's written report of station reception, which includes the date, time, frequency, transmission details, and overall quality of reception.

QSL:
A confirmation by a station in the form of a letter, card, or other document, that verifies that a listener has heard the station's signal.

Verification Signer:
Or Veri Signer, is the person at the station who prepared the confirmation and signed the QSL.

Full Data QSL:
A QSL that includes the time, date, and frequency of reception as indicated on the listener's report.

Partial Data QSL:
Exclusion on the QSL, of either time, data, or frequency.

No Data QSL:
No date, time, or frequency included on the QSL sent to the listener.

Mint Stamps:
Unused postage stamps included with the reception report, to be used by the station for the return reply of a QSL.

IRC:
International Reply Coupon, included with the reception report, which the station may exchange for return postage. Available at most post offices.

Prepared QSL Card:
A card or form letter of confirmation prepared by the listener, with the date, time, and frequency information already filled in. If verified, the station will sign, stamp, and return the QSL to the listener.

AIRCRAFT TRAFFIC

MUROC 13, 11176 kHz USB. Full data prepared QSL card signed by Michael Wood, 1st Lt. Personal letter included with 8x10 color photo of C-17's in formation over Edwards AFB. Received in 57 days for an English utility report. QSL address: c/o Michael E. Wood-Lt. USAF, Executive Officer, C-17 CTF, Edwards AFB, CA 93523. Aircraft tail # 91189 is one of the new C-17A 'Globemasters' being built to replace the aging C-141 'Starlifter.' This aircraft was the third built (there are now 12), and was on deployment to Alaska for cold weather testing. (Steve McDonald, Port Coquitlam, BC Canada)

REACH 71839, 11176 kHz USB. Full data prepared QSL card signed by Frank R. Longosky. Personal letter included with REACH itinerary. Received in 12 days for an English report. QSL address: McChord AFB, WA. REACH 71839 was a C-141B 'Starlifter'; tail # 65-0239 on temporary re-assignment from Travis AFB, CA 94535.(McDonald, CAN)

AGAR 93, 1117 kHz USB. Full data prepared QSL card signed by Wing Commander. Received in 51 days for an English utilityreport. QSL address: 4950th Test Wing, Wright-Patterson AFB, OH 93523. Aircraft tail # 81-0893 is an EC-18 (Boeing 707 type electronic instrumentation/data platform) involved in recent cruise missile test over northern Alberta. (McDonald, CAN) *Thanks Steve! - Ed.*

NEW ZEALAND

Radio New Zealand Intl, 15115 kHz. Full data QSL card verified. Schedule, and promotional material included. Received in 13 days for an English report, and two U.S. dollars. Station address: Bowen St., P.O. Box 2092, Wellington, New Zealand. (Gerry Le Strange, East Brunswick, NJ)

SHETLAND ISLANDS

GNK1-Wick Marine Radio, 2832.7 kHz. Full data station QSL signed by Neil M. Muir-Radio Officer. Friendly letter, postcards and station info sheet enclosed. Letter noted my report was the first from the USA. Received in 209 days for an English utility report, 1 IRC (returned), and address label (not used on reply). Station address: British Telecommunications, Newton Rd., Wick, Caithness, United Kingdom KW1 5LT. (Mike Hardester, Jacksonville, NC)

SHIP TRAFFIC

HIBISCUS-PJYG, 8240 kHz (Container). Full data prepared QSL card verified and stamped with ship's seal. Received in 77 days for an English utility report, one U.S. dollar, and a stamped-addressed-envelope. Ship address: c/o Bermuda Container Line, Prins Hendrikkade 48, 1012 AC Amsterdam, Netherlands. (Russ Hill, Oak Park, MI)

HIMALAYA SECONDO-9HVK3, 8282 kHz (Tanker). Full data prepared QSL card verified and stamped with ship's seal. Received in 60 days for an English utility report, one U.S. dollar, one IRC, and a stamped-addressed-envelope. Ship address: c/o COMOMAR, 12 Avenue de Fontvieille, Monte Carlo 98000, Monaco. (Hill, MI)

ADRIAN MAERSK-OY1T2, 156.65 MHz (RO/RO/Container). Full data prepared QSL verified. Received in 29 days for an English utility report, and one U.S. dollar. Ship address: Moller, AP, Esplanaden 50, DK-1098 Copenhagen K, Denmark. (Hank Holbrook, Dunkirk, MD)

CLIFFORD MAERSK-OXME2, 156.65 MHz (Container). Full data verification letter. Received in 45 days for an English utility report, and one U.S. dollar. Ship address: Moller, AP, Esplanaden 50, DK-1098 Copenhagen K, Denmark. (Holbrook, MD)

SLOVAKIA

AWR via Rimavska Sobota, 7180 kHz. Full data card signed by I.M. Brandi-Program Dept. Asst. Personal letter, schedule, report form and AWR Current magazine included. Received in 5 months for an English report. Station address: P.O. Box 100252, 64202 Darmstadt, Germany. (Marie Lamb, Brewerton, NY)

SURINAME

Radio Apintie, 4990 kHz. Full data letter signed by Ch. E. Vervuurt-Director. Received in 115 days for an English report, cassette tape, and one U.S. dollar. Station address: P.O. Box 595, Paramaribo, Suriname. (Charlie Washburn, Robbinston, ME)

UNITED STATES

WRMI, 9955 kHz. Full data "First Day of Regular Broadcast" card, signed by Jeff White. Info sheet on WRMI/Radio Copan Intl included. Received in 10 days for an English report. Station address: P.O. Box 526852, Miami, FL 33152. FAX: +1 (305) 267-9253. (Lamb, NY)

KSD-550 AM. Full data prepared QSL signed by Dave Obergoenner. Report details on station's DX Test. Received in 203 days (11 days after a follow-up report). Station address: 10155 Corporate Square Rd., St. Louis, MO 63132. (Hardester, NC)

WPAD-1560 AM. Full data prepared card signed by Jennifer Taylor-WPAD Programming. Personal letter enclosed with coverage map. Received in 148 days (12 days after follow-up report). Station address: P.O. Box 450, 1700 North 8th St., Paducah, KY 42002. Phone: (502) 442-8231. (Hardester, NC)

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Savings Time) 4, 5, 6 or 7 hours for Eastern, Central, Mountain or Pacific Time, respectively.

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

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

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

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

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

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

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

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

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

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

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

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

Broadcast news from these political hot spots has been collected by Glenn Hauser.

AFGHANISTAN (non?) R. Message of Freedom (Dari: *Pyam-e Azadi*) supports Hekmatyar's Islamic Party, also in Pashto 0145-0315 and 0730-0830 on 7000v ex-7090, no longer at 1400-1530; address PO Box 875, University Town, Peshawar, Pakistan. *The Frontier Post*, Peshawar reported station started 22 Jan. 1992 "from inside Afghanistan" (BBC Monitoring)

ANGOLA RNA reported the UNITA's V. of Resistance of the Black Cockerel will continue to broadcast on SW for about 270 days after peace agreement reached; then, depoliticized on "adequate frequencies" (BBCM)

COLOMBIA R. Patria Libre, clandestine, very strong on 6245v at 2125 giving schedule as Mon.-Fri. 1630 around 6300; Sat. 0100 on 19mb, Sun. 1530 around 6260; no jamming (Ing. Santiago San Gil, Venezuela) Daily at 1130-1210 on 6260, no longer at 0030 on 6530; also says Sat. 1330 on 15050, Sun. 1500 on 6260 (BBCM)

CROATIA HRT on 4769.6 at 2320-0105, which is 5894.6 minus 1125 MW (Finn Krone, Denmark, DSWCI *SW News*)

KOREA NORTH Following death of Kim Il-Sung, Sentry stations on 1614, 2624 and 3025 stopped broadcasting—either because of full alert on DMZ or restrictions on entertainment (Tooru Yamashita, Radio Japan *Media Roundup*) R. P'yongyang announces that the 1300 English broadcast to S.E. Asia is also to America on 13760, 15230 (Stan Slonkosky, CA, USENET via Thurman)

KOREA SOUTH R. Korea announced that on its 41st anniversary, Aug. 15, would become R. Korea International but retain old theme and interval signal (Yamashita, RJ*MR*) Another one succumbs to this five-syllable redundancy

KURDISTAN V. of Independent Kurdistan, Pro-PKK, is heard at 0900 and 1300 on 7400v to avoid jamming. V. of Iraqi Kurdistan, 4180, at 0245-0400, 1445-1700 (BBCM)

MYANMAR Defence Forces Broadcasting Unit, Taunggyi, Shan State, reactivated 6570, most nights around 1100, squeezed by Pyongyang on 6560, 6576 (Ralph Famularo, Japan, *W.O.R.*) I've heard some incredibly beautiful music on 6570 winter afternoons (Michael Osborn, UK, BDXC) (non) Democratic Voice of Burma, via Norway, frequently changes: 0030-0055 on 9600 or 11835; 1430-1455 on 11850 or 15180 (BBCM)

RWANDA Reporters Without Borders plans to set up an independent radio station, with French and Swiss aid (SRI via BBCM) perhaps from Burundi including 1 kW on SW, 60 mb (RN*MN*) To counter hatred propagated by R.-TV Libre des Mille Collines, accused of inciting massacres (RFI via BBCM) France will fund half the budget, 250 kilofrancs (*Le Quotidien de Paris* via BBCM) French participation rejected once they became militarily involved. Maybe in Kivu province, Zaire or Tanzania if not Burundi (RVI *Radio World* via Mauer, Cline, BBCM)

After RPF captured Kigali, announced they would reactivate RRR on 49m, presumably 6055 (Chris Greenway, BBCM via RN*MN*) IARN also wants to set up a Radio for Rwanda, as in Bougainville and Somalia, from a refugee camp where people live together in peace (John Norfolk)

It may take one or two years to reopen important Deutsche Welle Kigali site, not disturbed during the war (Dieter Weirich, DW, RN*MN*)

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Dave Datko
California

B.W. Battin
New Mexico

Jim Frimmel, Program Manager
Texas

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

Next Reporting Deadline
September 23, 1994

newsline

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

0000 UTC
(8:00 PM EDT, 5:00 PM PDT)
BBC
CBC Northern Quebec Service
China Radio Int'l
Monitor Radio Int'l [T-F]
Radio Australia
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Prague
Radio Thailand
Radio Ukraine Int'l
Radio Yugoslavia [M-A]
Spanish National Radio
Voice of America (am/as/ca)
0003
Radio Pyongyang
0009
BBC*
China Radio Int'l*
0010
Radio Havana Cuba [T-S]*
Voice of America (ca) [T-A]*
0030
HCJB
Radio Havana Cuba [T-A]
Radio Moscow
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int'l
Radio New Zealand Int'l [M-F]
Radio Sweden [T-A]
Voice of America (am) [T-S] (Special English)
Voice of America (as) (Special English)
0050
RAI Italy
0055
Vatican Radio [S-W-F]
0057
Spanish National Radio [F]

0100 UTC
(9:00 PM EDT, 6:00 PM PDT)
All India Radio
BBC
CBC Northern Quebec Service [S/T-F]
Deutsche Welle
FEBC (Philippines)
Monitor Radio Int'l [T-F]
R Slovakia Int'l [T-S]
Radio Australia
Radio Budapest Int'l
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [M]
Radio Prague
Radio Tashkent
Radio Thailand
Spanish National Radio
Swiss Radio Int'l
Voice of America (am/as/ca)
Voice of Indonesia
0110
Radio Australia [M-F]*
Radio Havana Cuba [S/T-F]*
Radio Japan [A]*
0130
BBC (as) [T-A]*
Radio Austria Int'l
Radio Havana Cuba [T-A]
Radio Moscow [T-A]
Radio Netherlands Int'l
Radio Portugal Int'l [T-A]
Radio Sweden [T-A]
Radio Tirana
Voice of Greece
0145
BBC (ca) [T-A]*
0155
Voice of Indonesia
0157
Spanish National Radio [F]

0200 UTC
(10:00 PM EDT, 7:00 PM PDT)
BBC ("Newsdesk")
CBC Northern Quebec Service [M-A]
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Romania Int'l
Radio Thailand
Voice of America (am) [T-A]
Voice of America (as)
Voice of Myanmar (Burma)
WWCR #3 [T-A]
0203
Voice of Free China
0210
Radio Havana Cuba [T-S]*
0215
Radio Cairo
Radio Nepal
0230
Radio Budapest Int'l
Radio Havana Cuba [T-A]
Radio Moscow
Radio Netherlands Int'l
Radio Pakistan
Radio Sweden [T-A]
Radio Tirana
0245
Radio Yerevan

0300 UTC
(11:00 PM EDT, 8:00 PM PDT)
BBC
CBC Northern Quebec Service
China Radio Int'l
Deutsche Welle
HCJB
KVOH [T-A]
Monitor Radio Int'l [T-F]
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Prague
Radio Thailand
Radio Ukraine Int'l
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of Turkey
WHRI #2 [T-A]
WINB [T-A]
WWCR #1 [S]
WWCR #3 [T-A]
0303
Voice of Free China
0309
BBC*
China Radio Int'l*
0310
Radio Havana Cuba [S/T-F]*
0315
Radio Cairo
0320
Radio Philipinas [M-A]
0330
BBC (af)*
Radio Bulgaria
Radio Dubai
Radio Havana Cuba [T-A]
Radio Japan [A]*
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int'l
Radio Prague
Radio Sweden [T-A]
0340
Voice of Greece
0355
Radio Japan

0400 UTC
(12:00 AM EDT, 9:00 PM PDT)
BBC ("Newsdesk")
BBC (af)
CBC Northern Quebec Service
Channel Africa
China Radio Int'l
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [A]
Radio New Zealand Int'l [M-F]*
Radio Romania Int'l
Radio Tanzania
Radio Thailand
Swiss Radio Int'l
Voice of America (af/me)
Voice of Israel
WHRI #2 [T-H/A]
WINB [M-A]
WYFR (Satellite Network) [T-S]
0403
Radio Pyongyang
0409
China Radio Int'l*
0410
Radio Havana Cuba [T-S]*
0411
Channel Africa [T]
0425
RAI Italy
0430
Channel Africa [A]
Radio Finland
Radio Havana Cuba [T-A]
Radio Moscow
Radio Yugoslavia
Voice of America (af) [M-F]*
0431
Channel Africa [T/H/F]
0440
BBC (af) [A-M]*
0445
BBC (af) [T-F]*

0500 UTC
(1:00 AM EDT, 10:00 PM PDT)
BBC ("Newshour")
CBC Northern Quebec Service
Channel Africa
Christian Science Sentinel [S]
Deutsche Welle
HCJB
Monitor Radio Int'l [T-F]
Radio Australia
Radio Cameroon
Radio Canada Int'l [M-F]
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Norway Int'l [M]
Radio Thailand
Spanish National Radio
Swiss Radio Int'l (eu)
Vatican Radio [T/F]
Voice of America (af/me)
WINB [T-A]
0510
Radio Australia [M-F]*
Radio Havana Cuba [T-S]*
0530
Channel Africa [S-F]
Radio Austria Int'l
Radio Dubai
Radio Havana Cuba [T-A]
Radio Moscow
Radio Romania Int'l
Radio Thailand
Voice of Nigeria
0531
0555
Radio Japan [A]

0600 UTC
(2:00 AM EDT, 11:00 PM PDT)
BBC
BBC (af) [A-S]*
BBC (af) [M-F]
Channel Africa
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Havana Cuba
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Prague
Swiss Radio Int'l
Swiss Radio Int'l (eu)
Vatican Radio [M-A]
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Kenya
Voice of Malaysia
WINB [T-A]
WWCR #1 [S-H]
0603
Radio Pyongyang

0609
BBC*
0610
Radio Havana Cuba [S/T-F]*
0627
BBC (af) [M-F]*
0630
Channel Africa []
Radio Austria Int'l [T-S]
Radio Havana Cuba [T-A]
Radio Japan [A]*
Radio Moscow
Radio Vlaanderen Int'l
Vatican Radio [H]
Voice of Nigeria [M-F]
0631
0632
Radio Romania Int'l
0640
Vatican Radio [T]
0645
Radio Finland
Radio Romania Int'l
Voice of Nigeria [M-F]*
0655
Voice of Med. (Malta) [M-F]

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

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

0803
Radio Pyongyang
0810
Radio New Zealand Int'l [M-F]*
0830
R Slovakia Int'l
Radio Austria Int'l
Radio Moscow
Radio Netherlands Int'l
0845
Radio Yerevan [S]
0855
Voice of Indonesia [A-H]

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

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
BBC
China Radio Int'l
Christian Science Sentinel [A]
FEBC (Philippines) [M-F]*
HCJB
Monitor Radio Int'l [M-F]
Papua New Guinea
Radio Australia
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Tanzania
Swiss Radio Int'l (eu)
Vatican Radio [M-A]
Voice of America (as/ca)
Voice of Israel
Volce of Kenya
WWCR #1 [M-F]
WYFR (Satellite Network) [M-A]
1009
China Radio Int'l*
1010
Radio New Zealand Int'l [M-F]*
1030
Radio Austria Int'l [M-A]
Radio Dubai
Radio Korea
Radio Moscow
Radio Netherlands Int'l
Radio Prague
Voice of Nigeria
WYFR (Satellite Network) [M-A]

1045
Radio New Zealand Int'l [M-F]*
Voice of Nigeria [A-S]*

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
BBC ("Newsdesk")
Channel Africa
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int'l [M-F]
Papua New Guinea
Radio Australia
Radio Ghana [A-S]
Radio Japan
Radio Jordan
Radio Moscow
Radio Mozambique
Radio New Zealand Int'l
Radio Pakistan
Radio Singapore Int'l
Swiss Radio Int'l
Swiss Radio Int'l (eu)
Voice of America (as/ca)
WYFR (Satellite Network) [M-A]
1103
Radio Pyongyang
1110
Radio Australia*
1130
Radio Austria Int'l
Radio Finland [M-A]
Radio Japan [A]*
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Singapore Int'l
Radio Sweden [M-F]
Voice of Asia
WYFR (Satellite Network) [M-F]
1135
Radio Thailand
1145
Deutsche Welle [M-F]*
1155
Radio Japan [T-S]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC
China Radio Int'l
Christian Science Sentinel [A]
Monitor Radio Int'l [M-F]
Papua New Guinea
Radio Australia
Radio Bulgaria
Radio Canada Int'l [M-F]
Radio France Int'l
Radio Moscow
Radio New Zealand Int'l [H-T]
Radio Norway Int'l [S]
Radio Singapore Int'l
Radio Tashkent
Radio Thailand
Voice of America (as)
WYFR (Satellite Network) [M-F]
1203
HCJB [M-F]
Radio Korea
Voice of Free China
1209
BBC [W]*
China Radio Int'l*
1230
HCJB [M-F]
Radio Bangladesh [S-M]
Radio Cairo
Radio Canada Int'l
Radio Finland [M-A]
Radio Moscow [M-A]
Radio Netherlands Int'l
Radio Singapore Int'l
Radio Sweden [M-F]
Radio Vlaanderen Int'l [S]
Swiss Radio Int'l (eu)
Volce of Turkey
Voice of Vietnam
WYFR (Satellite Network) [M-F]
1240
Voice of Greece

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC ("Newshour")
CBC Northern Quebec Service [S]
China Radio Int'l
Christian Science Sentinel [A]
KNLS
Monitor Radio Int'l [M-F]
Papua New Guinea
Radio Australia
Radio Canada Int'l [S]
Radio Ghana
Radio Korea
Radio Moscow
Radio Norway Int'l [S]
Radio Romania Int'l [M-A]
Radio Singapore Int'l
Radio Tanzania [A-S]
Radio Tashkent [S]
Radio Vlaanderen Int'l [M-A]
Swiss Radio Int'l
Voice of America (as)
Voice of Israel [S-H]
Voice of Kenya
WWCR #1 [M-F]
WYFR (Satellite Network) [M-F]
1301
Radio Romania Int'l [S]
1303
Radio Pyongyang
1309
China Radio Int'l*
1310
Radiobrçs [M-F]
1324
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
FEBC (Philippines)
Radio Austria Int'l
Radio Canada Int'l
Radio Dubai
Radio Finland
Radio Moscow
Radio Netherlands Int'l
Radio Singapore Int'l [S-F]
Radio Sweden [M-F]
Radio Tashkent [M-A]
Voice of America (as) (Special English)
Voice of Vietnam
1335
Voice of Greece
1355
Radio Singapore Int'l

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
All India Radio [M/W/F]
BBC
BBC (as) [M-F]*
CBC Northern Quebec Service [S]
China Radio Int'l
Christian Science Sentinel [A]
Monitor Radio Int'l [M-F]
Radio Australia
Radio Bulgaria
Radio Cameroon
Radio Canada Int'l [S]
Radio France Int'l
Radio Ghana
Radio Japan
Radio Jordan [A]
Radio Korea
Radio Moscow
Radio Tirana
Voice of America (as)
WWCR #1 [M-F]
1409
China Radio Int'l*
1410
Radio Japan [M-F]*
1415
Radio Nepal
1424
HCJB [M-F]
1430
FEBC (Philippines)
Radio Austria Int'l
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Romania Int'l [T-S]
RTM Morocco [S]
Voice of Myanmar (Burma)
WYFR (Satellite Network) [M-F]
1431
Radio France Int'l [T]*
Radio Romania Int'l [M]
1440
FEBC (Philippines) [S-F]*
1445
BBC (as) [M-F] (Special English)
Voice of Myanmar (Burma)
1450
All India Radio
1455
All India Radio
Radio Japan [A]
Voice of Med. (Malta) [M-F]

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
BBC
BBC (af) [M-F]
CBC Northern Quebec Service [S]
Channel Africa
China Radio Int'l
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int'l [M-F]
Radio Australia
Radio Canada Int'l [S]
Radio Japan
Radio Jordan
Radio Moscow
Radio Omdurman
Radio Prague

Radio Tallinn [M-F]
Swiss Radio Int'l
Voice of America (as/me)
WHRI #2 [A]
WRNO [W]
WYFR (Satellite Network) [A]
1503
Radio Pyongyang
1505
Radio Algiers [M]
1509
China Radio Int'l*
1510
Radio Japan [M-F]*
1525
BBC (af) [S]*
Radio Veritas [T-F]
1530
All India Radio
Deutsche Welle [M-F]*
FEBC (Philippines)
Radio Austria Int'l
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int'l
Radio Portugal Int'l [M-F]
Voice of Nigeria [M-H]
1540
Radio Veritas [A-M]
1550
Voice of Med. (Malta) [F]
1555
Radio Japan [A]
Radio Veritas [A-M]
Voice of Med. (Malta) [M-H]

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC
Channel Africa
China Radio Int'l
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int'l [M-F]
Radio Australia
Radio France Int'l
Radio Jordan
Radio Korea
Radio Moscow
Radio Pakistan
Radio Tanzania
Voice of America (af) [A-S]
Voice of America (as/me)
Voice of Kenya
Voice of Nigeria [M-F]
WRNO [M-F]
WYFR (Satellite Network) [M-A]
1609
BBC*
China Radio Int'l*
1611
Radio France Int'l [T]*
1612
Vatican Radio [S-F]
1615
Radio Sweden [M-F]
1630
Radio Canada Int'l
Radio Dubai
Radio Moscow [S-F]
Voice of America (af) [M-F]
Voice of America (as) (Special English)
Voice of America (me) (Special English)
1645
BBC (as)*

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
BBC (af)
Channel Africa
China Radio Int'l
Christian Science Sentinel [A]
HCJB [M-F]
Monitor Radio Int'l [M-F]
Polish Radio
Radio Australia
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-F]*
Radio Pakistan
Radio Prague
Swiss Radio Int'l
Voice of America (af/as/me)
WWCR #1 [M-F]
WWCR #3 [S-F]
1703
Radio Pyongyang
1709
China Radio Int'l*
1710
Radio Australia*
1725
Radio New Zealand Int'l [F]*
1730
Radio Moscow
Radio Netherlands Int'l
Radio Romania Int'l
Radio Sweden [M-F]
Vatican Radio [F]
Voice of America (af) [S]
1740
BBC (af)*
1745
All India Radio
1755
Radio Japan [A]
Radio New Zealand Int'l [M-H]*

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC ("Newsdesk")
Christian Science Sentinel [A]
Monitor Radio Int'l [M-F]
Radio Australia
Radio Cameroon
Radio Moscow
Radio Mozambique
Radio New Zealand Int'l [M-F]*
Radio Norway Int'l [S]
Radio Omdurman
Radio Tanzania
Radio Tirana
Radio Vlaanderen Int'l
Voice of America (af/me)
Voice of Kenya
WHRI #1 [M-F]
WINB [M-F]
WWCR #1 [M-F]
WWCR #3 [S-F]
1805
Radio New Zealand Int'l [H-F]*
1830
R Slovakia Int'l
Radio Austria Int'l
Radio Kuwait
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Yugoslavia
Voice of America (af) [A-S] (Special English)
Voice of America (me) (Special English)
1835
Radio New Zealand Int'l [F]*
1840
Voice of Greece [M-A]
1845
Radio Yerevan
1855
Radio New Zealand Int'l [M-H]*
1857
BBC (af) [M-F]*

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio [W]
BBC
China Radio Int'l
Christian Science Sentinel [A]
Deutsche Welle
HCJB
Monitor Radio Int'l [M-F]
Radio Australia
Radio Budapest Int'l
Radio Bulgaria
Radio Finland
Radio Japan
Radio Moscow
Radio New Zealand Int'l
Radio Portugal Int'l [M-F]
Radio Romania Int'l [T-S]
Radio Tallinn [M/H]
Spanish National Radio
Swiss Radio Int'l (eu)
Voice of America (af/as/me)
Voice of Israel
WHRI #1 [M-F]
WINB [M-F]
WWCR #3
1901
Radio Romania Int'l [M]
1909
China Radio Int'l*
1910
All India Radio [W]
Radio Australia [M-F]*
Voice of Israel [W]*
1930
BBC (af) [S]*
Deutsche Welle [T-F]*
Polish Radio
Radio Japan [A]*
Radio Moscow [A-S]
Radio Netherlands Int'l
1933
Deutsche Welle [M]*
1935
RAI Italy
1955
Radio Japan []

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
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 Prague
Swiss Radio Int'l
Vatican Radio [M-T]
Voice of America (af/me)
Voice of Greece [M-A]
Voice of Indonesia
Voice of Nigeria [M-F]
Voice of Turkey
WHRI #1 [M-F]
WINB [M-F]
WWCR #3 [S-F]
2003
Radio Pyongyang
2009
China Radio Int'l*
2010
Radio New Zealand Int'l [S-H]*
2025
RAI Italy
2030
HCJB
Radio Canada Int'l
Radio Korea
Radio Moscow
Radio Riga Int'l [M-F]
Radio Sweden [M-F]
Radio Yugoslavia
2045
All India Radio [A]
2055
Voice of Indonesia [M]

2100 UTC
(5:00 PM EDT, 5:00 PM PDT)
All India Radio
BBC ("Newshour")
China Radio Int'l
Deutsche Welle
KVOH [S]
Monitor Radio Int'l [M-F]
Radio Australia
Radio Budapest Int'l
Radio Bulgaria
Radio Cameroon
Radio Canada Int'l [A-S]
Radio Damascus [F]
Radio Havana Cuba [M-A]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [A-H]
Radio Prague
Radio Romania Int'l
Radio Ukraine Int'l
Radio Vlaanderen Int'l [M-F]
Radio Yugoslavia
Spanish National Radio
Voice of America (af/as/me)
WINB [M-F]
WWCR #3 [S-F]
2109
China Radio Int'l*
2110
Radio Damascus [S-M]
Radio New Zealand Int'l [S-H]*
2112
Radio Damascus [F]
2115
BBC (ca) [M-F]*
2120
Radio Cairo
2125
Radio Canada Int'l [M-F]
2130
Radio Austria Int'l
Radio Cairo
Radio Havana Cuba [M-T/H]*
Radio Havana Cuba [W/F]
Radio Moscow [M-F]
Radio Nacional de Venezuela [M-A]
Radio Sweden [M-F]
Voice of Israel
2142
Voice of Israel [H]*
2145
Radio Damascus [W]
Radio Korea
Radio Yerevan
2155
Radio Japan [A]

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC
China Radio Int'l
Christian Science Sentinel [A]
Monitor Radio Int'l [M-F]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Korea
Radio Moscow
Radio New Zealand Int'l
RAI Italy
Voice of America (as)
Voice of Turkey
WWCR #3 [M-F]
2203
Voice of Free China
2209
China Radio Int'l*
2215
All India Radio [M/W/F]
Radio Cairo
2230
Radio Canada Int'l [A-S]
Radio Finland
Radio Havana Cuba [M-F]*
Radio Moscow
Radio Sweden [M-F]
Voice of America (as) (Special English)
2240
Radio Cairo
Voice of Greece [S-F]
2245
Radio Bulgaria
Radio Yerevan

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
BBC ("Newsdesk")
CBC Northern Quebec Service [A]
Christian Science Sentinel [A]
Monitor Radio Int'l [M-F]
Radio Australia
Radio Canada Int'l [A-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [A]
Radio Norway Int'l [S]
Voice of America (as)
WWCR #3 [A]
2303
Radio Pyongyang
2330
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int'l
Radio Sweden [M-F]
Radio Vlaanderen Int'l
SLBC (Sri Lanka) [M]
2335
Voice of Greece [S-F]
2355
Radio Japan

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Lawrence Magne
Monitoring Times

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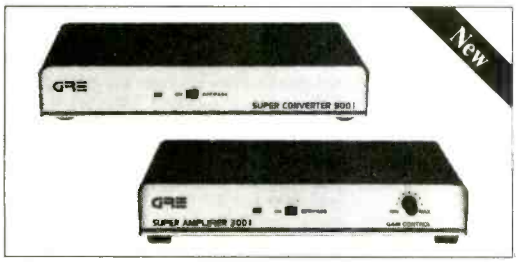
Improve Your Scanning Coverage!

GRE America is proud to introduce a new family of products to enhance your scanning pleasure! First, GRE has designed the new **Super Converter 9001** for base model scanners. The 9001 converts 810 MHz - 950 MHz down to 410 MHz - 550 MHz. The 9001 is the perfect alternative to buying a new, expensive scanner covering the 800 MHz band. Next, GRE announces the new **Super Amplifier 3001** for base model scanners. The 3001 will increase gain by as much as 20 dB, and is engineered to help scanners with low sensitivity pull in weak signals. Both products use BNC connectors, (1) 9 volt battery and have an off/pass switch for returning to normal operation.



Super Converter 9001 & Super Amplifier 3001

Super Converter II

Super Amplifier

All-Band Antenna

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For more information, please call GRE at (800) 233-5973. GRE is a subsidiary of General Research of Electronics, Inc.

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GRE America, Inc.
425 Harbor Blvd., Belmont, California 94002
(415) 591-1400 Outside California: (800) 233-5973

0000 UTC SHORTWAVE GUIDE 8:00 PM EDT 5:00 PM PDT

FREQUENCIES

0000-0100	Australia, Radio	11855as	13605as	13745as	17750as
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	Cambodia, Natl Voice of	11940as			
0000-0100 vl	Canada, CBC N Quebec Sce	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, China Radio Intl	9780na	11715na		
0000-0100 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0000-0100	Cuba, Radio Havana Cuba	6010na	13700na		
0000-0027	Czech Rep, Radio Prague	7345na	9485na		
0000-0045	India, All India Radio	9705as	11745as	15110as	15145as
		17800as			
0000-0100 vl	Italy, IRRS Milano	7125eu			
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		
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	5940na	7295na	9480na	9685na
		9750na	9765na	11750na	11790na
		11805na	12050na	15290na	15410na
		15425na	17570as	17890as	21625as
0000-0030 mtwhfa	Serbia, Radio Yugoslavia	9580na	11870na		
0000-0100	Spain, Spanish Natl Radio	9540na			
0000-0100	Thailand, Radio	9655as	11905as		
0000-0100	Ukraine, R Ukraine Intl	7285na	9685na	9860na	11720na
		12030na	15180na	15580na	
0000-0100	United Kingdom,BBC London	5965as	5975na	6175na	7325na
		9580as	9915na	11750sa	12095sa
		15260sa	15310as	15360as	
0000-0100	USA, KCBI Dallas TX	13740na			
0000-0100	USA, KTBN Salt Lk City UT	15590am			
0000-0100	USA, KVOH Los Angeles CA	17775am			
0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	USA, Monitor Radio Intl	7535na	9430ca		
0000-0030	USA, R Bosnia H via WHRI	7315am			
0000-0100	USA, VOA Washington DC	5995am	6130am	7215au	7405am
		9455am	9770au	9775am	11580am
		11695am	11760as	15120am	15185as
		15205am	15290as	17735as	17765as
		17820as			
0000-0100	USA, WCSN Scotts Cor ME	9855af			
0000-0100	USA, WEWN Birmingham AL	7425na	9410eu	9985sa	
0000-0100 vl	USA, WHRI Noblesville IN	7315am			
0000-0100	USA, WINB Red Lion PA	11950am			
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	9580pa	9660pa	11855as	13605as
		13745as	13755as	15240pa	15365pa
		15415as	15510as	17750as	17795pa
		17860as			
0030-0100	Ecuador, HCJB Quito	9745am	12005am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	7100na	9022na		
0030-0100	Netherlands, Radio	6020na	6165na	9840na	9860as
		12025as			
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	Sweden, Radio	6065sa	9810na	9850sa	
0050-0100	Italy, RAI Rome	9725na	11800na		

SELECTED PROGRAMS

Sundays

0000 WEWN: The Best of Mother Angelica Live.
0000 WYFR (Satellite Network): Patterns in Music. Musical essays based on scripture.
0000 WYFR: The Open Forum. Harold Camping answers biblical questions from listeners.
0006 Radio Ukraine Int'l: Hello from Kiev. Weekly mailbag program of letter-reading, responses, and music.
0010 Radio Australia: Study in Australia. Jillian Hocking reports on educational opportunities in Australia for overseas students.
0030 Radio Australia: Correspondents' Report. In-depth reports from around the world on a variety of topics.

Mondays

0000 Radio Australia: Network Asia (Part 1). Brian Abott hosts this program of news, interviews, current affairs, and developments in the Asian/Pacific region.
0000 WEWN: The Kingdom.
0000 WINB: Now Take My Hand.
0010 Radio Ukraine Int'l: Ukraine Today. A program of news, interviews, and reports.
0018 Radio Ukraine Int'l: Music from Ukraine. Ukrainian folk music.
0028 WEWN: Who Do You Say I Am?
0030 Radio Australia: International Report. Twenty minutes of information and comment on the half-hour every two hours.
0030 WINB: Prophetic and Evangelistic Ministry.

Tuesdays

0000 Radio Australia: Network Asia (Part 1). See M 0000.
0000 WEWN: The Best of Mother Angelica Live.
0000 WINB: Resurrection Light.
0000 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0010 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0015 WINB: Radio Bible Class.
0025 Radio Ukraine Int'l: Closeup. Focus on current national issues.
0030 Radio Australia: International Report. See M 0030.
0030 WINB: Take My Hand Missions.
0030 WYFR (Satellite Network): Family Bible Study. See M 0520.
0037 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (6th). See S 0037.

Wednesdays

0000 Radio Australia: Network Asia (Part 1). See M 0000.
0000 WEWN: Mother Angelica Live.
0000 WINB: Resurrection Light.
0010 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0015 WINB: Radio Bible Class.
0018 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0025 Radio Ukraine Int'l: Closeup. See T 0025.
0030 Radio Australia: International Report. See M 0030.
0030 WINB: Take My Hand Missions.
0030 WYFR (Satellite Network): Family Bible Study. See M 0520.

Thursdays

0000 Radio Australia: Network Asia (Part 1). See M 0000.
0000 WEWN: Mother Angelica Live.
0000 WINB: Making a Difference.
0000 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0010 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0015 WINB: Radio Bible Class.
0025 Radio Ukraine Int'l: Closeup. See T 0025.
0030 Radio Australia: International Report. See M 0030.
0030 WINB: Take My Hand Missions.
0030 WYFR (Satellite Network): Family Bible Study. See M 0520.

Fridays

0000 Radio Australia: Network Asia (Part 1). See M 0000.
0000 WEWN: Mother Angelica Live Encore.
0000 WINB: Making a Difference.
0000 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0010 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0015 WINB: Radio Bible Class.
0025 Radio Ukraine Int'l: Closeup. See T 0025.
0030 Radio Australia: International Report. See M 0030.
0030 WINB: Take My Hand Missions.
0030 WYFR (Satellite Network): Family Bible Study. See M 0520.

Saturdays

0000 WEWN: The Best of Mother Angelica Live.
0000 WINB: Making a Difference.
0000 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0010 Radio Australia: Feedback. Dennis Gibbons answers letters and discusses new programs and reception problems.
0010 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0015 WINB: Radio Bible Class.
0018 Radio Ukraine Int'l: Baroque. A program of Ukrainian culture.
0030 Radio Australia: Indian Pacific. Weekly program of news and analysis of events in the Pacific and Asia.
0030 WINB: Take My Hand Missions.
0030 WYFR (Satellite Network): Family Bible Study. See M 0520.
0037 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (3rd). The average Dutch family is compared with the average immigrant one.

Looking for a Good Antenna Handbook?

If you'd like a good source of information about antennas you will be interested in ***THE ANTENNA HANDBOOK*** by Clem Small. Within its 200-plus, 8 1/2" by 11" pages, there is much material from past "Antenna Topics" columns plus a considerable amount of new material.

It is an excellent source of information for selecting, constructing, understanding, and utilizing your antenna system. Also covered are subjects like the history of antennas, odd and unusual antennas, signal propagation, factors affecting antenna performance, antenna accessories, and antenna troubleshooting.

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).

FREQUENCIES

0100-0200	Australia, AOF Radio	18735as				
0100-0200	Australia, Radio	9580pa	9660pa	11855as	13605as	
		13755as	15240pa	15365pa	15415as	
		15510as	17750as	17795pa	17860pa	
		17880as				
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 vl	Canada, CBC N Quebec Sce	9625do				
0100-0200	Canada, CFCX Montreal	6005do				
0100-0200	Canada, CFRX Toronto	6070do				
0100-0200	Canada, CFVP Calgary	6030do				
0100-0200	Canada, CHNX Halifax	6130do				
0100-0200	Canada, CKZN St John's	6160do				
0100-0200	Canada, CKZU Vancouver	6160do				
0100-0200	Canada, RCI Montreal	6120na	9535na	9755na	11845na	
		11940na				
0100-0200	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am	
0100-0200	Cuba, Radio Havana Cuba	6010na	13700na			
0100-0127	Czech Rep, Radio Prague	7345na	9485na			
0100-0200	Ecuador, HCJB Quito	9745am	12005am	17490am	21455am	
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9700na	
		11740na	11865na			
0100-0200 m	Guatemala, Radio Cultural	3300do				
0100-0130	Hungary, Radio Budapest	6025na	9835na	11910na		
0100-0200	Indonesia, Voice of	9675as	11752as			
0100-0130	Iran, VOIRI Tehran	7100na	9022na			
0100-0200 vl	Italy, IRRS Milano	7125eu				
0100-0110	Italy, RAI Rome	9725na	11800na			
0100-0200	Japan, NHK/Radio	9680as	11840as	11860as	11910as	
		15195as	17810as	17845as		
0100-0130	Laos, National Radio of	7116as				
0100-0200	Netherlands, Radio	9860as	12025as			
0100-0125	Netherlands, Radio	6020na	6165na	9840na		
0100-0200	New Zealand, R NZ Intl	15115pa				
0100-0130 m	Norway, Radio Norway Intl	9560ca	11925na			
0100-0200 vl	Papua New Guinea, NBC	9675do				
0100-0200	Philippines, FEBC Manila	15450as				
0100-0200	Russia, Radio Moscow Intl	5940na	7165na	7180na	7295na	
		9530na	9685na	9695me	9750me	
		9765me	11665me	11685na	11750na	
		11805na	11810na	12050na	15425na	
		17570as	17690na	21625as		
0100-0200	Slovakia, AWR Europe	9465as				
0100-0130	Slovakia, R Slovakia Intl	5930na	7310na	9810na		
0100-0200	South Korea, R Korea Intl	7550eu	15575am			
0100-0200	Spain, Spanish Natl Radio	9540na				
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as		
0100-0130	Switzerland, Swiss R Intl	5905am	6135am	9885am		
0100-0200	Thailand, Radio	9655as	11905as			
0100-0200	United Kingdom,BBC London	5965as	5975na	6175na	7160as	
		7325na	9580as	9590na	9915sa	
		11750sa	11955sa	15260sa	15310as	
		15360as	17790as			
0100-0200	USA, KCBI Dallas TX	13740na				
0100-0200	USA, KTBN Salt Lk City UT	7510na				
0100-0200	USA, KVOH Los Angeles CA	17775am				
0100-0200	USA, KWHR Naalehu HI	17510as				
0100-0200	USA, Monitor Radio Intl	7535na	9430ca			
0100-0130 stwhfa	USA, Radio Miami Intl	9955am				
0100-0200	USA, VOA Washington OC	5995na	6130am	7205as	7405am	
		9445na	9775am	11580am	11705as	
		15120am	15205am	15250as	17740as	
		21550as				
0100-0200	USA, WCSN Scotts Cor ME	9855af				
0100-0200 vl	USA, WEWN Birmingham AL	7425na	13710na			
0100-0200 vl	USA, WHRI Noblesville IN	7315am				
0100-0200	USA, WINB Red Lion PA	11950am				
0100-0200	USA, WJCR Upton KY	7490na	13595na			
0100-0200	USA, WRNO New Orleans LA	7355am				
0100-0200	USA, WWCR Nashville TN	5810am	7435am	13845am		
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na	15440na		
0130-0200	Albania, R Tirana Intl	9580na	9760na			
0130-0200	Austria, R Austria Intl	9655na	9870na	13730na		
0130-0150	Greece, Voice of	9380na	9420na	11645na		
0130-0200	Netherlands, Radio	9860as	12025as			
0130-0200 twhfa	Portugal, Radio	9550na	9570na	9600na	9635na	
		9705na	11840na			
0130-0200	Sweden, Radio	9695au	11695as			
0140-0200	Vatican State, Vatican R	7335as	9650as			

SELECTED PROGRAMS

Sundays

0100 WEWN: Mariology.
0100 WINB: Newslight.
0100 WYFR: The Open Forum. See S 0000.
0105 Swiss Radio Int'l: Newsnet.
0109 Deutsche Welle: Commentary. Guest commentary about a current event.
0113 Deutsche Welle: Mailbag (biweekly). Listener mail is answered (alternates with Nickelodeon).
0113 Deutsche Welle: Nickelodeon (biweekly). German music as requested by North American listeners (alternates with Mailbag).
0128 WEWN: The Church and Society.
0132 Deutsche Welle: German by Radio. An advanced German language course for English speakers.
0145 WYFR (Satellite Network): Music. Recordings of music with a religious flavor.

Mondays

0100 WEWN: Living Fully.
0100 WINB: Southwest Radio Church.
0105 Swiss Radio Int'l: Newsnet.
0109 Deutsche Welle: Commentary. See S 0109.
0111 Deutsche Welle: Living in Germany. A weekly look at the social and political issues in the 1990s.
0128 WEWN: A Closer Walk.
0130 Deutsche Welle: Larry's Random Selection. Larry Wayne looks at Germany's lighter side for North American listeners.
0137 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (5th). See S 0037.

Tuesdays

0100 WEWN: The Truth Will Set You Free.
0100 WINB: Making a Difference.
0100 WYFR (Satellite Network): Behind the Scenes at Family Radio. See M 1500.
0104 WYFR (Satellite Network): Echoes. Repeats of sermons from the Family Radio archives.
0105 Swiss Radio Int'l: Newsnet.
0109 Deutsche Welle: European Journal. See M 0223.
0115 WINB: Church of the Open Door.
0128 WEWN: Mary's Offspring.
0130 WINB: Getting Acquainted.
0133 Deutsche Welle: German Tribune. News and views from the Federal Republic.

Wednesdays

0100 WEWN: Tree of Life.
0100 WINB: Making a Difference.
0100 WYFR (Satellite Network): Behind the Scenes at Family Radio. See M 1500.
0104 WYFR (Satellite Network): Echoes. See T 0104.
0105 Swiss Radio Int'l: Newsnet.
0109 Deutsche Welle: European Journal. See M 0223.
0128 WEWN: Faith Makes You Whole.
0133 Deutsche Welle: Backdrop. A program of culture and the arts in Germany.

Thursdays

0100 WEWN: Livewire (live).
0100 WINB: Making a Difference.
0100 WYFR (Satellite Network): Behind the Scenes at Family Radio. See M 1500.
0100 WYFR: The Open Forum. See S 0000.
0104 WYFR (Satellite Network): Echoes. See T 0104.
0105 Swiss Radio Int'l: Newsnet.
0109 Deutsche Welle: European Journal. See M 0223.
0133 Deutsche Welle: German Tribune. See T 0133.

Fridays

0100 WEWN: Winners for Christ.
0100 WINB: Truth House.
0100 WYFR (Satellite Network): Behind the Scenes at Family Radio. See M 1500.
0104 WYFR (Satellite Network): Echoes. See T 0104.
0105 Swiss Radio Int'l: Newsnet.
0109 Deutsche Welle: European Journal. See M 0223.
0128 WEWN: University in the Sky.

Saturdays

0100 WEWN: La Verité Vous Liberera.
0100 WINB: Truth House.
0100 WYFR (Satellite Network): Behind the Scenes at Family Radio. See M 1500.
0104 WYFR (Satellite Network): Echoes. See T 0104.
0105 Swiss Radio Int'l: Newsnet.
0109 Deutsche Welle: European Journal. See M 0223.
0130 WINB: Focus on the Family.
0133 Deutsche Welle: Through German Eyes. See S 1518.
0137 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (3rd). See S 0037.

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

FREQUENCIES

0200-0300 mtwhf	Argentina, RAE	11710am			
0200-0300	Australia, Radio	11880pa	13605as	15240pa	15365pa
		15415as	15510as	17715as	17750as
		17795pa	17860pa	17880as	
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 vl	Canada, CBC N Quebec Sce	9625do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0230	Canada, RCI Montreal	6120na	9535am	9755na	11845na
		11940am			
0200-0300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0200-0300	Cuba, Radio Havana Cuba	6010na	9820na		
0200-0300	Ecuador, HCJB Quito	9745am	12005am	17490am	
0200-0300	Egypt, Radio Cairo	9475na	11600na		
0200-0250	Germany, Deutsche Welle	7285as	9580as	9615as	9690as
		11945as	11965as	12045as	15185as
0200-0300 as	Guam, KSDA AWR Agat	13720as			
0200-0300 vl	Italy, IRRS Milano	7125eu			
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	9860as	12025as		
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0300 vl	Papua New Guinea, NBC	9675do			
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0200-0300	Russia, Radio Moscow Intl	5940na	7205af	7295na	9530na
		9620na	9685af	9695af	9765af
		11665na	11805na	12050as	15410na
		15425na	17570as	17655au	21625na
0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0200-0300	Taiwan, VO Free China	5950na	9680na	9765au	11740ca
		11860as	15345as		
0200-0300	Thailand, Radio	9655as	11905as		
0200-0300	United Kingdom,BBC London	5975na	6175na	6195me	7155me
		7235me	9410eu	9630af	9915am
		11750sa	11955me	15260sa	15360as
		17790as			
0200-0230 vl	USA, KCBI Dallas TX	9815am	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	5995am	6130am	7405am	9775am
		11580am	15120am	15205am	
0200-0300	USA, VOA Washington DC	7115as	7205as	7651as	9740as
		11705as	15250as	17740as	21550as
0200-0300	USA, WCSN Scotts Cor ME	7465am			
0200-0300	USA, WEWN Birmingham AL	7425na			
0200-0300	USA, WHRI Noblesville IN	7315am			
0200-0300	USA, WINB Red Lion PA	11950am			
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		
0200-0245	USA, WYFR Okeechobee FL	15440na			
0215-0255	Nepal, Radio	5005do	7165do		
0230-0245	Albania, R Tirana Intl	9580na	9760na		
0230-0300	Hungary, Radio Budapest	5970na	9835na	11910na	
0230-0300 s	Kenya, Kenya BC Corp	4935do			
0230-0245	Pakistan, Radio	7290as	15190as	17705as	17725as
		21730as			
0230-0300	Sweden, Radio	6040na	6155na	9850na	
0250-0300	Vatican State, Vatican R	6095na	7305na		

SELECTED PROGRAMS

Sundays
0200 WEWN: Christifidelis.
0200 WINB: Scriptures for America.
0200 WYFR (Satellite Network): The Quiet Hours. Easy listening music on the spiritual side.
0208 Deutsche Welle: Commentary. See S 0109.
0212 Deutsche Welle: Sports Report. The latest news from the world of sports.
0216 Deutsche Welle: Asia-Pacific Mailbag. Listener mail from Asia-Pacific region is answered.
0228 WEWN: Say Yes.
0238 Deutsche Welle: Technical Tips for DXers. Last Sat/Sun of the month.

Mondays
0200 WEWN: The Abundant Life.
0200 WYFR: Family Bible Reading Fellowship. See S 1200.
0205 WINB: Radio Free America.
0208 Deutsche Welle: Asia-Pacific Report. Correspondent reports, interviews and background news from the Asia-Pacific region.
0223 Deutsche Welle: European Journal. A review of major events in Europe and Germany through interviews, analyses and background reports.
0237 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (5th). See S 0037.

Tuesdays
0200 WEWN: Mother Angelica Talks It Over.
0200 WYFR (Satellite Network): The Open Forum. See S 0000.
0205 WINB: Radio Free America (live).
0208 Deutsche Welle: Asia-Pacific Report. See M 0208.
0223 Deutsche Welle: European Journal. See M 0223.
0228 WEWN: A Homily for Today.

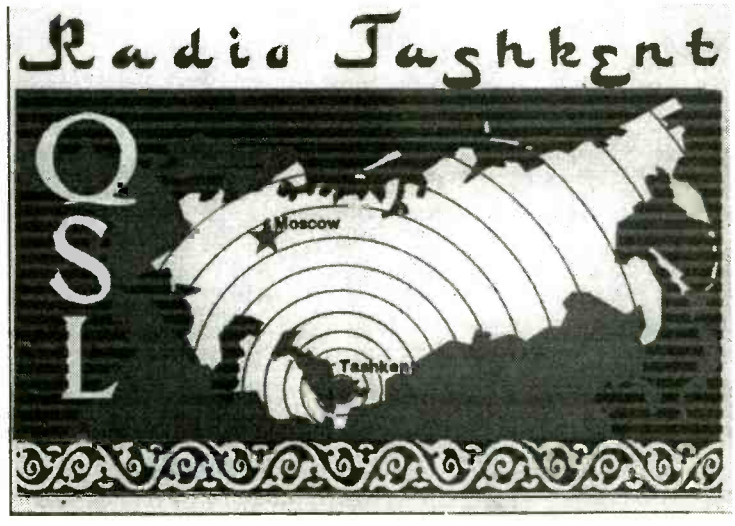
Wednesdays
0200 WEWN: Stumbling Blocks and Stepping Stones.
0200 WYFR (Satellite Network): The Open Forum. See S 0000.
0205 WINB: Radio Free America (live).
0208 Deutsche Welle: Asia-Pacific Report. See M 0208.
0223 Deutsche Welle: European Journal. See M 0223.
0228 WEWN: A Homily for Today.

Thursdays
0200 WEWN: Survey of Theology.
0200 WYFR (Satellite Network): The Open Forum. See S 0000.
0205 WINB: Radio Free America (live).
0208 Deutsche Welle: Asia-Pacific Report. See M 0208.
0223 Deutsche Welle: European Journal. See M 0223.
0228 WEWN: A Homily for Today.

Fridays
0200 WEWN: You and The God of Mercy.
0200 WYFR (Satellite Network): The Open Forum. See S 0000.
0205 WINB: Radio Free America (live).
0208 Deutsche Welle: Asia-Pacific Report. See M 0208.
0223 Deutsche Welle: European Journal. See M 0223.
0228 WEWN: A Homily for Today.

Saturdays
0200 WEWN: Today with Father Rutler.
0205 WINB: Radio Free America (live).
0208 Deutsche Welle: Commentary. See S 0109.
0212 Deutsche Welle: The Week in Germany. A summary of the week's events in Germany by Deutsche Welle's Bonn correspondents.
0222 Deutsche Welle: Economic Notebook. See T 0333.
0228 WEWN: A Homily for Today.
0237 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (3rd). See S 0037.

QSL from Radio Tashkent, Russia, courtesy of Anthony B. Cantory of South Brittain, CT.



FREQUENCIES

0300-0400	Australia, Radio	11880pa	13605pa	13650as	15240pa
		15365pa	15415as	15510as	17715as
		17750as	17795pa	17860pa	17880as
0300-0400 vl	Australia, VL8A Alice Spg	4835do			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400	Bahrain, Radio	6010do			
0300-0400 vl	Canada, CBC N Quebec Sce	9625do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9780na	11715na	
0300-0400	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0400	Cuba, Radio Havana Cuba	6010na	9820na		
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB Quito	9745am	11925am		
0300-0330	Egypt, Radio Cairo	9475na 1	1600na		
0300-0350	Germany, Deutsche Welle	6085na	6185na	9535na	9640na
		11750na			
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 vl	Italy, IRRS Milano	7125eu			
0300-0400	Japan, NHK/Radio	5960am	9610as	11875am	15210am
		15325am	17810am	17845am	
0300-0330	Japan, NHK/Radio	9680na	11885na	11895na	15230na
0300-0400	Kenya, Kenya BC Corp	4935do			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0325	Netherlands, Radio	9860as	12025as		
0300-0400	New Zealand, R NZ Intl	15115pa			
0300-0350	North Korea, R Pyongyang	6522eu	9345eu		
0300-0400 vl	Papua New Guinea, NBC	9675do			
0300-0400	Russia, Radio Moscow Intl	5940na	7150na	7205na	7295na
		9530na	9765na	9880as	11665as
		11690as	12050as	13615na	15265as
		15360as	15375as	15385as	15410na
		15425na	15470as	15525na	15535as
		17605as	17675as	17720as	
0300-0400	S Africa, Channel Africa	3220af	5955af		
0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Taiwan, VO Free China	5950na	9680na	9765au	11740as
		15345as			
0300-0400	Thailand, Radio	9655as	11905as		
0300-0350	Turkey, Voice of	9445na			
0300-0400 vl	Uganda, Radio	4976do			
0300-0400	Ukraine, R Ukraine Intl	9620na	9685na	9860na	11720na
		12030na	5180na	15580na	
0300-0330	United Kingdom,BBC London	6175na	7235me	7325na	9915sa
		15260sa	15360as		
0300-0400	United Kingdom,BBC London	3255af	5975na	6005af	6180eu
		6190af	6195eu	7230eu	9410eu
		11730af	11760me	11955as	15280as
		15310me	21715as		
0300-0400	USA, KCBI Dallas TX	9815am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785am			
0300-0400	USA, KWHR Naalehu HI	17510as			
0300-0400	USA, Monitor Radio Intl	5850na			
0300-0400	USA, VOA Washington DC	7105af	7265af	7280af	7340af
		7405af	9575af	9885af	11965af
0300-0400	USA, WCSN Scotts Cor ME	7465am			
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	7315am			
0300-0400	USA, WINB Red Lion PA	11950eu			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400	USA, WWCR Nashville TN	5810am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0315	Vatican State, Vatican R	6095do	7305do	9605do	
0315-0330 sh	Greece, Voice of	9380na	9420na	11645na	
0315-0345	Vatican State, Vatican R	7360af	9695af		
0330-0400	Bulgaria, Radio	9700na	11720na		
0330-0357	Czech Rep, Radio Prague	5930eu	9440eu	11640af	
0330-0400	Netherlands, Radio	6165na	9590na		
0330-0400	Sweden, Radio	6040na	6155na	9850na	
0330-0400	Tanzania, Radio	5050af			
0330-0357	UAE, Radio Dubai	11945na	13675na	15400eu	17890eu
		21485na			
0340-0350	Greece, Voice of	9380na	9420na	11645na	
0345-0400	Tajikistan, Radio	7245as			

SELECTED PROGRAMS

Sundays

0300 WEWN: The Holy Rosary with Father Scanlon.
0300 WYFR (Satellite Network): The Quiet Hours. See S 0200.
0306 Radio Ukraine Int'l: Hello from Kiev. See S 0006.
0309 Deutsche Welle: Commentary. See S 0109.
0313 Deutsche Welle: Mailbag (biweekly). See S 0113.
0313 Deutsche Welle: Nickelodeon (biweekly). See S 0113.
0328 WEWN: The Chaplet of the Divine Mercy.
0332 Deutsche Welle: German by Radio. See S 0132.
0337 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (4th). See S 0037.

Mondays

0300 WEWN: The Holy Rosary with Father Scanlon.
0300 WYFR: The Open Forum. See S 0000.
0309 Deutsche Welle: Commentary. See S 0109.
0311 Deutsche Welle: Living in Germany. See M 0111.
0320 Radio Ukraine Int'l: Music from Ukraine. See M 0018.
0328 WEWN: The Chaplet of the Divine Mercy.
0330 WINB: Making a Difference.
0331 Deutsche Welle: Larry's Random Selection. See M 0130.

Tuesdays

0300 WEWN: The Holy Rosary with Father Scanlon.
0300 WYFR (Satellite Network): The Open Forum. See S 0000.
0305 WINB: Radio Free America (live).
0309 Deutsche Welle: European Journal. See M 0223.
0310 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0325 Radio Ukraine Int'l: Closeup. See T 0025.
0328 WEWN: The Chaplet of the Divine Mercy.
0330 WYFR (Satellite Network): The End of the Day. Discover life with meaning.
0333 Deutsche Welle: Economic Notebook. The economic scene in Germany and around the world.
0337 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (6th). See S 0037.

Wednesdays

0300 WEWN: The Holy Rosary with Father Scanlon.
0300 WYFR (Satellite Network): The Open Forum. See S 0000.
0305 WINB: Radio Free America (live).
0309 Deutsche Welle: European Journal. See M 0223.
0310 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0325 Radio Ukraine Int'l: Closeup. See T 0025.
0328 WEWN: The Chaplet of the Divine Mercy.
0330 WYFR (Satellite Network): The End of the Day. See T 0330.
0333 Deutsche Welle: Insight. See T 1533.

Thursdays

0300 WEWN: The Holy Rosary with Father Scanlon.
0300 WYFR (Satellite Network): The Open Forum. See S 0000.
0305 WINB: Radio Free America (live).
0309 Deutsche Welle: European Journal. See M 0223.
0310 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0325 Radio Ukraine Int'l: Closeup. See T 0025.
0328 WEWN: The Chaplet of the Divine Mercy.
0330 WYFR (Satellite Network): The End of the Day. See T 0330.
0334 Deutsche Welle: German by Radio. See S 0132.

Fridays

0300 WEWN: The Holy Rosary with Father Scanlon.
0300 WYFR (Satellite Network): The Open Forum. See S 0000.
0305 WINB: Radio Free America (live).
0309 Deutsche Welle: European Journal. See M 0223.
0310 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0325 Radio Ukraine Int'l: Closeup. See T 0025.
0328 WEWN: The Chaplet of the Divine Mercy.
0330 WYFR (Satellite Network): The End of the Day. See T 0330.
0337 Deutsche Welle: Letter from Berlin/Bonn. Correspondents report on the old capital and the new one.
0342 Deutsche Welle: Science and Technology. See M 1634.

Saturdays

0300 WEWN: The Holy Rosary with Father Scanlon.
0300 WYFR (Satellite Network): The Open Forum. See S 0000.
0305 WINB: For the People.
0309 Deutsche Welle: European Journal. See M 0223.
0310 Radio Ukraine Int'l: Ukraine Today. See M 0007.
0318 Radio Ukraine Int'l: Baroque. See A 0018.
0328 WEWN: The Chaplet of the Divine Mercy.
0330 WYFR (Satellite Network): The End of the Day. See T 0330.
0333 Deutsche Welle: Through German Eyes. See S 1518.

THANK YOU ...

Additional contributors to this month's Shortwave Guide:

John Babbis, Silver Spring, MD; James A. Gross, Willow Springs, IL; Clyde W. Harmon, Anniston, AL; Jim Moats, Ravenna, OH; NASWA Journal; BBC Summary of World Broadcasts; Grove Enterprises BBS; Internet Shortwave Newsgroup via Larry Van Horn.

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

FREQUENCIES

0400-0500	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415pa	17630as	17750as
		17795pa	17860pa	17880as	
0400-0500 vl	Australia, VL8A Alice Spg	4835do			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500	Bahrain, Radio	6010do			
0400-0430	Bulgaria, Radio	9700na	11720na		
0400-0500 vl	Canada, CBC N Quebec Sce	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	9650me	11905me	11925me	15275me
0400-0500	China, China Radio Intl	11680na	11840na		
0400-0500	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0400-0500	Cuba, Radio Havana Cuba	6010na	9550na	9820na	
0400-0430	Ecuador, HCJB Quito	9745am	12005am		
0400-0450	Germany, Deutsche Welle	5980af	6015af	6185af	7150af
		7225af	9565af	9765af	
0400-0500 twtfa	Guatemala, Radio Cultural	3300do			
0400-0415	Israel, Kol Israel	9435na	11605na	17545as	
0400-0500 vl	Italy, IRRS Milano	7125eu			
0400-0500	Kenya, Kenya BC Corp	4935do			
0400-0500 mtwhf	Lebanon, Wings of Hope	9960me			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0425	Netherlands, Radio	6165na	9590na		
0400-0500 vl	New Zealand, R NZ Intl	15115pa			
0400-0450	North Korea, R Pyongyang	6130as	15230as	17755as	
0400-0500 vl	Papua New Guinea, NBC	9675do			
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0400-0500	Russia, Radio Moscow Intl	5940na	7205eu	9465na	9530na
		9580na	9685eu	9750na	9765na
		9880eu	11765af	12010as	12050af
		13615as	15180na	15375me	15385me
		15425na	15525as	15535as	17655af
		17675as	17720as	17805as	17880as
		17890as	21670na	21845as	
0400-0500	S Africa, Channel Africa	3220af	5955af		
0400-0500	Slovakia, AWR Europe	9455as	11610as		
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0500	Swaziland, Swazi Radio	6155af			
0400-0430	Switzerland, Swiss R Intl	6135na	9860na	9885na	
0400-0430	Tanzania, Radio	5050af			
0400-0430	Thailand, Radio	9655na	11905na		
0400-0500 vl	Uganda, Radio	4976do			
0400-0500	United Kingdom,BBC London	3255af	5975na	6005af	6180eu
		6190af	6195eu	9410af	11760me
		12095eu	15280as	15310as	15575as
		21715as			
0400-0500	USA, KCBI Dallas TX	9815am			
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9785am			
0400-0500	USA, KWHR Naalehu HI	17780as			
0400-0500	USA, Monitor Radio Intl	7465eu	9840af		
0400-0500	USA, VOA Washington DC	5995me	6040me	6873eu	7170eu
		7265af	7280af	7340af	7405af
		9575af			
0400-0500 vl	USA, WEWN Birmingham AL	7425na			
0400-0500 vl	USA, WHRI Noblesville IN	7315am			
0400-0500	USA, WINB Red Lion PA	11950eu			
0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	USA, WWCR Nashville TN	5810am	5935am	7435am	
0400-0500	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0458	USA, WYFR Okeechobee FL	9770eu			
0425-0440	Italy, RAI Rome	5990me	7275eu		
0430-0500	Australia, ADF Radio	18735as			
0430-0450	Finland, YLE/Radio	6120af	9655af	11755me	15440af
0430-0500 vl	Nigeria, Radio	3326do	4770do	4990do	
0430-0500	Serbia, Radio Yugoslavia	9580na	11870na		
0430-0500	Swaziland, Trans World R	5055af	6070af	7125af	
0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na		

SELECTED PROGRAMS

Sundays
0400 WEWN: Spanish Mass (encore).
0405 Swiss Radio Int'l: Newsnet.
0408 Deutsche Welle: Sports Report. See S 0212.
0415 Deutsche Welle: International Talking Point. Journalists discuss major trends and events.
0435 Deutsche Welle: People and Places. Interviews, stories and music for Africa listeners.
0435 Radio Finland: Focus. A Review of Finland's top news stories.

Mondays
0400 WEWN: Late Have I Love Thee.
0405 Swiss Radio Int'l: Newsnet.
0407 WINB: For the People.
0408 Deutsche Welle: European Journal. See M 0223.
0428 WEWN: This is Our Faith.
0430 Radio Finland: Compass North. See S 0645.
0433 Deutsche Welle: Africa in the German Press. What the German newspapers and weeklies have to say about Africa.

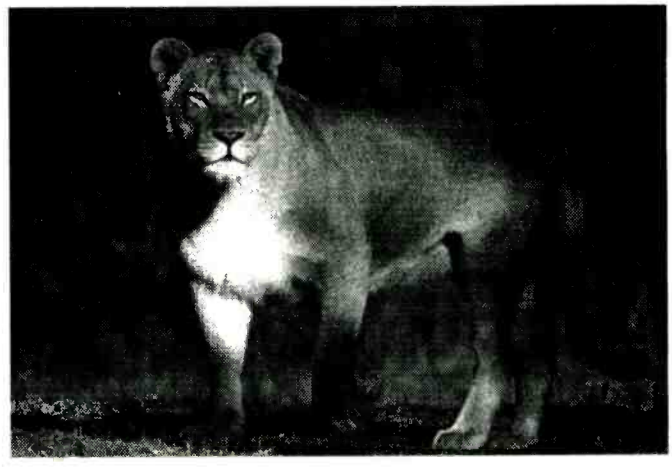
Tuesdays
0400 WEWN: Living the Scripture.
0405 Swiss Radio Int'l: Newsnet.
0406 WINB: For the People.
0408 Deutsche Welle: Africa Report. Reports and background to the news from Africa by Deutsche Welle correspondents.
0423 Deutsche Welle: European Journal. See M 0223.
0428 WEWN: Drama of Jesus.
0430 Radio Finland: Compass North. See S 0645.

Wednesdays
0400 WEWN: Bright and Good.
0404 WYFR (Satellite Network): Music. See S 0145.
0405 Swiss Radio Int'l: Newsnet.
0406 WINB: For the People.
0408 Deutsche Welle: Africa Report. See T 0408.
0423 Deutsche Welle: European Journal. See M 0223.
0428 WEWN: A Journey of Faith.
0430 Radio Finland: Compass North. See S 0645.

Thursdays
0400 WEWN: Thomism.
0404 WYFR (Satellite Network): Music. See S 0145.
0405 Swiss Radio Int'l: Newsnet.
0406 WINB: For the People.
0408 Deutsche Welle: Africa Report. See T 0408.
0423 Deutsche Welle: European Journal. See M 0223.
0428 WEWN: Seven Gifts of the Holy Spirit.
0430 Radio Finland: Compass North. See S 0645.

Fridays
0400 WEWN: The Vineyard.
0404 WYFR (Satellite Network): Music. See S 0145.
0405 Swiss Radio Int'l: Newsnet.
0406 WINB: For the People.
0408 Deutsche Welle: Africa Report. See T 0408.
0423 Deutsche Welle: European Journal. See M 0223.
0428 WEWN: You Better Believe It.
0430 Radio Finland: Compass North. See S 0645.

Saturdays
0400 WEWN: Retreat Teachings.
0405 Swiss Radio Int'l: Newsnet.
0406 WINB: For the People.
0408 Deutsche Welle: Commentary. See S 0109.
0430 Radio Finland: Compass North. See S 0645.
0431 Deutsche Welle: Man and Environment. See T 1634.



A QSL from Verwoerd Shortwave Station of Channel Africa was shared by Patrick Barry of Mission Viejo, California.

FREQUENCIES

0500-0530	Australia, ADF Radio	18735as			
0500-0600	Australia, Radio	9580pa	9660do	13605as	15240pa
		15365pa	15415as	17630pa	17750as
		17795as	17860pa	17880as	
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	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			
0500-0530 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	15430af
		17840af			
0500-0600	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0500-0600	Cuba, Radio Havana Cuba	6010na	9820na		
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0600 as	Eqt Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	9515na	9670na	11705na
0500-0600 vl	Italy, IRRS Milano	7125eu			
0500-0600	Japan, NHK/Radio	5975eu	7230eu	9680as	9725am
		11740as	11885na	15410as	17810as
0500-0600	Kenya, Kenya BC Corp	4935do			
0500-0600 mtwhf	Lebanon, Wings of Hope	9960me			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600	New Zealand, R NZ Intl	11900pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0550	North Korea, R Pyongyang	9640me	9977af		
0500-0530 m	Norway, Radio Norway Intl	9590na	11865na		
0500-0600 vl	Papua New Guinea, NBC	9675do			
0500-0600	Russia, Radio Moscow Intl	7165na	9530na	9685na	9750na
		9760na	9880as	12010na	12050na
		15180na	15425na	15465af	15590na
		17570af	17590af	17610me	17675as
		17835af	21670na	21725as	
0500-0600	S Africa, Channel Africa	5995af	9695af		
0500-0553 f	Seychelles, FEBA Radio	17750me			

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	6070af	7125af	
0500-0515	Switzerland, Swiss R Intl	3985eu	6165eu		
0500-0600	Thailand, Radio	9655as	11905as		
0500-0600 vl	Uganda, Radio	4976do			
0500-0600	United Kingdom,BBC London	3255af	5975na	6005af	6180eu
		6190af	6195eu	9410eu	9640na
		11760me	12095eu	15280as	15310as
		15360as	15400af	15420af	15575as
		17830as	17885af		
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	17780as			
0500-0600	USA, Monitor Radio Intl	9840af			
0500-0600	USA, VOA Washington DC	6035af	7405af	9665af	11965af
		12080af	15600af		
0500-0530	USA, VOA Washington DC	5995eu	6140eu	6873af	7170eu
		9530eu	9700eu	11825me	15205me
0500-0600	USA, WHRI Noblesville IN	7315am	9495am		
0500-0600	USA, WINB Red Lion PA	11950am			
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	11580eu		
0500-0545	USA, WYFR Okeechobee FL	9870af			
0500-0530	Vatican State, Vatican R	9695af	11625af	15090af	
0500-0520	Vatican State, Vatican R	3945eu	3975eu	6245eu	
0510-0520	Botswana, Radio	3356af	4830af	7255af	
0520-0550 s	Mongolia, R Ulaanbaatar	12015as			
0525-0600	Ghana, GBC Radio 2	3366do			
0530-0600	Australia, Radio	9660do	13605as	15240pa	15365pa
		15415as	15510as	15565as	17715as
		17795pa	17860pa	17880as	
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Georgia, Radio	11910as			
0530-0600	Romania, R Romania Intl	11810af	15340af	15380af	17790af
0530-0600	Swaziland, Trans World R	6070af	9650af		
0530-0600	UAE, Radio Dubai	15435as	17830as	21700as	

SELECTED PROGRAMS

Sundays

0505 Voice of Nigeria: VoN-Linkup. Call-in request music program.
0509 Deutsche Welle: Commentary. See S 0109.
0513 Deutsche Welle: Mailbag (biweekly). See S 0113.
0513 Deutsche Welle: Nickelodeon (biweekly). See S 0113.
0530 Voice of Nigeria: VoN-Scope. News, reports, review of Nigerian press, interviews and sports.
0532 Deutsche Welle: German by Radio. See S 0132.
0549 WYFR: The Bible Quiz. Test your knowlege of the Bible.

Mondays

0500 Voice of Nigeria: Morning Flight. Music magazine which lightens up and informs listeners.
0500 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0500 WYFR: Family Bible Reading Fellowship. See S 1200.
0509 Deutsche Welle: Commentary. See S 0109.
0511 Deutsche Welle: Living in Germany. See M 0111.
0520 WYFR (Satellite Network): Family Bible Study. See M 0520.
0520 WYFR: Family Bible Study. Harold Camping reads and interprets the scriptures.
0530 Deutsche Welle: Larry's Random Selection. See M 0130.
0530 Voice of Nigeria: VoN-Scope. See S 0530.
0546 WYFR (Satellite Network): The Radio Reading Circle. See M 0546.
0546 WYFR: The Radio Reading Circle. Readings from the classics of American literature.

Tuesdays

0500 Voice of Nigeria: Morning Flight. See M 0500.
0500 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0500 WYFR: Family Bible Reading Fellowship. See S 1200.
0507 WINB: For the People.
0509 Deutsche Welle: European Journal. See M 0223.
0518 WYFR: Family Bible Study. See M 0520.
0520 WYFR (Satellite Network): Family Bible Study. See M 0520.
0530 Voice of Nigeria: VoN-Scope. See S 0530.
0533 Deutsche Welle: German Tribune. See T 0133.
0546 WYFR (Satellite Network): The Radio Reading Circle. See M 0546.
0546 WYFR: The Radio Reading Circle. See M 0546.

Wednesdays

0500 Voice of Nigeria: Morning Flight. See M 0500.
0500 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0500 WYFR: Family Bible Reading Fellowship. See S 1200.
0507 WINB: For the People.
0509 Deutsche Welle: European Journal. See M 0223.
0518 WYFR: Family Bible Study. See M 0520.
0525 WYFR (Satellite Network): Family Bible Study. See M 0520.
0530 Voice of Nigeria: VoN-Scope. See S 0530.
0533 Deutsche Welle: Backdrop. See W 0133.
0545 WYFR (Satellite Network): The Radio Reading Circle. See M 0546
0546 WYFR: The Radio Reading Circle. See M 0546.

Thursdays

0500 Voice of Nigeria: Morning Flight. See M 0500.
0500 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0500 WYFR: Family Bible Reading Fellowship. See S 1200.
0507 WINB: For the People.
0509 Deutsche Welle: European Journal. See M 0223.
0518 WYFR: Family Bible Study. See M 0520.
0520 WYFR (Satellite Network): Family Bible Study. See M 0520.
0530 Voice of Nigeria: VoN-Scope. See S 0530.
0533 Deutsche Welle: German Tribune. See T 0133.
0546 WYFR (Satellite Network): The Radio Reading Circle. See M 0546.
0546 WYFR: The Radio Reading Circle. See M 0546.

Fridays

0500 Voice of Nigeria: Morning Flight. See M 0500.
0500 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0500 WYFR: Family Bible Reading Fellowship. See S 1200.
0507 WINB: For the People.
0509 Deutsche Welle: European Journal. See M 0223.
0518 WYFR: Family Bible Study. See M 0520.
0520 WYFR (Satellite Network): Family Bible Study. See M 0520.
0530 Voice of Nigeria: VoN-Scope. See S 0530.
0546 WYFR (Satellite Network): The Radio Reading Circle. See M 0546.
0546 WYFR: The Radio Reading Circle. See M 0546.

Saturdays

0500 Voice of Nigeria: African Safari. Thirty minutes of music from the countries of Africa.
0500 WYFR (Satellite Network): Family Bible Reading Fellowship. See S 1200.
0500 WYFR: Family Bible Reading Fellowship. See S 1200.
0507 WINB: For the People.
0509 Deutsche Welle: European Journal. See M 0223.
0516 WYFR: Family Bible Study. See M 0520.
0520 WYFR (Satellite Network): Family Bible Study. See M 0520.
0530 Voice of Nigeria: VoN-Scope. See S 0530.
0533 Deutsche Welle: Through German Eyes. See S 1518.
0546 WYFR (Satellite Network): The Radio Reading Circle. See M 0546.
0546 WYFR: The Radio Reading Circle. See M 0546.

RADIO JAPAN
Direct to North America at 0100-0700 on 9680 (changed from 9610) (via Bob Thomas, Büschel)
Terrible choice; VOFC via WYFR already on 9680
0145-0600 (*DX Listening Digest*)
Features during *Magazine Hour*, at about half past 03, 06, 07, 09, 11, 15, 19, and 23:
Mon., *Sports Spotlight*;
Tue., *Japanese Culture Today*
Wed., *Asian Report*
Thu., *Crosscurrents*
Fri., *Business-Focus*
(via Mickey Delmage, Tom Kuca, Gigi Lytle)

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

FREQUENCIES

0600-0700	Australia, Radio	9580pa	9660do	9860pa	11910pa
		13605as	15240pa	15510as	17715as
		17795pa	17880as		
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			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0600-0700	Cuba, Radio Havana Cuba	9820na			
0600-0627	Czech Rep, Radio Prague	7345eu	9505eu	11990eu	
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am	
0600-0700 as	Eqt Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	11915af	13790af	15185af	15205af
		17820af	17875af	21680af	
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	9680as	11860as	21610as	
0600-0625	Kenya, Kenya BC Corp	4935do			
0600-0700 vl	Kiribati, Radio	9825do			
0600-0630	Laos, National Radio of	7116as			
0600-0700 mtwhf	Lebanon, Wings of Hope	9960me			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765me			
0600-0700	New Zealand, R NZ Intl	11900pa			
0600-0700	Nigeria, Radio	3970do	4770do	4990do	
0600-0700	Nigeria, Voice of	7255af			
0600-0650	North Korea, R Pyongyang	15180as	15230as		
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0700	Russia, Radio Moscow Intl	9530eu	9580af	9750eu	9765eu
		11985as	12010na	12050na	15180na
		15190eu	15425na	15470me	15535as
		15540as	15560me	17675as	17805me
		21670na	21725me	21830as	
0600-0700	S Africa, Channel Africa	15220af			
0600-0700	Slovakia, AWR Europe	13715as			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, R Korea Intl	11945na	15155na		
0600-0700	Swaziland, Swazi Radio	6155af			
0600-0700	Swaziland, Trans World R	6070af	9650af		
0600-0630	Switzerland, Swiss R Intl	3985eu	6165eu	9885af	13635af
		15430af			
0600-0700	United Kingdom,BBC London	6005af	6180eu	6195af	9410eu
		9640na	11760me	11940af	11955as
		12095eu	15280as	15310as	15360as
		15400af	15575eu	17790as	17830as
		17885af			
0600-0700	USA, KCBI Dallas TX	9815am			
0600-0700	USA, KTBN Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	9785am			
0600-0700	USA, KWHR Naalehu HI	17780as			
0600-0700	USA, Monitor Radio Intl	9840eu	9870eu		
0600-0700	USA, VOA Washington DC	6035af	7120af	7405af	9530af
		9665af	11950af	12080af	15080af
		15600af			
0600-0630	USA, VOA Washington DC	3980eu	5995eu	6040eu	6060eu
		6140eu	6873eu	7120eu	7170eu
		7325eu	11805me	11825me	15205me
0600-0700	USA, WEWN Birmingham, AL	7425na			
0600-0700	USA, WHRI Noblesville IN	7315am	9495am		
0600-0700 vl	USA, WINB Red Lion PA	11950na			
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	11770eu	13695af
0600-0610 mtwhfa	Vatican State, Vatican R	3945eu	6245eu	7250eu	9645eu
		15210eu			
0600-0700	Yemen, Yemeni Rep Radio	9780do			
0625-0700	Kenya, Kenya BC Corp	4935do			
0630-0700	Australia, Radio	9580pa	9860as	11880as	11910as
		15240as	17715as	17795pa	17880as
		21725as			
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Belgium, R Vlaanderen Int	6015eu	9925au		
0630-0700	Vatican State, Vatican R	9725af	11625af	15570af	
0632-0641	Romania, R Romania Intl	7225eu	9550eu	9665eu	11810eu
0640-0700	Monaco, Trans World Radio	7385eu			
0645-0700	Finland, YLE/Radio	6120eu	9560eu	11755eu	
0645-0700	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			

SELECTED PROGRAMS

Sundays

0600 Voice of Nigeria: Preview of Programs for the Week. What's happening on Radio Nigeria in the next seven days.
0600 WEWN: Life in the Holy Spirit.
0600 WYFR: Hymn Storytime. Focus on a hymn and its message.
0605 Swiss Radio Int'l: Newsnet.
0605 WYFR: The Open Forum. See S 0000.
0609 Deutsche Welle: Commentary. See S 0109.
0612 Deutsche Welle: Sports Report. See S 0212.
0615 Voice of Nigeria: Listeners' Letters. Typical mailbag program with info for pen pals.
0616 Deutsche Welle: International Talking Point. See S 0415.
0628 WEWN: Christ in My Life.
0634 Deutsche Welle: People and Places. See S 0435.
0640 Voice of Nigeria: Commentary. Opinion on events in Nigeria.
0645 Radio Finland: Compass North. World and Finnish news, commentary and background reports.

Mondays

0600 WEWN: Truths of Salvation.
0600 WYFR: The Open Forum. See S 0000.
0605 Swiss Radio Int'l: Newsnet.
0609 Deutsche Welle: European Journal. See M 0223.
0628 WEWN: Old Testament Prophets.
0634 Deutsche Welle: Africa in the German Press. See M 0433.
0640 Voice of Nigeria: Commentary. See S 0640.
0641 WYFR: Creation Moments. Revealing facts about life's beginnings.
0645 Radio Finland: Compass North. See S 0645.

Tuesdays

0600 WEWN: Through the Ministry of Angels.
0600 WYFR: The Open Forum. See S 0000.
0605 Swiss Radio Int'l: Newsnet.
0609 Deutsche Welle: Africa Report. See T 0408.
0625 Deutsche Welle: European Journal. See M 0223.
0628 WEWN: Profiles in Greatness.
0640 Voice of Nigeria: Commentary. See S 0640.
0641 WYFR: Creation Moments. See M 0641.
0645 Radio Finland: Compass North. See S 0645.
0649 WYFR: The Basic Bible Study. Pastor Henry Van Dyke explains Bible fundamentals.

Wednesdays

0600 WEWN: God Bless.
0600 WYFR: The Open Forum. See S 0000.
0605 Swiss Radio Int'l: Newsnet.
0609 Deutsche Welle: Africa Report. See T 0408.
0615 Voice of Nigeria: Wheel of Progress. Industrial and agricultural development in Nigeria.
0625 Deutsche Welle: European Journal. See M 0223.
0628 WEWN: Mercy Our Mission.
0641 WYFR: Creation Moments. See M 0641.
0645 Radio Finland: Compass North. See S 0645.
0649 WYFR: The Basic Bible Study. See T 0649.

Thursdays

0600 WEWN: The Apostles' Creed.
0600 WYFR: The Open Forum. See S 0000.
0605 Swiss Radio Int'l: Newsnet.
0609 Deutsche Welle: Africa Report. See T 0408.
0615 Voice of Nigeria: Midweek Sports. News, views and reports of sports in Nigeria and the whole world.
0625 Deutsche Welle: European Journal. See M 0223.
0628 WEWN: Basic Steps in the Christian Journey.
0641 WYFR: Creation Moments. See M 0641.
0645 Radio Finland: Compass North. See S 0645.
0649 WYFR: The Basic Bible Study. See T 0649.

Fridays

0600 Voice of Nigeria: Listeners' Letters. See S 0615.
0600 WEWN: Seed of Abraham.
0600 WYFR: The Open Forum. See S 0000.
0605 Swiss Radio Int'l: Newsnet.
0609 Deutsche Welle: Africa Report. See T 0408.
0615 Voice of Nigeria: Images of Nigeria. See S 1645.
0625 Deutsche Welle: European Journal. See M 0223.
0628 WEWN: Windows of Heaven.
0641 WYFR: Creation Moments. See M 0641.
0645 Radio Finland: Compass North. See S 0645.
0649 WYFR: Family Bible Counseling. See M 1349.

Saturdays

0600 Voice of Nigeria: Music for Royalty. Hear drums and unusual instruments in music for African royalty.
0600 WEWN: Catholic Beliefs and Practices.
0600 WYFR: The Open Forum. See S 0000.
0605 Swiss Radio Int'l: Newsnet.
0609 Deutsche Welle: Commentary. See S 0109.
0628 WEWN: Father Ray Shares His Love.
0634 Deutsche Welle: Man and Environment. See T 1634.
0640 Voice of Nigeria: Commentary. See S 0640.
0645 Radio Finland: Compass North. See S 0645.
0648 WYFR: Farm Radio. Useful tips for farm families.

FREQUENCIES

0700-0800	Australia, Radio	6080pa	9580pa	9860pa	11720pa
		11880pa	11910pa	13605pa	15240pa
		15565as	17695as	17750as	21595as
		21715as			
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	9400am	15030am	21465am
0700-0800	Ecuador, HCJB Quito	6205eu	9600eu	9745au	11835eu
		11925eu	21455eu		
0700-0800 as	Eqt Guinea, R East Africa	9585af			
0700-0730	Georgia, Radio	11910as			
0700-0715	Ghana, GBC Radio 1	4915do			
0700-0715	Ghana, GBC Radio 2	3366do			
0700-0800 vl	Italy, IRRS Milano	7125eu			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11740af	15270af
		15380me	15410as	17810me	21610au
0700-0800	Kenya, Kenya BC Corp	4935do			
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800 mtwhf	Lebanon, Wings of Hope	9960me			
0700-0800	Liberia, Radio ELWA	4760do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800 mtwtfa	Monaco, Trans World Radio	7385eu			
0700-0730	Myanmar, Radio	9730do			
0700-0800	New Zealand, R NZ Intl	6100pa			
0700-0800	Nigeria, Radio	3326do	4770do	4990do	
0700-0800	Nigeria, Voice of	7255af			
0700-0800 vl	Papua New Guinea, NBC	4890do			
0700-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			
0700-0800	Russia, Radio Moscow Intl	7270na	7305eu	9530eu	9750eu
		9890eu	11765me	15190eu	15220me
		15480me	15500me	17710af	17755af
		17835af	21630af		
0700-0715 vl	Sierra Leone, SLBS	3316do			
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Swazi Radio	6155af			
0700-0735	Swaziland, Trans World R	6070af	9650af		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800	United Kingdom,BBC London	6005eu	6180eu	6190af	6195eu
		7325eu	9410eu	9600af	9640na
		11760me	11940af	11955as	12095eu
		15070eu	15280af	15310as	15360as
		15400eu	15575eu	17790as	17830as
		17885af	21660af		
0700-0800	USA, KCBI Dallas TX	9815na			
0700-0800	USA, KTBN Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785am			
0700-0800	USA, KWHR Naalehu HI	17780as			
0700-0800	USA, Monitor Radio Intl	9840eu			
0700-0800	USA, WEWN Birmingham AL	7425am	9350am	13615am	
0700-0800 vl	USA, WHRI Noblesville IN	7315am	9495am		
0700-0800 vl	USA, WINB Red Lion PA	11950na			
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	11770af	13695af		
0700-0745	USA, WYFR Okeechobee FL	7355eu	11770eu		
0730-0800	Austria, R Austria Intl	6155eu	13710eu	15410me	7870me
0730-0757	Czech Rep, Radio Prague	15605as	17535as	21705pa	
0730-0745 sh	Greece, Voice of	9425eu	11645eu	15650eu	
0730-0745 mtwhf	Iceland, Natl BC Service	9265am			
0730-0800	Netherlands, Radio	9630pa	9720pa		

0735-0800 mtwtf	Swaziland, Trans World R	6070af	9650af		
0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	11720as	11910pa
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, AWR	6150am	9725am		
0800-0900	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0800-0830	Ecuador, HCJB Quito	6205eu	9600eu	9745pa	11835eu
		11925pa	17490au	21455eu	
0800-0900 as	Eqt Guinea, R East Africa	9585af			
0800-0900	Finland, YLE/Radio	15445au	17800as		
0800-0805 s	Ghana, GBC Radio 1	4915do			
0800-0805 s	Ghana, GBC Radio 2	3366do			
0800-0900	Guam, KTWR Agana	9785as			
0800-0900	Indonesia, Voice of	9675as	11752as		
0800-0900 vl	Italy, IRRS Milano	7125eu			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0900 mtwhf	Lebanon, Wings of Hope	9960me			
0800-0830	Liberia, Radio ELWA	4760do			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0820 mtwtfa	Monaco, Trans World Radio	7385eu			
0800-0825	Netherlands, Radio	9630pa	9720pa		
0800-0900	New Zealand, R NZ Intl	6100pa			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0850	North Korea, R Pyongyang	11335na	13760na	15180as	15230as
0800-0848	Pakistan, Radio	17900eu	21520eu		
0800-0900 vl	Papua New Guinea, NBC	4890do			
0800-0900	Russia, Radio Moscow Intl	6065eu	7305af	7315af	9750af
		11690me	12010eu	12020eu	13615eu
		15105me	15125me	15290as	15420me
		15500na	15540me	17580eu	17890as
		21585eu			
0800-0815 vl	Sierra Leone, SLBS	3316do			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	7550eu	13670eu		
0800-0830	South Korea, R Korea Intl	15575af			
0800-0900	United Kingdom,BBC London	7325eu	9410eu	9640na	11760as
		11955as	12095eu	15070eu	15280as
		15360as	17640eu	17790af	17830as
		17885af	21660af		
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900 vl	USA, KNLS Anchor Point AK	9615as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	13615au			
0800-0900	USA, WEWN Birmingham AL	7425sa	9350na		
0800-0900 vl	USA, WHRI Noblesville IN	7315am	7355am		
0800-0900 vl	USA, WINB Red Lion PA	11950na			
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	
0830-0845 s	Armenia, Radio Yerevan	15170eu	15400eu	17700eu	
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	15450au	17870au		
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Netherlands, Radio	5955eu	9720pa	9895pa	
0830-0900	Slovakia, AWR Europe	7180as			
0835-0845 s	Monaco, Trans World Radio	7385eu			
0855-0900	Guam, KTWR Agana	11840au			

BBC Program Previews

(BBC full schedule arrived too late to work in to Selected Programming)

Women of the World is BBC's "season" theme for Aug and Sep: *Love's Labour* - romantic novelists, Sun Aug 28 1401, 2330, Mon 0630, 1001. *March of the Women* - female musicians challenging male domain, 6 weeks from Sun 21st 0715, Mon 0145, Tue 1445. *Women at the Top* - leaders in Britain, 7 weeks from Aug 8, Mon 1635, Tue 0750, Wed 1235. *Women's Magazines Worldwide* - Russia, South Africa, Germany, India, 6 weeks from Sat 20th 0015, Mon 1930, Tue 0915. *Daughters of Abraham* - How Judaism, Islam, and Christianity have shaped the fate of women, 3 weeks from Sun Sep 4 1401, 2330, Mon 0630 , 1001 *Liberation Now* - Women's movement in US and Britain, 3 weeks from Wed 14th, 2215. *Women in Science* - Sep 30 Fri 0730, 1215.

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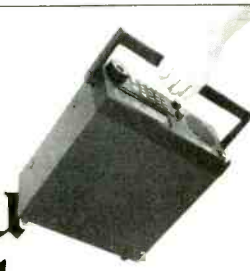

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Dimmer: Yes
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Memory: 400 channels; frequency and mode
Scan: 26 channels per second
Banks: 10
Lockout: Individual channel
Priority: Any channel
Search: 26 channels per second
Audio Output Power: 1.3 watts @ 8 ohms
Conversion Scheme: Triple up-conversion
Sensitivity: 0.5 uV NFM 25-1100 MHz; 2 uV AM; 3 uV WFM
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FREQUENCIES

0900-1000	Australia, Radio	9510as	9580pa	9860pa	13605as
		15170as	21725as		
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Bahrain, Radio	6010do			
0900-0930 mtwta	Belgium, R Vlaanderen Int	6035eu	13690eu	17595af	
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	8450au	11755pa	15440pa	17710pa
0900-1000	Costa Rica, AWR	6150am	9725am		
0900-1000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-1000 as	Eqt Guinea, R East Africa	9585af			
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	12055as
		15410af	17715as	17780as	17800af
		21600af	21680as		
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	9785as			
0900-1000 vl	Italy, IRRS Milano	7125eu			
0900-1000	Japan, NHK/Radio	9610as	9750as	11815as	15195as
		15270au			
0900-1000 mtwhf	Lebanon, Wings of Hope	9960me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0930	Netherlands, Radio	5955eu	9720pa	9895eu	
0900-1000	New Zealand, R NZ Intl	6100pa			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000 mtwtfa	Palau, KHBN Voice of Hope	9830as			
0900-1000 vl	Papua New Guinea, NBC	4890do			
0900-1000	Russia, Radio Moscow Intl	9680eu	12070eu	13650eu	15190eu
		15210eu	15290as	15345eu	15380eu
		15440eu	15495eu	15500na	15540eu
		17595eu	17605eu	17760eu	21515eu
		21540eu			
0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17515au	
0900-1000	United Kingdom,BBC London	6190af	6195as	9410eu	9740as
		11750as	11760me	11940af	12095eu
		15070eu	15190sa	15310as	15575me
		17640eu	17705eu	17790af	17830as
		17885af	21660af	21715as	
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	9840pa	13615pa	17555au
0900-1000	USA, WEWN Birmingham AL	9350na	12160eu		
0900-1000 vl	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000 vl	USA, WINB Red Lion PA	11950na			
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5810am			
0910-0940	Mongolia, R Ulaanbaatar	11850as	12015as		
0915-1000	Ghana, GBC Radio 2	6130do	7295do		
0920-0935 sh	Greece, Voice of	15650au	17525au		
0930-1000	Australia, ADF Radio	18735as			
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	5955eu	9715pa	9720pa	9810eu
		9895eu	12065as	15470as	
0930-1000	Philippines, FEBC Manila	11690as			
0940-0950	Greece, Voice of	15650au	17525au		
1000-1030	Australia, ADF Radio	18735as			
1000-1100	Australia, Radio	9580pa	9710pa	9860pa	15170as
		21725as			
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Bahrain, Radio	6010do			
1000-1100 mtwha	Belgium, R Vlaanderen Int	6035eu	13690eu	17595eu	
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	8450au	11755pa	15440pa	17710pa
1000-1100	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100 as	Eqt Guinea, R East Africa	9585af			
1000-1100	Ghana, GBC Radio 2	6130do	7295do		
1000-1100	India, All India Radio	15050as	15180as	17387au	17895as
		21460as			
1000-1030	Israel, Kol Israel	15640na	15650as	17575eu	
1000-1100 vl	Italy, IRRS Milano	7125eu			
1000-1100 mtwhf	Lebanon, Wings of Hope	9960me			
1000-1100 vl	Malaysia, RTM Kota Kinaba	5980do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	Netherlands, Radio	12065as	15470as		
1000-1030	Netherlands, Radio	5995eu	9715pa	9720pa	9895eu
1000-1100	New Zealand, R NZ Intl	6100pa			
1000-1050	North Korea, R Pyongyang	15340as	17765as		
1000-1100 mtwhfa	Palau, KHBN Voice of Hope	9830as			
1000-1100 vl	Papua New Guinea, NBC	4890do			
1000-1100	Philippines, FEBC Manila	11690as			
1000-1100	Russia, Radio Moscow Intl	7205eu	9750eu	11675na	12015eu
		12020eu	12070eu	13650eu	15175eu
		15210eu	15290as	15320na	15355na
		15380eu	15435na	15465na	15470na
		15500na	17710na	17760eu	21515eu
		21540eu			
1000-1100	S Africa, Channel Africa	17810af			
1000-1030	Switzerland, Swiss R Intl	6165eu	9535eu		
1000-1100	United Kingdom,BBC London	6190af	6195as	7160as	9410eu
		9740as	11750as	11760me	11940af
		12095eu	15070eu	15190sa	15310as
		15400eu	15575me	17640eu	17705eu
		17790me	17830af	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	7395sa	7465na	13625pa	17555as
1000-1100	USA, VOA Washington DC	5985as	7405am	9590am	11915am
		15120am			
1000-1100	USA, WEWN Birmingham AL	9370as			
1000-1100 vl	USA, WHRI Noblesville IN	7315am	7355am		
1000-1100 vl	USA, WINB Red Lion PA	11950na			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5935am	15685am		
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1020-1030 mtwtfa	Vatican State, Vatican R	6245eu	11740af	15210af	21515me
		21730me			
1030-1100	Austria, R Austria Intl	15450au	17870au		
1030-1057	Czech Rep, Radio Prague	7345eu	9505eu	11990eu	
1030-1100 vl	Malaysia, RTM Sarawak	4950do	7160do		
1030-1100	South Korea, R Korea Intl	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835au	15120as	17850as	
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605eu

1100 UTC SHORTWAVE GUIDE 7:00 AM EDT 4:00 AM PDT

FREQUENCIES

1100-1200	Australia, Radio	9710pa	9860pa	15565as	
1100-1130	Australia, Radio	9580pa 15565as	9860pa	13605as	15170as
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Bahrain, Radio	6010do			
1100-1130 mtwha	Belgium, R Vlaanderen Int	6035eu	13690eu	17595eu	
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1150	Germany, Deutsche Welle	15370af 17800af	15410af 17860af	17715af 21600af	17765af
1100-1115	Ghana, GBC Radio 1	4915do			
1100-1200 vl	Italy, IRRS Milano	7125eu			
1100-1200	Japan, NHK/Radio	6120na	9610as	15295as	
1100-1200 mtwhf	Lebanon, Wings of Hope	9960me			
1100-1200 vl	Malaysia, RTM Kota Kinaba	5980do			
1100-1200	Malaysia, RTM Radio 4	4950do	7295do		
1100-1200 vl	Malaysia, RTM Sarawak	4950do	7160do		
1100-1200	New Zealand, R NZ Intl	6100pa			
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1120	Pakistan, Radio	17900as	21520as		
1100-1200 mtwhf	Palau, KHBN Voice of Hope	9830as			
1100-1200 vl	Papua New Guinea, NBC	4890do			
1100-1200	Russia, Radio Moscow Intl	7305eu 11990as 15120as 15320as 17825as	11705af 12015eu 15170as 15335eu	11800as 12020eu 15210eu 17710as	11900as 15105as 15290as 17760na
1100-1200	Singapore, SBC Radio One	6155do			
1100-1200	Singapore,R Singapore Int	9530as			
1100-1130	Sri Lanka, SLBC Colombo	11835au	15120as	17850as	
1100-1130	Switzerland, Swiss R Intl	6165eu 17515as	9535eu	13635as	15505as
1100-1200	United Kingdom,BBC London	5975na 9410eu 11750as 15070eu 17885af	6190af 9515na 11760me 15310as	6195na 9660eu 11940af 15575as	7160as 9740na 12095af 17640eu
					21660af
1100-1130	United Kingdom,BBC London	5965na	6110as	15400eu	17790sa
1100-1200	USA, KCBI Dallas TX	9815am			
1100-1200	USA, KTBN Salt Lk City UT	7510na			
1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	USA, Monitor Radio Intl	7395ca	7465na	9425pa	
1100-1200	USA, VOA Washington DC	5985as 9645as 15120as	6110as 9760as 15160au	7405am 11720au 15425as	9590am 11915am
1100-1200	USA, WEWN Birmingham AL	9350na	9370as		
1100-1200 vl	USA, WHRI Noblesville IN	7315am	9850am		
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WWCR Nashville TN	5810am	5935am	15685am	
1100-1200	USA, WYFR Okeechobee FL	5950na	11830na		
1130-1200	Austria, R Austria Intl	6155eu	13730na		
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1200 mtwhfa	Finland, YLE/Radio	11900na	15400na		
1130-1200	Iran, VOIRI Tehran	9525me 11930as	11715me	11790as	11910as
1130-1200	Netherlands, Radio	5955eu	9850eu		
1130-1200	Sweden, Radio	13775as	15120as	1 5240au	
1130-1200	Thailand, Radio	9655as	11905as		
1130-1200	Vietnam, Voice of	6115as	10059as	12025as	15010as

SELECTED PROGRAMS

Sundays
1100 WEWN: The Abundant Life.
1105 Swiss Radio Int'l: Newsnet.
1109 Deutsche Welle: Arts on the Air. Reports and interviews on major cultural events and developments.
1134 Deutsche Welle: German by Radio. See S 0132.

Mondays
1100 WEWN: Patterns for Christian Living.
1105 Swiss Radio Int'l: Newsnet.
1109 Deutsche Welle: Newsline Cologne. Worldwide current affairs program with a review of the German or European press.
1122 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1128 WEWN: Say Yes.
1130 Radio Finland: Compass North. See S 0645.
1134 Deutsche Welle: Hallo Africa. A program with musical requests and greetings to friends.
1137 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (5th). See S 0037.
1145 Radio Finland: Business Monday. Summary of the previous week's business news.
1150 Radio Finland: Closeup. Focus on an aspect of life in Finland.

Tuesdays
1100 WEWN: Catholic Apologetics.
1105 Swiss Radio Int'l: Newsnet.
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1122 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1128 WEWN: In My Father's House.
1130 Radio Finland: Compass North. See S 0645.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1140 Radio Finland: Finnish Press Review. Editorial opinion and reports on Finnish and world events.
1150 Radio Finland: Northern Lights. A closeup on life in Finland.

Wednesdays
1100 WEWN: Praying the Scriptures.
1105 Swiss Radio Int'l: Newsnet.
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1122 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1128 WEWN: After Eden.
1130 Radio Finland: Compass North. See S 0645.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1140 Radio Finland: Finnish Press Review. See T 1140.
1150 Radio Finland: Northern Lights. See T 1150.

Thursdays
1100 WEWN: Domestic Church.
1105 Swiss Radio Int'l: Newsnet.
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1122 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1128 WEWN: The Many Faces of Mary.
1130 Radio Finland: Compass North. See S 0645.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1140 Radio Finland: Finnish Press Review. See T 1140.
1145 Radio Finland: Finnish History. A look back at Finland during the the great war.
1150 Radio Finland: Northern Lights. See T 1150.

Fridays
1100 WEWN: Timely Topics.
1105 Swiss Radio Int'l: Newsnet.
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1122 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1128 WEWN: The Choices We Face.
1130 Radio Finland: Compass North. See S 0645.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1140 Radio Finland: Finnish Press Review. See T 1140.
1145 Radio Finland: Highlights (biweekly). A review of the arts and culture in Finland.
1150 Radio Finland: Northern Lights. See T 1150.

Saturdays
1100 WEWN: Ethics in Medicine.
1105 Swiss Radio Int'l: Newsnet.
1109 Deutsche Welle: The Week in Germany. See A 0212.
1120 Deutsche Welle: Mailbag Africa. Listener mail from Africa is answered.
1122 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1128 WEWN: Prayer Quest.
1130 WYFR (Satellite Network): For the Record. Community action news as reported by local AM station affiliates of Family Radio.
1135 Radio Finland: Starting Finnish. Finnish language lessons for English speakers.
1137 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (3rd). See S 0037.

BBC Program Previews
(BBC full schedule arrived too late to work in to Selected Programming)

Media Magnates - Conrad Black week of Aug 21, Ted Turner Aug 28, Sun 0230, 1615, Wed 2215. *Power and Disorder* - in post-Cold War Japan, Fri 26 2215, Sat 0230, 0730. *The Kiss* - pecking etiquette, Fri 26th 0730, 1215, 1930. *Persona* - Sandra Duncan performs from novels of Margaret Laurence, Sun 28th 0101, 1201, 1901. *Poems by Post* - new request series from Wed 24th 0130, 0930, 1715. *Songs, Sonnets and Sounds of Laughter* - 3 weeks from 18th, Thu 1130, 1715, Fri 0230. *Game, Set and Match* - sports panel quiz, 6 weeks from Wed 17th 1530, Thu 1030, 2330. *Podium Power* - the maestro myth, Mon 29th 0101, 1515. *Prom concerts* - live at 1830 Aug 25, 27, 31, Sep 3, 10 (last night). *Mind Matters* - human psyche, 7 weeks from Aug 14, Sun 0445, Mon 0015, 1145, Wed 0815. *The Sounds of South Africa* - musical heritage, 6 weeks from 20th, Sat 2330, Tue 1030, Fri 1715. Blues World - 75 years of blues music, 6 weeks from Sun 11th 2015, Mon 0445 (*BBC Worldwide* and via Glenn Hauser)

FREQUENCIES

1200-1230	Australia, Radio	5995pa	6060pa	6080pa	9580pa
		11800pa	15565as		
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Bahrain, Radio	6010do			
1200-1300	Brazil, Radiobras	11745na			
1200-1300	Bulgaria, Radio	17625au			
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300 mtwhf	Canada, RCI Montreal	9635na	9705na	11855na	17820na
1200-1300	China, China Radio Intl	8425as	9665as	9715as	11660as
		11795pa	15210na	15440pa	
1200-1300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1200-1300	France, Radio France Intl	9805eu	13625af	13640af	15155eu
		15195eu	15325af	17575na	
1200-1230	Iran, VOIRI Tehran	9525me	11715me	11790as	11910as
		11930as			
1200-1300 vl	Italy, IRRS Milano	7125eu			
1200-1300	Jordan, Radio	9560eu			
1200-1300 vl	Malaysia, RTM Kota Kinaba	5980do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1230 mwha	Mongolia, R Ulaanbaatar	11850as	12015as		
1200-1300	Netherlands, Radio	5955eu	9650eu		
1200-1206	New Zealand, R NZ Intl	6100pa			
1200-1230 s	Norway, Radio Norway Intl	17860as			
1200-1300 mtwhf	Palau, KHBN Voice of Hope	9830as			
1200-1230 a	Palau, KHBN Voice of Hope	9830as			
1200-1300 vl	Papua New Guinea, NBC	4890do			
1200-1255	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	9525eu
		11815eu			
1200-1300	Russia, Radio Moscow Intl	9540af	9835af	11705as	11985eu
		12055eu	15105af	15280af	15290eu
		15320eu	15335af	15350af	15355na
		15440eu	15485eu	15500na	15525af
		15540eu	17760na		
1200-1300	Singapore, SBC Radio One	6155do			
1200-1300	Singapore,R Singapore Int	9530as			
1200-1300	South Korea, R Korea Intl	7180as			
1200-1300	Taiwan, VO Free China	7130na	9610na		
1200-1230	Thailand, Radio	9655as	11905as		
1200-1300	United Kingdom,BBC London	6190af	6195na	7160as	9410eu
		9515na	9740na	9760eu	11750as
		11760me	11940af	12095af	15070eu
		15220na	15310as	15575as	17640eu
		17790af	17885af	21660af	
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300 vl	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	7465ca	9425pa	9455na	13625as
1200-1300	USA, VOA Washington DC	6110as	9560as	9760as	11715au
		15160as	15425as		
1200-1300	USA, WEWN Birmingham AL	9350na	9985ca	15695na	
1200-1300 vl	USA, WHRI Noblesville IN	7315am	9850am		
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WWCR Nashville TN	5810am	13845am	15685am	
1200-1300	USA, WYFR Okeechobee FL	5950na	6015na	11830na	17750na
1200-1230	Uzbekhistan, R Tashkent	15295as	17815as		
1200-1300	Vietnam, Voice of	6115as	10059as	12025as	15010as
1207-1300 ocasnal	New Zealand, R NZ Intl	6100pa			
1215-1300	Egypt, Radio Cairo	17595as			
1220-1230 vl	Ghana, GBC Radio 1	4915do			
1230-1300	Australia, Radio	5995pa	6060pa	7260as	11800pa
		15565as			
1230-1300	Bangladesh, Radio	9548as	13615as		
1230-1300 s	Belgium, R Vlaanderen Int	15545na	17775as		
1230-1300	Canada, RCI Montreal	9660as	15195as		
1230-1300 mtwhfa	Finland, YLE/Radio	11900na	15400na		
1230-1300	Ghana, GBC Radio 2	6130do	7295do		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1230-1300	Sweden, Radio	15240na	17870na		
1230-1300	Switzerland, Swiss R Intl	6165eu	9535eu		
1230-1300	Turkey, Voice of	9675as			
1240-1250	Greece, Voice of	11645af			

SELECTED PROGRAMS

Sundays
1200 WEWN: Sunday Mass Live.
1200 WYFR: Family Bible Reading Fellowship. A Bible read-along program.

Mondays
1200 WEWN: Daily Mass Live.
1200 WYFR (Satellite Network): Rise and Rejoice Program. A mix of news, christian music, scripture, and advice to live by.
1200 WYFR: Family Bible Reading Fellowship. See S 1200.
1218 WYFR: Family Bible Study. See M 0520.
1219 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1230 Radio Finland: Compass North. See S 0645.
1237 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (5th). See S 0037.
1245 Radio Finland: Business Monday. See M 1145.
1246 WYFR: The Radio Reading Circle. See M 0546.
1250 Radio Finland: Closeup. See M 1150.

Tuesdays
1200 WEWN: Daily Mass Live.
1200 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1200 WYFR: Family Bible Reading Fellowship. See S 1200.
1218 WYFR: Family Bible Study. See M 0520.
1219 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1230 Radio Finland: Compass North. See S 0645.
1240 Radio Finland: Finnish Press Review. See T 1140.
1246 WYFR: The Radio Reading Circle. See M 0546.
1250 Radio Finland: Northern Lights. See T 1150.

Wednesdays
1200 WEWN: Daily Mass Live.
1200 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1200 WYFR: Family Bible Reading Fellowship. See S 1200.
1218 WYFR: Family Bible Study. See M 0520.
1219 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1230 Radio Finland: Compass North. See S 0645.
1240 Radio Finland: Finnish Press Review. See T 1140.
1246 WYFR: The Radio Reading Circle. See M 0546.
1250 Radio Finland: Northern Lights. See T 1150.

Thursdays
1200 WEWN: Daily Mass Live.
1200 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1200 WYFR: Family Bible Reading Fellowship. See S 1200.
1218 WYFR: Family Bible Study. See M 0520.
1219 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1230 Radio Finland: Compass North. See S 0645.
1240 Radio Finland: Finnish Press Review. See T 1140.
1245 Radio Finland: Finnish History. See H 1145.
1246 WYFR: The Radio Reading Circle. See M 0546.
1250 Radio Finland: Northern Lights. See T 1150.

Fridays
1200 WEWN: Daily Mass Live.
1200 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1200 WYFR: Family Bible Reading Fellowship. See S 1200.
1218 WYFR: Family Bible Study. See M 0520.
1219 WYFR (Satellite Network): The Bible Quiz. See S 0549.
1230 Radio Finland: Compass North. See S 0645.
1240 Radio Finland: Finnish Press Review. See T 1140.
1245 Radio Finland: Highlights (biweekly). See F 1145.
1246 WYFR: The Radio Reading Circle. See M 0546.
1250 Radio Finland: Northern Lights. See T 1150.

Saturdays
1200 WEWN: Stations of the Cross.
1200 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1200 WYFR: Family Bible Reading Fellowship. See S 1200.
1205 WYFR (Satellite Network): Story Time. Saturday morning stories for children.
1218 WYFR: Family Bible Study. See M 0520.
1228 WEWN: The Heart of Jesus.
1235 Radio Finland: Starting Finnish. See A 1135.
1237 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (3rd). See S 0037.
1249 WYFR: The Bible Quiz. See S 0549.

A QSL from Radio Brazzaville in the Congo Republic of Africa sent to us by Martin Gallas of Springfield, Ill.

1300 UTC SHORTWAVE GUIDE 9:00 AM EDT 6:00 AM PDT

FREQUENCIES

1300-1400	Australia, Radio	5995pa	11800pa		
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485do			
1300-1400 vl	Australia, VL8T Tent Crk	2325do			
1300-1400	Bahrain, Radio	6010do			
1300-1330 mtwtfa	Belgium, R Vlaanderen Int	15545na	17775as		
1300-1320	Brazil, Radiobras	11745na			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955na	17820na		
1300-1400	China, China Radio Intl	7405pa	8425as	9715as	11660as
		15440pa			
1300-1400 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1330	Ghana, GBC Radio 1	4915do			
1300-1325 smtwh	Israel, Kol Israel	15640na	15650as		
1300-1400 vl	Italy, IRRS Milano	7125eu			
1300-1400 mtwhf	Lebanon, Wings of Hope	9960me			
1300-1400 vl	Malaysia, RTM Kota Kinaba	5980do			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1325	Netherlands, Radio	5955eu	9650eu		
1300-1400 ocasnal	New Zealand, R NZ Intl	6100pa			
1300-1350	North Korea, R Pyongyang	13760na	15230na		
1300-1330 s	Norway, Radio Norway Intl	9590eu			
1300-1400 mtwhf	Palau, KHBN Voice of Hope	9830as			
1300-1400 vl	Papua New Guinea, NBC	4890do			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	
1300-1400	Russia, Radio Moscow Intl	6025as	7305as	9560as	9755as
		9825af	9895eu	11705eu	11960as
		15105eu	15290me	15320me	15355me
		15360eu	15440eu	15455me	15470me
		15500na	17570eu	17590eu	17755eu
		17760na	21740af		
1300-1400	Singapore, SBC Radio One	6155do			
1300-1400	Singapore,R Singapore Int	9530as			
1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as
1300-1400	United Kingdom,BBC London	6190af	6195na	7160as	7180as
		9410eu	9515na	9580as	9740as
		11750as	11760me	11765as	11820na
		11940af	12095eu	15070eu	15220na
		15310as	15420af	15575me	17640eu
		17705eu	17790af	17840na	17880af
		17885af	21470af	21660af	
1300-1400	USA, KCBI Dallas TX	9815am			
1300-1400	USA, KJES Mesquite NM	11715na			
1300-1400 vl	USA, KNLS Anchor Point AK	7355as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, Monitor Radio Intl	7465na	13625as		
1300-1400	USA, VOA Washington DC	6110as	9560as	9760as	11715au
		15160as	15425as		
1300-1400	USA, WEWN Birmingham AL	9350na	15695na		
1300-1400	USA, WHRI Noblesville IN	9465am	15105am		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WWCR Nashville TN	13845am	15685am		
1300-1400	USA, WYFR Okeechobee FL	5950na	6015na	11550as	11830na
		13695na	17750na		
1300-1330	Vietnam, Voice of	6115as	10059as	12025as	15010as
1330-1400	Austria, R Austria Intl	15450as			
1330-1400	Canada, RCI Montreal	9535as	11795as	11935eu	15315eu
		15325eu	17820eu	17895af	21455eu
1330-1400	Finland, YLE/Radio	11900na	15400na		
1330-1400 tw	Ghana, GBC Radio 1	4915do			
1330-1400	India, All India Radio	13750as	15120as		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands, Radio	9890as	13700as	15150as	
1330-1400	Sweden, Radio	15240na	17870na		
1330-1400	UAE, Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1400	Uzbekhistan, R Tashkent	15295as	17815as		
1335-1345	Greece, Voice of	15630na	17520na		
1345-1400 vl	Myanmar, Radio	7185do			
1345-1400	Vatican State, Vatican R	12050as	15585as	17525au	

SELECTED PROGRAMS

Sundays
1300 WEWN: Daily Mass Live (from 1200).
1300 WYFR: Family Bible Reading Fellowship. See S 1200.
1305 Swiss Radio Int'l: Newsnet.
1328 WEWN: Holy Rosary (Glorious).
1335 Radio Finland: Focus. See S 0435.

Mondays
1300 WEWN: The Holy Rosary (Joyful).
1300 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1300 WYFR: The Open Forum. See S 0000.
1305 Swiss Radio Int'l: Newsnet.
1328 WEWN: The Chaplet of Divine Mercy.
1330 Radio Finland: Compass North. See S 0645.
1330 WYFR (Satellite Network): Family Bible Study. See M 0520.
1337 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (5th). See S 0037.
1339 WYFR: Creation Moments. See M 0641.
1345 Radio Finland: Business Monday. See M 1145.
1347 WEWN: Profiles in Greatness.
1349 WYFR: Family Bible Counseling. Advice for parents about family living.
1350 Radio Finland: Closeup. See M 1150.

Tuesdays
1300 WEWN: The Holy Rosary (Sorrowful).
1300 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1300 WYFR: The Open Forum. See S 0000.
1305 Swiss Radio Int'l: Newsnet.
1315 WYFR (Satellite Network): Bible Break. A one-minute reading from the Bible.
1325 WYFR (Satellite Network): Letter of Perspective. Advice and guidance for family living.
1328 WEWN: The Chaplet of Divine Mercy.
1330 Radio Finland: Compass North. See S 0645.
1330 WYFR (Satellite Network): Family Bible Study. See M 0520.
1339 WYFR: Creation Moments. See M 0641.
1340 Radio Finland: Finnish Press Review. See T 1140.
1347 WEWN: Profiles in Greatness.
1349 WYFR: The Basic Bible Study. See T 0649.
1350 Radio Finland: Northern Lights. See T 1150.

Wednesdays
1300 WEWN: The Holy Rosary (Glorious).
1300 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1300 WYFR: The Open Forum. See S 0000.
1305 Swiss Radio Int'l: Newsnet.
1315 WYFR (Satellite Network): Bible Break. See T 1315.
1325 WYFR (Satellite Network): Letter of Perspective. See T 1325.
1328 WEWN: The Chaplet of Divine Mercy.
1330 Radio Finland: Compass North. See S 0645.
1330 WYFR (Satellite Network): Family Bible Study. See M 0520.
1339 WYFR: Creation Moments. See M 0641.
1340 Radio Finland: Finnish Press Review. See T 1140.
1347 WEWN: Profiles in Greatness.
1349 WYFR: The Basic Bible Study. See T 0649.
1350 Radio Finland: Northern Lights. See T 1150.

Thursdays
1300 WEWN: The Holy Rosary (Joyful).
1300 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1300 WYFR: The Open Forum. See S 0000.
1305 Swiss Radio Int'l: Newsnet.
1328 WEWN: The Chaplet of Divine Mercy.
1330 Radio Finland: Compass North. See S 0645.
1330 WYFR (Satellite Network): Family Bible Study. See M 0520.
1339 WYFR: Creation Moments. See M 0641.
1340 Radio Finland: Finnish Press Review. See T 1140.
1345 Radio Finland: Finnish History. See H 1145.
1347 WEWN: Profiles in Greatness.
1349 WYFR: The Basic Bible Study. See T 0649.
1350 Radio Finland: Northern Lights. See T 1150.

Fridays
1300 WEWN: The Holy Rosary (Sorrowful).
1300 WYFR (Satellite Network): Rise and Rejoice Program. See M 1200.
1300 WYFR: The Open Forum. See S 0000.
1305 Swiss Radio Int'l: Newsnet.
1328 WEWN: The Chaplet of Divine Mercy.
1330 Radio Finland: Compass North. See S 0645.
1330 WYFR (Satellite Network): Family Bible Study. See M 0520.
1339 WYFR: Creation Moments. See M 0641.
1340 Radio Finland: Finnish Press Review. See T 1140.
1345 Radio Finland: Highlights (biweekly). See F 1145.
1347 WEWN: Profiles in Greatness.
1349 WYFR: The Basic Bible Study. See T 0649.
1350 Radio Finland: Northern Lights. See T 1150.

Saturdays
1300 WEWN: The Holy Rosary (Glorious).
1300 WYFR (Satellite Network): Children's Bible Hour. Songs and stories for children.
1300 WYFR: The Open Forum. See S 0000.
1305 Swiss Radio Int'l: Newsnet.
1328 WEWN: The Chaplet of Divine Mercy.
1330 WYFR (Satellite Network): The Adventures of Captain Patch. Patch the Pirate takes the kids for a ride.
1335 Radio Finland: Starting Finnish. See A 1135.
1337 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (3rd). See S 0037.
1345 WYFR (Satellite Network): Bible Story Adventure. Dramatized stories from the Bible for children.
1347 WEWN: Profiles in Greatness.
1350 WYFR: Farm Radio. See A 0648.

FREQUENCIES

1400-1430	Australia, Radio	5995pa	9710pa	11800pa	
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			
1400-1500 vl	Australia, VL8T Tent Crk	2325do			
1400-1500	Bahrain, Radio	6010do			
1400-1500	Bulgaria, Radio	15460as	17705as		
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955na	17820na		
1400-1500	China, China Radio Intl	4200as	7405na	11815as	15165as
1400-1500 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1400-1500	France, Radio France Intl	11910as	17560me	17695eu	
1400-1420	Ghana, GBC Radio 1	4915do			
1400-1500	Ghana, GBC Radio 2	6130do	7295do		
1400-1500	India, All India Radio	13750as	15120as		
1400-1500	Iraq, Radio Iraq Intl	15250as			
1400-1500	Italy, AWR Europe	7230eu			
1400-1500 vl	Italy, IRRS Milano	7125eu			
1400-1500	Japan, NHK/Radio	9535na	9750as	11705na	11840as
		11955na			
1400-1430	Kazakhstan, R Alma Ata	5035eu	5915eu	6135eu	
1400-1500 mtwhf	Lebanon, Wings of Hope	9960me			
1400-1500 vl	Malaysia, RTM Kota Kinaba	5980do			
1400-1500	Malaysia, RTM Radio 4	7295do			
1400-1500 vl	Malaysia, RTM Sarawak	4950do			
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1500 s	Morocco, RTV Marocaine	17595af			
1400-1500 vl	Myanmar, Radio	7185do			
1400-1500	Netherlands, Radio	9890as	13700as	5150as	
1400-1500 ocasnal	New Zealand, R NZ Intl	6100pa			
1400-1430 mtwhf	Palau, KHBN Voice of Hope	9830as			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow Intl	6025eu	7280eu	9560as	9755na
		9825eu	9890eu	9895na	11705na
		11960na	15105eu	15210na	15290na
1400-1500	Singapore, SBC Radio One	6155do			
1400-1500	Slovakia, AWR Europe	13595as			
1400-1500	South Korea, R Korea Intl	5975as			
1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1400-1500	United Kingdom,BBC London	6195as	7180as	9410eu	9515na
		9660eu	9740as	9750eu	11750as
		11820as	12095eu	15070eu	15260af
		15310me	15400af	15575me	17640af
		17705eu	17790af	17840af	17880af
		21660af			
1400-1500	USA, KCBI Dallas TX	15725am			
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510na			
1400-1500	USA, KWHR Naalehu HI	9930as			
1400-1500	USA, Monitor Radio Intl	9355as	11900na	15665na	
1400-1500	USA, VOA Washington DC	6110as	7125as	9645as	9760as
		9770as	11705au	15160as	15205au
		15395au	15425as		
1400-1500	USA, WEWN Birmingham AL	9350na			
1400-1500 vl	USA, WHRI Noblesville IN	9465am	15105am		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WWCR Nashville TN	13845am	15685am		
1400-1500	USA, WYFR Okeechobee FL	6015na	11550na	11830na	17750na
1415-1500	Bhutan, Bhutan BS	5025as			
1415-1425	Nepal, Radio	5005do	7165do		
1430-1500	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	11660as	11695pa
		11800pa			
1430-1500	Austria, R Austria Intl	6155eu	9870af	13730af	15450as
1430-1500	Ecuador, HCJB Quito	11925am	17490am	17890am	21455am
1430-1500	Myanmar, Radio	5990do			
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1445-1500	Mongolia, R Ulaanbaatar	7260as	13780as		

SELECTED PROGRAMS

Sundays

1400 WEWN: Spanish Mass (live).
1400 WYFR: The Open Forum. See S 0000.
1410 Radio Australia: Study in Australia. See S 0010.
1430 Radio Australia: Report from Asia. Weekly roundup of Asian events by Helene Chung.

Mondays

1400 WEWN: Late Have I Loved Thee.
1400 WYFR (Satellite Network): Back to the Bible. A 30-minute mix of music and daily Bible study
1400 WYFR: Family Bible Reading Fellowship. See S 1200.
1410 Radio Australia: Variable Feature. These are repeat programs (or music) which are used as program fillers.
1416 WYFR: Family Bible Study. See M 0520.
1428 WEWN: This is Our Faith.
1430 Radio Australia: International Report. See M 0030.
1437 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (5th). See S 0037.
1448 Radio Australia: Stock Exchange Report. Financial news from Sydney and other exchanges.

Tuesdays

1400 WEWN: Tree of Life.
1400 WYFR (Satellite Network): Back to the Bible. See M 1400.
1400 WYFR: Family Bible Reading Fellowship. See S 1200.
1410 Radio Australia: Variable Feature. See M 1410.
1416 WYFR: Family Bible Study. See M 0520.
1428 WEWN: Faith Makes You Whole.
1430 Radio Australia: International Report. See M 0030.
1448 Radio Australia: Stock Exchange Report. See M 1448.

Wednesdays

1400 WEWN: Mother Angelica Talks It Over.
1400 WYFR (Satellite Network): Back to the Bible. See M 1400.
1400 WYFR: Family Bible Reading Fellowship. See S 1200.
1410 Radio Australia: Variable Feature. See M 1410.
1422 WYFR: Family Bible Study. See M 0520.
1428 WEWN: Survey of Theology.
1430 Radio Australia: International Report. See M 0030.
1448 Radio Australia: Stock Exchange Report. See M 1448.

Thursdays

1400 WEWN: Prayer Quest.
1400 WYFR (Satellite Network): Back to the Bible. See M 1400.
1400 WYFR: Family Bible Reading Fellowship. See S 1200.
1410 Radio Australia: Variable Feature. See M 1410.
1416 WYFR: Family Bible Study. See M 0520.
1428 WEWN: You and the God of Mercy.
1430 Radio Australia: International Report. See M 0030.
1448 Radio Australia: Stock Exchange Report. See M 1448.

Fridays

1400 WEWN: The Vineyard.
1400 WYFR (Satellite Network): Back to the Bible. See M 1400.
1400 WYFR: Family Bible Reading Fellowship. See S 1200.
1410 Radio Australia: Variable Feature. See M 1410.
1416 WYFR: Family Bible Study. See M 0520.
1428 WEWN: You Better Believe It.
1430 Radio Australia: International Report. See M 0030.
1448 Radio Australia: Stock Exchange Report. See M 1448.

Saturdays

1400 WEWN: Retreat Teachings.
1400 WYFR (Satellite Network): Music. See S 0145.
1400 WYFR: Family Bible Reading Fellowship. See S 1200.
1410 Radio Australia: Ockham's Razor. Robyn Williams introduces straight, sharp talk about science.
1416 WYFR: The Mailbag Program. Letters from around the world are read and answered.
1425 WYFR (Satellite Network): Dad to Dad. Advice for fathers.
1426 WYFR (Satellite Network): Freedom Under Fire. See M 1606.
1430 Radio Australia: Background Report. Interviewing an expert on international affairs.
1430 WYFR (Satellite Network): Perspectives on Personal Living. Craig Ellison on matters related to psychology and spirituality.
1437 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (3rd). See S 0037.
1440 WYFR (Satellite Network): Music. See S 0145.

RADIO NETHERLANDS

Pete Myers departed RN and the *Happy Station* July 24, replaced by Jonathan Grubert (via Keith Perron, Kevin Hecht) Jonathan Marks promoted to Director of Programmes July 1, and may have to give up *Media Network*; new host, if any, will put his personal stamp on it (USENET via Thurman) QSL from RN took 14 months in transit because "USA" was not in my address in English, but Dutch! (Hecht)

Sep. previews:

Newsline, Sat. 3rd and Mon. 5th comparing immigrant and Dutch families.

Mirror Images, Tues., Early Music Festival in Utrecht.

Documentaries, Weds., repeated on alternate broadcasts Fris.

Then and Now, looking at three Dutch cities in 1944, 1994—Sept. 7, Arnhem; Sept. 14, Maastricht; Sept. 21, Eindhoven.

Towards 2000, Fris., Peacekeeping and Prostitution

(via Diane Mauer, Will Martin, Frank Orcutt, Steven Cline)

1500 UTC SHORTWAVE GUIDE 11:00 AM EDT 8:00 AM PDT

FREQUENCIES

1500-1600	Australia, Radio	6060pa	6080pa	7260as	9710pa
		9770as	11660as	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, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955na	17820na		
1500-1600	China, China Radio Intl	4200as	7405na	9785as	11815as
		15165as			
1500-1600 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1500-1527	Czech Rep, Radio Prague	5930as	7345eu	13580me	
1500-1600	Ecuador, HCJB Quito	11925am	15250am	17490am	17890am
		21455am			
1500-1600	Ethiopia, Voice of	7165do	9560do		
1500-1550	Germany, Deutsche Welle	7185af	9735af	11965af	17800af
		21600af			
1500-1600	Guam, KTWR Agana	11580as			
1500-1600	Iraq, Radio Iraq Intl	15250as			
1500-1600 vl	Italy, IRRS Milano	7125eu			
1500-1600	Japan, NHK/Radio	9535na	9750as	11915as	11955na
		15355af			
1500-1600	Jordan, Radio	9560eu			
1500-1600 mtwhf	Lebanon, Wings of Hope	9960me			
1500-1600 vl	Malaysia, RTM Kota Kinaba	5980do			
1500-1600	Malaysia, RTM Radio 4	7295do			
1500-1600	Malaysia, RTM Sarawak	4950do	7160do		
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1515	Mongolia, R Ulaanbaatar	7260as	13780as		
1500-1525	Netherlands, Radio	9890as	13700as	15150as	
1500-1600 ocasnal	New Zealand, R NZ Intl	6100pa			
1500-1600	Nigeria, Voice of	7255af			
1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13185eu
1500-1600	Philippines, FEBC Manila	11995as			
1500-1555 vl	Philippines, Veritas Asia	15140as			
1500-1555	Poland, Polish R Warsaw	7285eu	9525eu		
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as	
1500-1600	Russia, Radio Moscow Intl	6025eu	7305eu	9505eu	9540eu
		9560eu	9755af	9825eu	9895as
		11675eu	11695eu	11875eu	12030as
		15105eu	15180eu	15210as	15290na
		15320as	15425eu	15470as	15500na
		15540eu	15550eu	17760na	
1500-1600	S Africa, Channel Africa	4945af	11770af		
1500-1543 mtwhfa	Seychelles, FEBA Radio	9810as	11870as		
1500-1545	Seychelles, FEBA Radio	7205as			
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1500-1530	Switzerland, Swiss R Intl	11960as	13635as	15505as	
1500-1600	United Kingdom,BBC London	6190af	6195as	7180as	9410eu
		9515na	9740as	11750as	11940af
		12095eu	15070af	15260na	15310as
		15400af	15420af	17705eu	17840na
		17880af	21470af	21490af	21660af
1500-1600	USA, KCBI Dallas TX	15725am			
1500-1600 vl	USA, KJES Mesquite NM	11715na			
1500-1600	USA, KTBN Salt Lk City UT	15590na			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, VOA Washington DC	7245as	9510as	9770as	11785as
		15160as	15385as	15395as	17640as
		17730as	17800as	17830as	19379eu
1500-1600	USA, WCSN Scotts Cor ME	15665eu			
1500-1600	USA, WEWN Birmingham AL	9350na	17510eu		
1500-1600	USA, WHRI Noblesville IN	9465am	15105am		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WRNO New Orleans LA	15420na			
1500-1600	USA, WWCR Nashville TN	13845am	15685am		
1500-1600	USA, WYFR Okeechobee FL	11705na	11830na	17750na	
1530-1600	Austria, R Austria Intl	11780as			
1530-1600 mtwhf	Portugal, Radio	21515me			
1545-1600	Vatican State, Vatican R	12050as	15585as		

SELECTED PROGRAMS

Sundays

1500 WEWN: A Moment with Mother Angelica.
1505 Swiss Radio Int'l: Newsnet.
1508 Deutsche Welle: Religion and Society. News and developments concerning the world's major religions.
1518 Deutsche Welle: Through German Eyes. In-depth interviews with prominent German journalists.
1528 WEWN: Mountains and Valleys.
1530 Voice of Nigeria: In the News. Fifteen minutes of the news behind the news.
1533 Deutsche Welle: Pop from Germany. The German pop scene for listeners in Africa.

Mondays

1500 Voice of Nigeria: Images of Nigeria. See S 1645.
1500 WEWN: Mother Angelica Talks It Over.
1500 WYFR (Satellite Network): Behind the Scenes at Family Radio. Focus on a member of the Family Radio team.
1505 Swiss Radio Int'l: Newsnet.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 WYFR: The Open Forum. See S 0000.
1528 Deutsche Welle: Weekend Sport. All the latest scores of the seasonal matches.
1528 WEWN: Our Catholic Treasures.
1530 Voice of Nigeria: 60 Minutes. World and Nigerian news, correspondent reports, press review, and sports.
1530 WYFR (Satellite Network): Family Forum. A program of advice for youth on everyday living.
1537 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (5th). See S 0037.
1538 Deutsche Welle: Monday Special. Interview or report on events or developments in African affairs.
1541 WYFR: Creation Moments. See M 0641.
1549 WYFR: Family Bible Counseling. See M 1349.

Tuesdays

1500 WEWN: Living the Scriptures.
1500 WYFR (Satellite Network): Behind the Scenes at Family Radio. See M 1500.
1505 Swiss Radio Int'l: Newsnet.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 WYFR: The Open Forum. See S 0000.
1528 WEWN: Drama of Jesus.
1530 Voice of Nigeria: 60 Minutes. See M 1530.
1530 WYFR (Satellite Network): Family Forum. See M 1530.
1533 Deutsche Welle: Insight. A weekly analysis of major developments on the international scene.
1541 WYFR: Creation Moments. See M 0641.

Wednesdays

1500 WEWN: Saints and Other Powerful Men.
1505 Swiss Radio Int'l: Newsnet.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 WYFR: The Open Forum. See S 0000.
1528 WEWN: Journey of Faith.
1530 Voice of Nigeria: 60 Minutes. See M 1530.
1530 WYFR (Satellite Network): Family Forum. See M 1530.
1534 Deutsche Welle: Living in Germany. See M 0111.
1541 WYFR: Creation Moments. See M 0641.
1549 WYFR: Family Bible Counseling. See M 1349.

Thursdays

1500 WEWN: Thomism.
1500 WYFR (Satellite Network): Behind the Scenes at Family Radio. See M 1500.
1505 Swiss Radio Int'l: Newsnet.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 WYFR: The Open Forum. See S 0000.
1528 WEWN: Seven Gifts of the Holy Spirit.
1530 Voice of Nigeria: 60 Minutes. See M 1530.
1530 WYFR (Satellite Network): Family Forum. See M 1530.
1534 Deutsche Welle: Spotlight on Sport. Weekly magazine program with background stories and coverage of important events.
1541 WYFR: Creation Moments. See M 0641.

Fridays

1500 WEWN: Partakers of the Divine Nature.
1505 Swiss Radio Int'l: Newsnet.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 WYFR: The Open Forum. See S 0000.
1528 WEWN: Today with Father Rutler.
1530 Voice of Nigeria: 60 Minutes. See M 1530.
1530 WYFR (Satellite Network): Family Forum. See M 1530.
1534 Deutsche Welle: Economic Notebook. See T 0333.
1541 WYFR: Creation Moments. See M 0641.
1549 WYFR: Family Bible Counseling. See M 1349.

Saturdays

1500 WEWN: Christifidelis.
1504 WYFR (Satellite Network): Music and Inspiration. Christian music, advice, and guidance.
1505 Swiss Radio Int'l: Newsnet.
1510 WYFR: The Open Forum. See S 0000.
1523 Deutsche Welle: Development Forum. Reports and interviews on projects and progress in Africa and Asia.
1528 WEWN: Contemplating Jesus.
1530 Voice of Nigeria: 60 Minutes. See M 1530.
1533 Deutsche Welle: Science and Technology. See M 1634.
1537 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (3rd). See S 0037.
1538 WYFR (Satellite Network): The Family Room. Guest speakers talk on Christian topics.
1548 WYFR: Farm Radio. See A 0648.

FREQUENCIES

1600-1700	Algeria, R Algiers Intl	9535eu	15160eu		
1600-1700 mf	Australia, ADF Radio	10848af			
1600-1630	Australia, Radio	6020pa	6060pa	6080pa	7260as
		9770as	11660pa	11695pa	11800pa
1600-1700 vl	Australia, VL8A Alice Spg	2310do			
1600-1700 vl	Australia, VL8K Katherine	2485do			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			
1600-1700	Bahrain, Radio	6010do			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, China Radio Intl	4130af	11575af	15110af	15130af
1600-1700 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1600-1700	Ecuador, HCJB Quito	21455am			
1600-1700	France, Radio France Intl	6175eu	11700af	12015af	15530me
		17795af	17850af		
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	15595as
		17810as	21680as		
1600-1700	Guam, KSDA AWR Agat	7455as			
1600-1615	Guam, KTWR Agana	12025as			
1600-1627	Iran, VOIRI Tehran	11790eu			
1600-1700	Iraq, Radio Iraq Intl	15250as			
1600-1700 vl	Italy, IRRS Milano	7125eu			
1600-1700	Jordan, Radio	9560eu			
1600-1630 mtwhf	Lebanon, Wings of Hope	9960me			
1600-1630	Netherlands, Radio	5995eu	9890as	13700as	15150as
1600-1649 ocasnal	New Zealand, R NZ Intl	6100pa			
1600-1700	Nigeria, Voice of	7255af			
1600-1630	Pakistan, Radio	9470me	11570af	13590af	15555as
		15675af	17660as		
1600-1700	Russia, Radio Moscow Intl	6025eu	7250na	7260na	7345na
		9505na	9540na	9560na	9755na
		9880eu	11630eu	11840na	11940eu
		11945eu	11960eu	12030eu	15105na
		15290eu	15320na	15385eu	17760eu
		17875eu	21740as		
1600-1700	S Africa, Channel Africa	4945af	11770af		
1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu		
1600-1700	South Korea, R Korea Intl	5975as			
1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1600-1645	UAE, Radio Dubai	11795af	13675eu	15435eu	21605eu
1600-1700	United Kingdom,BBC London	3915as	6190af	6195eu	7160as
		9410eu	9515na	9580as	9740as
		11750as	12095eu	15070af	15260na
		15310as	15400af	17640af	17840af
		17880af	21470af	21660af	
1600-1700	USA, KCBI Dallas TX	15725am			
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	7425as			
1600-1700	USA, Monitor Radio Intl	9355af			
1600-1700	USA, VOA Washington DC	6110as	6180eu	7125as	9645as
		9700as	9760as	11855eu	11930af
		12040af	13710af	15205as	15255af
		15320af	15395as	15410af	15445af
		17790af	17895af	19379eu	
1600-1700	USA, WCSN Scotts Cor ME	15665eu			
1600-1700	USA, WEWN Birmingham AL	13615na			
1600-1700 vl	USA, WHRI Noblesville IN	9465am	15105am		
1600-1700	USA, WINB Red Lion PA	15715eu			
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WRNO New Orleans LA	15420am			
1600-1700	USA, WWCR Nashville TN	13845am	15685am		
1600-1700	USA, WYFR Okeechobee FL	11705na	11830na	15355eu	17750na
		21525af	21615eu		
1600-1630	Vietnam, Voice of	9840af	12020af	15010af	
1615-1645	Sweden, Radio	6065eu			
1615-1630	Vatican State, Vatican R	6245eu	7250eu	9645eu	
1620-1630 mtwtf	Estonia, Estonian Radio	5925eu			
1630-1700	Australia, Radio	6060pa	6080pa	7260as	9710pa
		9860pa	11660pa	11695pa	11800pa
1630-1700	Canada, RCI Montreal	7150as	9550as		
1630-1700	Ecuador, HCJB Quito	15270me	17790me		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700 s	Guam, KTWR Agana	12025as			
1630-1700	Liberia, Radio ELWA	4760do			
1630-1700	United Kingdom,BBC London	3255af	5965as	5975as	7180as
		9630af	15420af		
1645-1700	Afghanistan, Radio	9635as			
1645-1700	Tajikistan, Radio	7245as			
1650-1700 mtwtf	New Zealand, R NZ Intl	6100pa			

SELECTED PROGRAMS

Sundays

1600 Voice of Nigeria: VoN-Linkup. See S 0505.
1600 WEWN: Life in the Holy Spirit.
1600 WYFR: Family Bible Reading Fellowship. See S 1200.
1602 WINB: Music.
1609 Deutsche Welle: Arts on the Air. See S 1109.
1615 WINB: The Old Country Church.
1628 WEWN: Christ in My Life.
1630 WINB: Happy Half Hour of Heaven.
1634 Deutsche Welle: German by Radio. See S 0132.
1645 Voice of Nigeria: Images of Nigeria. Tourist attractions in Nigeria.

Mondays

1600 WEWN: Truths of Salvation.
1600 WINB: 20th Century Reformation Hour.
1600 WYFR: Family Bible Reading Fellowship. See S 1200.
1606 WYFR (Satellite Network): Freedom Under Fire. Attorney and author John Whitehead defends life, liberty, and family freedom.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1618 WYFR: Family Bible Study. See M 0520.
1628 WEWN: Old Testament Prophets.
1630 WINB: Morning Sunshine Ministry.
1634 Deutsche Welle: Science and Technology. Magazine program presenting new developments in science and technology.
1646 WYFR: The Radio Reading Circle. See M 0546.

Tuesdays

1600 WEWN: Through the Ministry of Angels.
1600 WINB: 20th Century Reformation Hour.
1600 WYFR: Family Bible Reading Fellowship. See S 1200.
1606 WYFR (Satellite Network): Freedom Under Fire. See M 1606.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1618 WYFR: Family Bible Study. See M 0520.
1628 WEWN: Profiles in Greatness.
1630 WINB: Morning Sunshine Ministry.
1634 Deutsche Welle: Man and Environment. Various topics relating to the environment in industrial and developing countries.
1646 WYFR: The Radio Reading Circle. See M 0546.

Wednesdays

1600 WEWN: God Bless.
1600 WINB: 20th Century Reformation Hour.
1600 WYFR: Family Bible Reading Fellowship. See S 1200.
1606 WYFR (Satellite Network): Freedom Under Fire. See M 1606.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1618 WYFR: Family Bible Study. See M 0520.
1628 WEWN: Mercy Our Mission.
1630 WINB: Morning Sunshine Ministry.
1634 Deutsche Welle: Insight. See T 1533.
1646 WYFR: The Radio Reading Circle. See M 0546.

Thursdays

1600 WEWN: Livewire (encore).
1600 WINB: 20th Century Reformation Hour.
1600 WYFR: Family Bible Reading Fellowship. See S 1200.
1606 WYFR (Satellite Network): Freedom Under Fire. See M 1606.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1618 WYFR: Family Bible Study. See M 0520.
1630 WINB: Morning Sunshine Ministry.
1634 Deutsche Welle: Living in Germany. See M 0111.
1646 WYFR: The Radio Reading Circle. See M 0546.

Fridays

1600 WEWN: Seed of Abraham.
1600 WINB: 20th Century Reformation Hour.
1600 WYFR: Family Bible Reading Fellowship. See S 1200.
1606 WYFR (Satellite Network): Freedom Under Fire. See M 1606.
1609 Deutsche Welle: Newsline Cologne. See M 1109.
1618 WYFR: Family Bible Study. See M 0520.
1628 WEWN: Windows of Heaven.
1630 WINB: Morning Sunshine Ministry.
1634 Deutsche Welle: Spotlight on Sport. See H 1534.
1640 Deutsche Welle: Religion and Society. See S 1508.
1646 WYFR: The Radio Reading Circle. See M 0546.

Saturdays

1600 WEWN: Catholic Beliefs and Practices.
1600 WINB: International Bible Crusade.
1600 WYFR: Family Bible Reading Fellowship. See S 1200.
1604 WYFR (Satellite Network): Music and Inspiration. See A 1504.
1609 Deutsche Welle: International Talking Point. See S 0415.
1623 Deutsche Welle: Development Forum. See A 1523.
1628 WEWN: Father Ray Shares His Love.
1630 WINB: Radio Bible School.
1645 WYFR (Satellite Network): Focus on Issues. A discussion of a current global topic.
1649 WYFR: The Bible Quiz. See S 0549.

FREQUENCIES

1700-1800	Australia, Radio	6060pa	6080pa	7260as	9580pa
		9710pa	9860pa	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	Azerbaijan, Voice of	7160eu			
1700-1800	Bahrain, Radio	6010do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	4130af	7405af	9535af	11575af
1700-1800	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1700-1727	Czech Rep, Radio Prague	5930eu	7345eu	11640eu	
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 vl	Eqt Guinea, Radio Africa	7200af			
1700-1800 as	Guam, KSDA AWR Agat	13720as			
1700-1800 vl	Italy, IRRS Milano	7125eu			
1700-1800	Japan, NHK/Radio	6150na	9535na	9580as	11930as
1700-1730	Jordan, Radio	9560eu			
1700-1713 mtwhfa	Lebanon, Voice of	6550eu			
1700-1800	Liberia, Radio ELWA	4760do			
1700-1800 mtwtf	New Zealand, R NZ Intl	6100pa			
1700-1750	North Korea, R Pyongyang	9640af	9977af	13785af	
1700-1800	Pakistan, Radio	7485eu	11570eu		
1700-1755	Poland, Polish R Warsaw	5995eu	7270eu	7285eu	
1700-1800	Russia, Radio Moscow Intl	6025eu	6120eu	6970eu	9505na
		9510eu	9560eu	9880na	11705af
		11840na	11995af	12050af	13665eu
		15105na	15180na	15190na	15290na
		15385na	15425eu	15500af	15520af
		17760eu	17875as	21740af	
1700-1800	S Africa, Channel Africa	4945af	11770af		
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1800	Slovakia, AWR Europe	13595as	15625as		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1700-1730	Switzerland, Swiss R Intl	9885af	13635me	15635af	
1700-1800	United Kingdom,BBC London	3255af	3915as	5975as	6180eu
		6190af	6195eu	7160me	9410eu
		9630af	9740as	11750as	11940af
		12095af	15070af	15260af	15400af
		15420af	17880af		
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	9355af			
1700-1800	USA, VOA Washington DC	6040eu	6110as	7125as	9645as
		9700eu	9760eu	11855as	11920af
		12040af	13710af	15205eu	15320af
		15395as	15410af	15445af	17790af
		19379eu			
1700-1800	USA, WCSN Scotts Cor ME	15665eu			
1700-1800	USA, WEWN Birmingham AL	13615na	15695eu		
1700-1800 vl	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WINB Red Lion PA	15715eu			
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WWCR Nashville TN	13845am	15610am	15685am	
1700-1800	USA, WYFR Okeechobee FL	21500eu			
1715-1730 mtwhf	Swaziland, Trans World R	7120af			
1730-1800	Netherlands, Radio	6020af	7120af	9605af	17655af
		21590af			
1730-1800	Romania, R Romania Intl	11830af	15340af	15365af	17805af
1730-1800	Sweden, Radio	6065eu	9655af	15390me	
1730-1800	Vatican State, Vatican R	9695af	11625af	15570af	
1745-1800	Bangladesh, Radio	7190eu	9683eu		
1745-1800	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	15075af		

1800-1900	Argentina, RAE	15345eu			
1800-1900	Australia, Radio	6060pa	6080pa	9710pa	9860pa
		11695pa	11880pa		
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1800-1900	Bahrain, Radio	6010do			
1800-1845	Bangladesh, Radio	7190eu	9683eu		
1800-1830	Belgium, R Vlaanderen Int	5910eu	15550af		
1800-1900	Brazil, Radiobras	15268eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1800-1900	Ecuador, HCJB Quito	21455am			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900 vl	Eqt Guinea, Radio Africa	7200af			
1800-1815	Ghana, GBC Radio 1	4915do			
1800-1815	Ghana, GBC Radio 2	3316do			
1800-1900 as	Guam, KSDA AWR Agat	13720as			
1800-1900	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	15075af		
1800-1900 vl	Italy, IRRS Milano	7125eu			
1800-1900	Kuwait, Radio	11990na			
1800-1900	Liberia, Radio ELWA	4760do			
1800-1900	Netherlands, Radio	6020af	9605af	17655af	21590af
1800-1900 mtwtf	New Zealand, R NZ Intl	6100pa			
1800-1850	North Korea, R Pyongyang	9640as	13750as	15435as	
1800-1830 s	Norway, Radio Norway Intl	5960eu	9590af	11745me	15220af
1800-1900	Russia, Radio Moscow Intl	6120eu	6970eu	7105eu	7170na
			7260na	12015as	12050na
12065af					
		13665af	15105eu	15190na	15290na
		15375af	15400na	15425na	15480na
		15580na	17760eu		
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900	Sudan, Radio Omdurman	9170af			
1800-1900	Swaziland, Trans World R	3200af			
1800-1845	Swaziland, Trans World R	9500af			
1800-1900	United Kingdom,BBC London	3255af	5975as	6005af	6180eu
		6190af	6195eu	7110as	9410eu
		9630af	9740me	11940af	2095af
		15070af	15400af	15420af	17880af
1800-1900	USA, KCBI Dallas TX	15725am			
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625as			
1800-1900	USA, Monitor Radio Intl	9355pa	13770eu	17510af	
1800-1900	USA, VOA Washington DC	6040eu	9700eu	9760eu	11920af
		12040af	13675af	13710af	15205af
		15410af	15580af	17800af	17895af
		19379eu			
1800-1900 vl	USA, WEWN Birmingham AL	13615na	15695eu	18930sa	
1800-1900	USA, WHRI Noblesville IN	9485am	13760am		
1800-1900	USA, WINB Red Lion PA	15715eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WWCR Nashville TN	13845am	15610am	15685am	
1800-1845	USA, WYFR Okeechobee FL	21500eu			
1800-1830	Vietnam, Voice of	9840eu	12020eu		
1800-1900	Yemen, Yemeni Rep Radio	9780do			
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880me	13730af
1830-1900	Serbia, Radio Yugoslavia	6100eu	9720af		
1840-1850 mtwhfa	Greece, Voice of	15650af	17525af		
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900	New Zealand, R NZ Intl	11735pa			

Late Breaking News

Jim Frimmel tells us that FEBC has just decided to close its Spanish-language San Francisco station, KGEI, in order to cut costs. This religious station carried only one hour of English language broadcasting, which was a program by Rev. Billy Graham.

FREQUENCIES

		11880pa			
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-2000	Bahrain, Radio	6010do			
1900-1918	Brazil, Radiobras	15268eu			
1900-2000	Bulgaria, Radio	9700eu	11720eu		
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955me	9440af	11515af	
1900-2000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1900-2000	Ecuador, HCJB Quito	15270eu	17490eu	17790eu	21455eu
1900-2000 vl	Eqt Guinea, Radio Africa	7200af			
1900-2000	Finland, YLE/Radio	9730eu	9770eu	11755eu	15440eu
1900-1950	Germany, Deutsche Welle	9670af	9735af	11740af	11785af
		11810af	13690af	13790af	
1900-1930	Hungary, Radio Budapest	3955eu	6110eu	7220eu	
1900-1945	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	15075af		
1900-1930	Israel, Kol Israel	9435eu	11603na	11675na	15640na
		17575af			
1900-2000 vl	Italy, IRRS Milano	7125eu			
1900-2000	Japan, NHK/Radio	6150as	7140au	9535as	9580au
		9610as			
1900-2000	Kuwait, Radio	11990eu			
1900-1930 as	Latvia, Radio	5935eu			
1900-2000	Liberia, Radio ELWA	4760do			
1900-1925	Netherlands, Radio	6020af	9605af	17655af	21590af
1900-2000	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, Radio	3326do	4770do	4990do	
1900-2000	Nigeria, Voice of	7255af			
1900-2000 vl	Papua New Guinea, NBC	4890do			
1900-1930 mtwhf	Portugal, Radio	9780eu	9815eu	11975af	15515af
1900-2000	Romania, R Romania Intl	9690eu	9750eu	11810eu	11940eu
1900-2000	Russia, Radio Moscow Intl	6120eu	6970eu	7105eu	7170na
	7260eu 9685eu	12050eu	13665eu	15105af	15180eu
	15290af 15425na	5525af	15580af	17560af	17605eu
		17760eu	17875af		
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu		
1900-2000	Slovakia, AWR Europe	15625as			
1900-2000	Spain, Spanish Natl Radio	11775af			
1900-2000	Swaziland, Trans World R	3200af	3240af		
1900-1930	Switzerland, Swiss R Intl	3985eu	6165eu		
1900-2000 vl	Uganda, Radio	4976do			
1900-2000	United Kingdom,BBC London	3255af	6180eu	6195eu	7110as
		7160me	9410eu	9630af	9740me
		11955as	12095af	15070af	15400af
		17880af			
1900-2000	USA, KCBI Dallas TX	15725am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000 as	USA, KVOH Los Angeles CA	17775am			
1900-2000	USA, KWHR Naalehu HI	13625as			
1900-2000	USA, Monitor Radio Intl	13770eu	15665eu	17510af	
1900-2000	USA, VOA Washington DC	3980eu	6040eu	9525as	9700eu
	9760eu 9770eu	11870as	11920af	12040af	13710af
	15180eu 15205na	15410na	15445af	15580af	17800af
	19379eu				
1900-2000	USA, WEWN Birmingham AL	13615na	18930sa		
1900-2000 vl	USA, WHRI Noblesville IN	9485am	9590am	3760am	
1900-2000	USA, WINB Red Lion PA	15715eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000	USA, WWCR Nashville TN	13845am	15610am	15685am	
1900-2000	USA, WYFR Okeechobee FL	15355eu	21615af		
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1915-2000	Vatican State, Vatican R	3945eu	3975eu	5882eu	
1930-2000	Iran, VOIRI Tehran	9022me	9745me		
1930-2000	Netherlands, Radio	17605af	17655af		
1930-2000	Poland, Polish R Warsaw	5955eu	6135eu	7285eu	
1930-2000	Slovakia, R Slovakia Intl	5915eu	7345eu	9440eu	
1935-1955	Italy, RAI Rome	7275eu	9575eu		
1940-2000	Mongolia, R Ulaanbaatar	11790as	12015eu		

2000 UTC

2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7240pa
		7260as	9560pa	9860pa	11660pa
		11695pa	11880pa		
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bahrain, Radio	6010do			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	4130eu	6950eu	8260eu	9440af
		9920eu	11715af	15110af	
2000-2100	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2000-2027	Czech Rep, Radio Prague	5930eu	7345eu	9485eu	
2000-2100	Ecuador, HCJB Quito	21455am			
2000-2100 vl	Eqt Guinea, Radio Africa	7200af			
2000-2030 mt	Estonia, Estonian Radio	5925eu			
2000-2050	Germany, Deutsche Welle	7170eu	9615eu		
2000-2030	Ghana, GBC Radio 1	4915do			
2000-2030	Ghana, GBC Radio 2	3366do			
2000-2010 mtwhfa	Greece, Voice of	9395eu			
2000-2100	Indonesia, Voice of	9675as	11752as		
2000-2100 vl	Italy, IRRS Milano	7125eu			
2000-2010 mtwhf	Kenya, Kenya BC Corp	4935do			
2000-2100	Kuwait, Radio	11990eu			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2010 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
2000-2025	Netherlands, Radio	17605af	17655af		
2000-2100	New Zealand, R NZ Intl	11735pa			
2000-2100	Nigeria, Radio	3326do	4770do	4990do	
2000-2100	Nigeria, Voice of	7255af			
2000-2100	North Korea, R Pyongyang	6576eu	9345eu	9977eu	
2000-2030 s	Norway, Radio Norway Intl	9590eu	15220af		
2000-2100 vl	Papua New Guinea, NBC	4890do			
2000-2025	Poland, Polish R Warsaw	5995eu	6135eu	7285eu	
2000-2100	Russia, Radio Moscow Intl	6120eu	7250eu	7260eu	9190na
	9450na 9620na	9665na	9685na	9880na	9895na
	11630eu 11675eu	11715eu	11750na	11760eu	11805na
	11940eu 12050na	15290eu	15425eu	15580na	17605na
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu		
2000-2100	Slovakia, AWR Europe	6055as			
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do		
2000-2100	Sri Lanka, SLBC Colombo	9720eu	15120eu		
2000-2045	Swaziland, Trans World R	3240af			
2000-2015	Swaziland, Trans World R	3200af			
2000-2030	Switzerland, Swiss R Intl	6135af	9885af	13635af	15505af
2000-2050	Turkey, Voice of	9400eu			
2000-2100 vl	Uganda, Radio	4976do			
2000-2030	United Kingdom,BBC London	7160me	9630af	9740me	17880af
2000-2100	United Kingdom,BBC London	3255af	6180eu	6195eu	7110as
		7325eu	9410eu	12095af	15070af
		15260sa	15400af		
2000-2100	USA, KCBI Dallas TX	15725am			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100 as	USA, KVOH Los Angeles CA	17775am			
2000-2100	USA, KWHR Naalehu HI	15405as			
2000-2100	USA, Monitor Radio Intl	13770af	15665eu		
2000-2100	USA, VOA Washington DC	3980eu	6040eu	7415af	9700eu
		9760na	11820af	13710af	15160af
		15410af	15445af	15580af	17800af
		19379me	21485af		
2000-2100	USA, WEWN Birmingham AL	13615na			
2000-2100	USA, WHRI Noblesville IN	9485am	13760am		
2000-2100	USA, WINB Red Lion PA	15715eu			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100	USA, WWCR Nashville TN	13845am	15610eu	15685am	
2000-2100	USA, WYFR Okeechobee FL	17612af	21525af	21615eu	
2000-2045	USA, WYFR Okeechobee FL	15355eu			
2000-2030	Vatican State, Vatican R	9645af	11625af	15570af	
2000-2010	Vatican State, Vatican R	3945eu	3975eu	5882eu	
2005-2100	Syria, Radio Damascus	12085eu	15095na		
2010-2100 sa	Kenya, Kenya BC Corp	4935do			
2025-2045	Italy, RAI Rome	7235me	9710me	11800me	
2030-2100	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670me
		15325me	17820me	17850af	17875af
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100	Lithuania, Radio Vilnius	9530eu	9710eu		
2030-2100 smtwha	Moldava, R Dnestr Intl	15290eu			
2030-2100 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2030-2100	Serbia, Radio Yugoslavia	9620eu			
2030-2100	South Korea, R Korea Intl	5965eu	5975eu	9640eu	9870eu
2030-2100	Sweden, Radio	6065af	9655me		
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15225pa		

FREQUENCIES

2100-2200	Australia, Radio	6060as	6080as	7240pa	7260pa
		11855pa	11880as		
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2106	Bahrain, Radio	6010do			
2100-2130	Belgium, R Vlaanderen Int	5910eu			
2100-2200	Bulgaria, Radio	9700eu	11645eu	11720na	
2100-2200 vl	Canada, CBC N Quebec Sce	9625do			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2130	Canada, RCI Montreal	5995eu	7235eu	13650me	13670me
		15325af	17820af	17850af	17875af
2100-2200	China, China Radio Intl	4130eu	6950eu	8260eu	9920eu
2100-2130	China, China Radio Intl	3985eu	11715af	15110af	
2100-2200	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2100-2200	Cuba, Radio Havana Cuba	15165eu	17760eu		
2100-2127	Czech Rep, Radio Prague	5930eu	7345eu	9420eu	
2100-2130	Ecuador, HCJB Quito	21455am			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	9670as	9735af	9765as	11765af
		11785as	13690as	15135af	
2100-2130	Hungary, Radio Budapest	3955eu	6110eu	7220eu	
2100-2200	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715eu	15225pa		
2100-2200 vl	Italy, IRRS Milano	7125eu			
2100-2200	Japan, NHK/Radio	6035as	6185as	9610af	9625af
		9750me	11925eu		
2100-2115	Japan, NHK/Radio	9660as	11915as		
2100-2200	Liberia, Radio ELWA	4760do			
2100-2137	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, Radio	3326do	4770do	4990do	
2100-2200	Nigeria, Voice of	7255af			
2100-2200 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2100-2200 vl	Papua New Guinea, NBC	4890do	9675do		
2100-2200	Romania, R Romania Intl	7225eu	9690eu	9750eu	11940eu
2100-2200	Russia, Radio Moscow Intl	6120eu	6970na	7150na	9470eu
		9550eu	9665na	9685eu	9750eu
		9820eu	9880eu	9895as	11730na
		11750na	11760na	11770na	11805na
		11920na	12050na	15290na	15425na
		15580na	17605na		
2100-2130	Serbia, Radio Yugoslavia	7265eu	9595eu		
2100-2115 vl	Sierra Leone, SLBS	3316do			
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2200	Spain, Spanish Natl Radio	6125eu			
2100-2130	Sri Lanka, SLBC Colombo	9720eu	15120eu		
2100-2105	Syria, Radio Damascus	12085eu	15095na		
2100-2200	Ukraine, R Ukraine Intl	4825eu	6010eu	6020eu	6090eu
		7150eu	7285eu	9640eu	11780eu
		11950eu	12030eu		
2100-2200	United Kingdom,BBC London	3255af	3915as	5975na	6005af
		6180eu	6195eu	7110as	7325eu
		9410eu	11955as	12095af	15070eu
		15260sa	15370as	15400na	15575eu
2100-2200	USA, KCBI Dallas TX	15725am			
2100-2200	USA, KTBN Salt Lk City UT	15590na			
2100-2200 s	USA, KVOH Los Angeles CA	17775am			
2100-2200	USA, KWHR Naalehu HI	13720as			
2100-2200	USA, Monitor Radio Intl	13770eu	13840pa	15665eu	
2100-2200	USA, VOA Washington DC	6040eu	6095eu	9760eu	11870as
		13710as	15185au	15205af	15410af
		15445af	15580af	17735as	17800af
		19379me	21485af		
2100-2200	USA, WEWN Birmingham AL	13615na	18930sa		
2100-2200 vl	USA, WHRI Noblesville IN	13760am			
2100-2200	USA, WINB Red Lion PA	9485eu	15715eu		
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465na			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200	USA, WWCR Nashville TN	13845am	15610am	15685am	
2100-2200	USA, WYFR Okeechobee FL	15566eu	17612af	21525af	
2100-2145	USA, WYFR Okeechobee FL	21615eu			
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom,BBC Carib	6110am	15390am	17715am	
2130-2145 s	Armenia, Radio Yerevan	11790eu	11945eu	11960eu	
2130-2200	Australia, Radio	15365pa	17795pa	17860pa	
2130-2200 vl	Australia, VL8A Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200	Austria, R Austria Intl	5945af	6155af	9880eu	13730af
2130-2200	Ecuador, HCJB Quito	11835eu	15270eu	17490eu	21455eu
2130-2200	Israel, Kol Israel	7465eu	9435sa	11603na	11675na
		17575sa			
2130-2200	Sweden, Radio	6065eu			
2138-2200	New Zealand, R NZ Intl	15115pa			

2200 UTC

2200-2300	Australia, Radio	11695pa	11855as	11880pa	13755as
		15365pa	17795pa	17860pa	
2200-2300 vl	Australia, VL8A Alice Spg	4835do			
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	11705as	11845am	11875am	1
5305am					
2200-2300	Canada, RCI Montreal	5960na	9755na	13670am	
2200-2300	China, China Radio Intl	9880eu			
2200-2300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2200-2300	Cuba, Radio Havana Cuba	9550na			
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300 vl	Eqt Guinea, Radio Africa	7200af			
2200-2230	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15225eu		
2200-2300 vl	Italy, IRRS Milano	7125eu			
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
2200-2300 vl	Malaysia, RTM Kota Kinaba	5980do			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, R NZ Intl	15115pa			
2200-2300	Nigeria, Radio	3326do	4770do	4990do	
2200-2300	Nigeria, Voice of	7255af			
2200-2250	North Korea, R Pyongyang	9325eu	13185eu		
2200-2300 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2200-2300 vl	Papua New Guinea, NBC	9675do			
2200-2300	Russia, Radio Moscow Intl	7180eu	9550eu	9620na	9665na
		9750na	11710as	11750na	11790na
		11805na	11960as	12050na	12065as
		15290na	15410na	15425na	17570as
		17605na	17690na		
2200-2215 vl	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, AWR Europe	11610as			
2200-2235 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2230	South Korea, R Korea Intl	9640as			
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	17750eu	21720eu		
2200-2250	Turkey, Voice of	7185me	9445na	11710eu	
2200-2300	UAE, Radio Abu Dhabi	9770na	11885na	13605na	
2200-2300	United Kingdom,BBC London	3915as	3955eu	5975na	6195eu
		7180as	7325eu	9410eu	9570as
		9590na	9915am	11695as	11750sa
		11955as	12095af	15070eu	15260sa
		15400af	15575eu		
2200-2300	USA, KCBI Dallas TX	15725am			
2200-2230 s	USA, KGEI San Fran CA	15280sa			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, KWHR Naalehu HI	17645as			
2200-2300	USA, Monitor Radio Intl	13625as	13770na	15405as	17555sa
2200-2300	USA, VOA Washington DC	6035as	7215as	9770as	11760as
		15185au	15290as	15305as	17735au
		17820as			
2200-2300	USA, WEWN Birmingham AL	13615na			
2200-2300	USA, WHRI Noblesville IN	9485am	13760am		
2200-2300	USA, WINB Red Lion PA	15715eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 vl	USA, WWCR Nashville TN	12160am	13845am	15685am	
2200-2245	USA, WYFR Okeechobee FL	17612af	21525af		
2230-2243	Armenia, Radio Yerevan	11790eu	11920eu	11945eu	
2230-2300	Finland, YLE/Radio	11755na	13750as		
2230-2300	Sweden, Radio	6065eu			
2240-2250 smtwhf	Greece, Voice of	7420eu			
2245-2300	Bulgaria, Radio	9700na	11720na		
2245-2300	Ghana, GBC Radio 1	4915do			
2245-2300	Ghana, GBC Radio 2	3366do			
2245-2300	India, All India Radio	9705as	9950as	11745as	15110as
		15145as	17800as		
2245-2300 mtwtf	USA, Voice of the OAS	9670am	11835am	15160am	
2245-2300	Vatican State, Vatican R	9600as	11830au		

FREQUENCIES

2300-0000	Australia, Radio	9580pa	9660do	11695as	13755as
		15365pa	17795pa	17860pa	
2300-0000 vl	Australia, VL8A Alice Spg	4835do			
2300-0000 vl	Australia, VL8K Katherine	5025do			
2300-0000 vl	Australia, VL8T Tent Crk	4910do			
2300-2345	Bulgaria, Radio	9700na	11720na		
2300-0000 vl	Canada, CBC N Quebec Sce	9625do			
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000	Canada, RCI Montreal	5960na	9755na	13670na	
2300-0000 as	Canada, RCI Montreal	11940am	15235am		
2300-0000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2300-0000	Ecuador, HCJB Quito	21455am			
2300-0000	Guam, KSDA AWR Agat	15610as			
2300-0000	India, All India Radio	9705as	9950as	11745as	15145as
		17800as			
2300-0000 vl	Italy, IRRS Milano	7125eu			
2300-0000	Japan, NHK/Radio	5965eu	6155eu	6185as	9610as
		9625as			
2300-2330 as	Lithuania, Radio Vilnius	9400eu	11770eu		
2300-0000 vl	Malaysia, RTM Kota Kinaba	5980do			
2300-0000 smtwha	Malaysia, RTM Radio 4	7295do			
2300-0000	New Zealand, R NZ Intl	15115pa			
2300-2350	North Korea, R Pyongyang	11700na	13650na		
2300-2330 s	Norway, Radio Norway Intl	9655sa	11860na		
2300-0000 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2300-0000 vl	Papua New Guinea, NBC	9675do			
2300-0000	Russia, Radio Moscow Intl	9620na	9685na	9750na	11665as
		11750as	11805na	12050na	15290as
		15410as	15425na	17570as	17610as
		17690na	17890as	21480na	
2300-0000	Thailand, Radio	9655as	11905as		
2300-0000	UAE, Radio Abu Dhabi	9770na	11885na	13605na	
2300-0000	United Kingdom,BBC London	5975na	6175na	6195na	9570as
		9590na	9915am	11945as	11955as
		15260sa	15370as		
2300-0000	USA, KCBI Dallas TX	13740am			
2300-0000	USA, KTBN Salt Lk City UT	15590na			
2300-0000	USA, KWHR Naalehu HI	17645as			
2300-0000	USA, Monitor Radio Intl	13625as	13770na	15405as	17555sa
2300-0000	USA, VOA Washington DC	7215as	9770as	11760as	15185as
		15290as	15305as	17735as	17820as
2300-0000	USA, WEWN Birmingham AL	9985eu	11820sa	13615na	
2300-0000 vl	USA, WHRI Noblesville IN	7315am			
2300-0000	USA, WINB Red Lion PA	15715eu			
2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000	USA, WRNO New Orleans LA	7355am			
2300-0000 vl	USA, WWCR Nashville TN	5810am	13845am	15685am	
2300-2315	Vatican State, Vatican R	9600as	11830au		
2330-0000	Belgium, R Vlaanderen Int	11740na	13655sa		
2330-0000	Netherlands, Radio	6020na	6165na		
2330-0000 m	Sri Lanka, SLBC Colombo	15425na			
2330-0000	Sweden, Radio	11910as			
2330-0000	USA, R Bosnia H via WHRI	7315am			
2330-0000	Vietnam, Voice of	9840as	12020as	15010as	
2335-2345 smtwhf	Greece, Voice of	9425sa	11595sa	11645sa	

SELECTED PROGRAMS

Sundays
2300 Radio Australia: Network Asia (Part 2). The second half of this program of news, interviews, current affairs, and developments in the Asian/Pacific region.
2300 WEWN: Life in the Holy Spirit.
2300 WINB: Music.
2310 Radio Australia: Sports Report. Results and reports from the Asia/Pacific region, and international events.
2328 WEWN: Christ in My Life.
2330 WINB: The Bible Time Program.

Mondays
2300 Radio Australia: Network Asia (Part 2). See S 2300.
2300 WEWN: Truths of Salvation.
2300 WINB: Herald of Truth.
2310 Radio Australia: Sports Report. See S 2310.
2315 WINB: Making a Difference.
2328 WEWN: Old Testament Prophets.
2337 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (5th). See S 0037.
2345 WINB: Preacher Brown.

Tuesdays
2300 Radio Australia: Network Asia (Part 2). See S 2300.
2300 WEWN: Through the Ministry of Angels.
2300 WINB: Herald of Truth.
2310 Radio Australia: Sports Report. See S 2310.
2315 WINB: Making a Difference.
2328 WEWN: Profiles in Greatness.
2345 WINB: Preacher Brown.

Wednesdays
2300 Radio Australia: Network Asia (Part 2). See S 2300.
2300 WEWN: God Bless.
2300 WINB: Herald of Truth.
2310 Radio Australia: Sports Report. See S 2310.
2315 WINB: Making a Difference.
2328 WEWN: Mercy Our Mission.
2330 WINB: Music.
2345 WINB: Preacher Brown.

Thursdays
2300 Radio Australia: Network Asia (Part 2). See S 2300.
2300 WEWN: The Apostles' Creed.
2300 WINB: Herald of Truth.
2310 Radio Australia: Sports Report. See S 2310.
2315 WINB: Making a Difference.
2328 WEWN: Basic Steps in the Christian Journey.
2330 The Voice of Salvation
2345 WINB: Preacher Brown.

Fridays
2300 Radio Australia: Network Asia (Part 2). See S 2300.
2300 WEWN: Seed of Abraham.
2300 WINB: Herald of Truth.
2310 Radio Australia: Asia Focus. Reporting on the commercial interrelationships of the Asia/Pacific Region.
2315 WINB: Making a Difference.
2328 WEWN: Windows of Heaven.
2330 Radio Australia: Blacktracker. Traditional and contemporary aboriginal music.
2345 WINB: Preacher Brown.

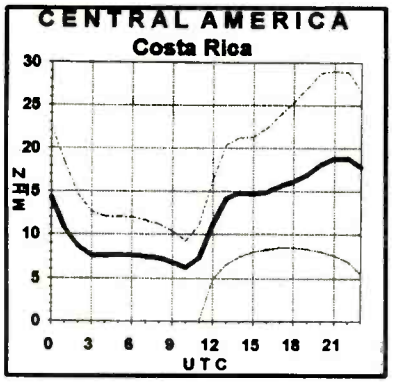
Saturdays
2300 WEWN: Catholic Beliefs and Practices.
2300 WINB: Music.
2310 Radio Australia: Asia Focus. See F 2310.
2330 Radio Australia: At Your Request. Dick Paterson plays requests and dedications.
2330 WEWN: Fr. Ray Shares His Love.
2337 Radio Netherlands Int'l: Newsline Special. Immigrant Families/Dutch Families (3rd). See S 0037.

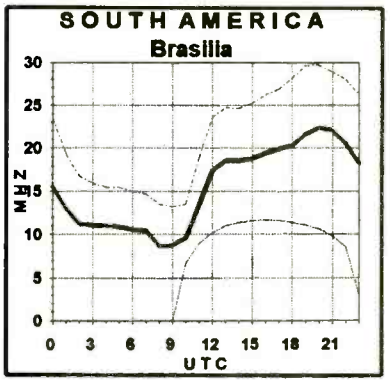
RADIO SINGAPORE INTERNATIONAL

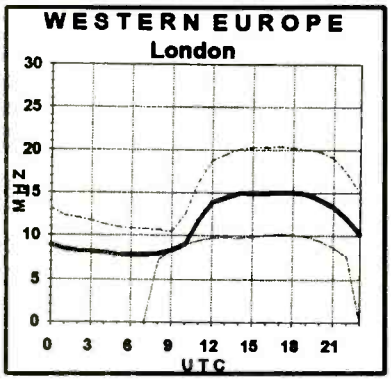
RSI in English at 1100-1400 on 9530 kHz includes:
News on the half-hour, headlines on the hour.
Business & Market Report, Mon.-Fri. 1120 & 1220
Current Affairs: Newsline——analysis, Mon., Wed., Fri. 1145 & 1340
Business World, Tue. & Thu. 1145, 1340, Sat. 1150
Regional Press Review, Sat. 1140, 1340
Commentary, Sun. 1140, 1340. Lifestyle
Frontiers, Mon. 1105, Wed. 1240, Sun. 1145
Catching On—trends, Tue. 1240, Sat. 1350
Bookmark, Mon. 1240, Fri. 1105
Singapore Snapshots, Thu. 1240, Sun. 1345
Potluck—culinary corner, Fri. 1240, Sat. 1105
Arts Arena, Tue., Thu. 1105, Sat., Sun. 1240—two weekly editions
Star Trax, entertainment, Wed., Sat. 1105
ASEAN Notes, Sat. 1225, Sun. 1120
Kiasu Capers—lighter side of life in Singapore, Tue. 1245, Sat. 1120, Sun. 1225.
Music: all at 1303
Singa-Pop, Mon. & Thu.
Hot Trax, Wed. & Fri.
Chartbeat, Sat.
You Asked For It, Sun.
The Vintage Years, Tue.
Radio One, 6155 includes:
Nightflight, Mon-Sat. 1100-1400, Sun. 1030-1800 except for
World of Jazz at 1200-1300
The Quiet Storm, Mon.-Sat. 1400-1800
Business & Market Report at 1030, 1130
Sports Hour, Mon. 1200
Toto Results, Mon. & Thu. 1000
(via Doug Dine, AZ, via Diane Mauer, WI)

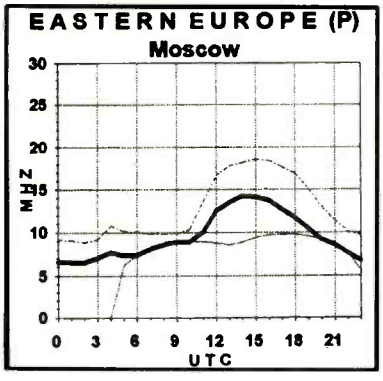
Propagation conditions: Eastern United States

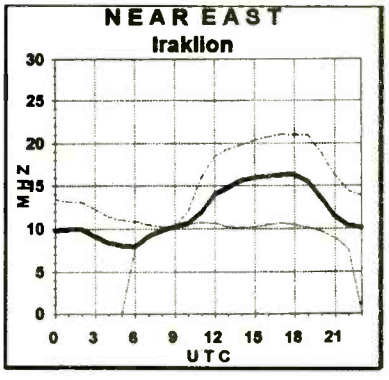
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the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

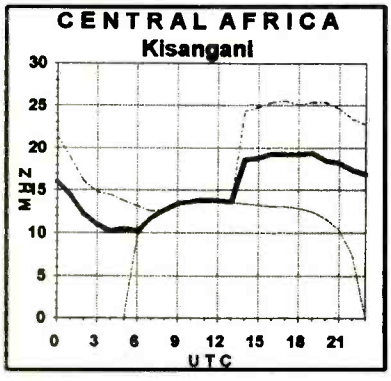


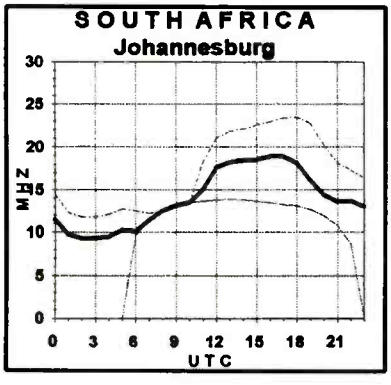


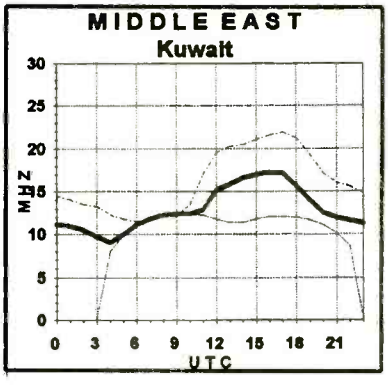


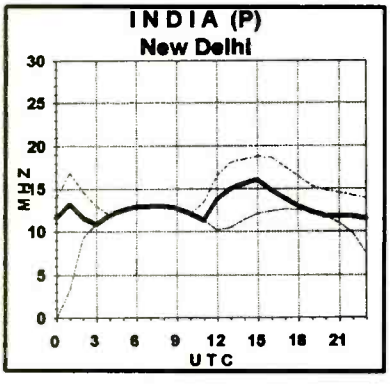


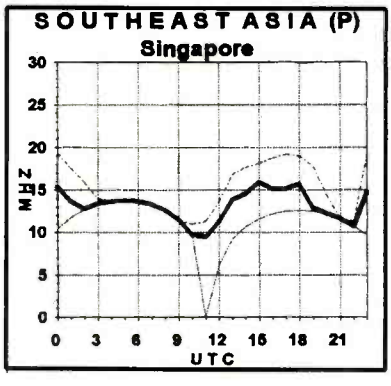


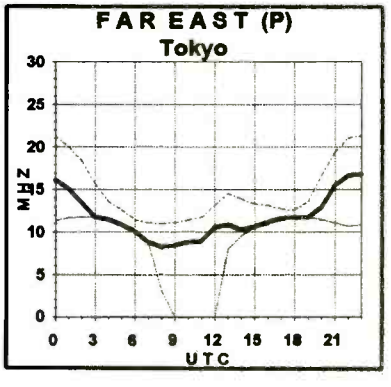


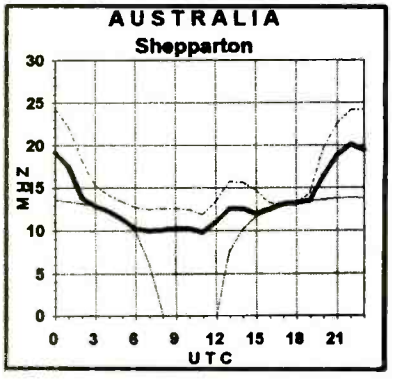






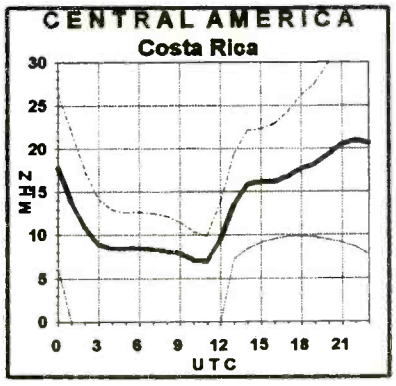


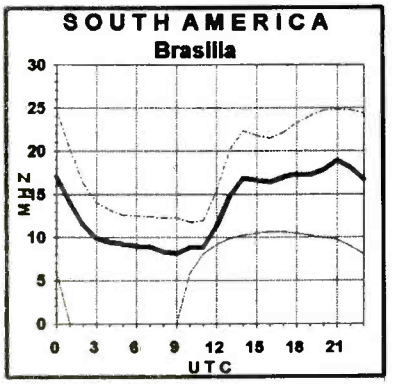


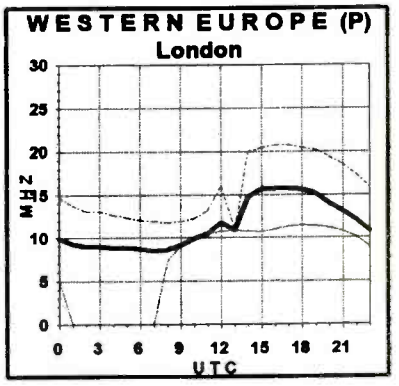


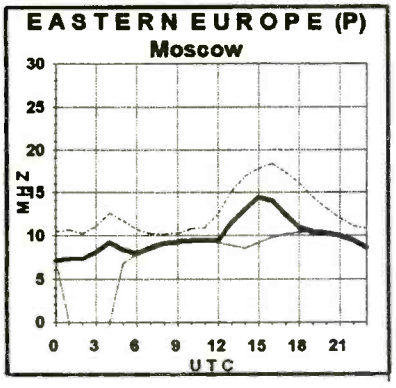
Propagation Conditions: Western United States

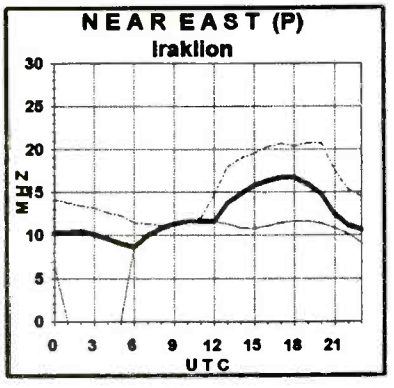
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.

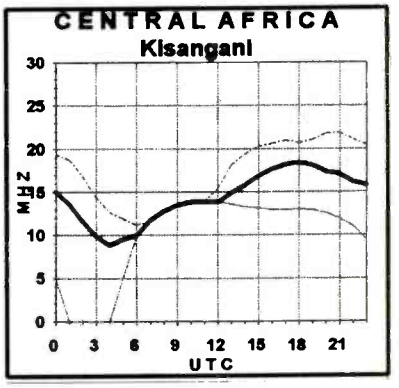


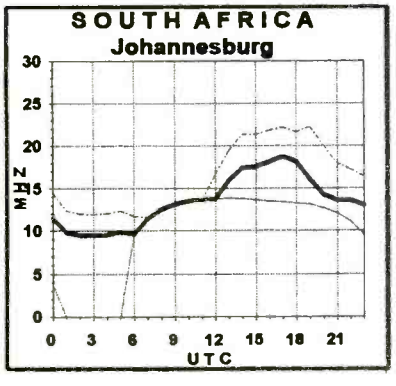


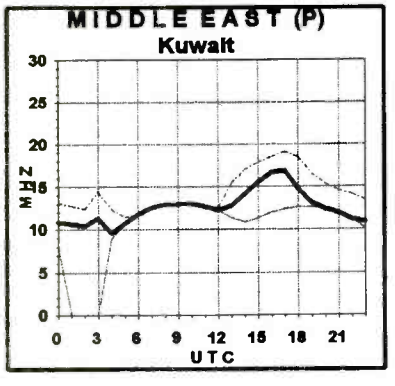


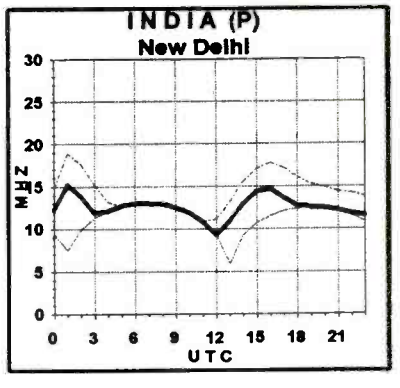


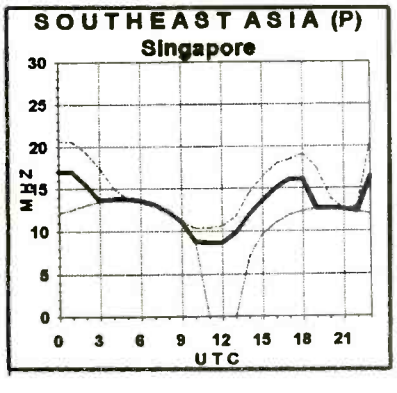


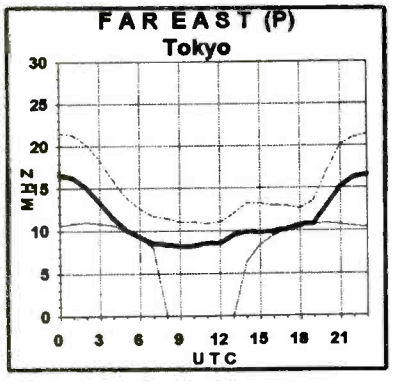


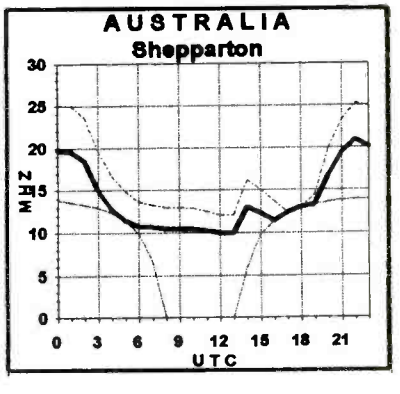












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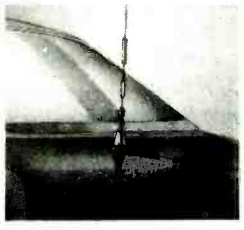

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Keeping up with Science and Technology

By Jim Frimmel

What's the most popular type of program on shortwave? DX/Media programs like Media Network?

I once posed these questions to Jonathan Marks of Radio Netherlands. Much to my surprise, he replied that, aside from news broadcasts, it was the programs dealing with science and technology that were the most popular to be found on shortwave radio. *Media Network* and similar programs generally ranked number two in the ratings.

I found this pronouncement to be somewhat stunning. After all, nobody passed around lists of science and technology programs, or published them in club bulletins, or devoted regular columns to them in magazines like *Monitoring Times*. And, nobody argued over the current broadcast schedule of one of these programs as has been known to happen over the most current schedule of Glenn Hauser's *World of Radio*.

So What's Out There?

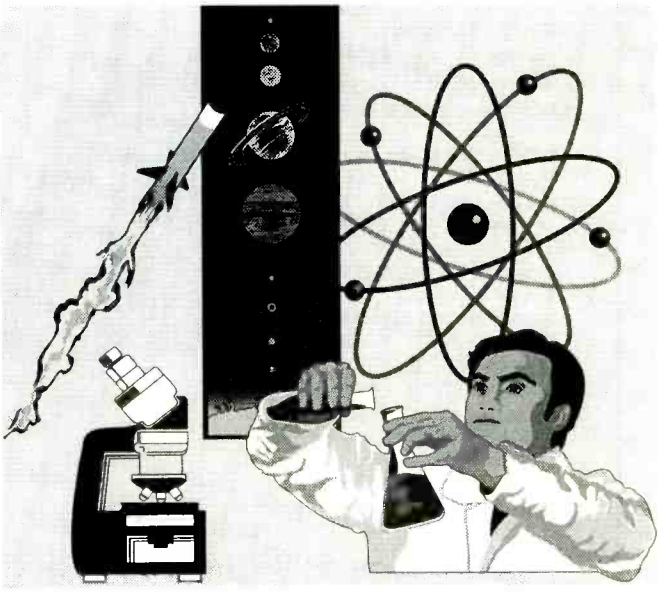
Science and technology programs can be loosely subdivided into:

- General Advancements
- Communications
- Ecology
- Health and Medicine
- Outer Space
- Religion

An unpredictable degree of crossover between categories will occur in some programs due to the broad scope of a program's coverage. Programs dealing with ecology, for example, often have an impact on health matters. This categorization simply provides a way for you to focus on an area of interest. (UTC Days: M=Mondays, T=Tuesdays, W=Wednesdays, H=Thursdays, F=Fridays, A=Saturdays)

General Advancements

BBC: *New Ideas (M1615, T0730, W1215)*
BBC: *Science in Action (F1615, F2030, S1001)*
Channel Africa (South Africa): *Science and Technology (S2301)*
Deutsche Welle (Germany): *Science and Technology (TWFS)*
FEBC (Philippines): *Great Scientists (T1315, F1005)*
HCJB (Ecuador): *El Mundo Futuro (TW)*
HCJB (Ecuador): *On Line (T0630, T2130, F0700, F2130, A0400)*
HCJB (Ecuador): *Towards Tomorrow (T1305)*
Radio Australia: *Innovations (M1130, M1530, M1930)*
Radio Australia: *Ockham's Razor (A1010, A1210, A1410)*
Radio Australia: *Science File (W1130, W1530, W1930)*
Radio Bulgaria: *Science, Technology, Ecology (M)*
Radio Canada Int'l: *Innovation Canada (SMA)*
Radio Canada Int'l: *Quirks and Quarks (M0200)*
Radio for Peace Int'l (Costa Rica): *From the Atom to the Universe (H2230, F0630, F1430)*
Radio France Int'l: *Science Notes (T1240, T1440, H1640)*
Radio Havana Cuba: *Breakthrough (SM)*
Radio Moscow Int'l: *Kaleidoscope (S0432, S1132, S1732, M2132, A1732, A2332)*
Radio Moscow Int'l: *Science and Engineering (S0511, S1311, S1911, M0311, M0611, M1011, M1611, M1811, T0311, T1611, W0211, H0211, H0911, H2011, F0611, F2139, A2139)*
Radio Netherlands Int'l: *Research File (M0752, M0952, M1152, M1352, M1552, M1752, M1952, T0052, T0252, T0352, H0852, H1052, H1252, H1452, H1852, H2352, F0152)*
Radio Singapore Int'l: *Frontiers (S1145, M1105, T1215, T1315, W1240)*
Radio Yugoslavia: *Science Report (F)*
Spanish National Radio: *Science Desk (H)*
Voice of America: *Agriculture Today (S0010, A1110, A1810)*
Voice of America: *New Horizons (S1110, S1510, S2110, M0110)*
Voice of America: *Science in the News (M2245, T1145, T1345, T1645, T1845, T2245)*
Voice of America: *Science Report (T2240, W0040, W1110, W1340, W1640, W1840, W2240, H0040, H1110, H1340, H1640, H1840)*
Voice of America: *Magazine show (M-F1030, M-F1230, M-F1530, M-F1930)*
WWCR (USA): *Extraordinary Science Radio Hour (A0300)*



Communications

BBC: *Waveguide (H0130, A0715, A1030)*
Deutsche Welle (Germany): *Headcrash (W2033, F0333) (Monthly)*
FEBC (Philippines): *Computer Corner (M-F0940, M-F1340)*
HCJB (Ecuador): *Ham Radio Today (W0800, W1030, W1730, W1930, H0100, H0330, H0530)*
Radio Japan: *Media Roundup (S0525, S0720, S1120, S1425, S1725, S2125, M0125)*
Radio Netherlands Int'l: *Media Network (H0152, H0752, H0952, H1152, H1352, H1552, H1752, H1952, F0052, F0252, F0352)*
Voice of America: *Communications World (S0110, A1010, A1610, SA2110)*
WWCR (USA): *Spectrum (S0200)*

Ecology

BBC: *Global Concerns (F0145, F915, F1445)*
Deutsche Welle (Germany): *Green Magazine (W2033)*
Deutsche Welle (Germany): *Man and Environment (T0934, T1634, T2133, A0431, A0634)*

Radio Australia: *One World (A0530, A0730)*
Radio Canada Int'l: *Earth Watch (S0130, A2104, A2234)*
Radio Finland: *Environmental News (W1145, W1245, W1345)*
Radio for Peace Int'l (Costa Rica): *Alternative Radio (M2000, T0400, T1200, H1900, F0300, F1100)*
Radio for Peace Int'l (Costa Rica): *Food for the Thoughtful (H2000, F0400, F1200)*
Radio France Int'l: *Planet Earth (M1246, M1446, M1646) (Biweekly)*
Radio Prague (Czech Republic): *Ecology and Health (W)*
Radio Sweden: *Green Scan (HF)*
Radio Vlaanderen Int'l (Belgium): *Green Society (H1319)*
Radio Yugoslavia: *Ecology Report (F)*
Spanish National Radio: *Planet Earth (H)*
Voice of America: *Environment Report (H2240, F1110, F1340, F1640, F1840)*
Voice of Israel: *Eco Alert (W1318, W2154)*
Voice of Nigeria: *Man and His Environment (S1500, H1900)*
Health and Medicine
BBC: *Health Matters (M0815, M1945, T0145)*
BBC: *Megamix (T1130, T1615, T2215)*
Radio Prague (Czech Republic): *Ecology and Health (H)*
Voice of Nigeria: *Health Corner (M1500, F1900)*

Outer Space

BBC: *Seeing Stars (S0430, S0915, S2215)*
Voice of America: *Space and Man (W0045, W1115, W1345, W1645, W1845)*
Religion
FEBC (Philippines): *Living with Science (W1005)*
HCJB (Ecuador): *Answers (W0415)*
HCJB (Ecuador): *Science, Scripture & Salvation (S0130)*
WYFR (USA): *Science, Scripture & Salvation (T-A 1749 plus)*

And What's Missing?

One would think that the world's greatest exporter of hi-tech consumer goods would be prominent in this listing of science and technology programs. Surprisingly though, Radio Japan does not offer a program devoted exclusively to the subject, although the *Radio Japan Magazine Hour* and *Media Roundup* would include segments in this category. A Japanese-produced program focusing on the newest radios, scanners, computers, and other consumer-electronics goods might certainly have a great deal of listener appeal and should be considered by that broadcaster. (Send mail to Radio Japan/NHK, Tokyo, 150-01 Japan.)

The BBC always has at least one special series in progress which qualifies to be in the science and technology area. Check the centerfold program listings in almost every issue of *Monitoring Times* for these special mini-series. These programs are worth the effort in searching out.

Look for reports on science and technology in Radio Australia's variable program spots at 0410, 1210, and 1410. These times provide fillers for programs from Australia's National Radio.

Tuning In

See the frequency listings in the centerfold pages of this issue for the frequencies used by these broadcasters. Do take the time to tune in some of these programs. Hopefully, you will find such listening to be a rewarding experience that will broaden your outlook and increase your appreciation of the world of shortwave broadcasting.

This information was compiled for daylight time. When using this guide during standard time, don't forget to check an hour earlier than the listed times if you don't find the program you're looking for.

Joe Eisenberg, WA0WRI

State-of-the-Art Studios "WOW" Radio Listeners!

I hope you have had a great E-skip season! It sure was interesting as always! Keep sending in your reports so we can list your DX in this column.

With fall and the MT convention in Atlanta on the way, we are going to look at a state of the art facility and how technology has changed the way stations look.

This month we will pay a visit to WOW AM and FM in Omaha, Nebraska. As you can tell by the "W" call letters west of the Mississippi River, WOW has been around for quite a while. Their new Radio Ranch, however, is only a few months old and is a real eye-popper. Located on the far north side of Omaha and right next to WOW-FM's 1000-foot tower, the Radio Ranch was designed to be the home for Omaha's most popular AM/FM pair. Both WOW-AM and FM are country music stations and run separate programming most of the day. Only the morning show is simulcast Monday through Friday. WOW-AM is a more traditional country format with the FM playing more current country hits.

Hourly news is a part of both the AM and the FM formats, making WOW unique among most FM stations. It is rare to hear a live local newscast on a popular FM station that is primarily a music format. WOW-AM 590 broadcasts in C-Quam AM stereo, and with its 5kW signal, covers a good part of the Nebraska-Iowa market. WOW-FM on 94.1 MHz also has great coverage from their tall tower.

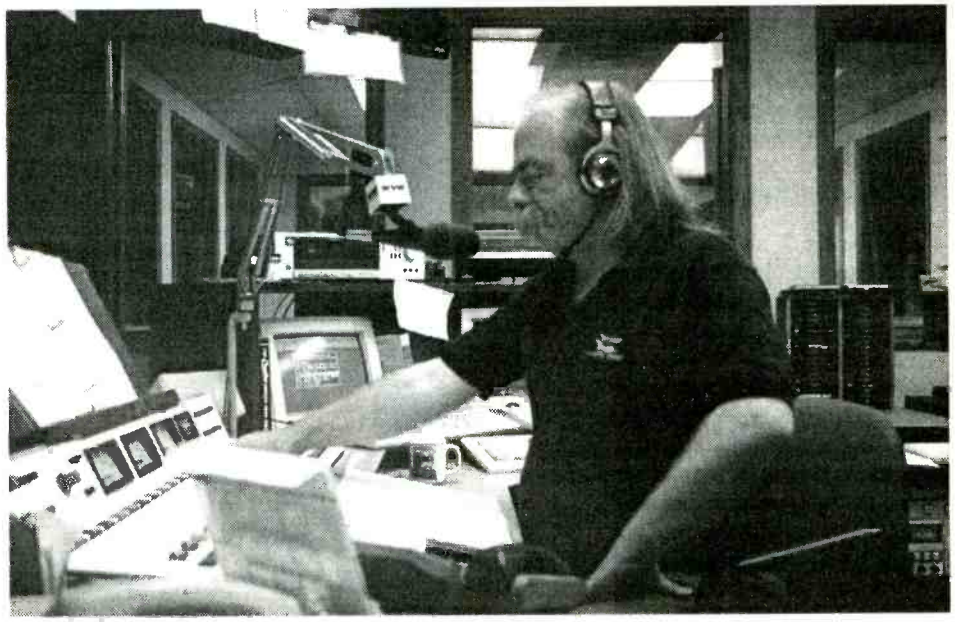
A look inside the Radio Ranch takes you first to the reception area. Behind there is the AM studio. Next to that is the news studio, tucked in between the AM and FM studios. The AM studio also has the responsibility for controlling both the AM and FM transmitters and monitoring their performance. Control of the RPU equipment is also in the AM studio. An impressive panel of monitors, ranging from transmitter data to TV security monitors hangs over the top of the AM console. A state of the art mixer board and computer screens and keyboards for accessing the spots are at the announcer's right. On his left is the telephone used for requests and talk shows.

The FM studio is identical to the AM studio with the exception of the overhead monitor console. The news studio in between them is equipped with scanners, news wire monitors and weather instruments. There is also a working newsroom across the hall from the news studio. WOW has a fleet of vehicles ranging from small vans to news cars to a big motor home for remote broadcasts. If there is a big event happening in the Omaha area, you'll see one of the WOW vehicles there!

A feature that is becoming increasingly popular in radio stations is the computerization of commercials and other announcements. The old faithful tape cartridge machines are being replaced by large PCs with huge hard drives. By storing audio as digital information in files on the computer, fussy tape cartridges are eliminated. No more dirty heads, broken tapes, or cracked plastic cartridges. The audio is placed into digital audio files with CD quality similar to files created with PC sound boards.

By networking a group of computers together, one can back up the other, allowing for failsafe operation. The only need for a cart machine is news and other sounds, like for morning shows. And even many of those are now put into the computer, too!

WOW makes big use of computerized audio. To play commercials, the announcer can either select the files he will need manually, or they can be preprogrammed to play in order by the office staff. There are no tapes to wear out and it always sounds as clear as when it was first recorded.



Joe Nittler sits at WOW's main console as host of the **Cracker Barrel** *talk show.*

WOW programming not only includes music and news, but on Saturday mornings a talk show, *Cracker Barrel*, is heard on WOW-AM. Hosted by Joe Nittler, *Cracker Barrel* airs from 9-11AM every Saturday. *Cracker Barrel* is a folksy sort of talk show dealing with mostly local issues. WOW also sponsors events like a free country concert for its listeners and broadcasts stock car races. A bimonthly newsletter published by the stations keeps their audience informed of upcoming station activities and events. A big 10-gallon "hats off" to the folks at WOW for such a fine operation and to Joe Nittler for allowing a peek at Omaha's Radio Ranch.

Overhead monitors track both the AM and the FM outlets.

Talking Long Distance

A look at our DX listings shows a good sporadic-E season this summer. Stations from mostly the south and east of the Midwest have been heard, and more reports are coming in! For those interested in finding out what the weather is like around the country and upper-air information to predict tropo openings, there is a toll-free BBS to help you. It is called DUATS and serves both the public and the aviation community. By setting your modem for 2400 baud 8N1, and calling 1-800-245-3828, you can have a tremendous amount of weather data at your fingertips. Remember to look for signs of long stationary fronts and stagnant air masses for big tropo openings.

Your computer can help you other ways, too. A recent *QST* magazine featured a program for charting sporadic-E openings that has great application for TV and FM DXers. The program, ES-PROP, allows you to enter frequencies manually so that you can estimate the location of the E cloud and its ability to support higher frequency skip. It also lets you know where it might be open, depending on the frequency you are DXing. You can download this free software from the ARRL BBS by setting your modem for 14,400 or less and 8N1. It is a very short file and downloads fast. The ARRL BBS is available at 1-203-666-0578.

Have you received some good tropo or E-skip? Send in your reports to *MT* at the Brasstown address, so we can include your DX catches in this column. You can also always send them by e-mail to me as well via the Internet or Prodigy. My e-mail address is: jpgc40a@prodigy.com. Prodigy users simply use the Prodigy address. Send news items about broadcasting in your community to the Brasstown address. See you next month!

Skipping In . . .

A lot of DX reports and many surprising summer AM reports round out this month's DX!

Charles Morford of Miami, FL sends in these DX catches:
0205 1500 kHz WTOP Washington, DC, News, baseball-Orioles Vs. Tigers
0245 760 kHz WJR Detroit, MI, Baseball, Tigers Vs. Orioles (same game!)
0255 PJB 800 kHz Bonaire, Netherlands Antilles, Religious programming
0305 ZNS3 Freeport, Bahamas, News-Bahamas Radio Network

Mr. Hunter from PA sent this report:
0900 1170 kHz WWVA Wheeling, WV, "The Road Gang" talk show for truckers

My own DX included these TV and FM catches:
2330 WPGC 95.5 MHz Morningside, MD, Urban music
2335 WNEU 94.5 MHz Eden, NC, Country music
0221 KEYW 98.3 MHz Pasco, WA, slogan "The Key"
0130 KBRZ 2 Baton Rouge, LA, ABC programming, Sesame Street primetime special
0234 WYBB 98.1 MHz Folly Beach/ Charleston, SC, "98 Rock" classic rock, ad for Carolina Dodge
0302 KELO 92.5 MHz Sioux Falls, SD "Kelo-land FM"
0200 WMJY 93.7 MHz Biloxi, MS, full ID and rock music, including Elton John "Someone Saved My Life Tonight"
0206 WRNO 99.5 MHz New Orleans, LA rock music, ad for local bars

John Fulford, WA4VPY

Summer Listening on Low Band

Well ... it's almost *Indian* summer for some folks, but it's still summertime in South Florida, and the low VHF band is definitely open with the signals rolling in. Our local 52.525 MHz remote base, which sits on top of one of the many tall condominiums along the ocean, is fed into a UHF repeater. When the six meter signals start coming out of my 440 MHz walkie, I know the low band is open. One of my projects for the future is to have a remote 30-50 MHz receiver located on a tall condo roof, being remoted back to my house over a data link, so I can do remote frequency changing and logging. This would almost make the ultimate monitoring setup.

If you do any low band monitoring, you will be hearing the 34.81, 34.83, and 34.85 MHz channels of the United States Fish and Wildlife Service in constant operation. This agency has the responsibility of overseeing over 90 million acres of Federal land. An agency of the Department of the Interior, its mission is to conserve, protect, and enhance fish and wildlife and their natural habitats for the continuing benefit of the American people.

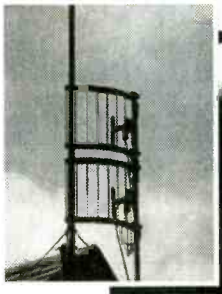
The main operational channel of 34.85 MHz can be used in either the simplex or repeater output mode. In the repeat mode, 34.43 MHz is the input frequency. When the propagation conditions are good, monitors can hear Fish and Wildlife Service stations from thousands of miles away.

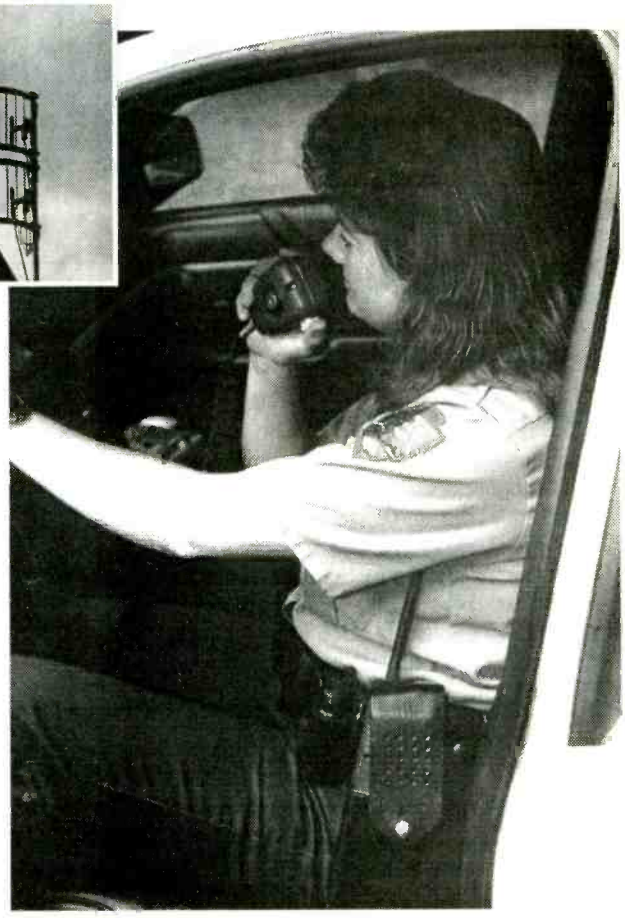
The Division of Law Enforcement of the FWs uses the VHF and UHF bands for its operations. The UHF radios are set up as:

Chan	Freq MHz	Use
01	410.6250	control/ mobile
	408.6750	rptr output
02	408.6750	simplex
03	408.7500	simplex

Undercover agents have been monitored also on 168.250 and 168.400 MHz.

While we are on Federal property, let's continue with the other Federal agency that works hand in hand with the Fish and Wildlife Service—the National Park Service. There are 357 Park Service Units scattered throughout the United States and its possessions. Only two states, Delaware and Virginia, have no NPS Units in them. There are ten geographical zones of operations.





Ranger Julie Parrish demonstrates the park radio system by GE. Two UHF corner reflector antennas (inset) are located on the ranger station at the park entrance. (Photos by Harry Baughn).

Scanning in the Smokies

I first became aware of National Park operations when I visited the Great Smoky Mountains for the first time. The main entrance to the Smoky Mountains is in Gatlinburg, Tennessee. At the ranger station located at the park entrance, there are two UHF corner reflector antennas pointed up the mountain to Clingmans Dome.

At greater than 6000 feet above sea level, the remote base/ repeater on top of the Dome is the tallest point in the Great Smoky Mountains. There is a paved walkway up to the top, and once you are there, the view is majestic. If you decide to walk up, take your scanner, your HT, binoculars, and a camera. The Dome is home to various other two way services.

The UHF link up the mountain is on 415.125 MHz and it comes back down to Gatlinburg on 408.725 MHz. The NPS repeater is on 167.150 MHz for both rptr out and simplex. The input is on 166.350 MHz. By monitoring the 167.15 MHz channel, you will hear all of the activity going on there.

The two way radios have four channels and are set up as:

Chan	Freq MHz	Use
01	167.150	simplex and rptr out
02	167.150	rptr out
	166.350	control/mobile
03	168.200	U.S. Forestry Service Tac-2
04	168.750	Cherokee Natl. Forest liaison

Other UHF links on the mountain are:

Location	Callsign	Freq. MHz
Cowee Boulder MHz	KID794	408.7250
Shuck Stock	KID795	408.6250
Look Rock	KIE727	408.4750
Clingmans Dome	KID726	415.1250
Mount Sterling	KIE728	408.5250
Cove Mountain	KIE729	408.7750

All these agencies work with the United States Department of Agriculture. We will review the Dept. of Agriculture at a different time, due to the complexity of their radio system.

Our national forests and parks, such as the Great Smoky and Cherokee, are crawling

with poachers and marijuana growers. The millions of acres under their control are outfitted with at least eight different types of surveillance systems, ranging from telephone taps and pen registers to television. Sensors are placed throughout the park systems to keep tab on human and wildlife populations.

Satellite surveillance is also used. Marijuana plants produce a different type of heat signature to the satellite cameras. By observing this, the growing marijuana fields can be located. This information is then given to the appropriate ground units. This is how the DEA keeps tabs on the fields in South America.

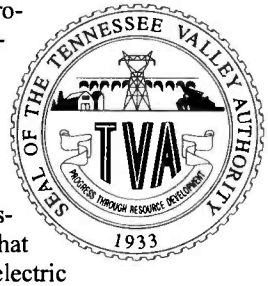
It would not be unreasonable to suspect that there are satellite uplinks located in the parks and mountains. A check of the 400-406 MHz range, with special attention to the 400-402 range, could produce some new signals. I found one out in the Everglades in the 401 MHz band. This was done while looking for another entirely different signal. A spectrum analyzer, good antenna, and a lot of patience could produce evidence of signals you might never have noticed. Again, a good high point, such as a mountain top like Clingman's Dome, is the best monitoring location.

The National Park Service has a set of nationwide operational and tracking frequencies. They are:

Chan	Use	Freq MHz
01	Archeology/ Surveys	40.070
02	Same	40.210
01	Georgia Tech Proj.simplex	417.400
02	Same, rptr out	417.400
	Same, rptr in	412.100
03	Same, simplex	417.525
04	Same, rptr out	417.525
	Same, rptr in	411.900
L1	Wildlife track	30.050
L2	Same	30.060
L3	Same	30.070
L4	Same	30.170
L5	Same	30.180
L6	Same	30.190
L7	Same	30.200
L8	Same	30.210
L9	Same	30.220
L10	Same	30.230
L11	Same	30.240
L12	Same	30.250
H1	Same	164.4375
H2	Same	164.4625
H3	Same	164.4875
H4	Same	164.5125
H5	Same	164.5375
H6	Same	164.5625
H7	Same	164.5875
H8	Same	164.6125
H9	Same	164.6375
H10	Same	164.6625
H11	Same	164.6875
H12	Same	164.7125

Air operations		117.975
Air operations		121.9375
Itinerant		
	KA2XJP	163.100
		418.575
Special operations		
Simplex		408.575
Rptr out		408.575
Rptr In		410.625

While you are up in the Western North Carolina/Eastern Tennessee area, be sure to listen to the Tennessee Valley Authority, which controls the watershed area with a massive set of dams that also provide hydroelectric power.



TVA on low band:

38.97 38.98 38.99 40.01 40.03 40.05 40.07 40.61 40.62 40.73 40.74 40.75 40.85 MHz.

The frequency of 38.98 is most interesting, being the TVA police/security frequency. We will look at the TVA radio system at a later date.

No matter where you are, be sure to listen to the exclusive federal low band allocations, such as 40-42 MHz, 36-37, etc., for wide band tactical military operations. Some recently monitored frequencies are:

Frequency	Use
30.00	Army—Drug task Force—Tac 1
30.30	Same—Tac 0
31.30	Same—Tac 4
31.85	Army—Drug Judicial Police
32.95	Army—Drug Task Force—Panama
33.25	Army—Drug Task Force
33.875	Army—Drug Task Force—Mexican Border
39.88	Army—Drug Task Force
40.25	Same
41.00	DEA operations

That's it for this month. 73's, John WA4VPY

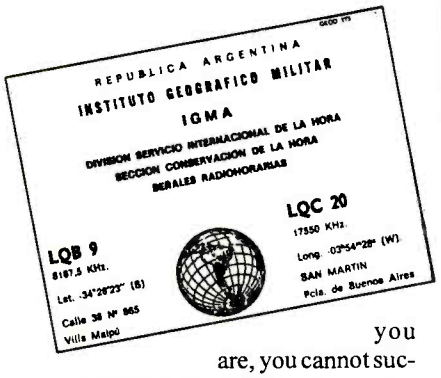
James Hay

Marking Time

Successful Navigating Requires Temporal Accuracy

Just how do ships find their way across the ocean? Navigational methods and aids have evolved dramatically since the days of the Polynesian navigators and Christopher Columbus, centuries later. It has often been said that Columbus finding America was an amazing feat. Seamen of that time used a form of celestial navigation and instruments which pale beside the modern chronometer and sextant. What was truly amazing about Columbus was not only that he found America, but that he managed to find it the second time and returned to Europe to tell of it.

One of the things which has been important to navigation since Columbus' days is time—accurate time. No matter how good



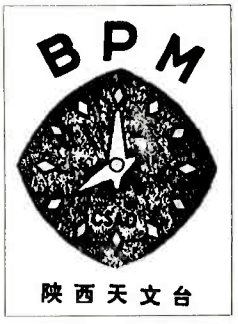
you are, you cannot successfully navigate by the stars using either an astrolabe or the modern sextant without an accurate time source. Fortunately, radio has made the setting of ships clocks and chronometers easy, and the International Radio Regulations still require that the clock in the radio room be checked daily for its accuracy.

Stations which broadcast time signals have a distinctive sound, and are usually easy to spot. The station may identify itself in either voice or Morse code and its voice announcements may be either in English or in the language of the country. Time signal stations make an interesting catch.

TABLE 1: *Active Time Signal Stations*

Freq kHz	Call Letters	Location	Mode
50	OMA	Prague	CW
	RTZ	Irkutsk	CW
60	MSF	Rugby	CW
	WWVB	Fort Collins	CW
75	HBG	Nyon	CW
77.5	DCF 77	Mainflingen	CW
2500	BPM	Xi'an	CW
	HLA	Taejon	AM/SSB
	JJY	Tokyo	AM/SSB
	RCH	Tashkent	CW
	VHG	Sydney	SSB
	WWV	Fort Collins	AM/SSB
	WWVH	Kihai	AM/SSB
3330	CHU	Ottawa	AM/SSB
3810	HD2 IOA	Guayaquil	AM/SSB
4286	VWC	Calcutta	CW
4996	RWM	Moscow	CW
5000	ATA	Delhi	SSB
	BPM	Xi'an	AM/SSB
	HD2 IOA	Guayaquil	AM/SSB
	HLA	Taejon	AM/SSB
	IAM	Rome	SSB
	JJY	Tokyo	AM/SSB
	LOL 1	Buenos Aires	AM/SSB
	RCH	Tashkent	CW
	VHG	Sydney	SSB
	WWV	Fort Collins	AM/SSB
	WWVH	Kihai	AM/SSB
	YVTO	Caracas	CW/SSB
6475.5	DAM	Norddeich	CW
7335	CHU	Ottawa	AM/SSB
7600	HD2 IOA	Guayaquil	AM/SSB
8000	JJY	Tokyo	AM/SSB
8167.5	LQB 9	Buenos Aires	CW
8473	4PB	Colombo	CW
8502	XSG	Shanghai	CW
8638.5	DAM	Norddeich	CW
9996	RWM	Moscow	CW
10000	ATA	Delhi	SSB
	BPM	Xi'an	CW/SSB
	JJY	Tokyo	AM/SSB
	LOL 2	Buenos Aires	CW/SSB
	RCH	Tashkent	CW
	RTA	Novosibirsk	CW
	WWV	Fort Collins	AM/SSB
	WWVH	Kihai	AM/SSB
10004	RID	Irkutsk	CW
12984	VNG	Sydney	CW
14670	CHU	Ottawa	AM/SSB
14996	RWM	Moscow	CW
15000	ATA	Delhi	SSB
	BPM	Xi'an	CW/SSB
	BSF	Tai-pei	CW/SSB
	JJY	Tokyo	AM/SSB
	LOL 3	Buenos Aires	CW/SSB
	RTA	Novosibirsk	CW
	WWV	Fort Collins	AM/SSB
	WWVH	Kihai	AM/SSB
15004	RID	Irkutsk	CW
16000	VNG	Sydney	SSB
20000	WWV	Fort Collins	AM/SSB
	WWVH	Kihai	AM/SSB

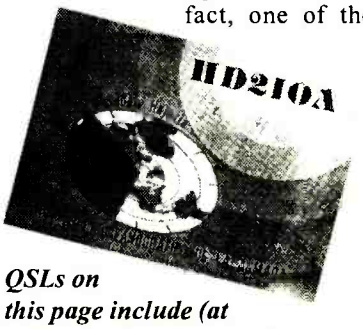
Table 1 is a list of some of the stations which are active.



Most of these time signal stations are not on 24 hours per day, but time signals will usually be found on the hour, or at intervals of usually 4 or 6 hours. Midnight, 0600, noon and 1800 local or universal time are common. Don't be deterred by the strong presence of WWVH and WWV on 2.5, 5, 10, and 15 MHz. I have logged WWVH and WWV simultaneously from Montreal, but I have also heard BPM when neither American station was anywhere to be found in the noise. These are interesting stations to chase, and they can provide a clue to the current propagation conditions.

Enter Loran

Celestial navigation, the sailor's mainstay, is now used as a backup system. The Loran-C system (Long Range Aid to Navigation) was the next navigational system to come into common use, operating on 100 kHz using a pulse modulated system to differentiate between stations. Again, time is an important factor. In fact, one of the



QSLs on this page include (at left) LQB 9 in Buenos Aires, (top) BPM in Xi'an, and (above) HD2 IOA in Guayaquil.

ways that the Bureau International de l'Heure keeps time coordinated among various countries is by using the precisely timed signals emanating from the various master and slave stations in the many Loran chains. In order for Loran to be an accurate navigational system, the timing of its signals must be kept within nanoseconds.

Since all of the Loran signals are on the same frequency, and the method of distinction between the chains is by the timing of each group of repetitive pulses from the master and slave stations, there is little of interest for the hobbyist to monitor. Specific questions on Loran are welcome, however, if you wish to know more.

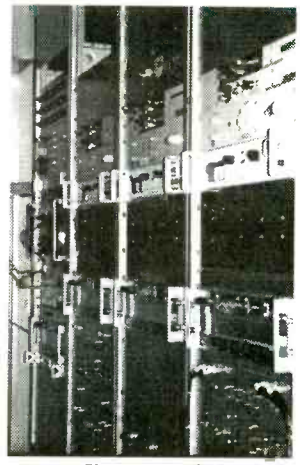


Photo courtesy of Joan Heinen

WWV'S time trasmission facilities in Colorado are linked to cesium clocks with frequency counters, shown at left.

From a bird's eye view

Loran-C is now being supplanted by the Global Positioning System (GPS), which is almost completely implemented, at least in North America. The system has gained considerable interest among navigators, surveyors, and others because of its high degree of accuracy and its virtually continuous coverage compared to the previous NavStar system which provided fixes only every ninety minutes to six hours.

The GPS satellites operate on 1575.42 MHz and 1227.6 MHz. The satellites are identified by code sequences unique to each satellite. What makes the system work is an application of the Doppler effect on radio signals. Remember the changing pitch of the passing locomotive whistle? The same applies to GPS. It is possible to determine where something is, if you know where *you* are and the frequency on which the object is transmitting. Calculations involving the frequency shift as the transmitter passes will tell you where it is, relative to you.

The same is true in reverse. You can determine *your* position using the Doppler shift of signals *from* a known location. This is the principle behind GPS.

Each satellite transmits, as part of its signal, the exact **time** (there's that word again!) of the start of the transmission and the location over the Earth. Using the time the signal takes to arrive at the receiver, and the frequency shift, the receiver can calculate how far it is from the satellite when it was in its advertised position. Using this method, one satellite alone will not provide a position; however, the use of three satellites will offer a position, and four satellites are more accurate yet.

In fact, the impressive part of this system is its accuracy. While as killed celestial navigator could expect an accuracy of between 1/4 to 1/2 miles (4 to 9 km) at the very best, Loran-C offered an accuracy of approximately 528 feet (1/10 mi., or 1.7 km). GPS offers an accuracy of at least 328 ft. (100 meters) on the horizontal plane and 984 ft. (300 m) on the vertical plane! Military users enjoy even greater accuracy.

The actual accuracy civilian users can expect is greater than the above in practice, because the military operators of the system selectively degrade the accuracy of the system; the numbers which I have quoted above are those guaranteed by the military, which take into account this selective and occasional degradation.

The Global Positioning System will shortly become a household word in the maritime world, as it will be part of the Global Maritime Distress and Safety System (GMDSS). GPS will be used in conjunction with Emergency Position Indicating Radio Beacons (EPIRB's) so that the beacons will be able to transmit the vessel's position when the EPIRB is activated. This should increase the chance of a distressed vessel being found quickly, and improve the odds of survival after a marine accident.

INMARSAT's communication equipment is also capable of being interfaced with the GPS to provide the vessel's position when the distress call button is activated. This allows the call to be virtually automated. The Rescue Coordination Center receives the name and position of the vessel, and the details of the distress incident can then be passed by voice.

Things Change; Things Stay the Same

Satellites are taking a greater part in the maritime navigation and communication areas; however, HF and VHF are still common and are likely to stay that way for a while yet. Sure, the nature of the traffic may change, but ship traffic control, harbor communications and the like will continue much as they do now. The cost of satellite communications will also keep some owners on HF. The times they are a'changin', but the old ways are not yet lost.

This column was prepared in response to inquiries from many readers about GPS and Loran-C, and the matter of Time comes up "from time to time" as well. In November we will return to more conventional maritime communications. As always, until next time, keep writing and pass on any interesting loggings which you may have to share with others.

Ken Reitz, KC4GQA

DIGITAL Future for SCOLA

There is one channel which, since its inception in the late 1980s, typifies satellite television's promise for the future. This non-commercial channel transmits programming from around the world both live and taped for the use and benefit of America's colleges and universities. It's called SCOLA—Latin for school—and it is the only one of its kind.

In an electronic universe which features dozens of religious and shopping channels harassing us for our money, SCOLA quietly brings to our homes the only video glimpse most of us are likely to get of distant lands and people. Nestled between two new and powerful satellites, SCOLA occupies channel 23 of ASC-1 (129 degrees west), a GE Astro satellite launched in August of 1985 via the Space Shuttle.

Therein lies the first of SCOLA's problems. ASC-1 has a design lifetime of nine years and is creaking to its weary end in its orbital slot in the Clarke Belt. Eagerly awaiting its new home on the Ku band side of Telstar 401 (97 degrees west)—itself a new generation satellite with transponders twice the power of ASC-1—SCOLA will have to wait until December at the earliest to make the move. They're just hoping the satellite will hold out until then. According to Dan Pike of SCOLA, in the event of ASC-1's demise, a temporary channel would be secured until they could move permanently to T401.

Even so, moving plans include switching from an analog transmitting mode, which is easily received on all satellite TV receivers, to the new DigiCypher I system from General Instrument. This system is totally digital and viewers will be required to have the GI DSR 2200 receiver to watch SCOLA programming.

Effect On World Radio Network

What makes SCOLA doubly worthwhile is that it retransmits the audio programming of the World Radio Network (WRN) on one of its ASC-1 audio subcarriers. According to Sybil Ramey of SCOLA, WRN originates in London and is sent to SCOLA headquarters and uplink facilities in McClelland, Iowa, via a SprintNet fiber optic line.

When SCOLA makes the move in December, WRN will move as well and will be receivable only on the DSR 2200. That could leave thousands of listeners out in the cold unless SCOLA takes steps to help. SCOLA's Dan Pike indicates that there could be other possibilities. While nothing has been finalized, SCOLA may ask for analog audio subcarrier space on PBS' C band analog feed (T401, channel 8) or possibly a third party not connected to SCOLA nor even perhaps on the same satellite.

Industry sources indicate that consumer versions of DSR 2200 receiver could be available by this time next year. At that time there may be quite a few satellite broadcasters using DigiCypher transmitting technology.

TVRO NEWS AND NOTES

Battling The Tyrants

Americans have enjoyed freedom of speech for so long that we sometimes find it inconceivable that those in other countries may not enjoy similar freedoms. Granted, the price of such freedom is constant vigilance against its usurpation, not necessarily by foreign invaders but more likely by our own well meaning or not-so-well meaning governments. Still, the free flow of information is so feared by tyrants of every political persuasion that steps are taken to prevent it.

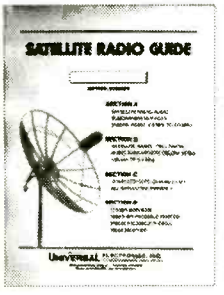
Among the fearful are China, Iran, and Saudi Arabia, each in its turn ruling that citizens may not enjoy the benefit of late twentieth century technology. In this country it's the local governments which are most likely to exhibit such tyrannical leanings. Ordinances, laws and rules are passed—usually at the urging of monopolistic cable companies—to restrict the rights of Americans to receive satellite TV signals. Happily, the FCC and a growing number of court cases are weighing-in on the side of individual rights rather than big business.

If you are experiencing a problem with your local government regarding your rights to view satellite TV, help could be a phone call away. American Satellite TV Alliance (ASTA) is a non-profit organization dedicated to protecting your viewing rights. They've had quite a bit of experience over the years and enjoyed a good deal of success in battling the "powers that be." For more information write ASTA at: 16 Broadway, Valhalla, NY 10595 or call 919-997-8192.

Satellite Radio Guide New Edition

Tom Harrington, of Universal Electronics and publisher of *Satellite Radio Guide*, announced that the latest edition of the *Guide* is now available. The 34 page 8-1/2 x 11 inch publication is a comprehensive list of satellite delivered audio services including analog subcarrier, FM Squared, FM Cubed, Single Channel Per Carrier (SCPC), Weather Facsimile and NOAA weather satellite imagery.

Published quarterly, the *Satellite Radio Guide* is mailed via first class for $25 per year. For more information write: Universal Electronics, Inc., 4555 Groves Road, Suite 12, Columbus, OH 43232. Phone: 614-866-4605 or FAX: 614-866-1201.



NOAA's GOES 8 Up and Running

According to news service reports, NOAA's latest weather satellite, GOES 8, becomes fully operational this month after extensive testing following its successful launch in April of this year.

In addition, NOAA is poised to begin operation of the Defense Department's polar orbiting weather satellites in a move designed to save taxpayers millions. It is said that it will take *ten years* for the transfer of operation to be complete.

AMSAT Beginner's Book In New Edition

The Radio Amateur Satellite Corporation (AMSAT) has announced the publication of a new (fourth) edition of Keith Baker, KB1SF's *How To Use The Amateur Radio Satellites*. This excellent introduction to amateur radio satellites is better than ever. The book features in-depth operational information on every amateur radio satellite in orbit today including modes; uplink and downlink frequencies; what it takes to "work" these satellites; how non-amateur SWLers can monitor all the action; details on Phase 3-D, the ultimate ham bird; other new satellites on the horizon; a thorough glossary of satellite related terms; a bibliography of references for further reading; and finally, more than a dozen computer bulletin board systems with lots of conferences and on-line satellite action.

The best part is that the book is only $5 and available from AMSAT, 850 Sligo Avenue, Washington, DC. Phone 301-589-6062.

Are you an SWLer without a computer? Forget the BBSs and tune into the weekly AMSAT nets on HF. Keith Baker says, "...Regional nets are now being conducted on Tuesday evenings at 2100 Local time (US East Coast and Midwest) and at 2000 Local time (US West Coast) on 3.840 MHz. International nets are conducted on 14.282 and 21.280 MHz (conditions permitting) at 1900 UTC, and on 18.155 MHz at 2300 UTC on Sundays." These nets are very well run and highly informative. Net control stations have good enough signals to be heard with even modest SW radios.

DBS Update

The DirecTV vs. USSB race for DBS supremacy is on! RCA, manufacturer of the IRDs for both systems, along with USSB and DirecTV, have launched the services in five American cities for evaluation. The chosen few are: Jackson, MS; Shreveport, LA; Little Rock, AR; Albuquerque, NM and Tulsa, OK.

Is there any public attention being given to this Earth shaking event? Longtime TVRO enthusiast and *MT* reader Joe Bernard N5EB of Keithville, LA, writes: "...The DBS systems went on sale locally this week. Ads show them at $695 plus about $70 hardware kit and $5.95 to $29.95 monthly programming. This will grab cable TV folks' attention. Most of the retailers sold out by noon the first day and had to order more units..." *MT*'s frequency monitor, B.W. Battin, witnessed the same enthusiastic response from Albuquerque consumers (see his report in *Satellite Times*).

Meanwhile, the nation's newspapers have been doing yeoman's work in presenting the DBS concept to consumers. Well illustrated and lengthy articles on DBS take up three to five columns often on the front pages of the business or entertainment sections. If Joe Bernard's observations are typical of all five cities, the pre-launch publicity has been well spent. My special thanks go to the many readers who have sent in copies of the coverage in their local newspapers.

New Telstar Bird

If all went well in early August, another high powered Telstar satellite (this one called 402) should be in the testing mode by now and ready for service in October. T402 will replace T302 and be located at 89 degrees west. The Martin Marietta built satellite was launched by Arianespace's French Guiana facility.

Record TVRO Sales

Is this thing catching on or what? According to SBCA (a TVRO industry organization), over 60,000 satellite TV systems were sold in the month of May this year. This is the strongest evidence yet of the recovery of this embattled industry. As alluded to in last month's column, satellite TV has indeed come of age in America.

MAILBAG

• *MT* reader and contributor Roger West of Amery, WI, writes, "...Last week we bought a new Zenith Color TV with stereo and the whole bit. When the store delivered the TV, the person explained everything to us. As he was going through the channels he came upon channel 58 that comes in fairly good. The only problem is, we have no channel 58 in the area. He explained that all the new TV's seem to pick up this station...I believe it is the Trinity Broadcasting Network which is on cable TV. However, we do not have cable...how are we receiving this channel?"

Roger, according to Broadcasting & Cable Market Place, *there are only 13 TV stations in the U.S. which are transmitting on channel 58. One of these happens to be WDJT-TV in Milwaukee. Now, I grant that's a little over 200 miles from your home, as the neutrino flies, but WDJT's transmitter puts out a hefty 5,000 kW into an antenna over 900 feet above ground (and 884 feet above average terrain!). I think it could easily put in a decent signal to your new TV (which is a great one, by the way).*

Incidentally, WDJT is second to none in Milwaukee in power output.

Is there a satellite TV related question gnawing at you? Don't reach for the seltzer, write! Additional thanks to readers John Marx and Ricardo Molinar for information pertinent to this column.

Kevin Carey, WB2QMY

Gearing Up

It won't be long now. With the cooler weather approaching, the static on the low bands will subside, and your chances for logging new catches will improve. Will you be ready? This month, I've compiled a brief list of publications geared towards the special needs of the LF enthusiast. They should be helpful in making wise decisions about equipment, accessories, and where to listen on the band.

Getting The Lowdown

The longest running publication devoted exclusively to LF enthusiasts is *The Lowdown*, published by the Longwave Club of America (LWCA). The Lowdown covers all aspects of the band including lowfers, natural radio, unidentified beacons, and homebrew projects.

A year's subscription to *The Lowdown* (which includes LWCA membership), is $18 in the United States, $19 in Canada and $26 by airmail delivery overseas. You can write the LWCA at: Dept. MT, 45 Wildflower Road, Levittown, PA 19057.

IDing What You Hear

Identifying newly logged beacons can be frustrating without the right tools. The reference book I reach for most is the *Aero/Marine Beacon Guide*. The guide lists over 7000 beacons in the Americas, the Caribbean, Pacific and Australasia regions of the world. Not only are the beacons listed by frequency, but a handy cross reference allows you to find a station just by knowing its ID.

Periodically, an updater is issued for the guide to keep it as accurate as possible. The *Aero/Marine Beacon Guide* is available for $15 by writing to: Ken Stryker, Dept. MT, 2856-G West Touhy Avenue, Chicago, IL 60645.

Another source for IDing beacons is the *ADF Directory and Manual* by Skip Carden. This booklet is intended for use by private pilots and lists all U.S. aviation beacons and AM broadcast stations. A unique feature of this guide is that the entries are listed by State—especially helpful when you're hunting for beacons in a specific area. In addition to station listings, the directory contains eight pages of helpful information on direction finding techniques.

The *ADF Directory* sells for $10 and is available from: Skip Carden, Dept. MT, P.O. Box 15388, Durham, NC 27704.

Build it Yourself

Want to build your own LF gear? Since the early seventies, the standard reference of lowfer homebrewing has been *The Low and Medium Frequency Radio Scrapbook*, by Ken Cornell, W2IMB. The *Scrapbook* is dedicated to the amateur experimenter and includes a wealth of information on simple receivers, lowfer transmitters, antennas, test equipment and the like.

Since his first edition over 20 years ago, Ken's main philosophy has been to inspire the hobbyist to "get to it" with a hot soldering iron and *build something!*

For further information on the *Scrapbook*, write to the author at: 225 Baltimore Avenue, Point Pleasant Beach, NJ 08742.

If kit building is your thing, you'll want to know about **Curry Communications Co.** Recently they have added a number of exciting products to their lineup, including a 1750 meter CW transceiver kit, and a sophisticated noise filter that is designed for the challenges of longwave reception. For information on their products, write them at 737 North Fairview Street, Dept. MT, Burbank, CA 91505.

One of the few companies devoted to the manufacture of ready-made longwave equipment is **LF Engineering** of East Haven, CT. Their catalog lists receiving and transmitting equipment for the lowfer band, receiving equipment for VLF/ELF Natural radio, active antennas, and many other LF/MF accessories.

You can get a free catalog from LF Engineering by writing them at: 17 Jeffry Road, Dept. MT, East Haven, CT 06513.

Reader News & Loggings

Mark Tribe of Tampa, Florida, has recently discovered the fun of DXing the lowbands. After years of using an old Zenith Transoceanic, he recently purchased a Drake R8 receiver and says "what a difference!" For an antenna, Mark uses a simple wire strung across the ceiling. His loggings in Table 1 prove that you don't need a fancy antenna to have fun on the low frequencies. By the way, Mark, you may want to keep that Transoceanic—it's become a favorite classic for many listeners and even a few of the *MT* staff!

TABLE 1: *Beacon Loggings*

FREQ.	ID	LOCATION	BY
216	CLB	Wilmington, NC	M.T. (FL)
257	SQT	Melbourne, FL	M.T. (FL)
275	FPR	Ft. Pierce, FL	M.T. (FL)
288	NCE	New Castle, NH	B.F. (MA)
291	NP	Nobska Point, MA	B.F. (MA)
293	MP	Montauk Point, NY	B.F. (MA)
302	1N	Rockaway, NY	B.F. (MA)
310	N	Beavertail, RI	B.F. (MA)
311	CH	Chatham, MA	B.F. (MA)
313	Z	Cape Canaveral, FL	M.T. (FL)
325	EP	Eastern Point, MA	B.F. (MA)
325	BP	Brant Point, MA	B.F. (MA)
332	FIS	Key West, FL	M.T. (FL)
356	PB	W. Palm Beach, FL	M.T. (FL)
391	DDP	San Juan, PR	M.T. (FL)
396	ZBB	Bimini, BAH	M.T. (FL)
413	CBC	Cayman Brac, BAH	M.T. (FL)
432	MHP	Metter, GA	M.T. (FL)

Frequent contributor Bob Fraser, of Cohasset, Massachusetts, has checked in again with an update on the status of marine beacons in New England. (See his loggings in Table 1.) As expected, the number of coastal beacons is shrinking, mainly because of the introduction of the satellite-based Global Positioning System (GPS). Some beacons, however, are actually being upgraded instead of shut down. These are the high power stations to be used for Differential GPS (DGPS)—an enhanced version of the system. This scheme uses existing radiobeacons to transmit special correction signals to GPS users.

End Notes:

John Davis, columnist for *The Lowdown*, has announced a new computer Bulletin Board System (BBS) for everyone interested in LF, MF, and Part 15 (license-free) experimenting. The telephone number is (607) 672-0360. The parameters of operation are: 2400 baud, 8 data bits, no parity, 1 stop bit. The BBS is available 7PM to 8AM EDT and all weekend.

That wraps up another month. Do you have a beacon near your home that you'd like to find? Next month, we'll go on the road to find out what it takes to pinpoint an elusive site. See you then!

RAMSEY America's #1 Source For Hobby Kits

TONE GRABBER

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

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

FM RECEIVER/TRANSMITTER

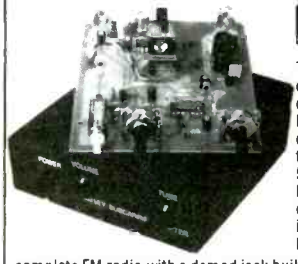
Keep an ear on the local repeater, police, weather or just tune around. These sensitive superhet receivers are fun to build and use. Tunes any 5 MHz portion of the band and have smooth varactor tuning with AFC, dual conversion, ceramic filtering, squelch and plenty of speaker volume. Complete manual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

FM Receiver kit	**$29.95**
Specify band: FR-146 (2M), FR-6 (6M), FR-10 (10M), FR-220 (220MHz)	
CFR Matching case set	**$14.95**
FT-146 Two Meter FM trans kit	**$79.95**

SCRAMBLER/DESCRAMBLER

Descramble most scramble systems heard on your scanner radio or set up your own scrambled communication system over the phone or radio. Latest 3rd generation IC is used for fantastic audio quality-equivalent to over 30 op-amps and mixers! Crystal controlled for crystal clear sound with a built-in 2 watt audio amp for direct radio hook-up. For scramble systems, each user has a unit for full duplex operation. Communicate in privacy with the SS-70. Add our case set for a fine professional finish.

SS-70 Scrambler/Descrambler kit	**$39.95**
CSSD Matching case set	**$14.95**
SS-70WT Fully assembled SS-70 and case set	**$79.95**



SCA DECODER

Tap into the world of commercial-free music and data that is carried over many standard FM broadcast radio stations. Decoder hooks to the demodulator of FM radio and tunes the 50-100 kHz SCA subcarrier band. Many radios have a demod output, but if your radio doesn't, it's easy to locate, or use our FR-1 FM receiver kit which is a complete FM radio with a demod jack built-in. These "hidden" subcarriers carry lots of neat programming-from stock quotes to news to music, from rock to easy listening-all commercial free. Hear what you have been missing with the SCA-1.

SCA-1 Decoder kit	**$24.95**
CSCA Matching case set	**$14.95**
FR-1 FM receiver kit	**$19.95**
CRR Matching case for FR-1	**$14.95**

SCANNER CONVERTER

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

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

FULLY WIRED & TESTED

DSP FILTER

What is DSP? DSP allows the "construction" of various filters of great complexity by using computer code. This allows us to have easy access to a variety of filters, each perfectly optimized for whatever mode we are operating. The DSP II has been designed to operate in 10 different modes. Four filters are optimized for reducing interference to SSB phone signals from CW, heterodynes and random noise interference. Four more filters operate as "brick-wall" CW bandpass filters. the remaining two filters are designed for reliable recovery of RTTY and HF packet radio information signals. A single front panel switch selects any of these filters. Easy hookup to rigs speaker jack.

W9GR DSP Filter	**$299.95**
12V DC Power Supply	**$11.95**

BROADBAND PREAMP

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

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

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

STEREO TRANSMITTER

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

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

ACTIVE ANTENNA

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

AA-7 Kit	**$24.95**
CAA Matching case & knobset	**$14.95**

AIRCRAFT RECEIVER

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

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

INTERCEPTOR

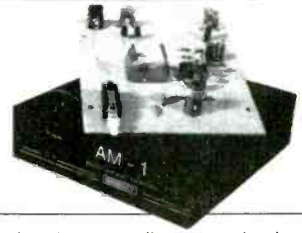
The Interceptor will lock on instantly to the nearest transmitter and allow you to listen with perfect audio quality. Since the Interceptor does not have to search through all frequencies, those quick transmissions that are hopelessly lost on scanners are captured easily. The Interceptor does not need tuning, making it ideal for hands-free surreptitious monitoring of nearby transmissions. The Interceptor is complete self-contained with internal speaker and earphone jack for private listening. Included are: Nicad battery pack, AC/adaptor charger, antenna and earphone. Increase your security and awareness-intercept the communications around you with the Interceptor. Fully wired with 1 year warranty. Covers 30-2000 MHz frequency range, FM deviations from 5 kHz to 200 kHz.

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

AM BROADCAST TRANSMITTER

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

AM-1 Transmitter kit	**$24.95**
CAM Matching case set	**$14.95**



FOXHOUND DIRECTION FINDER

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

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

SHORTWAVE CONVERTER

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

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

SHORTWAVE RECEIVER

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

SR-1 Shortwave Radio Kit	**$29.95**
CSR Case and Knob Set	**$14.95**

ORDERS ONLY CALL 1-800-446-2295

(No tech info at this number)

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

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

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

Ike Kerschner, N3IK

More Time = More Fun

One of the more onerous tasks in the ham station is record keeping and QSLing. Keeping the log up to date and filling out QSL cards can take a lot of time which would be better spent on the air, building things or engaging in activities that provide a lot more pleasure. But if you are working for an award, or just plain like to receive QSL cards, these mundane record keeping tasks must be done!

FIGURE 1

```
Cfm QSO with: N8ZAT
              2WAY:CW     MHz:50.10
ON:13-Jun-94  UTC:01:06   RST:569
-------------------------------
 Tnx for new grid on six mtrs, cul

N8ZAT
Liena G. Palia  (T)
POB 20401 Forrer Ave
Dayton, OH 45420
```

```
------ Confirming QSO With -------
N8ZAT         2WAY:CW     MHz:50.10
ON:13-Jun-94  UTC:01:06   RST:569
-------------------------------
 Tnx for new grid on six mtrs, cul

N8ZAT
Liena G. Palia  (T)
POB 20401 Forrer Ave
Dayton, OH 45420
```

For many years, I kept two *Call Books* in the shack so I could look up addresses for QSLing and usually spent the better part of an evening at least once a week catching up with the QSL chore. Recent acquisition of BUCKMASTERS CD-Rom disk, however, has eliminated the need for the *Call Books* and I can even print labels from the info on the CD.

In addition, I have a logging program for the computer and a QSL maker in the computer, and I have several data bases set up to keep track of the various awards that interest me. All of this really improved the record keeping a lot, but it still took more time than I liked.

LOG-EQF to the Rescue

A few months ago I had the opportunity to see the latest version of Log-EQF, a logging program I had used for basic log-keeping during contests when running entirely portable. I purchased the new version immediately, since the price was *three bucks*, and the program seemed to do everything I wanted. Since it was a shareware program, and I have had some problems with shareware, I was a bit cautious. But, after using it for a few days, I sent in my twenty five bucks to become a registered user. What I got for my twenty five dollars went 'way beyond what one would expect. The table at right shows only part of what it does, superbly!

Now don't think this program only controls Kenwood radios; it will handle any computer controlled unit available. The list of features is far too long to describe in detail, but let me tell you about a few.

The call book of your choice, stored on CD-rom or hard drive, is automatically accessed allowing you to print QSL mailing labels as well as the QSL info on a label (two different labels: see fig-1) at the same time.

The memory keyer is a blast. It has six memories and a 75 character type ahead buffer (you can answer a question or comment as you are receiving and send it with the tap of a key). The memory will automatically use the call of the station you have logged at the beginning and end of each transmission. If in a contest that requires a serial number, it will automatically generate and send the number.

A diagram is provided for an interface cable for either the parallel or serial port output. I would say anyone who can read can build the cable. It only requires a DB-25 connector, a 1k resistor and a simple transistor and four connections, plus wiring a connector to plug into the key jack of the rig. Registered users will receive free technical support, and be notified of upgrades as they are made.

Log-EQF will run on almost any IBM compatible. It requires 512k of memory, a monochrome or color monitor (no graphics adapter required), DOS 3.0 or higher, one floppy and a hard drive are recommended, although two floppy drives would do it. And of course a serial and parallel port are suggested. I am running the program on my hard-driveless lap top with only one 720k floppy for portable operation and it runs fine, with the elimination of some files I didn't need for portable operation.

There is nothing on the market to compare with this fine program at anywhere near the $25.00 price! Log-EQF was developed by Tom Dandrea, N3EQF. To obtain a registered copy of Log-EQF send $25.00 to-Tom Dandrea, N3EQF, 396 Sautter Drive, Coraopolis, PA 15108-9244. If you wish to purchase with a Visa or Master card call 800-995-1605 (24 hours a day). When ordering be sure to specify the type of disk you require.

In the Daily Logbook mode LOG-EQF provides:

- Easy to use menus for all operations, with mouse control.
- Full screen entry of logbook information in any order.
- Easy edit or deletion of any logbook entry.
- Automatic date and time logging with UTC conversion.
- DXCC Zone ond Continent info from callsign prefix.
- Beam headings displayed from DXCC prefix of callsign.
- Abbreviated or complete disploy of logbook entries.
- Ability to search or sort logbook for a pattern in any entry field.
- Print all or part of logbook.
- Print QSL labels with personalized message line.
- Customize screen colors and on-screen display of your callsign.
- Run other programs while Log-EQF stays in memory.
- Monitor PACKET or any other TNC operation while logging.
- Interfaces with SAM, HAMCALL and AMSOFT for auto name and QTH entry.
- Ten minute ID reminder.
- CW memory keyer thot outputs to the parallel or serial port.
- External device control over parallel port with eight data lines.

In the Contest Mode you get:

- Fast dupe checking with displayed details.
- Optional automatic generation of serial numbers for exchange.
- Optional printout of each entry as it is entered.
- Generate dupe sheets.
- Print entry logbook with auto QSO and multiplier totals (user defined).
- ASCII disk files created for dupe sheets and contest logs.
- Partial callsign check.
- On-screen QSO rate ond lapse time displays.

The program also provides a radio interface with:

- Automatic display and logging of radio mode and frequency.
- Control over radio VFO and mode from log entry screens.
- "Hot Key" access to the optionol Rig-EQF Kenwood rig control program.
- On-Screen display of two VFO's and "Transmit" for Kenwood radios.

The VHF "How To" Book

As most of you know, the VHF frequencies are rather scarcely populated (except for FM repeater operation) which I have always felt was a shame. In addition to providing interesting contacts, VHF allows QRM/QSB-less contacts, when contacting stations within your station's normal range.

So I was pleased when I found a copy of *CQ* magazine's new book, *The VHF "How To" Book*. This well written guide for the new amateur does an excellent job describing all

Rob Leonard's Ham DX Tips

September is a transition month for amateur radio DX. It has some aspects of "summer" activity, such as a VHF contest and a noted DX get-together. It also has some of the traditional fall/winter DX activities such as DXpeditions and HF contests. But, you won't miss out on a thing, thanks to *Monitoring Times*:

CONTESTS Sep 3rd and 4th will see the Bulgarian DX contest operating on 160, 80, 40, 20, 15, and 10 meters SSB and CW. Bulgarian stations work the world, and the world works Bulgarian amateurs for points. That same weekend will see the All Asian SSB contest on the same bands. The 10th and 11th, the ARRL VHF QSO party will take place. Amateurs can be logged using SSB and CW on the low ends of the VHF and UHF bands and FM simplex higher in the same bands. Repeater contacts cannot be made in this contest. Though mostly a North American contest, such contests are gaining popularity in Europe and Japan. The Worked All Europe SSB contest will take place that same weekend on the non-WARC HF bands. Rounding out the month is the *CQ Magazine* World Wide RTTY contest; look for DX stations within 10 kHz of 14085, 21085, and 28085 kHz, and around 3640 kHz and 7030 kHz. **ISLANDS ON THE AIR** The IOTA Committee has established spotting frequencies as follows for IOTA activity. CW: 3530 7030 10115 14040 18098 21040 24920 and 28040 kHz. SSB: 3755 7055 14260 18128 21260 24950 28460 and 28560 kHz. The IOTA committee "would like to make it clear that these frequencies will in no way be reserved exclusively for IOTA contacts, but will be shared with others on a normal non-interference basis." **ISRAEL** 4X6UO (whose QSL manager is WB3CQN, Ruthana Pearson, 3120 Alta Vista, Dover, PA 17315) offers this country to RTTY DXers on 14087 kHz at 1630 UTC daily. **MT ATHOS** This DXCC country has a resident population that includes *no women*, and even forbids women to enter its territory. This is because it is a monastery located on a Greek Island, although even Greece considers it to be a separately governed entity. There is only ONE resident amateur here and very few visiting hams (men only) are allowed to operate from here, making this one of the rarest DXCC countries. Monk Apollo, SV2ASP/A (The "A" indicating Mt. Athos) can be found on either 14180, 18145, or 28390 kHz SSB, whichever offers the best propagation between 0900 and 1100 UTC, weekends only. QSL to: Monk Apollo, Dochiarrious Monastery, GR 630 87 Mt Athos, Breece. **TAIWAN** The Ministry of Posts and Telecommunications has announced new blocks of frequencies authorized for amateurs to make international contacts as follows: 3500-3512.5 kHz CW, 3550-3562.5 kHz CW, 18068-18080 kHz CW, 18110 to 18122.5 kHz SSB, 24890-24902.5 kHz CW, 24930-24942.5 kHz SSB, 50000-50012.5 kHz CW, and 50110-50122.5 kHz CW and SSB. **PORTUGAL** The Telecommunications authorities here have restructured the amateur radio prefixes as follows for mainland Portugal and her other territories: CT1 to CT4 for Mainland Portugal, CT3 for Madeira Island and the nearby lesser islands, CT2, CT5 to CT8, and CQ1 to CQ8 are reserved for special events stations on the Mainland. CU1 to CU9 the Azores. CT3, CT9, CQ3, CQ9, CS3, CS9 for special events stations on Madeira and her lesser islands nearby. CR prefixes are now issued to the National Protection Service and no longer to amateurs. Callsigns with the numeral 0 will be amateurs who hold licenses that allow for VHF and UHF operations only. **USA** WB5GDN recently informed me that the W5VAS beacon has been upgraded to 100 watts with a 200 ft. antenna on the frequency of 50.060 MHz CW. Its location on the N shore of Lake Pontchartrain (near New Orleans) should inidcate when grid square EL-49 can be heard. If you log this beacon please notify operator W5VAS Henry Arsaga, 3516 James Dr, Metairie, LA 70003. Those in the Huntington Beach, CA, area who would like to study Morse code should tune to 144.300 MHz at 8 PM (local time) Tuesday nights. AB6CH hosts a Morse code practice session at that time and frequency. An IOTA DXpedition (for frequencies check the ls. on the Air listing) will take place from Appeldore Island (off the New England coast) 16 to 19 September. Operators will be: WF1N (Anthony Spino, 47 Madison Ave, Waterbury, CT 6706) KA1DIG (Louis Cable, 11 Maple Dr, Prospect, CT 06712) and K1SCN (Salvatore Spinao, 18 Weldon Ct., Goshen CT 06756). Each operator will take care of his own QSLing.

That takes care of another month. Tune in next month when we tell you about a major DX contest, more DXpeditions, and more news of the world of amateur DX. 73 de Rob

facets of VHF operating. Of special interest are chapters on antennas, weak signal operation, TV, contesting, and mountain topping. Several chapters on propagation are worth the price of the book alone.

The appendix lists beacon stations on all of the VHF bands. I found this extremely useful in determining band openings over the summer. A list of VHF organizations is another nice feature that will help the reader find detailed information about his particular interest. Author Joe Lynch, N6CL has done an excellent job with this manual. The book is available for $15.95 from *CQ* magazine; phone 1-800-853-9797 or visit your local ham radio dealer.

The Quad Antenna

That is the title of a second book from *CQ* magazine. This handbook will tell you everything you need to know to design a quad or loop antenna for your particular location. It is not a build-it-this-way book, with tables of lengths and dimensions. What you *will* find are detailed explanations of the possible configurations the loop antenna can take and their performance possibilities. *Quad Antennas* is rich with diagrams, formulas and information about quad antennas never before published in one place.

I have used this manual to build a new quad loop for 80 meters and am absolutely delighted with the results. If you have any interest in the quad this is a book you must own. Price is $15.95 from same sources as *The VHF "How To" Book*.

First Day of Spring

N1QKE sent a nice card describing this year's "first day of spring" operating activities from Knight's Point State Park in Vermont. Kim suggests calling *"CQ Spring"* to let everyone know you are in the activity.

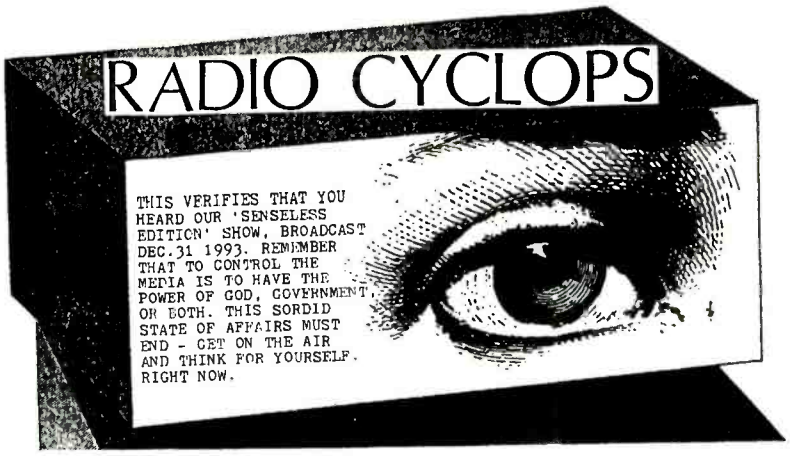
Let's try the same thing on September 24 and 25th this year for the first day of fall. Take your portable rig to a place of natural beauty and call *"CQ-Fall."* Send photo postcards for QSLs. There's no contest; just fun and learning. See you from one of our local natural spots (Lehigh Gap). Or just write the column and let us know about your activities.

73 de Ike, N3IK

Pirate Activity Explodes During Summer

Given the news covered in the "Outer Limits" this year, you would think that pirate activity might slow down a little bit. The new FCC direction finding cars that run off of the GPS satellite system, the FCC's denial of Andrew Yoder's $17,500 fine appeal, the *Fury* bust, and new FCC subpoena powers are clear evidence of an attempt to stiffen enforcement of unlicensed broadcasting in the USA. Some have theorized that North American pirates might lie low for a while 'til the Lone Ranger and Tonto ride out of town.

Nothing could be farther from our experience. The summer of 1994 definitely is breaking all previous records for pirate activity. As our detailed reporter Kirk Trummel of Springfield, IL, establishes in this month's loggings, more than forty stations were active. During most of June and July, pirate activity was heard on *every single night* of the week! We devote a large portion of our September column to the logging results.



These sharp Cyclops veries are arriving via Wellsville.

La Voz del CID Goes Silent

Anti-Castro clandestine **La Voz del CID** was off the air for about two months between mid-May and mid-July. In a June 2 interview on **Radio Netherlands'** "Media Network," Jeff White of **WRMI** told Jonathan Marks that Miami rumors widely suggest that the CIA ceased funding for the clandestine broadcasts. But, they seem to have raised some of the required funding for their operations, and have been maintaining at least a partial schedule on their traditional 9941.65 kHz frequency.

Stern Pirate Jamming Update

Last month we covered an unusual commercial station jamming incident that temporarily forced syndicated radio host Howard Stern off the air during a remote broadcast from Cleveland, OH. The FCC has been investigating a deliberate pirate broadcast that interfered with Stern's studio to transmitter link, but they have not yet issued a Liability Notice. However, a Cuyahoga County grand jury has returned an indictment against William J. Alford of Cleveland.

Alford, an assistant engineer at **WMMS**, was charged with disrupting a public service, possession of criminal tools, and breaking and entering. He allegedly cut a cable used by Stern for his live syndicated show, aired in Cleveland on **WNCX**. Alford pleaded not guilty in Cleveland Municipal Court on June 13, and was released on a $10,000 bond. A spokesman for WMMS said that Alford had been suspended without pay.

Haiti Clandestine

Radio Democracy is a USA government-sponsored clandestine operating from an airplane above Haiti (see feature article). Among other messages, the station urges Haitians not to sail toward the United States. Thanks to ACE, Harry Helms, Rob Keeney, and others for forwarding information to this column.

Errata

We unfortunately ran into slight technical difficulties in the July edition of the "Outer Limits." During the page layout process, **Radio Doomsday** was combined by mistake with **Radio USA (fake)**, producing a bizarre result. Station logs from **Radio Esoterica, Radio Free Euphoria, Radio Gumby International, Radio Magic,** and **Radio USA (real version)** were inadvertently omitted. Rick Doehner of Houston, TX, who heard Euphoria, vanished from the column. *Monitoring Times* apologizes for the omissions.

New Address at KIWI

Our regular reporter Gigi Lytle of Lubbock, TX, says that Graham Barclay, the moving force behind New Zealand pirate **KIWI**, is now using a new address: PO Box 3174, Onokawa, Napier, New Zealand. The station has been heard in North America on many recent occasions, usually on weekend evenings between about 0600-0800, normally on 7445 kHz. Kirk Trummel of Springfield, MO, is among our readers who have heard KIWI, sometimes relaying other Oceania pirates such as **Radio G'Day** and **Shortest Day Radio.**

What We Are Hearing

Maildrop addresses used for correspondence by North American pirates listed this month include PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 17534, Atlanta, GA 30316; PO Box 605, Huntsville, AL 35804; PO Box 2024, Faribault, MN 55021; PO Box 146, Stoneham, MA 02180; and PO Box 220342, D-42373, Wuppertal, Germany. When writing to a pirate you should include three 29¢ US stamps to USA addresses and $1 US to other countries. For all stations, frequencies are in kHz, with times in UTC.

6YVOS- 7386 at 0145. Pig Pen Marley's Jamaican accent gives authenticity to the reggae music on the "Voice of Smoke." Addr: Wellsville. (Trummel)

Amiga Computer Generated Radio- 7385 at 0130. All of the programming on this new operation is via computer, including computer generated music and remarks by a computer synthesized voice. Addr: Faribault. (William Hassig, Mt. Prospect, IL, Trummel)

CSIC- 7375 at 1915. Pirate Rambo's veteran station features rock music and commentary. The remarks are often about Canadian politics and pirate radio. Every 50th reception report still receives an actual rubber chicken QSL in reply. Addr: Blue Ridge Summit. (Trummel)

CRSN- 7385 at 0100. Also known as Radio Star of the North, this new station programs Canadian rock music. Their announcer frequently discusses the current pirate radio scene. Addr: Wellsville. (Chris Scheiner, River Ridge, LA; Trummel)

Down East Radio- 7415 at 2315. Some stations are still using 7415 kHz, especially before the powerful USA broadcasters sign on after 0000. Oscar Guggins' New England comedy station from Maine is one of them. Addr: Blue Ridge Summit. (Dick Pearce, Brattleboro, VT, Max Syko, Gaylord, MI)

Free Radio Signal Corps- 7387 at 0030. Here's a very unusual station that transmits all of its shows in either RTTY (170/45) or CW Morse code digital modes. It's not unlike the old **Swiss Radio International** RTTY service, except that the program content involves pirates. Addr: None, says it will verify ACE logs. (George Zeller, Cleveland, OH; Trummel)

Hello Radio- 7385 at 0330. This obnoxious jammer still appears from time to time, with no programming other than his station ID. Addr: None. (Scheiner)

Hit Parade Radio- 7385 at 0215. Dale Darman recreates the top 40 rock hit format that was common on commercial broadcasters 30 years ago. Sometimes he sticks to one artist, such as a recent Beach Boys special. Addr: Wellsville. (Scheiner, Trummel)

K-2000- 7385 at 0130. This station's parodies of DXers and DXing are outstanding productions. For instance, they retranslate Glenn Hauser's "World of Radio" into various English ethnic dialects. Addr: Stoneham. (Trummel)

KNAC- The FCC busted this 10 watt pirate in Naalehu, Hawaii, on April 27. As was reported in the May *MT*, the station was operated by the Hawaiian sovereignty group Kanaka Ma'oli. The FCC confiscated studio equipment from the Naalehu Theater. According to the Hilo *Tribune Herald*, station manager George Gali had no comment. (Dean Manley, Hilo, HI)

Kranker Radio International- 7415 at 2330. This slick oldies rock station usually has an excellent signal. Addr: Pittsburgh. (David Colvin, Painted Post, NY)

KTVI- 7385 at 0000. Emanuel Goldstein features new age and rock music (often Pink Floyd tunes) with pirate radio commentary between songs. Addr: Faribault. (Randy Ruger, Brandon, FL; David Chapchuk, Scranton, PA; Hassig, Pearce, Scheiner, Trummel)

Patriotic Front for the Liberation of America- 7385 at 0230. They are sort of a combination of Rush Limbaugh and the right wing patriot programs on **WWCR**. Look for their "Dragnet" theme song at sign-on. Addr: None. (Trummel)

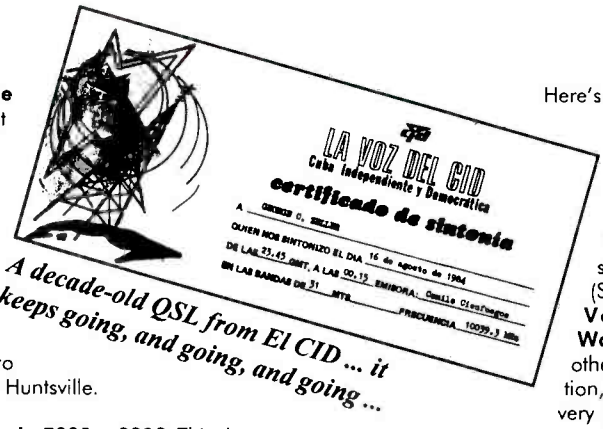
Pirate Radio Homosexuality- 7385 at 0130. Captain Bruce and Big Austin supplement rock music programming with overt advocacy for gay issues on this station. Addr: None, but verifies ACE loggings. (Trummel)

Quantum State Laboratory- 7415 at 0015. The announcer on this new one programs eclectic rock music to "control" his listeners, but his announcements are tough to copy because of a heavy reverb effect in the studio. He sent your columnist a QSL for a show on 14400 kHz with a transmitter power of one watt! Addr: Stoneham. (Zeller, Pearce, Hassig)

Radio Airplane- 7385 at 0300. Captain Eddy's airborne rock and comedy station has joined the parade of other pirates this summer. Addr: Wellsville. (Trummel)

Radio Doomsday- 7385 at 0330. Nemesis returned over the summer holidays with a plug for the record-breaking unlicensed broadcasting activity. Addr: Wellsville. (Lytle, Trummel)

Radio Free Jesus- 7385 at 0100. Max Gain obviously has a religious flavor, but he adds secular discussions of pirate radio to his fare. Addr: Huntsville. (Trummel)



A decade-old QSL from El CID ... it keeps going, and going, and going ...

Radio Free O. J.- 7385 at 0030. This short-lived station was devoted to the search for the missing O.J. Simpson in Los Angeles. They announced that QSL's would only be forthcoming if O. J. was caught and subsequently executed in the California electric chair. Addr: None. (Trummel)

Radio Garbanzo- 7385 at 0100. Fearless Fred was relatively inactive for the last few years, but this veteran rock and comedy station is resuming activity. Addr: Wellsville. (Trummel)

Radio Outhouse- 7385 at 0130. This new station cleverly extends a single theme into an entertaining show: two good ole boys program comedy from a transmitter inside an Arkansas outhouse. Addr: None yet. (Hassig)

Radio Peace in Action- 7385 at 0000. This Europirate programs discussions of peace and environmental issues, not unlike licensed **RFPI** in Costa Rica. Their North American relay is usually **NAPRS.** Addr: Wuppertal. (Chapchuk)

Radio Spam- 7385 at 0300. Hormel's Spam meat product is the driving force at yet another new station. Clever comedy and pirate radio discussions are woven between frequent renditions of Monty Python's Spam music. Addr: Fairbault. (Hassig)

Radio Thirteen- 7385 at 0300. This new operation programmed a gong interval signal and banjo music from Virginia. Addr: Unclear at press time. (Trummel)

Radio USA- 7387 at 2300. Mr. Blue Sky's punk rock and pirate comedy has been around now for more than ten years. Addr: Wellsville. (Robert Ross, London, Ontario, Trummel)

RBCN- 15050 at 2000. Radio Bob has been fairly active lately with his rock music and good ole boy southern humor, including pokes at *MT*'s Glenn Hauser. One mailbag show read imaginary reception reports from Hauser and the Pope. His production standards and amusement value are always high. Addr: Atlanta. (Chapchuk, Ruger, Scheiner, Pearce, Hassig)

Solid Rock Radio- 7385 at 0330. Dr. Love has exploded into the pirate bands with diverse efforts, including rock and rap music programs, CW Morse code broadcasts, and occasional relays of other pirates. Addr: Wellsville. (Ross, Scheiner, Trummel, Hassig)

The Asylum- 7385 at 0100. The station appears very irregularly, but features a mentally disturbed announcer who plays songs about psychoses. Kirk says that it's his favorite station. Addr: None. (Trummel)

The Kid- 7385 at 0330. This one is barely classifiable as a broadcaster, since it discusses pirate radio events. But, it mainly is a parody of "Kids Playing Radio" and a bootleg QSO station. Addr: None, says that it will verify ACE logs. (Trummel)

The Kid (fake)- 7385 at 0400. This is a double parody station, making fun of both **The Kid** and **Radio USA (fake).** Pirate humor is endlessly creative. Addr: None. (Trummel)

Up Against the Wall Radio- 7385 at 0045. Here's another new station with a format of 1960's nostalgia leftist radical messages and songs hosted by Owsley. Look for their "oogha" horn interval signal. Addr: Wellsville. (Scheiner, Chapchuk)

Voice of the Real World- 7385 at 0300. Another relatively new operation, this one broadcasts a very well produced discussion of individual liberties, including conservative attacks on environmentalist and civil rights groups. Addr: Unfortunately none. (Trummel, Scheiner)

Voice of the Runaway Maharishi- 7385 at 0500. Although he also appears as a character on **Radio Free Euphoria,** the Maharishi now has his own spin-off drug advocacy station, similar to the way that "The Jeffersons" evolved from "All in the Family." Addr: Wellsville. (Trummel)

WEED- 7385 at 0430. Johnny Smoke still produces what is probably the slickest mix of rock music, sound collages, and drug advocacy that is on the pirate bands today. Plus, his signal normally covers all of North America. Addr: Huntsville. (Trummel, Scheiner)

WKIK- 7385 at 0500. Their format still combines rock music with relays of commercial radio stations in the Jacksonville, FL, area. On a recent show, the announcer read one of his own pirate logs in hopes that it would be verified. But, he apologized for the fact that he is not QSLing reports to his station. Addr: Wellsville still very sluggish. (Trummel)

WKND- 7415 at 2330. Radio Animal is back on a regular basis with rock music, plugs for pirate publications, and QSL discussions. Addr: Blue Ridge Summit. (Trummel)

WLIS- 7385 at 0215. Charles Poltz has the most consistent format in pirate radio. All of his shows feature renditions of genuine interval signals from licensed international shortwave broadcasters. Addr: Blue Ridge Summit. (Hassig)

WREC- 7385 at 0245. P. J. Sparx is still active with a mix of rock music and comedy, a staple pirate format. His interval signal is a short organ tune. Chris had a little trouble with the call letters, and he reminds us that phonetic spellings can really be helpful during weak reception conditions. Addr: Wellsville. (Syko, Scheiner)

WSM- 7413 at 2300. "Grand Ole Opry Radio" has not transmitted lately, but Charles' QSL #22 recently arrived. Addr: Huntsville. (Charles Walters, Painted Post, NY)

WVOL- 7386 at 2315. Captain Willy still appears occasionally at the "Voice of the Loon" with rock music and pirate radio discussions. Addr: Wellsville. (Trummel)

WYDX- 7485 at 0200. This new one's call letters stand for "why DX?" They ran a commemorative show in honor of Alan Weiner's birthday, including a hilarious parody of a southern black preacher who attacked the FCC with "amens" in the background. Addr: Blue Ridge Summit. (Hassig, Pearce)

Xray Yankee Zulu- 7385 at 0100. They burst on the pirate scene during the summer with an unusually diverse mission. Sometimes they relay other pirates. They occasionally produce their own discussions of pirate radio affairs. At other times they broadcast actual shows in digital Morse code CW or RTTY (170/45) modes. Addr: None, but says will verify ACE loggings. (Hassig)

WHAT'S NEW?

BOOK REVIEWS AND NEW PRODUCTS

by Larry Miller

Guest Reviewers: Bob Grove and Rachel Baughn

Interference Eliminators

Not too many years ago, I had the misfortune of living under the shadow of WCOJ's towers. Actually, I wasn't *that* close, but I was close enough that I found the 5,000 watt voice of Chester County seemingly all over the dial of my Icom R-71A.

I nearly had to give up on logging anything until Bob Grove was kind enough to brew up a bandpass filter for me. It sure beat having to wait for 'COJ to go off the air for maintenance!

Scanner listeners can have their own problems with interference, as my mail regularly attests. A paging system can wreak havoc on your scanning as can interference from aircraft transmitters. Of course, no one even wants to start to talk about problems with the neighborhood CBer.

So. How do you spell relief? G-R-O-V-E has introduced a line of interfence eliminators that will reduce or even stop strong signal overload on your scanner or general coverage receiver. There's the FTR6—a 30-2000 MHz Bandpass Filter that removes AM broadcast, CB and shortwave interference from scanners. It's $19.95. The FTR-7 is a 540-1700 kHz Band Reject Filter. The price for the FTR7 is $29.95.

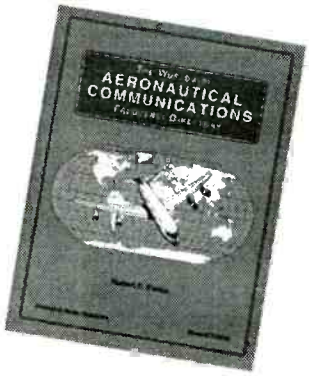
The FTR8 is a 118-137 MHz Band Reject Filter that removes aircraft interference from scanners. According to the manufacturer, unwanted signals are knocked down by 40 dB or more. Intermod is reduced by at least 120 dB. Those are some pretty impressive numbers that you can put to work for yourself. The price for this one is $19.95.

There are a variety of adaptor kits to fit virtually any radio. For technical assistance, call 704-837-7081, or to order call 800-438-8155.

Excellent Aero Book

Every once in a rare while—rarer even than cuts in the individual federal income tax rate—an author comes along who knows his subject matter so thoroughly, so completely, that he produces the uncontested best book in the field. This is the case with the new second edition of Robert Evans' *The Worldwide Aeronautical Communications Frequency Directory*. The publisher, Universal Radio, says that it's "the most complete and up-to-date aeronautical communications frequency directory ever published."

It's not just sales hype. There are over 2,350 discrete frequencies with full commercial and military coverage, encompassing both voice and digital modes in the scanner bands as well as HF. There are over 260 pages of information—complete major world and regional domestic air route information for 137 countries, company operations for 116



world airlines, VOLMET broadcasts from 70 cities and full military coverage for 30 world air forces.

In addition to the cross-referenced frequency lists, several pages of comprehensive text serve to introduce the reader to the concepts, message content and deciphering of aeronautical communications. This invaluable aero source book is available for $19.95 from Grove Enterprises or from the publisher (Universal Radio, 6380 Americana Pkwy, Reynoldsburg, OH 43068; 800-431-3939).

New 11th Edition of Passport

We've had the opportunity to get a sneak preview of the new 11th edition of *Passport to World Band Radio* and it is vintage *Passport*. Encompassing the regular crew—professional monitor Tony Jones edits frequency material from around the world, while *MT*'s own Larry Magne does the receiver reviews—you'll find everything the shortwave listener could ever dream of. From the most obscure DX to the hottest programs for casual listeners, *Passport* has it all (not to mention a Gahan Wilson cartoon cover).

Pick up your copy of *Passport* direct from the publisher (IBS, Box 300, Penns Park, PA 18943) or from Grove Enterprises at 1-800-438-8155 and get ready as the DX season gets under way!

The Crystal Set Handbook

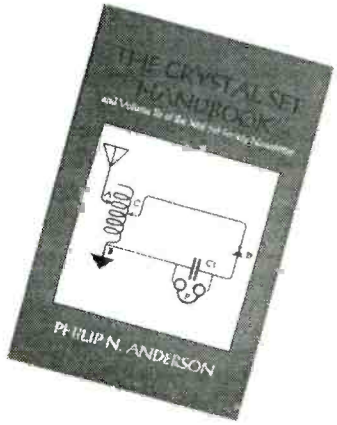
Batteries not required. That was part of the magic of crystal sets—just hook up an antenna and ground wire, plug in the headphones, and listen to music forever! Ah, the good old days. A chunk of galena or even a razor blade could become the detector, and wind a few hundred turns of wire around an old oatmeal box; you were almost there.

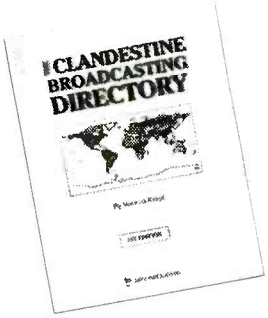
Of course there were a few minor deficiencies in such a system, like sensitivity, selectivity and audio power for starters. But was it fun? You bet! I remember with great warmth my crystal set hideaway — my "fort" — a trampled-down clearing in a sumac thatch behind my house. I would sit for hours listening to that wonder. It worked flawlessly for days—and then it rained! Soggy cardboard coils do not happy coil forms make.

Phil Anderson has compiled newsletters of the Xtal Set Society along with his own writings to produce an informative book on crystal sets. For us old-timers, it is a nostalgic trip down memory lane. Who built the first crystal set? What was heard? What frequencies did it cover? For culturally-deprived newcomers who think radios need batteries, the handbook provides both an easy-to-read look at the theory and practice of crystal set building as well as the math—if you want it.

The Crystal Set Handbook by Philip N. Anderson is $10.95 plus $2 shipping from the Xtal Set Society, PO Box 3026, St. Louis, MO 63130.

—*BG*





Clandestine Survey

Mathias Kropf is a well-known name in clandestine broadcast monitoring circles. (He writes for the Danish Shortwave Club's "Shortwave News.") This specialized area of shortwave and sometimes mediumwave DXing provides one of the highest levels of challenge.

As its devotees are quick to remind us, it also provides one of the highest levels of reward; these stations can and often do presage the destiny of nations.

In his new book, *Clandestine Broadcast Directory*, Kropf produces what is primarily a frequency listing of clandestines around the world. Section One is shortwave stations in frequency order, Section Two is in time order and Section Three is a database that is arranged by country. Each station is listed by name (in English with native language identification), sign on date, address and an audibility rating. There is additional information including Kropf's own statistical analysis of broadcasting activity (reproduced from the most recent Danish Shortwave Clubs International).

An excellent first effort, *Clandestine Broadcasting Directory* could be improved by taking a lesson from its sister publication, *Pirate Radio Directory*. Missing from the former are the interesting "mini profiles" that tell the stories ofindividual stations and makes the *PRD* such an interesting read. The stories would be fascinating, and Kropf no doubt knows them all.

The *Clandestine Broadcasting Directory* is $12.95 plus $2.00 book rate shipping from Tiare Publications, P.O. Box 493, Lake Geneva, Wisconsin 53147.

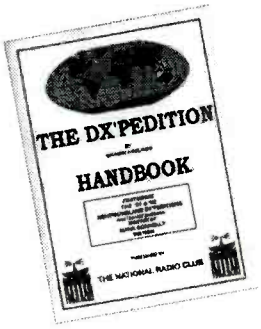
The DXpedition Handbook

Some of the most useful, consistently excellent publications for radio hobbyists come from the National Radio Club. The new *DXpedition Handbook* is another in a long line of helpful how-to books. Although they're written for the Broadcast Band (BCB) DXer, their wisdom is often transferable to other disciplines within the hobby. In this title, Shawn Axelrod gives you "we've been there" instructions you'll need to set up a successful DXpedition.

A DXpedition is, as the name implies, an expedition for DX. You go away, preferably to a electrically quiet place, where signals can slip into your receiver quick and clean. In many cases, the results can be quite impressive. You should see their logbook (which takes up about half the pages in the publication): the BBC relay at Lesotho—on AM—at 1197; Spain on 531; Luxembourg on 1140; Egypt, Libya, Portugal, Italy, the Azores and virtually all of Latin America.

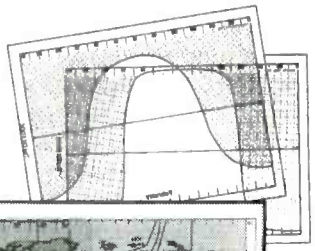
People who listen to shortwave would be pleased with a set of loggings like this. But we're talking about the 540-1600(+) kHz broadcast band! What's more, these are not loggings collected over the course of a year or two. These were all done on one night!

If you've ever wanted to sit down with some real pros and get the absolute low-down, inside scoop on how it's done, *The DXpedition Handbook* is your answer. The *Handbook* is 80 pages and is available for $12.95 postpaid from The National Radio Club, Publications Center, P.O. Box 164, Mannsville, NY 13661-0164. Tell 'em *MT* sent you.

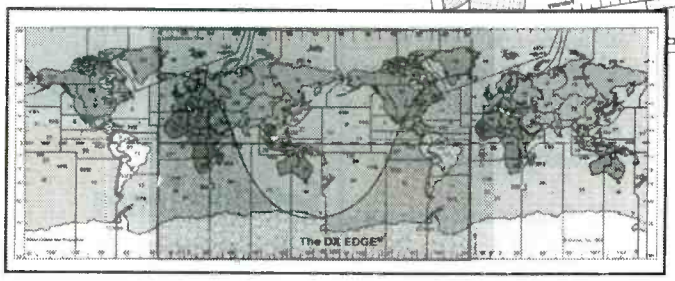


MT REVIEW

The DX Edge



Shown, the DX Edge with overlays



Gray-line propagation (taking advantage of the "twilight zone," or terminator, between daylight and nighttime), is a well-established trick for maximizing DX, both for amateur radio contacts as well as shortwave listening.

The DX Edge is a clever, attractive, and very professional slide-rule map with twelve, durable, monthly overlays enabling the user to instantly compute both short path and long path DXing opportunities throughout the year. In other words, you can compute in an instant what the best time would be to work (or listen to) a particular part of the world, or what distant points are most likely to be heard at a particular time.

Continued on page 96

It must be understood, however, that it does not predict maximum usable frequency (MUF), sunspot or solar storm influences, or any other propagational phenomena. But it does show the global day/night boundary for any time, 'round the clock, on a month-by-month basis, and this it does superbly. Used in conjunction with *MT*'s monthly propagation charts you will have an unfair advantage in shortwave competition!

The DX Edge is available for $24.95 plus $4.50 shipping from Grove Enterprises, PO Box 98, Brasstown, NC 28902; phone 800-438-8155.

—BG

LesComm Scanner Mods

A new set of flyers arrived from Les Jernigan at LesComm with information on his GEScan kit, for people living in areas afflicted by GE-manufactured trunked radio systems.

Although some find it hard to believe, the GE system plays their "We bring good things to life" jingle at the end of each transmission and this hangs up people's scanners. The GEScan kit eliminates the jingle, bringing blessed relief to the scanner listener.

The GEScan kit is easily installed into your PRO-2004, '2005, or '2006—Although we haven't installed one ourselves, I have seen the instructions and they appear pretty straighforward. The price of the GEScan kit is $49.95.

LesComm is also offering their new LC180-A Channel Finder. This unit allows you to store frequencies while in the search mode in up to 1024 channels! The number stored is programmable by the user. The LC180-A is available for the PRO-2004, '2005 and '2006 as both a kit ($64.95) and installed ($89.95.)

For more information, write LesComm at P.O. Box 81294, Corpus Christi, Texas 78468-1294 or call 512-986-2220.

Satellite Times

We just got an advance copy of *MT*'s new sister publication, *Satellite Times*, and if you haven't already received your copy, here's a little preview. As many hobbyists already know, satellites are no longer the "cutting edge" of monitoring; they're here and they're in everyday use.

Larry Van Horn—you already know him from his excellent work in *Monitoring Times*—has assembled an incredible team of experts and virtually all of them are represented in the premier issue. The first edition features International Broadcasting relayed by satellite instead of shortwaves (by George Wood); Digital Audio Broadcasting (by Kirk Kleinschmidt); reports on consumer reaction to the new DBS systems; and pictures from the Hubble telescope of the comet/Jupiter collision.

Regular departments represent the cream of the crop in its writing staff, and cover the gamut of satellite topics, including launch schedules and reports, radio astronomy, satellites used for personal communications, navigation, weather fax, broadcasting—you name it.

Satellite Times has borrowed from the success of *Monitoring Times* in presenting technical topics in an easy-to-understand, noncondescending manner. The comprehensive, 16-page "Satellite Services Guide" provides schedules, frequencies, satellite location, and transponders for audio and video services of all sorts, including amateur satellites. Naturally, new product announcements, reviews, and news of interest to the satellite monitor will also appear in each issue. This first edition reviews the ICOM IC-802H transceiver.

Satellite Times looks great, too. This is a first-class publication that's going to change the way you think about monitoring satellites as part of your hobby.

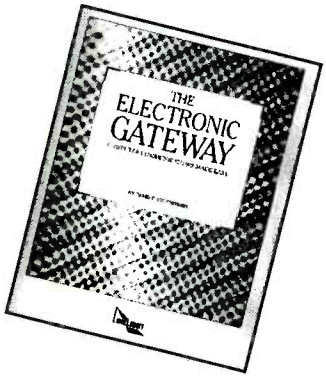
If you haven't already, now's a great time to place your order for *Satellite Times*. The introductory subscription rate for the bimonthly magazine is $16.95. Even if you're not set up for satellite reception right now, this is a great way to get ready. 'Cause sooner or later, everyone will be doing it.

—LM & RB

Gateway to the Future

Modems are also becoming part of the everyday lives of a growing number of people. These once exotic gizmos are now becoming so commonplace that many computers already have them installed when you buy them. On-line services like Internet make them a must-have, and for the increasing number of employees who do their work from home, they are a necessity.

The Electronic Gateway is a new title from Limelight Books (a division of Tiare Publications) written by David Kruchowski, and it's designed to help people understand and get full use out of their modems. The book touches on virtually every aspect of what the publisher calls "making magic" with your modem.



Topics include selecting terminal software, signing on for your first time, even bulletin board etiquette. There's also material for the non-novice, like how to use an offline mail reader and setting up macros to expedite online procedures.

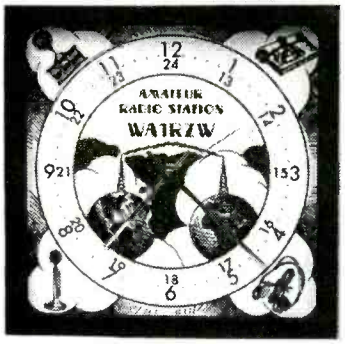
Some of this is heady stuff for the computer illiterate, but it's written in an easy-to-understand style to avoid cranial overload. With all of the online services catering to the radio hobbyist, you can't afford to be without a modem. *The Electronic Gateway* will help get you there. *Gateway* is available for $24.95 plus $2.00 book rate shipping and handling. The address is P.O. Box 493, Lake Geneva, Wisconsin 53147.

New Video Modem

Communications Specialists, Inc., of Orange, California, is now offering a *video* modem. That's right; the new CSI-100 sends and receives broadcast quality, single frame, color video over any narrow-band communications channel. According to the manufacturer, this includes SMR trunked systems, cellular or IMTS telephone, satellite, or standard dial-up landline.

The modem is compatible with any NTSC device and any NTSC compatible monitor or VCR can serve as the output device. The CSI-100 Video modem sells for $794.95. For more information contact CSI at 800-854-0547 or write them at 426 West Taft Avenue, Orange, California 92665-4296.

Classic Clock



Amateur Radio Excellence is selling a "classic" clock for "the ultimate ham shack." The clock, which features a 12- and 24-hour dial includes the call letters of your choice, custom printed on the face. Frames are available in simulated light oak, walnut, or black (shown) finishes. The Classic Clock is powered by one AA battery, which is included.

To order, call Amateur Radio Excellence, P.O. Box 1551, Manchester, New Hampshire 03105. The price is is $39.95 plus $4.50 shipping. Tell them that *MT* sent you.

Classic Yoder

Over the years, Andrew Yoder has honed his impressive talent as a writer, making him today one of the hobby's brightest stars. Indeed, Yoder's future lies somewhere well beyond the radio hobby press. In any case, he has another book out: the second edition of *Build Your Own Shortwave Antennas*.

If you didn't see the first edition, you should know that *BYOSWA* is not your typical antenna book. This is simple stuff, designed for the average person. Rocket scientists need not apply.

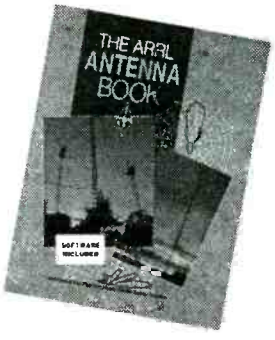
Most of the designs border on makeshift. That's not to be disparaging—they will all undoubtedly work well. It's just that they're like a breath of fresh air. There's no electromechanical posturing here, just plain-English instructions for ordinary people who want to get more out of their shortwave radios. Some are even whimsical, like the kite-mounted antenna.

The "pros" may be disappointed here. There's not one full-page formula for abidirectional end-fed quasi-rhombic moon shooter here—just real antennas for ordinary people. We recommend *Build your Own Shortwave Antennas*. It's $16.95 plus shipping from Tab Books at 1-800-822-8158. Mention *MT* when you call and you'll get a potato grater—or maybe you won't.

The ARRL Antenna Book, Seventeenth Edition

No antenna publication in print contains the girth of accurate information at such a bargain price as this famous antenna handbook. This giant, 700+ page reference now includes a 3-1/2" IBM-formatted disk which provides a variety of antenna design programs such as Yagi analysis, propagation prediction, transmission line analysis, and other utilities.

Chapters evolve from antenna



basics through arrays; from portable, mobile and maritime antennas to space communications; from transmission lines through test instruments and procedures; and from VLF through microwave.

Illustrations are lavish and clear; text is easy to read and concise; concepts are described thoroughly, both for the beginner as well as the seasoned engineer.

Are you looking for a direction-finding loop for hidden transmitters? An indoor receiving loop? How about a multiband dipole for receiving or even transmitting? Would you like to build your own dish, horn or helical antenna for VHF and above? Do you wonder how antenna tuners work, or care to build your own? If you own anything that needs an antenna, it will be in this internationally-recognized, definitive reference from the ARRL.

The ARRL Antenna Book is $30 plus $6 shipping from Grove Enterprises, PO Box 98, Brasstown, NC 28902; phone 800-438-8155.

—BG

Gilfer Name Change ... NOT!

Gilfer Associates, Inc/Gilfer Shortwave is under new management, yes, but its name has not changed. New owner Paul Lannuier clarified that former Gilfer president Jeanne Ferrell, retained right to *the Confidential Frequency List* (9th edition just published), and the name of her new publishing company—not that of Gilfer Associates— is **Listening In**. We apologize for printing incorrect information.

NOTE ON ADVERTISEMENT AT RIGHT:
As of 4/26/94 it became unlawful to market cellular-capable receivers in the U.S. Atlantic Ham Radio assures us it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by U.S. Customs.

Bob Grove, WAP4YQ

AOR AR8000 Handheld Scanner

Considerable interest has been directed toward the newest scanner entry from AOR, the AR8000. Handsome and stylish, the 8000 radiates a professional appearance. An oversized, edgelit LCD window offers four rows and eleven columns of bold alphanumeric characters—44 in all. More features are packed into this package than into any previous scanner, handheld or not.

Operation is not intuitive; resist the temptation to switch the unit on and listen. Twenty-four keys (most of which are dual-function) pose a challenging task, especially since many of the functions and their terms like "hunt", "pass", "free scan", "edit", "swap", "move," and "change" are unfamiliar.

"Newuser" or "Expert?"

For the inexperienced scannist, a "Newuser" function may be selected which considerably simplifies operation, although some options are thereby made inaccessible. AOR recommends that all users begin at this level for familiarity.

For diehard scanner veterans (and masochists), select "Expert" and unbridle all of the scanner's convoluted functions. The 115-page owner's manual (that's right—115 pages!) is well written and comprehensive, but if you are intimidated by high tech, this is not going to make you a happy camper.

Autostore, RS232 remote control, cloning a second radio, power save, keyboard beep defeat and cursor activation are a few more selections. A four-character password may be entered into any channel(s) that you want to blank out so that others won't see your selection(s).

Specifications

With a stated frequency coverage of 500 kHz (programmable down to 100 kHz) through 1900 MHz (less 824-849, 869-894 MHz cellular) and 1000 memory channels (twenty 50-channel banks), the 8000 offers AM, USB/LSB, CW, WFM and NFM modes. Tuning steps may be selected from 50 Hz through any multiple of that base through 999.995 kHz, accommodating any bandplan.

A top-panel rotary knob is used for a variety of tasks including continuous frequency tuning, channel stepping, and function selection during setup routines. Dual VFO capability, with the LCD displaying both frequencies, permits monitoring of two-frequency simplex as well as setting the limits for the search function.

VFO-tuned frequencies can be entered directly into memory, and any memorized frequency can be tuned up or down in frequency by the tuning knob.

Scan and search rate are a respectable 30 steps per second. Each channel may be programmed for frequency, mode, audio or free (carrier) scan/search stop (with up to 99 second programmable rescan/re-search delay), a 10-dB attenuator, step size, offset step, and channel designator. Any one channel may be selected for priority sampling. An LCD bargraph S-meter provides a convenient reference for signal strengths.

Sensitivity varies with frequency and mode. On shortwave (2-30 MHz), expect 1 microvolt (μV) for SSB/CW and 3 μV for AM; VHF and UHF are better—0.25 μV SSB and 0.35 μV NFM, with 1 μV for AM and WFM. NFM sensitivity decreases somewhat as frequency climbs: 1-3 μV in the 1-1.9 GHz range. These specifications assume 10 dB signal-to-noise ratio on AM/SSB, and 12 dB SINAD for NFM/WFM.

Selectivity is a mixed bag. SSB (-6/-50 dB) is 4/15 kHz (4:1 shape factor): not good, but this isn't a communications receiver. AM/NFM, on the other hand, shows -6/-60 dB points at 12/25 kHz (2:1 shape factor): quite good. WFM at -6/-50 dB (4.5:1 shape factor) is 180/800 kHz—not audiophile, but usable.

Audio is a robust, 120 milliwatts into 8 ohms with 10% total harmonic distortion (THD). Power is provided by four replaceable AA NiCds (provided) or alkaline cells. A recharger is included. The radio can be recharged or powered by an external 9 to-16 volt DC source.

A BNC antenna connector supports the factory-provided antenna or accommodates a mobile or rooftop antenna lead. An internal ferrite rod antenna is utilized for medium-wave broadcast band reception.

A slow (five-second sweep), narrow-span "band scope" (spectrum display unit) allows the user to view a few kilohertz either side of the center frequency for signal presence. Any signal being monitored will be interrupted every five seconds as the vertical bargraph elements are updated.

Up to seven alphanumeric characters may be entered for channel identification. Every time the 8000 is switched on, a four-second commercial appears, "WELCOME TO THE

WORLD OF AR8000 RECEIVER," before the scanner can be used. I am told that this is defeatable (maybe when I become an "expert?"), but I couldn't find the procedure in the manual.

So, does it work?

It's actually easier to test the performance of a radio like the AR8000 than to describe its functions. You hook it up to an antenna and see how it behaves under key specs like sensitivity, selectivity and dynamic range.

Tuning the scanner through shortwave in upper sideband (USB), we discovered that our sample was mistuned by about 500 Hz; that is to say, all frequencies were reading 500 Hz lower than they really were. The rather wide SSB filter let a great deal of adjacent-channel interference through, and strong SSB signals "pumped" the AGC to distortion.

But once again, we must keep this all in perspective; as we pointed out, this is not a communications receiver, it is a scanner. Strong AGC pumping can be reduced by activating the attenuator (which will also reduce adjacent-channel interference), and frequency stability is excellent. The 50 Hz steps are a good choice for SSB fine tuning.

Narrowband FM (NFM) showed excellent sensitivity and selectivity; wideband FM (WFM) was acceptable, given the 200 kHz channel spacing for broadcasters. AM bandwidth is a bit too wide for shortwave, making it difficult to determine what frequency a station is on as well as allowing adjacent-channel interference. Audio quality is very good.

The S-meter is much too generous, pegging full scale with an external antenna regardless of where the radio is tuned throughout the HF spectrum. The full-scale characteristic is very telling—like most scanners, the dynamic range is quite limited. A background din of shortwave stations is omnipresent when using an outside antenna. The attenuator, of course, reduces, or even eliminates that, but also reduces weak signal reception.

Service personnel will be pleased to note that the 8000 uses plug-in boards which are swapped by the factory for replacement rather than having to face laborious, microscopic troubleshooting of the teensy components.

All in all, the new AOR product is an impressive piece of work, a definite substitute for the former leader of the pack—the now illegal to import Yupiteru MVT-7100. Plan on spending many hours reading the manual, but once this radio is harnessed and its power unleashed, it's hard to imagine any function which has been overlooked.

The AOR AR8000 handheld scanner is $649.95 plus $7 shipping from Grove Enterprises, PO Box 98, Brasstown, NC 28902; toll-free phone orders, 1-800-438-8155.

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

• Sony's New ICF-SW7600G

with Synchronous SSB

• Watkins-Johnson HF-1000:

How's It Faring?

Now marks an unusual tenth anniversary. Sony's ICF-2010 has not only been around that long—longer than most marriages—but also continues to be a brisk seller.

There are lots of reasons for this unprecedented success, but at or near the top of the list is its synchronous selectable sideband circuit. For years, the '2010, sold in some countries as the ICF-2001D, was the only radio that offered this. Indeed, until this year, you couldn't get that synchronous feature in a new portable for less than around $350, street price. With shortwave and AM stations, synchronous selectable sideband not only reduces fading distortion, it also reduces adjacent-channel interference—a winning combination for increasing listening pleasure.

Well, forget all that. Sony has finally come out with a portable that lists for $229.95, with a street price expected to be under $200. This is no Chinese-made *el cheapo,* either. It's made in Japan, and its synchronous selectable sideband works just like that of the venerable '2010, but more easily.

But let's come down to earth. For all that, this is no '2010. Rather, the '7600G is the latest evolution of what started years ago as the ICF-2002. This evolved into the ICF-2003—George Bush's radio when he was in the White House—and, most recently, the ICF-SW7600. Now, it's been upgraded into the '7600G.

How can they do it? By including only those features that you really need. For example, it has a direct-frequency entry keypad, up/down slewing, 22 presets and signal-seek scanning (finds a signal, stops two seconds, seeks the next signal, stops two seconds, and so on). Yet, there is no tuning knob, which the '2010 has.

Also unlike the '2010—or Grundig's $199.95 Yacht Boy 400—there's only one bandwidth, although it's very effective. There is a 24-hour clock, which displays only when the radio is off. There's also a basic timer/sleep feature.

Sony's ICF SW7600G

The ergonomics aren't in the same league, either. For example, some controls, such as for operating the synchronous detector, are secreted on the side of the radio. And memory presets are called up through the numeric keypad, not a discrete bank of one-push buttons, as on the '2010.

Also, pretty much all you get with the radio is, well, a radio. However, it does come standard with a measuring-tape-type antenna to boost sensitivity slightly—something you do not get with the '2010—and a simple vinyl carrying case. But there is no AC adaptor, which really should be standard on any serious portable. No stereo earpieces, either, so you can enjoy the radio's FM in stereo (another feature not found on the '2010).

What you do get is a radio that handles shortwave signals very nicely. Selectivity is more than ample, especially when it is coupled to the synchronous detector's ability to select one sideband over the other. This knockout combination puts the '7600G ahead of anything at or near its price class, especially for thrifty DXers on the trot.

The '7600G's weak-signal sensitivity with its telescopic antenna is not exceptional, but there is little circuit "hiss." This makes weak signals easier to copy and more pleasant to hear.

That's the good news. Where the '7600G does not excel is in audio quality. Through the speaker, it's only average—clearly (or not so clearly) not in the same league as the Grundig Yacht Boy 400. Aggravating this is the '7600G's lack of a second, wider, bandwidth.

The bottom line is this: If you want a moderately priced compact portable that excels in coping with signals that are weak or hemmed in by interference, the Sony ICF-SW7600G will make your day. But if you listen mainly to the major international broadcasters, see if you can A-B the '7600G against the Grundig Yacht Boy 400.

Consider where you live, too. In Eastern North America and Europe, the '7600G's quiet circuitry won't mean all that much, as most signals are relatively strong. But in the

American heartland or farther west, the '7600G's virtual lack of circuit hiss is more likely to make it preferable to the Yacht Boy 400.

First Looks: Watkins-Johnson HF-1000

We avoided testing the $4,000 Watkins-Johnson HF-1000 when it first appeared some months back, as it lacked some of its advertised features. Now that it's out in an improved version, we've tested it. However, our fundamental finding is that it still needs some upgrading before it can be thought of as having reached its stride.

In a nutshell, we found much to commend. Its selectivity, for example, will knock your socks off. But we also found significant shortcomings, among them harsh audio quality. Too, the synchronous detector lacks selectable sideband—something you can get for around $200 on the Sony ICF-SW7600G reviewed above.

The manufacturer advises us that they are beavering away to improve matters. Selectable sideband will be offered before long, and at least some of the audio problem can be traced to a software glitch in the AGC. Too, more audio processing is likely to be added, which might improve matters even more.

We expect to retest the HF-1000 when it is fully decked out with these and other improvements. In the meantime, we'd recommend it only for those whose receiving activities are largely confined to utility signals, where the HF-1000 already shines.

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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The Watkins-Johnson HF-1000

John Catalano

I Stand Corrected

Review of the Powerful AEA PC PakRatt for Windows

Well, if that title doesn't get lots of people reading this column, I don't know what will! But actually, this month we are going to revisit a program which we started to run last month, but ran into problems. As it turns out, the problems were with my equipment.

Flashing back to last month, we were comparing new programs which provide the user with control of their digital signal decoding equipment (also called a Terminal Node Controller, or TNC). This new generation of program doesn't simply make you look up the commands in the instruction book and then make you key them in. No way! After all, what is a computer for?!

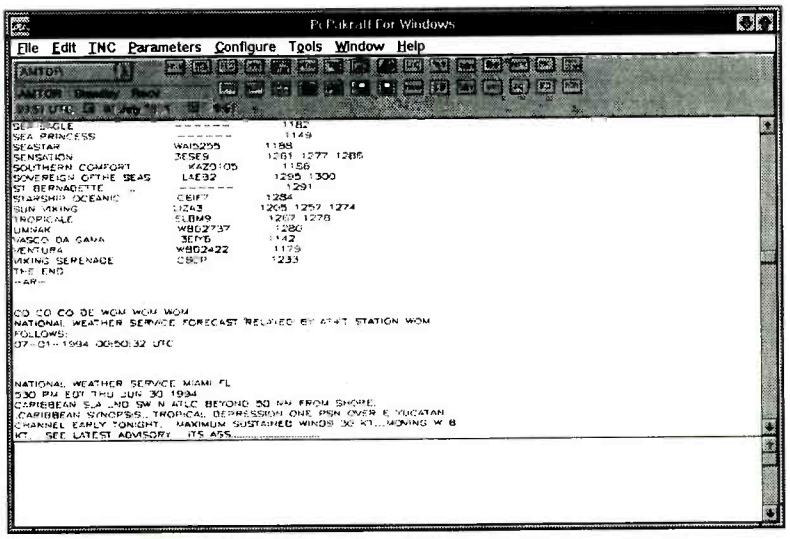

FIGURE 1: *AEA PC PakRatt for Windows main screen*

These new, "user directed" programs have all the commands in their memory. The user simply picks from a menu, and his/her bidding is done. No more memorization of strange language commands that make Klingonese sound simple. Now you can use all the power of your TNC, not merely the limited number of commands you can remember.

TNCs come in many shapes and sizes. We are trying these programs on AEA's PK-232MBX. See last month's column for our discussion of another of these new TNC control programs—CopyCat, from Computer Aided Technologies (See ad in this issue).

We also tried AEA's PC PAKRATT for Windows, but encountered some problems. Well, after a word with the good people at AEA, the problem was tracked down. If you remember, I said that the instructions which came with PC PAKRATT said that it required TNC firmware to be dated 1991 or newer. This firmware stuff refers to memory chips in the TNC which contain all the decoding and operating programming. We tried to use a PK-232MBX with mid-1990 firmware, against the warnings on page 16 of the manual.

Although I think that this critical system requirement should be clearly stated on the box and in the advertisements, I was wrong trying to run it once I read page 16. A contrite call to AEA, shipment of new firmware and a mere ten minutes of installation time was all it took. Installation of the new firmware was: simply removing six screws, gently removing the old electrically alterable programmable memory (EPROM) chip from its socket, insertion of the new chip in the socket and buttoning up the case.

With upgraded firmware in the PK-232MBX, PC PAKRATT worked as soon as it was loaded. How did it perform? Let's see.

PC PAKRATT for Windows, version 1.00A, comes on both 3.5 and 5.25 high density disks, requires Windows 3.1 on an IBM AT with 4MB RAM, 3MB free hard disk space, VGA or SVGA display, one or more serial ports and a mouse. Oh, and don't forget—AEA TNC firmware dated 1991 or later. This can be obtained from AEA if required.

The program installation is almost automatic and easily loads in a few minutes. Clicking the PAKRATT icon brings up the opening screen with all controllers compatible with the program graphically displayed. These include all the AEA controllers. Unlike CopyCat, this is an AEA-only product controller.

The first time you run PAKRATT, a very neat and simple startup configuration screen appears which allows you to enter your system details, such as which comm port your TNC is connected to, the TNC model and the baud rate of the port/controller. PAKRATT can handle two TNCs if you have them. Once you define your TNC(s), the opening intro screen will now only display an image of your TNC—not a functional feature, but indicative of the amount of programming effort that AEA has put into this package.

Next, the now familiar top line tools bar, which is common to most Windows programs, is displayed with eight pull down menu choices. Clicking on main menu choice TNC, and then on OPEN TNC1, brings us to the display screen "heart" of PAKRATT (See Figure 1). The screen has seven display regions: Starting from the top, 1. the eight pull down menus, 2. a pull down TNC mode selection menu, 3. "buttons" for selecting all the possible control/feature choices associated with a mode, 4. the status of the TNC, 5. date and time, 6. decoded data and, 7. for hams, the bottom of the screen is where text for transmissions is typed.

Looking at the third screen region—available control/features the selectable options are really split into three categories: mode control functions, received data storage and station logging. That's right! PAKRATT includes a very elegant logging section. By clicking the LOG button you are now ready to log the station you are decoding. It's only a single page per entry, set up for the Ham user with entry titles such as POWER and UR RST. But, it's very useful to SWLers and very, very easy to learn to use.

The three main received data storage buttons allow you to capture (store) received data to a disk file, suspend saving data to the file and erase the receive screen (buffer) of all data. There is also a print button which sends all data in the received screen to your printer.

PAKRATT, when used with a PK-232MBX, can be switched into ten different modes: HF Packet, VHF Packet, AMTOR, ASCII, Baudot, Pactor, Morse, Navtex/TDM, Signal Analysis and Dumb Terminal (this mode doesn't provide any command or function

menus—get out the old instruction manual!). The number of operational options would literally fill a book, so we cannot cover them all in this review.

Let's choose a simple mode, Morse, and see what the screen displays (See Figure 2). Clicking MORSE reconfigures the third region into nineteen function "buttons." For Morse, three of these buttons are operating parameters: Morse speed, Mweight (dot tone length) and speed lock. You can either watch the TNC adjust the first two "on-the-fly" as it decodes a signal, or set the values yourself. By clicking PARAMETERS on the top line and then clicking Morse Params, nineteen (19) more setable parameters are displayed along with their commonly used default values. On all modes I tried, with the exception of VHF Packet, the default values resulted in acceptable decoding. But it's nice to know the capability exists if you want to experiment.

Under the PARAMETERS pull down menu is yet another menu with ten MISC setable parameters!

One more very useful feature is the operation of the HELP button on the parameter screen. HELP will bring up an explanation of every setable parameter and its default value. Very nice! Goodbye to the bulky, no index, where did I put the ---- manual!

The more complex decoding modes display twice as many command buttons and at least as many selectable parameters.

Now, calm down. As I said, PC PAKRATT can be used with the default values for all common shortwave modes with excellent results. The exceptions are Packet and TDM and are due to the nature of the modes. So it really is a "load and go" program.

The Bottom Line

I have used my PK-232MBX since my wife gave it to me for Christmas 1990. I studied that darn manual for hours on end: while watching TV, nights I couldn't sleep, on airplane trips, in trains and cars (not as the driver). But every time I used the PK I wondered if I was getting all that it was capable of doing. With PC PAKRATT I don't have to wonder any longer. It squeezes the PK-232, and the other AEA TNCs, to produce their maximum potential for their users. It's easy to learn and a pleasure to use.

Wish List Additions

I'm sure those of you who read this column regularly can guess my first suggested addition to PC PAKRATT. It is, of course, receiver control. It's not a total monitoring environment without it. No matter how super they make some of the parts, we need all of the parts, and that includes receiver control.

Now, I realize the limitations of memory size on program functions. But that will not stop me from "wishing" that PAKRATT for Windows could be included as part of AEA's Log Windows program (reviewed in July) and not a separate program.

A small, maybe too small, but important wish: the function buttons have been designed with almost too much attention to detail. The text on some of the button commands is a strain to read. How to improve it? I admit I don't have all the answers; only the observations.

And finally, let me voice the SWLer's wish that the log screen contained two user selectable formats: one for Hams (the current one) and an alternative for SWLers. It shouldn't be that difficult to include both and let the user choose. In a similar manner, the whole transmit portion of the screen and associated commands could be chosen for deletion by the SWL user.

COPYCAT vs PC PAKRATT for WINDOWS

That's a tough call. Both of these fine programs have features we haven't covered. Who is the winner? PAKRATT has a built-in logging function. CopyCat does not. CopyCat can be used in a user directed manner with AEA, Universal and MFJ-1278. PAKRATT cannot. PAKRATT assists you in fine tuning all the parameters of AEA's TNCs. Copycat cannot. CopyCat is priced at $69.95 and PC PAKRATT for Windows is priced more than $30 higher (check with your AEA dealer for exact price).

For use with both AEA and Universal TNCs, CopyCat is the winner. But for AEA TNCs, PC PAKRATT, with its parameter help and flexibility and its logging function, is the winner.

PC PAKRATT for Windows, by AEA, Advanced Electronic Applications, 2006 196th St. SW, Lynnwood, WA 98036, Tel (206) 774-5554, is available from AEA local dealers. AEA also makes a DOS version of PC PAKRATT.

CopyCat is available from Computer Aided Technologies at (318) 686-1234. Check AEA's and Computer Aided Technologies' ads in this issue of *MT* for the latest program details.

Holy HOKA!

Next month we tackle a subject that has collected comments such as "Does it really exist?", "Stop teasing us!" and "Holy HOKA!" Yes, we have managed to trap the legendary HOKA Code 30. Get the whole story of the hunt, taming (I hope) and use of the HOKA. The story is still "decoding" as we speak.

Before we close I'd just like to remind all readers that software programs evolve at rapid rates. On media such as CD rom, the time to publish a review can be greater than the time it takes to release a new version. So once you find, or read about, a program you are interested in, always check with the manufacturer/author. Ask about the latest version and the availablity/cost of registration and regular updates for public domain and shareware.

Radio monitoring is a fast moving, rapidly changing hobby in itself. When coupled to computers, it can be blinding and all consuming. But it's important for all of us to remember it's all only electrons, and not the real world. The human world with all of its problems is the reality in which we all live and die, and to which we hopefully make a positive contribution. To borrow a phrase from the author Richard Bach, "Perspective..., use it or lose it."

'Til next month.

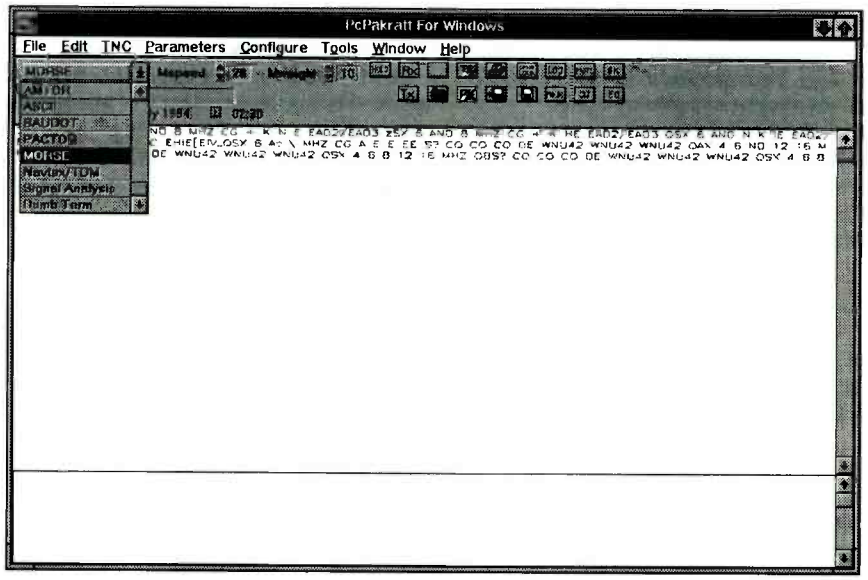

FIGURE 2: *PakRatt main screen in Morse mode*

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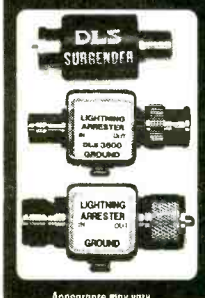

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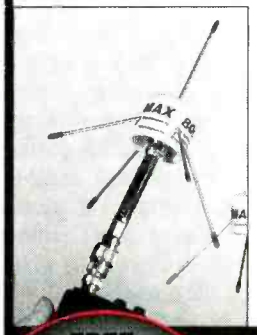

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Fun for Beginners—Kit Building

Have you built an electronics kit? If so, how long has it been since you sorted parts, puzzled over the instructions and heated a soldering iron? If you've missed this fascinating pastime, you owe it to yourself to get involved and experience the thrill of hearing or sending signals with equipment you practically built from scratch.

Numerous companies sell raw kits at reasonable prices today. Some of the equipment is purely for receiving, and there are kits for transmitters, transceivers, test gear and amateur station accessories.

Kit Building is Educational

A basic understanding of electronics is helpful when you need to repair home made or commercially built equipment. Kit building provides an opportunity to follow a circuit from start to finish, stage by stage. Identifying and installing components on a PC board enables you to learn what various parts look like, and this can be helpful later on when you repair existing apparatus.

Proper soldering is an art. The more projects you build, the better your skill in creating a secure, neat solder joint. This is valuable knowledge also when making repairs.

Many beginners have their greatest difficulty when using a soldering iron or pencil. The secret is to warm the two mating metal surfaces with the tip of the iron before applying the solder. Knowing when to remove the iron is important also. As soon as the solder flows easily and provides a shiny bead, remove the iron and allow the work to cool. Use only enough high-quality rosin-core solder to cover the surfaces being soldered.

Poor joints often result from too much sustained heat. The resultant joint may appear dull and grainy, and this can lead to an intermittent condition later on. Excessive heat is apt to lift the copper foil from the PC board, and it can damage the component being soldered to the board.

Too little heat, on the other hand, causes a similar malady, which is referred to as a "cold solder joint." The best advice I can offer is to not "send a man to do a boy's job." Specifically, use a light-wattage soldering pencil for all PC board work. A 25-watt iron with a pointed, conical tip is best for this light-duty soldering. See last month's column for more advice on soldering techniques.

TABLE 1: Kit Manufacturers

A & A Engineering	2521 W. LaPalma, Unit K Anaheim, CA 92801	Amateur radio and test equipment kits
Oak Hills Research	20879 Madison Ave. Big Rapids, MI 49307	Amateur radio and test equipment kits
MXM Industries	Rt. 1, Box 156C Smithville, TX 78957	Amateur radio kits
Dan's Kits	1935 S. 3rd West Missoula, MT 59801	Short wave receiver and other items (kits)
Science Workshop	Box 310B Bethpage, NY 11714	Test equipment kits (spectrum analyzer)
S & S Engineering	14102 Brown Road Smithburg, MD 21783	Test equipment kits
Ramsey Electronics	793 Canning Parkway Victor, NY 14564	Receivers and Accessories kits

Kit Building Basics

The day you've been waiting for has come! Your kit just arrived and you're anxious to commence building it. At this important phase of the project you must exercise caution and avoid stuffing parts into the PC board. First, sit down and read the instruction manual from cover to cover. Read again those portions that did not seem clear to you. Study the schematic diagram and try to learn what's happening in the circuit.

After you have become familiar with the assembly instructions and the circuit, it is time to count the parts. Make certain that all of the components are in the various packets before you start assembling the project. Don't be surprised if something is missing, or that there are more parts than the circuit specifies. I just built a 40-meter transceiver kit and ended up with 14 unneeded parts! When I spoke to the kit supplier on the phone he laughed and said, "I often pack too many parts. I'm getting old and my eyes aren't what they used to be."

If you are short on the parts count, notify the supplier immediately so that he or she can ship those components to you in time to prevent a delay in construction.

Kit Building Tools

Perhaps the most important item a kit builder needs is a magnifying glass. Even younger builders with sharp vision will find this device essential for accurately identifying the color codes on resistors and RF chokes. A magnifying glass is helpful also when identifying transistors and ICs in accordance with their assigned numbers.

Diodes are very difficult to identify, owing to the very small print on their bodies. A magnifying glass will be invaluable for this application as well. Furthermore, the glass will enable you to look for bad solder joints and unwanted solder bridges between PC board conductors after the assembly is finished (and before you apply dc voltage to the circuit!).

Solder wick and/or a solder sucker is another vital addition to the kit builder's collection of tools. It is not unusual to install a component in the wrong place on a circuit board.

Solder wick removes the solder to permit lifting the component from the board and relocating it. Solder wick is laid on the soldered joint and heated with the soldering pencil. It absorbs the solder, leaving a clean

joint. A solder sucker is placed on the joint after it has been heated with the iron. When the plunger is released it sucks up the melted solder and cleans the joint.

Important Construction Tips

I have seen the results of kit-building efforts on behalf of some who lacked experience, and the end result has been tragic. Specifically, some first-time builders leave very long leads on capacitors and resistors, which results in the parts standing 1/2 to 1 inch above the component side of the board. All of the parts should be snugged tightly against the PC board surface before they are soldered in place. Long leads cause instability (self-oscillations) and degeneration (a loss in stage gain).

Be sure to keep the wire leads between the PC board and the panel hardware as short and direct as practicable. Mount the PC board in the project box so that RF and audio leads to the panel are short. The dc leads may be as long as necessary without ill effects.

Make an effort to learn to read the color code for resistors before you start your project. Knowing how to identify the resistors by their color bands can save a lot of time and this will help to ensure that the proper resistor is plugged into the correct holes on the PC board. Pay special attention to the colors on 1/4-watt resistors. What may appear purple, for example, may actually be brown. Here's where that magnifying glass comes in handy.

It can be difficult to know which capacitor is which, because the markings on the capacitor bodies are often confusing. Most disc ceramic and "match head" capacitors contain a numerical coding that confuses beginners. For example, 101M means 100 pF. In a like manner, 473M signifies a 470-pF capacitor. I don't understand why the last numerical digit has to be so confusing, but that's the manufacturer's code. Also, 104M or 104Z equals 0.1 μF, and 103M or 103Z is often assigned to 0.01-μF capacitors.

If you're confused at this point, you're not alone! I find that the best solution to the problem is to have a capacitor checker on hand when assembling a kit. It will remove all doubt when selecting the proper capacitor for a specified point in the circuit. An ohmmeter is similarly useful for ensuring that you have selected the correct resistor.

Pay special attention to the polarity markings on electrolytic capacitors, such as those 10- and 22-μF units that are so common in kit circuits. One side of the capacitor body has a black stripe that runs from top to bottom. The negative lead is closest to the stripe. In most circuits the negative lead connects to circuit ground. Kit suppliers usually silk screen a + mark on the PC board to indicate how the electrolytic capacitor should be indexed. If not, check the schematic diagram to learn where the positive lead should be connected. If the polarity is mistakenly reversed, the circuit may not function, or the capacitor may get hot and destroy itself.

Kit Suppliers

There are many suppliers of quality kits. Most of them provide catalogs upon request. You may want to order catalogs and browse through them before choosing a kit project. If you need a drilled PC board for a *QST*, *CQ* or *73* magazine project, chances are that Fred Reimers at FAR Circuits, 18N640 Field Court, Dundee, IL 60118 can supply it. Ask Fred for a listing of what he has in stock. Table 1 lists some of the better-known suppliers of kits.

In Summary

If you're new to the art of circuit or kit building, I suggest you begin with a couple of simple projects in order to gain experience before tackling the more complex types of kits. Your reward will come in personal satisfaction for having built a piece of equipment that is useful in your radio room.

Bill Cheek
bill.cheek@f731.n202.z1.fidonet.org

Digital Logic Simplified

I am painfully aware of the intense fear some of you dear readers may have for things digital. I myself was a confirmed holdout against the digital transition. I still have boxes and bins full of old tubes, 2N404 transistors and selenium rectifiers. Nevertheless, I am a convert to the world of digital technology. I have to be, if I want to squeeze the most performance out of the new receivers coming out today.

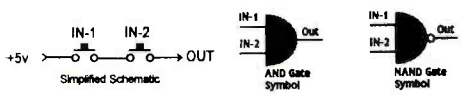
We will take it slow and easy, though, with a little something thrown in each month for those of you who haven't made up their minds about the world of 1's and 0's.

You digital gurus will have to bear with me for a couple of months while I introduce the fundamental circuits of digital technology to those who are just waking up to it. Sorry, it can't be helped. Digital novices should sit up and pay attention because we're going to have some fun as we learn. I will skip as much "theory" as possible and by next month, we'll be into hard core, hands-on, down and dirty circuit building.

Digital technology offers cheap and effective ways to inject raw horsepower into our monitoring stations. In most cases, digital IC's are priced at around a buck or less. What's more, the necessary peripheral components for each IC usually amount to no more than a few cents. In many cases, the hobbyist can concoct a fairly sophisticated digital circuit for well under $5.00 and reasonably expect it to work the first time out. Now let's get to the groundwork; fun stuff just ahead!

The fundamental building block IC's of digital electronics include: AND, OR, and BUFFER circuits followed by their logical opposites: NAND, NOR, and INVERTER circuits. Add to this list, the EXCLUSIVE OR (XOR) and EXCLUSIVE NOR (XNOR) circuits to round out the first lot. There are a few other basic logic circuits but those listed here will do for now. Figure 1 lists some examples of each IC with pinouts for the 74HCxx series. Symbols and simplified schematics are given in the following introduction of the more common logic circuits: AND, NAND, OR, NOR, and buffers/inverters.

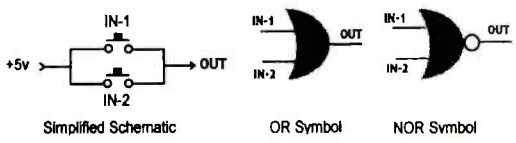
AND and NAND Gates



The AND circuit is easiest to comprehend and be understood as two switches in series, such that Switch 1 AND Switch 2 have to both be closed in order to get an output. Closing just one switch won't do. That's why this circuit is called an AND gate. Suppose you had a heat sensor on one input and a smoke sensor on the other. The AND gate would not output to an alarm until BOTH conditions existed. This "intelligent" logic helps prevent false alarms.

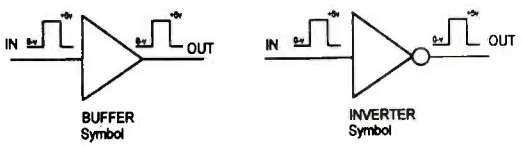
The opposite logic circuit of the AND gate is called a NAND (Not AND). Don't get hung up on the NOT term here; it is only a Boolean expression that means logical opposite of what is to follow. A NAND isn't as easily represented with switches as the AND gate, but is understandable described as an inverted AND function. If both switches are closed, the output is low, but if either switch is open, then the output is high.

OR and NOR Gates



Next, we have the OR gate. Either switch closed (or both: it doesn't matter), will produce an output high. An OR gate could be used to trigger an alarm if either smoke OR heat existed, see? The opposite logic of the OR is the NOR and like the NAND, it is more difficult to depict than to describe. Neither an input on 1 nor an input on 2 are required to get an output high. Conversely, there is no output high if there is an input high on either 1 or 2 or both.

Buffers and Inverters



BUFFERS and INVERTERS are the simplest of all. First, both are properly called "buffers" with specific terms to identify each type: non-inverting buffers and inverting buffers. I shall refer to them as "buffers" and "inverters," however. Both of these circuits completely isolate the output side from the input side. Buffers provide only isolation while inverters first isolate and then invert the input to its opposite state in the output. Logic inversion turns 1's into 0's and 0's into 1's. There are instances of non-isolating inverters, but we'll not use them in our projects.

Applications

Now, let's look at some real world applications of AND and OR logic. The simplest AND circuit exists in your home with Switch 1 as one of the circuit breakers in the AC service entrance and another as the switch on your radio. Both the circuit breaker AND the On/Off switch on your radio must be ON before the radio will work.

Simple OR logic exists in most two-story homes where there is a light switch at the top of the stairs and another at the bottom, and where either switch being on will satisfy the OR wiring to light the bulb.

AND and OR logic are not complicated....not in the real world and not in electronic logic circuits. On the other hand, NAND and NOR logic can be confusing because it is hard to draw a picture of how they work. This is a case where a few words are worth more than a hundred pictures. The best way to understand NOT logic is to first view the function in its positive logic state; (analyze it in terms of AND and/or OR) and then invert the output! For example, a NAND gate is only an AND gate with an inverted output. Same with a NOR gate being only an inverted OR, you see. Think of NOT logic as in the case where an indicator LED signifies trouble (oil pressure idiot light in your car) as opposed to another light indicating normal operation (pilot lamps).

Spend a little time with Fig-1 to come up to speed for our next several projects. You'll notice some peculiar pin markings in Fig-1, but relax, because all these chips offer the economy of several identical circuits on a single chip. One or more sections can be used in any project. For example, look at the pinout for the 74HC08A NAND gate. NAND "A" consists of two inputs at pins 1-2 with an output at pin 3. NAND "B" has two inputs at pins 4-5 with an output at pin 6. Ground is at pin 7 followed

FIGURE 1: *Common CMOS Logic Chips*

AND	OR	NAND	NOR	XOR	XNOR	BUFFER	INVERTER
4081	4071	4011	4001	4030	4077	4050	4049
74HC08	74HC32	74HC00	74HC02	74HC86	74HC7266	74HC4050	74HC04
				4070			

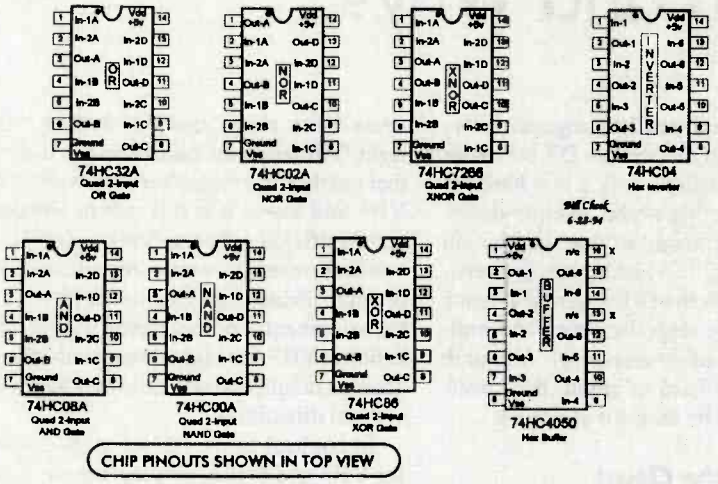
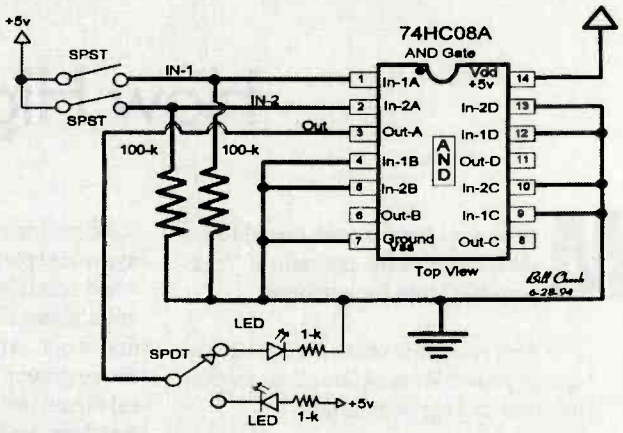


FIGURE 2: *Trainer Circuit for -AND- Logic*



Note: Bold traces are the required AND circuit. Light traces are the optional control interface. The SPST switches can be a simple 2-seg DIP switch. The SPDT toggle switch and LEDs demonstrate the two different ways to derive logical outputs for this type of AND gate. Eliminate the light-trace circuits and add your own In/Out requirements as desired.

by two inputs for NAND "C" at pins 9-10 with an output at pin 8. NAND "D" inputs are at pins 12-13 with an output at Pin 11. +5v feeds Pin 14.

None of these four NAND gates interact with each other. As with all CMOS circuits, the INPUT pins of all unused sections must be grounded to prevent oscillations. For example, in Fig-2, a test circuit for the AND gate, we'll use section 1 only, so you'll see that the other inputs—Pins 4-5, 9-10, and 12-13—will be grounded. Unused outputs should be left alone, unconnected.

Closing Notes:

Two different logic families are shown in Fig-1: the 4000 series and the 74HCxx series. As a rule of thumb, logic families are not to be mixed, though we can sometimes mix these particular two families without adverse consequences. You should avoid the mixture where possible, though. The 4000 series IC's draw more current; operate slower; and are best suited for +8v and even +15v logic though they will work at +5v. The 74HCxx series are limited to +5v logic, but are faster with extremely low current requirements. The 74HCxx series will be the logic family of choice for most of our forthcoming projects.

Use the 4000 series only if you must, and then be sure to have a data sheet on each one, because the pinouts can differ from the 74HCxx series. In all cases, standard CMOS handling precautions should be exercised with these two logic families. Static charges can zap them. You probably can't go wrong with laying in a small supply of 74HC00A, 74HC08A, 74HC4050, and 74HC04 for future projects. Also stock a supply of LEDs, 0.1-µF capacitors, and resistors in the range of 680-Ω to 100-kΩ. It won't hurt to peruse my recent columns in back issues of *MT* and build, buy or have available a +5v regulated power supply for bench and testing needs.

By the way, for the most timely and expedient technical support for projects in this column, you can always reach me direct at my BBS, the Hertzian Intercept, (619) 578-9247, after 5:30pm and before 1:30pm, weekdays, PDT; 24-hrs, weekends. Replies usually posted by noon the following day. I am available by E-Mail over the Internet at the address above.

A Hidden Feature of the Sony ICF-2010?

Gerald S. Busch of Coderre, Saskatchewan, Canada, has an interesting shortwave listening tip to share with us this month. Gerald says owners of the Sony ICF-2010 receiver may be disappointed by the audio quality of the USB and LSB modes. The narrow SSB filter can make signals sound very muddy. There is a workaround, probably unintended by the set's designers, since it involves use of the apparent AM-only function. The owner's manual makes no mention of the technique, nor does it explain single-sideband reception.

Gerald says you can clarify those muddy sideband signals by using the synchronous detector! First, tune a sideband station in the usual manner. As soon as you have adjusted the frequency to bring the voice to normal pitch, switch on the "SYNC" mode. You may have to toggle back and forth between this and the SSB mode a couple of times until the circuitry locks in properly and the voice becomes intelligible. Once it does, you are still using the narrow filter, but you now have the option of switching to the wide filter, which was not available in sideband mode.

If adjacent frequency interference is not a problem, reception with the wide filter yields clearer and natural sounding audio, for a more pleasant monitoring session!

W. Clem Small, KR6A, CET

How High and Why?

Maybe you have heard the old-time shortwave radio operator's "best-possible" rule for antennas:

"For best reception make the antenna as high as possible, as in-the-clear as possible and as long as possible."

Using this rule the old-timers accomplished a lot of effective radio communications, so let's take a look at each of the factors in the rule and see if we can find out what those radio operators of yesteryear were trying to tell us.

Hang 'em High!

Radio wave propagation follows the same rules as light wave propagation: if the antenna can't "see" an incoming wave it can't respond to it. Hanging the antenna as high as possible gives it maximum exposure to incoming signals. But there's another important consideration in deciding the height of your antenna. Note in fig. 1 that the vertical directivity pattern for a horizontal single-wire antenna changes dramatically with changes in the height of that antenna above the ground (radio ground, also called electrical ground, is usually somewhat below the surface of the earth).* For instance, the 3/8 wavelength height for fig. 1B gives a good amount of low-angle response, which supports line-of-sight local work as well as DX.

The 1/4 wave height (fig. 1A), with its combination of high and low-angle directivity, would perform less well on DX but better when receiving stations only a few hundred miles away or for high-orbit satellite-detection work. At the height of one wavelength above ground (fig. 1C) and higher, the vertical directivity pattern of a horizontal antenna develops multiple response lobes and multiple nulls (areas of no response). Although these heights are hard to attain, the lower-angle nulls could be used for DX work.

Hang 'em in the Clear!

If there are electrically-conductive obstructions in the path between the antenna and an incoming signal then much of that signal may be absorbed or reflected before it can reach the antenna. Although we know that metal buildings are conductive obstructions, keep in mind that earth (hills, for instance), metal inside wood buildings (heating ducts, wiring, etc.), and even trees and other vegetation can be conductive and degrade reception when they are in the path between a desired signal and your antenna. Keeping the environment around the antenna free of conductive obstructions is an important part of good reception.

Changing Bands

The higher the frequency of the received signal the more necessary it is that the path between the transmitting and receiving antenna be a clear, straight shot or "line of sight."Although the radio horizon is a bit farther out than our visual horizon, we find that at VHF and above it is difficult to consistently get significant over-the-horizon (OTH) communication unless we use repeaters, satellites or sophisticated and expensive forward-scatter equipment. For local terrestrial communication at VHF and higher we usually choose an antenna height that will allow good low-angle vertical directivity.*

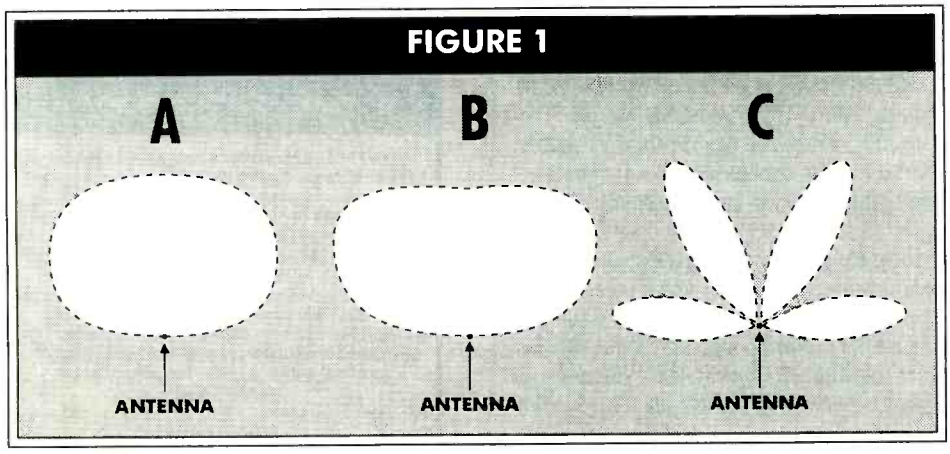
In contrast to the line-of-sight limitations for VHF and higher frequencies, we find that on the HF band OTH propagation is the primary means of communications. This is because of the prevalence of ionospheric skip. By utilizing skip an antenna which can "see" only the sky above it can receive signals from nearby stations up to several hundred miles out. To receive really distant signals the antenna must often be able to "see" as low as a few degrees above the horizon. And so for maximum skip performance antenna height should be chosen to provide the vertical radiation pattern appropriate to the distance of the received stations from the receiving antenna.*

In addition to skip propagation there is also limited ground wave OTH communication at the lower end of the HF band. As we move down in frequency we see that groundwave communication is the major basis of OTH work on MF, and at LF and lower frequencies we find that ground waves become the only dependable source of OTH communication. Groundwaves remain close to the ground even on around-the-world paths; thus antennas which are near the ground can be utilized, and higher is not necessarily better.

Is Longer Really Better?

Is a longer antenna always better? The old-timer's rule we're dealing with came from the days before beams and other resonant antennas with decent gain-levels were in common use. Random-length antennas tuned to resonance with a loading coil were typical in those days, and with this design longer usually was better.

On the other hand, we now often utilize various antenna designs which function properly only when their lengths are close to their design values. Making them longer than they were designed to be changes things like their



Vertical directivty patterns for horizontal single-wire antennas viewed from one end of the antenna. Antenna height above electrical ground is (A) 1/4 wavelength, (B) 3/8 wavelength, and (C) 1 wavelength.

radiation patterns, their gain and their feedpoint impedance; making these antennas longer often degrades their performance. This is particularly true at VHF and higher frequencies where receiving-antenna resonance is more important than it is at lower frequencies.

Even on HF longer is not always better, although increasing antenna length may yield a higher signal-level output. This is because at these frequencies signal-to-noise ratio is the primary determiner of reception quality. On these frequencies, once an antenna is long enough to pick up an easily-detectable level of the desired signal, increasing its length may only serve to increase its received noise output as well. This means that the signal-to-noise ratio is not improved and reception does not benefit from the increased signal level.

A Final Word

Note that we've been talking about getting *maximum* results from your antenna. You can actually work two-way DX with an antenna laid out on the top of a field of weeds. Even antennas laid on the ground will usually support *some* communication. On the other hand, for really good shortwave reception, your antenna should be reasonably high and in the clear, and if it is a random-length wire, then making it longer may—or may not—cause it to perform better.

RADIO RIDDLES

Last Month:

Last month I asked "So now you know that a receiving antenna can transmit, but can a transmitting antenna receive?"

Sure they can; antennas, while they are transmitting, can receive tremendous power from nearby lightning discharges. Unfortunately this received power can travel down the transmission line and destroy the line and the transmitter as well! As another example, amateur radio operators are very familiar with repeater antennas which, by use of highly selective filters, allow simultaneous reception of a signal on one frequency and retransmission of that same signal changed to a slightly different frequency—all on the same antenna. And when a Yagi-Uda antenna is transmitting, its parasitic elements (those which aren't connected to the feedline) receive energy radiated from the driven element (the one that is connected to the feedline) of that antenna and transmit along with the driven element.

This Month:

I've just pointed out that putting your antenna high is usually good for reception. I also discussed how different heights above ground can affect vertical directivity patterns, sometimes favorably and sometimes unfavorably. What relatively common applications can you think of in which mounting an antenna higher might make reception worse?

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

* *The ARRL Antenna Book*, any issue, is a good source for further reading on the effect of antenna height and on radio ground.

ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ

Q. *I own two early-model Realistic PRO-2026 mobile scanners which have a third wire which must be attached to an unswitched source of +12 volts to retain memory channels. I understand that the new models have non-volatile memory; can I convert mine to do the same? (John Shimkunis, Philadelphia, PA)*

A. By attaching a 9-volt battery holder on the rear of the radio case (or even mounting it inside the case), that third wire can be connected to the +9 volt battery terminal and the other battery wire attached to the negative power lead at the radio.

Q. *Our local paper reports that a new "trunking" system for police will make scanners useless. Is this true? (Paul Imming, Peterborough, Ont.)*

A. No. Marketing zealots make wild claims in their feverish frenzies to woo customers, but the truth is often very different from the sales pitches.

Trunking is nothing more than automatic channel switching between transmissions so that several users can equally share a common pool of frequencies. While the scanner may have to change frequencies between each transmission, there is a fixed number of frequencies (in sets of five) to scan.

The problem is that there are several different trunking technologies, and no scanner knows which frequency will be selected next by the trunking transmitter.

This often results in the listener manually having to step through the channels in order to continue monitoring transmissions from the same agency.

Q. *What were the common frequencies used in the Marconi days of radio? (Gerald Gaule, Lebanon, OR)*

A. 'Way below the medium-wave broadcast band. Discrete frequencies were not the issue since spark-gap transmitters were broadband in nature, and coherers were not the most selective of detectors.

A good guess would be 100-200 kHz.

Q. *Why can I hear 5800-5900 kHz shortwave broadcasters in the 1600-1700 kHz range of my cheap AM/FM radio? (Jerome Kaye, D.D.S., Bayswater, NY)*

A. You are probably hearing an intermodulation ("intermod") product produced by overloading the limited capabilities of your radio.

Intermod is produced by two strong signals mixing in some non-linear (driven to distortion) amplifying component in the receiver's "front end" (RF amplifier stage). Sum and difference products of the two original signals are then produced.

For example, if a strong signal were heard on 9000 kHz and another at 7400 kHz, their sum and difference products would produce spurious signals ("spurs") on 1600 kHz and 16,400 kHz, the sum and difference frequencies of the two original frequencies.

Q. *I was surprised to hear Radio "Nacional da Amazonia" May 30th on 11780 at 1400-1530 UTC here in New York; it usually disappears completely by 1100 UTC. Any explanation? (Arsenio Fornaro, Brooklyn, NY)*

Bob's Tip of the Month

Ford Taurus Interference Problem

Unlike those among us who just complain a lot, Ed Olalde of Burbank, Illinois, decided to do something about the obnoxious electrical-noise interference which he experienced on his mobile radios every time he started his Ford Taurus. He discovered that it was the electric fuel pump located inside the car's gas tank.

To confirm whether or not your Taurus has this problem, switch the ignition from "off" to the "run" position (just before "start"); make sure your radio(s) is/are on. If you hear electrical noise interference for no more than one or two seconds, it's the fuel pump.

The fix is straightforward, but it must be done by a repair facility because it involves installing an RFI (radio frequency interference) filter inside the gas tank. The cost will be in the $100-$150 range if the warranty does not apply (and it probably doesn't since your radio equipment was your option).

Ford can supply you with an 11-page RFI troubleshooting manual by calling 800-367-3333. Since other manufacturers supply RFI filters on their cars, you may also file a complaint by calling 800-241-FORD (3673).

Preventing Lockup on the Regency 4030 Scanner

Steven Kitts of Wadmalaw Island, South Carolina, discovered that the all-channel-erase procedure for the Bearcat BC2500XLT as described in the September 1993 (p.94-95), issue of *MT* would also work on his Regency 4030 (same as the BC200/205XLT). He also discovered, however, that when he subsequently tried to do a search routine, he got an "ERROR" message, and the scanner's search mode would not respond to further keyboard commands.

Steven called Uniden who informed him they would be happy to clear up the problem—for $70. Steven decided he would be much happier clearing it up himself!

He discovered that by alternately and repeatedly pressing the zero and decimal keys, the SEARCH mode would finally accept a frequency, restoring his 4030 to normal operation.

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.

A. Since I am unaware of any solar enhancements during that period, it was probably long path. While 11 MHz is compromised by solar radiation during the daytime, it is nighttime on the other side of the earth. That's probably the path your RN signal took.

Q. *Where can I listen to the Distant Early Warning System and Ballistic Missile Early Warning System communications? (Greg Pruitt, Alpharetta, GA)*

A. Alaskan DEW Line communications are confined to their local UHF network, not receivable in the lower 48 United States. BMEWS and related communications are most likely conducted over secure satellites like AFSATCOM (240-270 MHz).

Q. *Tuning around the dial of an old FM radio, I ran across what sounded like AM at about 105 MHz on the FM band, announcing the call letters, "KKUB." I can't find that on my local directory. Where is it? (Bob Brock, Phoenix, AZ)*

A. Brownfield, Texas, but it's on 1300 kHz!

Continued from page 4

values for JAN FEB MAR, OCT NOV DEC are *South* declinations and are *minus*. But the values for APRIL through SEP are *North* declinations and are *plus*."

Another reader is concerned that am (ante meridian) and pm (post meridian) make the designations of 12 am or 12 pm in the Shortwave Guide section meaningless. No doubt he's *technically* correct: Seems to me that's a good argument to use UTC instead.

Deutsche Welle Update

Just as Voice of America and its subsidiary services are divided about whether administration reorganization will result in a loss of independence or in greater freedom (see this month's feature), Deutsche Welle is undergoing a similar shift. Dean Mahin, author of last month's profile of Deutsche Welle, received word that the German parliament passed a new law governing DW. The report from *This Week in Germany* said, "Deutsche Welle's mandate will remain...to provide foreign listeners with a comprehensive, impartial overview of events in Germany and around the world."

However, the board of overseers is being expanded from 17 to 30 members and its administrative board from 7 to 9 members, which some fear will give the government a potentially greater influence in its affairs, which have always been financially dependent upon government committees.

Remembering Morocco

"I enjoyed the article on Morocco by Colin Miller (May 94), but was surprised to read nothing about the U.S. military involvement there unless they are gone," says Stan Lopes of Concord, CA.

That could be because Colin Miller is Canadian, but also because he was not covering utilities. He did mention the VOA relay. What Lopes has to say about the military's former presence is interesting, though.

"In the 60's the Navy sent me to Morocco to be Electronics Officer at the transmitter site located at Bouknadel. Later I advanced to Officer in Charge of the 1500 acre base complete with about 75 transmitters, an antenna field, diesel power plant and dependent housing area. Perhaps some of your readers will recall copying the LF submarine broadcasts provided by two walk-in transmitters and two 800' towers which radiated by virtue of being set on huge insulators at the bottom, fed by an antenna tuner. Frequencies were in the vicinity of 18-21 MHz and could be received by submarines while submerged. I recall issuing a few QSL cards."

"Modulation of the transmitters was provided from the receiver site at Sidi Yahia via microwave. The combination was called Naval Communications Station Morocco. A support base was at Kenitra. We weren't allowed to wear uniforms to town as the King didn't want to offend other Arab nations by displaying the U.S. military presence." (To the best of our knowledge, that presence is no longer there.)

Hot Shorts

Regarding letter from Bill Krantz, July *MT*, on right-wing shortwave programming:

"Why does Mr. Krantz feel the need to express his personal political views, and *MT* feel the need to print them? I, like many others, enjoy this hobby and this magazine because it gives us a break from all the political bickering..."

Gary Beck, Florence, AL

"I agree the far right is increasingly taking over the SW bands. My 'home grown' list of religious frequencies has grown to nearly 200. These outlets are never logged nor written to, for that is only aiding a cancer on our SW bands. These stations cause interference by bleeding on adjacent channels, as well as blocking out distant broadcasters."

James Snow, Murray, KY

"Cease bemoaning the presence of a few 'right wing' commentators on shortwave and begin paying attention to the machinations of the federal government, which, if given free rein, would be delighted to dictate what you can, or cannot listen to."

Larry Lane, Humble, TX

"You told Bill he could always write to the station if he has a problem with a particular personality. I would have introduced him to a concept called the tuning knob. By fiddling with it, he will find something much more to his liking! ABC, NBC and CBS news, as well as plenty of other talk show hosts, are very politically correct. Beijing, Pyongyan, Hanoi and Havana SW prove that the right wing has not swallowed the whole world!"

Walter Chmara, Bensalem, PA

From the Editor

Thanks for expressing your insights, memories, advice, information—and yes, your emotions—with us and other readers. We receive your testimonials every day regarding how much you enjoy your hobby, and your magazine. We are very pleased to be part of something which enriches your life, and always welcome your participation—in whatever way you may choose—in the creation of these monitoring times.

Rachel Baughn,
Editor

Helping Hands

Thanks to the reader who responded to W.M.'s request in July for an *MT* subscription. I know the magazine will enrich the lives of many in that prison facility.

We have two more requests this month, both for equipment.

From UA0SIA: "We live in Siberian town Shelekhov. There is child's radio club (RK0SXX) that was formerly financed by Department of People's Education, but today is not financed by anyone. We have struggled to find help for two years. Today we and the children only have a fair AM receiver (25 and 31m bands), and a fair 160m band transceiver with 5W output. Little by little the children have gone cold on radio and are going away.

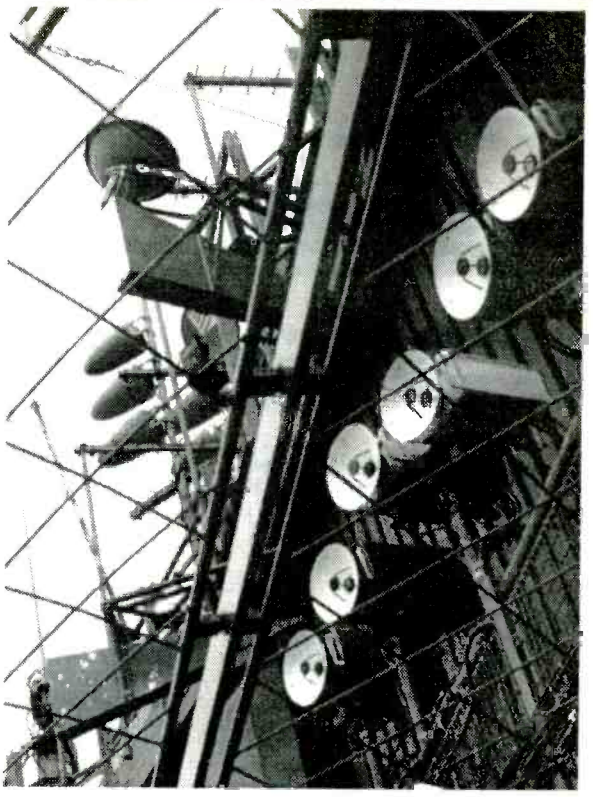
"Please if you have old unnecessary equipment for the ham and DXing, please send it to us. We'll be grateful to you for your help!"

We have contacted FAIRS (Foundation for Amateur International Radio Service) for advice on how to handle such a request. Since they have had experience in helping to establish amateur stations in places like Russia, Bangladesh, Guyana, etc., they have agreed to coordinate any offers of help for this youth club. If you have equipment, wish to help with shipping expenses, or have other ideas of how to help, please contact FAIRS - Shelekhov Project, P.O. Box 341, Floyd, VA 24091. Tell them *Monitoring Times* sent you!

Closer to home, T.H. experienced a back injury that has had him in three hospitals and now without income. He says, "if it wasn't for your magazine and my scanners, I would have gone crazy. But even with the scanners, it can still get very boring." T.H. has a PRO-37 and 2006, but asks if anyone could donate a handheld or small portable that receives shortwave for his return to the hospital for more surgery. If you have a receiver to donate, please call or write the *MT* Editor.

Antennas on the Eiffel?

by Jacques d'Avignon



When you have the possibility of installing literally hundreds of antennae on the same structure, you have an advantage that very few broadcasters have anywhere in the world.

During my stay in Paris, while attending the European DX Council, I found such a structure: the Eiffel Tower! When you look up at the tower from the Champs de Mars (as in the background photo), you do not realize all the equipment that is nested at the top of it. Yes, you do see a few TV transmitting antennae and maybe a few other unusual pieces of hardware, but that is all.

If you climb the tower (not using the stairs, thank you!), and reach the highest level open to the public, however, you suddenly find yourself just below a maze of antennae. Not that anyone really looks up—you are too busy looking at the superb view of Paris below you (left). But after you have enjoyed the view, turn your attention to just above your head!

The photo above will give you an idea of what you can see on just one side of the tower just above the public platform. I counted over 200 antennae of various shapes and sizes in addition to the regular TV transmitting installations! Another surprise was to find other anntennae installed on each leg of the tower at various levels between the second floor and the top.

I wonder what level of intermod is present around the top of this structure? Probably enough to give a few technicians and engineers grey hair just trying to insure that there is no interaction between each piece of equipment!

All Ohio Scanner Club: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. Ohio and surrounding states; VHF/UHF/HF utilities. Net Mon 9:30pm 146.940. *American Scannergram*. $18 U.S, $21 Can/Mex, $28 ww. $3 sample. Annual summer meeting.

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia. SWBC, utilities, longwave, clandestine.*SWL*.$20 US, $22 Can/Mex. $1 sample ($2 ww). Meets1st Sats 10am address above.

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*. $18 US, $19 Can/Mex, $25 ww.

Association of DX Reporters (ADXR): Reuben Dagold, 7008 Plymouth Rd., Baltimore, MD 21208. International; Utilities, ham band, QSLing, MW, LW, and SWBC. *DX Reporter*. $19 US, $29 Can/Mex, $22ww. $1 or 5 IRC's sample.

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. Meets monthly. $2.

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* (bi-monthly). Meets 2nd Mons. 7:30 Milpitas Police Admin Bldg. $25 US, $2 sample, or SASE for info.

Bayonne Emergency Radio Network (BERN): Ray Baron/Bob Frasca, P.O. Box 1203, Bayonne, NJ 07002-6203, 1-800-286-2876. Metro NJ, NY; Fire/disaster, pub safety.

Bearcat Radio Club: Larry Miller, Box 360, Wagontown, PA 19376, 1-800-423-1331. National. Scanning only. *National Scanning Report* (bi-monthly). $17.50 or $29.90, $5 more Can. $3 sample.

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810-1408, (508)470-1971, 50 mile radius Boston; 3-30 MHz. Meets 3rd Fris 7:30pm, Bull Billerica Facility, 300 Concord Rd., Billerica.

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

Canadian Int'l DX Club: Sheldon Harvey, 79 Kipps St., Greenfield Park., Quebec, Canada J4V 3B1, (514)462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger*. $26 Can, $25 US, $US28 or $Can35 ww. $2 sample. Meets 2nd Tues 7pm Montreal; several annual events.

Capitol Hill Monitors: Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531/5774 fax. DC, MD, No.VA, So.DE. Scanner bands. Frequency Forum BBS 703-207-9622 (8-N-1) Net 1st & 3rd Mons 7:30pm 146.91. *Capitol Hill Monitor*. $8. Meets irregularly.

Central Florida Listeners Group: David Grubbs N4EF, 956 Woodrose Court, Altamonte Springs, FL 32714-1261; (407) 296-2055 Andy Fountain. Central Florida; All bands. Net on 146.73 MHz Sun 8 pm. Meets 2nd Sats 12 noon. Conf#10 on Laser BBS (407)647-0031.

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. Meets quarterly in Richmond.

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 300 mile radius of Chicago; DXing all bands. *DX Chicago*. $17, $1 sample. Meets irregularly.

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, 6219 N. Greenview, Chicago, IL 60660-1815. Chicago & midwest. Public safety & general coverage. SCUG/CARMA BBS (708)852-1292. *CARMA Newsletter*. Meetings (Sats) and newsletter bi-monthly on alternate months.

Colorado Shortwave Listeners Club: Rob Harrington N0NNI, P.O. Box 370593, Denver, CO 80237-0593, 303-756-9455. Longwave, shortwave. *Colorado Shortwave Listener* (4x) 35 cents each. Meets 1st Sundays.

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. *DecalcoMania*. $10 US, $11 Can/Mex, $16 Eur, $17.50 Asia/Pac.

Drake SPR4 Int'l Club: Bill Swiger, Route 1, Box 142A, Bridgeport, WV 26330. Worldwide; Drake SPR4 owners.

Fire Net: Tom Kravitz, Box 1307, Culver City, CA 90232, 310-838-1436, internet mpage@netcom.com. All of California; fire, EMS, tied in with nationwide notification net.

Global DX Club: David Williams, P.O. Box 1176, Pinson, AL 35126-1176. Worldwide; all bands. *Radio Waves* (bi-monthly). $1 sample. Meets monthly.

Houston Area Scanners & Monitoring Club: Glen Dingley, 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW. Paging network. *HASMC Newsletter*. Meets Jan & June.

Hudson Valley Monitors Association (HVMA): Patrick Libretti, P.O. Box 706, Highland, NY 12528. Mid-Hudson valley and surrounding counties; VHF/UHF, public safety. *The Hudson Valley Monitor*.

International 11 Meter Alliance: Allen Newton, Rt. 1 Box 187-A, Whitney, TX 76692, (817) 694-4047. Public safety, traffic handling, all bands, esp. 11 meters.

Int'l Radio Club of America (IRCA): Ralph Sanserino, P.O. Box 1831, Perris, CA 92572-1831. Worldwide; BCB/AM DX. *DX Monitor (34 x)* $25 US, $27 Can/Mex, $28.50 ww. $.29 or 2 IRCs sample.

Longwave Club of America: Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215) 945-0543. Worldwide; Longwave only. *The Lowdown*. $18 US, $19 Can/Mex, $26 ww.

Listeners' Nets

This bi-monthly space is available for amateur radio nets primarily devoted to the radio monitoring hobby, whether shortwave, scanning, utilities, or other. Your listing should include the following information:

Name of Net and Sponsor ; frequency; day and time of week; region covered; topics of interest; net manager; who may participate; and modes of participation, including:
- Address for contributions/questions by mail
- BBS number for participation by computer
- Phone number for phone patch
- Club address and membership fee if required for participation

Capitol Hill Monitors
146.91 MHz 1st & 3rd Mon 7:30pm ET, DC, Md, N.Va, S.Del; Scanning and amateur radio
Frequency Forum BBS 703-207-9622 [8-N-1]
Net Mgr: N3RDC, John Korman
Call Alan Henney 301-270-2531 or John Korman 301-299-5455 for info
Newsletter $8; 6912 Prince George's Ave, Takoma Park, MD 20912-5414

Central Florida Listeners Group
146.730 MHz, Sun 8pm ET, Central Florida; any radio communications outside amateur bands
Net Mgr: N4EF
Telephone gateways announced; CFLG BBS conference on LASER BBS 407-647-0031
Call Mark Kuziv, KC4ZVK, 407-933-7163 for info

Montreal DX Listeners Net
146.910 MHz, Sun 8:15 pm ET, Montreal PQ area; MW SW, & Scanner
Net Mgr: Sheldon Harvey VE2SHW
Telephone gateways announced

Monitoring the Long Island Sounds Net
146.805 Tues 8pm ET, Long Island, NY; Primarily scanning
Net Mgr: WB2RVA, 2134 Decker Ave, North Merrick, NY 11566

Monix SW and Scanner Listeners Info Net
146.835 MHz, Thurs. 9:30 pm ET; Cincinnati/Tri-State Area; All band
Net Mgr: Mark Meece, N8ICW, (513) 777-2909 (no collect calls)
Open to all amateurs; Telephone gateways to net mgr up to 1/2 hr before net; The Listening Post BBS (513) 474-3719

New York DX Association
146.880 Mon 9pm ET, NYC area; "DC to Light"
Net Mgr: Charles Hargrove N2NOV, 723 Port Richmond Avenue, Staten Island, NY 10302-1736
Voice mail 1/2 hr before net: 212-978-3375; Compuserve 73167,312

Northeast SW Listeners and Scanners Net; Rip Van Winkle Society
147.21 MHz (WB2UEB) Wed 8pm, Albany, NY, area.
Net Mgr: Ray Loeper N2RAD

Rocky Mountain Monitoring Net
147.225, 224.980 Denver; 145.460 Boulder; 145.160 Colorado Springs Sun 20:00; communications monitoring
Brian Gould, KB0MEP, Mt. News Net

Scanner and Shortwave Listeners Net; AOSC
146.940 Mon 9:30pm ET, SW Ohio; Scanning, SW, AM-FM-TV DX
Net Mgr: N8OAY.
Open to licensed amateurs; no phone or mail gateways

Shortwave Listeners Net, Association of North American Radio Clubs
7.240 MHz LSB, Sun 10am ET, Eastern US; Shortwave broadcasts and utilities
Net Mgr: KW3F, 238 Cricklewood Circle, Lansdale, PA 19446
Telephone gateways announced

Larkfield Net
147.21 MHz, Fri 8pm ET, Long Island, NY; Shortwave and scanning

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Sep 2-5	**Nashua, NH**	National Radio Club Convention / Bruce Conti, 46 Ridgefield Drive, Nashua, NH 03062-1174. Location: Ramada Hotela at Merrimack. $40 registration.
Sep 3,4	**Shelby, NC**	Shelby Hamfest / Shelby ARC, John Ledford N4GOQ, 3410 Oakcrest Drive, Shelby, NC 28150, 704-482-4507 (Aug 28-Sep 4, call 704-480-6928). Location: Cleveland Co Fairgrounds, US Business 74. Talk-in 146.28/88. $5 admission covers both days. Camping, activities, packet seminar by *CQ* magazine's packet editor.
Sep 11	**Gaithersburg, MD**	F.A.R. (Foundation for Amateur Radio) Fest / Mary Morris, (703) 971-3905 or Al Brown (301) 490-3118. Location: Montgomery Co Agricultural Center, Exit 11 off I-270, 6am. Talk-in 146.955-, 443.400+ and 146.52. $5 general admission.
Sep 11	**Joliet, IL**	Hamfest/Bolingbrook ARS, Ed Weinstein WD9AYR, P.O. Box 1009, Bolingbrook, IL 60440, BARS hotline (708) 759-7005. Location: Inwood Recreation Center, 3000 W. Jefferson St (Rt 52), 8am, $5 at gate. Talk-in: 147.33, 224.54, 146.82
Sep 11	**Du Quoin, IL**	Hamfest & Computer Swap Meet / Shawnee ARA, Joey Helleny, KB9HNO, 600 South 16th St., Herrin, IL 62948, (618) 457-8114 Location: DuQuoin State Fairground, 8am-2pm. Talk-in 147.09/69 MHz.
Sep 11	**Suffern, NY**	Hudson Division ARRL Conv/Hudson ARC, Tom Raffaelli, WB2NHC, 544 Manhattan Ave., Thornwood, NY 10594, (914) 769-1486. Location: Rockland Community College Field House near I-87/287, 9am. Talk-in 147.165/765 MHz.
Sep 17-18	**Peoria, IL**	Peoria Superfest / Peoria Area ARC, P.O. Box 3508, Peoria, IL 61612-3508, (309) 685-6698. Location: Exposition Gardens, Northmoor University, 6am. Talk-in: 146.76/16. $5 per day at gate. Scanner Forum Sunday by John Coker N9FAM.
Sep 18	**Newtown, CT**	Western CT Hamfest / Candlewood ARA, Box 3441, Danbury, CT 06813, (203) 743-9181. Location: Edmond Town Hall, Newtown, CT, 8am-1pm, $4 admission, $10 table, $6 tailgating. Talk-in 147.12+
Sep 18 & Oct. 16	**Cambridge, MA**	MIT Radio Society and Harvard Wireless Club Flea Market, 9am-2pm, Albany and Main St., $2 admission, Free off-street parkin
Sep 24-25	**Grayslake, IL**	Radio Expo/Chicago FM Club, P.O. Box 1532, Evanston, IL 60204. Location: Lake Co. IL Fairgrounds, Rts 45 & 120, 6am-6pm. Talk-in 146.16/76. $6 general admission.
Oct 1-2	**Boxboro, MA**	New England ARRL Convention / Federation of E. Mass. ARA , 18 Churchill Rd, Marblehead, MA 01945, (617) 631-7388. Location: Host Inn and Conference Center (formerly Sheraton)
Oct 14-16	**Omaha, NE**	Midwest ARRL Supervention / AK-SAR-BEN ARC / Todd LeMense KG0EJ, Supervention, P.O.B. 24551, Omaha, NE 68124-0551. Location: Holiday Inn Central I-80 & 72nd St.
Oct 21-23	**Atlanta, GA**	Monitoring Times 5th Annual Convention / Airport Hilton. See ad in this issue for all the great details.
Oct 23	**Sellersville, PA**	Spr: RH Hill ARC / P.O. Box 29, Colmar, PA 18915, Hamfest Hotline Linda Erdman (215) 679-5764. Location: Sellersville Nat'l Guard Armory, Rt. 152, 5 mi. S. of Quakertown. Talk-in 145.31. $5 general admission.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Events Calendar
P.O. Box 98, Brasstown, NC 28902-0098

INDEX OF ADVERTISERS

STOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

Ads for **Stock Exchange** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.
Ad copy must be typed for legibility.

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word — *Subscribers only!* All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue. Send camera-ready copy or copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads, contact Beth Leinbach, 704-389-4007.

FINALLY! Monitoring awards you can be proud of! Details—SASE. ISWAC, Box 87-MT, Hanover, MI 49241.

SHORTWAVE AND SCANNER Computer Service. ShortWave Paradise—1019 Cambridge Drive #2, Kalamazoo, MI 49001. 6 mo $15, 1 yr $25. Call our Computer System today! (616) 383-4979.

R-390-A SALES—SERVICE—PARTS. Information SASE Miltronix, P.O. Box 3541, Toledo, OH 43608.

GE SUPERADIO III, custom designed with up to four noise-free SCA channels. Performance guaranteed. Credit Card orders accepted. (800) 944-0630.

ANTENNA BUILDERS! V/UHF Frequency Length Chart. 30-960 megahertz. Three waves & cuts per frequency. Over 700 cuts. Military, Hams, more! $5.00 total...BEX ELECTRONICS Box 1054, Killen, AL. 35645.

MONITORING TIMES-First issue July 1986 and 7 years, 1987 through 1994 $55. Gene Glover (502)554-9676

Highest price paid for used scanners! (614)544-5842 (03-95)

DISCONE ANTENNA-Procomm Supercone. New in box, never used. Has 10/11 meter top vertical element, additional HF elements can be added if desired. Paid $105, will sell for $65. Dann (407) 898-4152.

GRUNDIG 650-$600. SONY 2010-$240. Both excellent-extras too. Mike (916)671-2960 7-10 am pst.

FOR SALE:BEARCAT 800XLT, $140; BEARCAT 210XLT, $85; REGENCY D810, $85; REGENCY (CRYSTAL) ACT-C4H, $35; Excellent condition! Will trade for small portable shortwave. Call Ken evenings at (410)275-2509

WANTED:UNIVERSAL M-7000/V7. Call Ron (303)879-2736 (09-94)

Take heed SHORTWAVE LISTENERS. Are you planning to deal with Mike Papagorgio's coin show "Money Makes Money"? Please contact me before you buy from him. George DiPrinzio 837 E 232 St., Bronx, NY 10466 or call collect (718)231-5638 (01-95)

NRD 525 VHF & UHF converters $400; SHERWOOD installed COLLINS 4.3 & 3.2 FILTERS $700; SHERWOOD SE 3 III all included $1500. L.T. Ray (415)664-0486. 3030 24th Avenue, San Francisco, CA 94132

WANTED:HAMMARLUND HQ-180 or 180A receiver. Rick N6NVG (510)687-2719

WANTED: Scanners, programmable, older, newer, for children's club. Bill (203)288-4477.

REALISTIC DX-440 portable, $100. GRUNDIG SATELLITE 500, $300. SONY SW7600, $150. All in mint condition. Peter (312)278-8133

FOR SALE:DRAKE R8 excellent condition $750 obo. Joseph Cejka (209)592-1816

GSR-920 MILITARY SW RECEIVER. This mint, late '70s digital receiver is manufactured by Sunair, operates on 120 V and covers 1.6-30 mHz. Modes include LSB, USB, AM and CW. Audio is exceptional, $450. SONY ICF-SW7600 receiver like new $150. (603)929-4339

WANTED:COLLINS R-390 in good working order. Must be ready to use out of box. Neal Wilson 399 Main Street, Unit 10, Manchester, CT 06040

YUPITERU MVT-7100 new in box with all accessories plus carrying case. Call (519)945-6370

FOR SALE: Glenn Hauser's *Review for International Broadcasting* magazine. Complete Feb/77 to present (issues 1-147). $100/bo. Hauser's *DX Listening Digest* magazine. Complete Oct/85 to Apr/91 (issues 1-33). $50/bo. Tom (612)476-6897

WANTED: ICOM R7100 receiver. Karl Heil, PO Box 55, Blue Mounds, WI 53517 (608)437-8962.

INFO WANTED

BUSINESS BAND AND AERO BAND frequencies for commercial blimps (Fuji, Bud, Sea World, Met Life, Family Channel, McDonalds, etc.). Already have "standard" list for GoodYear. Keven O'Rourke, 1751 Trent Court, Wheaton, IL 60187.

CLOSING COMMENTS

Bob Grove
Publisher

Scanner Restrictions: It Gets Worse

Word from our own Federal Communications Commission (FCC) and from our Canadian friends as well would seem to indicate that we haven't heard the end of the cellular-scanner issue.

An FCC official has indicated that the Commission is likely to issue a directive to U.S. Customs agents to confiscate incoming cellular-capable scanners now being advertised to Americans by Canadian dealers. U.S. dealers are now prohibited from importing such products for resale, and American manufacturers are prohibited from making them as well.

The increased enforcement effort comes in the wake of mounting complaints filed with the FCC by American retailers who cite unfair competition from foreign vendors who continue to market cellular-capable scanners illegally in the United States with apparent impunity, depriving lawful American firms from sales of legitimate, FCC-compliant products.

While the Commission usually utilizes citizen complaints coupled with sales receipts to bring charges against unlawful marketeers, officials occasionally initiate "plant sales," whereby FCC employees make a purchase prior to an enforcement action.

Several American-made peripheral products are also under scrutiny by the Commission. The use of external computers or microprocessors to enable cellular reception on non-cellular-capable scanners is prohibited by law, yet several firms are widely advertising such products. The 1986 Electronic Communications Privacy Act (ECPA '86) makes it unlawful to sell or even own a device, the primary purpose of which is to monitor mobile telephone calls.

Additionally, some FCC-certified scanners, like the new Realistic PRO-23 and PRO-51, can still receive cellular frequencies by a simple keyboard routine. The Commission is re-examining such scanners with the prospect of revoking their certification. Not only that, but since it is impossible to manufacture a cellular-blocked scanner that CANNOT be cellular-restored with an external computer, all such scanners are probably illegal.

It's hard to feel sorry for the scanner manufacturers, however. They are active members of the Cellular Telecommunications Industry Association (CTIA), the profit-driven lobbyists who brought you the ECPA in 1986 which forbids listening to a variety of services, and the new anti-cellular-scanner legislation which outlaws the marketing of cellular-capable scanners or converters. Now they are being caught in their own web of repressive, self-serving legislation..

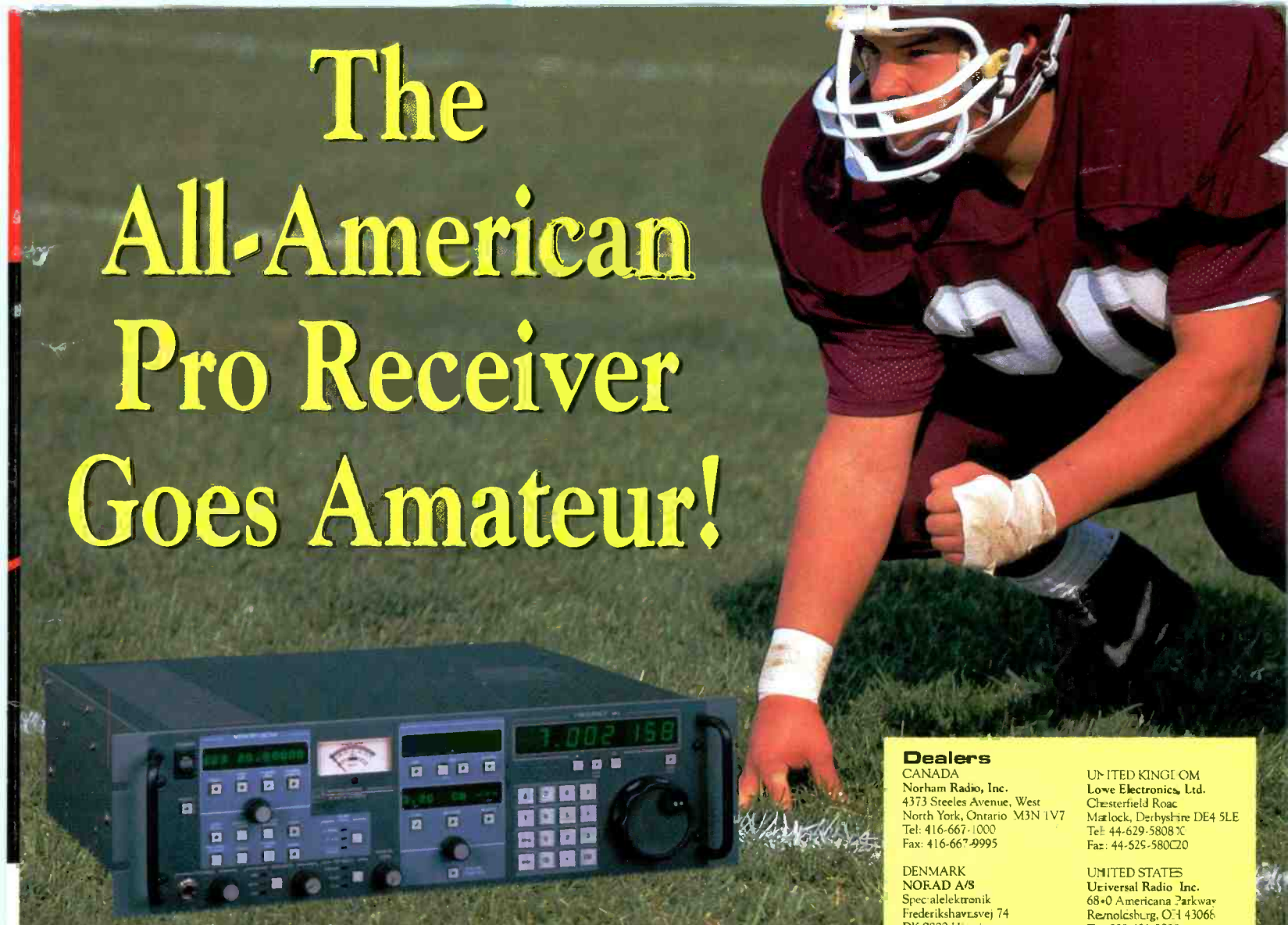
Currently, several scanner dealers are offering cellular-restoring modification services at the point of sale. Since such alterations directly impact on a scanner's FCC certification, they are unlawful for a dealer to perform. The dealers are selling non-compliant merchandise, subjecting them to fine, imprisonment and confiscation of their inventory.

And now Canada is catching up in this regulation feeding frenzy. A Canadian Press release reveals a rising official tide to ban cellular and cordless eavesdropping, with further prospects of prohibiting the manufacture, importation, sale, distribution, or modification of scanners capable of monitoring radio-based phone calls.

Monitoring Times does not condone intrusion into privacy. We believe that Americans—and Canadians—have a right to privacy. But we also are aware of the background and motivation of the current—and pending—legislation. The cellular industry bought legislation which represses the traditional freedom of the airways in order to avoid their obligation to provide privacy for their customers.

The bottom line is simple. The FCC should require the cellular providers to abide by the same privacy guidelines which they require of other licensees, and rescind the repressive and unworkable anti-cellular regulations.

The All-American Pro Receiver Goes Amateur!



HF-1000

Since 1957, Watkins-Johnson Company has been the leading supplier of high quality, high performance receivers for governments and military worldwide. Now, through the magic of digital signal processing and state-of-the-art manufacturing technology, W-J offers the HF-1000 Digital Receiver to short-wave listeners and HAM stations.

Trade publications worldwide have given the HF-1000 high rankings. To give the HF-1000 a tryout, contact your area distributor or dealer today.

Features:

- Frequency Range of 5 to 30,000 kHz in 1-Hz Steps
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- 58 Standard IF Bandwidths with exceptional shape factors
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- RS-232 or CSMA Remote Control
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For information, call 1-800-W-J HELPS

Dealers

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4373 Steeles Avenue, West
North York, Ontario M3N 1V7
Tel: 416-667-1000
Fax: 416-667-9995

DENMARK
NORAD A/S
Specialelektronik
Frederikshavnsvej 74
DK 9800 Hjoerring
Tel: 45-98-909-999
Fax: 45-98-909-988

FINLAND
Aventel OY
Kuoppatie 4
00730 Helsinki
Tel: 358-0-346-3415
Fax: 358-0-3-6-3540

FRANCE
Generale Electronique Services
BP 46 77542 Savigny-Le Temple
Cedex, France
Tel: 33-1-64-41-7888
Fax: 33-1-60-63-2485

ISRAEL
STG International Ltd.
7, Derech Hashalom
Tel-Aviv 67892
Tel: 972-3-696-5231
Fax: 972-3-696-5141

NETHERLANDS/BENELUX
DELTRON Comms. Int'L
P. O. Box 474
NL-7900 AL Hoogeveen
The Netherlands
Tel: 31 (0) 5280-68816
Fax: 31 (0) 5280-72221

UNITED KINGDOM
Lowe Electronics, Ltd.
Chesterfield Road
Matlock, Derbyshire DE4 5LE
Tel: 44-629-580800
Fax: 44-629-580820

UNITED STATES
Universal Radio Inc.
6830 Americana Parkway
Reynoldsburg, OH 43068
Tel: 800-431-3939
614-866-4267
Fax: 614-866-2339

Ross Distributing Co.
785 South State Street
Preston ID 83263
Tel: 208-852-0830
Fax: 208-852-0853

Electronic Equipment Bank
328 Mill Street, NE
Vienna, VA 22180
Tel: 800-368-3270
703-938-3350
Fax: 703-938-6911

Grove Enterprises, Inc.
P.O. Box 98
300 S. Highway 64, West
Brasstown, NC 28902
Tel: 800-438-8155
704-837-9200
Fax: 704-837-2216

Tucker Electronics, Co.
1717 Reserve Street
Garland, TX 75042-7621
Tel: 800-527-4642
214-348-8500
Fax: 214-348-0357

Distributors

CANADA
Support Measures, Inc.
P. O. Box 1279
20 Main Street, #8
Manotick, Ontario K4M 1B1
Tel: 613-692-2915
Fax: 613-692-2878

GERMANY, AUSTRIA & HUNGARY
Stabo Ricolunk
Muenchewiese 14-16
31137 Hildesheim, Germany
Tel 49-5121-7620-0
Fax: 49-5121-516846

ITALY
Watkins-Johnson Italiana Sp.A.
Piazza G. Marconi, 25
00144 Roma - EUR - Italy
Tel: 39-6-591-2...15
Fax: 39-6-591-7942

TEAM ICOM '94

An "All-Star" Line Up!

NEW from ICOM

Tech
N7QMU
Dennis Dannemiller (AZ)
Won a new
IC-820H!

Extra
KJ6GR
William Shanney (CA)
Won a new
IC-736!

General
KA9WMI
David Arata (IL)
Won a new
IC-737A!

Tech
N8SVY
Brian Tessneer (OH)
Won a new
IC-Δ100H!

Advanced
WB3DHF
Phill Beistel (PA)
Won a new
IC-2700H!

General
N9BBE
Jeff Dillon (IL)
Won a new
IC-2340H!

Tech
KD6HNL
Johnny Anderson (CA)
Won a new
IC-481H!

Tech
KA0CDO
Teresa Dall (MN)
Won a new
IC-281H!

Advanced
KB5JKE
Ivan Keup (TX)
Won a new
IC-T41A!

Tech
N0YBP
Karen Avery (MO)
Won a new
IC-T21A!

NA
VE1UNI
Chris Findley (Canada)
Won a new
IC-2GXAT!

This year's "All-Star" Line Up includes (L to R):
Top row: IC-2340H, IC-Δ100H, IC-2700H
Middle row: IC-2GXAT, IC-820H, IC-T21A, IC-281H
Bottom row: IC-737A, IC-736
(Not pictured: IC-T41A UHF handheld and IC-481H UHF mobile)*

Get Your Mitts on an ICOM "All-Star" this Season!

IC-2340H 144/440 MHz Mobile
- Independent Controls
- Large Display
- 110 Memories
- CTCSS Encode
- Auto Repeater Functions
- Built In Duplexer
- 2.4 W Audio
- True Dual Band

IC-Δ100H Triple Band Mobile
- Triple Band Flexibility
- 642 Memories
- Detachable Panel
- 8 Selectable Band Combinations
- Full Remote Cntrl. Mic.
- High Performance
- Voice Synth. (opt.)

IC-2700H 144/440 MHz Mobile
- Detachable Panel
- Full Remote Ctrl. Mic.
- CTCSS Encode
- Infrared Wireless Mic. (opt.)
- V/V, U/U or V/U
- Auto Repeater Functions
- Pager/Code Squelch

IC-2GXAT 144 MHz Handheld
- Tone Scan
- 350 mW Audio
- Selectable DTMF Speed
- Auto Repeater Functions
- 700 mAh Battery
- 7 W (opt.)

IC-820H 144/440 MHz All Mode Base Station
- Auto Satellite Features
- New DDS (I-Loop)
- 116 Memories
- High Stability Crystal
- 9600 bps Ready
- Compact Size

IC-T21A 2 M w/440 MHz Rx Handheld
- 114 Memories
- Tone Scan
- Selectable DTMF Speed
- 800 mAh Battery
- Auto Repeater Functions
- 6 W (opt.)

IC-281H 2 M Mobile w/440 MHz Rx
- 80 Memories
- 9600 bps Ready
- Plug & Play
- Large Display
- Auto Repeater Functions
- Tone Scan (opt.)

IC-737A 100 W HF Transceiver
- New DDS (I-Loop)
- Built In Tuner
- Dual Ant. Connectors
- 100% Duty Cycle
- Built In Keyer
- VOX

IC-736 100 W HF & 6 M Transceiver
- VOX, RF Gain
- New DDS (I-Loop)
- Built In Keyer
- Built In Power Supply
- Built In Tuner (6 M too)
- 4 Function Display

View a video demonstration of this product at your participating ICOM dealer today!

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*This device has not been approved by the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained.

For free literature on ICOM radios call our Brochure Hotline: (206) 450-6088

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