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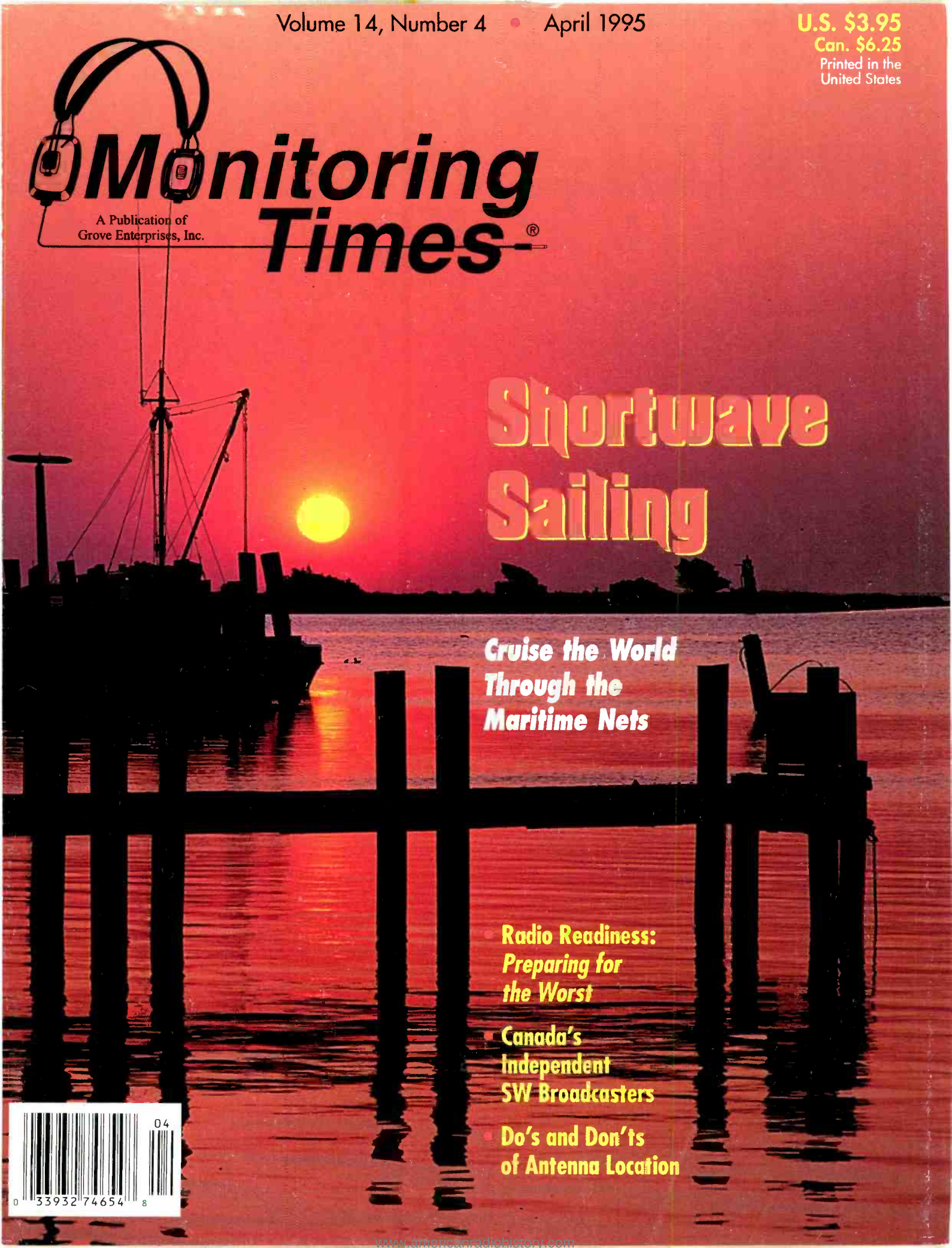

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Vol. 14, No.4 April 1995

Cover Story

Sailing through the Ham Bands

by Deborah Howe

Kindle a sense of adventure from your armchair radio by listening in to the "cruisers." This rare breed of pleasure boaters has done what others only dream of doing—given up home, comfort, pets, and possessions for an uncertain existence at sea. You can follow their adventures—and misadventures—as they call for companionship, news, weather, and sometimes emergency aid via the maritime amateur nets. *See page 9.* Photo by John Bailey.

CONTENTS

Reviews:

"Which portable scanner is lightning fast, has an intelligent Auto Store feature, and remains reasonably calm in the presence of strong signals? The new **Uniden/Bearcat BC3000XLT** scanner is all of these and more." For more results of our hands-on review of the BC3000XLT, turn to page 100.

The **Sony ICF-2010** may be the best-selling model of any shortwave radio in history, says reviewer Larry Magne (p.102). What has given this mid-sized portable its longevity in the marketplace and made it the "champion of portables"? Magne, who has been writing for *MT* for nine years, pays his first visit to this classic in his column, because even then the '2010 was no longer new!

DEPARTMENTS

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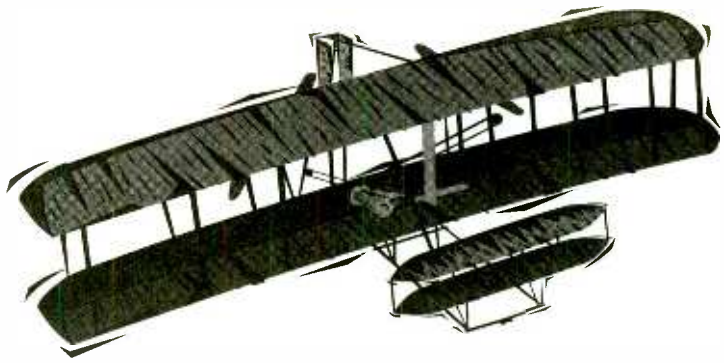
"THE WORLD IS FLAT"



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"THAT ANTENNA IS TOO SMALL TO WORK"

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

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

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

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

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

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LETTERS

■ J. Paul Brennan drove from his home in Kilkenny "on a sunny, crisp day" to scenic Mount Leinster on the western side of the Blackstairs Mountains in County Carlow. (No matter that this was actually last November; "the countryside was still lush and green and the views always and everywhere spectacular.")

On the top he found a bunker-like building and tower belonging to Radio Telefis Eirinn (RTE)—a television and communications relay tower perhaps?—and some hang-gliders by the Irish Sail Plane Club. One of the flyers told him their altimeters and radio communicators would not work properly near the tower.

"I could see everything inside: equipment, monitors, lights blinking, ashtrays overflowing, newspapers on desks ... Lots of 'stuff' around, no people and a pallet loaded with boxed tubes alongside the building. These were very large tubes, the packing material decaying in the weather and I assume worth plenty. Like Ireland in general, this place always seems the same; no hurried activity, no rush to accomplish, and no vandalism—what a nice feeling..." Brennan also has a home in Fairport, New York.

More on Motorola

■ The case against Francis (Jay) Harris, author of the *Federal Intelligence Directory*, and the subject of a feature report in November 1994, has proceeded slowly. In an apparent plea bargain, the Harris has pled no contest to "Disturbing the contents of a container" and the state chose not to prosecute two other counts: "Loitering/Prowling," and "Unlawful Use of Radio Communications."

However, criminal charges brought by the U.S. Government for allegedly possessing the MIN/ESN combinations, equipment, and software to "clone" cellular telephones are going forward. Motorola is asking for a summary judgement by the court instead of a trial by jury, asking for $20,000 in damages, (although they claim they would be within their rights to demand $880,000). Harris is defended by a court-appointed lawyer in the felony case, but has been defending himself in the civil case against Motorola.

MT has received a couple of letters from Motorola system users who have had their own complaints to make, particularly about Motorola's attitude toward consumers. One trunked system owner did not realize that the maintenance agreement signed with Motorola gave them the right and ability to enter and control his system through the lab software. He wonders if there are any laws regulating their use of that ability, and disputes questions whether the Motorola's full abilities are disclosed to the purcaser of the system. (Such questions are generic to the providers of any such system, not just Motorola's.) He would like to correspond with others (anonymously if they wish) if they have information to share. Write Guntis Ositis, P.O. Box 426, Orinda, CA 94563.

Another (anonymous) reader says, "I own two Motorola radios and a programming box. I lost the RSS software that came with it. So I called Motorola to get more. What I got in return was a nasty call from one of their higher-ups who didn't tell me that their senior attorney was on the line. They really gave me the once-over and threatened me with legal stuff; this was followed by a letter from their legal office. I can't believe they treat customers like that.

"They basically accused me of attempting some sort of fraud and told me to just go to a Motorola service center to get my radios programmed. They said they don't sell their software; they just license it. When I asked to buy a software license I was told it was only sold to dealers. There are two prices: a list price and a dealer price. If the RSS is sold only to dealers, who is the list price for?

"I am a licensed amateur radio operator and have a right to use portions of UHF and VHF bands these radios cover. Why should I have to pay some service center 50 dollars of bench time to reprogram my radios when I know the software is available on the open market?

"I am a law abiding citizen who went through the front door asking to purchase a software license. I can't believe I got the response from them that I did."

A Helping Hand

■ We have two requests for help of our generous *MT* readers/subscribers. The first is from John Demmitt—a familiar name to anyone who has been around the hobby long. John's contributions, questions, and curiosity have appeared in *MT* and many club bulletins over the years. However, not everyone knows that John is a federal prison inmate. Recently, he has been ill and has been moved to a new facility, which has apparently cut off a lot of his previous correspondence. He is also finding it difficult to afford an *MT* subscription. Although we have picked up the tab for the moment, anyone wishing to subscribe for him or to correspond with him may contact the *MT* editor. He is interested in both mediumwave and shortwave broadcasting.

The second request is for equipment. This appeal comes from the wife of a NY Transit Authority worker who, she says, lost his job

(Continued on Page 114)

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A shortwave antenna so good you won't need or want any other type of antenna system!

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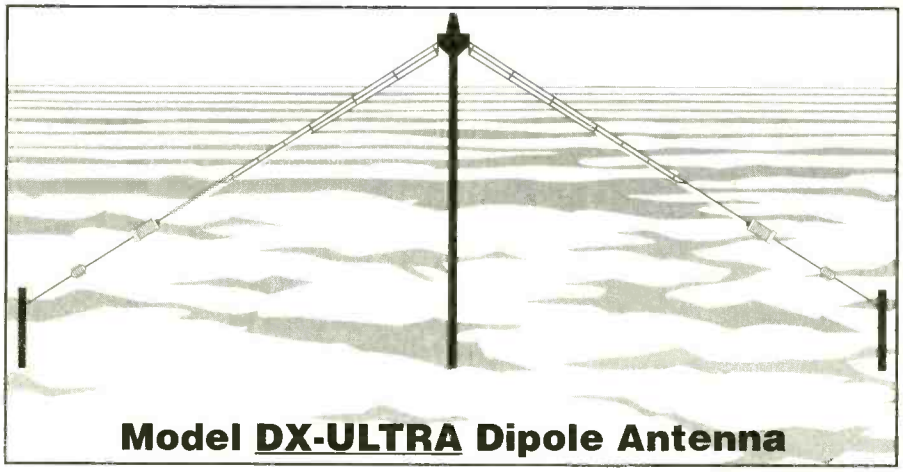

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current solutions to current problems

It's Clean Already!

■ A Kent, Washington, woman and her two children had just driven into a service station car wash when the doors at both ends dropped closed and locked. Diedre Finley said that soap and water began to flow and the brushes moved, but the automatic track failed to propel the car forward.

She began to honk, but service station attendants couldn't hear her. Finally, she used her car phone to call the attendants and plead for help. For a short while, the attendants were unable to raise the doors either, but after twenty minutes, entry was made into the car wash and the doors were raised.

The station owner offered Finley a free tank of gas, plus reimbursement for calls made during the time she was trapped. Apparently, Finley called several friends and her mother in California while she waited out the ordeal, which could amount to quite a bill.

Ohio Outlaws Cordless Listening

■ The Ohio Supreme Court ruled unanimously that the state's wiretapping law bans citizens from intercepting someone else's private conversation—whether it's carried through the air or over a wire. The ruling allowed the court to throw out some evidence used in the 1991 conviction of Ivo Bidinost, Jr., who was convicted of raping two young boys.

Following the arrest, the boys' mother used her baby monitor to listen to conversations from the Bidinost home. She recorded seven hours of conversation which was used to back up the boys' testimony.

Despite the new ruling that the recordings were illegal, Bidinost's conviction was upheld. The ruling is not expected to affect listeners, according to Dave Harb, manager of the Amateur Electronic Supply store in Wickliffe. "They can say it's illegal, but how do they know I'm listening?"

An R-8 in Every Room

■ The Peninsula Hong Kong Hotel, known by travelers as one of the very best, recently completed renovations, including a thirty story tower housing 132 new guest rooms. While upgrading the Presidential Suites, the management decided to merge technical innovations with traditional elegance.

While gazing out at the panoramic views of Hong Kong Island and Kowloon peninsula, guests can tune in to the latest news and information via Drake R8 Worldband Communications Receivers. The addition of the radios was the brainchild of Fraser Hickox, Group Research and Technology Manager for the Hong Kong and Shanghai Hotels, Limited.

"The R8 was selected for The Peninsula's Presidential Suite because of its user friendly operation, excellent sensitivity, and a synchronous detector which works well."

The Peninsula uses Drake satellite equipment, as do all Peninsula Group hotels. "Drake has been a well established name in the radio business for many years which, in turn, gives us great confidence in the equipment." Presumably, there will still be chocolates on every Presidential Suite pillow, as well as an R8 on the bedside table!

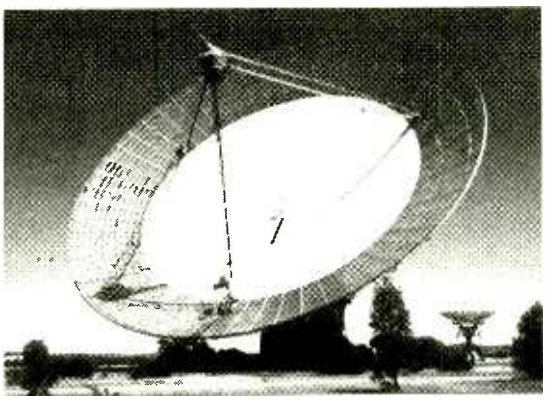
Project Phoenix

■ If they're out there, scientists from the SETI Institute will find them. Using the 210-foot diameter Parkes telescope in New South Wales, Australia, a group of Silicon Valley scientists are hunting for radio signals from outer space. It's been done before, but never with such sophisticated equipment, according to Seth Shostak, one of the Project Phoenix members. Shostak and others will spend five months using high-speed computers to analyze more than 28 million radio channels at once.

"Unfortunately, ET didn't send us a postcard to tell us where on the radio dial we could find him," Shostak said. In June the team will wrap up and move to radio telescopes in the northern hemisphere to continue the search.

"Will we hear something before the millennium? Yes, I think we will," Shostak said.

Incidentally, since federal funding for the project was terminated in 1993, the project is being financed by private contributions which range from $10 to $1,000,000. Anyone wishing more information on this project and its fund-raising efforts may write Project Phoenix, SETI Institute, 2035 Landings Drive, Mountain View, CA 94043; (415) 961-6633, Internet phoenix_info@seti-inst.edu



The Parkes 64-meter parabolic antenna—largest steerable radiotelescope in the southern hemisphere—is pointed toward the unknown in outer space. Photo by John Masterson, Australia Telescope National Facility; courtesy Commonwealth Scientific and Industrial Reasearch Organization.

Radio Via Internet

■ Radio Sweden's *MediaScan* report is now available as a sound file on the Internet. Though this is the first radio program from Sweden to find its way into cyberspace, Swedish Radio is currently setting up its own world wide web server to distribute excerpts of news broadcasts. WXYC, The University of North Carolina at Chapel Hill's student radio station, is broadcasting its on-the-air signal via the net. Their world wide web page is http://sunsite.unc.edu/wxyc. Kansas University's KJHK-FM is also putting a live signal on the Internet 24-hours per day; their world wide web page is http://www.cc.ukans.edu/kjhknet.

We Just Want TV

■ The island of Futuna was recently treated to the gift of television. The 64 square kilometer island of 5,000 is the last French territory to receive television. The neighboring island of Wallis received TV in 1986, touching off a rivalry. The French minister for overseas departments and territories finally announced the intent to provide Futuna with TV, and within three months, three tons of equipment was transported in from France by the French Air Force. The installation was finished on Christmas Day. Currently, ten hours of programming is shown on Futuna, sent via satellite.

French Station Suspended

■ French government censors punished a radio station with a forced twenty-four hour shutdown because of an on-air comment calling the murder of a police officer "good news." Officer Jorges Janvier was killed in Nice during a gang shootout. A talk show host for Skyrock radio said that, "There's a cop who has died in Nice and that's rather good news."

Despite cries from the Independent Police Professional Federation and the Independent Syndicate of National Police that the station's license be withdrawn, the government instead imposed a 24 hour shutdown in support of a 1986 law requiring broadcasters to "safeguard public order and respect personal dignity."

The downed Forest Service transmission tower on Aubrey Butte, Bend, OR. Photo by Diane Kulpinski.

Argentine ATC Disrupted

■ Five incidents of ground-to-air communications interruptions in the last week of December has the government of Argentina worried. U.S. air safety officials say that the "pirating of air traffic control operations is the latest, and perhaps most dangerous, of many incidents that have taken place in Argentina's airports."

The first interference took place on December 22 when an Austral Airline flight was descending for a landing at Aeroparque Buenos Aires. The airliner was instructed to descend to 3,000 feet by a voice that did not belong to an air traffic controller. The second incident occurred three days later when false transmissions caused a private jet to deviate from its route. Officials believe the radio pirates are operating a mobile transmitter and may be a product of labor unrest at Argentine airports.

What a Delivery!

■ A United Van Lines truck delivering a new CCA transmitter to KQAK-FM of Bend, Oregon, accidently snagged a low-hanging U.S. Forest Service guy wire attached to the top section of a 200 foot tower. In a bizarre domino effect, the tower collapsed, crashing into the guy wires of nearby KTVZ-TV, which in turn fell across the main power line to that television station and five FM radio stations. The stations went dark for two hours before power could be restored.

The incident completely destroyed the Forest Service tower, according to Keith Clinton of the Dechutes National Forest Supervisor's Office. The Service is using a backup system that is limited in frequencies and range and are hoping to effect repairs before forest fire season begins. Repair to KTVZ's tower could take many months, though the station is currently running at 100 percent.

Cellular Concern

■ Residents of Ravenna, Washington, don't want US West to build a cellular antenna atop a 20-unit housing project. Fear of health problems from transmitting radiation led over 140 people to protest the installation and request that city officials reject the company's application.

"This thing isn't very nice," said resident Brian Peyton. "It's like they are building a smokestack in a residential community."

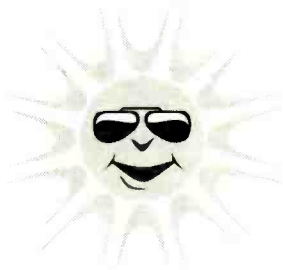
US West operates more than 80 cellular towers in the city, three of which reside on low income apartment building rooftops.

Classic Interference

■ In a classic, but always interesting case of interference, Omaha, Nebraska, residents who had purchased garage door openers from a local Sears store had been besieging the business with calls about doors that refused to open once closed. Local amateur radio operators assisted the FCC in tracking the source of the problem to Offutt Air Force Base, where a newly installed air-to-ground radio system was broadcasting on a frequency close to the one used by the garage door openers. The FCC will help the Air Force find a less harmful frequency.

"Communications" is written by Larry Miller with help from Laura Quarantiello, Rachel Baughn, and the following readers who are members of the Communications Media Monitoring Team: Dave Alpert, New York, NY; Howard Bornstein, Menlo Park, CA; James Brown, Carmel, CA; Jeffrey Farrar, Manchester, TN; Victor Garcia-Rivera, Fairfield, OH; Mike Greer, Rochester, IL; Kevin Hecht, Devon, PA; Russell Hood, Eupora, MS; Jack McCartan, Newark, DE; Chris Michael, Great Bend, KS; Charles E. Mullens, Jr., Downey, CA; Lou Shirley, NJ; Richard A. Sklar, Seattle, WA; Donald Sutherland, San Jose, CA; Phil Yasson, Vancouver, WA; Arnold Weiner, Brentwood, NY and *MT*'s own George Zeller of Cleveland, OH. We also consulted the following publications and we list their names in appreciation: BBC *World Broadcast Information, National Scanning, Radio World, W5YI Report.*

IT'S OUTDOOR ANTENNA TIME!



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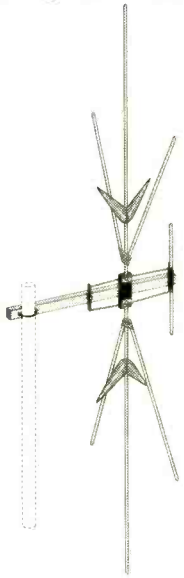

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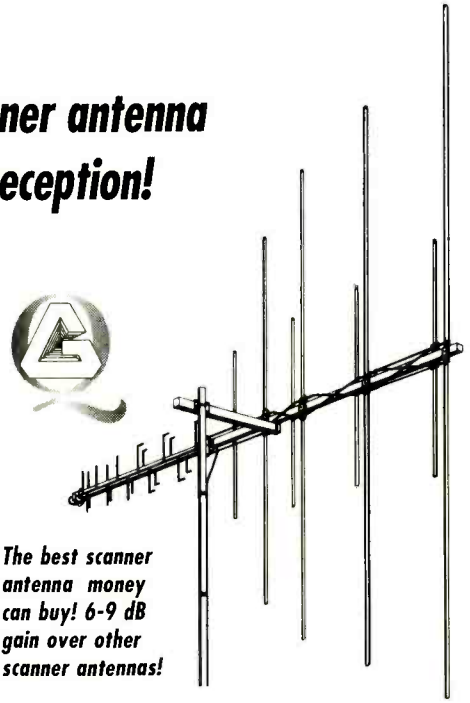

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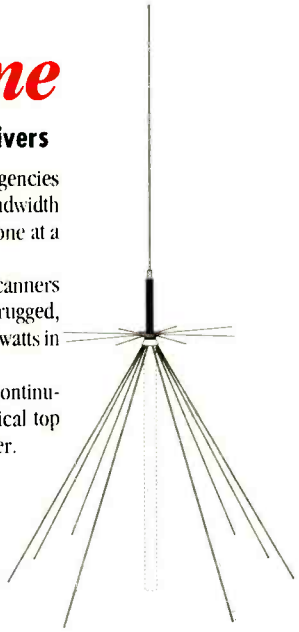

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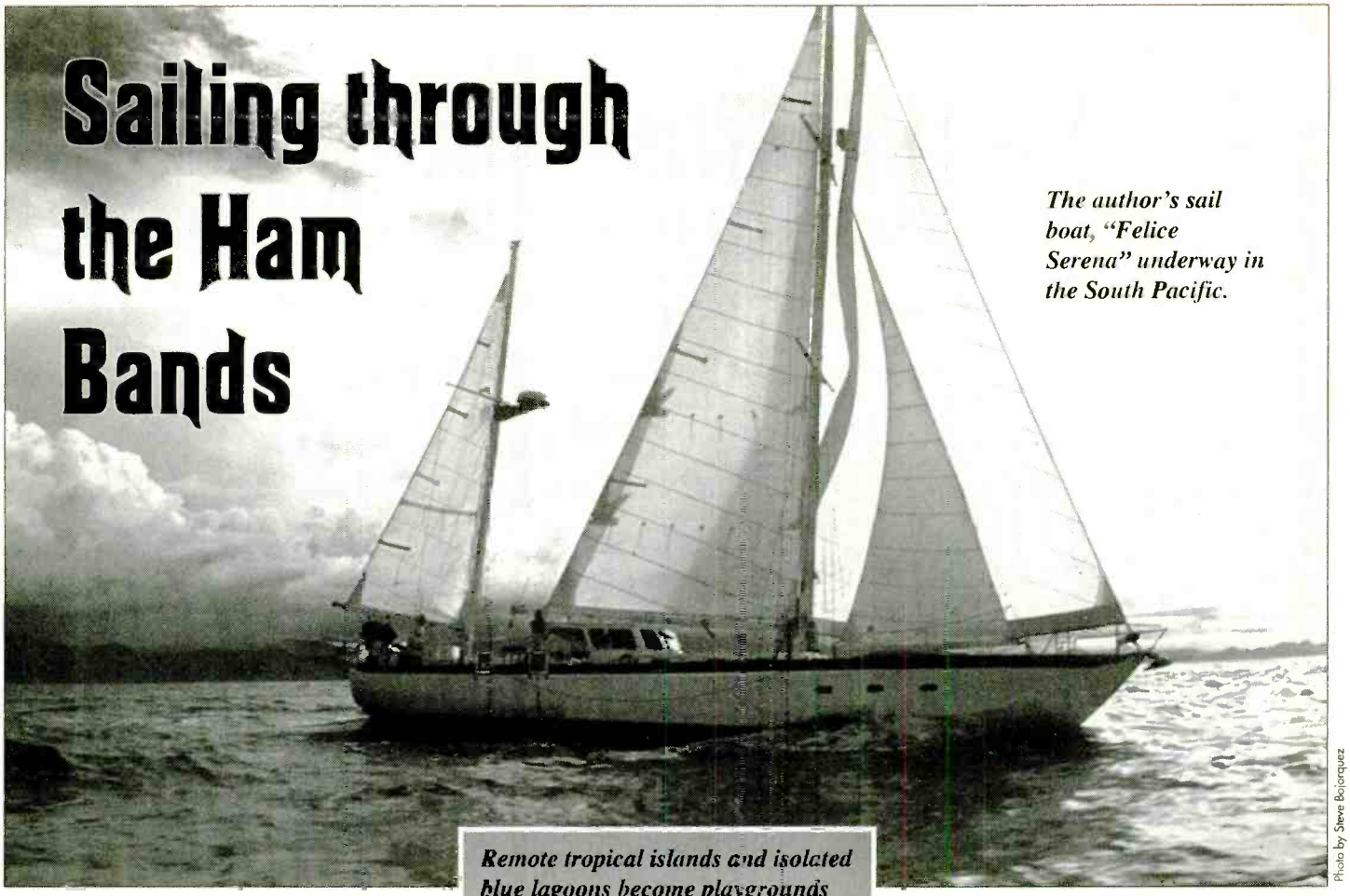


The author's sail boat, "Felice Serena" underway in the South Pacific.

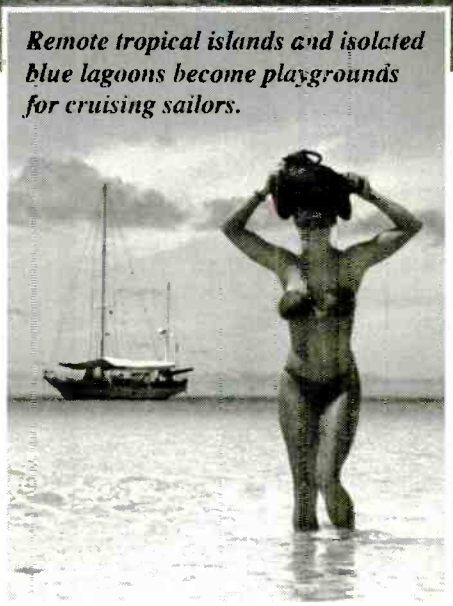
Photo by Steve Bojorquez

By Deborah K. Howe

What would it be like to sail around the world, to cruise to remote Pacific islands or down the coast of Mexico? What would it be like if suddenly nothing were ordinary anymore, if every morning the rising sun ushered in a new adventure?

By tuning in the often entertaining maritime mobile nets, shortwave listeners can easily obtain the answers to these questions. Daily, hundreds of blue water sailors check in to maritime nets either to contact friends or to report their QTH (position) to radio operators who monitor the health and welfare of men and women at sea. Through these nets the listener can participate in the excitement of sailing around the world.

Cruisers, as these worldly sailors are known, are an interesting group to get to know. They are curious individuals willing to give up most of their worldly possessions—houses, cars, pets—in order to fulfill their dream of sailing around the world. Eccentrically, they prefer to live on the water. As Paul Theroux astutely noted in his book, *Happy Isles of Oceania*:



Remote tropical islands and isolated blue lagoons become playgrounds for cruising sailors.

Photo by Deborah K. Howe

"They bobbed offshore, making the odd foray into town. Who in marine history, or in the history of oceanic exploration, ever lived like this? Either they went ashore and conquered, claimed the island, and left; or they stayed ashore, anthropologizing, botanizing, evangelizing, being a complete nuisance to the locals, whom they wished to subvert.

"The yachties at their moorings had the equivalent of a gypsy camp at the edge of town, slightly exotic, occasionally insinuating themselves into the life of the place."

When it's time to move on, at six miles per hour (the average speed of most sail boats) land can be days, if not weeks away. (The average person, with a little effort, can speedwalk as fast as a sail boat can sail. Imagine how long it would take to walk from California to Tahiti.) Needless to say, amateur radio, the only form of communication available to most cruising sailors, becomes an integral part of their daily lives. Not only is it used to keep in touch with friends and family, but it acts as a safety net should things go wrong.

But once a sailor reaches land, he doesn't hang up his mike. The radio keeps this mobile community in touch. While sitting in port, chit-chat usually takes place over coffee or happy hour drinks and cruisers' conversations are, without a doubt, some of the most interesting QSO's (conversations) found on the amateur bands. Talk centers on new islands, new cultures, new books, new underwater adventures. They offer intimate insights into island nations that are foreign indeed not only to you and me, but to NBC, ABC, and CBS as well.

In one memorable QSO the hullabaloo that ensued after an island feast in the Tuamotos filled the airwaves for days.

The author's sailboat "Felice Serena" motoring through the doldrums that spread across the equator.

Photo by Deborah K. Howe

"It was a two dog night," one of the partygoers exclaimed.

What did that mean? Well, it seems that to feed the large number of visitors (fifteen people off six boats) to Raroria, a tiny, infertile atoll, two skinny dogs were sacrificed to supplement the meat that came off one skinny pig. But the yachties (as cruisers are also known) had no idea of the ingredients of the main course and helped themselves to generous portions of what had been, until that morning, family pets, one brown dog and one black dog. It wasn't until the next day that the truth leaked out.

"I'm glad I didn't know or I wouldn't have tried it. Now I can say I've eaten dog. How many people can lay claim to that?"

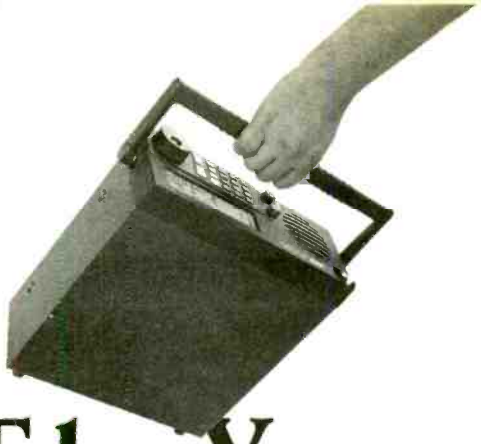
"I think I prefer brown dogs over black ones," one crew member joked.

Ironically, most of the yachties had favored the dog—simmered in a sauce laden with soy—over the blander, unspiced pork.

QSO's change their flavor, too—switching from comedy to drama when bad weather develops or disaster strikes. While battling a fierce three day storm between Fiji and American Samoa, the crew of two boats sailing in tandem achieved near celebrity status when cruising friends and SWL'S tuned in to their hourly conversations. Forty and fifty knot winds blew constantly and a brief bout of even higher, hurricane force winds blew out the sails of both boats. Visibility was almost zero and close encounters with reefs set nerves on edge.

Photo by Deborah K. Howe

Daily, sailors check in to maritime nets either to contact friends or to report their QTH to radio operators who monitor the health and welfare of men and women at sea.



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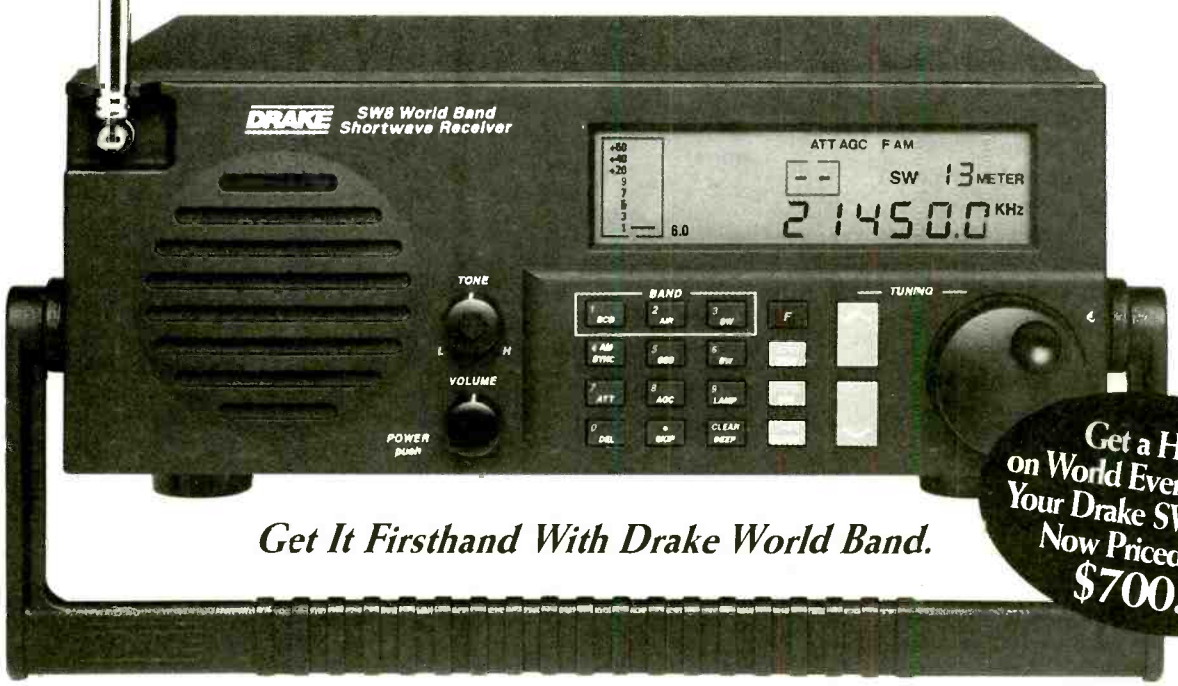

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Photo by David K. Howe

As you listen in on the maritime nets, you'll find cruisers to be an interesting group to get to know.

Anxiety levels soared even higher when a lightning storm struck on their last night at sea. The radio contacts were frightening and not soon forgotten by those who listened. After approximately sixty exhausting hours the weather broke and the two boats limped into Pago Pago for repairs.

Casting for Nets

While these two boats kept tabs on each other (little did they know at the time just how many people were following their conversations), many sailors who are underway check in with maritime mobile nets whose main purpose is to monitor ships at sea.

There are numerous nets, and almost all of them begin with a call for emergency traffic. Due to propagation the call is passed from relay to relay: "We are now listening for emergency traffic." At this point, all ears are alert for the faintest of calls. If a boat is in trouble, often generators and engines are down, power is lost, and batteries are low. Occasionally, someone actually responds to this call.

One time a female voice came back. She and her husband had set sail from Hawaii on their dream cruise around the world. Unfortunately, they managed to hit the first reef on the first island they encountered. They were a thousand miles from home, their boat was on the reef of a remote Pacific island, and the woman was so terrified that all she wanted was a tug boat to tow them back to Hawaii—

W6SOT Maritime Mobile Net List©

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Time Order Sequence, As of July 1994

TIME (UTC)	FREQ (MHz)	NET NAME	DAYS	COV. AREA	DETAILS
0000/0100+	3.968	HAPPY HOUR UN-NET	Dly	Baja, W/MEX	MM, Soc.
0000	14.320	SEA MM Net	Dly	S/PAC,W/PAC, SEA	MM
0100	3.925	Gulf Coast Hurr. Net	Dly	G/C USA	WX, TFC
0100+	3.855	BR. COL. BOATER'S NET	Dly	Sts. of Geo.	Summer MM
0100>0300+	14.305	Cal. - Haw. Cocktail Hr.	Dly	Cal/Haw/PAC	MM OK
0130>0300+	28.313	10 METER M/M NET	Dly	E/PAC-Haw	Novice OK
0200/0100+	21.402	GERRI'S HAPPY HOUR M/M	M-F	PAC/ Baja	MM/Social
0200	14.334	Brazil/East Coast Net	Dly	E/C, ATL	WX, TFC
0200	3.932	Great Lakes Emerg, Tfc	Dly	G/L	WX, TFC
0200>0400+	14.300/.313	SEAFARER'S NET	Dly	PAC, W/C	MM
0300+	14.116	Traveler's Net	Dly	Aust-W/PAC-I/OC	TFC, MM
0330/0230+	7.294	Sandia Net	Dly	W/C, Baja	Soc/Trivia
0400+	3.856	Taco Net	Dly	Baja	Also 1600Social
0400+	14.115	CANADIAN DDD NET	Dly	PAC	W/U 0330
0400+	14.318	ARNOLD'S NET	Dly	S/PAC	MM, WX
0500/0400+	14.313	PAC MAR NET - WARMUP	Dly	PAC	W/U
0500	21.200	UK/NZ/AFRICAN NET	Dly	PAC, Ind OC	MM
0530/0430+	14.313	PACIFIC MARITIME NET	Dly	PAC	MM, R/C
0630+	14.316/.105	SO AFRICAN MAR NET	Dly	S/ATL, Ind Oc	Also 1130
0630	14.313	INTERNATIONAL MM NET	Dly	ATL, MED, CAR	Also 1700
0700/0800+	7.085	MED SEA CRUISER'S NET	Dly	MED SEA	MM
0715+	3.820	BAY OF ISLANDS NET	Dly	NZ, Aus, PAC	MM
0800>0830+	14.315	Pac Inter Isl Net	Dly	S/PAC, W/PAC	TFC
0800+	14.303	UK MARITIME NET	Dly	MED, PAC	Also 1800
0900	14.313	MED SEA MM NET	Dly	MED	MM
1000	14.313	GERMAN MM Net	Dly	ATL, MED	MM
1000+	14.320	South China Sea Net	Dly	S/PAC	
1030	3.815	Caribbean WX Net	Dly	CAR	WX, Also 2230
1100/1000+	3.770	Mar Provinces WX Net	M-Sa	NE Canada	WX
1100>1200+	7.237	CARIBBEAN MM NET	Dly	CAR	MM
1100>1600+	14.300/.313	Intercon Net (MM ok)	Dly	N/S/C/Am	TFC, MM
1100+	14.283	Carribus Tfc Net	Dly	E/C, CAR	TFC
1100	3.930	Puerto Rico WX Net	Dly	PR/VI	WX Also 2310
1115+	14.316	INDIAN OCEAN MM NET	Dly	W/PAC, I/O	14.320-340 MHz
1130+	14.316/.105	SO AFRICAN MM NET	Dly	S/ATL, Ind Oc	Also 0630
1130	21.325	So Atl Roundtable	Dly	SO/ATL	TFC Also 2330
1200+	28.380	MARITIME MOBILE NET	Dly		Novice OK
1200+	14.121	Mississauga Net	Dly	E/Canada, ATL	WX
1200+	14.320	So/East Asia Net	Dly	SEA/S PAC	
1200>1400+	7.233	E/C Rec Veh Serv. Net	Dly	E/US	RV TFC
1220+	7.096	Bahamas WX Net	Dly	Bah/Fla	WX, MM
1230	7.185	Barbados Info Net	Dly	CAR	TFC
1245/1145+	7.268	E/C WATERWAY NET	Dly	E/C, CAR	MM
1300>1400+	21.400	TRANS ATL MM NET	Dly	N/ATL, CAR, R/C	WX
1300>1400+	3.963	E/C Rec Veh Net	Dly	E/C US	RV TFC
1300+	7.085	C/A BREAKFAST CLUB	Dly	C/Amer	MM Social
1400+	3.980	SONRISA NET	Dly	Baja, So Cal	MM
1400>1600+	7.263/.268	Rocky Mtn RV Net	Dly	Mid West	RV TFC
1530/1430+	7.294	CHUBASCO NET	Dly	Baja, So Cal	MM
1600/1500+	7.238	BAJA CAL MAR NET	Dly	Baja, So Cal	WX-0815
1600+	7.200/.268	Taco Net	Dly	Baja	Also 1400 Social
1600>0200+	14.300/.313	MAR MOBILE SERV NET	Dly	ATL, CAR, PAC	
1600>1800+	7.263/.268	PAC RV Service Net	M-F	W/US	RV TFC
1630/1530+	3.865	PT LUDLOW BOATER'S NET	Dly	Wash	MM, WX, R/C
1630	14.303	SWEDISH MAR NET	Dly	MM	0530,2030
1700>1800+	14.308	Reh Veh Service Net	Dly	US	RV TFC
1700+	14.323	US/Canada Pwr Sqdn Net	Sat	US/Canada	Boat TFC
1700+	14.340	Cal Hawaii Net	Dly	E/PAC	TFC
1700+	7.240	Bejuka Net	M-F	C/Amer	TFC
1700	14.313	INTERNATIONAL MM NET	Dly	ATL/MED	MM Also 0630
1700>1900+	14.280	Inter Mission RA Net	M-Sa	C/A, S/A, CAR	TFC
1800+	14.303	UK MARITIME NET	Dly	ATL/MED	MM Also 0800
1800**	7.076	SO PAC CRUISING NET	Dly	S/PAC	MM, WX, Informal
1830/1730+	14.340	MANANA NET-WARM UP	M-Sa	W/C, E/PAC	MM, W/U
1900/1800+	14.340	MANANA NET	M-Sa	W/C, E/PAC	MM
1800+	14.283	KAFFEE KLATCH UN-NET	MWSa	HAW/Tahiti	Social, News
1900/1800	14.305	Confusion Net	M-F	PAC, ALA	TFC

Continued on Page 13

TIME (UTC)	FREQ (MHz)	NET NAME	DAYS	COV. AREA	DETAILS
1900+	7.285	Hawaii AM Net	Dly	Hawaii	TFC, WX
1900>2000+	21.390	Halo Net	Dly	N/A, S/A	TFC
1900+	14.329	BAY OF ISLANDS NET	Dly	NZ, S/PAC	MM
2000+	7.080	NEW ZEALAND WX NET	Dly	NZ	WX, MM
2000/2200+	21.390	Inter. Amer. Tfc. Net	Dly	N/A, C/A,S/A	TFC
2030	14.303	SWEDISH MAR NET	Dly	ATL	MM 0530,1630
2030+	14.315	TONY'S NET WARM UP	DLY	NZ, S/PAC	MM, W/U
2100+	14.261	Ben's Friends MM Un-Net		E/C	MM Social
2100+	14.315	TONY'S NET	Dly	NZ, S/PAC	WX-2130Z
2100+	14.113	MICKEY MOUSE CONNECTION		Dly	S/ATL, S/PAC MM
2200>2230+	3.963	E/C Rec Veh Net	Dly	E/C US	RV Also 1300
2200+	21.402	PACIFIC MAR NET-15 MTR	M-F	PAC, C/A, Baja	MM
2200+	21.412	MAR MOBILE SERVICE NET	M-F	PAC	MM
2230	3.815	Caribbean WX Net		CAR	WX Also 1030
2310	3.930	Puerto Rico WX Net	Dly	P/R, V/I	WX Also 1110
2330	21.325	South Atlantic Roundtable		SO ATL	TFC, Social
AS NEEDED	14.325	Hurricane Net	A/R	ATL, CAR, PAC	Hur Track

LEGEND:

ATL = Atlantic
CAR = Caribbean
C/A = Central America
EC = East Coast
E/PAC = East Pacific
G/C = Gulf Coast
MED = Mediterranean
MM = Maritime Mobile
R/C = Roll Call -- passage maker positions taken
TFC = Traffic
W/C = West Coast
W/PAC = West Pacific
W/U = Warm Up Session - Check-ins
WX = Weather
"+" = Net information check recently
"***" = No current information, may be outdated
">" - Net operates from /to time listed
"/" = Net time changes from / to daylight savings or summer to winter

FOOTNOTES:

1. Credits:

Many thanks to the dozens of people, both cruisers and base stations, who have provided this information. Cruisers "out there" and dedicated base stations are often the only source of updated information. Roger appreciates all updates; you can contact him on air on the Manana Net, 14.340 MHz, 1900Z, or send to:

Roger Krautkremer W6SOT
SV Fantaseas
757Emory St., #180
Imperial Beach, CA 91932
Voice Mail/Pager: (619) 984-4304

Roger also publishes the *Cruiser's Radio Guide*, a 150-page operating guide written especially for the recreational boater. Send check or MO for $19.95 plus $2.90 shipping (within the U.S.) to Fantaseas Marine Services at the address above.

2. Amateur Nets:

MM Nets are shown in capital letters. Other nets listed above provide information or service useful to cruising hams. MM Nets are active nearly world-wide, 24 hours a day, between 14.300 - 14.320 MHz.

Traffic Nets: In the US, many state and regional Traffic nets exist on 75 and 40 meters, normally above 3.900 MHz on 75 and 7.225 MHz on 40. Most are active in the early evening. Cruisers may find them useful for phone patches and message traffic.

VHF/2 Meter Nets are run in popular cruising grounds and often provide check-ins, WX and sometimes wide area linked systems. The B.C., Straits of Georgia, system has several repeaters linked together covering the entire straits area. It runs daily MM Nets in the late afternoons during the summer months. The Chesapeake Bay 2 Meter Net provides check-ins and WX during the summer months.

Nets often vary over time and frequency, based upon conditions and QRM. If nets are not found when or where listed, listen around plus or minus frequency/time.

3. Marine Band Nets:

Marine VHF Nets are frequently run in popular cruising areas. Examples are the PMS Cruisers Net on Ch 68, 0900 M-F in San Diego; and the Cruisers Net in La Paz, Baja Mexico on Ch. 22.

Marine HF Nets are often run for regional areas. Popular examples include:

Keri Keri Net, (New Zealand) Western S PAC on 2480/ 4417/ 4445 Khz, WX at 1925/2000L, Position Reports taken at 0800/1900 Local time.

Caribbean SSB Net on 6.215 MHz at 1200/2300Z.

Herb's WX Net (Southbound II) on 12A, 12.353 MHz at 1900/2400Z, detailed WX for E/C and CAR passage makers (also on 6A).

VNN555 Net (NSW Australia, by VK4NN), 2000Z, ITU Channels #608-622IT/6522R, #1234-12329T/ 13176R, #1642-16483T/17365R.

Informal nets are often held during popular passage making times. Examples include the 8A, 8.294 or 12B, 12.356 MHz nets for boaters heading south from San Diego to Baja and vice versa. WX information is often provided.

an unreasonable and very expensive request.

But not everyone gets themselves in trouble, and not all nets are geared for those underway. Other nets exist solely to pass traffic to and from cruising sailors. It's on these designated frequencies that cruising friends separated by nautical miles look for each other. They make contact and move off frequency to chat. If the propagation gods allow, this is a golden opportunity for the SWL to follow.

Each net is operated by a net controller who is assisted by a handful of ham radio operators known as relays. The net controller does just what his name implies. Like a traffic cop, he maintains control over conversations that crisscross the ocean like an Etch-a-sketch gone wild, efficiently moving traffic in and out of the net. The relays assist with check-ins that are out of his range. Almost all are landbased and have powerful beam antennae that rotate to cover as wide an area as possible.

Informal nets also pop up from time to time. A group of cruising friends agrees to meet on a certain frequency at a certain time on a certain day, sometimes every day. These nets are less structured—they are more like party lines—but contain no less content.

So how can you find these nets? you might ask. The maritime nets maintain schedules, and, thanks to W6SOT, who has compiled the *W6SOT Maritime Mobile Net List* (see sidebar), finding high seas QSO's is simple. As for the informal nets, it's a random dial through the ham bands. But once you garner the rhythm of cruising conversations through the formal maritime nets, picking up on the informal will be easy.

Monitoring cruisers' adventures is the closest most of us will come to sailing around the world. The radio allows one to be a silent partner to adventure on the high seas. In my opinion, it's the ultimate in short wave listening.

Photo by Steve Bojorquez

Cruisers are curious individuals willing to give up most of their worldly possessions in order to fulfill their dream of sailing around the world.

Preparing for the WORST

Don't wait for disaster to strike. Putting together a basic emergency scanning station today could rescue you from danger tomorrow.

By Haskell Moore, KB5WIX

October 15th, 1994. Ellington Air National Guard Base. The clouds are at 400 feet and a light drizzle is falling. The prospects for clearing conditions are dim, and the only thing more dismal than the weather is my mood. This is the annual Ellington air show and everyone from the Confederate Air Force to the Thunderbirds are here. I had my heart set on some serious scanning, but obviously, that's not going to happen today. Of course, I'd probably have been in a much worse mood had I known that this annoying drizzle would lead to the one of the worst floods in Houston history.

How quickly disaster can strike! And it seems that no part of the nation is immune. From the hurricanes of Florida to the earthquakes of Los Angeles, our lives can be turned upside-down in just moments.

These are the times where the scanning enthusiast can have a decisive advantage over the general public. While everyone else is forced to rely on highly edited news reports that may be hours old, the well prepared scanning station can keep you informed of the latest news as it happens.

The time to start your disaster preparations is now. When the flood waters are rising a foot an hour and there are trout swimming in your garage, it will probably be too late to be running to the store for batteries!

Philadelphia FD Disaster Drill

There are four basic components which must be considered for a successful emergency scanning station: radios, batteries, antennas, and frequencies.

Get Set with a Receiver

The first, obvious element required is a radio. What may not be so obvious is the type of radio. Though any scanner that will function on twelve volts or less is a candidate, a hand-held radio has many advantages. For instance, if you need to get moving in a hurry, a hand-held will be a lot easier to carry and operate than a base unit with a ten pound battery pack. In inclement weather, a portable scanner in a clear "freezer" size zip lock bag with only the antenna and the earphone cord protruding will help protect the radio from the elements. Operating the controls isn't always convenient, but at least you can usually perform the basic functions without getting the radio soaked.

Probably the least desirable option is a scanner that operates only on house current. Even though you may have a generator, you wouldn't want to have to crank it up just to listen to the scanner. An AC inverter, which converts 12 volts DC to 120 volts AC may be the best bet if you have to run this type of scanner. However, my experience has been

that if you are going to use an inverter, you'd better have a power source that can supply a lot of current.

Another factor to consider is the channel storage capability of the radio. It is essential to have sufficient channel capacity to hold the appropriate number of frequencies required for your area. If you live in Podunk and plan to listen only to the fire department, your needs will be much different than if you live in a large metro area and will need to listen to numerous agencies. Besides having an adequate number of channels, having the ability to segregate the channels into banks is quite helpful. As we'll discuss later, the way you organize your scan banks is a vital part of your emergency scanning strategy.

Having two or more radios can allow you to keep an ear on the local, immediate situation, while monitoring the larger picture. (Photo at right, courtesy of Ed Hesse, certainly qualifies as a well-stocked scanner shelf!) Radio Shack's PRO-62 with 200 memory channels is one of the newer and more versatile handhelds on the market today.

Back it up with a Battery

Usually the first utility to fail in a storm is the electricity. This means that if you don't have some type of ancillary power, odds are you'll soon be in the dark and out of touch.

A backup power source that I've relied on in several emergencies is the Recoton *Smart-Charge*® Portable Power Station (800-732-6866). A similar product is now also marketed under the ANLI brand name (800-666-2654). It has a built-in cigarette lighter socket, voltmeter, and will supply three, six, nine or twelve volts. The Power Station utilizes lead-acid cells, and has an automatic charge shut-off circuit, so the unit can be left plugged in continuously and will always be fully charged when needed. There is even an adapter provided so you can quick-charge the Power Station from your car's battery.

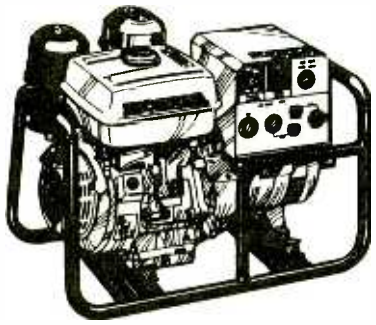
I have found that the Power Station can run a scanner, CB, cellular phone or HT for hours, or even days (depending, of course, upon the level of usage and current draw).

Another handy source for 12 volt power had been the Innova Powerpak, available through Grove Enterprises. However, Innova (714-433-0121) recently discontinued their 6.5 amp version.

Of course, no discussion of DC power alternatives would be complete without the most common 12 volt source, the car battery. In a pinch, a car battery can provide 12 volts at high current for a very long duration. However, when dealing with car batteries, there are some special considerations which should be heeded. Some car batteries have vent holes where acid may spill out if the battery is tilted. This acid can cause severe burns to skin, or practically anything else it touches. So gloves, eye protection, and extreme caution are advised during handling. These batteries may also give off explosive or toxic fumes when charged, so be sure to observe the precautions on both the battery and charger.

It should be noted that conventional car

Keep power packs charged and accessible in case of an emergency (two examples at right; see text for specific recommendations). If you can't justify the purchase of a portable generator (below), you can borrow temporary DC voltage from your car with a cigarette lighter adaptor (below, center). Of course, it is always a good idea to keep plenty of fresh alkaline batteries around to operate your equipment (below, far right).



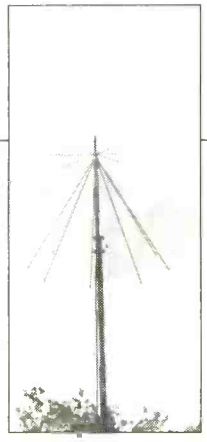
Philadelphia FD Disaster Drill

batteries may be damaged if they are deeply drained even a few times. If you are going to use a large 12 volt battery as emergency power, I would recommend you check out those designed to tolerate repeated deep discharges, such as boat trolling motor batteries. Obviously, the battery must be checked periodically and charged when necessary. However, given the disadvantages of this type of power source, I tend to steer away from them for emergency use.

Regardless of which type of emergency power source you use, you will also need the appropriate cords and connectors. During our last power outage, I found that splicing two wires together while clenching a penlight between my teeth can be quite frustrating! I now have all of the appropriate power cords made up, along with a tag on each indicating their tip polarity, and have them stored in a separate container for just such emergencies. Also, if you plan to run multiple devices off of one power source, be sure you have an adequate number of extensions and "Y" connectors.

If you opt to use internal batteries in your radios, be sure you have a sufficient supply of fresh alkalines. It might be wise to put a new set in your radio, then operate it at average volume to see how long the batteries last. From this simple test, you can get an idea of how many batteries your particular radio will require for extended use during a disaster. Just be sure to conduct your test with the volume turned up to average level, since the audio level has a lot to do with how much current your radio will draw.

For emergency use, most experts don't recommend NiCad batteries for



Boost your reception with an antenna to suit the situation (clockwise, from upper right): a high gain discone, magnetic-base mobile mount antenna, Grove's "No-Tenna" (which turns your car into a giant all-band antenna), universal whip antenna, and high performance flex ("rubber ducky") antenna.

two main reasons. First, most NiCads don't have the useful life of alkaline batteries. Second, NiCads typically have a very short shelf life, and may be totally dead when you need them most. NiCads are great for casual use when they can be recharged as necessary. However, I don't include them as a part of my emergency power resources.

And while on the subject of batteries, probably one of the best investments you can make is a simple battery tester. In just a matter of minutes you can go through your entire stash of 1.5 volt batteries and get an accurate assessment of their state of readiness. I prefer the Radio Shack model 22-096 tester due to its simple, rugged design.

Improve Your reception

The antenna you choose for your emergency scanning station will mainly be determined by what you intend to scan, as well as how strong the signal is. In many cases, the whip or flexible antenna that came with your scanner may be sufficient. However, if you intend to listen to distant stations, you may need something with a bit more gain or elevation. For example, on a handheld, it may prove worthwhile to invest in a more efficient whip or rubber duckie in order to pick up weak signals.

Photo courtesy of Darren Goldberg

Another critical factor when choosing an antenna is whether you intend to remain stationary at home, will be moving to another fixed location, or operating while mobile. If you have the luxury of staying at home, then you can be prepared by installing and testing the right antennas ahead of time. Just remember that if your typical weather related emergencies involve icing or high winds, you need to secure the antenna accordingly. If possible, keep a backup antenna in the attic, where it will be safe from the elements.

One of the best emergency antennas is the discone. Even if you require a portable antenna to take to another location, the discone can be dismantled and reassembled in a matter of minutes. And the unique design of the base allows it to be free-standing on a roof or balcony. Not only is the discone an excellent scanner antenna which can operate over a wide range of frequencies, but it can also be used to transmit. Discones will typically operate equally well from around 100 MHz up to one GHz.

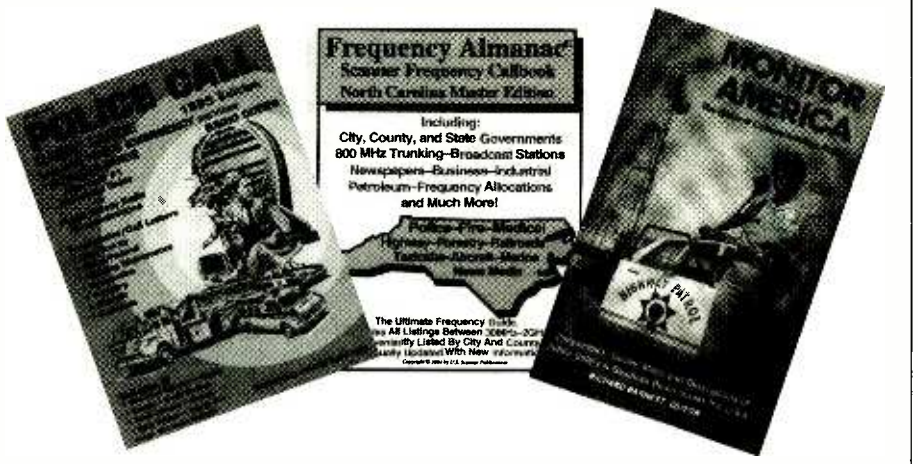
If you will be operating mobile, or need an antenna which can be easily transported from one base to the other, a magnetic mount

mobile antenna should be considered. If the antenna will not be used for transmitting, it doesn't have to be attached to a metal base. However, most mag mount antennas, when used for transmitting, need the metal base to act as a ground plane.

If you do need use your mag mount for transmitting from a temporary base, any large, flat piece of metal will serve as a ground plane. In an emergency, a metal garbage can lid, or even a pizza pan will work. Just be sure to check the SWR before extended operation.

One of the best emergency portable antennas is the dipole. The disadvantage of the dipole is that it will usually exhibit optimum characteristics for a relatively narrow frequency range. This is offset by the fact that one, or even several dipoles, when rolled up, will occupy very little space. Just remember that the vast majority of signals above 30 MHz are vertically polarized, so you will obtain best results if you mount your dipole vertically as well.

When the emergency is in progress is too late to be looking up and entering critical frequencies. Take the time to research frequencies using the excellent books available on the market today, then spend the time necessary to program promising scanning channels.



■ Know Where to Look

Of course, all of this hardware is useless without the key ingredient: frequencies. To further complicate matters, the services you choose to monitor will vary greatly from one part of the country to another. Careful documentation and preparation before a disaster strikes is your key to success.

During our recent floods, I took the opportunity to scan most of the emergency services, and have developed a strategy for future situations. The strategy you employ will depend upon the services available, as well as the geographic characteristics of your area.

One thing I discovered is that a lot of activity took place on emergency channels that are hardly used under normal operations. For instance, many of the fire and EMS "back channels" were very active with rescue coordination. So if your scanner list has a number of channels you've never heard active, they may come to life during a disaster when most of the main channels get crowded.

To get a global picture, I found the media services most helpful. Television, radio and traffic reporters provided a steady flow of information on events around the area. I used this information to plan an escape route, should it become necessary. It was especially helpful to have the "raw" news long before the edited version hit the air.

Needless to say, the local fire, police and EMS were kept busy around the clock. By monitoring the fire and EMS in my community, I was able to keep abreast of events occurring in my own back yard. This information became even more relevant when I heard the fire department dispatching evacuation airboats to my subdivision!

Unfortunately, monitoring those services which used trunked radio systems is largely an exercise in futility. One of the most-often-used arguments for trunked systems is the security it provides by making it difficult to monitor with a scanner. It's this same aspect of the system that may deprive the general public of much-needed information in times of emergency.

Another excellent source of information during emergencies is the two-meter amateur band (144 through 148 MHz). Often the hams in the affected area will work with various services to provide emergency communications. During our floods, hams provided communications for the Red Cross, and even the neighboring sheriff's department when their communications equipment was under water. Also, hams operated in conjunction with the National Weather Service to provide up-to-the-minute reports of weather conditions in the area. And, unlike so many agencies who are reluctant to share their frequencies, hams are typically more than willing to help.

To prevent information overload, you may wish to organize the various agencies in your scan banks according to your particular needs. For me, I prefer to separate them into (1) fire and EMS, (2) police, (3) media, and (4) amateur. Having two or more radios can also be very useful, allowing you to monitor a few channels which may be most relevant to your personal situation, and use the other to listen to the general activity.

Another strategy employed by many seasoned scannists is to organize the frequencies into banks which represent concentric rings of information in your area. For instance, the first bank would contain all the emergency frequencies within a ten mile radius of your base. The second bank would extend out from approximately ten to twenty miles, and so on. This allows you to scan on a global level, and then zero in on your community as the need arises.

■ Before it Floods, Do a Dry Run

Though a discussion of emergency lighting is out of the scope of this article, I would like to share a couple of thoughts on the subject. First, I've found it's very tough to operate a scanner, take a shower, or even read a book with a conventional flashlight. You may wish to invest in one or more fluorescent lights, preferably those which may also be operated on a twelve volt power supply. Additionally, I try to always use flashlights and scanners which will function on the same size batteries. Then you only have to stock up one type of battery which can be easily interchanged among your equipment.

The final step is to test your emergency scanning station. Some evening, just flip the lights off in your home and give all of your equipment a dry run. Or better yet, move everything to a friend's house and simulate an emergency where you would have to relocate. This simple exercise will help uncover any flaws in your disaster preparedness plans, and ensure all will flow smoothly when your everyday routine is abruptly swept away.

O CANADA!

Independent Shortwave Broadcasting in the World's Second Largest Nation

Part 1 of 2

By Adrian Peterson

Canada! Such a vast land, so open and so wide. In fact, so vast is the country that its east coast is closer to Europe than it is to its own west coast. Just a little larger in expanse than its neighbor to the south—the United States, Canada is superseded only by Russia in size.

Canada is a land of great variety, with towering mountain ranges, crystal clear lakes, and lush green forests. Grain lands cover the wide prairies, and fertile farmlands strike a vivid contrast to the northern snow fields.

Canadian history stretches back into the dim, distant past with the arrival of the Eskimos and Indians from Asia and the nomadic visits by Viking seafarers from Europe. During the era of world exploration by European navigators, both the French and English explored coastal areas of Canada. Settlements and wars followed, until finally, Canada was established as a Dominion in 1867.

Canada claims two firsts in international radio communication. One of these significant events was the reception of the first transatlantic radio signal when the letter "S" was sent in Morse Code from Poldhu in England. It was received by Marconi himself at Signal Tower near St. John's in Newfoundland on a cold and windy afternoon, December 12, 1901. The other Canadian radio "first" is station XWA, which began experimental broadcasting in 1919 and grew into the respected Canadian broadcaster, CFCF; the world's oldest, they claim.

Two aspects of radio broadcasting in Canada have captured the interest of the international radio monitor: the extensive network of low powered mediumwave relay stations in small communities throughout Canada, and the cluster of exotic little independent shortwave stations that span the nation. On this occasion, we look at the latter—the low powered shortwave stations that have been on the air since the end of World War 2. In order to gain a correct perspective, we go back, quite briefly, to the beginning.

The Early Days

During the early experimental era of shortwave broadcasting between the two World Wars, a large number of shortwave stations sprouted up everywhere throughout Canada. Distances were so vast and communities so wide spread, that regional shortwave broadcasting was considered to be a very effective supplementary method of giving radio coverage to the entire country.

A count of the different shortwave stations on the air at the time reveals more than one hundred callsigns. Most of these stations were quite small operations, owned privately or commercially, though some were operated by the CBC. Most stations were at first identified with amateur callsigns in the VE series, and were later regularized into the "C" series. Some of the stations were on the air for only a short period of time, while others continue to this day.

With the clouds of another world war gathering over Europe, the

number of shortwave stations remaining on the air was thinned out quite dramatically. By 1939, only a handful of the commercial shortwave stations remained on the air, and by this time each was now operating under a standardized callsign in the four letter, C series.

Canada's use of shortwave broadcasting has presented a rich potential for QSLs over the years. The veries on this page are from CHNS (left) of Nova Scotia; CFRX (this photo), an affiliate of CFRB in Toronto; CFCX (middle) of Drummondville, Quebec (here crossed out and replaced by CIQX on the QSL—although the station never made the call letter change!); and (bottom) the Canadian Broadcasting Corporation, Newfoundland.

■ After the War

When the dust of distant battle had settled and the shortwave scene in Canada had stabilized, records of the time reveal that there were only nine local shortwave stations remaining on the air.

Let's take a look now at each of the shortwave stations that have been on the air in Canada since the end of World War 2. Beginning with the sunrise in the far east and moving with the course of the sun towards the distant west, we take each province in turn in two installments. This month, we will travel from Newfoundland through Ontario.

■ Newfoundland - CKZN

The first station that we look at in this panoramic sweep of the shortwave scene throughout Canada is one with a many splendored past. Radio station CKZN, as it is now known, began in mid-1939 as the exotic little VONH with 300 watts on 5980 kHz. This station was the shortwave relay of the mediumwave VONF, the "Voice of Newfoundland." It was owned and operated by a government entity, the Broadcasting Corporation of Newfoundland, in St. John's.

Radio station VONH was installed to provide radio programming to the coastal areas of Newfoundland and Labrador which were not covered by existing mediumwave transmitters. It operated under two callsigns, VONH and VONG, depending on which channel was in use, in the 49 or 31 meter bands. For a period of time toward the end of the 1940's VONH also broadcast on 3480 kHz just beyond the 90 meter band.

The transmitter for VONH was a 300 watt unit made by Canadian Marconi and the antenna was a half-wave vertical, because of the heavy snow falls in the area. At the time, studios were located in the Newfoundland Hotel in downtown St. John's, and the signal was fed by underground cable to the transmitter site at Mt. Pearl. This transmitter base was the site of a World War I navy wireless station.

When Newfoundland was confederated with Canada on March 31, 1949, the Broadcasting Corporation of Newfoundland became the Newfoundland Division of the Canadian Broadcasting Corporation (CBC), mediumwave VONF became CBN, and shortwave VONH/VONG became CBNX. Studios were established in Duckworth Street, still the current location.

In mid-1963, shortwave CBNX moved from its traditional channel 5970 kHz to 6160 kHz because Radio Canada International at Sackville, NB, was also using that channel. The Vancouver CBC home service outlet is also broadcasting on 6160 kHz.

The callsign of CBNX was changed in 1965 to CKZN with the last letter now designating the mediumwave station CBN. A new 1 kW transmitter was installed in 1985 together with a new folded dipole antenna and reflector beaming slightly northwest. Today, programs are relayed from CBY in Corner Brook, Nfld., via a satellite feed back to St.

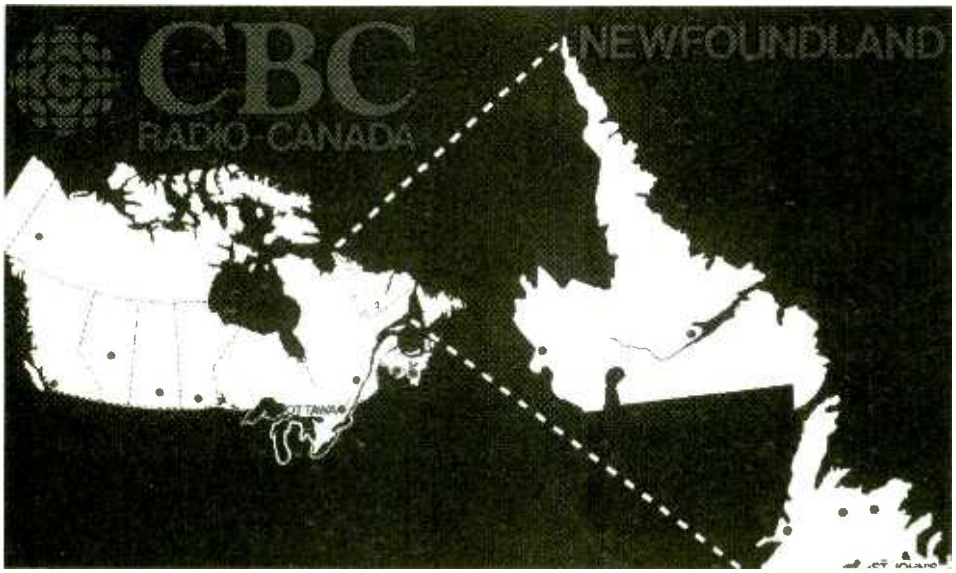


TABLE 1: Newfoundland

City	Year	Date	Call	Watts	kHz	kHz	MW	kHz
St. John's	1939	Mid	VONH	300	5980	3480	VONF	1195
			VONG	300				
	1949	Mar 31	CBNX	300	5970		CBN	640
	1963	Mid	CBNX	300	6160		CBN	640
	1965		CKZN	300	6160		CBN	640
	1985		CKZN	1000	6160		CBN	640
	1994		CKZN	1000	6160		CBN	640

John's, and this produces a micro-second delay behind the mediumwave CBN on 640 kHz in St. John's.

■ Labrador—VONW

Beginning about mid-1950 a faint new station in Labrador appeared on the radio dial. It was station VONW with 100 watts on 3490 kHz, just above the 90 meter tropical shortwave band. This station was located at North West River in Labrador, which was a small village of some 250 people located on a river inlet on the western coastline of Lake Melville, some twenty miles north of Goose Bay.

TABLE 2: Labrador

City	Year	Date	Call	Watts	kHz
North West River	1950	Mid	VONW	100	3490
	1952		VONW	100	3480
	1954		CKA35	75	3420
Nain	1952		VO??	Low	3480

Radio station VONW was established by the Labrador Mission of the United Church of Canada. Its programming, which was directed to isolated communities in the area, consisted of school instruction, church services and local information. The broadcast schedule for VONW was somewhat irregular, though the station was usually on the air each Sunday and at various times during the week. This unique radio service was similar in style to the School of the Air in Australia, though the Labrador version presented augmented programming.

In 1952, VONW was using the channel 3480 kHz and in 1954 it was on 3420 kHz with a power output now of just 75 watts. The callsign was changed in 1954 from a regular Newfoundland callsign, VONW, to a Canadian communication callsign, CKA36. That was the last that was heard from this station.

In 1952, a similar station was established at Nain, which is just a small fishing village on the Atlantic Coast of Labrador. This Eskimo village is the most northerly permanent settlement in Labrador. The radio station in Nain was also low powered and it operated with similar programming to VONW, and on the same channel, 3480 kHz. The callsign of this station was never ascertained.

■ Nova Scotia—CHNX

The origins of the current CHNX go back to 1929 when the first shortwave station in Halifax, Nova Scotia, was launched under the experimental callsign, VE9CF. This station radiated 500 watts on 6050 kHz, though 6100 kHz was taken later.

Then, in 1935, a second shortwave station appeared on the scene in Halifax—VE9HX on 6110 kHz. Soon afterwards it also assumed a subsidiary callsign, as VE9HK on 6120 kHz. Shortly afterwards, in 1936, the two shortwave stations in Halifax were amalgamated. The experimental callsigns were replaced by the standardized callsign, CHNX, operating on 6110 kHz and at times, on 11835 kHz. Then, in 1937 a new 500 watt transmitter was installed and this was tuned to 6130 kHz. Since that time, CHNX has remained virtually unchanged. Programming has always been a tandem relay of the mediumwave station, CHNS.

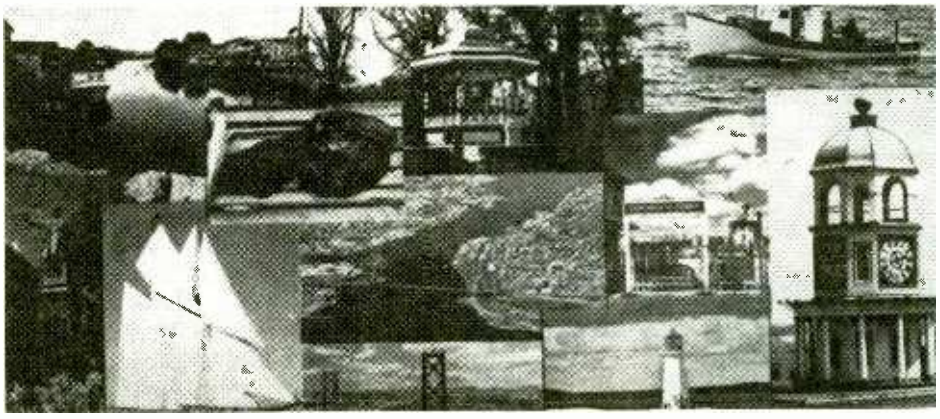
In the early 1930's, CHNX-VE9HX participated in a round-the-world radio relay with a network of other shortwave stations located in the United States, Africa, Asia and Australia.

■ Nova Scotia—CJCX

Radio station CJCX, located in Nova Scotia's second city, Sydney, made a sudden appearance onto the radio dial in 1938. The 1 kW transmitter was co-located with the mediumwave transmitter on South Bar Road, south of Sydney, and the studios of the mediumwave counterpart CJCB were located in Radio Building, Charlotte Street, Sydney. The specifications for this shortwave station never changed, and when the transmitter died about 1976, so did the shortwave service which has never been revived

TABLE 3: Nova Scotia CHNX

City	Year	Date	Call	Watts	kHz	kHz	MW	kHz
Halifax	1929		VE9CF	500	6050	6100	CNRH	910
	1935		VE9HX	500	6110		CHNS	910
			VE9HK	500	6120		CHNS	910
	1936		CHNX	500	6110		CHNS	930
	1937		CHNX	500	6130		CHNS	930
	1994		CHNX	500	6130		CHNS	930



QSL from CHNX of Halifax, Nova Scotia.

■ Quebec—CFCX

The Marconi company launched the first experimental wireless station in Canada (and, they claim, in the world) with the callsign XWA at Drummondville, some fifty miles

TABLE 4: Nova Scotia CJCX

City	Years	Call	Watts	kHz	MW	kHz
Sydney	1938-1976	CJCX	1000	6010	CJCB	1270

downstream from Montreal in November, 1919. This historic communication station evolved into Montreal's mediumwave station CFCF which was relayed spasmodically by shortwave transmitters at Drummondville under many different callsigns, such as VE9DN, VE9BA, VE9DR, etc. Many different channels were used for this experimental relay service, though one of the earliest was listed simply as 32 meters.

In 1930, one of these units, designated as VE9DR, began a regular relay from CFCN to provide radio coverage for Marconi staff working on electronic installations in far north Quebec. This original VE9DR was a 50 watt unit radiating on 6005 kHz.

Two years later, in 1932, the shortwave transmitter, along with the mediumwave station, was relocated to the top of the Mt. Royal Hotel in Montreal. Four years later again, in 1936, the shortwave callsign was regularized to the now familiar CFCX. This small shortwave outlet, rated at that stage at 75 watts, was on the air for a period of eighteen years, until its closure in 1948.

However, some fifteen years later, in 1963, and at the request of the Department of Communication in Ottawa, the shortwave service was revived. A small 500 watt Canadian Marconi transmitter was co-sited with the new mediumwave installation in the Iroquois Indian reserve across the St. Lawrence River at Caughnawaga. The signal is fed into a lazy-H antenna beamed almost North and South at 340 and 160 degrees. Coverage is intended for Northern Quebec.

In December 1988, the three radio stations, AM, FM, and SW were sold for $11.8 million. The callsigns were changed on September 9, 1991, when CFCF became CIQC and CFCX became CIQX. This information, even though it has been disputed, is contained in a letter from the station and also on their QSL cards, though a subsequent letter states that the shortwave callsign was *not* changed.

TABLE 5: Quebec CFCX

City	Year	Date	Call	Watts	kHz	MW	kHz
Drummondville	1930		VE9DR	50	6005	CFCF	730
Montreal	1932		VE9DR	50	6005	CFCF	1030
	1936		CFCX	75	6005	CFCF	600
	1948	Closed					
Caughnawaga	1963		CFCX	500	6005	CFCF	600
	1991	Sep 9	CIQX	500	6005	CIQC	600
	1992	Mid	CFCX	500	6005	CIQC	600
	1994		CFCX	500	6005	CIQC	600

Does this mean then that my QSL card for CIQX is in reality for a station that never existed?

In recent times, this shortwave station, again designated as CFCX, has been off the air for extended periods of time, though latest reports indicate that it is on the air again intermittently. Interestingly, this shortwave station sometimes relays English programming from the mediumwave CIQC and sometimes French programming from the mediumwave CKOI.

■ Quebec—CBFW

The experimental relay service from the Marconi transmitters located at Drummondville near Montreal also provided the earliest beginnings of a CBC service for northern areas. In the early days, the transmitters were used for continental and international communication, special broadcasts, and experimental broadcast services with a relay from local mediumwave stations.

The Canadian Broadcasting Corporation was formed in 1936 and some of the Marconi shortwave transmitters at Drummondville carried spasmodic relays of the local mediumwave stations—CBM in English, and CBF in French after 1937. The spontaneous relay of mediumwave programming over shortwave transmitters was suspended during the war.

In 1946, after the war was over, the CBC introduced a regional shortwave service in French over two transmitters located at Vercheres, on the south bank of the river just north of Montreal. Station CBFW with 200 watts on 6090 and CBLX with 7.5 kW on 15090 relayed the programming as a regular service from the parent mediumwave station, CBF in Montreal. Three years later, in 1949, this French service was augmented with the installation of an additional transmitter of 7.5 kW at Vercneres and the usage of additional channels.

However, when a new 50 kW transmitter was installed for mediumwave CBF in 1953, the CBC regional shortwave service from Montreal was suspended, though it was reintroduced temporarily for a few months in 1956.

Some time after the CBC international shortwave service was inaugurated from the new transmitter base in Sackville, New Brunswick, in 1939, a special regional service for Canada's northern areas was introduced, usually airing on two channels. This service was augmented in 1980 with additional programming in Eskimo languages.

TABLE 6: Quebec CBFW

City	Year	Call	Subsidiary	Calls	Watts	kHz	MW	kHz
Vercheres	1946	CBFW			200	6090	CBF	690
	1949		CBFA	11760	7500		CBF	690
			CBFL	11720				
			CBFO	9630				
			CBFR	9520				
			CBFX	9610				
			CBFY	11705				
			CBFZ	15190				
	1946	CBLX			7500	15090	CBF	690
			CBLX	15090	7500		CBF	690
	Closed 1956							

■ Ontario—CFRX

This station is probably the best known and widest heard of all of Canada's exotic little shortwave stations, and it is the only one that provides a separate identification announcement for the shortwave service. Once each hour, a pre-recorded tape is cut in which identifies CFRX as the shortwave service of CFRB Toronto.

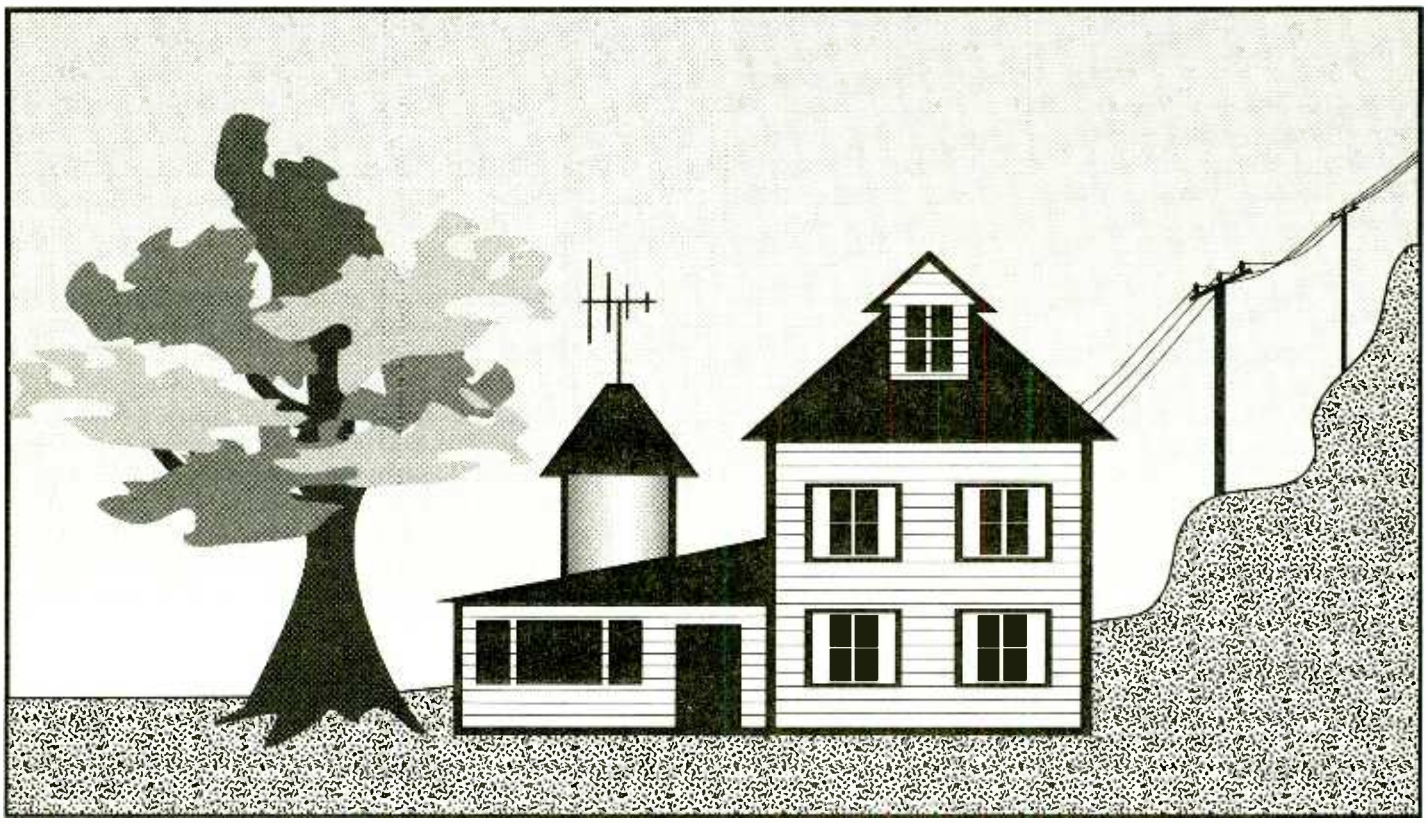
TABLE 7: Ontario - CFRX

City	Year	Date	Call	Watts	MW	kHz
Aurora	1937		CFRX	1000	CFRB	690
Clarkson	1946		CFRX	1000	CFRB	860
	1983	Dec 31	CFRX	1000 -new	CFRB	1010
	1994		CFRX	1000	CFRB	1010

Station CFRX began broadcasting in 1973. It has always been co-sited with its parent mediumwave station CFRB. The original CFRX transmitter was a 1 kW unit built by the station engineers and installed at the first location, Aurora, on the northern edge of Toronto. In 1946, the shortwave transmitter was moved to Clarkson and co-sited with the new mediumwave facility. This location, against Lake Ontario south of Toronto, is the current site for CFRB/CFRX.

A new 1 kW Elcom-Bauer from Sacramento was installed and became operative on December 31, 1983. Since October 1, 1991, the prestigious Ontario DX Association has been recognized as the official QSL organization on behalf of CFRB and CFRX.

Antenna Location: Fact & Fiction



What's wrong with this picture? Almost everything if you are a radio buff. Terrain, trees, wiring, metal siding, nearby buildings, and other reflective surfaces all affect antenna performance. The lower the antenna, the more obstructed it is likely to be. To borrow a phrase from the world of real estate: the three most important factors in antenna performance are are location, location, location.

By Bob Grove

This month's excerpt from my new *Antenna Factbook* compares good and bad locations for antennas. Remember, your antenna is the most important accessory you will ever buy for your receiver or transceiver; don't skimp on its quality or its placement.

Location is Everything

A very poor antenna location would be an indoor basement. Signals are unpredictably reflected by metal and wiring in the structure; nearby electric and electronic appliances invite interference to reception; and the earth absorbs transmitted energy as well as reflects signals upward; and it receives signals from overhead, rather than from the horizon. Nearby trees, buildings and hills take their toll, too.

Locating an antenna inside a large building with steel frame and metal reinforcements may attenuate signals up to 25 dB at VHF and UHF, according to one study. Brick walls, slate or tile roofs can account for 6 dB, even more when wet. Shorter wavelengths (900 MHz) get through small windows in shielded walls where longer wavelengths (150 MHz) do not.

The lower the frequency, the more the signal is capable of following the contour of the terrain, and the less likely it is to be absorbed by trees and foliage. One study showed that with dense trees and vertical polarization, attenuation at 30 MHz is about 3 dB, increasing to 10 dB at 100 MHz (see Fig. 1 on next page).

While ground-mounted verticals are simpler to install than elevated antennas, nearby obstructions profoundly affect their performance. Of course, even an elevated antenna can suffer from the effects of poor location, as the opening illustration for this story plainly shows.

Because horizontal antennas radiate at right angles to their axes, they should be elevated at least 1/2 wavelength—higher if possible—as measured at their lowest operating frequency, to avoid ground

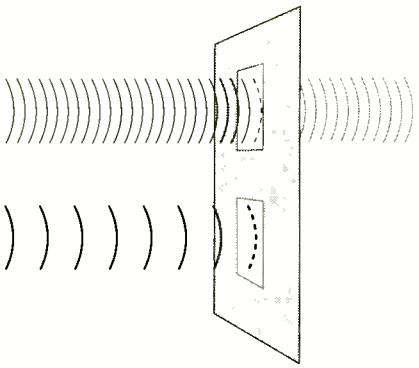


Fig. 1—The higher the frequency, the shorter the wavelength, and the easier it is for a signal to get through an opening in an absorptive or reflective enclosure.

effects which force the pattern upward. An antenna at that elevation can have a 6 dB (one full S-unit) stronger signal than one only 0.1-0.25 wavelengths above the ground. One-half wavelength above the ground at its lowest frequency of operation appears even higher (in wavelengths) at higher frequencies because of their shorter wavelengths. See Fig. 2.

The Radio Horizon

Radio waves, like light waves, follow the line of sight. Because of the curvature of the earth, higher antennas "see" a farther horizon.

Assuming a flat, unobstructed terrain, the visual horizon is about 8 miles for a 30-foot-elevated antenna, increasing to only 16 miles at 120 feet! Notice the square law effect: it requires roughly four times the height to get twice the distance. Once an antenna is high enough to "see" past nearby obstructions, it takes at least double that height to notice any improvement. See Figure 3 below.

The lower the frequency, the more radio waves are capable of following the curvature of the earth beyond the visual horizon.

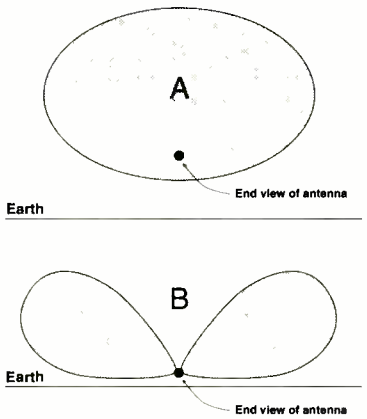


Fig. 2—A horizontal antenna, high over the ground (A) enjoys a more uniform radiation and reception pattern toward the horizon than a low antenna (B) which is distorted upward by ground reflections.

Typical base-to-mobile communications ranges are about 50 miles in the 30-50 MHz band, 30 miles at 150-174 MHz, 25 miles at 450-512 MHz, and 20 miles at 806-960 MHz. Obviously, these distances will vary depending upon radiated power, receiver sensitivity, antenna gain, elevation and location.

$$\text{Distance (mi.)} = \sqrt{1.5 \times \text{Antenna Ht. (ft.)}}$$

Antenna Ht. (ft.)	Visual Horizon (mi.)	Radio Horizon (mi.)
20	5	6
50	9	10
100	12	14

Fig. 3—A reasonable approximation of the visual horizon; due to groundwave effects, the radio horizon is slightly greater.

TYPE	IMPEDANCE	LOSS IN dB 1 MHz	30 MHz	150 MHz	450 MHz	1000 MHz
RG-6/U	75	0.5	1.2	2.5	4.2	6.5
RG-8/(foam)	50	0.1	0.9	2.1	3.8	6
RG-8/X(mini)	50	0.5	2	4.5	0.9	13.5
RG-11/U	75	0.3	0.8	1.4	2.6	4.0
RG-58/U	50	0.4	2.5	6	12	17
RG-59/U	75	0.3	2	4.5	8	12
RG-174/U	50	1.9	4	10	21	34
Belden 9913	50	0.1	0.7	1.7	3	4.5

Typical coax losses in dB per 100 feet, assuming ideal conditions

Fig. 4—Typical coax losses in dB per 100 feet, assuming ideal conditions.

Although the higher the antenna the better, coax cable losses may negate any signal improvement; the higher the frequency, the worse the losses.

For example, at 450 MHz, extending a 30-foot antenna to 60 feet could increase signal strengths by 5 dB, but if you are using common RG-58/U coax, signal strengths may be attenuated by the same amount, resulting in no improvement at all! At 800 MHz, using this small-diameter, lossy cable, signals would get worse with height!

Always use low-loss cable like (in increasing performance) RG-8/X, RG-8/U, Belden 9913, or 1/2" foam (Andrews) Heliax (all 50 ohm cables); or RG-59/U, RG-6/U or RG-11/U (72 ohm cables).

Buried antennas

While a wire antenna on the ground or even buried a few inches under the soil is very inferior to an elevated antenna at shortwave and above, it does respond well to signals below 3 MHz or so. It is virtually immune to lightning, requires no mounting, is essentially invisible, and has excellent noise immunity (which probably accounts for its good reception).

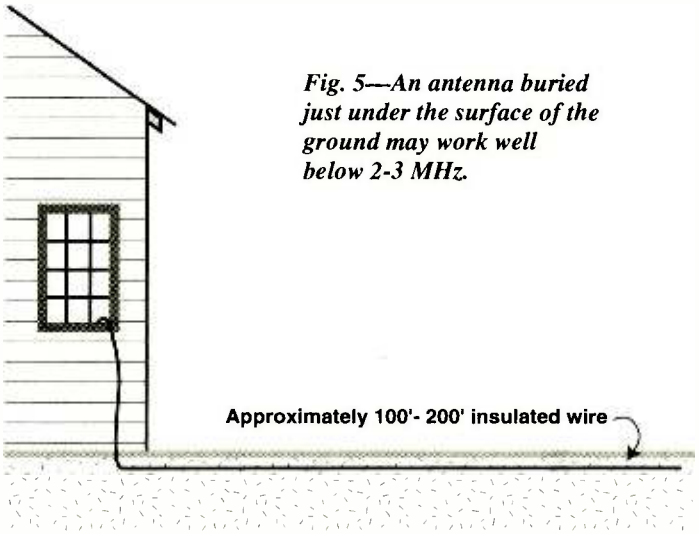


Fig. 5—An antenna buried just under the surface of the ground may work well below 2-3 MHz.

Such an antenna should be insulation-covered to prevent electrical contact with the soil, and should be 100-200 feet in length. It is also a good idea to seal the far end with a dab of silicone rubber to discourage moisture penetration.

How Good are Uniden's New BC9000XLT and BC3000XLT Scanners? Just ask Bob Parnass.

"The most feature-rich and sensibly designed base scanner of the current crop."
(BC9000XLT reviewed in Monitoring Times *by Bob Parnass, March 1995)*

Uniden BC9000XLT Desktop Scanner

An impressive performer, this improved-design scanner is for serious monitors of the 25-550, 760-1300 MHz (less cellular) spectrum. Featuring 500 memory channels, tuning knob, 16-digit, alphanumeric display with adjustable brightness, powerful 2.2 watts of audio, treble-cut tone control, CTCSS tone squelch option.

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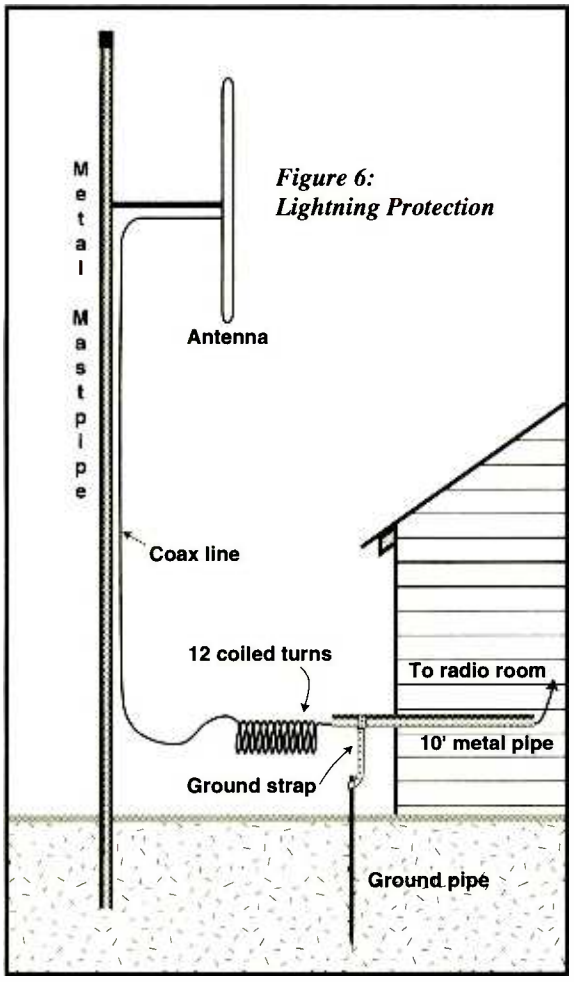

Figure 6: Lightning Protection

Lightning protection

Nothing can withstand a direct lightning hit. The best you can expect from a lightning arrestor or surge protector is to harmlessly short-circuit small voltage spikes resulting from nearby hits.

Old-style, spark-gap, antenna lightning arrestors were satisfactory for high-voltage-tolerant, tube-type equipment, but not for modern, low-voltage, solid-state equipment. Gas-discharge tubes which fire at under 100 volts offer better protection, while allowing full amateur transmitter power to pass unaffected.

During storms or extended periods of non-use, disconnnect your antenna line from your radio. You may wish to ground it or, alternatively, hang the connector away from the radio equipment, even hanging it inside a glass tumbler for additional insulation.

Improved lightning protection may be realized by suspending the antenna below the top of a well-grounded metal mast (which then becomes a lightning rod), by coiling the coax for about a dozen turns before it enters the building, and by passing the coax through a ten-foot metal pipe which is well grounded. See Figure 6 above.

Although electrical power line protection is beyond the scope of this book, highly-effective metal-oxide varistors (MOVs) are available in strip-line extension cords, and even for distribution panels to protect the whole house.

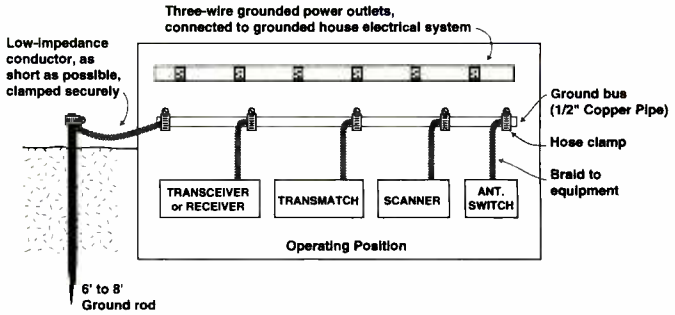

Fig. 7—A good electrical ground system utilizes short, large-gauge wire to connect radio equipment commonly to at least one deep ground rod. A second ground rod placed 10 feet away works better still.

What is a "ground"?

The earth plays an important role in radio signal propagation, but "grounding" your radio equipment is not one of them. While attaching the chassis of your radio to a buried conductor in moist soil may protect you from electrical shock, will drain off static charge buildup, can help dissipate nearby lightning-induced spikes, and even reduce electrical noise pickup, it will not make received or transmitted signals stronger.

A radio wave travels through space, not through the ground except at very close ranges or at extremely low frequencies. It is intercepted by the antenna metal, not by the soil beneath it which absorbs and dissipates the signal as heat.

A good electrical ground consists minimally of two eight-foot metal rods, at least ten feet apart, connected to the radio equipment by a short length of heavy braid. Moist, mineralized soil is best; dry, sandy soil is worst. See Figure 7 above.

A radio-frequency (RF) ground, on the other hand, is more extensive. A vertical antenna may be thought of as a center-fed dipole turned on its end, and the lower half removed so that we can mount the remaining element on the ground where the coax will be attached. But we must somehow supply that missing half of the antenna.

If we simply bury the needed wire in the ground, the energy that would radiate from that element is absorbed by the mineralized soil, simply heating it. Such an antenna is sometimes referred to as a "worm warmer!"

Instead, we construct a "counterpoise" on or above the soil, a metallic surface emulating a "perfect" (reflective) earth, composed of radial wires connected to and extending outward from the coax shield at the base of the antennas. Figure 8 below illustrates the radial wire ground.

How many spokes of wire, and how long? AM broadcasters use at least 120; for transmitting purposes, you should use at least sixteen 1/8-wavelength wires to avoid power losses from soil absorption.

Because current is at its maximum at the feedpoint, density of metal around the base of the antenna is more important than the length of the radials. If you have 100 feet of wire, ten 10-foot lengths is better than two 50-foot lengths. Receive-only antennas are not so critical.

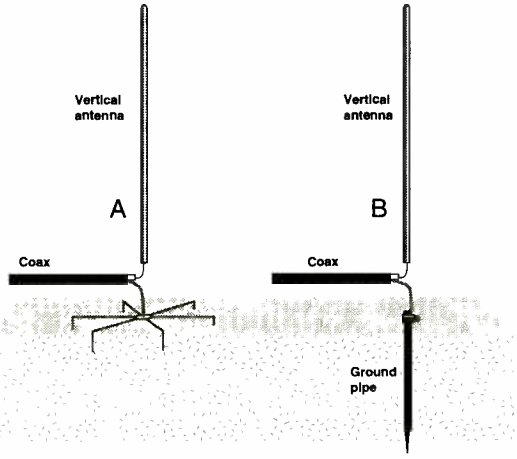

Fig. 8—A good radial counterpoise (A) is always preferable to using lossy earth (B) in a vertical antenna system.

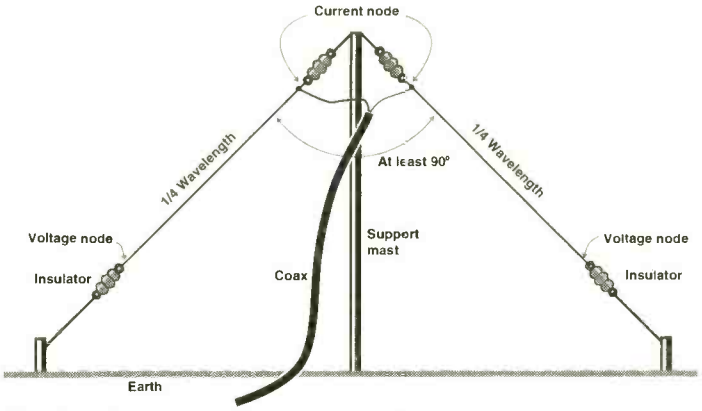

Fig. 9—The inverted V is a popular dipole configuration.

Even a single quarter-wavelength wire provides counterpoise effect; it may be run randomly or even coiled loosely in some cases. Such a wire is often connected to the chassis of the transmitter if it is "hot" during transmitting as evidenced by painful RF burns when touching the equipment.

The inverted V antenna (Figure 9 above) is a good example of how to keep the high-current feedpoint away from absorptive and reflective earth by elevating it to the apex of the antenna. The ends of the drooping elements (high-voltage points) come to within a few feet of the ground where their capacitive interaction with the soil may cause some length detuning of the antenna, but little signal loss.

Don't confuse a ground-mounted, counterpoised vertical with an elevated ground-plane antenna. On the ground we are trying to prevent radiation from being absorbed by the soil; an elevated ground-plane antenna, however, behaves more like a dipole in free space, with the radials supplying half of the antenna and forming the pattern. See Figure 10 below.

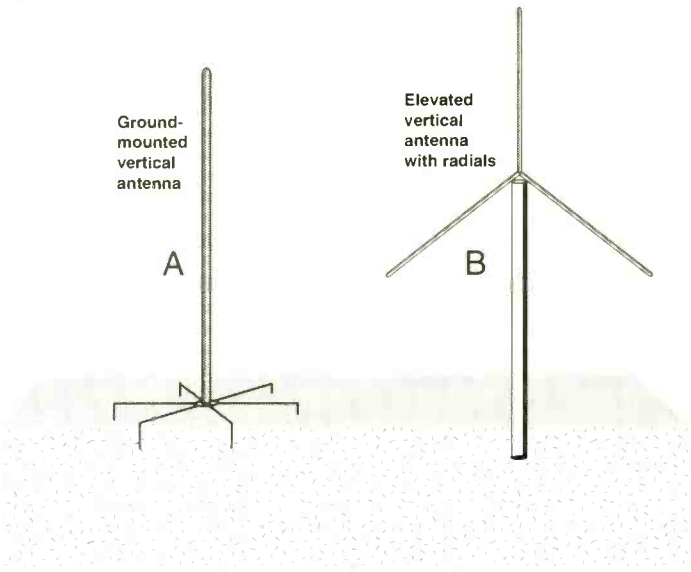

Fig. 10—The radial counterpoise on a ground-mounted vertical (A) prevents soil absorption of the radio; the radials on an elevated vertical (B) are part of the antenna itself and help shape the pattern.

"MIRACULOUS" RECEPTION?

"Way-out" radio reports are phenomenal, even if you don't buy the explanation! An April no-fooling story

By Henrik Klemetz

Comunicações

A fria Finlândia pega carona na Rádio Jornal

No dia 19 de julho de 1990, de 22h17min às 22h31min, a Rádio Jornal de Leopoldina foi sintonizada na Finlândia, uma república com cerca de 5 milhões de habitantes, situada na Europa do Norte. O autor da façanha foi Jan-Erik Usterholm, 40 anos, doutor em Química e diretor de Departamento de Química da Industria Nestle Corporation. Erik, que também é redator do jornal "Prekvensnytt", lidera cerca de 260 radioamadores do seu clube, Rádio Oyantes, e conseguiu a sintonia com os aparelhos ICOM R71E e Sony ICF 2001D cinco antenas existentes de 30 metros longitudinal.

Após receber "interferências fortes de uma emissora brasileira em 1.560 Kiloherts", como afirma em carta enviada à emissora, o finlandês tratou de anotar o prefixo, endereço e até a programação que passava no momento da recepção. "Estou muito interessado na sua programação, que muito me alegrou (...) Terei muito prazer em lhe enviar novas informações, se o desejar", escreveu Jan-Erik, num português 'arranhado', na carta que chegou semana passada em Leopoldina.

A Rádio Jornal, com sua frequência em 1.560 Khz, ondas de 192,3 metros funciona com potência inferior a 1.000 Watts no seu transmissor marca SNE, ano 86. Nunca 'viajou' tão longe em seus 43 anos de existência. Segundo o sub-gerente da emissora, Marcos Vinícius, em outras oportunidades a rádio foi sintonizada em Florianópolis, em 87 e 88, Duque de Caxias-RJ e em Salvador-BA, em maio deste ano. "Todas as provas estão devidamente arquivadas", diz. Geralmente a sintonia é feita à noite e a pessoa escreve uma carta com todos os detalhes da programação. Daí, a ser captada no exterior, a surpresa foi geral.

continua na página 5

With satellite downlinks, cellular telephones, faxes, and e-mail almost everywhere, a DX report to a distant AM station doesn't seem to cause the kind of surprise it used to do some years back. Long-distance communication is here to stay.

On the other hand, in an ever-shrinking world, a reception report and a subsequent request of a QSL (verification of reception) may sometimes be viewed as a waste of staff time. If you include a friendly personal letter with your report, postcards, etc., you stand a better chance of receiving a reply, but if such a reply is a true verification or not, is, of course, an altogether different story.

Finnish DXer Jan-Erik Österholm a few years ago received an unusual QSL from a Brazilian mediumwave station, Rádio Jornal de Leopoldina, which operates a 1 kW transmitter on 1560 kHz, in the small town of Leopoldina, in the state of Minas Gerais, Central Brazil. Along with his QSL there was a copy of the local newspaper which is published by the same company as the radio station.

The staff of Rádio Jornal was quite familiar with DX reports, as they had already received a few reports from distant areas within Brazil. However, a reception report from Europe was deemed interesting enough for the local newspaper.

In the newspaper account, Österholm's DX reception is dealt with at some length, as well as another report—also from Finland—to a second Leopoldina station, Rádio Sirena. How come, the newspaper asks, radio waves from the town of Leopoldina seem to be picked up so precisely in such a distant country as Finland?

Newsman Hudson Andrade, who used to work with the other Leopoldina station, Rádio Sirena, on 2410 kHz, recalled that in 1967, in a letter to the station, "radio amateur" Zabana Wichanen reported hearing the 120 meter band signal in Finland. The amazing thing about his report was that Rádio Sirena had left the air already one year earlier!

Said Andrade, "In 1966, Rádio Sirena closed down, but one year later we received a letter from a Finn who said that he had listened in to a program of ours. I was astounded. He gave a good description of the program."

The report was from Finland, in Europe, from a place where people normally wouldn't be aware even of the existence of the town of Leopoldina. Yet the Finnish DXer knew the station's frequency and address! Journalist Andrade started to meditate about radio waves and the marvelous things they seemed to be capable of.

He hastened to send the Finnish DXer a reply, where he said how delighted and surprised the station staff was at this report, especially as the station had been off the air for several months at the time of reception.

Looking for a reasonable explanation but unable to find one, Andrade now approached a friend of his, a physics professor at the University of the town of Juiz de Fora.

There was none, the physics professor told him. Such delayed reception is a physical impossibility. However, as the professor was also an amateur astronomer, he offered to produce an astral chart based on the date of the reception, as well as the place of transmission and reception. Maybe this way he would find an explanation to this strange phenomenon which the laws of nature denied him.

The astrologer didn't tell the newsman in writing about his finds, but privately he explained that the radio waves must have traveled right into space, where they must have bumped into some object, some asteroid perhaps, which then made the waves bounce back to earth, where they were casually picked up by this Finnish listener almost one year later!

The Manager of Rádio Jornal de Leopoldina, José Américo Barcellos, says to the local newspaper that in Mr. Österholm's case the explanation is quite simply that radio waves may travel very far at night, if reflected by certain ionized layers in the atmosphere.

As for the delayed reception of Rádio Sirena, Mr. Barcellos had nothing to add, nor did the newspaper reporter ask him. Maybe the people of Leopoldina prefer to think of their town as a place where miracles do intervene.

Artist's conception of a miraculous reception: Even a professor of physics is at a loss to explain the reception of these local Brazilian stations.

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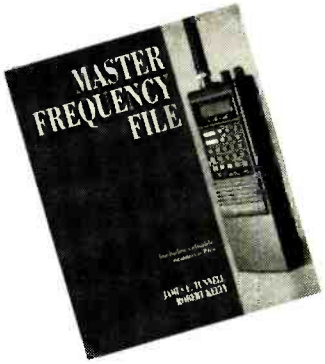

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Larry Van Horn, N5FPW

Single Letter High Frequency Markers Revealed!

Over the years, the shortwave utility spectrum has had its share of mysterious signals for listeners to contend with. The utility bands are primarily known for voice communications, but you will hear all sorts of bleeps, blips, sweeps, tones, and other mysterious signals that no one can seem to identify. Maybe that's the magic that keeps so many listeners monitoring the utility bands; you just never know what you are going to hear on your radio from one minute to the next.

The most common of the mysterious signals heard in the utility bands are the infamous numbers stations. These eerie, mechanical female voices have captured the lion's share of coverage in our hobby press over the years, almost to the exclusion of all the other mysterious signals out there to hear.

There is one set of mysterious signals, though, that continues to pop up from time to time, known to hobbyists as the SLHFM or "single letter high frequency marker" stations. This is the subject of this month's Utility World column. The trademark of these stations is the repetition of a single letter of the alphabet in Morse code continuously — well, almost continuously, as you will see shortly.

These signals have been with us in the shortwave spectrum since the early 1960's. The story begins with the appearance of the 'K' beacon on 9043 kHz over thirty years ago. From that time on, more and more SLHFMs have been reported from monitors worldwide.

Occasional breakthroughs in tentative identification have occurred at infrequent intervals. One of these discoveries pointed toward Khabarovsk—a Russian naval shipyard near the Sea of Japan and site of the famous Korean airliner incident—as the location of the 'K' SLHFM station. Since this discovery and as additional information became available, it now appears the 'K' station is further north near Petropavolovsk, the main Pacific Russian submarine base.

Mysterious Identity

Many theories have been reported over the years concerning the identity of these CW marker stations. One reporter in the May 1990 Ute World column attributed the use of such markers to the recording and transmission of data indicating water levels of a reservoir or canal system. Others have theorized that these markers are radio propagation beacons, fishing buoys, or back up transmitters used to send some sort of unknown data to other unknown stations in case some unknown satellite system had failed.

What do we really know about these mysteries of Morse code? Quite a lot actually. So let's put on our detective hat, grab the magnifying glass and pipe, and explore the world of SLHFM monitoring.

Our first task is to find out "who dunit," or more appropriately, who's transmitting these signals. For starters, we can assume that all the various single letter marker signals probably belong to the same system. Whoever put together this communications system is probably responsible for all of SLHFM transmissions.

As noted above, some of the facts uncovered over the last few years have pointed to a Russian communications system, and rightfully so. Credence to the Russian origin theory is supported by the fact that some SLHFM characters are transmitted using the Cyrillic alphabet. Cyrillic characters like Ю(..--) and Я(.-.-) have been used as markers in the past on several frequencies.

Like its numbers station cousins, official radio direction-finding efforts were lacking until just a few years ago. What was needed by the observers of these signals was some location information. In 1986, a breakthrough was made when the FCC released DF information on some of the SLHFM stations being heard at the time. These fixes all pointed toward stations located in the former Soviet Union. Table 1 is the FCC list that appeared in the October 1986 issue of *MT*:

TABLE 1: FCC 1986 SLHFM DF Information

ID	General Fix	Location
C	56N x 41E	Moscow
D	46N x 29E	Odessa
G	No fix given	
K	48N x 135E	Khabarovsk
O	56N x 32E	Moscow
P	56N x 19E	Kaliningrad
S	65N x 45W	Arkhangelsk
U	No definite fix area observed. Most likely transmitting from multiple locations between Murmansk and Amderma.	
YU	45N x 66E	Kzyl Orda
Z	49N x 23E	Mukachevo

It should be pointed out, however, that not all SLHFM activity has originated from Russian territory. In the mid-1970s, Russian personnel were constructing new military facilities in Cienfuegos, Cuba. On Cuban soil, they were building a naval base capable of servicing Russian naval surface ships and ballistic missile carrying submarines. Cienfuegos has long been a regular port of call for the Russian Navy, but this was the first time permanent facilities were being constructed in Cuba which would indicate a permanent presence of ships and subs.

By coincidence, a SLHFM station (ID 'W') surfaced in the mid-1970s on 3584 kHz causing interference to U.S. hams in the 80 meter band. FCC direction finding showed the transmitter to be operating on the island of Cuba. Following a formal protest to the Cuban government, the 'W' station went off the air for several months. It returned to the air for a short period of time on 3533 kHz, but finally left the air in 1978. Given the timeline above, it is easy to draw a connection between 'W' SLHFM station activity and military events in Cuba at that time.

As I mentioned before, these markers do not transmit their single letter identification continuously. From time to time, some of these markers have been observed breaking into high speed CW traffic or even an occasional high speed data burst. Some listeners have even claimed they have monitored FSK (frequency-shift keying) signals interrupting the normal single letter marker transmissions. In fact, both 50 and 75 baud FSK signals have been reported.

Following the Clues

Another interesting characteristic of the SLHFMs is the apparent clustering of frequencies used by multiple SLHFM stations. It would

almost appear that these stations appear are synchronized with each other in some way. It is not uncommon to hear several SLHFM transmissions within a kilohertz or two of each other. It has also been noted that several clusters can be in operation at the same time on different frequencies (multiple transmitters at each of the sites). Variations in transmit frequencies have been noted from time to time, which could be caused by poor power regulation or frequency control. (The Russians have been noted for both.)

In the western world, the closest parallel system to the SLHFM transmissions I can think of is the U.S. Air Force Global HF System, where you have multiple sites on a common frequency serving its users' communications needs.

One other interesting characteristic of these stations is the apparent, occasional disappearance of various stations in the network. More than once, reporters have indicated that certain stations appeared to go off the air. After a certain period of time, however, the bulk of these stations returned to a broadcast status.

This phenomenon could be the result of HF propagation more than anything else; on the other hand, other stations have been reported on-the-air for only a few months only to disappear forever. Could these be stations brought on the air for some tactical purpose or maybe even for a specific military exercise?

Probably the most profound evidence that this is a Russian communications system is based on the traffic that has been heard on these markers, infrequent though it may be. Several monitors have reported the occasional transmission of various Russian military callsigns from these markers (i.e.-UMS, ROT, RMP, etc). All of these callsigns are associated with the Russian navy communications facilities. It is significant to note that the majority of the sites mentioned in Table 1 are also closely tied to the Russian Navy, and most of them contain VLF/LF communications sites for submarine communications.

To clinch the matter, a very interesting logging has just been received by your editor. Long-time Ute World reporter, Ary Boender in the Netherlands, has supplied this column with the most convincing evidence to date about the usage and identity of these stations. Here is that log:

3262.0 'P'-Channel marker 'P' started at exactly 2100 sending 3 groups of 5 'P' in CW followed by 'RMP' (Navy Kaliningrad) then into a weather forecast for the Baltic area. Finally a positive ID that these markers are military stations.

■ Conclusion

I think the evidence presented in this column shows exactly what we are dealing with in regards to SLHFM systems. Over the 30 years I have been monitoring and the seven years of this column, I cannot remember ever hearing or seeing any reports of actual Russian voice military or civilian HF communications. This is the first plaintext transmission I have ever seen reported, and it is significant that the text should be a weather forecast for the Baltic. It would appear that the Russians, especially the military services, like to use CW or digital modes for the bulk of their communications systems.

My best guess is that we are hearing some sort of military command and control, and broadcast network for the Russian Navy. It is probably a backup communications system for the subs, but could be a primary comm system for the Russian surface fleet. I invite your comments and observations on these stations as well. If enough material is received, I hope we can revisit this topic in a future Ute World column.

For those of you who would like to give SLHFM monitoring a try, Table 2 gives all the frequency/station information I currently have on these SLHFM (Russian Navy) stations.

■ COMINT Book Update

In the January 1995 column I reviewed Tom Roach's new book, *The Hobbyist's Guide to COMINT Collection and Analysis*. At the time, we did not have any information on the book's availablity. The author has since contacted this column to say the book can be ordered directly from him at the following address:

Tom Roach
1330 Copper Peak Lane
San Jose, CA 95120-4271

Send a check for $26.00 in the US or $28 overseas. All US orders are sent 2nd day priority mail; all overseas orders are sent via air mail. The author will gladly autograph any books ordered directly from him and he will be glad to include a personalized message to you if you request it.

Now it is time to see what all of you have been hearing out there in the world of utility communications. It's time for the Utility World logging section. CU in 30 de Larry.

TABLE 2: Ute World List of SLHFM Station Activity

ID	Location	Frequencies
A	Unknown	4305 6572 7435 9352 13568
B	Unknown	8698 20991.6
C	Moscow	4032 4302 5306 7039 8495 8500 9011 10612 10644 10872 13610 13636 17016 20992
D	Odessa	5305.7 6803 7038.7 8494.7 8647 10645 10871.7 11155 12150.5 13635.7 17015.7 20991.7
E	Unknown	6657 6965 14893 29060
F	Vladivostok	3350 5494.8 10644.5 13636.1 17016.1 17106 20991.5
G	Unknown	13637.4
H	Unknown	6791
I	Unknown	5374.6 10894.1 12149.5
K	Khabarovsk	2842 3977 3978 4005 4055 7905 7906 8144 8158 9043 11155.5 11476.5 12150 13538 13635.9 13979 14967
L	St. Petersburg	3091 26170
M	Magadan	8682
O	Moscow	5307.3 6803.5 8681.9 10646 13638 17016
P	Kaliningrad	3167 3212 3262 3291 3592 3608 3732 3807 3837 4031 4043 4476 4604 4752 4812 4899 5305.8 5308.8 5446 5862 6308.8 6622 6728.3 6968 7033.8 8494.8 8646.8 10644 10871.8 13635.8 17015.8 20991.8 26250
R	Unknown	3195 4324.7 6390 25250
S	Arkhangelsk	4301 5305.7 6801.5 7038.9 7395 8494.9 8645.5 8898 9011 10871.9 13636 17015.7 20991.7
T	Unknown	5158 8090.3 9309 10071 14862 17458 21901
U	Murmansk	3637 4448 5376 6247 6862 7395 7569 7677.3 8077 8136 8670 9042 9057 10215 12185 12328 13339 14476 14967 15705.5 16655 18170 20992
V	Unknown (Note 2)	3658 6790 7395 7895.3 8997.1 10285.3 10332 13234
W	Unknown	9015 11321
X	Unknown	3170 3180 5922 6735 9325
Z	Mukachevo	5308 17018.6

Note 1: Not all frequencies listed in this table are currently being used and not all stations on this list are currently being heard. Tuning around the bands, especially around SLHFM frequency clusters, will produce the best results.
Note 2: The RFL2 callsign has been heard on this beacon

Utility Loggings

Larry Van Horn

UTILITY WORLD

Abbreviations used in this column

ABCCC	Airborne Battlefield Command and Control Center	FAC	Forward Air Control
AFB	Air Force Base	FF	French Forces
AFTN	Aeronautical Fixed Telecommunications Network	GHFS	Global HF System
AG	Air Group	HF	High Frequency
AM	Amplitude Modulation	HMCS	Her Majesty Canadian Ship
ANG	Air National Guard	MARS	Military Affiliate Radio System
AOCC	Air Operations Coordination Center	Metro	Pilot-to-Metro voice call
ARIA	Advanced Range Instrumentation Aircraft	MFA	Ministry of Foreign Affairs
ARINC	Aeronautical Radio, Inc	NATO	North Atlantic Treaty Organization
ARQ	Synchronous transmission and automatic repetition teleprinter system	NORAD	North American Aerospace Defense Command
ARQ-E3	Single-channel ARQ teleprinter system	OR	Off-route
ARQ-M2	Multiplex ARQ teleprinter system with two data channels	Petra	Jordan News Agency
ATOC	Air Terminal Operations Center	PTT	Post, Telegraph and Telephone Administration
AWACS	Airborne Warning and Control System	RAF	Royal Air Force
CAMSLANT	Communications Area Master Station, Atlantic	Rompress	Agentia Romana de Presa
Canforce	Canadian Forces	RTTY	Radioteletype
CCG	Canadian Coast Guard	SAM	Special Air Mission
CG	Coast Guard	SAR	Search and Rescue
COMSTA	Communications Station	SELCAL	Selective Calling
CQ	General call for any station	SITOR	Simplex teleprinting over radio systems
CW	Continuous Wave (Morse Code)	SITOR-A	Simplex teleprinting over radio systems, mode A
EAM	Emergency Action Message	SITOR-B	Simplex teleprinting over radio systems, mode B
FAA	Federal Aviation Administration	Tanjug	Telegrafska Agencija Nove Jugoslavija
		UN	United Nations
		USAF	United States Air Force
		USAV	United States Army Vessel
		USB	Upper Sideband
		USCG	United States Coast Guard
		UTC	Coordinated Universal Time
		VIP	Very Important Person

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

82.2 MKL-RAF Edinburgh with V CW marker followed by RTTY at 1712. (Ary Boender-The Netherlands)

2182.0 VAU-CCG Yarmouth, NS Canada, working SAR operation involving the motor vessel *Mirage* in USB at 0300. (Ken Weindel-Carlstadt, NJ)

3150.0 PCD-Israeli Mossad number station in USB at 2102. (Boender-Netherlands)

3262.0 German female 3/2-digit number station (GK) in USB at 2030. (Boender-Netherlands)

3296.0 USAF MARS Region 6 (CA, AZ, NM, NV) voice traffic net, 6S1 daily from 0200-0400 winters; 7457 from 0100-0300 summers. (Paul Swietek-Gilbert, AZ)

3417.0 ART-Israeli Mossad number station in USB at 2200. (Boender-Neth)

3485.0 New York Volmet radio with weather for U.S. airports in English using USB at 0804. (Mike Adams-Hutto, TX)

3840.0 YHF-Israeli Mossad number station in USB at 2230. (Boender-Neth)

4125.0 USCG Kodiak, AK, with securite announcement in USB at 1404. for additional transmissions on 2670.0. (Claudia Lyons-Muir Beach, CA)

4165.0 CIO2-Israeli Mossad number station transmitting "CIO22F11T14R19" for 1/2 hour, simulcast on 5629 in AM at 9455 (Sun UTC). CIO2 marker at 0549, ending 0550 (Sat UTC). (Fernandez-MA)

4342.7 WLO-Mobile Radio, AL, with SITOR-B transmission at 0856. (James Callaway-Imlay, NV) *Be sure to report window frequency-Larry.*

4469.0 English female 3/2-digit number station in AM at 0120. (Lyons-CA)

4470.0 English female 3/2-digit number station in AM 0117 (Fri UTC) and 0132 (Sun UTC). (Fernandez-MA) Noted same, parallel to 5545. (Robert Thompson-Kilgore, TX) Noted same at 0122. (Gordon Levine-Anaheim, CA)

4495.0 Brickyard working Nightwatch 01 in USB on this frequency S-304 and 5700 (P-381) at 0445. (Jeff Haverlah-Houston, TX)

4560.0 YHF-Israeli Mossad number station in USB at 2101. (Boender-Neth)

4724.0 Skier 48 (LC-130H, 109th AG NY ANG) working Andrews GHFS in USB with phone patch traffic in USB at 2323. (Rick Baker-Austintown, OH)

4742.0 SAM 200 working Andrews in USB at 2311. (Fernandez-MA) Sandusky working Nightwatch 01 in USB at 0806 on X-209, also on 5700 (P-381). (Haverlah-TX)

4780.0 KPA2-Israeli Mossad number station in AM at 0554 (Sat UTC). (Fernandez-MA)

4923.0 Bookshelf (EC-130 ABCCC) working AOCC Longbow in USB at various times, new FAC's voice coordination frequency in Bosnia. (Diebels-SC-MAC)

5005.0 JYF-Petra News Agency, Amman, Jordan, with English news in 50 baud RTTY at 1715. (Robin Hood-UK)

5047.0 English female 3/2-digit number station in AM on 0123 (Mon UTC). (Jeff Lund-Forest Lake, MN)

5091.0 JSR-Israeli Mossad number station in USB at 2200. (Boender-Neth)

5308.0 French network. "Charlie Vingt' (C20) working 'Charlie Soixante-deux' (C62) reading out what sounded like maintenance or test instructions for electronic equipment in USB at various time around 0830. Other participants heard in what I call 'Les Charlies' include C30, C36, C42, C52 and C63, but always working C20. No idea who this is. (Pedro-UK) *Might be French forces in Bosnia?-Larry*

5310.0 I7J working K7G with details of ship movements in Adriatic (UN Blockade) in USB at 0756. (Pedro-UK)

5462.0 UN382 working Airbridge (Sarajevo) in USB at 0902. (Pedro-UK)

5547.0 Continental 02 working Continental dispatch via phone patch through Honolulu ARINC. moved to 6640 at 0325. (Swietek-AZ)

5658.0 Khartoum Air Radio, Sudan, working various aircraft in USB at 0100. (Fernand Vaillancourt-St. Pamphile, PQ Canada) Khartoum Air Radio, Sudan, working Luthansa 569 in USB at 2313. (Jack Dix-Yonkers, NY)

5762.0 Spanish female 5-digit number station in AM at 0608 (Sat UTC). (Fernandez-MA)

5775.0 Czech female 5-digit number station in USB at 0610 (Sat UTC). (Fernandez-MA)

5779.0 NATO (Navy) in Adriatic Sea supporting UN blockade, vessel inspection frequency in USB. (Gerbrand Diebels-Stichting SC-MAC)

5790.0 German female 3/2-digit number station in USB at 0327 (Sun UTC). (Fernandez-MA)

5796.0 USCG Rescue 6007 working CAMSLANT Chesapeake in USB at 2107. CG 2101 working COMSTA New Orleans requesting 3E5 for phone patch traffic in USB at 2117. (Norm Pihale-MN) *My list shows 3E5 is 5223.0-Larry.*

6416.0 WLO-Mobile Radio, AL, with SITOR-B maritime traffic and traffic list at 0142. (Callway-NV)

6683.0 Air Force One working Andrews in USB at 2118. (Pihale-MN) SAM 202 working Andrews in USB at 0101. (Haverlah-TX)

6712.0 Elmendorf GHFS with a communications test in USB at 0309. Pony Ops calling Pony 22 in USB at 0040. (Haverlah-TX) *I believe Pony ops could be out of Camp Lejuene-Larry.*

6715.0 Halifax military working H5Y in USB at 0055, moved to Delta 1 Charlie. (Haverlah-TX) *I don't have D1C on any of my list, anybody have a good Canforce designator list they would like to share?-Larry.* Nightwatch 01 working MacDill GHFS with 26 character EAM for injection into autodin using USB at 0005. Done, and immediately rebroadcast by the GHFS network. (Haverlah-TX)

6728.0 Croughton GHFS in USB sill using this frequency after December 1994 aeronautical OR band frequency shift. (Diebels-SC-MAC)

6737.5 Possible Navy Link 11 transmissions in USB at 0231 noted here. (Haverlah-TX)

6739.0 Reach 11E2 with phone patch to Rota Metro and Rota ATOC via Thule GHFS. Also heard Thule testing on 8968. (Bob Lewallyn-The Woodlands, TX)

6745.0 Canforce 751 working Trenton military in USB for phone patch traffic at 2335. Moved to 8989. (Baker-OH) *New freq. for me too, Rick-Larry.*

6750.0 ARIA 1 (aircraft) at 1925 in USB with long count for ARIA Control. (Baker-OH)

6754.0 Trenton military (Canforce) with weather broadcast in USB at 0132. (Fernandez-MA)

6761.0 Andrews Presidential testing on F957 after telling Navy 50511 to move here in phone patch via Albrook in USB at 1707. (Lewallyn-TX) Air Force 2 working Andrews in USB at 2015. (Baker-OH)

6797.0 Spanish female 5-digit number stations in AM at 0505. (Rick Sumner-Olney, IL)

6825.0 Spanish female 5-digit number station in AM at 0305. (Sumner-IL)

6826.0 Spanish female 5-digit number station in AM at 0306 (Sun UTC). (Fernandez-MA)

6830.0 SAM 206 working Andrews in USB at 0331. (Haverlah-TX)

6865.0 Spanish female 5-digit number station in AM at 0726. (Christopher Duquette-Hamden, CT)

6970.0 English female 5-digit number station (each group repeated) in AM at

0336 (Sun UTC). (Fernandez-MA)

7482.0 Spanish female 5-digit number station in AM at 0310. (Sumner-IL)

7615.0 English female 5-digit number station in AM at 0609 (Mon/Tues UTC). (Raymond Hodgkiss-Mississippi State, MS) *Welcome aboard, Raymond, check in often-Larry.*

7700.0 Marlin 01 on with a 20 character EAM, repeated then clear at 0636 in USB. Cactus Man and Nightwatch 01 setting up for a data transfer via a telephone link, then cleared at 1535 in USB. Then at 1542, Cactus Man heard sending RTTY transmissions to Nightwatch 01. (Fernandez-MA)

8125.0 WHX45-FAA Burlington, MA, at 1731 in USB calling KEM80-FAA Headquarters, Washington, DC in USB, no joy. (Baker-OH)

8279.0 UJSO-m/v *Volgobalt 240* working Helsiniki Radio in USB at 0830. A sea/river cargo vessel, she was in the Mediterranean. (Hood-UK)

8297.0 ADMM-USAV *Contreras* (LCU-2015) at 1702 in USB working AAC2-Harbormaster, Ft. Eustis, VA, for noon position report. (Baker-OH)

8514.0 WLO-Mobile Radio, AL, with SITOR-B weather and traffic list at 0230. (Callway-NV)

8546.0 OBC3-Callao Radio, Peru, with V CW marker at 2331. (Dix-NY)

8656.6 Bravo Whiskey working single letter calls in a US Navy tracking net, tracking civilian aircraft and other aircraft for at least 24 hours. (Haverlah-TX)

8705,5 PKB-Belawan Radio, Indonesia, with CQ CW marker at 1229. (Dix-NY)

8942.0 Singapore Air Radio working Mauritian 26 with SELCAL check in USB at 1620. (Hood-UK)

8968.0 Crown 87 requesting frequencies for Lajes in USB at 2204. (Pihale-MN)

8983.0 CG 2101 working CAMSLANT Chesapeake requesting phone patch on 3E5 in USB. (Pihale-MN)

8992.0 MacDill GHFS at 1630 in USB working Telltale for immediate traffic, phone patch to Hardship at Tinker AFB, regarding date-time group message. (Baker-OH)

9007.0 Trenton military working Hunter 04 in USB at 2157, moved to 11232. Canforce 01 (aircraft with Prime Minister) working Trenton military at (Vaillancourt-PQ)

9014.0 Shadow 01 inbound Birmingham, AL, working Andrews AFB in USB at 2110. (Pihale-MN)

9017.0 Telltale/Kilogram working Nightwatch 01 in USB then moved to X-210 (11229) then moved to S-311, they noted S311 higher than 11229. (Swietek-AZ) *S-311 is 11494 and S-309 is 9057-Larry.*

9022.0 Aria 1 working Aria Control apparently on a duplex basis in USB at 1846. (Haverlah-TX)

9023.0 CZJV-HMCS Terra Nova (DD-259) working Sidecar in USB at 1853. Also heard Chalice Charlie (E-3 AWACS) and Northern Lights, all in NORAD exercise. (Baker-OH) Lamb 01 calling Lamb 02 at 2333, moved to 148.125. Fragnet Tango working Deerhunter at 1722. All in USB. (Swietek-AZ)

9070.0 English female 3/2-digit number station in AM at 1831. (Dix-NY)

9251.0 English female 5-digit number station in AM at 1839. (Dix-NY)

11053.0 SAM 972 working Andrews in USB at 2158. (Valliancourt-PQ) Noted same. (Lewallyn-TX) Noted same at 2229-0415. (Swietek-AZ)

11170.0 Jambo 16, 18, 19, 24, 26 and others heard at 1902 and for several hours in USB, new frequency? (Levine-CA) *Maybe so, sounds like intercomm channel for Jambo B-52 bombers from the 2nd Bomb Wing at Barksdale AFB, LA-Larry.*

11175.0 Raleigh 70 working Offutt with phone patch about picking up special forces unit at Fort Lewis in USB at 2019. SAM 206 working Ascension, switched to 8992 in USB at 2103. Airevac 60194 (C-141) working Offutt GHFS in USB at 2236. (Pihale-MN)

11187.0 Blue Pal working Dependant setting up for data transmissions in USB at 1532. (Fernandez-MA)

11214.0 Dragnet Tango working Trenton military at 1811 in USB passing immediate traffic. (Baker-OH)

11217.0 Gordo 13 working MacDill GHFS at 1700 in USB. (Baker-OH)

11220.0 SAM 86972 (VC-137B) working Thule GHFS in USB at 2111. (Pihale-MN) SAM 200 working Andrews with phone patch to SAM command in USB at 2051. Geranium working Nightwatch on S-310 (new designator for me) at 2302. (Swietek-AZ) Navy 676 working Andrews in USB at 2133. (Haverlah-TX)

11226.0 SAN 203 working Andrews with phone patch traffic in USB at 2119. (Pihale-MN) Nightwatch working Deckboat, Oversleep and WAR46 with net checks on X-905 at 1700 in USB. Oversleep and Deckboat with TQuad (training) circuit moved to 11220 and 13211. (Swietek-AZ) SAM 973 working Andrews in USB at 2133. (Haverlah-TX)

11229.0 Nightwatch working Trainman on X-210 at 2237 with data communications, moved to X-904 (9017) secondary. (Swietek-AZ) Override passing 26 character EAM to Nightwatch 01 in USB at 2014. Relayed shortly afterward by GHFS network. Tiptank working Rarefind and Nightwatch 01 in USB at 2337. Also heard on 11244 and 9017. (Haverlah-TX)

11232.0 JT1P working Trenton military with request for weather for KLFI and KNGU. This was a Canforce rescue aircraft involved in SAR operations in USB at 2019. (Lewallyn-TX) Sentry 52 (E-3 AWACS Darkstar November) working Trenton military with phone patch to Tinker AFB via DSN in USB at 2010. Canforce 632 working Edmonton military in USB at 2258. (Pihale-MN)

11244.0 Reach 67947 (C-141B) with phone patch to Lajes command post and metro via Offutt in USB at 1942. (Lewallyn-TX) Offutt with EAM in USB at 1936. (Pihale-MN) Gordo 13 working MacDill GHFS at 1659 in USB. Moved to 11217. (Baker-OH) *11217 seems to be a common 11 MHz MacDill discrete now-Larry.* MacDill with 26 character EAM for 'Group'. Offutt with 4 or more 20 character EAMs in USB at 1453. (Haverlah-TX)

11270.5 Magic 81 (AWACS aircraft over Bosnia) working DHN66-Geilenkirchen, Germany, in USB at 0909 with radio check and requesting take-off time of Magic 53. (Pedro-UK)

11288.0 N71 working WHZ78-Unknown FAA location in USB at 2036. Per my reference, this is an FAA Beech Super King Air 300 aircraft. (Lewallyn-TX) *My list shows this frequency as a non-scan FAA aeronautical frequency-Larry.*

11541.9 RFHJ-FF Papeete, Tahiti, with ARQ-E3 transmission at 0635. (Robert Hall-Capetown, RSA)

12070.0 Walkover working Hightide in USB at 2020 with authentications into the SCACS net here on W-108. Also heard Nightwatch 01. (Baker-OH)

13204.0 SAM 60203 working Ascension GHFS with phone patch in USB at 0920. Then phone patch with Andrews VIP. Told to move to F-567 (13565) and F-646 (13440). (Pedro-UK)

13209.5 Possible US Navy Link 11 transmission in USB at 1842. (Haverlah-TX)

13242.0 MacDill, McClellan, Nightwatch 01/02 working each other in USB at 2025. Steelwork working McClellan on this frequency, 11175, 9016, 11181 with Flash Override traffic in USB at 1920. (Haverlah-TX)

13565.0 SAM 681 working Andrews on F-567 with phone patch to SAM command and Metro in USB at 2131. (Lewallyn-TX)

13994.0 MFA Sofia, Bulgaria, sending English language news about Bulgarian economic and political items. This was in 120 baud RTTY at 1535. After 5 or 6 minutes, the text was stopped and 13894 sent. Station moved to 13894 and found rest of message there. Ended with "Transmitted by the information department of the ministry of foreign affairs of the Republic of Bulgaria." This is the first time I have ever encountered 120 baud speed RTTY. (Hood-UK)

14937.5 AFTN N'Djamena, Chad, with ARQ-M2 weather code transmission at 1244. (Hall-RSA)

15016.0 Offutt, McClellan, Andrews and MacDill working Important, Big Cage, Silver Dollar, Nightwatch 01/02 with 'Exercise Inject' traffic in USB at 1721-2130. Also heard on 8968 and 11244. (Haverlah-TX)

15034.0 Trenton military (Canforce) with weather broadcast in USB. (Fernandez-MA)

15705.0 YZJ6-Tanjug Belgrade, Serbia, with 50 baud French RTTY news bulletins at 1541. (Dix-NY)

16124.9 RFQP-FF Djibouti with ARQ-M2 transmission at 1529. (Hall-RSA)

16304.2 OMZ-MFA Prague, Czech Republic, with 100 baud RTTY Czech news at 0813. (Hall-RSA)

16975.0 RKLM-Archangel Radio, Russia, with traffic list and local weather (minus 6C) in CW at 0905. Callsign given as RKLM/UFD9. Not same station as UCE-Archangel Radio. This one serves the Arctic fishing fleets, whereas UCE serves ocean-going vessels, mostly owned by the Northern Shipping Company of Archangel. (Hood-UK)

17022.5 WLO-Mobile Radio, AL, with SITOR-B weather traffic broadcast at 2246. (Callway-NV)

17973.0 McClellan GHFS working Steelwork for data tests in USB at 1956. (Haverlah-TX)

17976.0 Rick 56/57 working Offutt and Whiteman in USB at 1909. (Haverlah-TX)

18042.1 Indonesian Embassy, Hanoi, Vietnam, with 50 baud RTTY 5-letter groups at 0815 for Deplu Jakarta. Deplu Jakarta with 5-letter groups for all embassies at 0825. (Hall-RSA)

18300.1 OMZ-MFA Prague, Czech Republic, with Czech news 100 baud RTTY at 0844, parallel 18320.1. (Hall-RSA)

18380.0 RFFTB-FF Aircomis Base Paris, France, with French ARQ-E3 traffic at 1547. (Hall-RSA)

18380.4 RFFAAP-FF Guerre Depermil Paris, France, with French ARQ-E3 traffic for Comsup Reunion at 1135. RFFLVA-FF Soudirnav Toulon, France, with ARQ-E3 traffic to RFFVIC/Marine Reunion in French at 1150. (Hall-RSA)

18668.1 MFA Cairo, Egypt, with SITOR-A Arabic traffic at 0900. (Hall-RSA)

19048.9 RFFLUW-FF Toulon, France, with ARQ-E3 weather warnings for RFFLGD and RFFLCMTO at 1548. (Hall-RSA)

19106.6 MFA Jakarta, Indonesia, with SITOR-A traffic at 1056. (Hall-RSA)

20167.0 Valorous working Nightwatch 01 and Vulcanize on this frequency, 12244 and 18046 in USB at 2023. (Haverlah-TX)

20351.8 9RE203-PTT Lumumbashi, Zaire, with ARQ-M2 French traffic (channel B) to Gecamines Brussels at 1144. (Hall-RSA)

21807.7 YOV28-Rompress Bucharest, Romania, with English 50 baud RTTY news bulletins at 0740. (Hall-RSA)

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

Spring Cleaning

The month of April is typically associated with spring cleaning. In homes throughout the country, basements, garages, and attics will be cleaned out and the items will be offered for sale. Flea markets, yard sales, and antique shops are just a few of the places where you can find crystal-controlled scanner radios, antennas, speakers, hardware, and coax cable. If you're comfortable with a soldering iron and basic hand tools, there are plenty of additional items that can be modified for use in your listening post.

Antennas for the CB band can be used to monitor the VHF low band between 30 and 50 megahertz. The 102 inch CB whip is especially well suited for monitoring the cordless phone band between 46.10 and 46.97 megahertz. Prior to using the antenna, disassemble it, and check for corrosion. It's also a good idea to clean and lightly lubricate the connection points—including the coax connector.

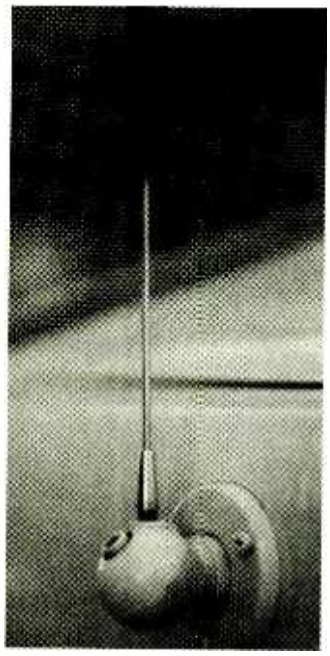
As most of you already know, television antennas can be modified to receive the scanning bands. (See Antenna Conversions below). To find used television antennas, visit a trailer campsite. Campers are always experimenting with ways to improve their television reception. With any luck, you'll find a wide assortment of antennas that are free for the asking. Stop by your local camp ground office and ask for permission to canvass the site. The best time to go is on Saturday mornings.

Crystal-controlled scanner radios should be removed from the case, dusted with compressed air (available in cans for cleaning computers and cameras), and checked for loose wires and connections. If the power cord insulation is brittle or cracked, unsolder the cord from the circuit board and replace it. The crystals should also be removed, cleaned and reinserted. Don't forget that the frequency range of each channel may be controlled by a small slide switch. You can't, for example, place a low band crystal into a slot that has been switched to the UHF High Band. You'll need to adjust the switch settings accordingly.

Motorola antenna connectors were used on all of the old, crystal-controlled radios. As you probably know, these are poor connectors which exhibit a high degree of signal loss. To improve the performance of the radio, purchase a BNC chassis mount from Radio Shack, (Cat #278-105), and replace the old motorola jack. In most cases, the BNC connector will fit into the original mounting hole.

Purchasing coax cable at a yard sale or flea market can save you money, but don't forget to check the cable thoroughly. Look for moisture contamination at each end and check the outer jacket for cracks and abrasions. Also note the configuration of the cable. If it has been kinked or rolled too tightly, it may be damaged internally.

Cable television accessories can also be used in your scanning shack. Splitters, A/B switches, and preamps are the most common flea market and yard sale items. Before you decide to buy, check the frequency range of each individual item. It makes little sense to purchase an accessory that doesn't include the frequencies that you're trying to monitor.



Spring inspires a great many of us to clear out attics and garages. But one person's junk may be another person's treasure. This CB mount was converted for use with a mobile scanning antenna, both picked up from yard sales.

The ultimate check for any piece of scanning equipment is to actually plug it in and turn on the power. As easy as that may seem, it can be a major problem at outdoor flea markets. To solve the problem, you'll need a 12 volt car battery and a 12 volt DC to 115 volt AC converter (Radio Shack #22-132). The converter and battery can be stored in your vehicle and transported to the seller's location in a small wagon.

Suppose for a moment that you find an irresistible item but you're somewhat skeptical. The owner claims that the unit is in good condition, but house current is not available and you forgot to bring along a battery and converter. What do you do? Use your nose. Place your nose by an air vent, exhaust fan, or similar opening in the item you're considering. If the unit smells burnt, don't buy it. It's not a foolproof method, but it may prevent you from buying something that has been completely fried.

Purchasing scanning equipment at a flea market or yard sale is always a fun-filled, but somewhat risky adventure. The above hints and ideas can reduce that risk and help you to bring home an armful of scanning treasures. Happy hunting!

Treasure Hunt

Can't hear your hand-held scanner radio? No problem. The folks at Naval Electronics have the answer. The HTS-2 is an amplified speaker that can be powered from your car battery or from AA batteries. You'll get one full watt (more than adequate) of audio power. With the HTS-2 installed in your vehicle, you can open the windows, enjoy the fresh air and hear your scanner radio!

To win the HTS-2, answer the following clues:

1. In a 12 volt, negative ground, automotive electrical system, the positive battery wire is connected to the frame. True or False?
2. The HTS-2 will automatically adapt itself to a negative or positive ground electrical system. True or False?
3. Which wire has the largest diameter — #18 AWG or #16 AWG?
4. I ordered the Grove #ACC-47. What did I get?
5. When is the first day of Spring?

The HTS-2 (now replaced by the HTS-3) is a compact, lightweight unit that features an LED light, audio level adjustment, and a tape trigger that can start and stop a tape recorder. For more information, contact Naval Electronics, 5417 Jetview Circle, Tampa, Florida 33634, (813)-885-6091.

■ Frequency Exchange

Our first stop is **Mifflin County, Pennsylvania**. Anthony P. Swailes lives nearby and here are his favorite springtime frequencies.

31.54 ..... Forest service
33.44 ..... Lockhaven fire
33.480 ..... Cambria fire
33.58 ..... Huntington fire
35.10 ..... Palm construction co.
35.14 ..... Smith's Towing
37.36 ..... Logan Twp. Police
42.20 ..... Blair Co. Sheriff
44.64 ..... Game wardens
44.88 ..... Fish wardens
45.16 ..... State correctional center
154.665 ..... State Police
154.695 ..... State Police
155.04 ..... Penn State Univ. security
157.59 ..... Altoona Cab
157.71 ..... Yellow Cab
160.86 ..... Conrail-yard
160.98 ..... Conrail-yard
161.73 ..... WJAC-TV
453.325 ..... White Hill Correct. Inst.
460.15 ..... Altoona Police

Since we're already in Pennsylvania, let's stop to visit with Rich Kramer. Rich lives in **Mount Penn, Pennsylvania**, and here are his favorite air show frequencies.

Blue Angels

168.90 ..... Maintenance
170.90 ..... Jet start-up & taxi
236.60 ..... Air show control
238.15 ..... Delta formation
251.60 ..... Team leader
255.60 ..... Air show control
275.35 ..... Diamond formation
290.50 ..... Air show control

Dennis Varner lives in **Spartanburg, South Carolina**, and his Frequency Exchange invitation included the following:

42.08 ..... State Police
42.10 ..... State Police
42.12 ..... State Police
42.26 ..... State Police
154.665 ..... St. Law Enf. Div. (SLED)
154.695 ..... SLED
155.58 ..... SLED
155.895 ..... EMS
460.20 ..... Sheriff
460.225 ..... Police
460.325 ..... Police
460.425 ..... Sheriff
460.575 ..... Fire

Traveling North and West to **Chicago, Illinois**, we'll stop and visit with Mike Roth. According to Mike the State Police in the Chicago area have nearly completed their switch to an 800 megahertz trunked system. Here are the new frequencies that Mike has monitored.

Mutual Aid

866.0125 866.5125 867 0125 867.5125 868.0125

Northern & North Western Chicago

866.4625 866.8875 866.9625 867.3875 867.4625 867.8875
868.3875 868.4625 868 8875 868.9625

Southern Chicago

866.4125 866.4375 866.9375 867.4125 867.9125 867.9375
868.4125 868.4375 868.9125 868.9375

If your car needs a spring tune-up, Bogart's service station in **Aurora, Missouri**, is the place to stop. While you're waiting, here's a list of frequencies that were supplied by Bogart's.

42.06 ..... Highway Patrol
42.12 ..... Highway Patrol
154.22 ..... Police
155.475 ..... Mutual Aid
155.73 ..... Sheriff
155.775 ..... Police
155.205 ..... Cox Bus Company
460.10 ..... Police

Place your bets, order a drink, but save a few dollars for the trip home. Welcome to **Las Vegas, Nevada.** The following frequencies were sent in anonymously.

153.77	Las Vegas Fire (LVF)	453.15	LVF
153.95	LVF	453.40	LVF
154.205	LVF	460.05	Las Vegas Detectives
158.745	Las Vegas Police (LVP)	460.075	Las Vegas Detectives
158.97	LVP	460.125	Las Vegas Detectives
159.09	LVP	461.95	Caesar's
159.15	LVP	462.05	Sands
451.70	Caesar's security	462.90	Sands

Our final stop is **Los Angeles, California**. The new LA Fire Department frequencies are provided by Harry Jones.

856.2375	856.4375	856.7625	856.9375	857.2375
857.4375	857.7625	857.9375	858.2375	858.4375
858.7625	858.9375	859.4375	859.7625	859.9375
860.4375	860.7625	860.9375		

Send your favorite, local frequencies to the Frequency Exchange P.O. Box 98, Brasstown, NC 28902. Typed or handwritten lists are welcomed.

■ Caller ID

As most of you already know, Caller ID units show the phone number of the calling party. The small display units can be purchased from department stores or from your local phone company. The Caller ID unit is simply plugged into your phone line—no technical expertise is required. The Caller ID unit won't work, however, unless you have subscribed to Caller ID through your local phone company.

To prevent Caller ID from displaying your phone number, simply dial *67, wait for the second dial tone and then dial the number. Several phone companies offer units for sale that automatically dial *67 prior to every call that is made. Other phone companies automatically block caller ID for customers with unlisted number.

Although Caller ID is available in many areas of the nation, the service and how it is administered varies from state to state. Pac-Tel in California, for example, offers call blocking for its unlisted customers free of charge. Bell Atlantic, in Pennsylvania, charges a fee for the same service.

The service area of Caller ID seems to be limited. If you're a Caller ID customer, you probably already know that calls from outside of your local area code are not displayed. In some instances, long distance calls from within the same area code are also exempt.

To protect your phone number and your privacy, contact your local phone company and ask for the blocking code. The final step is to fasten the special code onto your phone. It will serve as a handy reminder to protect your privacy.

■ Murder by Phone

Although Caller ID can be blocked, cordless phone conversations are up for grabs. An example is the murder plot that was monitored by a female scanner buff in Bartlett, Tennessee—a story which has caught the interest of reporters nationwide. The scanner buff received a scanner radio for Christmas and decided to scan the cordless phone band.

What she heard was a murder plot between another woman and her boyfriend. The boyfriend would break into the woman's house and when her husband got up to investigate, the boy friend would shoot him. The widow would collect the insurance money and meet the boyfriend at a later date.

The listeners recognized the voices and first names of the two suspects and called the local authorities. When the boyfriend was questioned, he admitted to planning the murder plot. (News clipping from Larry Gould).

■ Walkie Talkie Bandits

Three teenagers in Lewistown, Pennsylvania, planned to rob a department store. To avoid capture by the police, they used walkie talkies. One teenager was positioned outside, on the roof of a garage. If the police arrived, the teen on the garage roof was supposed to alert his two partners in crime.

Unfortunately for the trio, a scanner buff was monitoring their frequency. The listener alerted police and the three would-be bandits were arrested.

■ Teaching New Dogs Old Tricks

During an especially severe thunderstorm in Tucson, Arizona, lightning knocked out the dispatch center, all radios, phones, 911 lines, and the CAD system. Meanwhile, in the surrounding community power lines were going down, roofs were being torn off of homes, and auto accidents were everywhere.

Initially, dispatch tried to transmit using a portable radio, but the signal was too weak to be heard. A fire captain used the fire chief's mobile radio until the dispatchers could move into an ambulance with a stronger signal. Employees who had been monitoring their scanners gradually began arriving to offer their help.

Just when the storm and the radio traffic was at its peak, the ambulance being used as a dispatch center began to run low on fuel. The fleet maintenance crew arrived and offered their truck. The captain who had been using the fire chief's office filled in again as dispatcher until the switch was complete.

According to the story in *Dispatch* magazine, the experience was a valuable one. "Newer" personnel found themselves having to perform many tasks manually for the first time in their experience, and a better appreciation of teamwork emerged. Tucson dispatch center says it's ready for the next time.

■ Antenna Conversions

Converting a standard VHF/UHF television antenna for use on scanning bands is easy. You'll need a few basic hand tools, and an old or new TV antenna.

The television antenna is modified in several different steps that require pictorial diagrams. As I've already mentioned, the conversion isn't difficult, but it's too lengthy to publish here. To receive your antenna conversion package, send $3.00 dollars to Bob Kay, P.O. Box 173, Prospect Park, PA 19076. If your budget is tight, send a 9x12 envelope with 75 cents postage to the same address and I'll pick up the tab.

Weather Stations/Scanners/CB

COMMUNICATIONS ELECTRONICS INC.
Emergency Operations Center

New Weather Products Available

Now readers of *Monitoring Times* magazine may purchase weather forecasting and communications equipment directly from the Weather Bureau, a division of CEI. Order today and save.

Weather Stations

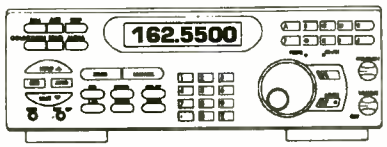
Now you can be your own weather reporter with the Davis Weather Monitor II. Our top-of-the-line weather station combines the most advanced weather monitoring technologies available into one incredible package. Glance at the display, and see wind direction and wind speed on the compass rose. Check the barometric trend arrow to see if the pressure is rising or falling. Push a button, and read indoor and outdoor temperature, wind chill, humidity and barometric pressure. Our package deal includes the new ultra high resolution 1/100 inch rain collector part **#7852-K**, and the external temperature/humidity sensor, part **#7859-K**. The package deal is order **#DAV1-K** for $479.95 plus $15.00 shipping. If you have a personal computer, when you order the optional Weatherlink computer software for $139.95, you'll have a powerful computerized weather station at an incredible price. For the IBM PC or equivalent order part **#7862-K**. Apple Mac Plus or higher including PowerBook, order part number **7866-K**.

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.

Davis Weather Monitor II 7440-K	$334.95
Davis Weather Wizard III 7425-K	$154.95
Davis Remote Display Unit 7815-K	$84.95
Davis Rain Collector II 0.01" 7852-K	$59.95
Davis Rain Collector II 0.2 mm 7852M-K	$59.95
External Temperature/Humidity Sensor 7859-K	$99.95
Davis Anemometer Mast Mount 7890-K	$15.95
Weatherlink Software for IBM PC-Version 3.0 7862-K	$139.95
Weatherlink Software for Apple-Version 3.0 7866-K	$139.95
4-Conductor 40' (12.2 m) extension cable 7876-K	$17.95
6-Conductor 40' (12.2 m) extension cable 7878-K	$21.95
8-Conductor 25' (7.6 m) junction box cable 7880-K	$14.95
8-Conductor 50' (15.2 m) junction box cable 7881-K	$24.95
8-Conductor 100' (30.5 m) junction box cable 7882-K	$44.95
Modem Adaptor 25-pin for communications port 7870-K	$9.95
Car/Boat/RV Lighter Cord 7873-K	$9.95
2400 baud modem for Weatherlink MEXT-K	$39.95
Talking weather line card - Call 313-994-9000 for demo IT1-K	$489.95
Weatherlink language disks: Française, Deutsche, Italiana, Española 7863-K	$24.95
Barometer, Indoor Hygrometer & Thermometer, Clock/Calendar BA888-K	$99.95
Indoor/Outdoor Thermometer/Barometer & Hygrometer by OSI BA213-K	$79.95
Thermometer with transparent calender & clock display by OSI TC188-K	$19.95
Thermometer with AM/FM clock radio by Oregon Scientific CR388-K	$39.95
Indoor/Outdoor Thermometer with Jumbo Display by OSI JB880EX-K	$24.95

Bearcat Scanners

Bearcat 9000XLT-K base/mobile	$399.95
Bearcat 8500XLT-K1 CLOSEOUT	$319.95
Bearcat 3000XLT-K handheld	$379.95
Bearcat 890XLT-K base/mobile	$228.95
Bearcat 860XLT-K base	$168.95
Bearcat 760XLT-K1 base/mobile	$188.95
Bearcat 700A-K info mobile	$148.95
Bearcat 560XLA-K base/mobile	$83.95
Bearcat 220XLT-K1 handheld/SPECIAL	$208.95
Bearcat 178XLT-K base/WX alert	$133.95
Bearcat 148XLT-K base/WX alert	$88.95
Bearcat 80XLT-K handheld	$168.95
Bearcat 60XLT-K handheld	$88.95
Bearcat BCT7-K info mobile	$168.95
Bearcat BCT2-K info mobile	$138.95



Bearcat® 890XLT-K Radio Scanner

Mfg. suggested list price $399.95/CE price $228.95
200 Channels · 10 banks · Weather Alert Feature
Turbo Scan · VFO Control · Priority channels
Auto Store · Auto Recording · Reception counter
Frequency step resolution 5, 12.5 & 25 KHz.
Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High

Frequency Coverage:
29.000 - 54.000 MHz. (NFM), 108.000 - 136.995 MHz. (AM) 137.000 - 173.995 MHz. (NFM), 216.000 - 224.995 MHz. (NFM), 225.000 - 399.995 MHz. (AM) 400.000 - 512.000 MHz. (NFM), 806.000 - 823.9875 MHz (NFM), 849.0125 - 868.9875 MHz (NFM) 894.0125 - 956.000 MHz. (NFM).

The new Bearcat 890XLT gives you pure scanning satisfaction with amazing features like Turbo Scan to scan and search up to 100 channels per second. This base and mobile scanner is ideal for weather watchers because it has a built-in tone activated ***Weather Alert Feature***. Other features include ***Auto Store*** - Automatically stores all active frequencies within the specified bank(s). ***Auto Recording*** - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional ***CTCSS Tone Board*** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box $14.95; **MB001** Mobile mounting bracket $14.95; **BC002** CTCSS Tone Board $54.95; **EX711** External speaker with mounting bracket & 10 feet of cable with plug attached $19.95. The BC890XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden.

CB/GMRS Radios

A National Weather Service (NWS) receiver with automatic emergency broadcast activation has been added to the legendary Cobra 29 CB radio. The integrated NWS receiver in the Cobra 29LTDWX will *automatically* activate to receive emergency announcements about severe weather and travel conditions. A special tone-alert signal broadcast by the NWS activates the weather receiver and overrides any CB radio reception for monitoring the warning message.

Cobra 29LTDWX-K CB/Weather Alert	$129.95
Cobra 25LTDWX-K CB/Weather Alert	$109.95
Cobra HH40-K1 CB 40 ch. Handheld	$89.95
Ranger RCI2970-K 100 watt 10 meter.	$369.95
Ranger RCI2950-K 25 watt 10 meter	$244.95
Uniden GMR100-K1 GMRS Handheld	$149.95
Uniden WASHINGTON-K SSB CB Base	$189.95
Uniden GRANTXL-K1 SSB CB Mobile	$129.95
Uniden PRO538W-K CB & Weather	$59.95

Talking Weather

Now your weather station can talk to callers. Call 313-994-9000 for a demonstration. The Talking Weather Station (TWS) from Innovative Tech Works, lets anyone phone your Davis Weather Monitor II and *hear* the weather. Here's how it works. You setup the TWS with most IBM PC 80286 or faster compatible computers with a 40 MB hard disk. Requires MS-DOS version 5.0 or later with 1 MB of RAM. Add phone lines and your own personal messages or promotional advertising. Callers are automatically greeted with your voice giving them the weather and your messages. Several times a minute, the TWS software will poll the Weatherlink and will update the voice library files to make your spoken report. A single line card, order # IT1-K is only $489.95. A two line card is order **#IT2-K** for $939.95. A complete turnkey system for commercial use is available, order **#ITPRO2-K** starting at $3,999.95.

VHF Transceiver

RELM® WHS150-K Transceiver

Mfg. suggested list price $481.67/CE price $339.95

Severe weather spotters depend on the RELM WHS150 transceiver for direct two-way communications with their police or fire department, civil defense agency or ham radio repeater. The WHS150 is our most popular programmable five watt, 16 channel handheld transceiver that has built-in CTCSS, which may be programmed for any 39 standard EIA tones. Frequency range 148.000 to 174.000 MHz. Will also work 144.000-148.000 with slightly reduced performance. The full function, DTMF compatible keypad also allows for DTMF Encode/Decode and programmable ANI. Weighing only 15.5 oz., it features dealer programmable synthesized frequencies either simplex or half duplex in both 5.0 and 6.25 KHz increments. Other features include scan list, priority channel, selectable scan delay, selectable 5 watt/1 watt power levels, liquid crystal display, time-out timer and much more. When you order the WHS150 from the Weather Bureau, you'll get a complete package deal including antenna, battery, belt clip and user operating instructions. Other accessories are available. A leather carrying case with swivel belt loop part **#LCWHS** is $49.95; rapid charge battery charger, part **#BCWHS** is $69.95; speaker/microphone, part **#SMWHS** is $54.95; extra nicad battery pack, part **#BP007** is $59.95. The radio technician maintaining your radio system must order programming instructions part **#PI150** for $18.00 to activate this radio. FCC license required for United States operation.

Other neat stuff

Grundig Satellit 700-K portable shortwave receiver with 512 memory & AC adapter	$389.95
Grundig Yacht Boy 400-K1 digital portable shortwave receiver - 40 memory presets	$189.95
Grundig Yacht Boy 230-K portable shortwave receiver	$139.95
Sangean ATS800-K portable 20 memory shortwave receiver	$69.95
Sangean ATS803A-K1 portable shortwave receiver w/AC adapter-9 memory/SPECIAL	$139.95
Sangean ATS806-K portable 45 memory shortwave receiver	$159.95
Sangean ATS818CS-K portable shortwave receiver with cassette recorder	$209.95
Uniden EXP9200-K 900 MHz 2 line cordless phone	$289.95
Uniden EXP9100-K 900 MHz 1 line cordless phone	$269.95
Cobra CP912-K 900 MHz spread spectrum cordless phone	$249.95
Bogen PR2000-K Digital two-line advanced voice mail system & answering machine	$279.95
Bogen PR0018-K memory expansion module, doubles recording time to 36 minutes	$79.95
FANS P161P-K 60 name/number caller ID, unwanted call blocker, automatic paging	$149.95
SNI ID200-K Bouncer name/number caller ID, call reject, forward to machine	$89.95
ICOM GP22-K1 handheld global positioning system (GPS)	$499.95
WR200-K weather radio with National Weather Service storm alert	$39.95
RELM WHS150-K VHF handheld 5 watt, 16 channel transceiver	$339.95
RELM RH256NB-K VHF 25 watt, 16 channel synthesized transceiver	$289.95
Ranger RCI2950-K 25 watt 10 meter ham radio transceiver	$239.95
Ranger RCI2970-K 100 watt 10 meter ham radio transceiver	$369.95
Uniden LRD9100SW-K Super Wideband Laser/Radar Detector	$139.95
ME2-K Map Expert CD Rom for IBM PC by DeLorme Mapping	$299.95
HCPC-K HamCall CD Rom for IBM PC by Buckmaster Publishing	$39.95
ANTK-K VHF scanner/VHF transmitting antenna PL259 connector	$29.95
ANTMMBNC-K magnet mount scanner antenna w/ BNC connector	$29.95
ANTMMMOT-K magnet mount scan antenna w/Motorola plug	$29.95
ANTMMPL-K magnet mount scan antenna with PL259 connector	$29.95
ANTSGBNC-K glass mount scanner antenna with BNC connector	$29.95
ANTSGMOT-K glass mount scanner antenna with Motorola jack	$29.95

Buy with confidence

It's easy to order from us. **Mail orders to:** Communications Electronics Inc., Emergency Operations Center, P.O. Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add $15.00 per radio or telephone product for U.P.S. ground shipping and handling in the continental U.S.A unless otherwise stated. Add $10.00 shipping for all accessories and publications. Add $10.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, P.O. Box, or APO/FPO delivery, shipping charges are two times continental U.S. rates. Michigan residents add state sales tax. No COD's. No returns or exchanges after 31 days. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Call 1-800-WX-BUREAU to order toll-free. Call 313-996-8888 if outside the U.S.A. FAX anytime, dial 313-663-8888. **For technical assistance to solve your communications problem, call the Communications Electronics technical support hotline for $2.00 per minute at 1-900-555-SCAN.**

For credit card orders call 1-800-WX-BUREAU

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Skip Arey, WB2GHA
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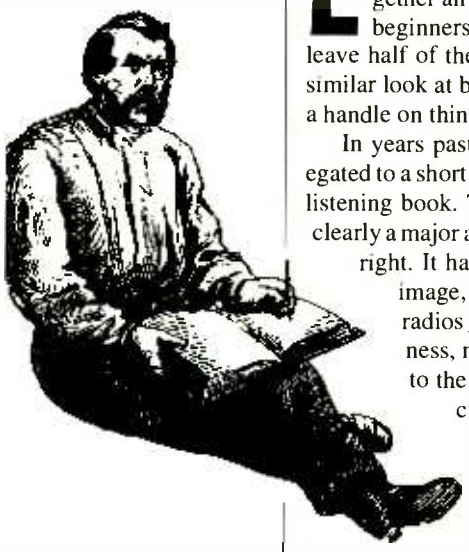
Beginner's Scanner Books



Last year at this time, Old Uncle Skip pulled together an article that reviewed the current crop of beginners books for shortwave monitors. Not to leave half of the hobby out, this month we will take a similar look at books to help a new scanner monitor get a handle on things.

In years past, VHF/UHF monitoring was often relegated to a short chapter, 'way in the back of a shortwave listening book. This is no longer the case. Scanning is clearly a major aspect of the monitoring hobby in its own right. It has also long since shed its "blue collar" image, as modern microprocessor-controlled radios give easy coverage of government, business, marine, air, and rail systems, in addition to the more traditional public safety frequencies.

Interfacing the traditional scanner with the personal computer has become a real option for today's monitor. But, along with more sophisticated equipment and techniques come more quandaries for the beginner. Several authors have taken the time to put together some books to help you out. Let's take a look at a few of them.

SCANNER RADIO GUIDE
by Larry M. Barker
148 Pages
$14.95
HighText Publications Inc.
Solana Beach, CA
ISBN: 1-878707-10-8

Barker's book is a great, one-volume guide to the modern world of VHF/UHF monitoring. Folks who attended the 1993 *Monitoring Times* Convention know that I referred heavily to this text during my workshop on the spectrum above 30 MHz.

Larry's book is divided into eight chapters, each covering an important area of the scanning hobby. The first chapter on fundamentals outlines the basic thinking behind scanning. Regular readers of *MT* will find this chapter a simple review.

Chapter two covers the essential information you will need to choose a scanner. This chapter goes on to teach the reader how to use their chosen scanner's features most effectively. The chapter also includes an all-too-brief section on antennas.

The third chapter on propagation really clears the air about the atmosphere's effect on high band listening. If you are an SWL just getting into scanning you will discover that some of the propagation rules that you hold near and dear to your heart are turned upside down in the VHF realm. This book will set you straight.

The remainder of the book gets into the "real deal" about what there is to listen to on your scanner. This tour of scanner monitoring begins with one of the best general overviews of the VHF/UHF bands available and then goes on to look at many of the more nontraditional scanning signals out there. Larry Barker is the person who got Old Uncle Skip hooked on monitoring the "Talking Heads" of my regional media services.

The book also contains a series of appendixes (or, to be proper, "appendices") listing books, magazines, publications, as well as a collection of nationwide frequencies worth plugging in and giving a listen to.

TUNING INTO RF SCANNING
FROM POLICE TO SATELLITE BANDS
By Bob Kay
150 Pages
$14.95
Tab Books
Blue Ridge Summit, PA 17294
ISBN 0-07-033964-3

Bob Kay is perhaps best known for his long-running "Scanning Report" column in *Monitoring Times* magazine. But if you are new to the radio hobby (and new to *Monitoring Times*) reading Bob's column might feel a bit like coming into the middle of a conversation. Bob's book is just the ticket to bring you up to speed on the subject of scanning. Bob has taken his years of experience both as a scannist and as a radio hobby journalist and combined them into an excellent single resource text for folks who are interested in scanning.

What sets Bob's book apart from the crowd is his devotion to topics that are often glossed over or grouped into a single chapter in other texts. For instance, Bob devotes an entire chapter to the topic of coaxial cable and connectors. Antenna feedline is perhaps the weakest link in a good scanning setup. Bob gives the subject the attention it deserves. He gives the same attention to other topics such as scanning laws and using computers to aid in listening.

As one of the newest books on the scene, Bob lets folks in on using accessories such as Spectrum Display Units. His information on scanners and the law is also very up-to-date and pragmatic. Bob is also a fan of using the frequency counter as a tool for hunting down hard-to-get frequencies. (Larry Van Horn and I had great fun following Bob, who was following the hotel security guards at the First Monitoring Times Convention in Knoxville, Tennessee, but that is another story). Bob shows beginners the

difference between the myth and reality of this monitoring technique.

The book is well illustrated and packed with information. I would have liked to have seen a bit more information on satellite monitoring. However, the information given on this subject is enough to get a beginner curious. Bob does devote a chapter to finding other resources for further study and experience. If you enjoy Bob's column, or if you are looking to spark someone's interest in scanning, this book is worth a look.

SCANNERS & SECRET FREQUENCIES
by Henry L. Eisenson
318 pages
$19.95
Index Publishing Group
San Diego, CA
ISBN 1-56866-083-3

My travels and network of friends in the radio hobby have allowed me to rub elbows with a lot of folks who write about the radio monitoring hobby. Henry Eisenson is one I must meet someday. This guy approaches the world from a wondrous angle—*he quotes Kafka in his scanner book!* I like the way this guy is wired! Eisenson combines a high degree of knowledge with just the right amount of irreverence to give us a book that should grace the shelves of scanner monitors new and old.

Eisenson takes beginners all the way to the beginning. His first chapter, entitled "Microphysics," gives you the most basic basics about those universal truths that make such things as radio possible. This is followed by a chapter on radio principles. I have never read a more entertaining account of these traditionally boring subjects.

The book continues with a series of extremely readable chapters covering every aspect of the scanning hobby. Each subject is given a thorough explanation that should serve to bring even the most raw novice up to speed on the VHF/UHF monitoring hobby. The author's pragmatic view of antennas goes a long way toward minimizing some of the more discouraging aspects of setting up a listening post.

One chapter, entitled "Dialogs," contains the "expressed attitudes" of professional folks who are intimately involved in the scanning world. Here you will read about the views of an electrical engineer, a radio retailer, law enforcement, and military personnel, as well as other scanning experts. This candid approach is unique to the hobby.

I won't deny that this book has a bit of an edge that might put a few folks off. But remember, Compadre, you can hear some fairly cynical things when you start snooping around the scanner frequencies. Isn't it better to learn the hard stories from someone who has a sense of humor? Personally I think this book's quotations alone are worth the price of admission. But then, I'm wired kind of differently, too!

YOUR VHF COMPANION
Edited By
Steve Ford WB8IMY
$8.00
American Radio Relay League
Newington, CT
ISBN 0-87259-387-8

When have I ever written a column that didn't include a plug for Amateur Radio? Hams have a lot of fun in the world above 30 MHz. Some of the most exciting things going on in the radio hobby are coming about at the hands of "No Code" Technician Class Licensees. If you are a scannist interested in monitoring amateur radio communication, or if you are planning to become a ham in the future, pick up this ARRL book.

Your VHF Companion gives the reader a look at some of the fun amateur radio folks are having. This information includes all of the predominant VHF modes currently available to the ham community. FM, Repeaters, Packet, CW, SSB, Satellites, ATV, and coverage of ham activity above VHF in the UHF and Microwave regions are given full explanation, complete with examples. This guide will show you both the equipment and the skills you will require to establish a fully functional VHF amateur radio station.

Even if you are content as a scanner monitor and have no intention of getting your ham ticket, this book will clue you in to the things you might hear as your scanner crosses through those chunks of the spectrum set aside for amateur ops. But let me warn you. Once you start to read this book I think you're going to be hooked.

—No problem, Bunkey. The League can point you in the direction of your nearest VE testing center as well.

SCANNER MODIFICATION HANDBOOKS
by Bill Cheek
Vol. I =160 Pages
Vol. II =220 Pages
$17.95 each
CRB Research Books, Inc.
Commack, NY 11725
Vol. I = ISBN 0-939780-11-9
Vol. II = ISBN 0-939780-14-3

Scanner modification is not technically a beginner's subject. However, I have yet to meet a beginner that was not curious about getting their scanner to do a little bit more then it was marketed to do. Rather than have you pick up this knowledge in some back alley, Old Uncle Skip is going to send you to one of the most trusted resources around: Bill Cheek's modification handbooks.

Scanner monitoring is a habit. Scanner modification is a serious addiction. Once you lift the lid on a Radio Shack Realistic PRO series or Uniden Bearcat BC series scanner, you just can't resist melting some solder.

Things start out innocently enough. Maybe you go in to clip a diode or two to "restore" some frequencies that the company had locked out. Before too long you're replacing memory chips. Who wants 400 channels when you can have 6400 with just a little tweaking? Bill Cheek is one of those guys who just can't leave well enough alone. He is always coming up with new and exciting ways to void factory warranties in search of seriously increased performance. What makes Bill special is he doesn't hoard his knowledge; he shares it.

His fame began some years ago as "Doctor Rigormortis"—everybody's favorite CB bench technician. Bill has written for just about everyone in the radio hobby at one time or another, and now serves as the *Monitoring Times* man in charge of the "Experimenter's Workshop." Bill is totally dedicated to wringing every last gram of performance out of a piece of equipment.

Many scanner modifications have floated around on computer bulletin boards for years. Now you can have the straight scoop right from Bill's own talented hands. Bill spells out even the most mundane details, making even inexperienced folks comfortable with the modification process. Each modification is laid out in step by step format reminiscent of the kit-building manuals that came with Heathkit gear. He will also teach you a bit of theory along the way.

With a new crop of scanners coming out of Radio Shack and Uniden Bearcat, Bill is also hard at work on Volume Three of this *Scanner Modification Handbook* series, so warm up your soldering iron, folks!

Knowledge is power, my friends. If you're ready to scan with the masters you will want to "book up" on a few things. Break open the covers of a scanning book and have fun!

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

Hot News from Cold Spots

American Forces **ANTARCTIC** network, McMurdo, was previously reported in a roundabout way to be back on SW, this time 6160 kHz, 24 hrs. *DX Ontario* then refined this to 2000-1200 UT, 3 kW on AM. Doubting all this, Al Quaglieri of NASWA e-mailed Brent Jones at the South Pole who replied that 6160 was not to be heard, and the communications manager at McMurdo had no knowledge of it.

Bill Matthews, DX reporting on RKI, spotted an item in the *World Radio TV Handbook* that religious broadcaster Radio Alpha and Omega planned to begin operating in February via transmitters of the **ICELANDIC** National Broadcasting Service, eventually installing its own SW transmitter of 50 or 100 kW; to operate 3-4 hours per day in English, German, Danish, Norwegian, Swedish. Address is Box 3340, 123 Reykjavík. Check the current out-of-band SSB frequencies of Iceland such as 13860. In DSWCI *SW News*, Stig Hartvig Nielsen reported Iceland on 3275, 5040, 9275, 11402, 13680, and 13870. A station of the same name has previously been carried by Russian outlets.

Alan Roberts, CIDX *Messenger*, was disappointed at the lack of 11-meter openings this winter, since he had finally obtained detailed info on the Alpine ski resort stations in **FRANCE** of Radio Neige, modified CB units rated from 3 to 30 watts on narrowband FM, but some actually powered up to 150 watts where local coverage is difficult. They're active from November to April, usually going off at local sunset, and when propagation permits start to be audible about a sesquihour after local sunrise in North America. Resorts on each frequency: on 25710, Grand Bornand, La Clusaz, Les Deux Alpes, Les Gets, Les Menuires, Val d'Isère. On 25900, Alpe d'Huez, La Plagne (3 units) Méribel, St Gervais, Val d'Isère, Valloire, Villiard de Lans. On 26070, Alpe d'Huez, Avoriaz/Morzine, Châtel, La Clusaz, Les Arcs, Megève, Tignes. A total of 1850 cable-cars now use the Radio Neige service of ski programming, standing by for emergency communications.

Seasonal Changes

March 26 marks the start of daylight shifting time in Europe, though not until April 2 in US; many make seasonal time and/or frequency changes on this date, often unavailable at presstime, and subject to fix-up refinements.

SW broadcasters use a "shorthand" to refer to broadcast periods, which you will see in the schedules below. The summer broadcasting season, which extends from the last Sunday in March to the last Sunday in September, is designated **Z** plus the year it starts (Z95), while the rest of the year is W95. Some stations follow a four-season pattern: the first Sundays of March, May, September, and November are designated **M, J, S,** and **D**, respectively.

ARMENIA (See item under RUSSIA last month) V. of the Martyrs, via R. Intercontinental at 1800-1812 on 9480, formerly used the Luxembourg 6090 transmitter, which ceased at year-end (Wolfgang Büschel, Germany) I QSLed them in 1985 and still get their stuff often in the mail (Jerry Berg, MA, *Fine Tuning*) R. Moscow, in French before 1800 and after 1830 on 9480 uses a different transmitter (BBC Monitoring) I heard WWCR previewing a program of the same name, but doubt the same organization, at 1-800-747-0085 (Tim Hendel, FL)

AWR

BAHRAIN RB, 6010, news in English at 0500 after 300 kW VOA closes (AWR *Wavescan*)

BELGIUM RVI has new e-mail addr: rvi@brtn.be (RVI *Radio World*) RVI swapping transmitter time with DW from Z95 (RN*MN*) RVI probably via Sri Lanka to SE Asia (Joe Hanlon)

CANADA Noticed CHNX, 6130, Halifax missing; phoned and Wayne Harvey told me transmitter broke down in late Nov; will be back eventually but not a high priority. Perhaps SWLs should encourage them to come back (Alan Roberts, PQ, *W.O.R.*)

COLOMBIA Rdif. Nacional excellent on new 4954.99 at 0140-0430+, ballads, lively music (Brian Alexander, PA) Reactivated after many years (gh) Reports wanted collect to Bogotá 222-0907 (Manuel Rodríguez Lanza, *Tropical Tuning* via Thurman) R. Católica Nacional, pirate on 3579.9, heard as far away as Europe, but location uncertain until back on in late January and DJ gave village of San Carlos, which is next to Túquerres. Upon receiving my report he extended broadcast from 0400* to 0515+. Formerly worked for Ecuadorian stations (Henrik Klemetz, Colombia, HCJB *DX Partyline*)

COSTA RICA RFPI and natural area around Ciudad Colón threatened by government plan to put waste dump for all of Central Costa Rica nearby; 400 garbage trucks per day would pass a few feet from station, worsening already bad dust level which shorted out a transmitter despite air filtering. Much programming in Spanish covered local community protests. RFPI also seeks donation of a satellite dish 12 ft. or larger, plus receiving equipment in order to downlink desired programs, some of them live (RFPI *Mailbags* and via Diane Mauer)

Wavescan on TIAWR scheduled Sun 0715 often starts 5-10 minutes early, best on 5030 (Brian Alexander, PA) and often off the air entirely for the 2315 repeat, or when on, program missing (gh)

CUBA RHC's 6000 kHz antenna has a high-angle lobe for Florida, otherwise no more than 10° (Arnie Coro, RHC *DXers Unlimited*) Jerry Coatsworth, P.O. Box 293, Merlin, Ont, Canada, N0P 1W0, will forward mail for DXers to and from Cuba. Send your report and US$2 (Ed Rausch, NJ)

[non] What's going on at Radio Martí? Trolling for clandestines, I came across an hour-long all-polka program played on a ballpark calliope. What a radical way to undermine a nation. I couldn't believe how strong the bubble-jamming was cranked up; Fidel must feel threatened (J.F. McGowan, IL)

DOMINICAN REPUBLIC Onda Musical, 4781, good with fiesta, music program 2135-

*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.*

2230 (Manuel Rodríguez Lanza, Venezuela, *Tropical Tuning* via Thurman) On 4779.55 at 2350, full ID; had not been reported in NASWA since March 94 (Ed Rausch, NJ, HCJB *The Latest Catch*) Not to be confused with the new Guatemalan just below 4780 (gh)

ECUADOR HCJB program previews and other publicity are available twice a week by e-mail on request to: english@mhs.hcjb.com.ec (gh) HCJB English to Europe 0700-0830 on 9435 ex-9420 // 6205; 24h USB including much English on 15540 ex-17490 // 21455. To Pacific: *DX Partyline* moved one hour earlier so no longer interrupted by frequency close, Sat 0909 on 6135, 9745 (via Diane Mauer, John Norfolk, Chris Hambly)

unID on 5453.9 at 0145-0305* with choral anthem; subsequently peaking to armchair levels at 0120-0300 with ID as Ondas Quevedeñas on 3325 and 5455, sesquikilowatt (Ed Rausch, NJ, HCJB TLC) Unlikely it's Quevedeñas, but a pirate in the sierra called Radio Alianza, estación juvenil, but DJ in Spanish never mentions any location. In Quechua the province of Imbabura was mentioned (Henrik Klemetz, HCJB *DXPL*) 5453.93 Sun at 2059-2123*, *0010-, Ecuadorian and Colombian music (Rich McVicar, *DXPL*) R. Alianza on 5686.3 instead, 1100 and 0200, very strong, believed in Otavalo region (Don Moore, IA, HCJB *TLC*)

La Voz de Saquisilí has a PR Director who wants reports from abroad to: Sr. Eddie Roger Velástegui Mena, Radio la Voz de Saquisilí, Calle 24 de Mayo 5, Saquisilí, Cotopaxi Province; return postage to Americas is 600 sucres mint stamps = 26 cents; hoped to reactivate 4900 in March or April (Rich McVicar, HCJB *TLC*)

Radio del Buen Pastor, Saraguro, delayed by war; now plans to be on by May on 4830, not 4815 (Claude Beachy, stn, HCJB *TLC*)

ERITREA Voice of the Broad Masses of Eritrea, 7020, *0330 IS, ID in Amharic, talking and singing also on 4999.9 LSB between time pips (Ed Rausch, NJ, HCJB *TLC*)

GERMANY DW's English DX program is fortnightly on the Wed 2000-2050 to Europe on 5960; monthly on the last Sat at 0935 to Asia/Pac, 1135 W. Africa, 2120 S.Asia, last Sun 0220 S.Asia and last Mon 0120, 0320, 0520, to N.Am (Rumen Pankov, Bulgaria via Büschel)

GREECE VOG on new 6260 ex-9420 to N.Am at 0000-0350 // 7448 and a traditional frequency since 1938 they will always protect, 9935. It's loud and clear on 6260 (John Babbis, MD, *World of Radio*) Also on new 6260 at 1900 and 2000 (Brian Alexander, PA; Ed Rausch, NJ) and 2050 (Büschel) In English at 0131, all 3 frequencies announced were wrong! (gh)

Η ΦΩΝΗ ΤΗΣ ΕΛΛΑΔΑΣ
THE VOICE OF GREECE

HONDURAS February sked for HRJA no longer shows *Mailbag* or *Radio Waves* on 15675, and *Texas Shootout* moved to Sat and Mon 2315-2330—now weekly? More pirates besides Albatross are: R.Marabu from Germany, Fris 2100-2200; Southern Music Radio from New Zealand Sats 2000-2100. When US goes on DST April 2, all Copán programs shift one hour earlier by UT (WRMI via Thurman) Marabu was already last Fri of month 2000-2100 (Marabu via *Play-DX*)

INDIA Supreme Court ruled airwaves cannot be monopolized by anyone, including the government, so private broadcasting will be allowed (VOA New Delhi, *Communications World*)

INDONESIA RRI Sorong,4875, heard at 1230-1300 with English letterbox and news, good chance to report a regional in English (Robert Shepherd, Qsld., *ADXN*)

ISRAEL IBA's cuts in English are much more to do with punishing people the Director of Radio does not like, than saving money. Virtually no money will be saved. A deal was done to sacrifice English and French for more Russian. The IBA Board of Governors says it was wrong for the Finance sub-committee to make the decision, and were to discuss it on March 1; we hoped to get it reversed (Jeff Cohen, WRN, via Daniel Rosenzweig, USENET via Thurman) Fax the chairman of the BOG, Micha Tinon at 972-2-242944. Were trying to save a megashekel by cutting 8-10 jobs (Helen Kays, *Jerusalem Post* via Martin Gallas)

JAPAN Special program being prepared for R. Japan's 60th anniversary June 1; would like to interview listeners who remember R. Tokyo from 1935, or post-war R. Japan (Okito Toyoda, R. Japan)

KOREA SOUTH RKI plans to send 25" color TV sets to 32 people winning its tri-monthly quiz in 1995, expenses-paid; also in 1995 will invite eight "exemplary" listeners for all-expenses paid weeklong visit (via Tom Kuca, Gigi Lytle)

MOROCCO The very strange English hour Sun at 1400 on 17595 featured some news, blues corner with three 1950's blues songs by J.B. Lenoir, Muddy Waters, *Women's Corner* on violence, big band music, alien talk (Norm Blakely, blues aficionado, Ont)

MOZAMBIQUE R.Moçambique is active on only two frequencies, 4855 and 4826.5, very strong but so badly modulated that they are worthless (Vashek Korzinek, South Africa, *NU* via NASWA)

NEW ZEALAND Phone of Kiwi Radio, 7445 or 7475 weekends in 0715-0835* period is 011-64-6-843-0084, per John Campbell (Jerry Berg, MA, *FT*) New phone is 0064-684-48166 (Nicholas Rian Grace, DC, *Tropical Tuning* via Thurman)

ROMANIA RRI English service has a new fax number: 401-223-2613; wanted reports on reactivated 11940 at 1300-1400 lest it be shut down again (Gigi Lytle, TX)

SLOVAKIA AWR *Wavescan*, initially two weeks behind other outlets, planned to be in sync in Feb, but DX news segment at end would differ geographically; Sun 0920 on 9445, 2120 on 6055 (via Diane Mauer)

SRI LANKA The "rumor" regarding attack on the VOA station was in fact quite accurate and factual. Damage estimate runs into the millions of dollars (Adrian Peterson, *Radio News Bulletin*)

TAIWAN V. of Asia has new address: PO Box 24-777, Taipei; fax 886-2-751-9277; English is at 1100-1200 on 7445 (Tetsuya Kondo, RN*MN*)

TAJIKISTAN [non?] V. of Free Tajikistan is regular on 7080 with 40-minute broadcasts, but times vary, such as 0350-0423*, 0345-0416*, 0620-0700*, 0615-0650* (BBCM)

THAILAND Thai Meteorological Station, 6765.1 and 8208 kHz, broadcasts weather, warnings, and 7 day outlook for ships and fisheries in the area of Thailand, the Gulf, Andaman Sea and Malacca Strait, for 2 hours each at 0000, 0300, 0600, 0900, 1200, 1500, 1800, 2100. In 2 months for taped report, got a long letter from Maneeroong Triyasunant, card of Typhoon Cecil. Address: Telecomm. Div., Met. Dept., 4353 Sukumvit Rd., Bangna, Bangkok 10260 (Jerry Berg, MA, *FT*)

USA Planned SW station in McCaysville, GA, will be WGTG;

address in Copperhill, TN, just across the border (*WRTH* via Kevin Hecht) For over a year, a SW station has been being built, with all the legalities taken care of. It will be leased by the Overcomer, soon on the air 24 hours as day. We do not own this station, nor have we built it, but we have secured plans to lease the SW transmitter for the end time message. And three transmitters in Africa will be utilized several hours a day (Brother R.G.Stair, *Overcomer*, via Diane Mauer) We assume he is referring WGTG, but he avoids naming it (gh)

Analyzing WRMI's Feb program schedule on 9955 shows 77 hours per week: 47% taken by *La Voz de la Fundación*, 21% by *Overcomer*, 6% by *Scream of the Chameleon*, 5% by *Viva Miami* in English, 1% by *Wavescan*, now UT Sun 0100, 1215, Sat 2200. Contrary to HRJA plans, WRMI stayed on UT last fall, making no shift as DST went off. R. Seize Desanm, Kriyol to Haiti is on WRMI 9955, ex-WRNO 7355, weekdays at 2300-2400.

Jim Farringer, a Lubbock teacher who does *Echoes from the Classroom* on WINB, hears that some satellite fellow named Baker has leased WINB for a year and is going to run 24 hour talk shows (Gigi Lytle, TX) Jeff Baker now programming WINB with right-wing talk instead of preachers (gh)

WCSN finally became WVHA UT Feb 1st at 0000 as Prophecy Countdown handed over the remaining $3 million. Now it identifies with Greenbush, a town of more substance than Scotts Corners, too closely connected with the former owners. *DXtra* finally started the following week, the first UT Tues in Feb at 0130-0149 on 7465, with C.E.Gordon Simkin asking for theme music suggestions and not talking about any station but WVHA itself; the next edition was to air exactly four weeks later, and a local address of WVHA, P.O. Box A, Olamon, ME 04467 was given. See Shortwave Guide for preliminary sked.

Another address for KAIJ: R.R.3, Box 120, Frisco, TX 75034 (Jerry Berg, MA, *FT*)

Seeking better propagation, WHRI moved 7315 to 5745 at 2300-0500, then back to 7315 after 0500 (Jim Moats, Diane Mauer, Steven Cline)

WWCR audible on spurs of B-A difference frequencies: 10620 = 15685 - 5065 at 1420, and on 8780 = 13845 - 5065 at 1440 (Brian Alexander, PA) WWCR has been waiting on FCC to approve some new frequencies. Projected *World of Radio* sked: Fri 2030 on 12160 or 12030, 2115 on 0475, Sun 0500 on 7435, 0930 on 5065, 2300 on 9475, Tues 1230 on 15685. (See Shortwave Guide for rest of preliminary skeds.)

W.O.R. on World Radio Network should also shift, to Sat 1900. Correcting the WRN on World Wide Web on URL given last month, for *W.O.R.* and all other programming: http://town.hall.org/radio/wrn:html/ — Cannot be accessed by analog telephone, requires minimum connection speed of 56 kb per sec; rent ISDN lines to home or business, and best quality via a PC soundcard, says WRN (gh)

Voice of America has greatly reduced SW output of some languages: Azeri, Bulgarian, Georgian, Polish, Slovene, Uzbek (BBCM) Added several frequencies at 1700-1800 only for Asia, Pacific, during live call-in, even though middle of night — 5900, 6045, 9525, 9770, relay sites unknown (Sunny Ashimori, Japan, via Bill Westenhaver, ex-SPEEDX) VOA promoted this program line-up replacing *Focus*, no times given: Mon, *Spotlight on Business and Finance*; Tues, *Inside the USA*; Wed, *International Focus* — discussion; Thurs, *Reporters Notebook*; Fri, *Perspectives* — religion, ethics, values (*Communications World*) Found at 1610 on 19379, 2410 on 5995, 7405, etc., and no doubt certain other hours at :10 past (gh)

Eleven meters sometimes still opens on Sunday afternoon. The AM remote unit in Portland, OR, on 25950 IDed at 2101 as Sports Radio 1520, The Fan, KFXX, Oregon City, Portland; ballgame, quite listenable on peaks (gh, OK)

Why was I hearing "Q-94.9" with contemporary music at 0030 on 3200? (Kevin Hecht, PA) UnID on 1600 at 0217 as "Q-94.9" — is this WJQI, ex-Joy 95? Fairly strong for 27 watts (Jeff Kitze, Boydton, VA, NRC *DX News*) WJQI 1600 is in Chesapeake, VA (*M-Street Directory*) So you were hearing 2nd harmonic of an AM station simulcasting FM (gh)

Strange noises heard day and night in Chicago on 1660, presumably the USA digital test formerly run from Cincinnati (George Thurman) Testing compatibility of DAB with analog AM (gh) Also something similar daytime on 1660 in Philadelphia area (Kevin Hecht, PA)

VATICAN Last month's item from RM*NM* is incorrect. 6245 remains from the lower-powered 80 kW facility in the Vatican proper, although frequency schedules only mention Santa Maria di Galleria as before (Bob Padula, *ADXN*) Vatican Radio has replaced 3945 with new 4010 USB at 0300-0730, 1730-2110 (AMID via Büschel) Joining Hungary, Kirgyzia on 4010.

VENEZUELA R. Barquisimeto was about to resume SW on 9510 when some people stole the radials of the SW antenna for the copper, costing the station 2.5 megabolívares, most of it covered by insurance, so still plans to go on 9510 (Luís Guerra Brandt, *Tropical Tuning* via Thurman) Usually blocked in N.Am by the Mexican, but R. Mundial Los Andes, Mérida, is active irregularly on 6010.5, during local visit noted around 0700, 1000, daytime and 0000. (Don Moore, Venezuela, *ibid.*)

VIETNAM Voice of Vietnam relay at 0400-0600 in English on 5940 likely via Armavir, Russia (Kevin Hecht, PA) Confirmed by direction-finding, Tbilisskaya site at 45-29 north, 40-07 east, often referred to as nearby "Armavir"; and more from same place at 0600-0700 in Spanish on 7400, 315 and 290° respectively (Chris Greenway and Dave Kenny, BBCM) Another VOV relay, in Vietnamese and other languages, 0700-0800 on 7270, likely via Petropavlovsk-Kamchatskiy (Allan Garshowitz, B.C., via Hecht) Expect higher frequencies for Z95, at least replacing 5940 (gh) [non non] Contrary to *WRTH*, Hanoi is using 7283.3 for Cambodian 1200 and possibly other earlier services, not 7415 (Craig Seager, NSW *ADXN*)

YEMEN Had English at 1800-1830 in November, but no English since, when checked on four dates in Jan, Feb (Norm Blakely, Ont) on 9780.

ZIMBABWE Contrary to previous info, ZBC on up to 3 SW transmitters at once, Radio 3 at 0300-0400 and 2000-2200 on 3306, 3396, 4828; approximate observed schedule is also different in between: 0400-0600 R.3 on 3306, 3396; 0600-0800, R.3 on 5975, 6045; 0800-1630 R.4 on 5975, 6045; 1630-2000 R.4 on 3306, 4828. R.4 also announced 0800-1630 on 7285 unconfirmed, and 1630-2000 on 3396, 4828 (BBCM) Thanks to tip from Thurman, heard ZBC nicely at 0409 on 3396 with R.3 jingle, 0411 vernacular on 3306 (gh, OK) *Wake Up Zimbabwe* from 0300 on 3396 is classic SW, a typical day, even traffic reports (Larry Shewcuk, Man., CIDX *Messenger*)

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

Broadcast Loggings

Gayle Van Horn

SHORTWAVE BROADCASTING

0010 UTC on 4915
GHANA: GBC. Regional news to public service announcements and African music. (Maywoods DX Team, KY; Loy Lee, Jim MCClure, Ed Shaw, Jerry Johnston, Chuck Everman, Dr. Joel Roitman, John Hafendorfer) *Thanks, guys!-ed.* Disco music program at 2304 on 3366. (Harold Frodge, Midland, MI)

0022 UTC on 9725
COSTA RICA: AWR. ID to address quote as, " P.O. Box 1177, Alajuela, Costa Rica." *Quiet Moment* program including trivia questions on Bible scriptures and religious music. (Larry R. Zamora, Alamogordo, NM)

0030 UTC on 9905
SWITZERLAND: Swiss Radio International. Interval signal to ID and frequency quote for Central America. Time pips to German service. (Zamora, NM) Italian and French service noted at 0544 on 3985. (Giovanni Serra, Roma, Italy)

0035 UTC on 9540
SPAIN: Radio Exterior Espana. Sports news, ID and *Cultural Encounters* program. (Zamora, NM) Spanish DX program *Amigos de la Onda Corta.* Lite music show heard on // 15110, 17755, 17715, 15380. (Serra, Italy)

0055 UTC on 7200
RUSSIA: Radio Yakutsk. Russian. Classical instrumentals at tune-in. "Radio Yakutsk" ID at 0100 into presumed news update. (Frodge, MI)

0125 UTC on 6804
PERU: Ondas del Mayo. Spanish. Peruvian vocals to pan flute instrumental. Station ID to regional comments. (GVH/NC)

0130 UTC on 7448
GREECE: Voice of Greece. Slow-speed English newscast. (William T. Hassig, Mt. Prospect, IL) Greek folk music on 11595 at 1823. (Frodge, MI; Jerry Witham, Keaau, HI) Sign-on interval signal to ID. National anthem into news on 9375//9425 at 2057. (Fraser, MA)

0145 UTC on 7386
COSTA RICA: Radio for Peace International. Spanish/English. // 9400 fair signal. Commentary on women's issues. (Frank Hillton, Charleston, SC)

0200 UTC on 12005
ECUADOR: HCJB. Time pips to ID and *On Line* program (Sue Wilden, Columbus, IN) *Morning in the Mountains* at 1340 on 12005. (Bob Fraser, Cohasset, MA) Ecuador's **La Voz del Napo** audible on 3280 at 0255. (Maywoods DX Team, KY)

0200 UTC on 4779
DOMINICAN REPUBLIC: Onda Musical. Spanish. ID and local time check at tune-in. Announcer's briefs to station information and 0210*. (Tom Banks, Dallas, TX)

0224 UTC on 4835
GUATEMALA: Radio Tezulutlan. Spanish. Announcer's chat and regional announcements about Coban. Gautemala's **La Voz del Atitlan** heard on 2390 at 0250. (Maywoods DX Team, KY)

0256 UTC on 4830
BOTSWANA: Radio Botswana. Barnyard interval signal to choral anthem. Sign-on ID and programming info. (Frodge, MI) English newscast at 0400. Station also audible at 2113. (Maywoods DX Team, KY)

0220 UTC on 5950
UNITED STATES: Voice of Free China relay. Essay on Taiwanese family life, cultures, and daily struggles. (Gerry Le Strange, East Brunswick, NJ) Station noted at 0302 on 5950, with announcer duo's news and Chinese classical music. (Wilden, IN)

0220 UTC on 5700
PERU: Frec San Ignacio. Spanish. DJ with dance music into station ID at 0241. Peru's Radio Yurimaguas heard on 6238 at 0225. Bad Boys song to talk and 0255*. (Maywoods DX Team, KY)

0300 UTC on 3306
ZIMBABWE: ZBC. Children's choral music to drum signal and station ID. (Maywoods DX Team, KY; Frodge, MI) African pop music to unid language to 0400. Heard also at 1650-1700. (Witham, HI)

0313 UTC on 7355
UNITED STATES: WRNO. German fellow talking about the misconceptions of the concentration camps during WWII. (Wilden, IN)

0335 UTC on 9820
CUBA: Radio Havana. Newscast to poetry readings and music by Jose Marti. (Wilden, IN) Noted 2132 on 11720, with item that Tropicana Cafe is celebrating its 55th anniversary. (Fraser, MA; Le Strange, NJ)

0505 UTC on 5020
SOLOMON ISLANDS: SIBC. English/Pidgin. Language mix for local public service announcements. Island music vocals to station ID. Local time check and commercials. (Banks, TX)

0540 UTC on 4904
CHAD: Radio Nationale. French. Announcer's program info. Afro pops to English rock music and news at 2130 on 4904. (David Bartwell, Paducah, KY)

0604 UTC on 4770
NIGERIA: Radio Nigeria. Moderate signal for instrumental pop tunes, followed by new age music selections. Co-channel interference. (Wilden, IN) News and critique at 0705, on the government's lack of instituting popular reforms. (Witham, HI)

0610 UTC on 6306
CLANDESTINE: La Voz de CID. Spanish. Commentary on Cuba. Fair signal with SIO=322. (Frodge, MI)

0613 UTC on 7405
UNITED STATES: Voice of America. Oldies rock n'roll show...circa 1955. (Wilden, IN) Heard on 5985 at 1130, with *Country Music USA*, featuring Garth Brooks. (Zamora, NM)

0915 UTC on 21725
AUSTRALIA: Radio Australia. DJ hosts *Soundabout* program. Station ID to signal time pips, music bridge and world newscast. (Serra, Italy) Feature on Bangladesh monitored on 5995 at 1620. Opening ceremonies for Radio Australia's new South Bank studios on 9860 at 1730. (Witham, HI)

1040 UTC on 4935
PERU: **Radio Tropical**. Spanish. Station IDs to tropical music tunes. Peru's **Radio Coro** heard on 4915 at 1049. Sign-on anthem to animal sound effects and upbeat music. (Frodge, MI)

1047 UTC on 3325
GUATEMALA: **Radio Maya de Barillas.** Spanish. ID as, "esta es Radio Maya." Campesino tunes to announcer's chat. Guatemala's **Radio Chortis** heard on 3380 at 1103. (Frodge, MI)

1106 UTC on 11835
RUSSIA: Voice of Russia. ID to news features on continued problems in the republics. (Frodge, MI) *Russian for Business People* in English and Russian translations. (Witham, HI; Bob Fraser, Cohasset, MA)

1113 UTC on 9624.96
BOLIVIA: Radio Fides. Spanish. Reporters feature and conversation. Commercial for "Banco de Bollvia," into regional style music. (Maywoods DX team, KY)

1130 UTC on 4890
PAPUA NEW GUINEA: NBC. Gospel music program to regional news. (Frodge, MI) "Good morning" IDs noted at 2019 on 4890. DJ's folk music show to pop tunes. (Serra, Italy)

1159 UTC on 9530
SINGAPORE: Radio Singapore International. Announcer's UTC time check to *News in Brief* and pop music. (Frodge, MI)

1210 UTC on 5990
MYANMAR: **Radio Myanmar**. Asian music to regional language lesson program. Station announcements to Myanmar ID. **National Defense Forces BC** noted on 6570 at 1247. (Maywoods DX Team, KY)

1227 UTC on 4920
INDIA: **AIR-Madras**. Talk and English at 1230. **AIR-Delhi** heard on 4860 at 1232 with national news. (Maywoods DX Team, KY)

1300 UTC on 7145
THAILAND: Radio Thailand. Bell interval signal to ID as, "this is HSK9 Radio Thailand broadcasting from Bangkok." Japanese service followed by Mandarin. (Zamora, NM) Audible on 11855 at 1935 in English and Asian dialect. (Frodge, MI)

1435 UTC on 11650
SWEDEN: Radio Sweden. *In Touch With Stockholm* to 1500*. (Zamora, NM)

1524 UTC on 11870
SEYCHELLES: FEBA Radio. Pop music tunes to Bangalore, India address. World newscast to IDs, religious sermon, interval signal and 1549*. (Serra, Italy)

1715 UTC on 4850
UZBEKISTAN: Uzbek Radio. Continuous mid-east style music to chimes interval signal and ID. Newscast at 1730 to pop music program. (Witham, HI)

1730 UTC on 7180
IRAN: VOIRI. Presumed Islamic or Farsi. Brief interval signal to station ID. Newscast on Iran and bordering nations, to station commentary. (Witham, HI)

1850 UTC on 9605
MADAGASCAR: Radio Netherlands relay. *Newsline* show, music and ID. Feature show *The Silver Screen,* heard on // 6015. (Serra, Italy)

1850 UTC on 9200
SUDAN: Sudan National BC. Arabic vocals to English news at 1856-1900. Listener's reception reports requested, but no clear ID. Arabic service commencing at 1900. (Frodge, MI)

1925 UTC on 11735
NEW ZEALAND: Radio New Zealand. Listener's call-in sports show. (Linda S. Newton, San Antonio, TX)

2028 UTC on 6150
KENYA: KBC. Regional vocals mixed with several mentions of VOA and Nalrobi IDs. (Maywoods DX Team, KY) KBC monitored on 4935 with features and anthem to 2107*. (Frodge, MI)

2115 UTC on 6180
CYPRUS: BBC relay. *Newshour* program on polltical murder in Mali. (Fraser, MA)

2135 UTC 4870
BENIN: Radio Du Benin. French. African pop music to ID and time check at 2145. (Frodge, MI) Audible at 2210 on 4870. (Maywoods DX Team, KY)

2212 UTC on 5047
Radio Togolaise. French. DJ with musical variety program of gospel, reggae, pop/rock and easy-listening. (Frodge, MI)

2235 UTC on 9735
PARAGUAY: Radio Nacional de Paraguay. Spanish. Station ID to Paraguayan song. Anthem at 2309 into presidential address. Station noted 0020 on 9735 with ID and chat to campesino music program. (Frodge, MI)

2248 UTC on 6400
NORTH KOREA: Radio Pyongyang. Asian dialect. Llte instrumental music to upbeat vocals. // 6250. Time pips at 2300, // frequency a bit cleaner. Commentary on Kim Il Sung noted on 11700 at 2323. (Frodge, MI)

2300 UTC on 6200
CZECH REPUBLIC: Radio Metropolis. Five minute station information in Czech. Info repeated in Russian, English and German. (Frodge, MI)

2320 UTC on 4785.63
COLOMBIA: Ecos Del Combeima. Spanish. Regional ads to local time check. Latino vocals to "Radio Super" ID. (Sam Wright, Biloxi, MS)

2346 UTC on 3995
GERMANY: Deutsche Welle. German. Dixieland music program. International news at 0000. Few amateur radio interferences noted. (Frodge, MI)

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

Prepared QSL Cards...A Concept That Works!

Are you including a prepared QSL card with your reception report?

A prepared QSL card is a card designed to include details such as time, date, frequency, power, and the veri text that states that your report is being confirmed as correct.

Enclosed with your reception report, the station can sign and/or stamp the card and return it to you.

If you're lucky, the station often will include a letter on their station letterhead or perhaps a station souvenir.

Bill Plum, of DX Postage and Supply, offers prepared QSL cards in English, Spanish, Portuguese, French, and Indonesian. For Bill's price list send your SASE to; 12 Glenn Rd., Flemington, NJ 08822. Tell Bill, *MT*'s "QSL Report" sent ya!

AIRCRAFT TRAFFIC

Roma 99-Dulles Int'l Airport, (KC-135R Tanker/Tail #62-3512) 1176 kHz USB. Full data prepared QSL card verified and personal letter. Copy of flight log, spec sheet for KC-135 Tanker, Dulles Airfield diagram and 3 patches (Air Mobility Command, Red Pegasus 509th AREFS, American flag) included. Received in 19 days for an English utility report. QSL address: Griffiss AFB, NY. 11551 (Steve McDonald, Port Coquitlam, BC Canada)

Lifter 91, (C-17A/Tail #923291) 1176 kHz USB. Full data prepared QSL card verified by Lt. Col. Ronald Ladnier-Aircraft Commander. This is my second C-17A verified. There are only a few in active service; the 17th A.L.S. at Charleston is the first unit to operate the new Globemasters. Received in 16 days for an English utility report. QSL address: Charleston AFB, SC. 29404 (McDonald, CAN)

Boeing B-17 (Flying Fortress), North American P-51 (Mustang), Heinkel HF-111 (Cesna 2111 H-16), Stinson L-5 (Sentinal), Douglass C-47 (Skytrain), Mitsubishi A6M2 (Zero), Boeing B-29 (Superfortress). All aircraft on 120.95 MHz. Full data QSL via prepared letter form, signed by David Cooper-Col. CAF. Received in 17 days after a follow-up report on airshow communications. Mitsubishi A6M2 (One Real Zero) is one of two known to be currently flying, other Zero aircraft were replicas. QSL address: Confederate Air Force, Colonial Air Wing, 13937 Willard Rd., Chantilly, VA 22021. (Hank Holbrook, Dunkirk, MD) Hank adds, "1,601 aircraft QSLed—the only way I knew to add any World War II aircraft was to go to an airshow." *Way to go, Hank! -ed.*

ANGOLA

D3E-Luanda Radio. Full data prepared QSL verified, signed by Joaquin Manuel Pedro. Cover letter enclosed. Received in 43 days after a Portuguese follow-up utility report, (Total of 356 days) 2 IRCs and address label (not used). No return address on envelope, reported to: c/o Empressa Nacional de Telecomunicacoes, C.P. 625, Luanda. Angola. (Mike Hardester, Jacksonville, NC)

LONGWAVE

WLO, 434 kHz. Mobile Marine Radio, Inc. Full data QSL letter verified. Received in 30 days for an English utility report and U.S. mint stamps (returned). Station address: 7700 Renla Ave., Mobile, AL 36619-1199. (Michael A. Schulsinger, Springfield, OH)

MEDIUM WAVE

HJJX-770 AM. Radio Cadena Nacional Bogotá. Full data QSL folder card, signed by Antonio Pardo Garcia. Personal letter, station stickers, and bumper sticker enclosed. Received in 1.5 months for a Spanish AM report and Colombian mint stamps. Station address: Oficina Central, Apartado Aereo 4984, Bogotá, Colombia. (Ed Rausch, Cedar Grove, NJ)

WILY-1210 AM. Partial data sheet/coverage map and business card from Eric Decker-Production Manager. Received in 15 days for an English AM report. Station address: 302 South Poplar St., P.O. Box 528, Centralia, IL 62801. (David Gasque, Orangeburg, SC)

WVKO-1580 AM. Full data sheet/coverage map signed by John Marocchi-Chief Engineer. "16-WVKO V.I.P. Card" enclosed. Received in 7 days for an English AM report. Station address: 4401 Carriage Hill Lane, Columbus, OH 43220-3800. (Gasque, SC)

WGNY-1200 AM. Full data data sheet signed by Shawn C. McGrath-Operations Manager. Received in 21 days for an English AM report, one U.S. mint stamp, and return address label (used on return reply). Station address: P.O. Box 2307, Newburgh, NY 12550. (Gasque, SC)

WBZY-1200 AM. Full data card signed by Bill King. Received in 42 days for an English AM report of DX Test, U.S. mint stamps, and address label (used on reply). Station address: 1906 Wilmington Rd., New Castle, PA 16105. (Hardester, NC)

POLAND

SPS-CW Idler on SITOR-Witowo, Poland, 2643.5 kHz. Full data verification letter. Received in 226 days for an English utility report. QSL address: Panstwowa Agencja Rodiokomunikacyjna, Zarzad Krajowy, Ul Kasprkaka 18/20, 01-211 Warszawa, Poland. (McDonald, CAN)

SHIP TRAFFIC

USS Caron-NOTC, 10493 kHz (Destroyer). Full data prepared QSL card verified, and photo of vessel. Received in 25 days for an English utility report and U.S. mint stamps. Ship QSL address: FPO AE 09566-1208. (Schulsinger, OH)

USS John Rogers-NYQL, 5211 kHz (Destroyer). Full data prepared QSL card verified. Received in 20 days for an English utility report and U.S. mint stamps. Ship QSL address: FPO AA 34092-1221. (Schulsinger, OH)

Tillie Lykes-WMLH, 500 kHz (Container). Full data QSL letter verified. Received in 46 days for an English utility report and U.S. mint stamps. Ship QSL address: Lykes Bros. Steamship Co., Inc. Lykes Center, 300 Poydras St., Suite 1901, New Orleans, LA 70130. (Holbrook, MD)

Louise Lykes-WLCV, 500 kHz (Clipper 595 ft.) Full data QSL letter verified. Received in 63 days for an English utility report and U.S. mint stamps. Ship QSL address: (please refer to *Tillie Lykes* address). (Holbrook, MD)

SWAZILAND

Trans World Radio, 4760 kHz. Received brief note in 45 days advising that their station was not on at the time/frequency I reported. Five days later I received a full data card advising that they were on at the time/frequency reported. Veri signer illegible. Address label used on reply, with IRC enclosed. Station address: P.O. box 64, Manzini, Swaziland. (Hardester, NC) *Wonder which one counts?*

TRAVELERS INFORMATION STATION (TIS)

WNJW 446-1610 AM kHz, Chapel Hill, NC. Full data QSL letter signed by Sandra Roberts-Director UNV Vistors Center. Received in 18 days for an English report and U.S. mint stamp. Station address: University of North Carolina at Chapel Hill, Division of University Relations, Visitor Center, Campus 3475, Morehead Building, Chapel Hill, NC 27599-3475. (Holbrook, MD)

UKRAINE

Radio Ukraine International, 9860/12030 kHz. Full data folder cards unsigned, and program schedule. Received via air for two separate reports on the same program, one sent via airmail and one sent via seamail. Replies received in 98 and 101 days respectively. Address labels and IRC enc osed with each report. Station address: ul. Kreshchatik 26, 252001 Kiev, Ukraine. (Hardester, NC)

ZAMBIA

Christian Voice, 6065 kHz. Full data FAX, signed by Andrew Flynn. Received in 4 days for a faxed report. Station address: Private Bag E-606, Lusaka, Zambia. (FAX: 260-1-274251) (Rausch, NJ)

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

Pres. Fujimori may not be aware of it, but **PERÚ** was at quite a disadvantage in the border war with **ECUADOR**, lacking an equivalent of HCJB, which kept English-speaking listeners abroad informed. From his listening post in Bogotá Henrik Klemetz noted that Radio Quito became active all day on 4920 to cover the conflict. Radio Centro, 3290 in Ambato, Ecuador, was downlinking Radio Programas del Perú on Sunday morning. But several Peruvians curtailed their usual fare of Ecuadorian *pasillo* music programming. R. Naylamp, 4549.4 replaced *Buenas Tardes Ecuador* weeknights at 0000-0100 with Peruvian waltzes on *Arriba Perú* for "brave soldiers at the frontier." Further south, R. Soledad, 4633v, didn't seem to care, still running their *La hora del passilo del Ecuador* around 0015. Two stations are using the same transmitter on 4238—mornings around 1100, Radio Cajamarca as listed; but at night until 0200* an outlet in Baños del Inca, Radio Nor Agricultura, ex-R. Inca del Perú, says Klemetz.

The Chiapas uprising in **MÉXICO** may involve some clandestine broadcasting, but they are not making it easy for us, by withholding frequencies for

UNOSOM
UNITED NATIONS OPERATION IN SOMALIA

security. La Voz de Chiapas Libre, or La Voz de Guatemala Mayán, were reported to be operating irregularly between 1200 and 0300 UT on MW and tropical SW with battery power. An American DXer has provided them a tape in English, and in case anybody manages to hear it, offers his address for reports: Jay Murley, San Diego, CA 92143-4106, per an item in NRC *DX News*.

Moving to Africa: **ANGOLA** has expanded its official International Service on 9535 and perhaps on 3355 which usually carries the domestic service, with one hour per day each in Spanish at 1800, French at 1900, English at 2000 (news at 2030), Portuguese at 2100, and new Lingala for neighboring countries at 2200, reports BBC Monitoring.

Radio Free **SOMALIA** is a project of Rotary Australia, jointly funded by the Australian government. Two Australian volunteers from IARN trained 24 local volunteers to run it, and it's now heard nationwide, quoted in the Mogadishu press, says Peter Krakolinig, Humanitarian affairs office of UNOSOM Galcaio in a message to Rotary Australia, via Bob Thomas, CT. The 13820 transmitter was heard as far away as Belgium by Eugene Gebruers on RVI *Radio World*, in local language at 1215-1303 in Somali, English ID, 800 watts full AM beamed to Sydney with log-periodic.

Those who can hear and understand the Radio Rossii *DX-Klub* program in Russian have a good source of info; it was scheduled on numerous frequencies, Sundays at 1230, repeated at 1530, Mon 0230, 0530, Wed 1330, 1630, 1930, Thu 0630. Via Wolfgang Büschel, Rumen Pankov in Bulgaria heard Pavel Mikhailov report that Radio "Abkhaz Committee for Human Rights" operated by separatists at Subkhumi, **GEORGIA**, was heard on a Monday at 0605 on 9365, also until 0540 on 9505 instead of 9375.

IRAN continues augmenting its external shortwave capability. The D94 ITU schedule showed four sites registered with 500 kW units—Zahedan, Kamalabad, Ahwaz; and Sirjan which is shown on 15165 at 1000-1230, 2230-0130; 15345 at 0730-0930, 1930-2200, 17765 at 0500-0700, 1730-2030; 21500 at 0930-1330, 2130-0130, extracted for *Australian DX News* by Bob Padula. BBCM found the new Swahili service at 1700-1730 on 9685, 11740. From the opposition, Voice of the Iranian Communist Party was intercepted at *1700-1800* on 6405 and 3910, announcing it's on 49, 65, 75 and 90 meter SW bands, with a repeat Fridays at 0430. Voice of Iranian **KORDESTAN** varies around 3739 and 4284 at 0330, 0900, and 1530, also announcing the 41 meter band.

Voice of the people of Kurdistan, from Sulaymaniyah, Iraq, announced it was starting a service to Europe at 1600 on 15060, but this has not been confirmed. Domestic service was on 4055, while rival Voice of Iraqi Kurdistan was on 4065, subsequently on 4105 at 1600-1715*, another day from *1550 on 4080, shifting to 4085 at 1615 due to jamming, later to 4065 until 1708*. BBCM also finds that radio **IRAQ** International is highly erratic, but confirmed only around 0900-1300 on 13680 in English, 2100-2340 on 9745 in Arabic. Wolfgang Büschel heard Arabic from Iraq with a poor signal on 11748.6.

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Dave Datko
California

Next Reporting Deadline
April 13, 1995

Jim Frimmel, Program Manager
Texas

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

newsline

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

0000 UTC
(8:00 PM EDT, 5:00 PM PDT)
BBC
Canada (North-Quebec)
China Radio Int'l
Monitor Radio Int'l [T-A]
Radio Australia
Radio Canada Int'l [S-M]
Radio New Zealand Int'l [M-A]
Radio Prague
Radio Thailand
Radio Ukraine Int'l
Radio Yugoslavia
Spanish National Radio
Voice of America (am)
Voice of Russia
WHRI [T-A]
WWCR #1 [T-A]
WYFR [T-F]
0003
Radio Pyongyang
0009
BBC*
0010
China Radio Int'l*
Voice of America (ca) [T-A]*
0015
Radio Cairo
0030
All India Radio
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int'l
Radio Sweden [T-A]
Radio Thailand [T-S]
Voice of America (am) [T-A] (Special English)
Voice of America (as) (Special English)
Voice of Russia
0050
RAI Italy

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

0200 UTC
(10:00 PM EDT, 7:00 PM PDT)
BBC
Canada (North-Quebec)
Deutsche Welle
Monitor Radio Int'l [T-A]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moldova
Radio New Zealand Int'l [M-A]
Radio Romania Int'l
RAE Argentina [T-A]
Voice of America (am) [T-A]
Voice of America (as)
Voice of Myanmar (Burma)
Voice of Russia
WINB [T-A]
WWCR #3 [T-A]
0203
Voice of Free China
0215
Radio Cairo
Radio Nepal
0230
Radio Budapest
Radio Havana Cuba [T-H/A]
Radio Netherlands Int'l
Radio Pakistan
Radio Sweden [T-A]
Radio Tirana
Voice of Russia [T-A]

0300 UTC
(11:00 PM EDT, 8:00 PM PDT)
BBC
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
KVOH [T/W/H]
Monitor Radio Int'l [T-A]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Int'l [M-A]
Radio Prague
Radio Thailand
Radio Ukraine Int'l
Voice of America (af) [A-S]
Voice of Russia
Voice of Turkey
WHRI [T-S]
WINB [T-A]
WWCR #1 [T-S]
WWCR #3 [T-A]
0301
Voice of America (af) [M-F]*
0303
Voice of Free China
0309
BBC*
0310
China Radio Int'l*
0315
Radio Cairo
Voice of Greece [S/H]
0320
Radio Philipinas [M-A]
Vatican Radio
0330
BBC (af)*
Radio Austria Int'l
Radio Dubai
Radio Havana Cuba [T-H/A]
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int'l
Radio Prague
Radio Sweden [T-A]
Voice of America (af) [M-F] (Special English)
Voice of Russia
0340
Voice of Greece
0345
Radio Yerevan
0355
Radio Japan

0400 UTC
(12:00 AM EDT, 9:00 PM PDT)
BBC
BBC (af)
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Bulgaria
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio New Zealand Int'l [A]
Radio New Zealand Int'l [M-F]*
Radio Romania Int'l
Radio Tanzania
Swiss Radio Int'l
Voice of America (af)
Voice of Russia
WHRI [T-A]
WWCR #1 [T-A]
ZBC Zimbabwe
0403
Radio Pyongyang
0410
China Radio Int'l*
0425
RAI Italy
0430
Radio Finland
Radio Havana Cuba [H]
Voice of Russia
0431
Voice of America (af) [M-F]*
0440
BBC (af) [A-M]*
0445
BBC (af) [T-F]*

0500 UTC
(1:00 AM EDT, 10:00 PM PDT)
BBC
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
HCJB
Monitor Radio Int'l [T-F]
Radio Australia
Radio Cameroon
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Spanish National Radio
Swiss Radio Int'l (eu)
Vatican Radio [T/F]
Voice of America (af)
Voice of Israel
Voice of Russia
WHRI [A]
0510
China Radio Int'l*
Radio Australia [M-F]*
0530
Radio Austria Int'l
Radio Dubai
Radio Havana Cuba [T-H/A]
Radio Romania Int'l
Voice of Nigeria
Voice of Russia
0555
Radio Japan [A]

0600 UTC
(2:00 AM EDT, 11:00 PM PDT)
BBC
BBC (af) [A-S]*
BBC (af) [M-F]
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Canada Int'l [M-F]
Radio Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio New Zealand Int'l [M-A]
Radio Prague
Radio Yemen
Swiss Radio Int'l
Swiss Radio Int'l (eu)
Voice of America (af) [A-S]
Voice of America (me)
Voice of Kenya
Voice of Malaysia
Voice of Russia
WWCR #3 [S]
0601
Voice of America (af) [M-F]*
0603
Radio Pyongyang
0609
BBC*
0627
BBC (af) [M-F]*

0630
Radio Austria Int'l [T-S]
Radio Havana Cuba [H]
Radio Vlaanderen Int'l
Radio Yemen
Vatican Radio [H]
Voice of Nigeria [M-F]
Voice of Russia
0632
Radio Romania Int'l
0645
Radio Romania Int'l
Voice of Nigeria [M-F]*
0655
Voice of Med. (Malta) [M-F]
0657
AWR Latin America [F]*

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)
BBC
Monitor Radio Int'l [T-F]
Papua New Guinea
Radio Australia
Radio Japan
Radio New Zealand Int'l [A-S]
Radio New Zealand Int'l [M-F]*
Voice of Myanmar (Burma)
Voice of Russia
0703
Radio Pyongyang
Voice of Free China
0710
Radio Australia [M-F]*
0730
BBC (af) [A]*
HCJB
Radio Netherlands Int'l
Radio Pakistan
Radio Prague
Vatican Radio [M-F]
Voice of Greece [S/H]
Voice of Russia
0745
Radio Finland
0750
Radio New Zealand Int'l [M-F]*
Russia (Radio Pacific Ocean) [A]
0755
Radio Japan
Voice of Med. (Malta) [M-F]

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)
BBC
KNLS
Monitor Radio Int'l [M-A]
Radio Australia
Radio Finland
Radio Korea
Radio New Zealand Int'l
Radio Pakistan
Voice of Indonesia [A-H]
Voice of Malaysia
Voice of Russia
0803
Radio Pyongyang
0810
Radio New Zealand Int'l [M-F]*
0830
R Slovakia Int'l
Radio Austria Int'l [T-S]
Radio Netherlands Int'l
Radio Yerevan [S]
Voice of Russia [M-A]
0855
Voice of Indonesia [A-H]

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
BBC
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Papua New Guinea [M]*
Radio Australia
Radio Bulgaria
Radio Japan
Radio New Zealand Int'l [M-A]
Radio Vlaanderen Int'l [M-A]
Swiss Radio Int'l
Voice of Russia
WWCR #3 [A]
0910
China Radio Int'l*
Radio Australia [M-F]*
0920
Voice of Greece [S/H]
0930
FEBC (Philippines)
Radio Netherlands Int'l
Voice of Russia
0940
Voice of Greece
0945
Deutsche Welle [M-F]*
0955
Radio Japan

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
All India Radio
BBC
China Radio Int'l
FEBC (Philippines) [M-F]*
HCJB
Monitor Radio Int'l
Papua New Guinea
Radio Australia
Radio New Zealand Int'l [S-F]
Radio Tanzania
Swiss Radio Int'l (eu)
Voice of America (as)
Voice of Kenya
Voice of Russia
1010
China Radio Int'l*
Radio New Zealand Int'l [M-F]*
1020
Vatican Radio [M-A]
1030
Radio Austria Int'l [M-A]
Radio Dubai
Radio Korea
Radio Netherlands Int'l
Radio Prague
Voice of Nigeria
Voice of Russia
1045
Radio New Zealand Int'l [M-F]*
Voice of Nigeria [A-S]*

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
BBC
Canada (North-Quebec) [A-S]
Channel Africa
Deutsche Welle
Monitor Radio Int'l [M-A]
Papua New Guinea
Radio Australia
Radio Ghana [A-S]
Radio Japan
Radio Jordan
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)
Voice of Israel
Voice of Russia
WHRI [A]
WWCR #1 [M-F]
WYFR [M-A]
1103
Radio Pyongyang
1110
Radio Australia*
1130
Radio Austria Int'l
Radio Bulgaria
Radio Finland [M-A]
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Singapore Int'l
Radio Sweden [M-F]
Voice of Asia
Voice of Russia
WYFR [M-F]
1145
Deutsche Welle [M-F]*
1155
Radio Japan [M-F]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC
Canada (North-Quebec) [A-S]
China Radio Int'l
Monitor Radio Int'l [M-A]
Papua New Guinea
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio France Int'l
Radio New Zealand Int'l [H-T]
Radio Norway Int'l [S]
Radio Singapore Int'l
Radio Tashkent
Voice of America (as)
Voice of Russia
WHRI [A]
WWCR #1 [S]
WYFR [M-F]
1203
Radio Korea
Voice of Free China
1204
HCJB [M-F]
1210
China Radio Int'l*
1230
HCJB [M-F]*
Radio Bangladesh [S-M]
Radio Cairo
Radio Canada Int'l
Radio Finland
Radio Netherlands Int'l
Radio Singapore Int'l
Radio Sweden [M-F]
Radio Vlaanderen Int'l [S]
Radio Yugoslavia
Voice of Russia
Voice of Turkey
Voice of Vietnam
WYFR [M-F]
1231
Radio France Int'l [T]*
1240
Voice of Greece
1258
Africa No. 1 (Gabon)

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC
Canada (North-Quebec) [S]
China Radio Int'l
KNLS
Monitor Radio Int'l [M-A]
Papua New Guinea
Radio Australia
Radio Canada Int'l [M-F]
Radio Ghana
Radio Norway Int'l [S]
Radio Romania Int'l [M-A]
Radio Singapore Int'l
Radio Tanzania [A-S]
Radio Vlaanderen Int'l [M-A]
Swiss Radio Int'l
Voice of America (as)
Voice of Kenya
Voice of Russia
WWCR #1 [M-F]
WYFR [M-F]
1301
Radio Romania Int'l [S]
1303
Radio Pyongyang
1310
China Radio Int'l*
Radiobrás [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 Netherlands Int'l
Radio Singapore Int'l
Radio Sweden [M-F]
Radio Tashkent
Voice of America (as) (Special English)
Voice of Russia [M-A]
Voice of Vietnam
1335
Voice of Greece
1339
Radio Finland
1355
Radio Singapore Int'l

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

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
BBC
BBC (af) [M-F]
Canada (North-Quebec) [A-S]
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio Canada Int'l [S]
Radio Japan
Radio Jordan
Radio Omdurman
Radio Tallinn [M-F]
Swiss Radio Int'l
Voice of America (as)
Voice of Russia
WINB [M-F]
WRNO [W]
WYFR [A]
1503
Radio Pyongyang
1510
China Radio Int'l*

Radio Japan [M-F]*
1525
BBC (af) [S]*
Radio Veritas [T-F]
1530
All India Radio*
Deutsche Welle [T-F]*
FEBA (Seychelles)
FEBC (Philippines)
Radio Netherlands Int'l
Radio Portugal Int'l [M-F]
Voice of Nigeria [M-H]
Voice of Russia
WYFR [M-F]
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
Canada (North-Quebec) [A]
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Radio Australia
Radio Canada Int'l [S]
Radio France Int'l
Radio Jordan
Radio Korea
Radio Pakistan
Radio Tanzania
Radio Tirana
Voice of America (af) [A-S]
Voice of America (as)
Voice of Ethiopia
Voice of Kenya
Voice of Russia
WINB [M-F]
WRNO [M-F]
WWCR #3 [M-F]
WYFR [A]
1604
HCJB [M-F]
1609
BBC*
1610
China Radio Int'l*
1615
Vatican Radio
1630
Channel Africa [F]*
HCJB [M-F]*
Radio Canada Int'l
Radio Dubai
Voice of America (af) [M-F]*
Voice of America (as) (Special English)
Voice of Ethiopia
Voice of Russia [M-A]
1645
BBC (as)*

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
BBC (af)
Canada (North-Quebec) [A]
Channel Africa
China Radio Int'l
HCJB
Monitor Radio Int'l [M-A]
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio France Int'l
Radio Japan
Radio New Zealand Int'l [M-F]*
Radio Pakistan
Radio Prague
Swiss Radio Int'l
Voice of America (af)
Voice of Russia
WINB [M-F]
WWCR #3 [M-F]
1703
Radio Pyongyang
1710
China Radio Int'l*
Radio Australia*
1725
Radio New Zealand Int'l [F]*
1730
Radio Netherlands Int'l
Radio Romania Int'l
Vatican Radio [F]
Voice of Russia [S-F]
1740
BBC (af)*
1745
Radio Canada Int'l [M-F]
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
Monitor Radio Int'l [M-A]
Radio Australia
Radio Bulgaria
Radio Cameroon
Radio Mozambique
Radio New Zealand Int'l [M-F]*
Radio Norway Int'l [S]
Radio Omdurman
Radio Prague
Radio Tanzania
Radio Tirana
Radio Vlaanderen Int'l
Radio Yemen
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Kenya
Voice of Russia
WINB [M-F]
WWCR #1 [M-F]
WWCR #3 [M-F]
1815
Radio Bangladesh
1830
R Slovakia Int'l
Radio Austria Int'l
Radio Kuwait
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Yemen
Radio Yugoslavia
Voice of America (af) [A-S] (Special English)
Voice of America (me) (Special English)
Voice of Russia
1835
Radio New Zealand Int'l [F]*
1840
Voice of Greece [M-A]
1855
Radio New Zealand Int'l [M-H]*
1857
BBC (af) [M-F]*

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio
BBC
China Radio Int'l
Deutsche Welle [T-S]
Monitor Radio Int'l [M-A]
Radio Australia
Radio Budapest
Radio Japan
Radio New Zealand Int'l
Radio Norway Int'l [S]
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)
Voice of America (as)
Voice of Russia
WHRI [M-F]
WINB [M-F]
WWCR #3 [S-F]
1901
Radio Romania Int'l [M]
1910
All India Radio [W]
China Radio Int'l*
Radio Australia [M-F]*
1930
BBC (af) [S]*
Deutsche Welle [T-F]*
Polish Radio [A-S]
Polish Radio [M-F]*
Radio Finland
Radio Korea
Radio Netherlands Int'l
Voice of Russia
1935
RAI Italy
1945
Radio Yerevan
1955
Radio Japan [T-W/S]

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-A]
Radio Australia
Radio Korea
Radio New Zealand Int'l
Swiss Radio Int'l
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Greece [M-A]
Voice of Indonesia
Voice of Israel
Voice of Nigeria [M-F]
Voice of Russia
Voice of Turkey
WHRI [M-F]
WINB [M-F]
WWCR #3 [S]
2003
Radio Pyongyang
2007
Radio Damascus [M-F]
2010
China Radio Int'l*
Radio New Zealand Int'l [S-H]*
2025
RAI Italy
2030
Radio Netherlands Int'l
Radio Riga Int'l [M-F]
Radio Sweden [M-F]
Radio Thailand
Voice of Russia [A-S]
2055
Voice of Indonesia [M]
2057
Radio Kuwait

2100 UTC
(5:00 PM EDT, 2:00 PM PDT)
All India Radio
BBC
Canada (North-Quebec) [A-S]
China Radio Int'l
Deutsche Welle
KVOH [S]
Monitor Radio Int'l [M-A]
Radio Australia
Radio Budapest
Radio Bulgaria
Radio Cameroon
Radio Canada Int'l
Radio Damascus [F]
Radio Havana Cuba [M-A]
Radio Japan
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)
Voice of Russia
WHRI [M-F]
2110
China Radio Int'l*
Radio Damascus [S-M]
Radio New Zealand Int'l [S-H]*
2112
Radio Damascus [F]
2115
BBC (ca) [M-F]*
Radio Damascus [T]
2120
Radio Cairo
2130
Radio Austria Int'l
Radio Cairo
Radio Canada Int'l [A]
Radio Nacional de Venezuela [M-A]
Radio Sweden [M-F]
Radio Yerevan
Voice of Russia
2145
Radio Damascus [W]
Radio Korea
2155
Radio Canada Int'l [M-F]
Radio Japan [A]

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC
China Radio Int'l
Monitor Radio Int'l [M-A]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Korea
Radio New Zealand Int'l
RAI Italy
Voice of America (as)
Voice of Russia
Voice of Turkey
WWCR #3 [S]
2203
Voice of Free China
2210
China Radio Int'l*
2215
All India Radio [M/W/F]
Radio Cairo
2230
Radio Finland
Radio Sweden [M-F]
Radio Yerevan
Voice of America (as) (Special English)
Voice of Russia [M-F]
2240
Radio Cairo
Voice of Greece [S-F]
2245
Organization of American States [M-F]*

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
AWR Latin America [H]*
BBC
Canada (North-Quebec) [S]
Monitor Radio Int'l [M-A]
Radio Australia
Radio Bulgaria
Radio Canada Int'l
Radio Japan
Radio New Zealand Int'l
Radio Norway Int'l [S]
Radio Vilnius
Voice of America (as)
Voice of Russia
2303
Radio Pyongyang
2315
Radio Cairo
2330
Radio Canada Int'l [A]
Radio Netherlands Int'l
Radio New Zealand Int'l [S-H]
Radio Sweden [M-F]
Radio Vlaanderen Int'l
Voice of Russia
2335
Voice of Greece [S-F]
2355
2355
Radio Japan

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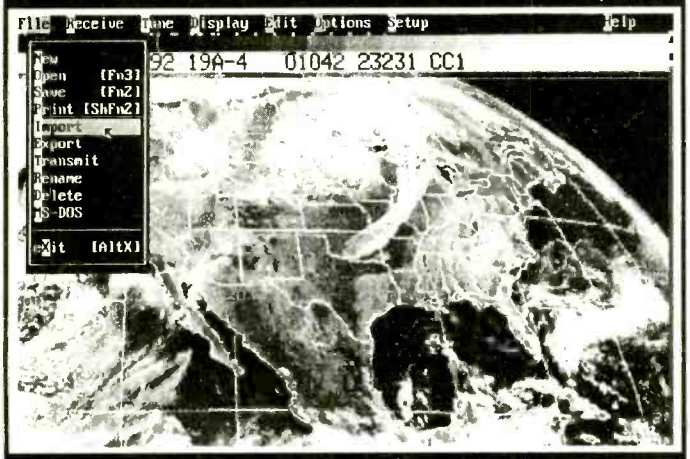

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- Worldwide Frequency Listing
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0000 UTC SHORTWAVE GUIDE 8:00 PM EDT 5:00 PM PDT

FREQUENCIES

0000-0030	Australia, Radio	9610as	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			
0000-0100	Bulgaria, Radio	7205na	9700na		
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100 vl	Canada, CBC N Quebec Svc	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	Canada, RCI Montreal	5960na	9755na	11920na	
0000-0100	China, China Radio Intl	9710na	11575af	11715na	
0000-0100	Costa Rica, AWR Alajuela	5030ca	7325am	9725am	
0000-0030	Czech Rep, Radio Prague	5930na	7345na		
0000-0030	Egypt, Radio Cairo	9900na			
0000-0100	Ghana, Ghana Broadc Corp	3366do	4915do		
0000-0030 vl	Guatemala, AWR	5980ca			
0000-0045	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
0000-0015 f/vl	Italy, IRRS Milan	7125va			
0000-0100	Lebanon, Wings of Hope	6280me	9960me		
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM/Kota Kinab	5980do			
0000-0100	Malaysia, RTM/Kuching	7160do			
0000-0030	Netherlands, Radio	6020na	6165na		
0000-0100 mtwhfa	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0100 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
0000-0100 vl	Papua New Guinea, NBC	4890do	9675do		
0000-0100	Philippines, FEBC/R Intl	15450as			
0000-0100	Russia, Voice of	7125af	9750na	11750na	17570as
0000-0100	Spain, R Exterior Espana	9540na			
0000-0030	Thailand, Radio	9655as	9680af		
0000-0100	Ukraine, R Ukraine Intl	4820na	5940na	6055na	7240na
		7405na	9620eu	9810na	11870na
0000-0100	United Kingdom,BBC London	5965as	5970sa	5975na	6175na
		7325na	9590na	9760as	9915sa
		11750na	11955as		
0000-0015	United Kingdom,BBC London	6195as	7110as	7180as	9580as
		11945as			
0000-0100	USA, KAIJ Dallas TX	13740am	13815am		
0000-0100	USA, KTBN Salt Lk City UT	7510am			
0000-0100	USA, KVOH Los Angeles CA	9785am			
0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	USA, Monitor Radio Intl	7535na	9430ca		
0000-0100	USA, VOA Washington DC	5995am	6130am	7215as	7405am
		9455am	9770as	9775am	9890as
		11580am	11695am	11760as	13740am
		15120am	15185au	15205am	15290as
		17735as	17820as		
0000-0100	USA, WEWN Birmingham AL	5825eu	7425na	9410eu	
0000-0100	USA, WHRI Noblesville IN	7315am	9495am		
0000-0100	USA, WINB Red Lion PA	11950na			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100 vl	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WVHA Green Bush ME	7465eu			
0000-0100	USA, WWCR Nashville TN	5065am	7435am	13845am	
0000-0044	USA, WYFR Okeechobee FL	6085na			
0000-0030 mtwhfa	Yugoslavia, Radio	6195na	7115na		
0015-0030 sm	USA, VOA Washington DC	11835am	15155am		
0030-0100	Australia, Radio	13605as	13745as	13755as	15365pa
		15415as	17795pa	17860pa	
0030-0100	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0030-0100	Iran, VOIRI Tehran	7100na	9022na	9670na	
0030-0100	Netherlands, Radio	5905as	6020na	6165na	7305as
		9840na	11655na		
0030-0100	Russia, Voice of	7105na	7165na	13640as	
0030-0100	Sri Lanka, SLBC Colombo	15425as			
0030-0100	Sweden, Radio	6065sa	6200sa		
0030-0100	Thailand, Radio	9655as	11845af	11905as	
0045-0100 irreg	Belarus, Radio Minsk	7150eu	13650eu	17655eu	
0045-0100	USA, WYFR Okeechobee FL	6065na			
0050-0100	Italy, RAI Rome	9645na	11800na		

SELECTED PROGRAMS

Sundays

0010 Radio Australia: Charting Australia. A program intended to strengthen Australia's links with the Indian subcontinent.
0025 Radio Netherlands (na): EuroPress Review. Five-minutes of EuroPress news.
0030 Radio Australia: Correspondents' Report. A round-up of global stories with Hamish Robertson.
0038 Radio Netherlands (na): Newsline. Correspondent reports, interviews, and commentaries on current events.
0038 Radio Netherlands: Newsline. Correspondent reports, interviews, and commentaries on current events.
0052 Radio Netherlands: Sounds Interesting. Listener feedback and the signts and sounds of Holland.
0053 Radio Netherlands (na): Sounds Interesting. Listener feedback and the signts and sounds of Holland.

Mondays

0011 Radio Australia: Network Asia. See S 2320.
0025 Radio Netherlands (na): Music Break. Five-minutes of music at the end of an hour's program.
0036 Radio Netherlands (na): Happy Station. Jonathan Groubert hosts this 65 year old program of family entertainment.
0036 Radio Netherlands: Happy Station. See S 0137.

Tuesdays

0011 Radio Australia: Network Asia. See S 2320.
0025 Radio Netherlands (na): Press Review. Summary of items in the Dutch media.
0038 Radio Netherlands (na): Newsline. See S 0038.
0038 Radio Netherlands: Newsline. See S 0038.
0052 Radio Netherlands: Research File. See M 1152.
0053 Radio Netherlands (na): Research File. A program of science and technology.

Wednesdays

0011 Radio Australia: Network Asia. See S 2320.
0025 Radio Netherlands (na): Press Review. See T 0025.
0038 Radio Netherlands (na): Newsline. See S 0038.
0038 Radio Netherlands: Newsline. See S 0038.
0052 Radio Netherlands: Mirror Images. See T 1152.
0053 Radio Netherlands (na): Mirror Images. Weekly magazine of music, the arts, culture, and European festivals.

Thursdays

0011 Radio Australia: Network Asia. See S 2320.
0025 Radio Netherlands (na): Press Review. See T 0025.
0038 Radio Netherlands (na): Newsline. See S 0038.
0038 Radio Netherlands: Newsline. See S 0038.
0053 Radio Netherlands (na): Documentary. An in-depth treatment of one subject or a short series.
0054 Radio Netherlands: Documentary. See W 1154.

Fridays

0011 Radio Australia: Network Asia. See S 2320.
0025 Radio Netherlands (na): Press Review. See T 0025.
0038 Radio Netherlands (na): Newsline. See S 0038.
0038 Radio Netherlands: Newsline. See S 0038.
0053 Radio Netherlands (na): Media Network. Jonathan Marks surveys communications and media developments. Top-rated.
0053 Radio Netherlands: Media Network. See H 0152.

Saturdays

0010 Radio Australia: Feedback. See S 0410.
0025 Radio Netherlands (na): Press Review. See T 0025.
0030 Radio Australia: Indian Pacific. Peter Mares with news and analysis from across the Pacific and Asia.
0038 Radio Netherlands (na): Newsline. See S 0038.
0038 Radio Netherlands: Newsline. See S 0038.
0052 Radio Netherlands (na): Variable Feature Series. See T 2354.
0052 Radio Netherlands: Variable Feature Series. See T 0153.

HAUSER'S HIGHLIGHTS

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From April 1, **BBC** regionalizes its World Service, hoping to improve timing convenience. Among the major changes for North America:

Newshour	Only 2 daily at 1300 and new 1900 (so no conflict w/NPR *ATC*)
World Today	Weekdays 2115, 0330
Dateline East Asia	Strangely, to us Sunday-Friday 2330-2355
Newsdesk	Half-hour daily 1000, 1100, 1800, 2200, 0000, 0100, 0400
News Programme	Half-hour daily 0200, 0500
Play of the Week	Only one airing at new time—Sat 2230-2330 (sometimes to 2400)
Letter from America	Sat 1045, 2145, Sun 0030
Outlook	Weekdays 1405, 2005, 2305
Waveguide	Fri 1235, Mon 0845

This info was planned for satellite feed to Canada and may not exactly match SW relays (Jerry Timmins, BBC, via CKUT via Westenhaver)

FREQUENCIES

0100-0200	Australia, AF Radio	13525as			
0100-0200	Australia, Radio	9580pa	9610as	9660pa	11715as
		11855as	13605as	13755as	15240pa
		15365pa	15415as	15510as	17715as
		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 Svc	9625do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0130	Costa Rica, AWR Alajuela	5030ca	6150sa	7325am	9725am
0100-0200	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0100-0200	Cuba, Radio Havana Cuba	6000na	9830na		
0100-0130	Czech Rep, Radio Prague	7345na			
0100-0200	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9650na
		9670na	9700na		
0100-0200 m	Guatemala, Radio Cultural	3300do			
0100-0130	Hungary, Radio Budapest	6025na	9835na	11910na	
0100-0130	Iran, VOIRI Tehran	7100na	9022na	9670na	
0100-0110	Italy, RAI Rome	9645na	11800na		
0100-0200	Japan, NHK/Radio	9565na	11840as	11860as	11910as
		15195as	17810as	17845as	
0100-0200 smtwh	Malaysia, Radio	7295do			
0100-0130	Moldova, R Moldova Intl	7190na			
0100-0200	Netherlands, Radio	5905as	7305as		
0100-0125	Netherlands, Radio	6020na	6165na	9840na	11655na
0100-0200 mtwhfa	New Zealand, R NZ Intl	15115pa			
0100-0130 m	Norway, Radio Norway Intl	5905na	5910na	7450na	
0100-0200 vl	Papua New Guinea, NBC	4890do	9675do		
0100-0130	Philippines, FEBC/R Intl	15450as			
0100-0200	Russia, Voice of	7105na	7125na	9920me	13640as
		17665as	17890as		
0100-0200 vl	Slovakia, AWR	7270as			
0100-0130	Slovakia, R Slovakia Intl	5930na	9440na		
0100-0200	South Korea, R Korea Intl	6575na	7550eu	15575na	
0100-0200	Spain, R Exterior Espana	9540na			
0100-0200	Sri Lanka, SLBC Colombo	15425as			
0100-0130	Switzerland, Swiss R Intl	5885na	6135na	9885na	9905na
0100-0200	United Kingdom,BBC London	5965as	5970sa	5975na	6175na
		7325na	9590na	9760as	9915sa
		11750na	11955as	15360as	17790as
0100-0200	USA, KAIJ Dallas TX	5810am	13740am		
0100-0200	USA, KTBN Salt Lk City UT	7510am			
0100-0200	USA, KVOH Los Angeles CA	9785am			
0100-0200	USA, KWHR Naalehu HI	17510as			
0100-0200	USA, Monitor Radio Intl	7535na	9430na		
0100-0200	USA, VOA Washington DC	5995am	6130am	7405am	9455am
		9775am	11580am	13740am	15120am
		15205am	15340as	17740as	
0100-0200	USA, WEWN Birmingham AL	5825eu	7425na	9410eu	
0100-0200	USA, WHRI Noblesville IN	7315am			
0100-0200	USA, WINB Red Lion PA	11950na			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0130 twhfa	USA, WRMI/R Miami Intl	9955am			
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	USA, WVHA Green Bush ME	7465eu			
0100-0200	USA, WWCR Nashville TN	5065am	5935am	7435am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na		
0100-0130	Yugoslavia, Radio	6195eu			
0130-0145	Albania, R Tirana Intl	9580na	11840na		
0130-0200	Austria, R Austria Intl	9655na	9870sa	13730sa	
0130-0150	Greece, Voice of	6260na	7448na	9935na	
0130-0200	Netherlands, Radio	9860as	11655as		
0130-0200 twhf	Portugal, Radio	9570na	9705na		
0130-0200	Sweden, Radio	9895au	11695as		
0140-0200	Vatican State, Vatican R	5980as	7335as		

SELECTED PROGRAMS

Sundays

0106 Radio Budapest Int'l: Bookshelf. Readings of "The trials of Mr. X" by Tibor Dery.
0108 Deutsche Welle: Inside Europe. A radio magazine offering a European perspective on events of the week.
0110 Radio Australia: Book Reading. Serialized readings of the best Australian novels.
0125 Radio Netherlands: Program Info. Summary of upcoming program schedules.
0130 Radio Australia: The Europeans. Maria Zijlstra presents reports and features on aspects of European politics, culture and society.
0137 Deutsche Welle: Religion and Society. News and developments concerning the world's major religions.
0137 Radio Netherlands: Happy Station. Jonathan Groubert hosts this 65 year old program of family entertainment.

Mondays

0107 Radio Budapest Int'l: Newsroom Magazine.
0108 Deutsche Welle: Mailbag. Listener mail from the Americas is answered.
0110 Radio Australia: Sports Headlines. A one-minute sports update.
0118 Deutsche Welle: Living in Germany. A weekly look at the social and political issues in the 1990s.
0118 Radio Australia: Sports Summary. A two-minute wrap-up of Australian sport.
0120 Radio Australia: Network Asia. See S 2320.
0125 Radio Budapest Int'l: DX News.
0125 Radio Netherlands: Music Break. See S 0225.
0133 Deutsche Welle: German by Radio. See S 1134.
0136 Radio Netherlands: They're Playing My Song. See S 0235.
0137 Radio Budapest Int'l: Newsroom Magazine.
0154 Radio Netherlands: EuroQuest. See S 0253.

Tuesdays

0107 Radio Budapest Int'l: Newsroom Magazine.
0109 Deutsche Welle: European Journal. See M 0224.
0110 Radio Australia: Sports Headlines. See M 0110.
0118 Radio Australia: Sports Summary. See M 0118.
0120 Radio Australia: Network Asia. See S 2320.
0125 Radio Budapest Int'l: DX Tips.
0125 Radio Netherlands: Program Info. See S 0125.
0132 Deutsche Welle: German Tribune. News and views from the Federal Republic.
0138 Radio Netherlands: Newsline. See S 0038.
0153 Radio Netherlands: Variable Feature Series. A series of programs featuring a variety of subjects ranging from music to cinema to UFOs.

Wednesdays

0107 Radio Budapest Int'l: Focus on Business.
0109 Deutsche Welle: European Journal. See M 0224.
0110 Radio Australia: Sports Headlines. See M 0110.
0117 Radio Budapest Int'l: Listener Participation. Subjects are Report (5th), Gatepost (12th), Report (19th), and Gatepost (26th).
0118 Radio Australia: Sports Summary. See M 0118.
0120 Radio Australia: Network Asia. See S 2320.
0125 Radio Budapest Int'l: DX World.
0125 Radio Netherlands: Program Info. See S 0125.
0133 Deutsche Welle: Backdrop. A program of culture and the arts in Germany.
0138 Radio Netherlands: Newsline. See S 0038.
0153 Radio Netherlands: Sounds Interesting. See S 0052.

Thursdays

0107 Radio Budapest Int'l: Newsroom Magazine.
0109 Deutsche Welle: European Journal. See M 0224.
0110 Radio Australia: Sports Headlines. See M 0110.
0118 Radio Australia: Sports Summary. See M 0118.
0120 Radio Australia: Network Asia. See S 2320.
0120 Radio Budapest Int'l: Musica Hungarica.
0125 Radio Netherlands: Program Info. See S 0125.
0133 Deutsche Welle: German Tribune. See T 0132.
0138 Radio Netherlands: Newsline. See S 0038.
0152 Radio Netherlands: Media Network. Jonathan Marks surveys communications and media developments. Top-rated.

Fridays

0107 Radio Budapest Int'l: Newsroom Magazine.
0109 Deutsche Welle: European Journal. See M 0224.
0110 Radio Australia: Sports Headlines. See M 0110.
0118 Radio Australia: Sports Summary. See M 0118.
0120 Radio Australia: Network Asia. See S 2320.
0125 Radio Netherlands: Program Info. See S 0125.
0133 Deutsche Welle: Come to Germany. Focus on a seasonal event, festival, or attraction.
0138 Radio Netherlands: Newsline. See S 0038.
0152 Radio Netherlands: Research File. See M 1152.

Saturdays

0106 Radio Budapest Int'l: The Weeklies.
0108 Deutsche Welle: European Journal. See M 0224.
0110 Radio Australia: Oz Sounds. See S 1310.
0120 Radio Budapest Int'l: Musical Collectors.
0125 Radio Netherlands: EuroPress Review. Five-minutes of EuroPress news.
0130 Radio Australia: The Australian Scene. A state by state look at life in Australia presented by Denis Gibbons.
0131 Deutsche Welle: Through German Eyes. See S 1518.
0138 Radio Netherlands: Newsline. See S 0038.
0154 Radio Netherlands: Documentary. See W 1154.

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

FREQUENCIES

0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, AF Radio	13525as			
0200-0300	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415as	15510as	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 Svc	9625do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6120na	9535am	9755na	11725na
		11845na	13720na		
0200-0300	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0200-0300	Cuba, Radio Havana Cuba	6000na	9830na		
0200-0300	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	6035as	6130as	7255as	7265as
		7285as	9515as	9615as	9690as
0200-0300	Kenya, Kenya Broadc Corp	4885do	4935do		
0200-0300 smtwh	Malaysia, Radio	7295do			
0200-0230	Myanmar, Radio	5990do			
0200-0230	Netherlands, Radio	5905as	7305as	9860as	11655as
0200-0300 mtwhfa	New Zealand, R NZ Intl	15115pa			
0200-0300 vl	Papua New Guinea, NBC	4890do	9675do		
0200-0300	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0200-0300	Russia, Voice of	5940na	7105na	7205eu	7225na
		7270na	9825na	12050na	13640as
		15425na	15455na	17665as	
0200-0300 vl	Slovakia, AWR	7270as			
0200-0230	Sri Lanka, SLBC Colombo	15425as			
0200-0300	Taiwan, VD Free China	5950na	7130as	9680na	11740ca
		11825as	15345as		
0200-0300	United Kingdom,BBC London	5965as	5970sa	5975na	6135af
		6175na	7235me	7325na	9590na
		9760as	9915sa	11955as	15360as
		17790as			
0200-0300	USA, KAIJ Dallas TX	5810am	13740am		
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0300	USA, KVDH Los Angeles CA	9785am			
0200-0300	USA, KWHR Naalehu HI	17510as			
0200-0300	USA, Monitor Radio Intl	5850na	9430na		
0200-0300	USA, VOA Washington DC	6130sa	7115as	7205as	7215as
		9455sa	9740as	11705as	15250as
		15370as	17740as	21550as	
0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am
		13740am	15120am	15205am	
0200-0300	USA, WEWN Birmingham AL	7425na	9465me		
0200-0300	USA, WHRI Noblesville IN	5745am			
0200-0300	USA, WINB Red Lion PA	11950na			
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300	USA, WVHA Green Bush ME	7465am			
0200-0300	USA, WWCR Nashville TN	5065am	5935am	7435am	
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0230-0300	Albania, R Tirana Intl	9580na	11840na		
0230-0300	Hungary, Radio Budapest	5965na	9835na	11910na	
0230-0300	Netherlands, Radio	9860as	11655as		
0230-0245	Pakistan, Radio	7290as	15190as	17705as	17725as
		21730as			
0230-0300	Russia, Voice of	5905na	9850as		
0230-0300	Sweden, Radio	6200na	7120na		
0250-0300	Vatican State, Vatican R	6095na	7305na		

SELECTED PROGRAMS

Sundays

0208 Deutsche Welle: Commentary. Guest commentary about a current event.
0210 Radio Australia: Charting Australia. See S 0010.
0212 Deutsche Welle: Sports Report. The latest news from the world of sports.
0216 Deutsche Welle: Mailbag Asia. Listener mail from Asia is answered.
0225 Radio Netherlands: Music Break. Five-minutes of music at the end of an hour's program.
0230 Radio Australia: Correspondents' Report. See S 0030.
0235 Radio Netherlands: They're Playing My Song. Reminiscencing about songs which had meaning to RN's producers.
0236 Radio Budapest Int'l: Matrix. Arts, Media and Music.
0253 Radio Netherlands: EuroQuest. An audio magazine with correspondents from European locations.

Mondays

0208 Deutsche Welle: Asia-Pacific Report. Correspondent reports, interviews and background news from the Asia-Pacific region.
0210 Radio Australia: Sports Headlines. See M 0110.
0211 Radio Australia: Network Asia. See S 2320.
0224 Deutsche Welle: European Journal. A review of major events in Europe and Germany through interviews, analyses and background reports.
0225 Radio Netherlands: Music Break. See S 0225.
0236 Radio Netherlands: Happy Station. See S 0137.
0237 Radio Budapest Int'l: Newsroom Magazine.
0250 Radio Budapest Int'l: Society and the Child. The rights of the child (3rd), legal protection (10th), foster parents or homes (17th), and adoption (24th) are explored.

Tuesdays

0208 Deutsche Welle: Asia-Pacific Report. See M 0208.
0210 Radio Australia: Sports Headlines. See M 0110.
0210 Voice of America (am): Spotlight on Business and Finance. NEW! See M 1110.
0211 Radio Australia: Network Asia. See S 2320.
0224 Deutsche Welle: European Journal. See M 0224.
0225 Radio Netherlands: Music Break. See S 0225.
0237 Radio Budapest Int'l: Newsroom Magazine.
0238 Radio Netherlands: Newsline. See S 0038.
0250 Radio Budapest Int'l: Confrontations. Church and transplants (4th), cost of opportunity (11th), hoaxers and sharks (18th), and ethnic tensions (25th) are in the crossfire.
0252 Radio Netherlands: Research File. See M 1152.

Wednesdays

0208 Deutsche Welle: Asia-Pacific Report. See M 0208.
0210 Radio Australia: Sports Headlines. See M 0110.
0210 Voice of America (am): Inside USA. NEW! See T 1110.
0211 Radio Australia: Network Asia. See S 2320.
0224 Deutsche Welle: European Journal. See M 0224.
0225 Radio Netherlands: Music Break. See S 0225.
0238 Radio Netherlands: Newsline. See S 0038.
0247 Radio Budapest Int'l: Profiles. Focus on the state secretary (5th), the mayor (12th), an opera singer (19th), and a translator (26th).
0253 Radio Netherlands: Mirror Images. See T 1152.

Thursdays

0208 Deutsche Welle: Asia-Pacific Report. See M 0208.
0210 Radio Australia: Sports Headlines. See M 0110.
0210 Voice of America (am): International Focus. NEW! See W 1110.
0211 Radio Australia: Network Asia. See S 2320.
0224 Deutsche Welle: European Journal. See M 0224.
0225 Radio Netherlands: Music Break. See S 0225.
0238 Radio Netherlands: Newsline. See S 0038.
0254 Radio Netherlands: Documentary. See W 1154.

Fridays

0208 Deutsche Welle: Asia-Pacific Report. See M 0208.
0210 Radio Australia: Sports Headlines. See M 0110.
0210 Voice of America (am): Reporter's Notebook. NEW! See H 1110.
0211 Radio Australia: Network Asia. See S 2320.
0224 Deutsche Welle: European Journal. See M 0224.
0225 Radio Netherlands: Music Break. See S 0225.
0238 Radio Netherlands: Newsline. See S 0038.
0252 Radio Netherlands: Media Network. See H 0152.
0255 Radio Budapest Int'l: DX Catches.

Saturdays

0208 Deutsche Welle: Commentary. See S 0208.
0210 Radio Australia: Feedback. See S 0410.
0210 Voice of America (am): Perspectives. NEW! See F 1110.
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 0332.
0225 Radio Netherlands: Music Break. See S 0225.
0230 Radio Australia: Indian Pacific. See A 0030.
0236 Radio Budapest Int'l: Profiles. See W 0247.
0237 Deutsche Welle: The Jazz Corner. A musical change-of-pace from the world of jazz.
0238 Radio Netherlands: Newsline. See S 0038.
0247 Radio Budapest Int'l: Listener Participation. Subjects are Report (8th), Gatepost (15th), Report (22nd), and Gatepost (29th).
0252 Radio Netherlands: Bats, Balls & Baselines. Sports results, news, issues, features, personality profiles, and investigations.
0255 Radio Budapest Int'l: DX Quiz.

FREQUENCIES

0300-0400	Australia, Radio	9580pa	9660pa	13605pa	15240pa
		15365pa	15415as	15510as	17795pa
		17860pa			
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	Botswana, Radio	4830af	7255af		
0300-0400 vl	Canada, CBC N Quebec Svc	9625do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160co			
0300-0400 sm	Canada, RCI Montreal	6000ca	6120ca	9535ca	9725ca
		9755ca	11725ca	11845ca	
0300-0400	China, China Radio Intl	9690na	9710na	11715na	
0300-0400	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0400	Cuba, Radio Havana Cuba	6000na	9820na		
0300-0330	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0300-0330	Egypt, Radio Cairo	9475na			
0300-0350	Germany, Deutsche Welle	6045na	6085na	6120na	9535na
		9650na			
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Japan, NHK/Radio	5960na	9565na	11885na	11895na
		11920na	15210as	15230na	17810as
		17845as			
0300-0400	Kenya, Kenya Broadc Corp	4885do	4935do		
0300-0400 s	Lebanon, Wings of Hope	9960me			
0300-0400 smtwh	Malaysia, Radio	7295do			
0300-0330 tw	Mongolia, R Ulan Bator	7290na	12015na		
0300-0325	Netherlands, Radio	9860as	11655as		
0300-0400 mtwhfa	New Zealand, R NZ Intl	15115pa			
0300-0400 vl	Papua New Guinea, NBC	4890do	9675do		
0300-0400	Russia, Voice of	5905na	5940na	6035eu	7105na
		7180na	7225na	7270na	9825na
		15425na			
0300-0400	S Africa, Channel Africa	5955af	9585af		
0300-0400 vl	Slovakia, AWR	6050af	7270as		
0300-0400	Taiwan, VO Free China	5950na	7130as	9680na	11745as
		11825as	15345as		
0300-0400	Thailand, Radio	11890na			
0300-0400	Turkey, Voice of	9445na			
0300-0400	Ukraine, R Ukraine Intl	4820na	6055na	7180na	7405na
		9620na	9685na	9810na	11870na
0300-0330	United Kingdom,BBC London	5970sa	6135af	7235me	7325na
		9760as	9915sa	15360as	15380as
0300-0400	United Kingdom,BBC London	3255af	5975na	6005af	6175na
		6190af	9410me	9600af	11760as
		15310as			
0300-0400	USA, KAIJ Dallas TX	5810am	9815am		
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785am			
0300-0400	USA, KWHR Naalehu HI	17510as			
0300-0400	USA, Monitor Radio Intl	5850na	9455af		
0300-0400	USA, VOA Washington DC	6035af	7105af	7280af	7340af
		7405af	9575af	9885af	
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	5745am	9495am		
0300-0400	USA, WINB Red Lion PA	11950eu			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA	7355am			
0300-0400	USA, WVHA Green Bush ME	7465am			
0300-0400	USA, WWCR Nashville TN	5065am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0315	Vatican State, Vatican R	6095na	7305na		
0300-0400	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
0315-0330 sh	Greece, Voice of	6260na	7448na	9935na	
0320-0350	Vatican State, Vatican R	5865af	7360af	9725af	
0330-0400	Austria, R Austria Intl	9870sa	13790sa		
0330-0400	Czech Rep, Radio Prague	5930as	7345af	9440me	
0330-0400 fas	Mongolia, R Ulan Bator	7290na	12000na		
0330-0400	Netherlands, Radio	6015na	6165na		
0330-0400	Swaziland, Trans World R	9500af			
0330-0400	Sweden, Radio	6200na	7120na		
0330-0400	Tanzania, Radio	5050af			
0330-0400	UAE, Radio Dubai	11945na	13675na		
0330-0400	United Kingdom,BBC London	9610af	11730af	15280as	15575af
		17790as			
0340-0350	Greece, Voice of	6260na	7448na	9935na	
0345-0400	Tajikistan, Radio	7245as			

SELECTED PROGRAMS

Sundays

0308 Deutsche Welle: Inside Europe. See S 0108.
0309 Channel Africa: Gospel Music. Authentic regional music on a Sunday morning in Africa.
0310 Radio Australia: Book Reading. See S 0110.
0330 Radio Australia: At Your Request. Dick Paterson plays favorite music.
0331 Channel Africa: Religions of the World. An examination of religious beliefs throughout Africa and beyond.
0337 Deutsche Welle: Religion and Society. See S 0137.
0337 Radio Netherlands (na): Newsline. See S 0038.
0339 Channel Africa: Choral Music. Church music for a Sunday morning.
0352 Radio Netherlands (na): Sounds Interesting. See S 0053.

Mondays

0308 Deutsche Welle: Mailbag. See M 0108.
0310 Radio Australia: Sports Bulletin. See S 1120.
0318 Deutsche Welle: Living in Germany. See M 0118.
0320 Radio Australia: Network Asia. See S 2320.
0333 Deutsche Welle: German by Radio. See S 1134.
0336 Radio Netherlands (na): Happy Station. See M 0036.

Tuesdays

0308 Channel Africa: Dateline Africa. See M 0508.
0309 Deutsche Welle: European Journal. See M 0224.
0310 Radio Australia: Sports Bulletin. See S 1120.
0320 Radio Australia: Network Asia. See S 2320.
0332 Deutsche Welle: Economic Notebook. The economic scene in Germany and around the world.
0338 Radio Netherlands (na): Newsline. See S 0038.
0352 Radio Netherlands (na): Research File. See T 0053.

Wednesdays

0308 Channel Africa: Dateline Africa. See M 0508.
0309 Deutsche Welle: European Journal. See M 0224.
0310 Radio Australia: Sports Bulletin. See S 1120.
0320 Radio Australia: Network Asia. See S 2320.
0333 Deutsche Welle: Insight. See T 1533.
0338 Radio Netherlands (na): Newsline. See S 0038.
0353 Radio Netherlands (na): Mirror Images. See W 0053.

Thursdays

0308 Channel Africa: Dateline Africa. See M 0508.
0309 Deutsche Welle: European Journal. See M 0224.
0310 Radio Australia: Sports Bulletin. See S 1120.
0320 Radio Australia: Network Asia. See S 2320.
0333 Deutsche Welle: German by Radio. See S 1134.
0338 Radio Netherlands (na): Newsline. See S 0038.
0354 Radio Netherlands (na): Documentary. See H 0053.

Fridays

0308 Channel Africa: Dateline Africa. See M 0508.
0309 Deutsche Welle: European Journal. See M 0224.
0310 Radio Australia: Sports Bulletin. See S 1120.
0320 Radio Australia: Network Asia. See S 2320.
0332 Deutsche Welle: Headcrash (2)(3). News about computers for MS-DOS, Apple, and Amiga techies.
0332 Deutsche Welle: Science and Technology (1)(4)(5). See M 1634.
0338 Radio Netherlands (na): Newsline. See S 0038.
0352 Radio Netherlands (na): Media Network. See F 0053.

Saturdays

0308 Channel Africa: Africa and All That Jazz. News from the jazz music scene and selections of jazz recordings.
0308 Deutsche Welle: European Journal. See M 0224.
0310 Radio Australia: Soundabout. Kim Taylor and friends bring top new releases, a weekly chart countdownm, and rock news from around the world.
0331 Deutsche Welle: Through German Eyes. See S 1518.
0333 Channel Africa: Historical Almanac. See S 0407.
0338 Radio Netherlands (na): Newsline. See S 0038.
0340 Channel Africa: Channel Africa Sports. See M 1627.
0352 Radio Netherlands (na): Variable Feature Series. See T 2354.

THANK YOU ...

ADDITIONAL CONTRIBUTORS TO THIS MONTH'S SHORTWAVE GUIDE:

John Babbis, Silver Spring, MD; Gerald R. Brookman, Kenai, AK; Bob Fraser, Cohasset, MA; Kevin Hecht, Devon, PA; Ken Loh, Portland, OR; Al Wires, East Point, GA; NASWA Journal; DX Ontario; BBCMS; BBC Worldwide; 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	17750as	17795pa
		17860pa			
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			
0400-0500	Bulgaria, Radio	7335na	9700na		
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	6150me	9505me	9670me	
0400-0500	China, China Radio Intl	9730na			
0400-0500	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0400-0500	Cuba, Radio Havana Cuba	6000na	6180na	9830na	
0400-0430	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0400-0450	Germany, Deutsche Welle	6015af	6065af	7160af	7225af
		7265as	9565af	9765af	
0400-0500 twtfa	Guatemala, Radio Cultural	3300do			
0400-0500	Kenya, Kenya Broadc Corp	4885do	4935do		
0400-0500 s	Lebanon, Wings of Hope	9960me			
0400-0500 smtwh	Malaysia, Radio	7295do			
0400-0425	Netherlands, Radio	6015na	6165na		
0400-0458 mtwhfa	New Zealand, R NZ Intl	15115pa			
0400-0500 vl	Papua New Guinea, NBC	4890do	9675do		
0400-0430	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0400-0500	Russia, Voice of	5905eu	5940na	6035eu	7105na
		7180na	7270na	7300na	9705na
		9825na	15295na		
0400-0500	S Africa, Channel Africa	5955af	9585af		
0400-0500 vl	Slovakia, AWR	6050as	9465af		
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0500	Swaziland, Swazi Radio	6155af			
0400-0430	Switzerland, Swiss R Intl	6135na	9885na	9905na	
0400-0430	Tanzania, Radio	5050af			
0400-0415	Uganda, Radio	4976do	5026do		
0400-0500	United Kingdom,BBC London	3255af	5975na	6005af	6190af
		9410me	9585eu	9600af	11730af
		11760as	12095af	15280as	15310as
		15575me	17790as		
0400-0415	United Kingdom,BBC London	9610af			
0400-0430	United Kingdom,BBC London	6175na			
0400-0500	USA, KAIJ Dallas TX	5810am	9815am		
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9785na			
0400-0500	USA, KWHR Naalehu HI	9930as			
0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	USA, VOA Washington DC	5995eu	6040eu	6140af	6873af
		7170me	7280af	7340af	7405ca
		9575af	9885af		
0400-0500	USA, WEWN Birmingham AL	7425na			
0400-0500	USA, WHRI Noblesville IN	5745am	9495am		
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, WVHA Green Bush ME	7465eu			
0400-0500	USA, WWCR Nashville TN	5065am	5935am	7435am	
0400-0445	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0459	USA, WYFR Okeechobee FL	9770eu			
0400-0500	Vietnam, Voice of	5940na			
0400-0500	Zimbabwe, ZBC/Radio 3	3306do	3396do		
0415-0440	Italy, RAI Rome	5990me	7275eu		
0425-0500	Nigeria, FRCN/Radio	3326do	4990do		
0430-0500	Australia, AF Radio	13525as			
0430-0500	Ecuador, HCJB Quito	12005am			
0430-0500	Russia, Voice of	4975as	6000as	9785eu	9865eu
		11765as	15360as	17620as	17675as
0430-0500	Swaziland, Trans World R	3200af	5055af	7150af	
0430-0500	Switzerland, Swiss R Intl	9905na			
0430-0500	USA, VOA Washington DC	6035af	7280af	7340af	9575af
0455-0500	Nigeria, FRCN/Voice of	7255af			
0459-0500	New Zealand, R NZ Intl	11900pa			

SELECTED PROGRAMS

Sundays

0407 Channel Africa: Historical Almanac. What happened on this date in the past.
0408 Deutsche Welle: Commentary. See S 0208.
0410 Channel Africa: Popular Music. Selections of recordings of contemporary African music.
0410 Radio Australia: Feedback. Dennis Gibbons answers letters and discusses new programs, reception problems, and questions about Australia.
0412 Deutsche Welle: Sports Report. See S 0212.
0415 Channel Africa: Educational Rendezvous. Focus on public health problems and other issues.
0416 Deutsche Welle: International Talking Point. Journalists discuss major trends and events.
0425 Channel Africa: Popular Music. See S 0410.
0430 Radio Australia: Correspondents' Report. See S 0030.
0431 Channel Africa: Clinic of the Air. An examination of health problems and medicine.
0436 Deutsche Welle: People and Places. Interviews, stories and music for Africa listeners.

Mondays

0408 Deutsche Welle: European Journal. See M 0224.
0410 Radio Australia: Sports Headlines. See M 0110.
0411 Radio Australia: Pacific Beat. A magazine which provides a focus on the people and issues of the region.
0412 Channel Africa: Clinic of the Air. See S 0431.
0430 Radio Australia: International Report. Overseas and local correspondents analyze regional and global issues and events.
0432 Deutsche Welle: Africa Highlight. A weekly feature on an important topic concerning Africa.

Tuesdays

0408 Channel Africa: Historical Almanac. See S 0407.
0408 Deutsche Welle: Africa Report. Reports and background to the news from Africa by Deutsche Welle correspondents.
0410 Radio Australia: Sports Headlines. See M 0110.
0411 Radio Australia: Pacific Beat. See M 0411.
0418 Channel Africa: Did You Know?. Interesting questions and their factual answers.
0423 Channel Africa: English for Africa. Instructions in English grammar and language usage.
0424 Deutsche Welle: European Journal. See M 0224.
0430 Radio Australia: International Report. See M 0430.
0435 Channel Africa: Off the Press. Selections of the latest popular music releases.

Wednesdays

0408 Deutsche Welle: Africa Report. See T 0408.
0410 Radio Australia: Sports Headlines. See M 0110.
0411 Radio Australia: Pacific Beat. See M 0411.
0424 Deutsche Welle: European Journal. See M 0224.
0430 Radio Australia: International Report. See M 0430.
0444 Channel Africa: Historical Almanac. See S 0407.

Thursdays

0407 Channel Africa: Historical Almanac. See S 0407.
0408 Deutsche Welle: Africa Report. See T 0408.
0410 Radio Australia: Sports Headlines. See M 0110.
0411 Channel Africa: Our Wild Heritage. Conservation and Wildlife in Southern Africa.
0411 Radio Australia: Pacific Beat. See M 0411.
0424 Deutsche Welle: European Journal. See M 0224.
0430 Radio Australia: International Report. See M 0430.
0437 Channel Africa: Artist of the Week. Featuring the music of a particular recording artist.

Fridays

0408 Deutsche Welle: Africa Report. See T 0408.
0409 Channel Africa: Dateline Africa. See M 0508.
0410 Radio Australia: Sports Headlines. See M 0110.
0411 Radio Australia: Pacific Beat. See M 0411.
0413 Channel Africa: Historical Almanac. See S 0407.
0424 Deutsche Welle: European Journal. See M 0224.
0430 Radio Australia: International Report. See M 0430.

Saturdays

0408 Channel Africa: First Light Africa. An early morning radio magazine of features and music.
0408 Deutsche Welle: Commentary. See S 0208.
0410 Radio Australia: Book Reading. See S 0110.
0412 Deutsche Welle: Africa This Week. A weekly review of trends and events on the African continent.
0422 Channel Africa: Focus on Africa. Current events on the continent.
0430 Radio Australia: Indian Pacific. See A 0030.
0431 Channel Africa: The Hit Parade. The top ten recordings of the week.
0432 Deutsche Welle: Man and Environment. See T 1634.

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	**$34.95**
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	**$99.95**

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	**$27.95**
CSCA Matching case set	**$14.95**
FR-1 FM receiver kit	**$24.95**
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	**$28.95**
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

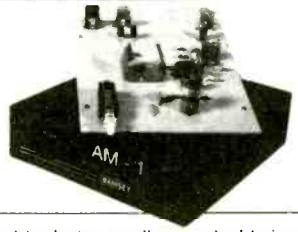
The Interceptor will lock on instantly to the nearest transmitter and allow you to listen with perfect audio quality. Since the Interceptor does not have to search through all frequencies, those quick transmissions that are hopelessly lost on scanners are captured easily. The Interceptor does not need 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	**$29.95**
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	**$34.95**
CSR Case and Knob Set	**$14.95**

ORDERS ONLY CALL 1-800-446-2295

(No tech info at this number)

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

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

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

0500 UTC SHORTWAVE GUIDE 1:00 AM EDT 10:00 PM PDT

FREQUENCIES

0500-0600	Australia, AF Radio	13525as			
0500-0600	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415as	17715pa	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, CKZU Vancouver	6160do			
0500-0600	China, China Radio Intl	9595na			
0500-0600	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0500-0600	Cuba, Radio Havana Cuba	9820na			
0500-0600	Ecuador, HCJB Quito	9745na			
0500-0600 as	Eqt Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	6185na
0500-0515	Israel, Kol Israel	7465na	9435na	17545as	
0500-0600 mtwh/vl	Italy, IRRS Milan	7125va			
0500-0600	Japan, NHK/Radio	5975eu	6025na	7230eu	9565as
		11740as	11885na	15410as	17810as
0500-0600	Kenya, Kenya Broadc Corp	4885do	4935do		
0500-0600 s	Lebanon, Wings of Hope	9960me			
0500-0600 as	New Zealand, R NZ Intl	11900pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4990do		
0500-0600	Nigeria, FRCN/Voice of	7255af			
0500-0530 m	Norway, Radio Norway Intl	5905na	5910na		
0500-0600 vl	Papua New Guinea, NBC	4890do	9675do		
0500-0600	Russia, Voice of	5905eu	7105na	7175eu	7270na
		7345na	9705as	9850na	9865as
		17890as			
0500-0600	S Africa, Channel Africa	7185af	11900af		
0500-0553 f	Seychelles, FEBA Radio	17725me			
0500-0600 vl	Slovakia, AWR	9465af			
0500-0600	Spain, R Exterior Espana	9540na			
0500-0600	Swaziland, Swazi Radio	6155af			
0500-0530	Swaziland, Trans World R	5055af	6070af	7150af	7200af
		9500af			
0500-0515	Switzerland, Swiss R Intl	3985eu	6165eu		
0500-0530	Switzerland, Swiss R Intl	9885af	13635af	15340af	
0500-0502	Uganda, Radio	4976do			
0500-0600	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410af
		9600af	9640na	11760as	11955as
		12095me	15280as	15310as	15360as
		15420af	15575me	17885af	
0500-0600	USA, KAIJ Dallas TX	5810am	9815am		
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9785am			
0500-0600	USA, KWHR Naalehu HI	9930as			
0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600	USA, VOA Washington DC	5995eu	6035af	6040eu	6140af
		6873af	7170me	7405af	9530eu
		9665af	9700eu	11825me	12080af
		15205me	15600af		
0500-0600	USA, WEWN Birmingham AL	7425na			
0500-0600	USA, WHRI Noblesville IN	7315am	9495am		
0500-0600	USA, WINB Red Lion PA	11950na			
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, WWHA Green Bush ME	7465eu			
0500-0600	USA, WWCR Nashville TN	5065am	5935am	7435am	
0500-0600	USA, WYFR Okeechobee FL	5985na			
0500-0545	USA, WYFR Okeechobee FL	9850eu			
0500-0530	Vatican State, Vatican R	5865af	7360af	9725af	11625af
0500-0520	Vatican State, Vatican R	4010eu			
0500-0600	Vietnam, Voice of	5940na			
0500-0600	Zimbabwe, ZBC/Radio 3	3306do	3396do		
0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0530-0600	Australia, Radio	9660do	15510as	15565as	17715as
		17860pa	17880as		
0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0600	Finland, YLE/Radio	6120eu	9635af	11755me	
0530-0600	Romania, R Romania Intl	11940af	15250af	15380af	17745af
0530-0600	Russia, Voice of	5930as	11710as		
0530-0600	Swaziland, Trans World R	9500af	9650af		
0530-0600	United Kingdom,BBC London	11735eu			
0535-0600	Swaziland, Trans World R	6070af			

SELECTED PROGRAMS

Sundays
0508 Deutsche Welle: Inside Europe. See S 0108.
0509 Channel Africa: Talking of Books. Weekly book review.
0510 Radio Australia: Beat of the Pacific. Conversations with and music by indigenous Pacific music-makers.
0530 Radio Australia: The Australian Music Show. Kim Taylor presents the music, people, and issues of the Australian contemporary music industry.
0532 Channel Africa: Gospel Music. See S 0309.
0537 Deutsche Welle: Religion and Society. See S 0137.

Mondays
0508 Channel Africa: Dateline Africa. A news magazine program.
0508 Deutsche Welle: Mailbag. See M 0108.
0518 Deutsche Welle: Living in Germany. See M 0118.
0518 Radio Australia: Sports Summary. See M 0118.
0520 Radio Australia: Pacific Beat. See M 0411.
0533 Deutsche Welle: German by Radio. See S 1134.

Tuesdays
0508 Channel Africa: Dateline Africa. See M 0508.
0509 Deutsche Welle: European Journal. See M 0224.
0518 Radio Australia: Sports Summary. See M 0118.
0520 Radio Australia: Pacific Beat. See M 0411.
0530 Radio Australia: Indigenous News. News for and about the aboriginal people of Australia.
0532 Deutsche Welle: German Tribune. See T 0132.
0535 Channel Africa: Sports. See M 1627.

Wednesdays
0508 Channel Africa: Dateline Africa. See M 0508.
0509 Deutsche Welle: European Journal. See M 0224.
0518 Radio Australia: Sports Summary. See M 0118.
0520 Radio Australia: Pacific Beat. See M 0411.
0530 Radio Australia: Pacific Women. Patti Orofino looks at issues of concern to women of the Pacific.
0533 Deutsche Welle: Backdrop. See W 0133.

Thursdays
0508 Channel Africa: Dateline Africa. See M 0508.
0509 Deutsche Welle: European Journal. See M 0224.
0518 Radio Australia: Sports Summary. See M 0118.
0520 Radio Australia: Pacific Beat. See M 0411.
0530 Radio Australia: Pacific Religion. Coverage of religious issues of relevance to people of the Pacific region.
0533 Deutsche Welle: German Tribune. See T 0132.

Fridays
0508 Channel Africa: Dateline Africa. See M 0508.
0509 Deutsche Welle: European Journal. See M 0224.
0518 Radio Australia: Sports Summary. See M 0118.
0520 Radio Australia: Pacific Beat. See M 0411.
0530 Radio Australia: Beat of the Pacific. See S 0510.
0533 Deutsche Welle: Come to Germany. See F 0133.
0535 Channel Africa: Sports. See M 1627.

Saturdays
0509 Deutsche Welle: European Journal. See M 0224.
0510 Channel Africa: Focus on Africa. See A 0422.
0510 Radio Australia: Oz Sounds. See S 1310.
0515 Channel Africa: Good Vibrations. Fifteen minutes of rock music and commentary.
0530 Radio Australia: One World. Carolyn Court reports on environmental issues important to the Pacific.
0533 Deutsche Welle: Through German Eyes. See S 1518.
0535 Channel Africa: Channel Africa Sports. See M 1627.
0554 Channel Africa: This Day in History. A look back on anniversary events.

BBC Takes a New Direction

Jim Frimmel, MT Program Manager

On April 1st, the World Service of the BBC begins a new chapter in its long history, and the name of it is "Slipstreaming."

Up to now, the Beeb's worldwide audience has experienced an uneven balance in programming. Often as not, what has been scheduled at a convenient time for one part of the world has not been a good listening time for another.

Although most programs are repeated, either the first airing or the rerun may be at an inconvenient time. For example, the popular "Waveguide" program was first aired (during March) at 0130 (a convenient time in North America), and repeated at 0715 and 1030 (two inconvenient times in North America).

Slipstreaming will split the BBC's single 24-hour "mainstream" into five separate streams, each of which will serve the needs of the time zone for which it is intended. The five streams are (1) Europe, Middle East, and Southwest Asia, (2) Africa, (3) South Asia, (4) Asia-Pacific, and (5) America.

Officials at the BBC emphasize that there will be no "regionalization" of program content and the Beeb will continue to be a truly world service. The changes are designed to broadcast programs such as "Play of the Week" at a more appropriate local time.

Specific details are expected to be announced in the April issue of *BBC Worldwide* magazine, too late for publication in this issue of *MT*. One of this month's "Hauser's Highlights" projects a possible line-up for North America.

FREQUENCIES

0600-0630	Australia, AF Radio	13525as			
0600-0700	Australia, Radio	9660do	11910pa	13755pa	15510as
		17715as	17880as		
0600-0630	Australia, Radio	13605as	15240pa	15415pa	17795as
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, CKZU Vancouver	6160do			
0600-0630 mtwhf	Canada, RCI Montreal	6050eu	6150eu	9760eu	11905me
0600-0700	Costa Rica, AWR Alajuela	5030am	6150am	7375am	
0600-0700	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0600-0700	Cuba, Radio Havana Cuba	9820na			
0600-0630	Czech Rep, Radio Prague	5930eu	7345eu	9505eu	
0600-0700	Ecuador, HCJB Quito	9745na			
0600-0700 as	Eqt Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	6100af	9565af	11765af	13790af
		15185af	17820af	21705af	
0600-0615	Ghana, Ghana Broadc Corp	3316do	4915do		
0600-0700 mtwh/vl	Italy, IRRS Milan	7125va			
0600-0700	Japan, NHK/Radio	11860as	21610as		
0600-0700	Kenya, Kenya Broadc Corp	4885do	4935do		
0600-0700 vl	Kiribati, Radio	9825do			
0600-0700 s	Lebanon, Wings of Hope	9960me			
0600-0700 vl	Liberia, Radio ELBC	7275do			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 asmtwh	Malaysia, Radio	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765me			
0600-0700 as	New Zealand, R NZ Intl	15115pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4990do		
0600-0700	Nigeria, FRCN/Voice of	7255af			
0600-0700 vl	Papua New Guinea, NBC	4890do	9675do		
0600-0700	Russia, Voice of	5905eu	5930eu	7175na	7270na
		7345na	9850as	9895as	11710na
		17620as	17890as		
0600-0700 vl	Slovakia, AWR	13715af			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, R Korea Intl	11945na			
0600-0700	Swaziland, Swazi Radio	6155af			
0600-0700	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0600-0630	Switzerland, Swiss R Intl	3985eu	6165eu		
0600-0615 s	Uganda, Radio	4976do	7110do		
0600-0700	United Kingdom,BBC London	3955eu	6005af	6190af	6195eu
		9410af	9600af	9640na	11760as
		11780eu	11940af	11955as	12095me
		15070af	15280as	15310as	15360me
		15400af	15420af	15575af	17790as
		17885af			
0600-0630	United Kingdom,BBC London	6180eu			
0600-0700	USA, KAIJ Dallas TX	5810am	13740am		
0600-0700	USA, KTBN Salt Lk City UT	7510am			
0600-0700	USA, KVOH Los Angeles CA	9785am			
0600-0700	USA, KWHR Naalehu HI	9930as			
0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	USA, VOA Washington DC	3980eu	5995eu	6035af	6040eu
		6060eu	6140af	6873eu	7170me
		7325me	7405af	9530af	9665af
		11805af	11825af	11950af	12035af
		12080af	15205me	15600af	
0600-0700	USA, WEWN Birmingham AL	6065eu	7425na		
0600-0700	USA, WHRI Noblesville IN	7315am	9495am		
0600-0700	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, WVHA Green Bush ME	7455eu			
0600-0700	USA, WWCR Nashville TN	5065am	5935am	7435am	
0600-0700	USA, WYFR Okeechobee FL	5985na	7355eu	9680eu	9850af
0600-0700	Zimbabwe, ZBC/Radio 3	5975do	6045do		
0604-0700	S Africa, Trans World R	11730af			
0630-0700	Australia, Radio	9580pa	9860pa	11880pa	15415as
		21725as			
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Belgium, R Vlaanderen Int	5985eu	9925au		
0630-0700	Vatican State, Vatican R	5865af	7360af	9660af	11625af
0640-0700	Monaco, Trans World Radio	7115eu			
0645-0700	Romania, R Romania Intl	15250pa	15335pa	17720pa	17805pa

SELECTED PROGRAMS

Sundays
0608 Deutsche Welle: Commentary. See S 0208.
0610 Radio Australia: Feedback. See S 0410.
0612 Deutsche Welle: Sports Report. See S 0212.
0616 Deutsche Welle: International Talking Point. See S 0416.
0630 Radio Australia: Correspondents' Report. See S 0030.
0630 Radio Austria Int l: Report from Austria. A magazine program covering all aspects of Austrian life and events in the news and opening with the latest news bulletin.
0636 Deutsche Welle: People and Places. See S 0436.

Mondays
0608 Deutsche Welle: European Journal. See M 0224.
0610 Radio Australia: Sports Headlines. See M 0110.
0611 Radio Australia: Pacific Beat. See M 0411.
0627 Radio Australia: Pacific Weather. The latest weather on the continent and in the region.
0630 Radio Australia: International Report. See M 0430.
0630 Radio Austria Int l: Report from Austria. See S 0630.
0632 Deutsche Welle: Africa Highlight. See M 0432.

Tuesdays
0608 Deutsche Welle: Africa Report. See T 0408.
0610 Radio Australia: Sports Headlines. See M 0110.
0611 Radio Australia: Pacific Beat. See M 0411.
0624 Deutsche Welle: European Journal. See M 0224.
0627 Radio Australia: Pacific Weather. See M 0627.
0630 Radio Australia: International Report. See M 0430
0630 Radio Austria Int l: Report from Austria. See S 0630.

Wednesdays
0608 Deutsche Welle: Africa Report. See T 0408.
0610 Radio Australia: Sports Headlines. See M 0110.
0611 Radio Australia: Pacific Beat. See M 0411.
0624 Deutsche Welle: European Journal. See M 0224.
0627 Radio Australia: Pacific Weather. See M 0627.
0630 Radio Australia: International Report. See M 043C.
0630 Radio Austria Int l: Report from Austria. See S 0630.

Thursdays
0608 Deutsche Welle: Africa Report. See T 0408.
0610 Radio Australia: Sports Headlines. See M 0110.
0611 Radio Australia: Pacific Beat. See M 0411.
0624 Deutsche Welle: European Journal. See M 0224.
0627 Radio Australia: Pacific Weather. See M 0627.
0630 Radio Australia: International Report. See M 0430.
0630 Radio Austria Int l: Report from Austria. See S 0630.

Fridays
0608 Deutsche Welle: Africa Report. See T 0408.
0610 Radio Australia: Sports Headlines. See M 0110.
0611 Radio Australia: Pacific Beat. See M 0411.
0624 Deutsche Welle: European Journal. See M 0224.
0627 Radio Australia: Pacific Weather. See M 0627.
0630 Radio Australia: International Report. See M 0430.
0630 Radio Austria Int'l: Report from Austria. See S 0630.

Saturdays
0608 Deutsche Welle: Commentary. See S 0208.
0610 Radio Australia: Book Reading. See S 0110.
0612 Deutsche Welle: Africa This Week. See A 0412.
0630 Deutsche Welle: Man and Environment. See T 1634.
0630 Radio Australia: Indian Pacific. See A 0030.
0630 Radio Austria Int'l: Report from Austria. See S 0630.

TIME CHANGES TO DX PROGRAMS

The following DX/Media programs are anticipated to shift their broadcast times to one hour earlier due to the changes from standard time to daylight savings time. (This amends the Radio Programs listing on page 47, *MT* Feb 95.)

Belgium	Radio World
Bulgaria	Radio Bulgaria Calling
Czech Republic	Calling All Listeners
Finland	YLE Media Roundup
Hungary	DX News
Korea, South	Shortwave Feedback
Poland	DX Club
Portugal	Radio Portugal DX
Sweden	Media Scan (biweekly)
Turkey	DX Corner
WRMI	Wavescan
WWCR	Spectrum

See Hauser's Shortwave Broadcast column for World of Radio updates.

FREQUENCIES

0700-0800	Australia, Radio	6080pa	9580pa	9860pa	11720pa
		11880pa	11910pa	13605pa	15240pa
		15565as	17695as	17750as	21595as
		21715as			
0700-0730	Australia, Radio	15415as	17795as		
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, CKZU Vancouver	6160do			
0700-0800	Costa Rica, AWR Alajuela	5030ca	6150sa	7325am	9725am
0700-0800	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0700-0800	Ecuador, HCJB Quito	6135pa	6205as	9420eu	9600eu
		9745pa	11835eu	11925pa	17490pa
		21455eu			
0700-0800 as	Eqt Guinea, R East Africa	9585af			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0800 mtwh/vl	Italy, IRRS Milan	7125va			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11740as	15270as
		15335me	15410as	17810me	21610au
0700-0800	Kenya, Kenya Broadc Corp	4885do	4935do		
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800 vl	Liberia, Radio ELBC	7275do			
0700-0800	Liberia, Radio ELWA	4760do			
0700-0800 asmtwh	Malaysia, Radio	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monaco, Trans World Radio	7115eu			
0700-0730	Myanmar, Radio	5990do	9730do		
0700-0716 mtwhf	New Zealand, R NZ Intl	11900pa			
0700-0800 as	New Zealand, R NZ Intl	9700pa			
0700-0758 a	New Zealand, R NZ Intl	11900pa			
0700-0728 s	New Zealand, R NZ Intl	11900pa			
0700-0800 vl	Papua New Guinea, NBC	4890do	9675do		
0700-0745	Romania, R Romania Intl	15250pa	15335pa	17720pa	17805pa
0700-0800	Russia, Voice of	5905eu	5930eu	7175na	7270na
		9700as	9850as	11675eu	15385me
		17840af			
0700-0715	Sierra Leone, SLBS	3316do			
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Swazi Radio	6155af			
0700-0735	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0700-0800	Taiwan, VO Free China	5950na			
0700-0715 mtwtfa	Uganda, Radio	4976do	7110do		
0700-0800	United Kingdom,BBC London	3955eu	6190af	6195eu	7325eu
		9410af	9600af	9640na	11760me
		11940af	11955as	12095af	15070af
		15280as	15310as	15360as	15400af
		17790as	17830af	17885af	
0700-0730	United Kingdom,BBC London	6005eu	11780eu	11860af	15575me
0700-0800	USA, KAIJ Dallas TX	5810am	13740am		
0700-0800	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KVOH Los Angeles CA	7415am			
0700-0800	USA, KWHR Naalehu HI	9930as			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	USA, WEWN Birmingham AL	7425na			
0700-0800 vl	USA, WHRI Noblesville IN	7315am	9495am		
0700-0800	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, WVHA Green Bush ME	7455eu			
0700-0800	USA, WWCR Nashville TN	5065am	5935am	7435am	
0700-0745	USA, WYFR Okeechobee FL	7355eu	9680eu	9850af	
0700-0800	Zimbabwe, ZBC/Radio 3	5975do	6045do		
0703-0710 mtwhfa	Croatia, Croatian Radio	5895eu	7370eu	9830eu	13830eu
0717-0800 mtwhf	New Zealand, R NZ Intl	9700pa			
0730-0800	Australia, Radio	9660pa	17880as		
0730-0800	Czech Rep, Radio Prague	17485as	21705as		
0730-0800	Georgia, Radio	11805eu			
0730-0745 sh	Greece, Voice of	9425eu	9935eu	11645eu	
0730-0800	Netherlands, Radio	9720pa	11895pa		
0730-0745 mtwhf	Vatican State, Vatican R	4010eu	7250eu	9645eu	11740eu
		15210eu	15570eu		
0735-0800 smtwhf	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0745-0800	Finland, YLE/Radio	6120eu	9560eu	11755eu	
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		

0800 UTC

0800-0900	Australia, AF Radio	15607af	18193af		
0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	15565pa	17715as
		17880as			
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, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		21455eu			
0800-0900 as	Eqt Guinea, R East Africa	9585af			
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, TWR/KTWR	15200as			
0800-0900 mtwh/vl	Italy, IRRS Milan	7125va			
0800-0900	Kenya, Kenya Broadc Corp	4885do	4935do		
0800-0900 vl	Kiribati, Radio	9825do			
0800-0900 vl	Liberia, Radio ELBC	7275do			
0800-0830	Liberia, Radio ELWA	4760do			
0800-0900	Malaysia, Radio	7295do			
0800-0830	Malaysia, Voice of	6175as	9750as	15295as	
0800-0820	Monaco, Trans World Radio	7115eu			
0800-0825	Netherlands, Radio	9720pa	11895pa		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0830 m	Norway, Radio Norway Intl	9590pa	15175as		
0800-0850	Pakistan, Radio	15625eu	17900eu		
0800-0900 vl	Papua New Guinea, NBC	4890do	9675do		
0800-0900	Russia, Voice of	11710as	15230me	17620na	17840as
		17890as			
0800-0815	Sierra Leone, SLBS	3316do			
0800-0900 vl	Slovakia, AWR	17630af			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	7550eu	13670eu		
0800-0805 smtwhf	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0800-0900	United Kingdom,BBC London	6190af	6195eu	7325eu	9740as
		11940af	11955as	12095af	15070af
		15280as	15360as	15400af	17640af
		17830af	17885af		
0800-0815	United Kingdom,BBC London	3955eu	9410eu	9600af	9640na
		11760me	15310eu	17790as	
0800-0900	USA, KAIJ Dallas TX	5810am	13740am		
0800-0900 tent/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	7535eu	13615pa	15665eu	
0800-0900	USA, WEWN Birmingham AL	5975na	9350na		
0800-0900 vl	USA, WHRI Noblesville IN	7315am	9495am		
0800-0900	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	5065am	5935am		
0800-0900	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do	
0803-0810 s	Croatia, Croatian Radio	5895eu	7370eu	9830eu	13830eu
0815-0900 mtwtf	Nigeria, FRCN/Radio	3326do	4990do		
0820-0835 as	Monaco, Trans World Radio	7115eu			
0830-0845 s	Armenia, Radio Yerevan	15275eu	15370eu		
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	6155eu	13730eu	15450as	17870au
0830-0900	Ecuador, HCJB Quito	6135pa	9745pa	17490pa	
0830-0900	Netherlands, Radio	9720pa	9895pa	13700pa	
0830-0900	Slovakia, R Slovakia Intl	11990au	17485au	21705au	
0835-0845 s	Monaco, Trans World Radio	7115eu			
0855-0900	Guam, TWR/KTWR	11830pa			

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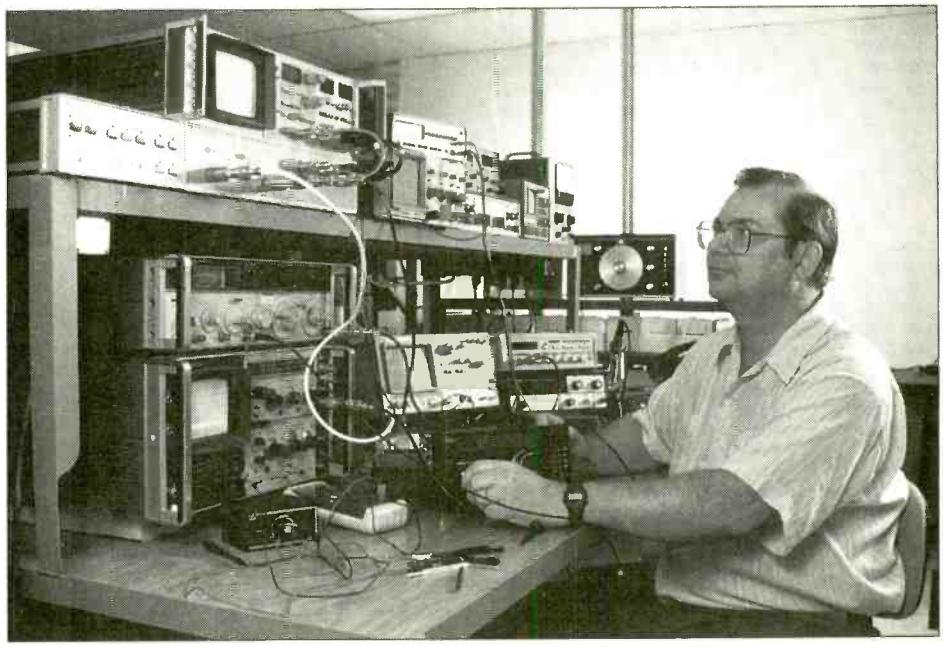

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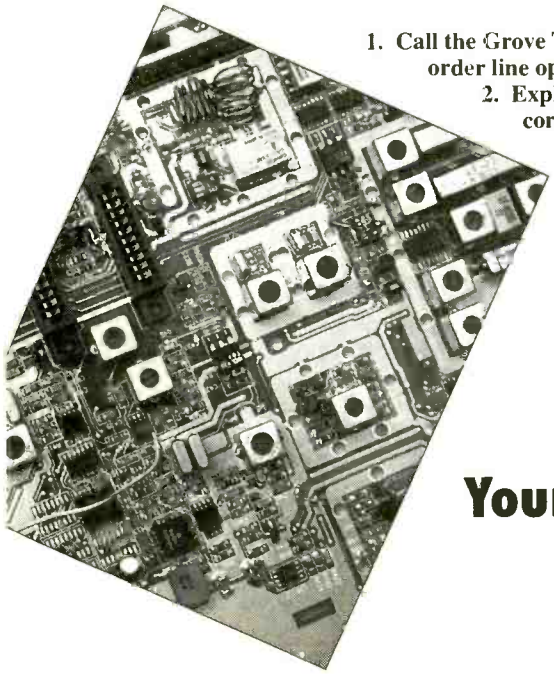

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FREQUENCIES

0900-1000	Australia, AF Radio	15607af	18193af		
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 mtwhfa	Belgium, R Vlaanderen Int	6035eu	15510af	17595af	
0900-1000	Bulgaria, Radio	12040au			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	6950as	11755pa	15440pa	
0900-1000	Costa Rica, AWR Alajuela	5030ca	6150sa	7325am	9725am
0900-1000	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0900-1000	Ecuador, HCJB Quito	6135pa	9745pa	17490pa	21455pa
0900-1000 as	Eqt Guinea, R East Africa	9585af			
0900-1000	Finland, YLE/Radio	15330as	17800au		
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	12055as
		15410af	17780as	17800af	21600af
		21650as	21680as		
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-0915	Guam, TWR/KTWR	15200as			
0900-1000	Guam, TWR/KTWR	11830pa			
0900-1000	Iraq, Radio Iraq Intl	13680as			
0900-1000 mtwh/vl	Italy, IRRS Milan	7125va			
0900-1000	Japan, NHK/Radio	9610as	9750as	11815as	15190as
		15270au			
0900-0948 vl	Kiribati, Radio	9825do			
0900-1000 vl	Liberia, Radio ELBC	7275do			
0900-1000	Malaysia, Radio	7295do			
0900-0930	Netherlands, Radio	9720pa	13700pa		
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-1000 mtwtf	Nigeria, FRCN/Radio	3326do	4990do		
0900-1000	Nigeria, FRCN/Voice of	7255af			
0900-1000 mtwtfa	Palau, KHBN/Voice of Hope	9830as			
0900-1000 vl	Papua New Guinea, NBC	4890do	9675do		
0900-1000	Russia, Voice of	9480eu	9550eu	11710me	13370as
		15580as	17765eu	17795eu	17860as
0900-1000 vl	Slovakia, AWR	9445eu	17630af		
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
		11760me	11940af	12095af	15070af
		15190sa	15280as	15310as	15400eu
		15575me	17640af	17705af	17790as
		17830as	17885af		
0900-0915	United Kingdom,BBC London	6120as	6195eu	7345eu	9580as
		11955as	15360as		
0900-1000	USA, KAIJ Dallas TX	5810am	13740am		
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu	9430eu	13615pa
0900-1000	USA, WEWN Birmingham AL	9350na			
0900-1000 vl	USA, WHRI Noblesville IN	7315am	9495am		
0900-1000	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	5065am	5935am		
0900-1000	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do	
0903-0910 mtwhfa	Croatia, Croatian Radio	5895eu	7370eu	9830eu	13830eu
0910-0940	Mongolia, R Ulan Bator	7290na	12000na		
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0920-0935 sh	Greece, Voice of	15650au	17525au		
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	7260pa	9720pa	9810pa	21505pa
0930-1000	Philippines, FEBC/R Intl	11690as			
0930-1000	Russia, Voice of	11675as	12015as		
0940-0950	Greece, Voice of	15650au	17525au		

1000 UTC

1000-1100	Australia, AF Radio	13525as			
1000-1100	Australia, Radio	9580pa	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	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	6590as	11755pa	15440pa	
1000-1100	Costa Rica, AWR Alajuela	5030ca	6150sa	7325am	9725am
1000-1100	Costa Rica, R Peace Intl	7385am	9400am	12150am	
1000-1100	Ecuador, HCJB Quito	6135as	9745pa	11925pa	21455pa
1000-1100 as	Eqt Guinea, R East Africa	9585af			
1000-1040	Ghana, Ghana Broadc Corp	6130do	7295do		
1000-1100	India, All India Radio	15050as	15180as	17387au	17895as
1000-1100	Iraq, Radio Iraq Intl	13680eu			
1000-1100 mtwh/vl	Italy, IRRS Milan	7125va			
1000-1100	Malaysia, Radio	7295do			
1000-1100	Malaysia, RTM/Kota Kinab	5980do			
1000-1030	Netherlands, Radio	7260pa	9720pa	9810pa	21505pa
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, FRCN/Radio	4990do	7285do		
1000-1100	Nigeria, FRCN/Voice of	7255af			
1000-1100 mtwhfa	Palau, KHBN/Voice of Hope	9830as			
1000-1100 vl	Papua New Guinea, NBC	4890do	9675do		
1000-1100	Philippines, FEBC/R Intl	11690as			
1000-1100	Russia, Voice of	9480eu	9550eu	9680na	11675na
		12015eu	15385na	17860as	
1000-1100 vl	Slovakia, AWR	9450eu			
1000-1030	Switzerland, Swiss R Intl	6165eu	9535eu	9885as	11640as
		13635as			
1000-1015	Uganda, Radio	4976do			
1000-1100	United Kingdom,BBC London	6165eu	6190af	6195as	9410eu
		9740na	11760me	11940af	12095af
		15070af	15190sa	15310as	15400eu
		15575me	17640af	17705eu	17790as
		17830af	17885af		
1000-1030	United Kingdom,BBC London	15280as			
1000-1100	USA, KAIJ Dallas TX	9815am	13815am		
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	9930as			
1000-1100	USA, Monitor Radio Intl	6095ca	7395sa	9430as	13625as
1000-1100	USA, VOA Washington DC	5985pa	7405am	9590am	11720pa
		11915am	15120am	15425pa	
1000-1100	USA, WEWN Birmingham AL	9350na			
1000-1100 vl	USA, WHRI Noblesville IN	6040am	9850am		
1000-1100	USA, WINB Red Lion PA	11950na			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5065am	5935am		
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	10059as	12025as	15010as	
1003-1010 s	Croatia, Croatian Radio	5895eu	7370eu	9830eu	13830eu
1020-1030 mtwtfa	Vatican State, Vatican R	11740af	15210af	17585me	
1030-1100 mtwhfa	Austria, R Austria Intl	6155eu	13730eu	15450as	17870au
1030-1100	Czech Rep, Radio Prague	7345eu	9505eu		
1030-1100	Malaysia, RTM/Kuching	7160do			
1030-1100	Netherlands, Radio	7260pa	9810pa		
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850au	
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605me

International Marconi Day, 22 April

Radio Austria International is one of 25 locations hosting special event amateur stations to operate from places important in Marconi's career. In Feb 1931 a SW experimental transmitter in Vienna was the first to relay a shortwave broadcast in the history of radio.

To commemorate the close connection between broadcasters and radio amateurs, RAI has another first: the first joint Special QSL for shortwave broadcasts and amateur radio.

Send reports of your QSO or accurate reception report to Radio Austria Intl, A-1136 Vienna.

Sat, 22 April 1995, 0000-2400 UTC

OE1M preferred SSB freqs: 3770, 7070, 14170, 21170, 28470

Via OSCAR 13 (appr. 0500-1220) and OSCAR 10 (appr. 1300-1500) 145.890

RAI Intl broadcasts on 5945, 6015 (0500-0700 via Sackville, Canada), 6155 (0400-2300), 9655, 9870, 11780, 13730 (0000-2400), 15410, 15450, 17870

FREQUENCIES

1100-1200	Australia, AF Radio	13525as			
1100-1200	Australia, Radio	9510pa	9580pa	9710pa	9860pa
		13605as	15170as	15565as	
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Bahrain, Radio	6010do			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, AWR Alajuela	5030ca	6150am	7325am	9725am
1100-1200	Costa Rica, R Peace Intl	9400am	12150am		
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1200	Ecuador, HCJB Quito	12005am	15115am	21455pa	
1100-1200 as	Eqt Africa, R East Africa	9585af			
1100-1130	Georgia, Radio	11815eu			
1100-1150	Germany, Deutsche Welle	15370af	15410af	17765af	17800af
		21600af			
1100-1110 as	Ghana, Ghana Broadc Corp	3366do	4915do		
1100-1200 vl	Guatemala, AWR	5980ca			
1100-1200	Iraq, Radio Iraq Intl	13680eu			
1100-1130	Israel, Kol Israel	15640na	15650eu	17575eu	
1100-1200 mtwh/vl	Italy, IRRS Milan	7125va			
1100-1200	Japan, NHK/Radio	6120na	9610as	15295as	
1100-1200	Malaysia, Radio	7295do			
1100-1200	Malaysia, RTM/Kota Kinab	5980do			
1100-1200	Malaysia, RTM/Kuching	7160do			
1100-1200	New Zealand, R NZ Intl	9700pa			
1100-1105	Nigeria, FRCN/Radio	4990do	7285do		
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1130 s	Norway, Radio Norway Intl	9590eu	11850eu		
1100-1120	Pakistan, Radio	15625as	17900as		
1100-1200 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1100-1200 vl	Papua New Guinea, NBC	4890do	9675do		
1100-1200	Russia, Voice of	7205as	9470eu	9550eu	9680eu
		11675eu	11835as	11980as	12015eu
		13370as	17765na	17860me	
1100-1115	Rwanda, Radio	6055do			
1100-1200	Singapore, SBC Radio One	6155do			
1100-1200	Singapore,R Singapore Int	9530as			
1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850au	
1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu		
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1102	Uganda, Radio	7110do	7195do		
1100-1200	United Kingdom,BBC London	5965na	6165eu	6190af	6195na
		9410eu	9670na	9740na	11760me
		11940af	12095af	15070af	15310as
		15575me	17640af	17830sa	17885af
		21660af			
1100-1130	United Kingdom,BBC London	5965na	9700as	15400eu	
1100-1200	USA, KAIJ Dallas TX	9815am	13815am		
1100-1200	USA, KTBN Salt Lk City UT	7510am			
1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	USA, Monitor Radio Intl	6095na	7395ca	9355eu	9425au
1100-1200	USA, VOA Washington DC	5985as	6110as	6165am	7405am
		9590am	9615as	9760as	11720as
		11915am	15120am	15160as	15425as
1100-1200	USA, WEWN Birmingham AL	6000na			
1100-1200 vl	USA, WHRI Noblesville IN	6040am	9850am		
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1130-1200	Austria, R Austria Intl	6155eu	11780as	13730eu	
1130-1200	Bulgaria, Radio	9770as	11740as		
1130-1200 vl	China, China Radio Intl	8660as	11445as	15135as	
1130-1200	Iran, VOIRI Tehran	11745as	11790as	11930me	
1130-1200	Netherlands, Radio	6045eu	7130eu	7160eu	
1130-1200	Russia, Voice of	11655na			
1130-1200	South Korea, R Korea Intl	9650na			
1130-1200	Sweden, Radio	13775au	15120as	15240as	
1130-1200	Vietnam, Voice of	10059as	12025as	15010as	
1145-1200	Rwanda, Radio	6055do			
1145-1200 s/vl	USA, WRMI/R Miami Intl	9955am			

SELECTED PROGRAMS

Sundays

1109 Deutsche Welle: Arts on the Air. Reports and interviews on major cultural events and developments.
1120 Radio Australia: Sports Bulletin. Ten-minute reports on Australian, regional and international sport.
1130 Radio Australia: Fine Music Australia. The best Australian fine music performances and compositions are presented by Ivan Lloyd.
1134 Deutsche Welle: German by Radio. An advanced German language course for English speakers.
1136 Radio Netherlands: Happy Station. See S 0137.

Mondays

1109 Deutsche Welle: Newsline Cologne. Worldwide current affairs program with a review of the German or European press.
1110 Voice of America (ca): Spotlight on Business and Finance. NEW! An examination of economic issues and events of regional or global concern.
1120 Radio Australia: Sports Bulletin. See S 1120.
1130 Radio Australia: Innovations. Desley Blanch reports on Australian inventions and innovative practices.
1134 Deutsche Welle: Hallo Africa. A program with musical requests and greetings to friends.
1137 Radio Netherlands: Newsline. See S 0038.
1152 Radio Netherlands: Research File. A program of science and technology.

Tuesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1110 Voice of America (ca): Inside USA. NEW! An in-depth look at political or social issues of major concern in the United States.
1120 Radio Australia: Sports Bulletin See S 1120.
1130 Radio Australia: Arts Australia. Amanda Smith presents reviews and comment on current events within the Australian arts scene.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0038.
1152 Radio Netherlands: Mirror Images. Weekly magazine of music, the arts, culture, and European festivals.

Wednesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1110 Voice of America (ca): International Focus. NEW! A look at international issues and developments of regional or global interest and impact.
1120 Radio Australia: Sports Bulletin. See S 1120.
1130 Radio Australia: Science File. Ian Wood examines the world of science, medicine and technology.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0038.
1154 Radio Netherlands: Documentary. An in-depth treatment of one subject or a short series.

Thursdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1110 Voice of America (ca): Reporter's Notebook. NEW! A look inside major news stories from a reporter's perspective.
1120 Radio Australia: Sports Bulletin. See S 1120.
1124 Deutsche Welle: DXers World Meeting (4/5). A program for listeners in Africa.
1130 Radio Australia: Couchman. Peter Couchman in conversation with people from all walks of life.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0038.
1152 Radio Netherlands: Media Network. See H 0152.

Fridays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1110 Voice of America (ca): Perspectives. NEW! Delving into religion, spiritual values, ethics, or morality.
1120 Radio Australia: Sports Bulletin. See S 1120.
1130 Radio Australia: The Parliament Program. A roundup of events in the Australian Parliament.
1134 Deutsche Welle: Hallo Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0038.
1152 Radio Netherlands: Variable Feature Series. See T 0153.

Saturdays

1109 Deutsche Welle: The Week in Germany. See A 0212.
1120 Deutsche Welle: Mailbag Africa. Listener mail from Africa is answered.
1120 Radio Australia: Sports Bulletin. See S 1120.
1130 Radio Australia: Business Weekly. See S 1610.
1134 Deutsche Welle: The Jazz Corner. See A 0237.
1137 Radio Netherlands: Newsline. See S 0038.
1152 Radio Netherlands: Sounds Interesting. See S 0052.

HAUSER'S HIGHLIGHTS

USA: WWCR

All programming shifts one UT hour earlier April 2 to stay on the same local time. Unconfirmed at press time, but WWCR planned Z-95 schedule for April and May:

85° antenna
13845 at 1200-0100,
5935 at 0100-1200;

46° antenna
15685 at 1000-2100,
(new) 9475 at 2100-2400,
7435 at 0000-1000;

40° antenna
12160 at 1400-2300,
5065 at 2300-1400,
(or) 12160 at 1400-1900,
12030 at 1900-2100,
12160 at 2100-2300,
5065 at 2300-1400.

Starting this summer, changeover time shifts for June and July in keeping with longer daylight: 13845 to 5935 at 0200; 9475 at 2200-0100; 12160 to 5065 at 0000

1200 UTC SHORTWAVE GUIDE 8:00 AM EDT 5:00 AM PDT

FREQUENCIES

1200-1230	Australia, Radio	5995pa	6060pa	6080pa	9580pa
		9610as	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	15445na			
1200-1230	Bulgaria, Radio	9770as	11740as		
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300 vl	Canada, CBC N Quebec Svc	9625do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1230 vl	China, China Radio Intl	8660as	11445as	15135as	
1200-1300	China, China Radio Intl	8425as	9715as	11660as	11795pa
		15440pa			
1200-1300	Costa Rica, R Peace Intl	9400am	12150am	15050am	
1200-1300	Ecuador, HCJB Quito	12005am	15115am	21455pa	
1200-1300 as	Eqt Africa, R East Africa	9585af			
1200-1300	France, Radio France Intl	11615na	13625na	15325af	15365na
1200-1300 vl	Guatemala, AWR	5980ca			
1200-1230	Iran, VOIRI Tehran	11745as	11790as	11930me	
1200-1300	Iraq, Radio Iraq Intl	13680eu			
1200-1300 mtwh/vl	Italy, IRRS Milan	7125va			
1200-1300	Jordan, Radio	9560eu			
1200-1300 vl	Liberia, Radio ELBC	7275do			
1200-1300	Malaysia, Radio	7295do			
1200-1300	Malaysia, RTM/Kota Kinab	5980do			
1200-1235	Moldova, R Moldova Intl	15315na			
1200-1230 mw	Mongolia, R Ulan Bator	7290na	12015na		
1200-1230 ha	Mongolia, R Ulan Bator	7290na	12000na		
1200-1300	Netherlands, Radio	6045eu	7130eu	7160eu	
1200-1206	New Zealand, R NZ Intl	9700pa			
1200-1230	Nigeria, FRCN/Radio	4990do	7285do		
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	9675do		
1200-1255	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	9525eu
		11815eu			
1200-1300	Russia, Voice of	7205na	9470eu	9540eu	9680eu
		11675af	11760eu	11980eu	12015af
		12065me	13370eu	15190af	15485eu
1200-1300	Singapore, SBC Radio One	6155do			
1200-1300	Singapore,R Singapore Int	9530as			
1200-1300	South Korea, R Korea Intl	7800as			
1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300	United Kingdom,BBC London	5965na	6190af	6195na	9410eu
		9515na	9740na	11750as	11760as
		11940af	12095af	15070af	15220na
		15310as	15575me	17640af	17705eu
		17830af	17885af	21660af	
1200-1300	USA, KAIJ Dallas TX	5810am	9815am		
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	6095na	9425au	9455na	13625as
1200-1300	USA, VOA Washington DC	6110as	9645as	9760as	11715as
		15160as	15425as		
1200-1300	USA, WEWN Birmingham AL	6000na			
1200-1300 vl	USA, WHRI Noblesville IN	6040am	9850am		
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300 s	USA, WRMI/R Miami Intl	9955am			
1200-1300	USA, WVHA Green Bush ME	11745eu			
1200-1300	USA, WWCR Nashville TN	5065am	5935am	15685am	
1200-1300	USA, WYFR Okeechobee FL	5950na	7355na	11830na	11970na
1200-1230	Uzbekistan, R Tashkent	6025eu	9715eu	13785eu	
1220-1229 vl	Ghana, Ghana Broadc Corp	4915do			
1230-1300	Australia, Radio	5995pa	6060pa	7260as	11800pa
		15565as			
1230-1300	Bangladesh, Radio	9650as	13615as	15520as	
1230-1300 s	Belgium, R Vlaanderen Int	13675na			
1230-1300	Canada, RCI Montreal	6150as	11730as		
1230-1300	Finland, YLE/Radio	11735na	11740na	15400na	
1230-1300	France, Radio France Intl	9850eu	15155eu	15195eu	
1230-1300	Ghana, Ghana Broadc Corp	6130do	7295do		
1230-1300	Indonesia, RRI Sorong	4875do			
1230-1300	Russia, Voice of	6000eu	6060eu	11655as	
1230-1300	South Korea, R Korea Intl	9570as	11740as	13670eu	
1230-1300	Sweden, Radio	11650na	15240na		
1230-1300	Turkey, Voice of	9675as			
1230-1300	Vietnam, Voice of	10059as	12025as	15010as	
1230-1300	Yugoslavia, Radio	11835au	11865au		
1240-1250	Greece, Voice of	9935af	11645af	15650af	

SELECTED PROGRAMS

Sundays

1210 Radio Australia: Charting Australia. See S 0010.
1216 Radio France Int'l: India Today. Correspondent reports and interviews on Indian affairs.
1222 Radio France Int'l: Paris Promenade. Spotlight on a city bistro or restaurant.
1225 Radio Netherlands: Program Info. See S 0125.
1227 Radio France Int'l: Counterpoint (biweekly). A specific human rights issue is examined.
1227 Radio France Int'l: Echoes from Africa (biweekly). An African music program.
1230 Radio Australia: Report from Asia. A weekly roundup of Asian events.
1233 Radio France Int'l: Club 9516. Listener letters are read in this mailbag program.
1235 Radio Netherlands: They're Playing My Song. See S 0235.
1253 Radio Netherlands: EuroQuest. See S 0253.

Mondays

1210 Radio Australia: Australiana. A variety of Australian topics are discussed in these 20-minute segments.

1225 Radio Netherlands: Press Review. Summary of items in the Dutch media.
1230 Radio Australia: International Report. See M 0430.
1231 Radio France Int'l: RFI Europe. European press review focuses on current affairs in other countries of the region.
1237 Radio Netherlands: Newsline. See S 0038.
1240 Radio France Int'l: Sports. A summary of the seasonal matches from around the continent.
1247 Radio France Int'l: Arts in France. Profile on the work of a French artist or a cultural activity such as music.
1253 Radio Netherlands: From Sapphire to Laser. Robert Green takes an issue and illustrates how composers have tackled the subject.

Tuesdays

1210 Radio Australia: Australiana. See M 1210.
1225 Radio Netherlands: Press Review. See M 1225.
1230 Radio Australia: International Report. See M 0430.
1231 Radio France Int'l: France Today. Current happenings in France.
1233 Radio France Int'l: RFI Europe. See M 1231.
1237 Radio Netherlands: Newsline. See S 0038.
1242 Radio France Int'l: Books. New books, publishing trends, and authors.
1249 Radio France Int'l: Science Probe. Developments in the world of science, technology, and health.
1252 Radio Netherlands: Variable Feature Series. See T 0153.

Wednesdays

1210 Radio Australia: Charting Australia. See S 0010.
1225 Radio Netherlands: Press Review. See M 1225.
1230 Radio Australia: International Report. See M 0430.
1231 Radio France Int'l: RFI Europe. See M 1231.
1237 Radio Netherlands: Newsline. See S 0038.
1241 Radio France Int'l: The Bottom Line. Focus on financial matters.
1247 Radio France Int'l: Land of France. A feature on life and times in France.
1253 Radio Netherlands: Sounds Interesting. See S 0052.

Thursdays

1210 Radio Australia: Australiana. See M 1210.
1225 Radio Netherlands: Press Review. See M 1225.
1230 Radio Australia: International Report. See M 0430.
1231 Radio France Int'l: Sports. See M 1240.
1234 Radio France Int'l: RFI Europe. See M 1231.
1237 Radio Netherlands: Newsline. See S 0038.
1244 Radio France Int'l: The Americas Magazine (5). NEW! Focus on a subject relating to a country of the western hemisphere.
1249 Radio France Int'l: North/South (biweekly). Focus on a public activity in France.
1249 Radio France Int'l: Planet Earth (biweekly). An interview with an expert on ecological matters.
1252 Radio Netherlands: Research File. See M 1152.

Fridays

1210 Radio Australia: Australiana. See M 1210.
1225 Radio Netherlands: Press Review. See M 1225.
1230 Radio Australia: International Report. See M 0430.
1231 Radio France Int'l: RFI Europe. See M 1231.
1237 Radio Netherlands: Newsline. See S 0038.
1240 Radio France Int'l: Made in France. See H 1448.
1247 Radio France Int'l: Film Reel. Interview with an performer or film maker.
1254 Radio Netherlands: Documentary. See W 1154.

Saturdays

1210 Radio Australia: Ockham's Razor. Robyn Williams with straight, sharp talk about science.
1225 Radio Netherlands: EuroPress Review. See A 0125.
1228 Radio France Int'l: Spotlight on Africa. Correspondent reports and interviews on African affairs.
1230 Radio Australia: Background Report. In-depth reports examining a broad range of influences that shape our world.
1237 Radio Netherlands: Newsline. See S 0038.
1247 Radio France Int'l: French Lesson. Learn French by radio.
1252 Radio Netherlands: Bats, Balls & Baselines. See A 0252.

FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240as	9610as	11800pa
1300-1330	Australia, Radio	6060pa	6080as		
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 mtwhfa	Belgium, R Vlaanderen Int	13675na			
1300-1320	Brazil, Radiobras	15445na			
1300-1400 vl	Canada, CBC N Quebec Svc	9625do			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 mtwhf	Canada, RCI Montreal	6150na	11855na	17820na	
1300-1400	China, China Radio Intl	8425as	9715as	15440pa	
1300-1400	Costa Rica, R Peace Intl	9400am	15050am		
1300-1400	Ecuador, HCJB Quito	12005am	15115am	17890am	21455eu
1300-1400 as	Eqt Africa, R East Africa	9585af			
1300-1330	Ghana, Ghana Broadc Corp	3366do	4915do		
1300-1400 vl	Guatemala, AWR	5980ca			
1300-1400 mtwh/vl	Italy, IRRS Milan	7125va			
1300-1400 mtwhfa	Lebanon, Wings of Hope	9960me			
1300-1400 vl	Liberia, Radio ELBC	7275do			
1300-1400	Malaysia, Radio	7295do			
1300-1400	Malaysia, RTM/Kota Kinab	5980do			
1300-1400	Malaysia, RTM/Kuching	7160do			
1300-1325	Netherlands, Radio	6045eu	7130eu	7160eu	
1300-1350	North Korea, R Pyongyang	9345as	11740as		
1300-1330 s	Norway, Radio Norway Intl	11730as	13800as	15190as	15605as
1300-1400 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1300-1400 vl	Papua New Guinea, NBC	4890do	9675do		
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1400	Romania, R Romania Intl	9690eu	11830eu	11940eu	15365eu
		15390eu	17745eu		
1300-1400	Russia, Voice of	5925as	7205eu	9540na	9680eu
		11765as	12065na	13370as	15320eu
		15460eu	15470me	15480as	15560me
1300-1400	Singapore, SBC Radio One	6155do			
1300-1400	Singapore,R Singapore Int	9530as			
1300-1330	Switzerland, Swiss R Intl	7250as	7480as	11640as	13635as
1300-1320	Turkey, Voice of	9675as			
1300-1400	United Kingdom,BBC London	5990as	6190af	6195na	7110as
		7160na	9410eu	9515na	9740na
		11750as	11760me	11940af	12095af
		15070af	15220na	15310as	15420af
		15575me	17640af	17705eu	17830af
	17885af	21660af			
1300-1330	United Kingdom,BBC London	15105af			
1300-1400	USA, KAIJ Dallas TX	5810am	9815am		
1300-1400	USA, KJES Mesquite NM	11715na			
1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, Monitor Radio Intl	6095na	9455na	13625as	
1300-1400	USA, VOA Washington DC	6110as	9645as	9760as	11805as
		15160as	15425as		
1300-1400	USA, WEWN Birmingham AL	6000na	7425na	12160na	
1300-1400	USA, WHRI Noblesville IN	6040am	15105am		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400 s	USA, WRMI/R Miami Intl	9955am			
1300-1400	USA, WVHA Green Bush ME	11745eu			
1300-1400	USA, WWCR Nashville TN	5065am	5935am	15685am	
1300-1400	USA, WYFR Okeechobee FL	5950na	9705na	11550na	11830na
		11970na	13695af		
1303-1310	Croatia, Croatian Radio	5895eu	7370eu	9830eu	13640eu
		13830eu			
1307-1400 occsnal	New Zealand, R NZ Intl	6100pa			
1330-1400	Austria, R Austria Intl	15450as			
1330-1400	Canada, RCI Montreal	6150as	9535as		
1330-1400	Costa Rica, R Peace Intl	9400am			
1330-1400	Finland, YLE/Radio	11735na	15400na	17740na	
1330-1400 tw	Ghana, Ghana Broadc Corp	4915do			
1330-1400	India, All India Radio	13732as	15120as		
1330-1400	Moldova, R Moldova Intl	15315eu			
1330-1400	Netherlands, Radio	9895as	13700as	15150as	
1330-1400	Russia, Voice of	12015as	15190eu		
1330-1400	Sweden, Radio	11650na	15240na		
1330-1400	Switzerland, Swiss R Intl	6165eu	9535eu		
1330-1400	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605me
1330-1400	Uzbekistan, R Tashkent	6025eu	9715eu	13785eu	
1330-1400	Vietnam, Voice of	10059as	12025as	15010as	
1335-1345	Greece, Voice of	15650na	17520na		
1345-1400	Vatican State, Vatican R	11625as	12050as	15585pa	
1400-1500	Australia, AF Radio	8743af	10623af		
1400-1430	Australia, Radio	5995pa	7240pa	9610pa	9710pa
		11800pa			
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			

SELECTED PROGRAMS

Sundays

1310 Radio Australia: Oz Sounds. Twenty minutes of music selections by Radio Australia announcers.
1330 Radio Australia: The Europeans. See S 0130.
1330 Radio Austria Int'l: Report from Austria. See S 0630.
1336 Radio Netherlands: Happy Station. See S 0137.

Mondays

1310 Radio Australia: Asia Focus. Reporting on the commercial interrelationships of the Asia/Pacific Region.
1310 Voice of America (as): Spotlight on Business and Finance. NEW! See M 1110.
1330 Radio Australia: The Australian Music Show. See S 0530.
1330 Radio Austria Int'l: Report from Austria. See S 0630.
1338 Radio Netherlands: Newsline. See S 0038.
1352 Radio Netherlands: Research File. See M 1152.

Tuesdays

1310 Radio Australia: Asia Focus. See M 1310.
1310 Voice of America (as): Inside USA. NEW! See T 1110.
1330 Radio Australia: Jazz Notes. The best of Australian jazz introduced by Ivan Lloyd.
1330 Radio Austria Int'l: Report from Austria. See S 0630.
1338 Radio Netherlands: Newsline. See S 0038.
1353 Radio Netherlands: Variable Feature Series. See T 0153.

Wednesdays

1310 Radio Australia: Asia Focus. See M 1310.
1310 Voice of America (as): International Focus. NEW! See W 1110.
1330 Radio Australia: Blacktracker. Mal Honess with traditional and contemporary aboriginal music.
1330 Radio Austria Int'l: Report from Austria. See S 0630.
1338 Radio Netherlands: Newsline. See S 0038.
1354 Radio Netherlands: Documentary. See W 1154.

Thursdays

1310 Radio Australia: Asia Focus. See M 1310.
1310 Voice of America (as): Reporter's Notebook. NEW! See H 1110.
1330 Radio Australia: Australian Country Style. Graham Bell goes up country.
1330 Radio Austria Int'l: Report from Austria. See S 0630.
1338 Radio Netherlands: Newsline. See S 0038.
1353 Radio Netherlands: Media Network. See H 0152.

Fridays

1310 Radio Australia: Asia Focus. See M 1310.
1310 Voice of America (as): Perspectives. NEW! See F 1110.
1330 Radio Australia: Music Deli. Paul Petran present music from a variety of cultures.
1330 Radio Austria Int'l: Report from Austria. See S 0630.
1338 Radio Netherlands: Newsline. See S 0038.
1352 Radio Netherlands: Variable Feature Series. See T 0153.

Saturdays

1310 Radio Australia: Business Weekly. See S 1610.
1330 Radio Australia: The Australian Scene. See A 0130.
1330 Radio Austria Int'l: Report from Austria. See S 0630.
1338 Radio Netherlands: Newsline. See S 0038.
1352 Radio Netherlands: Sounds Interesting. See S 0052.

1400 UTC SHORTWAVE GUIDE 10:00 AM EDT 7:00 AM PDT

FREQUENCIES

1400-1500 vl	Australia, VL8T Tent Crk	2325do			
1400-1500	Bahrain, Radio	6010do			
1400-1500 vl	Canada, CBC N Quebec Svc	9625do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, 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	9535as	9785as
1400-1500	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1400-1430	Ecuador, HCJB Quito	12005am	15115am	21455eu	
1400-1500 as	Eqt Africa, R East Africa	9585af			
1400-1500	France, Radio France Intl	5405as	7110as	17560af	
1400-1420	Ghana, Ghana Broadc Corp	3366do	4915do		
1400-1500 vl	Guatemala, AWR	5980ca			
1400-1500	India, All India Radio	13732as	15120as		
1400-1500 mtwh/vl	Italy, IRRS Milan	7125va			
1400-1500	Japan, NHK/Radio	9535na	9750as	11705na	11840as
		11915as			
1400-1500 mtwhfa	Lebanon, Wings of Hope	9960me			
1400-1500 vl	Liberia, Radio ELBC	7275do			
1400-1500	Malaysia, Radio	7295do			
1400-1500	Malaysia, RTM/Kota Kinab	5980do			
1400-1500	Malaysia, RTM/Kuching	7160do			
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1500 s	Morocco, RTV Marocaine	17575af			
1400-1500	Netherlands, Radio	9895as	13700as	15150as	
1400-1500 occsnal	New Zealand, R NZ Intl	6100pa			
1400-1405	Nigeria, FRCN/Radio	4990do	7285do		
1400-1430 s	Norway, Radio Norway Intl	13800na	17795na		
1400-1430 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1400-1500	Philippines, FEBC/R Intl	11995as			
1400-1500	Russia, Voice of	5925as	7205as	7490as	9680eu
		9830na	12015as	12065eu	13370as
		15320as	15465eu	15480as	15560as
1400-1500	Singapore, SBC Radio One	6155do			
1400-1500 vl	Slovakia, AWR	9455af			
1400-1500	South Korea, R Korea Intl	5975as	7275as	11740as	
1400-1500	United Kingdom,BBC London	5990as	6190af	6195as	7110as
		7180as	9410eu	9515na	9660as
		9740na	11750as	11940af	12095af
		15070af	15575me	17640af	17705eu
		17830af	17840na	21470af	21660af
1400-1500	USA, KAIJ Dallas TX	13815am	15725am		
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510am			
1400-1500	USA, Monitor Radio Intl	9355as			
1400-1500	USA, VOA Washington DC	6110as	7215as	9645as	9760as
		15160as	15205as	15395as	15425as
1400-1500	USA, WEWN Birmingham AL	7425na			
1400-1500 vl	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500 twhfas	USA, WRMI/R Miami Intl	9955am			
1400-1500	USA, WVHA Green Bush ME	11745eu			
1400-1500	USA, WWCR Nashville TN	5065am	13845am	15685am	
1400-1500	USA, WYFR Okeechobee FL	9705na	11550na	11830na	17760na
1400-1500	Zambia, R Christian Voice	6065af			
1415-1500 mtwtfa	Bhutan, Bhutan BC Service	5025do			
1430-1500	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	11660as	11695pa
		11800pa			
1430-1500	Austria, R Austria Intl	6155eu	9880me	11780as	13730eu
1430-1500	Canada, RCI Montreal	9555me	11915eu	11935me	15315eu
		15325me	17820af		
1430-1500	China, China Radio Intl	11445as	15135as		
1430-1500	Ecuador, HCJB Quito	15115am	17890am	21455eu	
1430-1500	Finland, YLE/Radio	11735na	15400na	17740na	
1430-1500 s	Ghana, Ghana Broadc Corp	3366do			
1430-1500	Myanmar, Radio	5990do	7185do		
1430-1500	Romania, R Romania Intl	11740as	11810as	15335as	
1445-1500	Mongolia, R Ulan Bator	7290na	12000na		

SELECTED PROGRAMS

Sundays

1410 Radio Australia: Sports Bulletin. See S 1120.
1416 Radio France Int'l: African Analysis (biweekly). An in-depth analysis of African current affairs.
1416 Radio France Int'l: Asian Analysis (biweekly). An in-depth analysis of Asian current affairs.
1422 Radio France Int'l: Paris Promenade. See S 1222.
1425 Radio Netherlands: Music Break. See S 0225.
1427 Radio France Int'l: Counterpoint. See S 1227.
1430 Radio Australia: Report from Asia. See S 1230.
1433 Radio France Int'l: Club 9516. See S 1233.
1436 Radio Netherlands: They're Playing My Song. See S 0235.
1453 Radio Netherlands: EuroQuest. See S 0253.

Mondays

1410 Radio Australia: Sports Bulletin. See S 1120.
1425 Radio Netherlands: Music Break. See S 0225.
1430 Radio Australia: International Report. See M 0430.
1431 Radio France Int'l: RFI Europe. See M 1231.
1438 Radio Netherlands: Newsline. See S 0038.
1440 Radio France Int'l: Sports. See M 1240.
1447 Radio France Int'l: Arts in France. See M 1247.
1450 Radio Australia: Stock Exchange Report. Financial news from Sydney and other exchanges.
1453 Radio Netherlands: From Sapphire to Laser. See M 1253.

Tuesdays

1410 Radio Australia: Sports Bulletin. See S 1120.
1425 Radio Netherlands: Music Break. See S 0225.
1430 Radio Australia: International Report. See M 0430.
1431 Radio France Int'l: France Today. See T 1231.
1433 Radio France Int'l: RFI Europe. See M 1231.
1438 Radio Netherlands: Newsline. See S 0038.
1442 Radio France Int'l: Books. See T 1242.
1449 Radio France Int'l: Science Probe. See T 1249.
1450 Radio Australia: Stock Exchange Report. See M 1450.
1453 Radio Netherlands: Mirror Images. See T 1152.

Wednesdays

1410 Radio Australia: Sports Bulletin. See S 1120.
1425 Radio Netherlands: Music Break. See S 0225.
1430 Radio Australia: International Report. See M 0430.
1431 Radio France Int'l: RFI Europe. See M 1231.
1438 Radio Netherlands: Newsline. See S 0038.
1443 Radio France Int'l: The Bottom Line. See W 1241.
1446 Radio France Int'l: Land of France. See W 1247.
1450 Radio Australia: Stock Exchange Report. See M 1450.
1453 Radio Netherlands: Sounds Interesting. See S 0052.

Thursdays

1410 Radio Australia: Sports Bulletin. See S 1120.
1425 Radio Netherlands: Music Break. See S 0225.
1430 Radio Australia: International Report. See M 0430.
1431 Radio France Int'l: Sports. See M 1240.
1435 Radio France Int'l: RFI Europe. See M 1231.
1438 Radio Netherlands: Newsline. See S 0038.
1443 Radio France Int'l: North/South (biweekly). See H 1249.
1443 Radio France Int'l: Planet Earth (biweekly). See H 1249.
1443 Radio France Int'l: The Americas Magazine (5). See H 1244.
1448 Radio France Int'l: Made in France. A review of something very French.
1450 Radio Australia: Stock Exchange Report. See M 1450.
1452 Radio Netherlands: Research File. See M 1152.

Fridays

1410 Radio Australia: Sports Bulletin. See S 1120.
1425 Radio Netherlands: Music Break. See S 0225.
1430 Radio Australia: International Report. See M 0430.
1431 Radio France Int'l: RFI Europe. See M 1231.
1438 Radio Netherlands: Newsline. See S 0038.
1441 Radio France Int'l: Film Reel. See F 1247.
1446 Radio France Int'l: Counterpoint (biweekly). See S 1227.
1446 Radio France Int'l: Silk Roads (biweekly). Focus on South Asia.
1450 Radio Australia: Stock Exchange Report. See M 1450.
1452 Radio Netherlands: Documentary. See W 1154.

Saturdays

1410 Radio Australia: Sports Bulletin. See S 1120.
1425 Radio France Int'l: Focus on France. Zooming in on a French news item.
1425 Radio Netherlands: Music Break. See S 0225.
1430 Radio Australia: Background Report. See A 1230.
1432 Radio France Int'l: Asia File. Correspondent reports and interviews on Asian affairs.
1438 Radio Netherlands: Newsline. See S 0038.
1440 Radio France Int'l: French Lesson. See A 1247.
1452 Radio Netherlands: Bats. Balls & Baselines. See A 0252.

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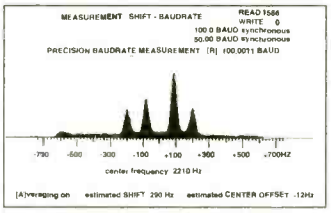

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- ARQ-E/ARQ1000 Duplex
- ARQ-N-ARQ1000 Duplex Variant
- ARQ-E3-CCIR519 Variant
- POL-ARQ 100 Baud Duplex ARQ
- TDM242/ARQ-M2/4-242
- TDM342/ARQ-M2/4
- FEC-A FEC100A/FEC101
- FEC-S • FEC1000 Simplex
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1500 UTC SHORTWAVE GUIDE 11:00 AM EDT 8:00 AM PDT

FREQUENCIES

1500-1600	Australia, AF Radio	8743af	10623af		
1500-1600	Australia, Radio	5995pa	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 vl	Canada, CBC N Quebec Svc	9625do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, 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	9335as	
1500-1600	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1500-1600	Ecuador, HCJB Quito	6080do	15115am	17490eu	21455eu
1500-1600 as	Eqt Africa, R East Africa	9585af			
1500-1550	Germany, Deutsche Welle	7195af	9735af	11965af	15145af
		17800af			
1500-1600 mt	Guam, TWR/KTWR	11580as			
1500-1600	Italy, AWR Europe	7230eu			
1500-1600 mtwh/vl	Italy, IRRS Milan	7125va			
1500-1600	Japan, NHK/Radio	9535na	9750as	11955as	15355af
1500-1600	Jordan, Radio	9560eu			
1500-1600 mtwhfa	Lebanon, Wings of Hope	9960me			
1500-1600 vl	Liberia, Radio ELBC	7275do			
1500-1600	Malaysia, Radio	7295do			
1500-1600	Malaysia, RTM/Kota Kinab	5980do			
1500-1600	Malaysia, RTM/Kuching	7160do			
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1515	Mongolia, R Ulan Bator	7290as	12000na		
1500-1525	Netherlands, Radio	9895as	13700as	15150as	
1500-1600 occsnal	New Zealand, R NZ Intl	6100pa			
1500-1530	Nigeria, FRCN/Radio	4990do	7285do		
1500-1600	Nigeria, FRCN/Voice of	7255af			
1500-1550	North Korea, R Pyongyang	9325eu	9977na	13785eu	
1500-1600	Palau, KHBN/Voice of Hope	9965as			
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1530	Romania, R Romania Intl	11740as	11810as	15335as	
1500-1600	Russia, Voice of	4940as	6035eu	7115na	7345na
		7490as	9600eu	9820eu	12015eu
		12065me	15465eu		
1500-1600	S Africa, Channel Africa	7225af			
1500-1550	Seychelles, FEBA Radio	9810as	11870as		
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600 vl	Slovakia, AWR	9455af			
1500-1600	Sri Lanka, SLBC Colombo	9720as	15425as		
1500-1530	Switzerland, Swiss R Intl	9885as	12075as	13635as	
1500-1600	United Kingdom,BBC London	5990as	6190af	6195eu	9410eu
		9515na	9660as	9740na	11705eu
		11750as	11940af	12095me	15070af
		15260na	15400eu	17830af	17840na
		21470af	21660af		
1500-1530	United Kingdom,BBC London	15420af	17790af	21490af	
1500-1600	USA, KAIJ Dallas TX	13815am	15725am		
1500-1600	USA, KTBN Salt Lk City UT	7510am			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, VOA Washington DC	6110as	7125as	7215as	9645as
		9700as	9760as	15205me	15395as
1500-1600	USA, WEWN Birmingham AL	6000na	7425na		
1500-1600	USA, WHRI Noblesville IN	13760am	15105am		
1500-1600	USA, WINB Red Lion PA	15715eu			
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600 as	USA, WRMI/R Miami Intl	9955am			
1500-1600	USA, WVHA Green Bush ME	15665eu			
1500-1600	USA, WWCR Nashville TN	12160am	13845am	15685am	
1500-1600	USA, WYFR Okeechobee FL	11830na	15215na	17760ca	
1500-1600	Zambia, R Christian Voice	6065af			
1520-]530 mtwtf	Estonia, Estonian Radio	5925eu			
1530-1545	India, All India Radio	7140as	7412as	9910as	11670me
1530-1600	Iran, VOIRI Tehran	9575as	11790as		
1530-1600	Netherlands, Radio	9895as	15150as		
1530-1600 mtwhf	Portugal, Radio	21515me			
1530-1600	Russia, Voice of	5920eu	7130na	7150af	9800eu
1545-1600	Vatican State, Vatican R	9500as	11640as		

SELECTED PROGRAMS

Sundays

1508 Deutsche Welle: Religion and Society. See S 0137.
1510 Radio Australia: Oz Sounds. See S 1310.
1518 Deutsche Welle: Through German Eyes. In-depth interviews with prominent German journalists.
1525 Radio Netherlands: Music Break. See S 0225.
1530 Radio Australia: Fine Music Australia. See S 1130.
1534 Deutsche Welle: Hits in Germany. The German pop scene for listeners in Africa.
1536 Radio Netherlands: Happy Station. See S 0137.

Mondays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 Radio Australia: Asia Focus. See M 1310.
1525 Radio Netherlands: Press Review. See M 1225.
1530 Radio Australia: Innovations. See M 1130.
1538 Deutsche Welle: Monday Special. Interview or report on events or developments in African affairs.
1538 Radio Netherlands: Newsline. See S 0038.
1553 Radio Netherlands: Research File. See M 1152.

Tuesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 Radio Australia: Asia Focus. See M 1310.
1525 Radio Netherlands: Press Review. See M 1225.

1530 Radio Australia: Arts Australia. See T 1130.
1533 Deutsche Welle: Insight. A weekly analysis of major developments on the international scene.
1538 Radio Netherlands: Newsline. See S 0038.
1553 Radio Netherlands: Variable Feature Series. See T 0153.

Wednesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 Radio Australia: Asia Focus. See M 1310.
1525 Radio Netherlands: Press Review. See M 1225.
1530 Radio Australia: Science File. See W 1130.
1534 Deutsche Welle: Living in Germany. See M 0118.
1538 Radio Netherlands: Newsline. See S 0038.
1553 Radio Netherlands: Documentary. See W 1154.

Thursdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 Radio Australia: Asia Focus. See M 1310.
1525 Radio Netherlands: Music Break. See S 0225.
1530 Radio Australia: Couchman. See H 1130.
1534 Deutsche Welle: Spotlight on Sport. Weekly magazine program with background stories and coverage of important events.
1538 Radio Netherlands: Newsline. See S 0038.
1552 Radio Netherlands: Media Network. See H 0152.

Fridays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 Radio Australia: Asia Focus. See M 1310.
1525 Radio Netherlands: Press Review. See M 1225.
1530 Radio Australia: The Parliament Program. See F 1130.
1534 Deutsche Welle: Economic Notebook. See T 0332.
1538 Radio Netherlands: Newsline. See S 0038.
1552 Radio Netherlands: Variable Feature Series. See T 0153.

Saturdays

1509 Deutsche Welle: Africa in the German Press. What the German newspapers and weeklies have to say about Africa.
1510 Radio Australia: Oz Sounds. See S 1310.
1518 Deutsche Welle: Focus on Development (biweekly). Reports and interviews on projects and progress in Africa and Asia.
1518 Deutsche Welle: Women on the Move (biweekly). A magazine promoting intercultural understanding and portraying the role of women in society.
1525 Radio Netherlands: Music Break. See S 0225.
1530 Radio Australia: Business Weekly. See S 1610.
1533 Deutsche Welle: Science and Technology. See M 1634.
1538 Radio Netherlands: Newsline. See S 0038.
1551 Radio Netherlands: Sounds Interesting. See S 0052.

HAUSER'S HIGHLIGHTS

USA: WVHA PROPHECY COUNTDOWN

Preliminary frequency schedule March 26 until Sep 24:
7455 at 0600-0800;
7465 at 0200-0600;
9852.5 (+/- 2.5) 2200-0200;
9870 at 0600-1000;
11745 (ex-11695) at 1200-1600;
11930 at 1000-1100;
13720 at 1700-2300;
13770 at 1000-1200;
15665 at 1200-1700;
new 15745 at 1100-2100 — is this too far out of band for your receiver?
17612.5 at 1700-1800
(via Diane Mauer, George Thurman, Daniel Atkinson, gh)

FREQUENCIES

1600-1615	Albania, R Tirana Intl	7155eu	9760eu		
1600-1630	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	11660pa	11695pa
		11800pa			
1600-1700 vl	Australia, VL8A Alice Spg	2310dc			
1600-1700 vl	Australia, VL8K Katherine	2485dc			
1600-1700 vl	Australia, VL8T Tent Crk	2325dc			
1600-1700	Bahrain, Radio	6010dc			
1600-1700 vl	Canada, CBC N Quebec Svc	9625dc			
1600-1700	Canada, CFCX Montreal	6005dc			
1600-1700	Canada, CFRX Toronto	6070dc			
1600-1700	Canada, CFVP Calgary	6030dc			
1600-1700	Canada, CKZN St John's	6160dc			
1600-1700	Canada, CKZU Vancouver	6160dc			
1600-1700 s	Canada, RCI Montreal	11955na	17820na		
1600-1700	China, China Radio Intl	4130as	11575as	15110af	15130af
1600-1700	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1600-1700	Ecuador, HCJB Quito	6080dc	15350eu	21455eu	
1600-1700	Ethiopia, Radio	7165af	9560af		
1600-1700	France, Radio France Intl	6175eu	9485me	11615af	11700af
		12015af	15530af		
1600-1650	Germany, Deutsche Welle	6170as	7225as	7305as	9525as
		9585as	11795as	13790na	
1600-1700	Guam, AWR/KSDA	9370as			
1600-1615 mt	Guam, TWR/KTWR	11580as			
1600-1630 whfas	Guam, TWR/KTWR	11580as			
1600-1630	Iran, VOIRI Tehran	9575as	11790as		
1600-1700 mtwh/vl	Italy, IRRS Milan	7125va			
1600-1700	Jordan, Radio	9560eu			
1600-1630 mtwhfa	Lebanon, Wings of Hope	9960me			
1600-1700 vl	Liberia, Radio ELBC	7275dc			
1600-1700	Malaysia, Radio	7295dc			
1600-1625	Netherlands, Radio	9895as	15150as		
1600-1649 occsnal	New Zealand, R NZ Intl	6100pa			
1600-1700	Nigeria, FRCN/Radio	4990dc	7285dc		
1600-1700	Nigeria, FRCN/Voice of	7255af			
1600-1630	Pakistan, Radio	9435af	9470af	11570af	13590af
		15555af	15675af	17660af	
1600-1700	Russia, Voice of	5905eu	5950eu	5965eu	6015as
		6035as	7205na	7345na	7370eu
		7490eu	9550na	11920na	15105af
		17780eu			
1600-1700	S Africa, Channel Africa	7240af	15240af		
1600-1700	Singapore, SBC Radio One	6155dc			
1600-1700 vl	Slovakia, AWR	9455af			
1600-1700	South Korea, R Korea Intl	5975as	9515af	9870af	
1600-1630	Sri Lanka, SLBC Colombo	9720as	15425as		
1600-1700	Swaziland, Trans World R	9500af			
1600-1640	UAE, Radio Dubai	13675eu	15320eu	15395me	
1600-1700	United Kingdom,BBC London	3915as	6190af	6195eu	9410af
		9515na	9740as	11750as	11940af
		12095af	15070af	15260na	15400eu
		17830af	21660af		
1600-1615	United Kingdom,BBC London	5990as	9660as	17705eu	17840na
		21470af			
1600-1700	USA, KAIJ Dallas TX	13815am	15725am		
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	6120as			
1600-1700	USA, Monitor Radio Intl	9355af	21640af		
1600-1700	USA, VOA Washington DC	3970af	6110as	7125as	7215as
		9645as	9700as	9760as	11920af
		12040af	13710af	15205as	15225af
		15320af	15395as	15410af	15445af
		17785af	17895af		
1600-1700	USA, WEWN Birmingham AL	9455na			
1600-1700	USA, WHRI Noblesville IN	13760am	15105am		
1600-1700	USA, WINB Red Lion PA	15715eu			
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700 as	USA, WRMI/R Miami Intl	9955am			
1600-1700	USA, WRNO New Orleans LA	15420am			
1600-1700	USA, WVHA Green Bush ME	15665eu			
1600-1700	USA, WWCR Nashville TN	12160am	13845am	15685eu	
1600-1700	USA, WYFR Okeechobee FL	11830na	15215na	15566eu	17760na
		21525af	21745eu		
1600-1700	Zambia, R Christian Voice	6065af			
1615-1700	United Kingdom,BBC London	5975as	9510as	9630af	15420af
1615-1630	Vatican State, Vatican R	7250eu	9645eu		
1630-1700	Australia, Radio	6060pa	6080pa	7260as	9710pa
		9860pa	11660pa	11695pa	11880pa
1630-1700	Austria, R Austria Intl	11780as			
1630-1700	Canada, RCI Montreal	7150as	9550as		
1630-1700 mtwhfa	Liberia, Radio ELWA	4760dc			
1630-1700	Russia, Voice of	6110eu	7150na	7380as	9800eu
1630-1700	Zimbabwe, ZBC/Radio 4	3306dc	3396dc	4828dc	
1640-1650 s	Rwanda, Radio	6055dc			
1645-1700	Tajikistan, Radio	7245as			
1650-1700 mtwhf	New Zealand, R NZ Intl	6100pa			

SELECTED PROGRAMS

Sundays

1609 Channel Africa: Africa This Week. A review of this week's major news events.
1609 Deutsche Welle: Arts on the Air. See S 1109.
1610 Radio Australia: Business Weekly. Business and finance developments in the Asia/Pacific region.
1618 Radio France Int'l: Environment Africa (biweekly). African endeavors to deal with environmental issues.
1618 Radio France Int'l: Health Africa (biweekly). African programs dealing with health and medicine.
1623 Radio France Int'l: Paris Promenade. See S 1222.
1630 Radio Australia: Report from Asia. See S 1230.
1630 Radio France Int'l: Club 9516. See S 1233.
1634 Deutsche Welle: German by Radio. See S 1134.
1646 Radio France Int'l: African Analysis (biweekly). See S 1416.
1646 Radio France Int'l: Echoes from Africa (biweekly). See S 1227.

Mondays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1610 Radio Australia: Australiana. See M 1210.

1610 Voice of America (as/eu): Spotlight on Business and Finance. NEW! See M 1110.
1627 Channel Africa: Sports Watch. The latest in sports from around the continent.
1630 Radio Australia: International Report. See M 0430.
1631 Radio France Int'l: RFI Europe. See M 1231.
1634 Deutsche Welle: Science and Technology. Magazine program presenting new developments in science and technology.
1640 Radio France Int'l: Sports. See M 1240.
1647 Radio France Int'l: Arts in France. See M 1247.
1648 Channel Africa: Techno Watch. The latest advances in technology in Africa.

Tuesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1610 Radio Australia: Australiana. See M 1210.
1610 Voice of America (as/eu): Inside USA. NEW! See T 1110.
1630 Channel Africa: Sports Watch. See M 1627.
1630 Radio Australia: International Report. See M 0430.
1633 Radio France Int'l: RFI Europe. See M 1231.
1634 Deutsche Welle: Man and Environment. Various topics relating to the environment in industrial and developing countries.
1642 Radio France Int'l: Books. See T 1242.
1647 Radio France Int'l: Drumbeat. African feature.

Wednesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1610 Radio Australia: Australiana. See M 1210.
1610 Voice of America (as/eu): International Focus. NEW! See W 1110.
1630 Channel Africa: Sports Watch. See M 1627.
1630 Radio Australia: International Report. See M 0430.
1631 Radio France Int'l: RFI Europe. See M 1231.
1634 Deutsche Welle: Insight. See T 1533.
1641 Radio France Int'l: The Bottom Line. See W 1241.
1646 Radio France Int'l: Land of France. See W 1247.

Thursdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1610 Radio Australia: Australiana. See M 1210.
1610 Voice of America (as/eu): Reporter's Notebook. NEW! See H 1110.
1630 Channel Africa: Sports Watch. See M 1627.
1630 Radio Australia: International Report. See M 0430.
1630 Radio France Int'l: Sports. See M 1240.
1632 Radio France Int'l: RFI Europe. See M 1231.
1634 Deutsche Welle: Living in Germany. See M 0118.
1641 Radio France Int'l: North/South (biweekly). See H 1249.
1641 Radio France Int'l: Planet Earth (biweekly). See H 1249.
1646 Radio France Int'l: Science Probe. See T 1249.

Fridays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1610 Radio Australia: Australiana. See M 1210.
1610 Voice of America (eu): Perspectives. NEW! See F 1110.
1630 Radio Australia: International Report. See M 0430.
1631 Radio France Int'l: RFI Europe. See M 1231.
1634 Deutsche Welle: Spotlight on Sport. See H 1534.
1641 Radio France Int'l: Film Reel. See F 1247.
1646 Radio France Int'l: Made in France. See H 1448.

Saturdays

1609 Channel Africa: Today's Dream. A musical magazine for Africa's youth.
1609 Deutsche Welle: International Talking Point. See S 0416.
1610 Radio Australia: Asia Focus. See M 1310.
1614 Radio France Int'l: Focus on France. See A 1425.
1623 Deutsche Welle: Development Forum. Reports and interviews on projects and progress in Africa and Asia.
1630 Radio Australia: Background Report. See A 1230.
1631 Radio France Int'l: Spotlight on Africa. See A 1228.
1639 Channel Africa: Music in the Sun. Pop music for a Saturday morning.
1640 Deutsche Welle: Religion and Society. See S 0137.
1645 Radio France Int'l: French Lesson. See A 1247.

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, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	4130as	7405af	9535as	11575af
1700-1800	Costa Rica, R Peace Intl	7385am	9400am	15050am	17910am
1700-1730	Czech Rep, Radio Prague	5930as	7345eu	9420me	
1700-1800	Ecuador, HCJB Quito	6080do	15490eu	21455eu	
1700-1800 vl	Eqt Guinea, Radio Africa	7200af			
1700-1730	France, Radio France Intl	9485as	11700af		
1700-1800 mtwh/vl	Italy, IRRS Milan	7125va			
1700-1800	Japan, NHK/Radio	6150na	9535na	9580as	11930as
1700-1730	Jordan, Radio	9560eu			
1700-1800 vl	Liberia, Radio ELBC	7275do			
1700-1800 mtwhf	New Zealand, R NZ Intl	6100pa			
1700-1800	Nigeria, FRCN/Radio	3326do	4990do		
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu
1700-1750	Pakistan, Radio	7485eu	11570eu		
1700-1755	Poland, Polish R Warsaw	6000eu	7270eu	7285eu	
1700-1800	Russia, Voice of	5905me	5950eu	7115eu	7325na
		7345eu	7370eu	7490eu	9550na
		9890eu	11825na	11920na	11980as
1700-1800	S Africa, Channel Africa	7240af	15240af		
1700-1800 vl	Slovakia, AWR	7270as	9450as		
1700-1715	Swaziland, Trans World R	7120af			
1700-1730	Switzerland, Swiss R Intl	6205af	9885af	13635me	
1700-1720	Uganda, Radio	4976do			
1700-1800	United Kingdom,BBC London	3955eu	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9510as
		9630af	9740as	11750as	11940af
		12095af	15070af	15400af	15420af
		17830af			
1700-1715	United Kingdom,BBC London	9515na	15260na		
1700-1745	United Kingdom,BBC London	3915as			
1700-1800	USA, KAIJ Dallas TX	13815am	15725am		
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	7425as			
1700-1800	USA, Monitor Radio Intl	9355af	21640af		
1700-1800	USA, VOA Washington DC	5900as	5990eu	6045as	6110as
		7125as	7215as	7235as	9525as
		9645as	9670af	9700eu	9760af
		9770af	11895af	11920af	11945af
		12040af	13710af	15205as	15395as
	15410af	15445af	17895af		
1700-1800	USA, WEWN Birmingham AL	9455na	15695eu		
1700-1800	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 as	USA, WRMI/R Miami Intl	9955am			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WVHA Green Bush ME	9930af			
1700-1800	USA, WWCR Nashville TN	12160am	13845am	15685eu	
1700-1800	USA, WYFR Okeechobee FL	15566eu	17760na		
1700-1800	Zambia, R Christian Voice	6065af			
1700-1800	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do	
1705-1800	Ghana, Ghana Broadc Corp	3366do			
1715-1730 mtwhf	Swaziland, Trans World R	7120af			
1715-1800	United Kingdom,BBC London	7160me			
1730-1800	Moldova, R Moldova Intl	7235eu			
1730-1800	Netherlands, Radio	6020af	9605af	11655af	
1730-1800	Romania, R Romania Intl	9510af	9750af	11740af	11940af
1730-1800	Russia, Voice of	7130me	7340eu	9520na	9720eu
1730-1745	Sweden, Radio	6065eu			
1730-1800	Vatican State, Vatican R	7305af	9695af	9725af	11625af
1745-1800	Bangladesh, Radio	7190eu	9647eu		
1745-1800 mtwhf	Canada, RCI Montreal	5995me	11935me	13610eu	15325eu
		17820eu			
1745-1800	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as	15075me	

1800-1830	Albania, R Tirana Intl	7230eu	9730eu		
1800-1900	Australia, Radio	6060pa	6080pa	9580pa	9860pa
		11660as	11695pa	11880pa	
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1800-1900	Bahrain, Radio	6010do			
1800-1900	Bangladesh, Radio	7190eu	9647eu		
1800-1830	Belgium, R Vlaanderen Int	5910eu	9925af		
1800-1900	Bulgaria, Radio	7305eu	9700eu		
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	7385am	9400am	15050am	17910am
1800-1830	Czech Rep, Radio Prague	5930eu	7345eu	9420eu	
1800-1900	Ecuador, HCJB Quito	6080do	15490eu	21455eu	
1800-1900 vl	Eqt Guinea, Radio Africa	7200af			
1800-1830	Ghana, Ghana Broadc Corp	3366do	4915do		
1800-1900	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as	15075me	
1800-1900 mtwh/vl	Italy, IRRS Milan	7125va			
1800-1900	Kenya, Kenya Broadc Corp	4885do	4935do		
1800-1900	Kuwait, Radio	11990na			
1800-1830 mtwhfa	Lebanon, Voice of	6550eu			
1800-1900	Liberia, Radio ELBC	7275do			
1800-1900	Liberia, Radio ELWA	4760do			
1800-1830	Netherlands, Radio	6020af	9605af	11655af	
1800-1849 mtwhf	New Zealand, R NZ Intl	6100pa			
1800-1830	Nigeria, FRCN/Radio	3326do	4990do		
1800-1830 s	Norway, Radio Norway Intl	5960eu			
1800-1900	Russia, Voice of	4940eu	5905me	5950eu	6065as
		7180as	7345eu	7370eu	7490eu
		9550eu	9860eu	9890eu	11945as
		13670af			
1800-1900 vl	Slovakia, AWR	9455af			
1800-1900 irreg	Sudan, Sudan Natl BC	9200af			
1800-1900	Swaziland, Trans World R	3200af			
1800-1845	Swaziland, Trans World R	9500af			
1800-1900	United Kingdom,BBC London	3955eu	6005af	6180eu	6190af
		6195eu	9410eu	9630af	9740as
		11955as	12095eu	15070af	15400af
		15420af	17830af		
1800-1830	United Kingdom,BBC London	5975as	7160me	9510as	11940af
1800-1900	USA, KAIJ Dallas TX	13815am	15725am		
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625as			
1800-1900	USA, Monitor Radio Intl	9355eu	9370eu	21640af	
1800-1900	USA, VOA Washington DC	4875af	4985af	6040eu	9700eu
		9760eu	11920af	12040af	13680af
		13710af	15580af	17800af	17895af
1800-1900	USA, WEWN Birmingham AL	9455na	15695eu		
1800-1900	USA, WHRI Noblesville IN	9495am	13760eu		
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 as	USA, WRMI/R Miami Intl	9955am			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WVHA Green Bush ME	9930af			
1800-1900	USA, WWCR Nashville TN	12160am	13845am	15685am	
1800-1845	USA, WYFR Okeechobee FL	15566eu			
1800-1900	USA, WYFR Okeechobee FL	17760na			
1800-1900	Zambia, R Christian Voice	6065af			
1800-1900	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do	
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880me	13730af
1830-1900	Kazakhstan, Radio Almaty	5035eu	5260eu	5940eu	5960eu
		5970eu	9505eu		
1830-1900	Netherlands, Radio	6015af	6020af	9605af	9860af
		9895af	15315af	17605af	
1830-1845	Rwanda, Radio	6055do			
1830-1900	Slovakia, R Slovakia Intl	5915eu	7345eu		
1830-1900	United Kingdom,BBC London	3255af			
1830-1900	Yugoslavia, Radio	6100eu	9720af		
1833-1900	Cote D' Ivoire, RDTV	11920do			
1840-1850	Greece, Voice of	9935af	11645af		
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900 mtwhfa	New Zealand, R NZ Intl	11910pa			

ICOM™ IC-R7100
Sweeping 1800 Channels/Minute

DELTACOMM™ I-7100 communication manager and your MS-DOS computer gives you a custom interface integrated with optimized software that will not just control but will maximize the potential of your R7100. Here are a few (there are many more) examples of the advanced features DELTACOMM™ I-7100 has to offer.

- DELTACOMM™ I-7100 CYBERSCAN feature for monitoring systems employing cluster or frequency hopping techniques.
- Individually programmable database volume levels (by channel) while scanning.
- Spectrum log function will sweep a frequency spectrum, generate a histogram and log frequency/activity to screen and/or disk in real time.
- Dual squelch detect electronics integrated with DELTACOMM™ I-7100 software guarantees optimum speed and performance during a frequency search or database scan.
- Programmable signal strength threshold limits with full 8-bit accuracy allow selective monitoring and logging. Only stations having signal strength less than or greater than or within upper/lower user defined signal strength window limits will be monitored and/or logged.
- Continously updating activity information window displays the last 19 active channels.
- Channel activity status is displayed in real time with activity log function. To determine system loading when first 5 channels are simultaneously busy, "All Trunks Busy" message is logged to disk.
- Receiver characterization with DELTACOMM™ I-7100 birdie log function automatically logs any receiver birdies prior to a frequency search operation. Birdie channels are then locked out during a frequency search operation, thus eliminating false channel logging.
- Custom interface allows selective program control of relay contact. Possible uses include activating an operator alert, switching antennas via coax relay or turning on a tape recorder when user defined frequencies are found to be active.

DELTACOMM™ I-7100 communication manager comes complete with Delta Research custom (CI-V) communication interface, UL listed power supply, manual and receiver interface cable for $349.00 + $8.00 (U.S.) or $25.00 (foreign) S&H. Contact us for additional information on DELTACOMM™ communication managers for ICOM™ R7000, R71A, R72 and IC735. Performance is proportional to video card, type of computer and receiver squelch detection method.

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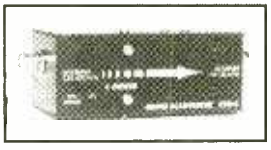

The CVR-4 Scanverter comes with a universal adaptor kit so that it can be connected directly to a handheld scanner for portability, or to the rear of a base or mobile scanner (BNC and Motorola adaptors included). Operates from standard 9-volt alkaline battery (not included).

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FREQUENCIES

1900-2000 mtwhf	Argentina, RAE	15345eu				
1900-2000	Australia, Radio	6060pa	6080pa	6150as	7240pa	
	7260as 9560as	9580pa	9860pa	11660pa	11695pa	
	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				
1900-1945	Bangladesh, Radio	7190as	9647eu			
1900-2000	Brazil, Radiobras	15268eu				
1900-2000	Canada, CFCX Montreal	6005do				
1900-2000	Canada, CFRX Toronto	6070do				
1900-2000	Canada, CFVP Calgary	6030do				
1900-2000	Canada, CKZN St John's	6160do				
1900-2000	Canada, CKZU Vancouver	6160do				
1900-2000	China, China Radio Intl	6955af				
1900-2000	Costa Rica, R Peace Intl	9400am	15050am	17910am		
1900-1930	Cote D' Ivoire, RDTV	11920do				
1900-2000	Ecuador, HCJB Quito	6080do	15490eu	17490eu	21455eu	
1900-2000 vl	Eqt Guinea, Radio Africa	7200af				
1900-1950	Germany, Deutsche Welle	7110af	9665af	9670af	9765af	
	11785af 11810af	11865af	13790af	15145af	15425af	
1900-1930	Hungary, Radio Budapest	3975eu	6110eu	7220eu		
1900-1945	India, All India Radio	7412eu	9650me	9950me	11620eu	
		11935af	13750as	15075me		
1900-2000 mtwh/vl	Italy, IRRS Milan	7125va				
1900-2000	Japan, NHK/Radio	6150as	7140au	9535na	9580au	
		11850au				
1900-2000	Kenya, Kenya Broadc Corp	4885do	4935do			
1900-2000	Kuwait, Radio	11990eu				
1900-2000	Liberia, Radio ELBC	7275do				
1900-2000	Liberia, Radio ELWA	4760do				
1900-1930	Lithuania, Radio Vilnius	9710eu				
1900-1925	Netherlands, Radio	6015af	6020af	9605af	9860af	
		9895af	15315af	17605af		
1900-2000 mtwhf	New Zealand, R NZ Intl	11910pa				
1900-1958 a	New Zealand, R NZ Intl	11910pa				
1900-2000	Nigeria, FRCN/Voice of	7255af				
1900-2000 vl	Papua New Guinea, NBC	4890do	9675do			
1900-1930	Philippines, R Pilipinas	11890as				
1900-2000	Romania, R Romania Intl	5995eu	6105eu	6150eu	6190eu	
		7195eu				
1900-2000	Russia, Voice of	6110eu	7170eu	7205eu	7345eu	
		7370eu	7490eu	9550eu	9800na	
		9890eu	11825as	15205af		
1900-1915	Rwanda, Radio	6055af				
1900-2000 vl	Slovakia, AWR	9455as				
1900-2000	South Korea, R Korea Intl	5975eu				
1900-2000	Spain, R Exterior Espana	9675af				
1900-2000	Swaziland, Trans World R	3200af	3240af			
1900-1930	Switzerland, Swiss R Intl	3985eu	6135af	6165eu	9770af	
		9885af	11640af	13635af		
1900-2000	Thailand, Radio	9655eu	9700eu	11855eu	11905eu	
1900-1915	Uganda, Radio	4976do	5026do			
1900-2000	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu	
	6190af 6195eu	7160me	9410eu	9630af	9740as	
	11955as 12095me	15070af	15400af	17830af		
1900-2000	USA, KAIJ Dallas TX	13815am	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	9355eu	9370eu	17510af		
1900-2000	USA, VOA Washington DC	3980eu	6040eu	7415af	9525pa	
	9700af 9760af	11870as	11920af	12040af	13710af	
	15180pa 15410af	15445af	15580af	17800af		
1900-2000	USA, WEWN Birmingham AL	9455eu	15695eu			
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu			
1900-2000	USA, WINB Red Lion PA	12160eu				
1900-2000	USA, WJCR Upton KY	7490na	13595na			
1900-2000	USA, WMLK Bethel PA	9465eu				
1900-2000 as	USA, WRMI/R Miami Intl	9955am				
1900-2000	USA, WRNO New Orleans LA	15420am				
1900-2000	USA, WVHA Green Bush ME	9930af				
1900-2000	USA, WWCR Nashville TN	11970am	13845am	15685am		
1900-2000	USA, WYFR Okeechobee FL	17760af				
1900-2000	Zambia, R Christian Voice	6065af				
1900-2000	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do		
1930-2000	Finland, YLE/Radio	6120eu	9730eu	11755eu		
1930-2000	Iran, VOIRI Tehran	7260af	9022eu			
1930-2000	Mongolia, R Ulan Bator	7290na	13670na			
1930-2000	Netherlands, Radio	6020af	9605af	9860af	9895af	
		11655af	15315af	17605af		
1930-2000	Poland, Polish R Warsaw	6000eu	6135eu	7285eu		
1930-2000	South Korea, R Korea Intl	7250eu				
1930-2000 a	Uganda, Radio	4976do	5026do			
1935-1955	Italy, RAI Rome	7275eu	9575eu	11905eu		
1945-2000	Armenia, Radio Yerevan	4810eu	4990eu	5930eu	6065eu	
1945-2000 t	Belarus, Radio Minsk	5940eu	7105eu	7210eu	7405eu	
1950-2000	Vatican State, Vatican R	4010eu	5882eu			
1959-2000 a	New Zealand, R NZ Intl	15115as				

2000-2100	Algeria, R Algiers Intl	11715eu	11745eu			
2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7260as	
		9580pa	9860pa	11660pa	11695pa	
		11855as	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				
2000-2020	Brazil, Radiobras	15268eu				
2000-2100 vl	Canada, CBC N Quebec Svc	9625do				
2000-2100	Canada, CFCX Montreal	6005do				
2000-2100	Canada, CFRX Toronto	6070do				
2000-2100	Canada, CFVP Calgary	6030do				
2000-2100	Canada, CKZN St John's	6160do				
2000-2100	Canada, CKZU Vancouver	6160do				
2000-2100	China, China Radio Intl	4130as	8260as	9440af	9920eu	
		11715na	15110af			
2000-2100	Costa Rica, R Peace Intl	9400am	15050am	17910am		
2000-2100	Ecuador, HCJB Quito	6080do				
2000-2100 vl	Eqt Guinea, Radio Africa	7200af				
2000-2050	Germany, Deutsche Welle	5960eu	7285eu			
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do			
2000-2010	Greece, Voice of	9375eu				
2000-2100	Indonesia, Voice of	9675as				
2000-2030	Iran, VOIRI Tehran	7260af	9022eu			
2000-2010	Israel, Kol Israel	7405na	7465na	9435eu	11603na	
		15640af				
2000-2015 mtwh/vl	Italy, IRRS Milan	7125va				
2000-2100	Kenya, Kenya Broadc Corp	4885do	4935do			
2000-2100	Kuwait, Radio	11990eu				
2000-2100	Liberia, Radio ELBC	7275do				
2000-2100	Liberia, Radio ELWA	4760do				
2000-2025	Netherlands, Radio	6020af	9605af	9860af	9895af	
		11655af	15315af	17605af		
2000-2050 mtwh	New Zealand, R NZ Intl	11910pa				
2000-2005 f	New Zealand, R NZ Intl	11910pa				
2000-2005	Nigeria, FRCN/Radio	3326do	4990do			
2000-2100	Nigeria, FRCN/Voice of	7255af				
2000-2050	North Korea, R Pyongyang	6576eu	9345as	9640af	9977na	
2000-2100 vl	Papua New Guinea, NBC	4890do	9675do			
2000-2025	Poland, Polish R Warsaw	6000eu	6135eu	7285eu		
2000-2030 mtwhf	Portugal, Radio	9780eu	9815eu	11975af		
2000-2100	Russia, Voice of	6085eu	7135eu	7170eu	7205eu	
		7345eu	9530eu	9550eu	9800na	
		9890na	11675as	12050as	15385na	
2000-2030	Russia, Voice of	5920eu	6110me	7400na		
2000-2100 vl	Slovakia, AWR	6055eu	9455af			
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do			
2000-2045 s	Swaziland, Trans World R	3240af				
2000-2100	Turkey, Voice of	9400eu				
2000-2002	Uganda, Radio	4976do	5026do			
2000-2030	United Kingdom,BBC London	6190af	7160me	9630af	12095me	
		15070af	17830af			
2000-2100	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu	
		6195eu	7325eu	9410eu	9740as	
		11750sa	11955as	15400af		
2000-2100	USA, KAIJ Dallas TX	13815am	15725am			
2000-2100	USA, KTBN Salt Lk City UT	15590am				
2000-2100 as	USA, KVOH Los Angeles CA	17775am				
2000-2100	USA, Monitor Radio Intl	7510eu	9355eu			
2000-2100	USA, VOA Washington DC	3980eu	6040eu	7415af	9700eu	
		9760af	13710af	15160af	15205me	
		15410af	15445af	15580af	17725af	
2000-2100	USA, WEWN Birmingham AL	9455na	15375na			
2000-2100	USA, WHRI Noblesville IN	9495am	13760eu			
2000-2100	USA, WINB Red Lion PA	12160eu				
2000-2100	USA, WJCR Upton KY	7490na	13595na			
2000-2100	USA, WMLK Bethel PA	9465eu				
2000-2100 as	USA, WRMI/R Miami Intl	9955am				
2000-2100	USA, WRNO New Orleans LA	15420am				
2000-2100	USA, WWCR Nashville TN	11970eu	13845am	15685am		
2000-2045	USA, WYFR Okeechobee FL	21525af				
2000-2100	USA, WYFR Okeechobee FL	13695af				
2000-2030	Vatican State, Vatican R	7355af	9645af	11625af		
2000-2030	Zambia, R Christian Voice	6065af				
2000-2100	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do		
2005-2100	Syria, Radio Damascus	12085eu	15095na			
2006-2100 f	New Zealand, R NZ Intl	15115pa				
2015-2100 f/vl	Italy, IRRS Milan	7125va				
2015-2045 s	Swaziland, Trans World R	3200af				
2025-2045	Italy, RAI Rome	7235me	9710me	11800me		
2030-2100 mt	Estonia, Estonian Radio	5925eu				
2030-2100 as	Latvia, Radio	5935eu				
2030-2100 asmtwh	Moldova, R Dnestr Intl	9620eu				
2030-2100	Netherlands, Radio	9860af	9895af			
2030-2100 mtwhfa	Palau, KHBN/Voice of Hope	11980as				
2030-2100	Russia, Voice of	6185eu	9520eu	9550eu		
2030-2100	Sweden, Radio	6065eu	9655af	13690me		
2030-2050	Thailand, Radio	9655eu	9700eu	11835eu	11905eu	
2030-2100	Vietnam, Voice of	10059as	12025as	15010as		
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu	
		11715pa	15225pa			
2051-2100 mtwhf	New Zealand, R NZ Intl	15115pa				

FREQUENCIES

2100-2200	Australia, Radio	6060pa	6080pa	7240pa	7260as
		11855as	11880pa	11955pa	
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2115	Bahrain, Radio	6010do			
2100-2130	Belgium, R Vlaanderen Int	5910eu	6035eu		
2100-2200	Bulgaria, Radio	7105eu	9700eu		
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	Canada, RCI Montreal	5995eu	7260eu	9725eu	11945eu
		13650eu	13690eu	15140eu	15325eu
		17820eu			
2100-2200	China, China Radio Intl	4130as	6950eu	8260as	9920eu
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica, R Peace Intl	7385am	9400am	15050am	17910am
2100-2200	Cuba, Radio Havana Cuba	11720eu			
2100-2130	Czech Rep, Radio Prague	5930eu	7345eu	9420eu	
2100-2150	Germany, Deutsche Welle	6185as	7225af	9615af	9670as
		9690af	9765as	11785as	11810af
		15270af			
2100-2130	Hungary, Radio Budapest	3955eu	6110eu	7220eu	
2100-2200	India, All India Radio	7412eu	9910eu	9950eu	11620au
		11715au	15225au		
2100-2200 f/vl	Italy, IRRS Milan	7125va			
2100-2200	Japan, NHK/Radio	6035eu	9560as	9580af	11800eu
		11875eu	11925eu		
2100-2115	Japan, NHK/Radio	9660as	11915as		
2100-2200 mtwhfa	Liberia, Radio ELWA	4760do			
2100-2125	Netherlands, Radio	9860af	9895af		
2100-2200 mtwhfa	New Zealand, R NZ Intl	15115pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4990do		
2100-2130 s	Norway, Radio Norway Intl	6015eu	9590eu		
2100-2200 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2100-2200 vl	Papua New Guinea, NBC	4890do	9675do		
2100-2200	Romania, R Romania Intl	5990eu	6105eu	6190eu	7105eu
		7195eu	9690eu		
2100-2200	Russia, Voice of	5905eu	5920eu	5965eu	7135as
		7170eu	7205na	7330as	7350as
		7380eu	9550eu	9890eu	15580na
2100-2150	S Africa, Channel Africa	5960eu	7285eu		
2100-2115	Sierra Leone, SLBS	3316do			
2100-2200 vl	Slovakia, AWR	6055eu	7270af		
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2200	Spain, R Exterior Espana	6125eu			
2100-2105	Syria, Radio Damascus	12085eu	15095na		
2100-2110	Uganda, Radio	4976do	5026do		
2100-2200	Ukraine, R Ukraine Intl	4780na	4820eu	5940eu	6020eu
		6055na	7205na	7405na	9620as
		9810na	11870eu		
2100-2200	United Kingdom,BBC London	3255af	3915as	3955eu	5975na
		5990as	6005af	6160as	6180eu
		6195eu	7325eu	9410eu	9740as
		11750sa	11955as	13660af	15400eu
2100-2200	USA, KAIJ Dallas TX	13815am	15725am		
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200 s	USA, KVOH Los Angeles CA	17775am			
2100-2200	USA, Monitor Radio Intl	7510eu	9355na	13840au	
2100-2200	USA, VOA Washington DC	6040eu	6125eu	7415af	9760eu
		11870pa	13710af	15185pa	15205me
		15410af	15445af	15580af	17725af
		17735pa	17800af	21485af	
2100-2200	USA, WEWN Birmingham AL	7435na	15375na		
2100-2200	USA, WHRI Noblesville IN	9495am	13760am		
2100-2200	USA, WINB Red Lion PA	11915eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200	USA, WWCR Nashville TN	12160eu	13845am	15685am	
2100-2200	USA, WYFR Okeechobee FL	7355eu	11580af	13695af	
2100-2130	Yugoslavia, Radio	6100na	6185eu		
2100-2200	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130	United Kingdom,BBC London	6110am	15390am	17715am	
2130-2345	Armenia, Radio Yerevan	9480eu	11960eu		
2130-2200	Australia, Radio	9580pa	9610as	9645as	9660pa
		11695pa	15365pa	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	9870sa	13730sa		
2130-2200	Belgium, R Vlaanderen Int	9935sa			
2130-2200	Iran, VOIRI Tehran	9670au			
2130-2200	Liberia, Radio ELWA	4760do			
2130-2200	Lithuania, Radio Vilnius	9710eu			
2130-2200	Russia, Voice of	7150na	7400na		
2130-2200	Sweden, Radio	6065eu	9655eu		

2200 UTC

2200-2215	Armenia, Radio Yerevan	9480eu	9685na	11920na	11970na
2200-2300	Australia, Radio	9580pa	9610as	9645as	9660pa
		11695pa	11855as	11880pa	11955pa
		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 vl	Canada, CBC N Quebec Svc	9625do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5995eu	7260eu	11705as	11945eu
		13650eu	13690eu	15140eu	15325eu
		17820eu			
2200-2230	China, China Radio Intl	3985eu	7170eu		
2200-2300	Costa Rica, R Peace Intl	7385am	9400am	15050am	17910am
2200-2300	Cuba, Radio Havana Cuba	6180na			
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	India, All India Radio	7412eu	9910eu	9950eu	11620au
		11715au	15225au		
2200-2230	Iran, VOIRI Tehran	9670au			
2200-2300 f/vl	Italy, IRRS Milan	7125va			
2200-2215 as/vl	Italy, IRRS Milan	7215va			
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
2200-2300	Malaysia, Radio	7295do			
2200-2300	Malaysia, RTM/Kota Kinab	5980do			
2200-2300 mtwhfa	New Zealand, R NZ Intl	15115pa			
2200-2205	Nigeria, FRCN/Radio	3326do	4990do		
2200-2230 s	Norway, Radio Norway Intl	5905sa	6120sa		
2200-2300 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2200-2300 vl	Papua New Guinea, NBC	4890do	9675do		
2200-2300	Russia, Voice of	5905eu	5920eu	6055eu	7135as
		7150na	7205eu	7300eu	7350eu
		7380as	7400na	9550eu	9620na
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300 vl	Slovakia, AWR	7270af			
2200-2235 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2205	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	5810eu	9850eu		
2200-2300	Turkey, Voice of	7185me	9445na	11710eu	
2200-2300	UAE, Radio Abu Dhabi	9605na	9770na	11885na	
2200-2300	United Kingdom,BBC London	3955eu	5975na	6195eu	7110as
		9590na	9915sa	11695as	11750sa
		11955as	15400eu		
2200-2215	United Kingdom,BBC London	6180eu	9410me		
2200-2300	USA, KAIJ Dallas TX	13815am	15725am		
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	7510eu	9430as	13625eu	13770sa
2200-2300	USA, VOA Washington DC	6035as	7215as	9705as	9770as
		9890as	11760as	12080af	13710af
		15185au	15290as	15305as	17735as
		17820as			
2200-2300	USA, WEWN Birmingham AL	7425na			
2200-2300	USA, WHRI Noblesville IN	9495am			
2200-2300	USA, WINB Red Lion PA	11915eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300	USA, WVHA Green Bush ME	9855eu			
2200-2300	USA, WWCR Nashville TN	12160am	13845am	15685am	
2200-2245	USA, WYFR Okeechobee FL	11580af	13695af		
2203-2210	Croatia, Croatian Radio	5920eu	7370eu	9890eu	13830eu
2230-2300	Russia, Voice of	9890as			
2230-2300	Sweden, Radio	6065eu			
2240-2250	Greece, Voice of	9375au	9425au		
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
2245-2300 mtwhf	USA, Voice of the OAS	9670na	11835na	15155na	
2245-2300	Vatican State, Vatican R	6150as	7305as	9600au	11830pa

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

FREQUENCIES

2300-0000	Australia, Radio	9580pa	9610as	9645as	9660pa
		9850as	11695as	11855as	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			
2300-0000 vl	Canada, CBC N Quebec Svc	9625do			
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000 as	Canada, RCI Montreal	9535am	9755na	11845na	11920na
		11940na			
2300-2330 mtwhf	Canada, RCI Montreal	5960na	9535na	9755na	11845na
		11940na			
2300-0000	Costa Rica, R Peace Intl	7385am	9400am	15050am	17910am
2300-0000	Ecuador, HCJB Quito	6080do			
2300-0000	Egypt, Radio Cairo	9900na			
2300-0000	Guam, AWR/KSDA	11980as			
2300-0000 vl	Guatemala, AWR	5980ca			
2300-0000	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
2300-0000 f/vl	Italy, IRRS Milan	7125va			
2300-0000	Japan, NHK/Radio	6055eu	6155eu	9560as	9580as
2300-2330 sm	Lithuania, Radio Vilnius	7150na			
2300-0000	Malaysia, Radio	7295do			
2300-0000	Malaysia, RTM/Kota Kinab	5980do			
2300-0000 mtwhfa	New Zealand, R NZ Intl	15115pa			
2300-2305	Nigeria, FRCN/Radio	3326do	4990do		
2300-2350	North Korea, R Pyongyang	11700na	13650na		
2300-2330 s	Norway, Radio Norway Intl	5905na	6115sa	6120na	
2300-0000 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2300-0000 vl	Papua New Guinea, NBC	4890do	9675do		
2300-0000	Russia, Voice of	9620na	9685na	13640as	15425na
		17655na	17890as		
2300-0000	UAE, Radio Abu Dhabi	9605na	9770na	11885na	
2300-0000	United Kingdom,BBC London	5975na	6175na	6195as	7110as
		7180as	7325na	9580as	9590na
		9915sa	11750sa	11945as	11955as
		15340as			
2300-2315	United Kingdom,BBC London	15400eu			
2300-0000	USA, KAIJ Dallas TX	13740am	13815am		
2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	USA, KWHR Naalehu HI	11980as			
2300-0000	USA, Monitor Radio Intl	7510eu	9430as	13625as	13770sa
2300-0000	USA, VOA Washington DC	6035as	7215as	9705as	9770as
		9890as	11760as	15185au	15290as
		15305as	17735as	17820as	
2300-0000	USA, WEWN Birmingham AL	7425na	11820sa		
2300-0000	USA, WHRI Noblesville IN	7315am			
2300-0000	USA, WINB Red Lion PA	11915eu			
2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000 as	USA, WRMI/R Miami Intl	9955am			
2300-0000	USA, WVHA Green Bush ME	9855eu			
2300-0000	USA, WWCR Nashville TN	5065am	13845am	15685am	
2325-2336	Lebanon, Voice of	6550eu			
2330-2355	Belgium, R Vlaanderen Int	6035na	9930sa		
2330-0000 mtwhf	Canada, RCI Montreal	5960na	9755na		
2330-0000	Finland, YLE/Radio	5990na	6015na	9680as	
2330-0000	Netherlands, Radio	6020na	6165na		
2330-0000	Russia, Voice of	7125na			
2330-0000	Sweden, Radio	11910as			
2330-0000	Vietnam, Voice of	12025as	15010as		
2335-2345	Greece, Voice of	9375sa	9425sa	11595sa	

SELECTED PROGRAMS

Sundays

2310 Radio Australia: Sports Bulletin. Ten-minute reports on Australian, regional and international sport.
2320 Radio Australia: Network Asia. John Westland hosts this program of in-depth interviews and information about world, regional and Australian issues (Sun-Thu). The best from the broadcast week and the domestic network on Sat-Sun.
2330 Radio Austria Int'l: Report from Austria. A magazine program covering all aspects of Austrian life and events in the news and opening with the latest news bulletin.
2336 Radio Netherlands (na): They're Playing My Song. Reminiscencing about songs which had meaning to RN's producers.
2352 Radio Netherlands (na): EuroQuest. An audio magazine with correspondents from European locations.

Mondays

2310 Radio Australia: Sports Bulletin. See S 2310.
2320 Radio Australia: Network Asia. See S 2320.
2330 Radio Austria Int'l: Report from Austria. See S 2330.
2338 Radio Netherlands (na): Newsline. Correspondent reports, interviews, and commentaries on current events.
2353 Radio Netherlands (na): From Sapphire to Laser. Robert Green takes an issue and illustrates how composers have tackled the subject.

Tuesdays

2310 Radio Australia: Sports Bulletin. See S 2310.
2320 Radio Australia: Network Asia. See S 2320.
2330 Radio Austria Int'l: Report from Austria. See S 2330.
2338 Radio Netherlands (na): Newsline. See M 2338.
2354 Radio Netherlands (na): Variable Feature Series. A series of programs featuring a variety of subjects ranging from music to cinema to UFOs.

Wednesdays

2310 Radio Australia: Sports Bulletin. See S 2310.
2320 Radio Australia: Network Asia. See S 2320.
2330 Radio Austria Int'l: Report from Austria. See S 2330.
2338 Radio Netherlands (na): Newsline. See M 2338.
2353 Radio Netherlands (na): Sounds Interesting. Listener feedback and the signts and sounds of Holland.

Thursdays

2310 Radio Australia: Sports Bulletin. See S 2310.
2320 Radio Australia: Network Asia. See S 2320.
2330 Radio Austria Int'l: Report from Austria. See S 2330.
2338 Radio Netherlands (na): Newsline. See M 2338.
2353 Radio Netherlands (na): Research File. A program of science and technology.

Fridays

2310 Radio Australia: Asia Focus. Reporting on the commercial interrelationships of the Asia/Pacific Region.
2330 Radio Australia: At Your Request. Dick Paterson plays favorite music.
2330 Radio Austria Int'l: Report from Austria. See S 2330.
2338 Radio Netherlands (na): Newsline. See M 2338.
2353 Radio Netherlands (na): Documentary. See An in-depth treatment of one subject or a short series.

Saturdays

2310 Radio Australia: That's History. Interpretations of past events by Bill Bunbury/Steven Rapley.
2330 Radio Austria Int'l: Report from Austria. See S 2330.
2338 Radio Netherlands (na): Newsline. See M 2338.
2353 Radio Netherlands (na): Bats, Balls & Baselines. Sports results, news, issues, features, personality profiles, and investigations.

HAUSER'S HIGHLIGHTS

SWITZERLAND: SRI

Features at 0430 only on 9905 via French Guyana are:

Sun *Technorama*
Mon *Rendezvous* — interviews
Tue *World Scene*
Wed *Business at Usual*
Thur *Swiss Scene*

Fri *Mosaic* — arts and culture
Sat *Down to Earth* — environment
(Richard D. Cuff, Naswa *Journal)*
May move up to 11 or 13 MHz for Z95; days may be one day off depending on time zone (gh)

ITALY: NEXUS-IBA

IRRS, Milano on 7125
shifts with DST
Schedule until June 30 is:

Mon-Thu	0500-2015
Fri	0500-2415
Sat and Sun	0500-2215

Programming is mostly from UN or religious.
The IRRS mailbag *Hello There* is scheduled:
Sun 0500, Mon 0515, Fri 0600, Sat 0515
(via Doug Dine via Diane Mauer)

Your Name in Lights!

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

Who Says 800 MHz Coverage Is A THING OF THE PAST?

We Say It's Here **NOW** *Through Our Incredible Limited Time Offer!*

Grove Has Combined the ICOM R7100 with a **FREE** GRE Super Converter to Give You Full 25-2000 MHz Coverage—***Legally.*** And You Will Save Almost **$450** in the Bargain!

Although cellular-capable scanners and converters can no longer be imported into or manufactured in the United States, Grove Enterprises is offering this special package while existing supplies last. The powerful **ICOM R7100** still has the same great quality as before, but now it lacks the 800-900 MHz range (actual range now is 25-800 and 900-2000 MHz).But by adding the **GRE Super Converter**, the missing cellular range is restored for continuous 25-2000 MHz coverage!

The ICOM R7100's retail price of $1850, with the addition of the $94 Super Converter, would make most people's wallet smoke! But for a limited time, we have combined these fine receivers and converters—**a value of $1944 per package**—and we are offering them to you for only ***$1499.95 plus $20 2nd Day Air shipping!***

Order SCN15-C

Only **$1499.95**

Plus $20 2nd Day Air Shipping

*(the **SAME** price as **GROUND** from other companies!)*

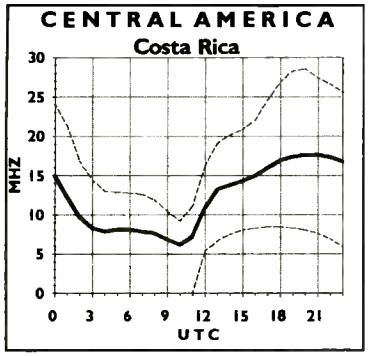
Call Now—Stock is Limited and Moving Rapidly!

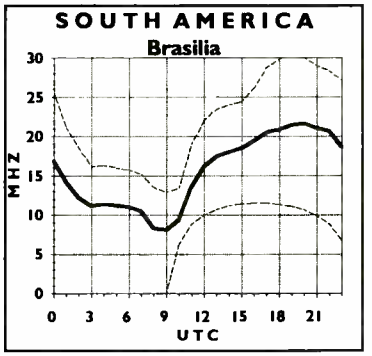
GROVE ENTERPRISES, INC.
300 South Highway 64 West
Brasstown, NC 28902

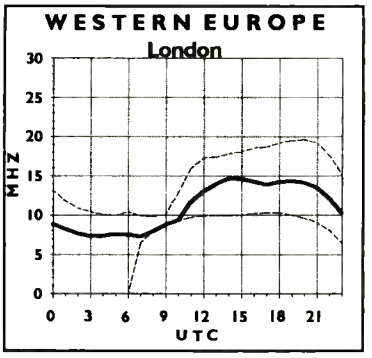
(800) 438-8155

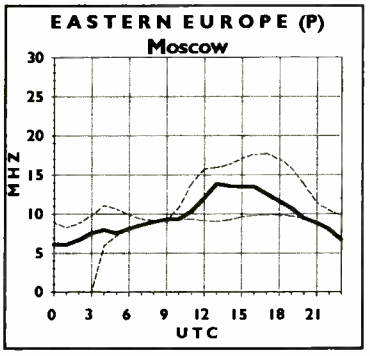
Propagation conditions: Eastern United States

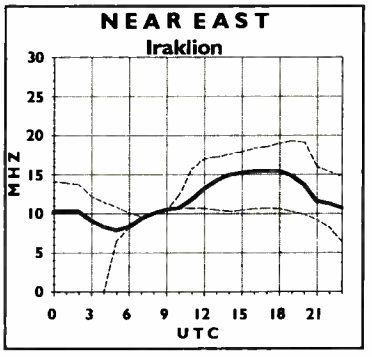
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear. The Sun Spot Number used this month for forcasting purposes is 13.

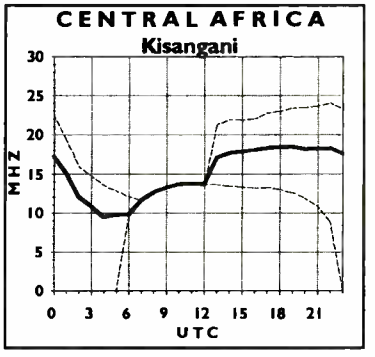


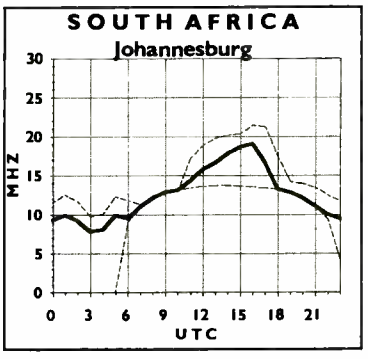


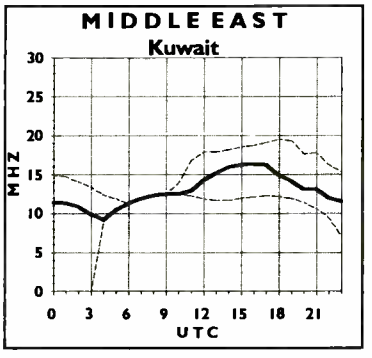


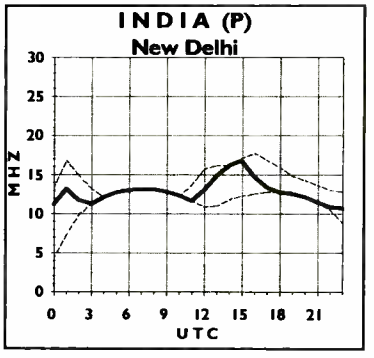


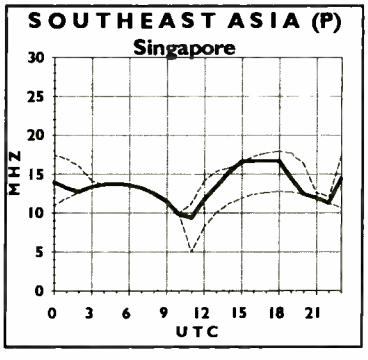


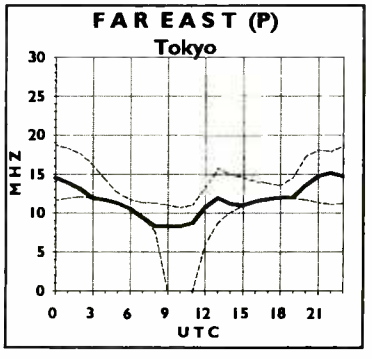


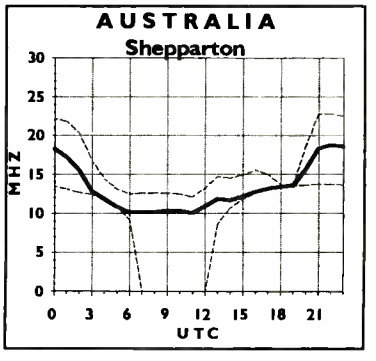






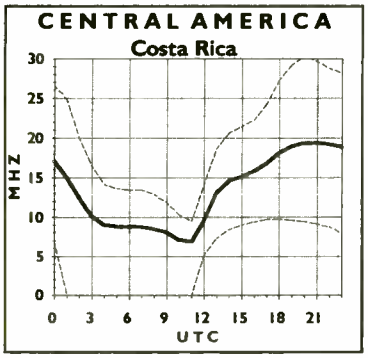


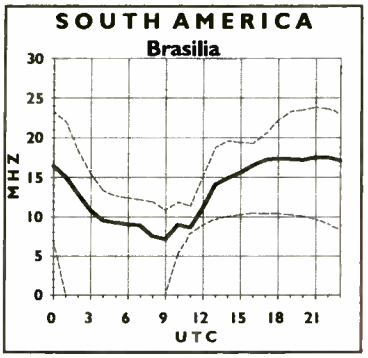


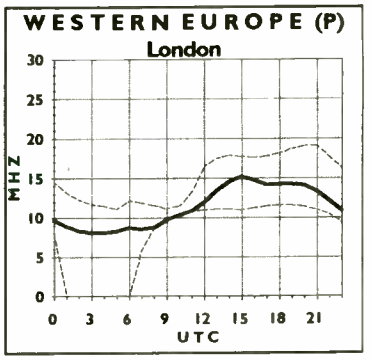


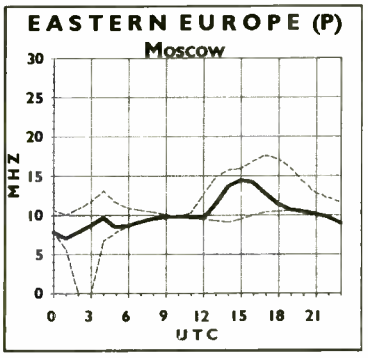
Propagation Conditions: Western United States

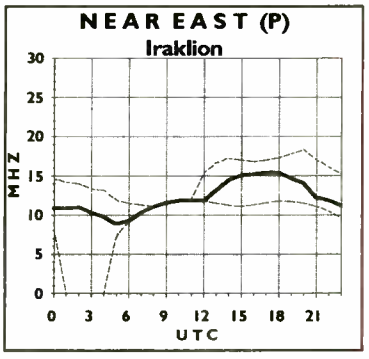
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom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

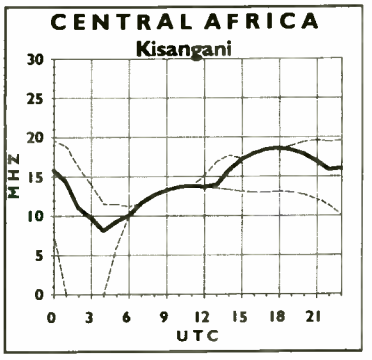


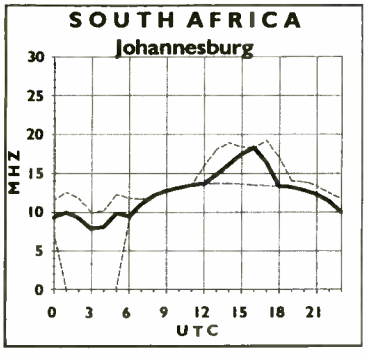


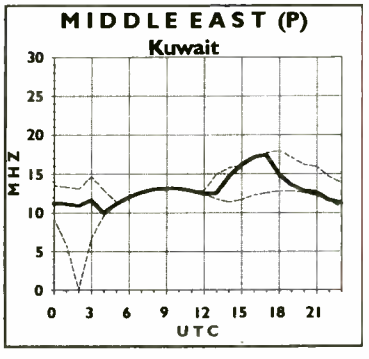


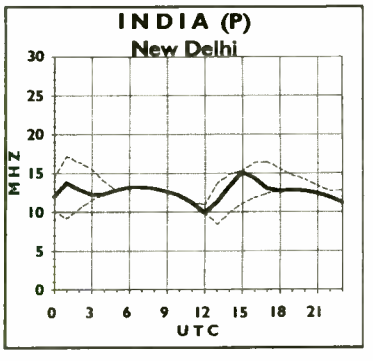


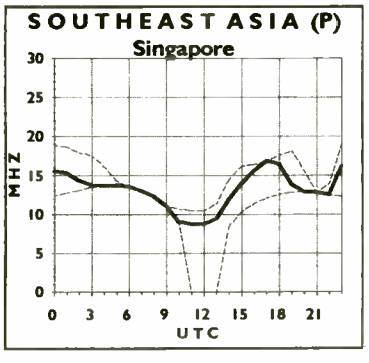


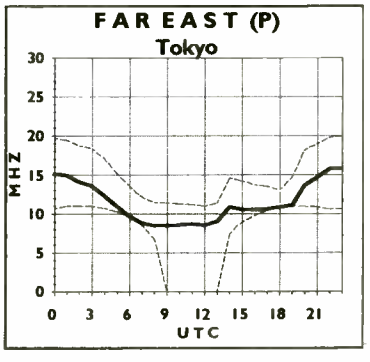


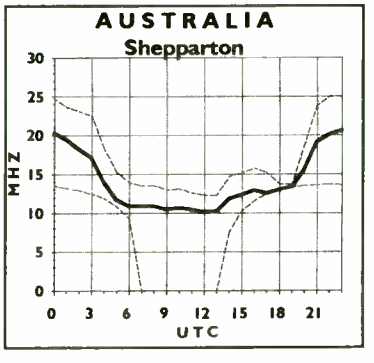












By Bob Evans

Third Shift Cyrillic

Prior to the break-up of the former Soviet Union, their maritime fleet was the largest single user of RTTY on the shortwave bands. Although not as plentiful as before, a great deal of traffic is still exchanged between vessels of the new Commonwealth of Independent States and their respective shore stations.

All Baudot RTTY is transmitted in upper case (capital letters). Each character is sent as a combination of five zeros and ones, or marks and spaces. With only five bits per character, transmission of more than 32 characters is impossible. To accommodate letters, numbers and special characters, two shifts are used. A Letters Shift is utilized for the letters of the alphabet from A to Z. A Figures Shift accommodates both numerals and punctuation. The two-shift system permits the transmission of all the required "Latin" characters.

The Russian language, however, has many additional native characters (33 in number). A special third shift for Cyrillic (the Russian character alphabet) was developed and is known as Third Shift Cyrillic.

Even though most decoding equipment cannot represent Cyrillic characters, the Cyrillic characters do yield 100% Latin transliterations. Some decoders can actually display Cyrillic characters on the video monitor.

Decoding in Cyrillic provides far more reliable translations of vessel callsigns and names than decoding using the International Alphabet. With a little practice using the charts provided, why not try your hand at decoding in Cyrillic?

Soviet RTTY (normally 50 Baud/170 Shift) is now most active between the frequencies in table 1 (500 kHz spacing). These represent the lowest and highest band frequencies logged since the July 1st, 1991, WARC 87 Maritime changes went into effect.

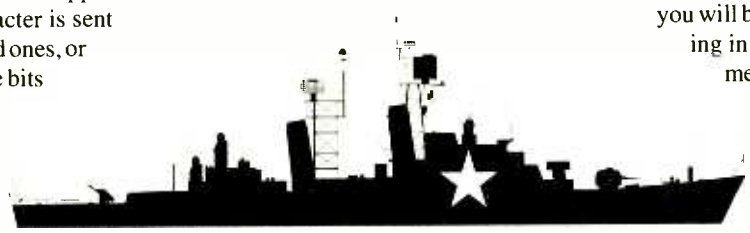
TABLE 1

Frequency Ranges for CIS RTTY

From	To
6263.0	6314.0
8373.0	8412.5
12553.5	12575.0
16796.0	16804.5
22350.5	22373.0
25193.0	25208.0

How To Decode

Soviet RTTY is usually sent at 50 Baud, 170 Shift. The polarity—Reverse or Normal—will depend on the receiver you are using.



Select a good signal. (The region between 12560.0 and 12575.0 kHz is a good place to look for one).

To display the transmission in Cyrillic, if your decoder supports this option, ensure that the alphabet selected is **Cyrillic** and that Unshift on Space (**UOS**) is *off*. To display the transmission in Latinized characters, select I for the International alphabet and ensure that **UOS** is *on*.

If the transmission seems unintelligible, reverse the polarity. You will find that about 95% of all traffic is sent at one polarity (Normal or Reverse—depending on your receiver).

Decoding Cyrillic RTTY on a video monitor is almost foolproof; printing it to a lineprinter is an entirely different kettle of ryba (fish). First of all, the lineprinter cannot print Cyrillic characters. All characters are automatically "Latinized." To further complicate matters, all lineprinters are not created equal. Each make/model assigns its own special character codes. Since the Cyrillic alphabet uses these special codes in transliteration, the output from two different makes of lineprinters can prove to be quite dissimilar.

Don't despair. All is not lost. Tune in to a strong Soviet RTTY signal. Decode a full screen of traffic in Cyrillic. Allow your printer to run as well, or use the screen print function once the screen is full. Remove the output from the printer. Compare each Cyrillic character on the screen with its printed counterpart until you have verified every single character in the Cyrillic alphabet. Make a table for yourself. Some Cyrillic characters are rarely used and you may have to repeat this process with several screens before you capture them all. But when you are done, you will have a transliteration chart that is personalized for your own printer.

Next, learn the Cyrillic alphabet and get into the habit of always decoding in Cyrillic on the screen. This advice is not simply purist in intention. Unless you decode in Cyrillic, you will be prone to decoding errors. Decoding in Cyrillic generally results in 100% message accuracy. Decoding using the International (Latinized) alphabet is subject to 10 to 30 % errors. These errors always seem to occur at the start of each new line of transmission, and they will ensure that you never get the correct sending vessel's name. (The decoder seems to go to numbers before it recovers).

This applies to messages you wish to print as well. Printed output from Cyrillic screen characters yields 100% error-free transliteration based on the table constructed for your printer. Printed output from an International (Latinized) screen also yields 10 to 30% garbage. Your editor made this discovery by taping and redecoding signals in both character sets.

The problem, I suspect, has something to do with the three shift codes being sent to a printer designed to handle only two. Your printed output as well, will be a strange mixture of upper and lower case words and characters, often changing case in the middle of a word. This is normal.

Every once in a while a surprise may be in store for you. Your editor has decoded traffic from Soviet vessels using 75 or 100 Baud instead of the standard 50.

Soviet maritime traffic from vessels at sea generally follows a set transmission pattern with regards to message format and content. Since the majority of vessels one encounters on the shortwave bands are fishing-related in nature, we will confine our examination of message content to these vessel types.

1) RY HAILING MARKER

The start of any transmission usually begins with a one or two minute RY marker from the calling vessel to the shore station. An

example of both the English and the Cyrillic is shown below in figure 1.

There is no guarantee that the vessel's call sign will be repeated once the hailing marker has terminated. The majority of vessel traffic is addressed to their home port.

Figure 1

RYRYRYRYRYRYRYRY UDK2 UDK2 DE ERBY ERBY
РЫ РЫ РЫ РЫ РЫ РЫ РЫ РЫ УДК2 УДК2 ДЕ ЕРБЫ ЕРБЫ

2) INITIAL HEADER LINE

Prior to the start of transmission, you usually will be able to hear the vessel idle on space for about 30 seconds while the radio operator removes the hailing tape.

The initial header line contains the vessel type and name, the three-letter designation for the shore station called and may optionally contain a message number, date and time. An example appears below in figure 2.

If the vessel is establishing contact with the shore station for the first time today, it usually will give details about its position, course, and other details related to its voyage or route.

It may also provide the shore station with high seas weather condition reports. For vessels operating in Atlantic waters, many of these reports to Russian ports eventually filter their way back to CFH—Canadian Forces Halifax marine weather broadcasts. The key word to watch for is PAGODA (weather in Russian) and you will often see the words ZONA KANADY in the transmissions of fishing vessels operating in international waters off the coast of Canada. All too often the word WOLNENIE (rough seas) appears.

Fishing vessels may next transmit a whole series of lines with multiple number columns. These lines refer to fishing catches, hold weights, etc.

If you missed the vessel call sign during the transmission of the RY hailing marker, it is usually repeated in the first line of the fishing catch numbers.

3) PERSONAL TELEGRAMS

Personal telegrams from the ship's crew to relatives and friends back in the former Soviet Union constitute the greatest amount of traffic transmitted on RTTY circuits. Many transmissions from Soviet vessels are limited to telegrams only, with none of the previously mentioned message content. Telegrams always follow a set format. They begin with the vessel's header line, the address and the last name of the addressee, the actual message itself, the name of the sender and an end of message marker.

Addresses in the Soviet Union tend to be quite long as well as colorful. The following is a typical translated example:
232070 ODESSA, KOSMONAUT SQUARE 29, BUILDING 1, APARTMENT 34.

No less colorful is the actual content of the telegram itself. The Russian language is given to phrases of endearment. A telegram to Kapitan Peter Ivonovich Demko from a colleague or subordinate would refer to him as KAPITAN PETR DEMKO; if the telegram was from his mother, the salutation would probably still be MY LITTLE PETENKA.

Opening phases such as MENYA WSE NORMAL-XNO (All is well with me) are commonplace. Typical ending phases include KREPKO CELU (I kiss you warmly). The sender may use an endearing form of his first name for messages to loved ones, and you will often see the diminutive form for Papa - PAPOCHKA.

The letters NNNN (HHHH in Cyrillic) signify the end of each telegram.

4) END OF TRANSMISSION MESSAGE

The message sent by the vessel's radio operator at the end of traffic transmission can be in Russian or more commonly may use standard English radioteletype codes and phrases. Consider the following example.
MNI TKS DE UTIH PLS QSL??

Soviet coastal stations use both RTTY and SITOR. RTTY is normally sent at 50 Baud, 170 Shift. When communicating with individual vessels, they use SITOR A. SITOR B is used for traffic lists and weather reports. Fishing vessels normally only use RTTY, while cargo and merchant fleet vessels generally broadcast in SITOR-A.

If you haven't tried your hand at monitoring Soviet maritime traffic, don't you think it's time you started, Továrishch?

Figure 2

FM BMRT GUEFEST MRM/MRH 155 2/20 1600=

FM	From (optional)
BMRT	Vessel Type (Stern Factory Fishing Trawler)
GUEFEST	Vessel Name
MRM	Three-letter shore station designation - Murmansk
/MRH	Addressee Code - Ministry of Fisheries
155	Message Number
2/20	Message Month/Day
1600	Message time
=	End of message line

DOUG SMITH, W9WI

Time to DX

When should I be DXing? Superficially, it sounds like a dumb question. Everyone knows AM DX only happens at night; FM/TV opens whenever it pleases, without warning. For the beginning DXer, this rule of thumb is fine. But once you bag the "easy" catches, paying attention to time will help bring you to the next level.

Obviously, long-haul conditions on AM are indeed best at night. The ionospheric D-layer, which absorbs AM signals, is powered by sunlight and becomes much less intense after sundown. For the same reason, AM is more productive in the winter; there are more hours of darkness, and more time for the D-layer to disintegrate, allowing DX signals to be returned to Earth. Also in winter, there are fewer thunderstorms to generate noise!

Late night, in winter, is the best time for those long-haul targets. But if you're also looking to add some closer-in, but smaller, stations to your log, you should be listening at sunrise and/or sunset too.

Most AM stations are required to reduce power, switch to a directional antenna, or both, at night. Many actually go off the air at sunset, returning the next morning. Sunrise doesn't happen at the same time everywhere in North America. Sunrise and sunset are earlier in the East than in the West. In the summer, sunrise is later and sunset earlier in the South than in the North; in winter, this pattern reverses.

How is this relevant to DX? Imagine that you live in Milwaukee, and you're listening to 810 kHz. At night, all you hear is WGY from Schenectady, New York. As sunrise approaches in Milwaukee, the sun has been out for an hour or more in New York. The D-layer is rapidly strengthening, and WGY's signals get weaker and weaker. But to the west of Milwaukee, it's still dark. Station KCMO in Kansas City, also on 810 but normally buried under WGY's night signal, may now surface. Bingo! A new one in your log! Similarly, DXing 1110 kHz at sunset may eliminate "pest" KFAB Omaha, and allow you to log WBT Charlotte, NC.

Let's stay in Milwaukee, but try another frequency—660 kHz. Normally at night, all you hear is WFAN New York. But 45 minutes before Milwaukee sunrise is well after sunrise in Greenville, South Carolina. What happens at sunrise in Greenville? WESC, also on 660 but not allowed to broadcast at night, signs on with 50,000 watts. It's still dark in Milwaukee, and for much of the path between Wisconsin and South Carolina, and WESC booms in to your radio—another new logging from a state you're going to have a hard time logging in the middle of the night.

If your schedule permits, try DXing in the hour either side of sunset or either side of sunrise. Watch your local TV weather forecast for the sunrise and sunset times for your city. Even if you have to DX on the car radio going to or from work, you'll land some nice catches.

AM during the day?

Yes, it is worth trying AM during the day! Of course, this is the only way you're going to log the local stations that sign off at sunset. In the Nashville area, that's 12 easy catches you'll only get during the day. You'll also get those "semi-local" stations—maybe 20 to 40 miles distant—which do broadcast at night but with such low power or directional antenna that you can't pull them out of the DX QRM. I count six here in the Nashville area.

You may also find some real DX surprises. 50,000 watt daytime-only stations on low frequencies—say, below 1000 kHz—will cover hundreds of miles even at high noon in summer. And especially at the bottom of the sunspot cycle (where we are right now), there may be DX openings bringing in stations from as far as 600 miles. I've heard WBAP Fort Worth, Texas, that way, at 11am local time. Again, many of the stations you hear this way may be impossible to log at night, because of the interference.

Up all night

Early Sunday and Monday mornings, between midnight and sunrise, can be productive times for DXing. FCC regulations 73.1520 and 73.72 allow for daytime-only AM stations to test their transmitters and antennas during these periods, and fulltime stations are allowed to use their higher daytime power and non-directional antennas.

Many of these test transmissions are made to allow station engineers to adjust the transmitter or antenna. AM antennas require considerable maintenance, especially when there's new construction nearby. The ability to do this maintenance after midnight is critical to the financial wellbeing of many smaller AM stations.

This is part of the justification for the "DX Tests," which appear in *MT* during the winter and early spring. Those tests listed this month on p. 117 will be the last until next fall. In these tests, stations use the authority in 73.1520 and 73.72 to broadcast special programs for DXers.

These programs generally include distinctive music, lots of station IDs, test tones, and Morse Code IDs (which can really punch through a noisy AM frequency). If you don't know the code, make a cassette recording and mail it to the station, or have a local ham decode it.

Disaster!

Another FCC regulation, 73.1250, allows AM stations to use their daytime facilities at night to transmit emergency information. One of the more notable uses of this regulation was during a hurricane in the Carolinas, when station WPDQ (690kHz) Jacksonville, Florida, broadcast hurricane information all night with 50,000 watts nondirectional. Many DXers logged their first Florida station that night.

DXing during major storms like this can be quite productive. More localized disasters may also result in emergency broadcasts. Tornado warnings, chemical plant fires, ice storms ... they've all kept daytime AM stations on at night.

Finally, try Friday nights, especially during the high school football season. Within the last few years, the FCC has authorized almost all AM stations to broadcast at night. However, since quite a few of these stations were only allowed very low power—as little as one watt—many don't exercise that authority on a regular basis. The exception is when they broadcast the Friday night local football game.

Not only are these broadcasts easier to hear for technical reasons, but there are usually frequent local commercials and other mentions of the community in which the station is located.

What about FM & TV?

I'll go into more detail about the VHF bands next month, as the exciting sporadic-E season approaches. For now, note that any off-season E-skip openings are most likely to occur between 10am and local noon time, and again between 5pm and 8pm. E-skip will pick up as we enter May, and continue at least through early August.

Tropospheric openings are at their best between sunset and sunrise; the best openings

happen when an approaching low-pressure area is about to push a stagnant high off to the east.

■ Bits and Pieces

• A major Paris radio station recently went off the air for 24 hours. No, it wasn't a serious transmitter failure, nor did it have anything to do with a format change. An Associated Press item forwarded by Kevin Hecht reports the French government ordered Skyrock Radio off the air on Monday, January 9, as punishment for offensive comments in "The Monsters"—a talk show. A station announcer is quoted as reporting the death of a police officer in a shootout in Nice, France, as "good news." This is the first time a French station's license has been suspended.

• I recently received a news item from the *Tampa Tribune* forwarded by Martin Theil, reporting local zoning approval for a new tower for WXTB 97.9FM in Clearwater, Florida. The station wants to build a 1,380 foot tower a half mile from the WTSP-TV (Channel 10) tower in southwest Pasco County. Local residents objected to the tower, fearing declining property values and wind noise, but station engineers and appraisers countered the claims.

More relevant to the *MT* reader, Mr. Theil says the Channel 10 transmitter already puts enough hash on his shortwave receiver and scanner, and fears what further interference will result from the new FM station.

Unfortunately, as more and more FM and TV stations come on the air, this is a growing problem for the DXer. I solved it by moving to the country, but obviously that's not an option for most. How do you deal with overload, hash, and the sheer strength of local stations? Do you have any magic hints for the urban DXer? I know of highly successful AM, FM, and TV DXers living in Chicago, so I know it can be done! Write me at the Brasstown address, or via the Internet at 72777.3143@compuserve.com.

Speaking of Compuserve, the HAMNET forum has recently added a section for domestic band DXers. GO HAMNET, and check section 21.

As the peak AM season wraps up, it's time to start thinking about summer, and sporadic-E skip. Good luck!

Anticipated Expanded Band Broadcasters

The FCC has released a list of AM stations authorized to move to the new 1610-1700kHz expanded band. Assuming threatened litigation doesn't delay implementation, the stations listed below will begin broadcasting both on their old frequencies and the new frequencies, possibly as soon as October.

City	Station	Old freq	New freq
Cullman, AL	WFMH	1460	1700
Huntsville, AL	WEUP	1600	1610
Mobile, AL	WKRG	710	1690
Fort Smith, AR	KWHN	1320	1670
Little Rock, AR	KITA	1440	1650
Phoenix, AZ	KIDR	740	1630
Tucson, AR	KCEE	940	1700
Yuma, AZ	KBLU	560	1660
Auburn, CA	KAHI	950	1700
Concord, CA	KKIS	1480	1680
Crescent City, CA	KFVR	1310	1610
El Cajon, CA	KECR	910	1670
Fresno, CA	KFRE	940	690
Long Beach, CA	KFRN	1280	1650
Merced, CA	KLOQ	1580	1640
Redding, CA	KNRO	600	1650
Roseville, CA	KRCX	1110	1660
Vallejo, CA	KXBT	1190	1620
Arvada, CO	KQXI	1550	1680
Denver, CO	KRKS	990	1640
Fort Collins, CA	KCOL	1410	660
Callahan, FL	WELX	1160	1680
Mims, FL	WPGS	840	1630
Punta Gorda, FL	WCCF	1580	1660
Winter Garden, FL	WOKB	1600	1700
Adel, GA	WBIT	1470	1640
Atlanta, GA	WAOK	1380	1640
Warner Robins, GA	WRCC	1600	1670
Cedar Falls, IA	KCFI	1250	1650
Iowa City, IA	KCJJ	1560	1630
Blackfoot, ID	KECN	690	1610
Normal, IL	WBCI	1440	1690
South Bend, IN	WIWO	1580	1640
Liberal, KS	KYUU	1470	1630
Bowling Green, KY	WKCT	930	1680
Port Sulphur, LA	KAGY	1510	1660
Salisbury, MD	WTGM	960	1670
Brewer, ME	WNSW	1200	1680
Duluth, MN	WEBC	560	1680
Jackson, MN	KKOJ	1190	1670
Hannibal, MO	KHMO	1070	1620
Biloxi, MS	WVMI	570	1620
Farmville, NC	WGHB	1250	1690
Laurinburg, NC	WLNC	1300	1620
Mount Airy, NC	WSYD	1300	1630
Sylva, NC	WRGC	680	1660
Bismarck, ND	KLXX	1270	1640
West Fargo, ND	KQWB	1550	1620
Grand Island, NE	KRGI	1430	1700
Elizabeth, NJ	WJDM	1530	1660
Farmington, NM	KENN	1390	1610
Buffalo, NY	WNED	970	1680
Elmira Heights, NY	WEHH	1590	1620
Troy, NY	WTRY	980	1640
Claremore, OK	KTRT	1270	1640
Enid, OK	KCRC	1390	1690
Lake Oswego, OR	KPHP	1290	1640
Phoenix, OR	KTMT	880	1630
Adjuntas, PR	WPJC	1020	1660
College Station, TX	WTAW	1150	1630
Denison, TX	KDSX	950	1680
Edinburg, TX	KURV	710	1640
El Paso, TX	KSVE	1150	1650
Fort Worth, TX	KHVN	970	1660
Fort Worth, TX	KAHZ	1360	1700
Granbury, TX	KPAR	1420	1620
Brigham City, UT	KSOS	800	1650
Sandy, UT	KTKK	630	1630
Leesburg, VA	WAGE	1200	1700
Portsmouth, VA	WPMH	1010	1650
Frederiksted, VI	WRRA	1290	1690
St. Thomas, VI	WGOD	1090	1620
Dishman, WA	KEYF	1050	1660
Olympia, WA	KCPL	920	1700
Renton, WA	KRIZ	1420	1620
Seattle, WA	KPOZ	1590	1680
Sussex, WI	WKSH	1370	1700
Wisconsin Dells, WI	WNNO	900	1660
Fox Farm, WY	KSHY	1530	1620

FEDERAL FILE

A GUIDE TO GOVERNMENT COMMUNICATIONS

John Fulford, WA4VPY

The Feds Conform

This month, let's look at the communications systems used by the top federal agencies. The FBI, US Customs, and the Secret Service are now using the Motorola microprocessor-based system. The radios are the SYNTOR X-9000 radios and the SABER III portable units, which are equipped with Data Encryption Standard (DES) XL.

This system is also known under the trademark of "SECURENET." SECURENET offers protection against unwanted eavesdropping through the use of digital scrambling. The highest level of privacy is available without the loss of range usually identified with previous types of digital scrambling.

Each SABER radio is equipped with six zones allowing seventy-two frequencies. Each SYNTOR radio allows up to thirty- two different frequencies. Both radios operate in either the clear analog voice mode or the secure mode. Modifications have now been made to these radios that make up to 128 frequency combinations available as an option.

The Department of Justice has mandated that all field division radio systems will conform with a new national radio plan. The repeater inputs will be in the 162-163 MHz range. The output and simplex frequencies will be in the 164-173 MHz range.

Encryption

The two voice encryption systems currently used are DVP and DES. DES stands for DIGITAL ENCRYPTION SYSTEM. DVP stands for DIGITAL VOICE PRIVACY. The DES standard is the only one used by the government.

DES/DVP converts the voice to a digital code comprised of digits and letters. It then sends the message to the receiving unit. The receiving unit converts the digital information back to analog voice. When you are receiving the digital information, you will hear a system sound that resembles a carrier with no modulation, or a burst of static with a little "tink" sound at the end of the transmission.

To load the radio with the SECURENET encryption scheme, you use a device known as a keyloader. This is also known in the trade as a KMC (KEY MANAGER CONTROLLER). This system is a microprocessor based product devised by Motorola. The loader is capable of loading two encryption mathematical formats, or algorithms. It will support up to 5000 subscriber units, and 50,000 keys can be loaded on a single system.

For those of you that are technically-minded, the KMC can support UNIX R3-V6 operation systems equipped with over the air zeroization, a 25 MHz Motorola 68030 processor, and 8 megabit main memory.

What does all of this mean? It means that these radios are programmable over the air. If a radio is stolen, it can be disabled remotely. Crystals are a thing of the past. You can hear an example of this by listening to 165.2375 MHz. This is U.S. Customs' main frequency. They update their radios at 0700 local time daily. It sounds like a data burst, which is just what it is.

Other covert digital encryption systems such as SECUREFAX, the military AN/PRC-68 secure voice terminal, the commercially available CSD909 digital multi-dimensional polycipher, and the SATCOM secure voice terminals, are more likely to be used by the National Security Agency, Department of Defense, Central Intelligence Agency, and, of course, the sophisticated international drug smuggler.

Table 1

FREQUENCY	USE
41.000	MISSOURI AIR NATIONAL GUARD "HAWKOPS"
119.650/285.600	KANSAS CITY CENTER (AIR TRAFFIC CONTROL)
121.750/273.500	ATIS
125.100/284.000	APPROACH AND DEPARTURE
127.450/398.200	SAME
128.275/275.800	GROUND
128.275/335.800	CLEARANCE DELIVERY
134.200/255.600	TOWER
138.325	VOICE PAGING (FM FORMAT)
139.800	AIR BOSS AIR TO GND (AM MODE)
227.800	303 FS OPS (AFRES A-10)
252.100	442 FW COMMAND POST
311.000	ACC COMMAND POST PRIMARY
321.000	ACC COMMAND POST SECONDARY
344.600	WEATHER
372.200	BASE OPS

The Sysem in Operation

The system may contain up to 100 frequencies. The base and repeater frequencies can change to any predetermined set of radio channels when commanded by any master mobile handheld, aircraft, or base station with the correct set of commands. The encryption algorithm is non-linear. This means it is a pretty much random code and cannot be broken. The storage of the encryption format can be volatile or non-volatile. This means that if the battery is disconnected, the memory may or may not be lost.

The system can change frequency approximately seven times a second. The codes are continuously updated and are stored on the internal ROM chips in the radios. These codes are usually changed on a weekly or even a daily basis, depending on the sensitivity of the mission.

I just returned from the Miami Hamfest, and, yes, practically everything I described above was available for sale at the flea market down there. A little judicious shopping will find these items at most any large hamfest. I saw the Motorola SYNTOR and SABRE radios for sale at prices much less than what the government pays for them. The older walkie talkies with the DVP and DES encryption modules in them were for sale with the associated keyloaders.

When I was doing police intelligence work, my agency had the first DVP walkie-talkies in South Florida. We paid over $5,000 per unit with the key loaders going for for $3,000 a unit. At the hamfest I purchased four VHF walkie-talkies, a DVP keyloader, batteries, and chargers for less than five hundred dollars. Think about it. If *I* have them, and any communications I have over them cannot be decrypted in my lifetime, just think what the drug smugglers surely have at their disposal.

MAILBAG

Whitman Air Force Base

Enough theory for one month. Let's check the mailbag. An anonymous contributor sent in the frequencies in table 1 from the July 30, 1994, Whitman Air Force Base Air Show in Missouri.

Groups one and two 406-420 MHz trunking systems are **combined** for ten channels; one is a control channel.

406.350-409.550 Group one
406.750-409.950 Group two

■ US Customs

Some information came in on monitoring US Customs intercept aircraft operating in the Mexico/California area. The best bet for VHF ops is 165.7375 MHz. It is referred to as BLUE ONE WEST or BRAVO 3 XRAY. The control is "950" and is at the Customs C3I Center in Riverside, California.

Also listen on Blue One on 282.425 MHz (AM mode) or Blue Three on 353.9 MHz, also in the AM mode.

■ US Post Office

The Post Office in Cincinnati, Ohio, is using the following:

FREQ	USE
162.225	MOTOR POOL MAINTENANCE
163.375	MECHANICS
166.350	MOTOR VEHICLE SERVICE
169.575	MECHANICS SUPERVISORS
409.425	BULK MAIL CENTER
414.725	OPERATIONS SIMPLEX
414.750	POSTAL INSPECTORS

■ Earthquake Warning!

For all of you living in California, the earthquake season is upon you again you know—it runs from Jan. 1 to Dec. 31. There are some frequencies that bear special monitoring. These are the Seismic Monitor Transmitter frequencies—also referred to as the "tilt meters." These frequencies emit a high pitched tone. If you hear the tone changing frequency, be prepared to move out. The signals are low power and a beam antenna will probably help reception. The monitors have also been reported in Oregon and Washington states.

162.5943 162.8097 163.3937
163.3968 163.6031
163.6062 163.6093 163.7937
163.7968 164.0062
164.0093 164.8406 164.8437
164.8468 165.8062
165.8093 166.4052 166.4187
166.4203 166.4218
166.6562 166.6593 167.1937
167.1968 167.8031
167.8062 167.8093 167.9900
168.0000 168.4690
171.2156 171.2187 171.2218
171.3947 171.4062
171.4203 171.4297

■ Dept of the Interior

We'll finish this column with the Department of the Interior—the US Geologic Survey shown in figure 2. That's it for this month. 73, John, WA4VPY

Figure 2

Water Resources Division

FREQUENCY	USE
164.000	control/mobile
164.800	repeater output
164.800	simplex

National Mapping Division

FREQUENCY	USE
164.675	control/mobile
169.825	repeater output
169.825	simplex
169.925	simplex

Jean Baker, KIN9DD

The Black Box: An Impartial Witness

Welcome aboard! Spring's on the way and I can't wait to see something besides white snow and brown slush. Of course, when spring comes, nasty weather conditions begin that can make monitoring an exercise in futility. Nevertheless, we die-hard monitors persist!

Our main topic for today concerns the Flight Data Recorder, or the "black box" as it is commonly called; also, we'll look at the Cockpit Voice Recorder.

Since 1957, federal authorities have required a shatter-proof flight data recorder as standard equipment aboard all commercial aircraft over a certain weight. Although the media refer to this instrument as the "black box," it's not black at all. It's actually a bright fluorescent orange with reflective yellow stripes, so it can be easily seen if dislodged by a crash.

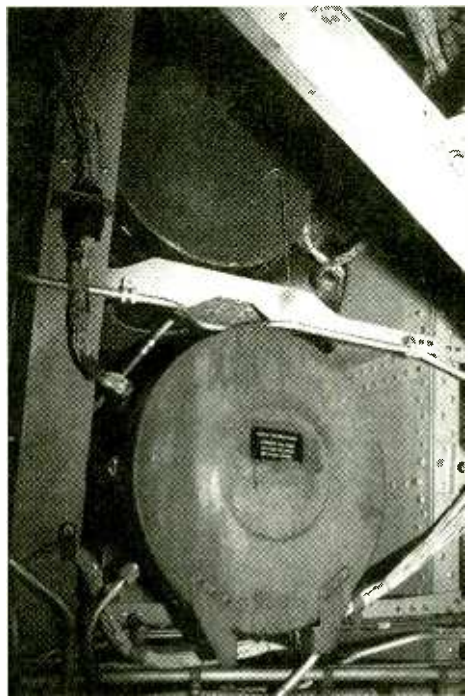
The flight data recorder has been labeled "the best witness" in terms of learning about instrument settings, engine functions, etc., when a crash occurs. For the sake of brevity, we will refer to the flight data recorder in the following paragraphs as the *FDR*.

The American Eagle ATR commuter flight that crashed near Roselawn, Indiana, on 31 October 1994, had a computerized cockpit that dumped measurements of 128 separate conditions into the FDR. Some aircraft deliver more than 200 measurements. In contrast, when the 747 was introduced in 1969, its FDR tracked just five categories of data: altitude, speed, heading, G-forces (an increase or decrease in apparent gravity, like what you feel in an elevator), and engine function.

Back then, the information was still traced onto a roll of tinfoil by moving needles. The foil would advance at one-tenth of an inch a minute; laboratory technicians read it with a microscope. That technology dates at least as far back as Lindbergh's flight across the Atlantic!

Now most planes record onto magnetic tape, somewhat like digital audio tape, a string of computer-readable ones and zeros. Some of the newest planes store data in computer chips.

U.S. aircraft have had to replace the tinfoil recorders, but sometimes the National Safety Transportation Board's (NSTB) lab will get a foil record to read from a plane crash in South America or Africa. In all, the lab reads about three dozen FDRs a year, only a **few** of which are from crashes. The others are from planes that had less serious problems, such as mechanical malfunctions.



The Flight Data Recorder, or "Black Box" is actually orange for better visibility at a crash site. Pictured are the voice and data recorders from a 727. Photo courtesy of D.Bauder.

The NSTB lab is crammed with sophisticated computers, but the log of flight data recorders analyzed is kept in a slightly frayed accountant's ledger (!).

One of the advantages of microchips over foil is that investigators at the lab can read a box quickly enough to enable them to send questions to investigators while theyare still at the crash site. Previously, the foil could take weeks to read and decipher.

New aircraft in the United States log a minimum of 28 categories of data; older planes will have to expand from the original five categories to at least 11 by 28 May1995.

Some of the more recently built aircraft record such details as height above the terrain (as compared to height above sea level, which is the way altitude is usually described); temperature of the external air; engine performance; throttle position; angle of the plane relative to the horizon and relative to the wind; degree to which the plane is rolling; and position of "control surfaces" such as flaps, rudders, spoilers, and ailerons.

Dennis R. Grossi, the chief analyst of FDRs at the NSTB Laboratory, looks at the data as a graph, covered with lines, each a different color. The computer re-creations are more useful to nonexperts, but analysts at the lab can look at the graph and relive the accident, in the same way a conductor can look at an orchestral score and hear the music.

However, more information does not make the job easier—it simply expands what they can do, such as computer re-creations of crashes. When the analysts re-created by computer a crash that killed 262 people, it was found that the aircraft followed a standard glide-path down toward the runway at first, but then the nose pointed too high, and the plane lost speed. It stalled at 1,700 feet. The display showed the engines revving, but there was not enough power for recovery. The animation also showed that some of the control surfaces were aligned to drive the nose down, while others were trying to drive it upwards.

This particular flight was not identified—except to say that it was a foreign plane that recently crashed overseas—because the case is still under investigation.

Data from the crash of a commercial, widebody aircraft near Dallas during a thunderstorm on 2 August, 1985, are now part of several training programs for airline pilots, and helped set the Federal Aviation Administration's policy on a particular type of wind shear called ring vortices.

The electronic portions of the FDRs are not heavily armored, but the part with the tape reel and the recording heads—parts which actually resemble reel-to-reel tape recorders—are guarded by quarter-inch stainless steel.

This armor works. Many flight data recorders survive impacts equal to the speed of sound. Fire is a bigger hazard: the devices are designed to survive 30 minutes at 1,100 degrees centigrade.

The Cockpit Voice Recorder

Since 1966, the Cockpit Voice Recorder (CVR) has been required by law in commercial aircraft. This device tapes all conversations within the flight deck and between the cockpit and the ground. The CVR is a self-erasing, thirty-minute loop. Most accidents in the air occur from start to finish in less than a half hour.

Adjacent to the FDR laboratory is the cockpit voice recorder lab, which looks a bit like the studio for a small radio station. There, techni-

TABLE 1

HF En Route Networks Serving the Major World Air Route Areas

NAT: NORTH ATLANTIC

NAT-A	NAT-B	NAT-C	NAT-D	NAT-E	NAT-F
3016	2899	2862	2971	2962	3476
5598	5616	5649	4675	6628	6622
8906	8864	8879	8891	8825	8831
13306	13291	13306	11279	11309	13291
17946	17946	17946	13291	13354	11339
			17946		

CWP: CENTRAL W. PACIFIC

CWP	
2998	13300
4666	17904
6532	21985
6562	
8903	
11384	

NP: NORTH PACIFIC

NP	
5667	2932
6655	5628
8915	8951
13339	10048
17946	13273
21925	17904

CAR-CARIBBEAN

CAR-A	CAR-B
2887	3455
5550	5520
6577	6586
8918	8846
11396	11330
13297	17907
17907	

SEA: SOUTH EAST ASIA / EA: EAST ASIA

SEA-1 & 3	SEA-1 & EA-2
3470	3485
6556	5649
10066	5655
11396	8942
13318	11396
17907	13309
	17907

CEP: CENTRAL E. PACIFIC

CEP-1 & 2	
2869	8843
3413	10057
5547	11282
5574	13354
6673	17904

CP: SOUTH PACIFIC

SP
3467
5643
8867
13261
17904

SAM: SOUTH AMERICA

SAM-1	SAM-2
2944	3479
4669	5526
6549	8855
10024	10096
11360	13297
17907	17907

EA: EAST ASIA

EA-1
3016
6571
8897
10042
17958

MID: MID EAST

MID-1	& MID-3
2992	2944
4669	4669
6631	6631
8951	8951
11375	11375
17961	17961

NCA-NORTH CENTRAL ASIA

NCA-1	NCA-2
3019	2851
5646	4678
13315	6592
17958	10096
	17958

INO: INDIAN OCEAN

NCA-3	NO-1
3004	3476
5664	5634
10039	8879
13303	13306
17958	17961

SAT: SOUTH ATLANTIC

SAT-2
2854
5565
11291
17955

EUR: EUROPE

EUR-A	
3479	13288
5661	17961
6598	
10084	

AFI: AFRICA / SAT: SOUTH ATLANTIC / MID: MID EAST

AFI&SAT-1	AFI-2	AFI-3&MID-2	AFI-4
3452	3419	3467	2878
6535	5652	5658	5493
8861	8894	10018	8903
13357	13273	11300	13294
17955	17961	13288	17961
	17961		

Software

I have a neat shareware program called **Final Approach**, which contains scenery for Midway and O'Hare Airports. With both dynamic and static scenery, it's a terrific add-on to Flight Simulator, Ver. 4; however, it will not work well with Ver. 5. It requires that you also have the Aircraft and Scenery Design Software so that you can manipulate the scenery. For a 3-1/2 or 5-1/4 diskette and self-addressed stamped disk mailer, I'll be happy to mail you a copy.

World Air Routes

Table 1 is the most recent listing of world-wide aero HF in use which are known as ICAO High Frequency En-Route Radiotelephony Networks Serving the Major World Air Route Areas (MWARAS).

That's all for now. Next time we'll have a big LDOC listing and other goodies. Until then, 73 and out.

cians use a sound board that can separate three channels: one for the pilot, one for the first officer, and one for a microphone in the center of the cockpit.

Albert G. Reitan, a specialist in cockpit voice recorders, said the clues to be extracted from the recorders are sometimes referred to as "smoking guns," such as when a pilot says, "Oh, damn, I forgot to turn on thus and such."

Other times, though, the clues are much less obvious. For example, among the sounds the recorder picks up, said Reitan, is the nose wheel on the runway. If the runway has grooves in it to let water run off, investigators will measure the distance between the grooves. Measuring the pitch of the sound, they can then calculate backward to find the plane's speed.

But this is not the limit, either; the next step, some officials have proclaimed, is probably an eye to look over the cockpit crew's shoulders: a video camera!

We will have more on the cockpit voice recorders in a future issue.

Good Luck, George Ketner

All of us at *Monitoring Times*—staff and readers alike who attended the tours he arranged for the *MT* Convention in Atlanta the past two years—bid farewell to George Ketner, former Supervisor of Delta Air Lines' Radio Services. George, who retired in December of 1994, was a long-time employee of Delta and had seen numerous changes and improvements in equipment, training, and personnel in the many years he worked there. Good luck and Godspeed, George. Keep in touch with us.

We wish a happy retirement to George Ketner. Over his career he's seen it all and has been happy to share his experiences with MT readers and convention attendees.

Ken Reitz, KC4GQA

X*Press Information is "Ingenious"

Many years ago, in an earlier edition of my life, I was in commercial broadcasting. During that five year period I worked at a number of different radio stations and was intrigued by the variety of broadcast gear each station had. However, one thing was common to all of the stations: the Teletype newswire.

Usually sequestered in a soundproofed closet of its own but sometimes found in the transmitter room, the UPI or AP machine clacked insistently 24 hours a day. A mountain of CAPs-only, double-spaced newsprint spewed out of the top of the machine which transformed 25 pound boxes of the neatly folded blank paper into the latest news.

Working in radio in those days one had a sense of privilege; that a global network of correspondents and editors were busy putting together five-minute news summaries, feeding them down the line as thousands of Teletype machines would come to life. As the second hand swept toward the top of the hour you had just enough time to scan the summary for busted stories and difficult pronunciations. This was news.

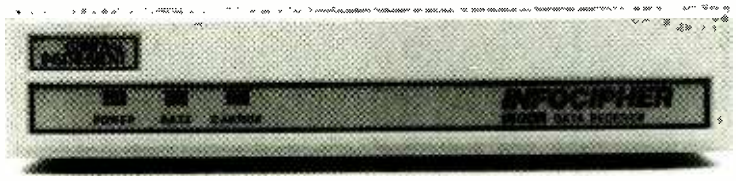
The Computer Revolution

Monitoring enthusiasts in those days, using surplus Teletype machines and shortwave radios could actually copy wire service transmissions, lumbering along at 66 words per minute (50 baud), which were sent globally via shortwave channels.

Years later, expensive solid state devices interfaced personal computers with the shortwave radios, and the wire services could be read on a computer screen. Just as these devices were becoming more economical, the wire services began migrating from HF to satellite. Once on satellite it was a short time before the signals were encrypted and copyable only by authorized reception sites. It appeared that technology was conspiring to prevent my lifelong dream of having access to the world's wire services right in my home.

"Ingenious" to the Rescue

In the late 1980s a new information company formed to bring the world's wire services into America's homes and schools. Calling itself X*Press Information Services, it retransmitted newswire services to cable and satellite TV customers for the one-time price of a decoder/interface and an annual subscription charge. Following an ownership change in late spring of 1995, the company changed its name to **Ingenious** and has sought to expand its service.



The InfoCipher 1500R Data Receiver connects your satellite system or cable system to your personal computer. Measuring 9 x 9 x 2 inches, the InfoCipher contains the decoding module which allows reception and has all cable connections in the rear. LED panel indicates system status. (Courtesy General Instrument Corporation)

Transmitted in packet bursts of 9600 baud, these international wire services are available to satellite and cable customers. Their literature states, "...X*Press services deliver a continuous stream of news and stories every day from newswires around the world. News articles are uncut, unedited, originating from the wire services. You receive them at the same time as other media sources, like TV and radio..."

AP and TASS, Just a Click Away

In a MAC or PC based platform, Ingenious software is very flexible, allowing users to customize the services according to their needs. The Windows format allows the service to sort, collect and store articles while you do other tasks. You can print interesting stories or build a file on a certain subject—you're the editor!

There are over 20 wire services available. You may recognize some of them: Associated Press, TASS/Itar, Kyodo News International, Agence France Presse, Xinhua, Deutsche Presse-Agentur, Notimex (in Spanish), Copely News Service, Reuters, SportsTicker, USA/Today Information, The National Weather Service, and more.

This is not just a headline service. These are full-fledged stories ranging anywhere from a few paragraphs to a few pages. From late-breaking news bulletins to thoughtful essays on today's news, you'll get enough information each day to fill up a decent-sized newspaper, but without the ads and newsprint on your fingers!

Your Eye On Wall Street

So, what else can you do? How about: Invest your lottery winnings in the Market or just track some of your favorite 2,000 issues in the Securities side of the service. You can keep up-to-date on thousands of stock and mutual fund quotes throughout the day.

Hourly history records of your stocks are constantly updated throughout the trading session. A daily history keeps track of closing quotes and a weekly history is updated after collecting the daily close for Friday. The software keeps track of stocks, mutual funds, warrants, rights and preferred stocks, stock and index options, selected futures, selected commodities and futures options and Canadian instruments. Whew! There could be a sailboat in your life soon.

But wait, there's more! You can outfox the big foxes by setting alarms to let you know when a specific price or volume level on any given issue is reached. Imagine the look on your discount broker's face as you bail out of a bull market just as it turns ursine!

Go Orioles!

Have you ever wished you could have access to the same SportsTicker that sports broadcasters have up in the broadcast booth? Now you can, with Ingenious. Every score of every inning, quarter, half, set, match—whatever—is found in the sports category on this amazing service. Regardless of the sport, whether major league, minor league, or college, if there was a score it's in your computer. In-progress reports of all major league and important match-ups are given throughout the night. Complete box scores for all sports are transmitted as soon as the game is over.

Complete schedules for all sports are transmitted regularly; win-loss records, league standings—they're all here. Backgrounders

on up-coming match-ups are given before the event. There may be a great game you'd miss otherwise. Sports essays from popular columnists are also fed in the sports category daily. Again, print out what you want and dump the rest; there's more coming up every hour.

■ Have A Nice Day!

Anybody can get the weather report for their area on NOAA WeatherRadio, but how about the official National Weather Service forecast for any other part of the country? Ingenious subscribers have it all. If you like, you can get the reports for all 50 states or you can keep track of only the ones you're interested in. Have relatives in Oklahoma? Key in Oklahoma. Planned a trip to Oregon? Key in Oregon and get the latest forecast and climatological data for every region of this or any other state in the country.

In addition, there are National Weather summaries and International Weather summaries as well as current temperatures and conditions from around the world. You also get ski reports and beach conditions in season and complete earthquake reports as they happen.

■ The Bottom Line

Friends, I've gotten excited about a number of things that have had to do with satellite technology over the years and I've raved about them in this column. But, this has got to be the best kept secret in satellite/cable/DBS broadcasting. Here's what it's going to cost to get in on this tremendous service:

If you already have a C-band satellite system, it will cost you $209.95 for the InfoCipher 1500R Data Receiver (complete with cables, decoder module and computer software). From then on you'll pay $59.40 per year for the 24 hour/day service.

If you are on a cable system, the Data Receiver will cost $149.95 and you'll pay $59.40 per year. If your cable system is owned by Telecommunications Inc.(TCI), your yearly subscription is free with basic cable service. There are other cable systems which make similar offers, so call the Ingenious toll-free number to find out if your system is one.

If you are thinking of installing a DBS system, you'll want PrimeStar which charges just $99.95 for the Data Receiver and $59.40 per year for the subscription. This means that for $300 or less you can get a complete satellite system with 100 plus channels and a Data Receiver to start getting Ingenious. This has to be the electronics bargain of the decade! This service is not available for DirecTv or USSB.For more information on Ingenious call:1800-7PC-NEWS.

SATELLITE NOTES

• How to tell a Democracy: At a time when western countries are expanding their technological horizons, others seem to constricting theirs. Many readers sent in clippings of the Iranian legislature's attack on satellite TV owners. Basically, the government, with law enforcement forces or a volunteer guard, would have 30 days to collect all satellite reception equipment. Thereafter, offenders who still maintained systems would be fined. Collected equipment would be given to the government broadcasting agency which uses satellite communications. Happily, if the equivalent were to happen in the U.S., such a collection would equal, in volume, a large portion of the Appalachian mountains and take 25 years to collect.

• World Radio Network (WRN) is planning to bring National Public Radio (NPR) to the UK via their own channel on the Astra satellite. Plans called for the service to begin this month. Meanwhile, WRN's Karl Miosga told Radio Sweden's George Wood on his program *MediaScan*, that a new channel for North America would start later this year. Using a separate FM subcarrier on Galaxy 5, channel 6, WRN would present a number of international shortwave broadcasters in their native languages. At present the WRN service (at 6.80 MHz) broadcasts English language services from such broadcasters.

• KJAZ! The Voice of Jazz is Back! So proclaims their recent news release. KJAZ resumed broadcasting by satellite on December 1, 1994 thus continuing a tradition to which many jazz listeners had become accustomed. After unsuccessfully trying to stay on satellite as a local FM broadcaster last summer, they have returned to satellite without the local FM license and will try to make a go of it as satellite/cable broadcaster. However, their unfavorable position on Satcom C1 (137 degrees West) will make it difficult for Eastern listeners to receive the programming. Such a low elevation on the horizon allows trees, buildings, hills and mountains to interfere with the signal.

• AMSAT, The Radio Amateur Satellite Corporation, has finalized the frequencies which will be used aboard the Phase 3-D satellite. The frequencies were selected to minimize mutual interference with other amateur satellites and have been coordinated with IARU bandplands. These frequencies will literally be set in stone as crystals have been ordered for all receivers and transmitters to implement the plan. Analog downlink frequencies (all in MHz) are as follows: 10 meters 29.330 +/- 5 kHz; 2 meters 145.805-145.955; 70 cm 435.475-435.725; 13 cm 2400.225-2400.475; 3 cm 10451.025-10451.275; 1.5 cm 24048.450-24048.750. The Phase 3-D satellite is scheduled to launch April 1996.

When Something Goes Wrong

Most of the time, beacons seem to beat Murphy's Law. Despite all of the things that can go wrong at an unattended site, breakdowns are comparatively rare. However, beacons, as with all electronic equipment, are subject to an occasional component failure and this could cause a partial malfunction or a complete shutdown of the station. Let's take quick look at what can go wrong, and see how the FAA is alerted to trouble.

Problems can be grouped into two categories—those occurring inside the beacon shelter (electronic equipment problems), and those occurring outside the shelter (antenna, grounding or power line/phone line problems).

Some of the main equipment problems are: keying errors, low (or absent) keying modulation, a constantly keyed tone, low RF output, and frequency drift. These can occur due to lightning surges, a faulty solder joint on a pc board, loose connections or component aging.

On the outside of the shelter, the main culprit is the weather. The antenna system at any beacon site takes a real beating. It gets whipped around by the wind, baked by the sun, and may even take an occasional hit by lightning. Likewise, power and telephone lines are exposed to the elements and can fail prematurely under stress. A loss or degradation of any of these can cause a problem to show up on the air.

Keeping an Eye on Beacons

Obviously, it would be impractical for airport personnel to monitor beacons all day long for problems. How then, are problems brought to the prompt attention of repair personnel? The solution for most beacon sites involves the use of an *LF/MF Alarm Receiver.*

A popular unit used in the United States today is the SR-515 receiver made by Scientific Radio Systems, Inc. (See Figure 1.) The SR-515 was specifically designed for use by the FAA under Contract number DTFA01-84-00064 and tunes from 190 to 535 kHz. It provides a visual *and* audible alarm for the following system failures:

- Low (or absent) ID modulation
- Constantly keyed tone (no on-off Morse keying)
- 2 to 10 dB drop in received carrier strength (adjustable)
- Receiver failure

When an alarm is received, the operator can silence the audible alarm, but the visual alarm (a flashing LED) cannot be extinguished until the actual alarm condition has been corrected.

The Alarm Receiver must be configured to monitor a *specific* beacon. First, the frequency is set using three internal rotary switches. Then the alarm level for a carrier reduction (in dB) must be decided. Typically, a reduction of between 2 and 10 dB constitutes an alarm. This level, as well as the modulation alarm level are set with internal adjustments.

The receiver is typically mounted in an equipment rack along with other control tower equipment, and can be equipped with a remote indicator/speaker panel for situations where space is limited. The receiver can be connected to either a high impedance "long wire" or an active antenna mounted outside the building.

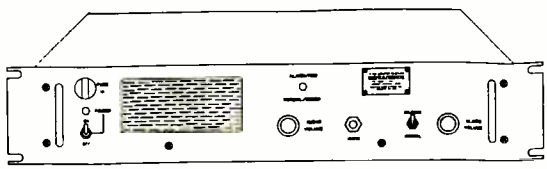


Figure 1. The SR-515 LF/MF Alarm Receiver

TABLE 1

Selected Beacon Loggings*

FREQ.	ID	LOCATION	BY
194	TUK	Nantucket, MA	A.H.
201	YKX	Kirkland, Lake, ONT	A.H.
203	AEW	Biscane Bay, FL	A.H.
204	GB	Buffalo, NY	A.H.
204	YFY	Iqualiut, NWT	A.H.
210	CLO	Cali, Columbia	P.C.
212	PMX	Palmer, MA	A.H.
216	BID	Block Island, RI	A.H.
220	IHM	Mansfield, MA	A.H.
221	RQM	Rangley, ME	A.H.
226	EZE	Cleveland, OH	P.C.
227	CPC	Whiteville, NC	A.H.
232	GP	Gaspe, QUE	A.H.
233	CNH	Claremont, NH	A.H.
233	PPK	Palisades, NJ	A.H.
235	9H	Camp David, PQ	A.H.
236	GNI	Grand Isle, LA	A.H.
246	FAU	Fairview, OK	P.C.
256	UNV	Nuevas, Cuba	A.H.
257	TBY	Oxford, CT	A.H.
260	PYA	Penn Yan, NY	P.C.
260	TOY	Tongoy, Chile	A.H.
272	BT	Battle Creek, MI	P.C.
280	IPA	Isla de Pascua, Easter Is.	A.H./P.C.
280	MID	Merida, MEX	P.C.
284	TEH	Bogota, Colombia	A.H.
292	NIQ	Maiquetia, VENZ	P.C.
294	J	Jupiter Inlet, FL	A.H.
305	RO	Roswell, NM	P.C.
319	OR	Norfolk, VA	P.C.
320	YTC	Itacoutiara, Brazil	A.H.
400	RO	Rochester, NY	P.C.
407	SWA	Swan Island, Hond.	A.H.
451	USC	Santa Clara, Cuba	P.C.

**This month's Loggings by Al Hemmalin (Rhode Island) and Perry Crabil (Virginia)*

DX Loggings

By all accounts, this past winter was an excellent season for longwave DX. Despite higher than normal (for wintertime) noise levels, propagation was very good overall. Al Hemmalin, for instance, logged more than 400 beacons during December from his location in Rhode Island. According to Al, December 1st was perhaps the best night of all.

He writes: *"The signals were crisp and clean and easily readable—even in a pile up. It was one of those nights when the signals were coming in from all directions at the same time."* To prove his point, Al sent along a fine list of loggings, several of which were from stations south of the equator—a notable accomplishment. You'll find many of Al's intercepts listed in Table 1. Additional listings for this month's list were provided by DXer Perry Crabil (VA).

Many listeners assume that once you've logged something on a given channel, it's time to move on to another frequency. This isn't necessarily so! In looking over the logs that are sent in, I've noticed that all successful

DXers have *at least* three loggings on a given frequency, and sometimes as many as eight or nine.

By listening carefully you can sometimes pick out competing IDs underneath a dominant station. Also, if you have a directional antenna, you may be able to null out a strong signal in favor of a weaker one. Don't rule out propagation changes, either. A signal that is barely audible today may be a kingpin tomorrow. The point is, be sure to re-visit "spent" frequencies now and then. You might be surprised at what you hear.

DXpedition Results

When *MT's* George Zeller isn't busy chasing pirates, he can also be found sifting through the longwave spectrum. During a December DXpedition, George had the chance to do just that in a remote part of Pennsylvania. Equipped with a Watkins Johnson HF-1000 and a 500 foot longwire, George was astonished at the longwave signals he heard.

He reported hearing every European longwave broadcaster, the strongest being Radio Luxembourg on 234 kHz. Their signals were coming in at a very steady S7 with no fading. He also heard a 1-watt Lowfer station—DCH (Berlin, PA) breaking through the noise.

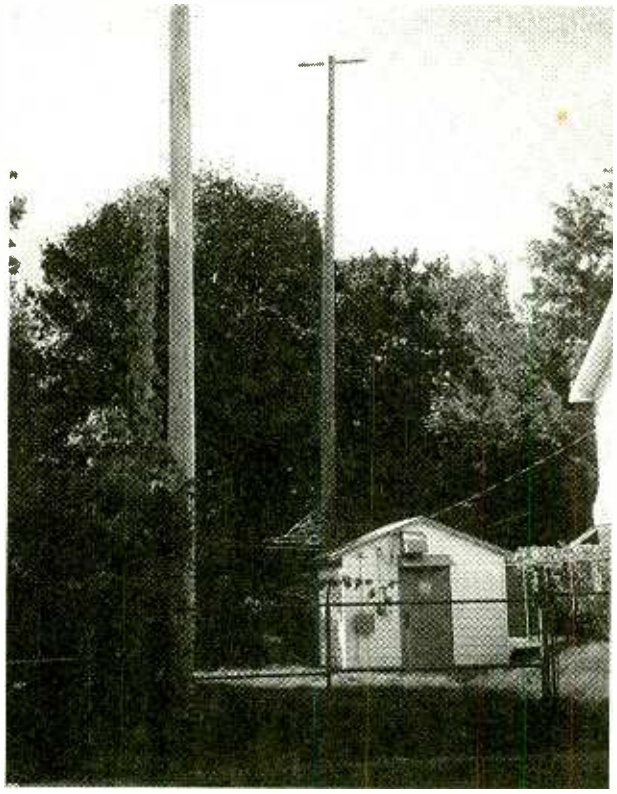


Figure 2 Chuck Bliley (NY) snapped this photo of CQD (372 kHz), Erie, PA

The next day at around noon there were still distant signals to be heard, including several Canadian and North Carolina beacons. To top everything off, George even logged beacon **MT** (209 kHz) coming in from Quebec. *(Honest folks, we had nothing to do the ID programming!)*

Fix for the WR-3 Receiver

Has the whip antenna on your WR-3 Whistler Receiver come loose at the base? A handy repair tip suggested by LWCA member Doug Williams is to file all of the chrome plating from the whip below the crimp, and then solder the antenna to the female threaded shaft that it is crimped to. Many thanks to the folks at *The Lowdown* journal who originally published this tip.

End Notes

Now is the time to start looking for some new signals to hit the band. Winter's grip is nearly gone, and many Navigation Season Only (NSO) beacons are returning to the air. These include some low power marine beacons, as well as aviation beacons at small airfields.

See you next month for more longwave monitoring times!

BEYOND THE BASICS

With air variable capacitors becoming harder to find, you might want to consider using a varicap instead for your next longwave project. A varicap is a diode whose capacitance varies with the amount of DC voltage applied. Instead of turning the shaft on a conventional plate capacitor, you simply adjust a potentiometer for the desired capacitance.

Varicaps of 350 pf and higher are currently available from many sources, including DC Electronics, P.O. Box 3203, Scottsdale, AZ 85271. They sell a 440 pf device for $2 (National NTE 618).

For some practical designs using the varicap, you might want to check out Ken Cornell's *Low and Medium Frequency Radio Scrapbook* , 9th Edition, available from the author for $17.50 postpaid, 225, Baltimore Avenue, Point Pleasant Beach, NJ. 08742. This is a *new* edition that was announced in the *What's New* section of the January '95 *MT* .

Ike Kerschner, N31K

Ten Meters

With the decline in sunspot numbers a lot of old timers are vacating ten meters believing the band is dead. Those of us who continue to operate on ten know this is not the case. Almost weekly, DX is available on the band. Frequent openings to Central and South America with little or no competition or QRM has provided a lot of us with solid rag chews. Activity from Europe and Africa, while not abundant, is nevertheless there. I have had reports of openings to the Pacific, too, although I have not been there when they happened.

The continued activity of the novice and technician operators on the lower, phone portion of ten has spurred many hams to check the band out more frequently with some pretty decent results. There has not been much CW activity, but there has been quite a bit of SSB, packet, and RTTY activity.

10 meter FM is also seeing an increase in use with some activity via repeaters being heard at this QTH. This is due mainly to the availability of the FM mode on almost all of the new HF rigs on today's market. The possibility of DX on ten FM is a real plus.

Remote ten meter FM base stations with links on other VHF bands do allow the novice and tech operators some access to ten FM. Where such remote base stations exist, they are very popular with licensees who are forbidden direct use of the mode and band.

In case you are not familiar with the concept, let me explain. A club or individual establishes a remote ten meter base at a high (good) location and controls it via 146, 222, or 450 FM. Using this scheme, novice and tech ops who are not allowed on the band can access it via a frequency they are licensed for. Since the control operator of the remote base holds a proper license, everything is legal.

If the powers that be would allow the novice and tech operators to operate the FM portion of ten meters (29.5 to 29.7 MHz) we would see a fantastic surge of interest in ten FM. After all, a lot of these folks are into ham radio because of their interest in VHF FM and repeaters. Novice and tech operators would be a real asset to activity on a band and mode that needs it.

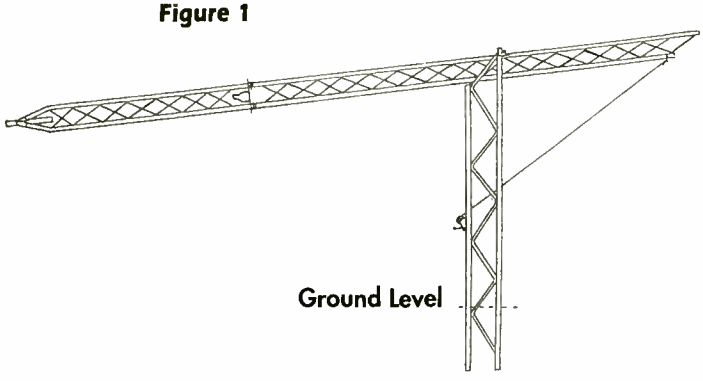
It is really neat to get onto a 10 meter repeater in a DX location and work the gang there. Often you will be the only stateside ham on the DX machine and can work a dozen or more stations.

I have available a listing of ten meter FM repeaters around the world. The listing includes input/output and any particulars required to get into a given machine. If you would like a copy, send a 9 x 12 envelope with two stamps to me c/o *MT* at PO Box 98 in Brasstown. This is a large list and copy cost is about a buck and a half, so please include a "green stamp" or two to cover expenses.

Antenna Observations

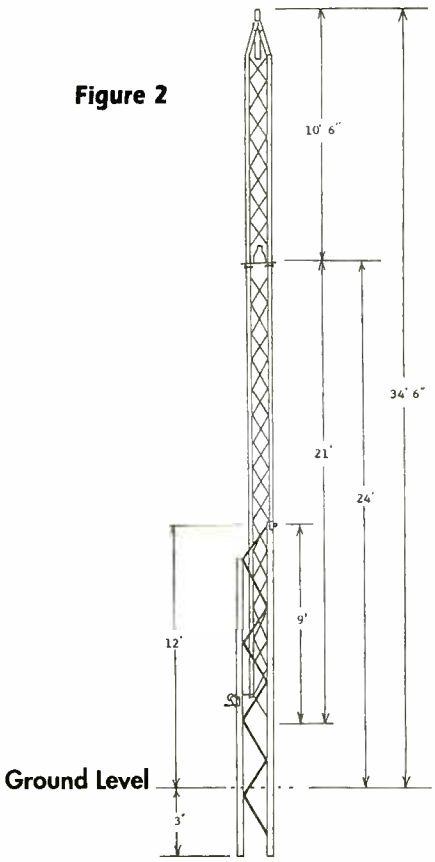
For a period of nearly seven years I conducted some interesting observations on antennas for ten meters. I had available two three-element yagis on one boom; one was polarized in the vertical plane, the other horizontal. At the same time, a two-element quad mounted at the same height and located about 120 feet away was in place. The quad could be switched from vertical to horizontal via a relay mounted on the boom. Both antennas were mounted at a height of 55 feet at the boom.

Figure 1



For long haul DX (via longpath) the vertical yagi was unbeatable. Often stations that were too weak to work on the horizontal beam were perfect copy when switching to the vertical.

Figure 2



The quad frequently outperformed the larger, three-element, horizontal yagi on long haul DX, but rarely did the quad perform as well as the vertical beam on the long path. It did not seem to matter if the quad was fed vertically or horizontally.

For normal, day-to-day use I liked the quad better because it was very consistent for working the average DX station; its low front-to-back ratio and wide pattern made it easy to work signals when the quad was not pointed directly at them. When band conditions became crowded, as in a contest, the horizontal yagi was usually preferred because the front-to-back ratio was a lot better than the quad, and the side rejection was much sharper.

At one point I added a third element to the quad. Results were not improved at all by this modification and the third element was removed.

I also experimented with diversity reception (using two different antennas to receive:

one vertical, one horizontal). Results were mixed; generally it did not seem to improve things that much, but did show promise under certain conditions, such as deep fading.

Before anyone gets on a soap box, let me say that I realize that my tests were not performed in a strictly scientific manner, and many variables were not controlled. The tests were conducted because I wanted to know "what if," and satisfy my own curiosity. Subsequent experience still leads me to prefer a vertical yagi for serious DXing on ten, the quad for all around use, and the horizontal for contesting. That does not really answer the question as to which is best, but may give you a starting point.

Addition of elements to any of the antennas is something that you might want to explore, as is height above ground.

If any of you have tried similar tests or are interested in doing so, please drop me a note. I would be especially interested in similar experiments on 15 and 6 meters!

■ Wanna Build a Tower?

While looking through the classified section of *QST* magazine I came across an advertisement for a book on how to build your own fold-over, free-standing tower. Well, what real ham could pass that up?! I sent off for the book, and was pleasantly surprised with it when it arrived. Dave Gingery is the author/publisher of *Build a 35-Foot, Free-Standing, Tilt-Over Antenna Tower*, and has done a very nice job of explaining the technique used to construct such a tower. A complete shopping list makes acquiring the proper components a snap.

This tower can be constructed for a fraction of the cost of similar commercial units and is worthy of consideration by anyone who needs/wants a tower of this size and style (see figs. 1 and 2). Yes, you must do a little cutting, welding, metal bending, and drilling. I, for one, feel quite capable of following Dave's manual and I hope one of these towers will grace my backyard before summer '95 is over.

Dave has written several other do-it-yourself manuals—one of them is *Build a Universal Coil Winder*. It—as with the tower manual—is a complete how-to book for a tool many home-brew artists will want (I am now collecting parts to build my version of the coil winder).

Both books are available from David Gingery, PO Box 9123, Springfield, MO 65801-9123; price is $8.95 plus $1.00 s/h for first book, .30 each additional book. Ask him for the list of his other interesting manuals.

That's all for April, see ya next month, 73 de Ike, N3IK

Rob Leonard's Ham DX Tips

April is not only the month when warmer and possibly more rainy weather makes its appearance, but it also is the beginning of the VHF/UHF DX season. Accordingly, we have some tips for DXers who enjoy those bands, as well as our usual roundup of HF DX tips ...

ANDAMAN ISLANDS VU2JPS is expected to be active from here for the next 20 or so months. He has been found on 7060 kHz SSB at 0730 UTC and around 14240 kHz SSB at 1130 UTC. His QSL manger was given as KI5GF, Steven Swatloski, 655 River Village, San Antonio, TX 78245. **BEACONS** Thomas Whitted, WA8WZG, has a CW beacon for SHF DXers to check. Operating from Sandusky Ohio Grid Square EN81OJ, Tom's beacon, using ten watts into a 3 ft. dish antenna at 60 ft, on the frequency of 5759.943 MHz, has been heard in Chicago on several occasions. If you are fortunate enough to hear Tom's beacon, he would like to hear from you. His address is: 116 East Algonquin Trail, Sandusky, OH 44870. **CURACAO** PJ9JT will be active until mid-April operating CW on or near 7010 to 7015 kHz at 0100 and 1100 UTC, and 3505 to 3510 kHz CW at 0130 UTC. QSL requests should be sent to Roger Corey, W1AX, 60 Warwick Dr., Westwood, MA 02090. **FRANCE** Members of the Le Viaduc (amateur radio club) whose club station uses the callsign F6KNN, have written to say that they have been given permission to use the special callsign TM0UN June 23 to 2 July, to honor the 50th anniversary of the founding of the United Nations. Their adddress: Le Viaduc, F-34660, Cournonterral, France. **GUATEMALA** TG/KE4LWT will be active until mid-June. He will be operating in either the 40 meter (7100 to 7150 kHz) or the 80 meter (3675 to 3750 kHz) US Novice sub-band, looking for slow speed CW operators daily between 0000 and 0600 UTC. The QSL route will be given over the air and had not yet been established at the time of this writing. **ISRAEL** 4X6UO has been on 14088 kHz RTTY at 1500 UTC most days. QSLs go to his manager: WB3CQN, Ruthana Perason, 3120 Alta Vista, Dover, PA 17315. **NETHERLANDS** To celebrate the 50th anniversary of the founding of their national radio society, VERON, amateurs in the Netherlands may add the number five to their prefix during the month of May. Thus, for example, PA3SBC will become PA53ABC. Club stations (which normally use the prefix PA4) will use the special prefix PA50. There is no word what PA0 prefix stations will use for a callsign. There will be special QSLs issued to amateurs who make contact or SWLs who log these special stations. **NETS** Midwest VHF DXers should check 244.263 MHz SSB at 9pm Eastern Time / 8pm Central Time (the net starts at the same local time regardless of its UTC equivalent); Tuesdays, for the Central States Two Meter Weak Signal Net. The net controls are located in Ohio and they start accepting check-ins to the net by pointing their horizontally polarized beams to the South, then the West, North, and then back East. Your DX Tips editor, N9LAG, is an occasional check-in to the net. **NORWAY** LA2IJ (Ove Knut Gronnerud, Skoyenkroken 5 B, N-0686 Oslo 6, Norway) has been a regular on 14090 kHz RTTY at 1400 UTC on weekends. **SATELLITE DX** The Russian Society for Military Sport and Technique has launched a new amateur radio satellite known as RS-15. The uplink (frequencies users would transmit on) fall in the range of 145.858 to 145.989 MHz SSB, the downlink (frequencies that users should search for signals) fall in the range 29.354 to 29.394 MHz SSB. The satellite has two CW beacons that can be heard on either 29.3525 MHz and 29.3987 MHz SSB. Reception reports on the beacons can be sent to RS3A Control Station, P.O. Box 59, Moscow 105122, Russia, or via e-mail to rsgroup@olymp.msk.su, or via packet to RS3A @ RS3A.msk.rus.eu. **SVALBARD** JW0BY is Stefan Heck (address: Flyvegen 25, N-9020 Tromsdalen, Norway), who passed along that he will be on Slavard until June. He says that he will answer QSL requests sent to his home address, above, when he returns. He wants to make schedules to contact amateurs who have 2 meter EME capabilities, on the frequency of 144.155 MHz CW (possibly SSB). You can make a schedule by contacting Stefan via e-mail at: stefan@escat.no. or via Telephone at: +47-77-692360. **SPRING SPRINTS** The annual ARRL Spring Sprints are an opportunity for VHF/UHF DXers to add new grids to their logs. All of the sprints take place starting at 7pm your local time (in each time zone) and end at 11pm your local time. The two meter Sprint will take place on Monday April 17th; check for stations on or near 144.200 MHz SSB. Tuesday April 25th, check around 222.100 to 222.120 MHz SSB. Wednesday May 3rd, the 432 MHz Spring will take place, same time periods. Check about 20 kHz above and below 432.100 MHz SSB. Participants will exchange callsigns and Grid Square locators. Again N9LAG will be active in this year's 144 MHz Spring Sprint, and I look forward to contacting several *MT* readers. *73 de Rob.*

George Zeller

FCC Loses One, Wins One in Pirate Enforcement

After an historically light level of unlicensed pirate enforcement actions in 1994, the FCC has bounced back into the news with two big 1995 confrontations. On the west coast, U.S. District Judge Claudia Wilken refused to grant an FCC request for an injunction that would prohibit future broadcasts by Stephen Dunifer's FM pirate **Radio Free Berkeley.** Elsewhere in the country, three residential visits by FCC agents at least temporarily reduced the volume of shortwave pirate broadcasting from the United States.

The FCC's unsuccessful request for an injunction against Dunifer was an unprecedented tactic. Wilken ruled that the FCC could follow its own radio spectrum regulatory processes, so an injunction was not warranted. Thus, Dunifer has won at least the first round in his confrontation with federal enforcement authorities. Thanks go to Don Wathen of California, Patrick Crumhorn of Austin, TX, Gordon Hullin of Baldwinsville, NY, Kevin Klein of Appleton, WI, Rene Borde of Sunnyvale, CA, and Tim Main of Crockett, CA, for sending in press coverage of the litigation.

In a possibly unrelated matter, FCC field office enforcement personnel visited the homes of three alleged pirate station operators on January 18 and 19. In one incident where the agents arrived with a warrant, about $2,000 worth of shortwave transmitting and receiving equipment was confiscated. Two virtually simultaneous visits elsewhere did not involve warrants, so no equipment was confiscated. It is unclear if the FCC plans to issue future Notices of Apparent Liability.

During an interview with *MT*, one of the visited individuals said that he had no transmitting equipment in his home. All three denied any unlicensed broadcasting activity, but said that FCC personnel indicated that the "visits" were coordinated. If the government hoped to intimidate pirates by the suddenly increased enforcement levels, they were relatively successful in late January and February. Pirate activity has continued since then, but at a noticeably reduced level. FCC comment could not be obtained by the deadline for this month's column.

In an important development linked to the three FCC visits, Richard T. Pistek of the **North American Pirate Relay Service** informed *MT* that his station has permanently left the shortwave bands. Pistek was a very active broadcaster of North American and European pirate programming, so he will be missed. The FCC's intimidation tactics were obviously successful in Pistek's case.

The Berkeley and shortwave pirate bust issues are linked by uncertainty caused by rejection of the FCC's new fine structure. As *Billboard* magazine pointed out in an article sent in by *MT* reader Scott Edwards of Cleveland, OH, in July 1994 the U.S. Appeals Court in Washington, DC "threw out the FCC's recently upgraded fine system, saying the commission sidestepped due process and public input when the system was developed."

Chiapas Libre

MT received a very unusual Press Release from two new clandestine stations that anticipate operations from Guatemala and southern Mexico. **La Voz de Chiapas Libre** and **La Voz de Guatemelan Mayan** plan mobile medium wave and tropical band shortwave transmissions from within Guatemala. The stations, which advocate pro-Mayan unity, also hope to issue postage stamps. Political and military forces of a group called Frente Segundo are associated with the clandestines. Although no frequencies have been announced, irregular operations are likely between 1200-0300 UTC. If you're lucky enough to hear them, reception reports can be sent c/o Jay Murley, San Diego, CA 92143-4106.

The five potatoheads Radio X logo.

SPEEDX and ADXR Fold

Two of the USA's largest general coverage radio hobby clubs have closed their doors. According to Don Thornton of SPEEDX, (the Society to Preserve the Engrossing Enjoyment of DXing) and Reuben Dagold of ADXR (the Association of DX Reporters), both groups disbanded in January 1995. The former ANARC clubs cited declining membership and resulting cash flow problems as factors in their demise.

Both organizations featured broad coverage of shortwave broadcasting, utilities, and other facets of the monitoring hobby. You're familiar with this format, since it is in *Monitoring Times* every month! The largest remaining United States shortwave club, NASWA, specializes in shortwave broadcast DXing only.

The closings are particularly sad for pirate and clandestine DXers, since both SPEEDX and ADXR historically featured coverage of unlicensed broadcasting. Except for their QSL column, current NASWA editors do not accept information on pirates for publication. However, ODXA (the Ontario DX Association) survives as a large and thriving DX club that covers pirate and clandestine radio, general shortwave broadcast news, and utility stations.

KIWI Remains Active

Graham Barclay's **KIWI** New Zealand pirate still seems to be active at least two or three weekend evenings every month. Many North American DXers have reported reception, including regular *MT* contributor Barry Williams of Enterprise, AL. Barry's first log of them came on their usual 7445 kHz frequency around 0630 UTC. *MT* reader Randy Ruger, now of North Hollywood, CA, also reports them on this frequency until past 0800 UTC, as did Robert Ross of London, Ontario. This is the place and time to look for them, usually on UTC Saturdays or Sundays.

Pirates Love Mail

Radio Bob of **RBCN** writes in to remind us that all pirate radio stations love to receive mail. Incoming reception reports and comments are an important motivation that keeps him on the air. Radio Bob's Communications Network uses the Atlanta maildrop.

Interestingly, Dick Pearce of Brattleboro, VT, and Barry Williams logged a recent RBCN broadcast on an unusual 5855 kHz frequency at 0030 UTC. Radio Bob played a tape of my seminar on Pirates and Clandestines from the 1994 *Monitoring Times* Convention in Atlanta, mixed with his own wisecracks here and there. (No, Radio Bob is *not* Bob Grove).

RBCN's advice applies to a large majority of pirates. Like international broadcasters, they eagerly solicit input and comments from their

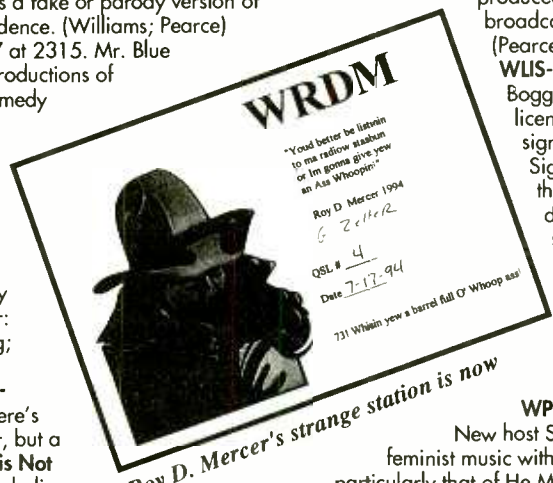
listeners. When you write to pirates, USA addresses require three 32¢ mint stamps for a reply. Outside the United States, $1.00 US cash is generally enough to cover mail forwarding costs.

What We Are Hearing

These North American pirate stations were all recently heard by *MT* readers. Your loggings are always welcome via PO Box 98, Brasstown, NC 28902. If you're trying to hear pirates, a patient bandscan around listed times (UTC) and frequencies (kHz), especially on weekends, will greatly improve your odds of success.

Maildrop addresses used by stations heard this month include PO Box 452, Wellsville, NY 14895; PO Box 2024, Faribault, MN 55021; PO Box 146, Stoneham, MA 01280; PO Box 17534, Atlanta, GA 30316; PO Box 25302, Pittsburgh, PA 15242; PO Box 28413, Providence, RI 02908; PO Box 293, Merlin, Ontario N0P 1W0; and PO Box 386, 5900 AJ Venlo, Netherlands.

Black Rider Radio- 6955 at 0200. The playlist on this pirate is quite eclectic, with rock, opera, bluegrass, and big band music sometimes supplemented by poetry readings. Addr: Wellsville. (Michael Prindle, New Suffolk, NY)
Bullfrog Radio- 6956 at 2200. This relatively new station has already been widely heard, usually with a classic rock music format. Addr: Faribault. (Harold Frodge, Midland, MI; Pearce; Ross; Prindle)
CSIC- 7413 at 1730. Pirate Rambo's veteran Canadian pirate features rock music, pirate discussions, and a trademark "Psycho Chicken" interval signal. He's always entertaining. Addr: Blue Ridge Summit. (Prindle)
CUMM- 6956 at 2300. This one-issue self-gratification station has made several appearances on the pirate bands lately. Addr: None, but verifies loggings in *The ACE* bulletin. (Ross; Prindle; Pearce)
K-2000- 7415 at 0445. Their elaborately produced parodies of DXing make them one of the most entertaining stations on shortwave. For instance, they sometimes run an "Unsolved Pirates" segment with host Bob Grope. Addr: Stoneham. (Max Syko, Gaylord, MI; Prindle)
Laser Hot Hits- 7415 at 0300. This Europirate rocker maintains a relay relationship with North American transmitters, so you have a decent shot at hearing it occasionally. Alan Pennington's "Alternative Airways" column in a European DX bulletin reported that Colin Clark was fined £1000 for driving in Stanmore, England with a radio tuned to this station's frequency! Addr: Merlin. (Nick Terrence, Huntington, NY; Andy Cadier, Folkestone, England; Syko)
North American Pirate Relay Service- 6955 at 0100. Before his announced permanent retirement, Richard T. Pistek plugged *Monitoring Times* by interviewing your Outer Limits columnist on his holiday show. Addr: Wellsville. (Jesse Rose, Hampton, VA; Chuck Porter, Troy, NY; Frodge)
Radio Airplane- 6958 at 0700. Captain Eddy's station is among those that have been heard even after the FCC's January clampdown. Randy reports that they put a fair signal into California. Addr: Wellsville. (Ruger; direct from the station)
Radio Doomsday- 6957 at 0215. Nemesis' activities lately have included an on-air suicide on Labor Day, a strange resurrection on Halloween, considerable activity around Thanksgiving, Christmas, and New Years, and comparative silence since then. Who knows what April Fools Day may bring? Addr: Wellsville. (William Hassig, Mt. Prospect, IL; David Chapchuk, Scranton, PA; Rose; Frodge; Ruger)
Radio is Not Radio- 6955 at 2200. If the situation between the real Radio USA and the fake Radio USA is not confusing enough, we now have this third station that is a fake or parody version of both. Addr: Providence. (Williams; Pearce)
Radio USA- 6957 at 2315. Mr. Blue Sky's elaborate productions of punk rock and comedy have entertained pirate DXers for more than a decade. You can tell this one from its various bogus imitators by the address. Addr: Wellsville. (Hassig; Prindle; Pearce)
Radio USA (fake)- 7415 at 0400. Here's the main imposter, but a letter from **Radio is Not Radio** says that including himself, there are actually three distinct parody versions of Radio USA (fake). Their programming mocks the real and parody stations while taunting well known pirate DXers. This was Gregory's first pirate! Addr: Still none, but sometimes verifies loggings in *The ACE*. (Timothy Rall, Cincinnati, OH; Gregory Majewski, Oakdale, CT; Frodge; Pearce; Prindle; Syko; Williams; direct from the station)
Radio X- 6800 at 2330. In addition to the strange logo QSL that we picture this month, they send a compact disc QSL featuring music from the station's programming. Addr: Pittsburgh. (direct from the station)
RFM- 1625 at 0400. H. V. Short occasionally takes an excursion down to the AM broadcast band, but he's also heard on shortwave. He created an unusual "two QSL" policy for New Years, one for 1994 in EST, and one for 1995 in UTC. Addr: Wellsville. (Terrence; Prindle)
RKNA- 6956 at 0000. Harry I. Ball has only been sporadically active since his first broadcast in 1991, but when he's on, his rock music, country tunes, and wisecracks are enjoyable. Addr: Wellsville. (Prindle)
Solid Rock Radio- 7415 at 1515. Dr. Love supplements his rock and soul music format with discussions of current issues in North American pirate radio. He's been fairly active in 1995, even after the FCC enforcement blitz. Addr: Wellsville. (Rose; Ross)
Sunshine Radio International- 7416 at 1745. As is the case with most European pirates, this station programs a format of rock music. Various North American transmitters have been relaying them. Addr: Venlo. (Syko)
Up Against the Wall Radio- 6957 at 2200. Owsley recreates a mood from the late 1960's and early 1970's with protest rock music from the days when Sonny Bono was with Cher, not in Congress. Addr: Wellsville. (Williams; Hassig; Prindle)
Voice of Anarchy- The staff and readership of *MT* extend their condolences to the family and friends of Etta-Joan Abernathy, who passed away suddenly on January 24 in Miami, where she had moved after a recent retirement from Ameritech. Etta was the woman's voice on this station's ads for longtime sponsor Suckmaster Vacuum Cleaners. (Direct from the station)
Voice of the Unknown Monkey Spanker- 6956 at 2245. Uncle Spanky's ID proves that there is always creativity among pirate radio stations. Some of his rock music is produced originally for the broadcasts. Addr: Providence. (Pearce; Prindle; Ruger; Ross)
WLIS- 7415 at 0330. Jack Boggan still transmits licensed station interval signals. Chief Verification Signer Charles Poltz says that they have 45 different QSL designs such as the new Ian MacFarland eating Spam model; you can request a particular QSL. Addr: Blue Ridge Summit. (Syko; Frodge)
WPMS- 7375 at 2100. New host She Woman mixes feminist music with jabs at sexist behavior, particularly that of He Man at **He Man Radio.** Addr: Merlin. (Prindle; Terrence)
WRDM- 6955 at 2215. This relatively strange station mixes rock music, social commentary, and fake telephone calls from listeners. They now issue the QSL that we see here this month. Addr: None, but responds to loggings printed in *The ACE*. (Frodge; direct from the station)
WREC- 7415 at 0330. P. J. Sparx mixes his own rock productions with relays of other pirates, but he says that his activity level has been unpredictable lately. Addr: Wellsville and Blue Ridge Summit. (Syko; Frodge; and direct from the station)



Roy D. Mercer's strange station is now verifying.

WHAT'S NEW?

BOOK REVIEWS AND NEW PRODUCTS

by Larry Miller

Guest reviewers: Bob Grove, Stephen J. Price

Low-End Portables from Grundig

Grundig has announced two new low-end analog shortwave receivers, the Yacht Boy 217 and the Yacht Boy 207. The '207 (top photo) is a palm-sized portable that covers 12 shortwave bands ("all significant worldwide shortwave broadcasting from 3.90 to 21.40 MHz") plus AM, FM and longwave. It's a bare-bones little radio that has a suggested list price of $59.95.

The Yacht Boy 217 looks to be a similar-sized portable, with 15 shortwave bands ("all significant shortwave broadcasting ... between 2.3 to 21.85 MHz") plus AM, FM and longwave. It retails for $119.95 in the U.S.

For more information on Grundig shortwave radios, call the Grundig hotline at 1-800-872-2228. Tell them that you read about their radio in America's best monitoring magazine.

New SWL Kits

All of a sudden, everyone is either selling or building kits. That's good news for everyone. New to the burgeoning kit scene is a name familiar to hams — Ten-Tec. Ten-Tec now has a kit division called "T·KIT" that seems to be catering primarily to shortwave listener. (Wait a minute. Didn't Ten-Tec come out with a shortwave receiver a few years ago?) The offerings are interesting, as are the prices.

Heading up the list is a 9-band regenerative shortwave receiver. Described as a "modernized `first radio kit' classic," it tunes from 1.8 to 24 MHz and retails for $49.00. A 4-band receiver runs for $17.00.

There's even a category called "Budget-Priced PC Board Projects for SWLs." These include a universal BFO which gives ordinary AM-only shortwave radios the ability to tune SSB and CW. The price is budget, indeed — $9.00.

Interesting, too, is the smart squelch. According to the manufacturer, the smart squelch "responds only to cumulative effect of several seconds of weak signal, not isolated noise." It "liberates you from unwanted hiss while monitoring." The price on this one is $15.00. Shipping and handling is additional but unspecified in the literature we saw.

Keep in mind, too, that we haven't seen any of these kits so we can't tell you anything about the quality of the instructions or their construction. If you'd like to get a copy of T·KIT's catalog, though, you can call 1-615-453-7172 or write 1185 Dolly Parton Parkway, Sevierville, TN 37862. As always, please be sure to let them know that you read about their company in *Monitoring Times*' "What's New" column.

Guide to Utilities

Few shortwave utilities buffs would deny that the guides by Joerg Klingenfuss are the most comprehensive and accurate listings of worldwide ute stations available. The new *1995 Guide to Utility Radio Stations* (13th Edition) is no exception.

Covering the full 1.6-30 MHz HF spectrum, the *Guide* lists in numerical order frequency, callsign, user, location and mode. Times for scheduled ute broadcasts are listed as well.

Some 15,000 frequencies include such services as military, diplomatic, public safety, aeronautical, maritime, disaster relief, meteorological and press. Dozens of modes include voice, CW, fax and digital.

Exhaustive appendices present tables and charts of Q and Z codes, international abbreviations and callsigns, telex and gentex service codes, glossary of terms, standard telegram formats, and much more.

This is one book that non-broadcast DXers must have at their fingertips for quick reference. The *Guide to Utilities* is $36.95 plus $2.50 bookrate from Grove Enterprises; also available from other *MT* advertisers.

—bg

Massachusetts Frequency Guide

Every time I see a new edition of Bob Coburn's *Official Frequency Guide* — especially the one for Massachusetts — I pick up the phone and tell him that he should do one for Pennsylvania, where I live. And every year, Coburn politely declines my invitation. (The rat.)

The *Official Scanner Guide* series is probably the best single-state scanner guide available. It is literally packed with information — in-depth information. Just under 600 pages — getting one of these is like getting a small piano in the mail — it starts with update for the state, highlighting specific systems and outline in general frequency assignments. Major state and national systems are also outlined in this section.

Part II presents listings by city and town and shows all licenses on file in a particular community. There are 23,000 in all. Part III is arranged by frequency so that you can look up those weird, unidentified signals that you hear. Pretty much everything is covered here except federal. I'm particularly fond of the business listings.

If you live in Massachusetts and want a radio road map to your state, this is it. Call Coburn and order a book. It's $29.95 plus $3.05 shipping from *Official Scanner Guides*, P.O. Box 712, Londonderry, NH 03053 or call 1-800-351-7226. Tell him that *MT* sent you.

Scanning Luxury

If you've been scanning any amount of time, you can't help but be amazed at the sheer technical sophistication of today's radios. Radios that carry this level of near artistry — not to mention price — deserve more than your respect. They deserve your loving care.

Howard Bornstein understands this and with the hand of a true craftsman has custom de-

signed sturdy leather cases for several of the leading scanners of the day.

If you have an AOR AR1000, Fairmate HP-100, 200, or 2000, a Yupiteru MVT-7100, or a PRO-39, 43, or 44, you're in luck. Howard's cases will fit your radio like a glove, offering a level of protection unparalleled in the hobby. Check it out for yourself. The cases retail for $29.95 plus $2 shipping. You can get more information — or order — by contacting Howard at his firm, Design EQ, Box 1245, Menlo Park, CA 94025. You can also call or fax Howard at 415-328-9181. Tell him that Larry Miller said to call.

Spectrum Guide

"One hundred and fifty years ago, the best-selling books in America were emigrant's guides describing trails and their landmarks to the thousands of people planning or making their ways across our continent," writes James Lovette in the Preface to Ben Kobb's new book, *Spectrum Guide*. *Spectrum Guide* is the equivalent for anyone exploring the radio spectrum today.

Spectrum Guide covers radio frequency allocations in the United States from 30 MHz to 300 GHz. This is an enormous undertaking — a mapping of radio frequency spectrum covering millions upon millions of Hertz and services as diverse as the local police dispatch and the search for life in space.

Kobb has produced an incredible reference that tells you, in plain English, the frequency range, who uses it and how. You'll learn, for instance, the largest user of spectrum between 30 and 30.5 MHz is the U.S. Army but that you will never, ever, hear anything between 608 and 614 MHz. (608-614 is a receive-only band reserved for radio astronomers who "listen" to the skies.) The book soars on into experimental, rarely charted areas of spectrum like 275-300 GHz where experiments are permitted for fixed and mobile uses. 300 GHz?

You'll feel like you're on the bridge of the starship *Enterprise*, boldly going where no radio hobbyist has gone before.

Ben Kobb's book is a "landmark publication" as Corwin Moore has said. It is your roadmap to the radio spectrum, to the future of the hobby. The price for this 300+ page book is $34.95. Get your copy from Grove Enterprises, DX Radio Supply, or from the publisher at 800-460-0090. Mention *MT* when you call so they'll know where you read about the book. I know you'll enjoy this one.

1995 Amateur Radio Almanac

Here's another neat book. This one reminds me of a *World Radio TV Handbook* for hams, but it's different. While the *WRTH* has page after page of station information, the *1995 Amateur Radio Almanac* is more of a hodgepodge of stuff. That's not to say it's bad. In fact, if you can't find something of interest in this book for virtually any type of radio hobbyist, perhaps

you're not looking very hard.

Editor Doug Grant includes everything from the FCC's general class license question pool, a ham radio "year in review," a ham census, and ham clubs, to information on space, rules and regs, geographical stats, propagation predictions, ham history, famous hams, and hams that have gone on to be "silent keys."

There are literally thousands of facts and figures to be rummaged through. For example, did you know that on September 14, 1995, the sun will set in Kinshasha, Zaire, at 1615 UTC? Or that WWV's first broadcast was in March of 1923 in Washington, DC? Maybe you're curious about the ARRL's recommended QSL card dimensions or need the address of the Albanian Radio Association (Box 66, Tirana).

There's even the story of a DXpedition from Peter I Island in Norwegian Arctic Territory. (One of the operators turned out to have an extensive criminal history and was sentenced to 24 to 37 months in federal prison at the conclusion of the event.)

The *1995 Amateur Radio Almanac* is an excellent, fun, and useful book for ham radio operators and any radio hobbyist. It's $19.95 from CQ Communications, 76 North Broadway, Hicksville, NY 11801. Tell 'em *MT* sent you.

Amateur Hambook

On a smaller scale, newly published by ARTSCII is a little handbook intended to provide handy data at a glance for the active ham. *The Amateur Hambook*, Second Edition, by Bill Smith N6MQS, contains 150 pages chock full of tables, hints, glossaries, and forms coverings such matters as coax and connectors, disaster plans, contests, frequency allocations and bandplans, simple antenna projects, comunications terminology, common electronic formulas, geographical coordinates, even SWL loggings.

Amateur HamBook is $14.95 plus $4 shipping from ARTSCII, PO Box 1428, Burbank, CA 91507; phone 818-843-4080.

—bg

Traveler's Guide to World Radio

Here's an interesting little book designed for "the information-seeking business or recreational traveler." Produced by the same people who bring you the *World Radio TV Handbook*, this publication highlights radio stations in 55 major travel destinations. Personally, I'd like to see a comprehensive list of domestic English-language stations, their programming and frequencies. This is not the case with the *Traveler's Guide to World Radio*, however. The bulk of the frequencies are for well-known international shortwave broadcasters.

For example, the city of Auckland, New Zealand, lists nine AM stations and eight FM stations plus seven frequencies for the BBC World Service, 11 for Deutsche Welle, 38 for Radio Australia, three for Radio Japan, four for Radio Netherlands, three for the Voice of America, and one frequency for Monitor Radio International. New York City lists only six AMs and two FMs (plus all the shortwave).

So then, the *Traveler's Guide to World Radio* is more of a boildown of the *World Radio Handbook* (with data presented in *Passport*-like graphics) than an entirely new product. Its main sales point must then be its size, portability and price. To get your copy you'll pay $9.95. The *Traveler's Guide to World Radio* is available from Grove Enterprises and other fine book dealers.

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 300 S. Hwy 64 West, Brasstown, NC 289202.

AEA Global Positioning System Firmware

AEA has released the APRS adapter cable and related firmware, allowing the PK-12 packet controller to obtain precise positioning information from a GPS receiver. According to the company, "vehicles equipped with the PK-12, a GPS receiver, and a radio can beacon their location and be seen on a computerized map by APRS users. Specially designed for GPS operations, the PK-12 parses GPS data so no computer is needed.

The PK-12 itself is a "solid 1200 bps Packet controller featuring Gateway firmware, so it works as a node." It's compatible with PC PakRatt for Windows 2.0 and comes with standard 15K MailDrop (32K RAM), expandable to 100K (128K RAM.) AEA hopes that by integrating the PK-12 with GPS, vehicles and people can be tracked during public service events, or emergencies, and DX spots can be mapped.

Suggested retail price for the PK-12 is $129.00, plus $30.00 for the APRS Adapter Cable. For more information, call Advanced Electronic Applications, Incorporated at 1-800-432-8873 or write AEA, P.O. Box C2160, Lynnwood, WA 98036.

Comms Decoder

Connect Systems, Incorporated of Ventura, California, has announced the release of a new model communications decoder. The Model CD-2 decodes and

displays 50 CTCSS codes, 104 DCS codes, and all 16 DTMF digits. Data is displayed via an LED panel and all data can be routed through an RS-232 port to a computer.

CD-2P, the optional software program, enables viewing of decoded data, as well as time, date, and hits per CTCSS or DCS code, plus usage graphs. This nice-looking unit is compatible with scanners, communication receivers and service monitors. Contact Connect Systems, Inc., 2259 Portola Rd., Ventura, CA 93003 or phone 800-545-1359 for more information.

Watching Pagers

PageWatch, by the company of the same name, is newly released Windows-based software that allows monitoring of POCSAG, SUPER-POCSAG and GOLAY pager formats. The program permits real-time collection of pager data, including pager address, page type, and alpha numeric message. PageWatch requires a scanner, an M-400 or similar data decoder, a parallel-to-serial convert and a Windows-equipped computer. The software is menu-driven and easy to use.

Intended for law enforcement, PageWatch is available for $29.95 plus shipping/handling from PageWatch, 15427 S. Long, Overland Park, KS 66221-2377.

AR 8000

The New Concept - AR8000 shocks the market. AOR made every effort to incorporate the latest technology in to this new scanner.

• SPECIFICATIONS •

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- **Filters:** (kHz) **SSB** 4 **AM/NFM** 12 **WFM** 180
- **Memories:** 50 ch. x 20 banks=1000 total
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- Clone your memory banks with a friend, load 1000 memory channels in seconds

.1 - 1900MHz*

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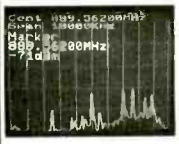
SDU 5000

NEW

The Spectral Display Unit adds a new dimension to the signal interception hobby. Imagine seeing stations above and below your receiving frequency. Usually the transmissions are short, perhaps 1 or 2 seconds. What are the chances of you being tuned to the exact frequency at the instant of transmission? Very slim. With an SDU you can watch for stations to pop up over a 10MHz window, then zero in. The SDU 5000 offers features unheard of only a year ago.



Δ Frequency coverage up to 10MHz Δ **Display** - 3.1" HQM Simple matrix color LCD Δ **Resolution:** 5 or 30kHz selectable Δ **Input:** 10.7MHz Δ 50dB Dynamic range Δ Screen refresh 2/s Δ Composite video out Δ Full computer control Δ Video output NTSC or Pal display, on TV or record on VCRΔ RS232 9600bps Δ Instant receiver set from cursor via RS232 Δ Store image on disc or your video recorder Δ Menu driven system makes SDU5000 simple to operate Δ SDU5000 is designed to work with the AR3000A (modified with a 10.7MHz output) using RS232 link with or without a computer. Other receivers with 10.7MHz IF output but digital linking may not be straight forward.

AR8000 Interface

Computer Interface for the AR8000

- Δ Low Power, powered by your serial port
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- Δ PC Software included for Windows and DOS
- Δ Manual included
- Δ Detailed Programers documentation available
- Δ Designed and Manufactured in the USA
- Δ Optional 100% shield computer cable from AR8000INF to computer for reduced interference

Unlike some of the European devices sold today, this unit is smaller, lighter, and makes no power demands on your receiver. With the extra shielding and smaller size there is less chance of additional interference leaking into your radio. The AR8000INF is also the only interface that is upgradeable for use with the optional Tape recorder controller due first quarter '95.

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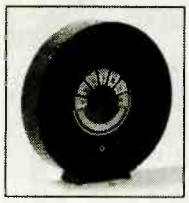
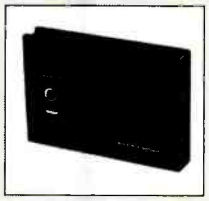


Select-A-Tenna versus the Black Box



Review by Stephen J. Price

When it came that time of year to decide what in the world I wanted the birthday fairy to bring me, it was a problem. Over the past 15 years, I've indulged myself in virtually anything DX-related to hit the market. Even the birthday fairy can't help bring new QSLs. It was time to pull out those radio catalogs and start browsing.

As I scanned page after page, a device called the Select-A-Tenna caught my eye. I have heard a little about these over the years; the more I read about it, the nicer it sounded. On birthday morning, sure enough, there was a package on my DX desk. It seemed larger than I expected. When I opened the box, I pulled out a round, brown, eleven-inch disk with a tuning knob in the center—my Select-A-Tenna!

My first instinct was to test it out on my handy clock radio. I tuned in an AM station that was about 70 miles away. It certainly was audible without the Select-A-Tenna, but extremely weak. It was necessary for me to have the volume cranked up full-blast to even hear it. I followed the instructions and brought the Select-a-tenna six to seven inches from and perpendicular to the radio. The next step was to slowly turn the tuning knob on the Select-A-Tenna until the station signal peaked and the audio became louder. As I tuned in the Select-A-Tenna, what was once a very weak station was suddenly pounding in like gangbusters! Indeed, it sounded like a local.

I repeated this with the home stereo, a boombox, and other various radios around the house and found out that this thing could make an optimum DX machine out of nearly any regular AM radio. However, the ultimate test was to use the Select-a-tenna with an el-cheapo five dollar AM headphone radio which can only pull in two 50 kW AM stations. I placed the Select-a-tenna near the radio, tuned it up, and once again, the results were fantastic. I was able to pull in stations that were absolutely inaudible without it. I was, indeed, impressed.

Late that evening I used the Select-a-tenna with my Magnavox AE3205 nine band portable. While Radio Vision Christiana for the Turks and Caicos Islands was nearly inaudible on 535kHz, (variable frequency +/-3 kHz) the Selecta-A-Tenna was able to make it armchair copy. Evening reception can be improved even more by using the Select-A-Tenna to null out co-channel interference by physically tuning a radio in conjunction with the Select-A-Tenna.

A Challenge from the Competition

With a sudden keen interest in this sort of an antenna, I recently acquired The Black Box. The Black Box antenna does not need batteries, either, and functions exactly like the Select-A-Tenna. The Black Box antenna can be described as a 10x7x2 black box with a tuning wheel. Its looks greatly remind me of a professional plastic videocassette storage box I've seen in studios.

Since I had both antennas in front of me, I did a little head-to-head comparison and here is what I found out: Over the course of a few days, I conducted the same tests as previously described. It turns out that the Select-A-Tenna does perform better by receiving the stations stronger and also has the better ability to null out co-channel interference. The difference between the two is small, but noticeable.

The Select-A-Tenna and the Black Box have provisional connections for radios such as the Kenwood R5000 which do not have a built-in ferrite bar antenna for AM reception. Both can easily be connected to the external antenna jack of these kinds of radios, but the results really aren't worth it if you have access to a random length longwire. These antennas are designed to work their very best when used with a regular AM radio that uses an internal ferrite bar antenna. I've used these antennas on five dollar Walkmans to twelve-hundred dollar digital audio stereo receivers. The reception *really is* improved.

If you are into the AM DX scene or just want to beef up your AM reception, perhaps one of these antennas is for you. Remember, the Select-A-Tenna outperformed The Black Box only by a small margin and the Select-A-Tenna costs around seventy dollars. The Black Box, on the other hand, costs about twenty dollars less at fifty dollars. Is the price difference worth it? I can't easily answer this questions, but can analyze it this way: If I am willing to spend fifty dollars already, twenty extra bucks for better results is certainly worth it to me. I think both antennas are one of the best kept secrets around.

Select-A-Tenna, by Intensitronics Corporation in Hales Corners, Wisconsin, is available from Grove Enterprises and other *MT* advertisers. The Black Box Antenna is available from 14624 Deon Dr, Sonora, CA 95370; 1-800-99RADIO.

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Bob Parnass, AJ9S

The Uniden Bearcat BC3000XLT Scanner

Which portable scanner is lightning fast, has an intelligent Auto Store feature, and remains reasonably calm in the presence of strong signals? The new Uniden/Bearcat BC3000XLT scanner is all of these and more.

The BC3000XLT is an improved successor to the earlier BC2500XLT and has 400 channels divided sensibly into 20 banks of 20 channels each. Frequency coverage is 25 - 1300 MHz except for gaps at 550 - 760 MHz and the cellular phone bands. AM, NFM, and WFM modes are user selectable on all frequencies. Step sizes of 5, 12.5, 25, and 50 kHz are provided. We discovered several "hidden" features, not mentioned in the operating guide, by pressing a combination of keys while turning the BC3000XLT power on (see Table 1).

■ Physical Description

Although the BC3000XLT is slightly thinner than a PRO-43, it is taller and wider, and thus is more difficult to "hide" in a pocket. The extra width affords a bigger display and a larger, easier-to-use keypad. Both scanners weigh about the same despite the size difference. The top mounted squelch and volume knobs are rounded instead of bar shaped as on the BC2500XLT.

A slide-off plastic belt clip is included, but is unimpressive. Bearcat scanners are no longer furnished with a leather case. You can buy an optional LC3000 leather carrying case to protect the BC3000XLT. Other options include straight (UA502) and coiled (UA502A) cigarette lighter power cords, an extra battery pack, earphone, antenna, and AC adapter.

■ Memory Organization

Each of the 400 channels may be locked out and, like its BC9000XLT cousin, the BC3000XLT always locks out channels programmed with a frequency of 0.0 so it doesn't waste time scanning them. You can unlock all the channels in the banks you choose by holding the L/O key down for two seconds. Each memory channel can be programmed with a two second rescan delay.

Up to 10 priority channels can be designated, one in each of the first 10 banks.

The BC3000XLT includes a selectable attenuator. You can program the attenuator on or off on a per-channel basis and use it during searches, too. It is a pity there is no way to disable the attenuator on all channels with a single command—useful when using the scanner in different places or using different antennas.

The BC3000XLT's partitioning of 400 channels into banks of 20 channels allows more flexibility than banks of 40 channels or, worse, banks of 100 channels. We discussed the advantages of small channel bank size in the March BC9000XLT review.

The older BC100XLT was the first Uniden/Bearcat portable equipped with a frequency query feature. When you type in a frequency, the scanner checks to see if the same frequency is already programmed in memory and displays the memory channel number. The BC3000XLT has this feature, too. It alerts you to duplicate memory channels, but you can override and enter the same frequency into several channels if you prefer.

The earlier BC2500XLT had a tuning knob, but the BC3000XLT does not. There is no Direct key function as found in many Radio Shack scanners, so there's no way to "tune around" except by entering search limits—too much work for a simple task.

A WX key scans preprogrammed NOAA weather channels, but there is no preprogrammed Service Search as found in the BC220XLT.

■ Fast Scanning and Searching

Uniden rates the BC3000XLT scan rate at a blazing 100 channels per second, twice as fast as the PRO-62. Like the BC9000XLT, the BC3000XLT scans frequencies in ascending order within each bank, not by channel number. This may frustrate listeners who program trunked system frequencies in descending order, a technique which makes it easier to follow conversations on some Motorola systems. Users may disable the sorting by using a hidden command in Table 1.

There is only a single search range, but up to 50 frequencies may be locked out during a search—very useful for skipping data channels, birdies, paging, or other uninteresting frequencies.

As in the BC9000XLT, the Auto Store feature searches a frequency range of your choosing and automatically stores active frequencies into empty channels of selected banks. The BC3000XLT is smart enough to store only frequencies not already programmed in memory.

We took the BC3000XLT on several trips to our favorite "frequency hunting preserve"—a three square mile area of shopping malls and fast food restaurants. The Auto Store uncovered several low power frequencies in the 455 - 460 and 465 - 470 MHz ranges missed on previous hunts using the conventional search mode on slower scanners.

■ Good, Crisp Audio

Using the internal speaker, the BC3000XLT's audio output is crisp and there's plenty of it. It passes the "noisy restaurant" audio test in the midst of loud music and conversation. Ron Smithberg, owner of several portable scanners, remarks that the audio quality is reminiscent of the BC200XLT and a cut above the muffled audio of his PRO-62 (see February *MT* for a review of the PRO-62).

There are separate 1/8" jacks on top for external speaker and earphones. Stereo headphones work just fine and audio is heard from both sides, no adapter needed. It is a pleasure to shop at the mall with the BC3000XLT tucked inside a large jacket pocket, listening to security guards and store clerks through comfortable, foam padded headphones!

Uniden stipulates the headphones must have an impedance of 32 ohms or higher. Jeff Goldman reports uneven volume in the left and right earpieces when he uses lower impedance headphones on his BC3000XLT.

Display and Keypad

The BC3000XLT's liquid crystal display is more legible than the PRO-43 and PRO-62. It is better lit, too, using green light emitting diodes. Pressing the LHT key activates the

dial light and a timer turns it off about 15 seconds later unless preprogrammed using the hidden command in Table 1.

The keypad on the 'Cat is easy to use, due, in part, to its girth, which permits good sized rubber keys and generous spacing between them. Also, different shapes and colors are used help distinguish among keys of different functions.

Performance

Switching an outdoor Antenna Specialists AV-801 antenna back and forth between the BC3000XLT and a PRO-43 shows both models equally sensitive except in the 850 MHz band, where the BC3000XLT excels. Adjacent channel selectivity comparison is difficult because off-frequency signals force the PRO-43 squelch closed.

Connecting a portable scanner to an outdoor antenna can cause overloading from strong signals, but the BC3000XLT is surprisingly well behaved. While connected to the AV-801 antenna, our PRO-43, fairly bulletproof as portables go, is almost unusable in the 160 - 162 range due to a witch's brew of paging mixing with a 162.55 MHz NOAA weather transmission. Railfans will delight that our BC3000XLT hears only what it should in this part of the spectrum.

Our PRO-43 hears paging interference on a few frequencies within the 2 meter ham band and the BC3000XLT does not. There's no need to devise a modification to restore full 800 MHz coverage, because the BC3000XLT hears cellular phone images clearly in the 1005 - 1030 MHz range.

In contrast to the Uniden/Bearcat BC9000XLT base model, the BC3000XLT's selectable attenuator is effective at reducing signals on all the bands.

Battery Consumption

The BC3000XLT is supplied with a BP2500 rechargeable NiCd battery pack which fastens to the bottom rear quadrant of the case. The BP2500 contains charging circuitry and five 600 milliamp hour cells versus the six cells in the BC200XLT. The 12 VDC wall power-supply plugs into a jack on the battery pack, and a red LED glows as the battery charges.

Everyone wants to know "how many hours will the battery pack last between recharges?" There is no single correct answer to this question because battery life depends on how the scanner is used. The best we can do is measure current consumption and compare it with other scanner models.

Our tests indicate the BC3000XLT consumes about 76 milliamps while scanning or searching. That's 15% less current than the Radio Shack PRO-62 and PRO-43. While listening to a signal, current consumption rises into the 100 - 120 milliamp range and higher on voice peaks—about the same as the two Radio Shack models.

The green LEDs used for display illumination draw an additional 20 milliamps when lit.

The battery-save feature is active only when the BC3000XLT is in the Manual mode, sitting on a channel with the Delay off. Measurements show that after 45 seconds of silence, most circuitry is shut down, reducing consumption to a mere 13 milliamps. Once per second, the BC3000XLT "wakes up" the rest of its circuitry for an instant to listen for a signal.

There was a defect in early BC2500XLTs which drained the battery while the scanner was off. That's no problem in the BC3000XLT, which draws a minuscule 45 microamps from the battery pack—about one tenth the current drawn by the older BC200XLT.

When the battery voltage drops, a battery icon flashes on the display and the BC3000XLT emits a soft beep every 15 seconds.

Overall

The BC3000XLT is a great portable scanner, a definite step above the PRO-62 and the now-aging PRO-43. It has a strong receiver, sensible memory bank size, respectable audio, a rich set of features, and is easy to use. The fast and "smart" Auto Store makes finding new frequencies a snap.

What's missing is a Direct tuning facility, an AA battery holder (please, no AAA cells), multiple search banks, an S-meter, an attenuator bypass key, and of course—a better belt clip. The manual should contain more complete specifications, too.

TABLE 1

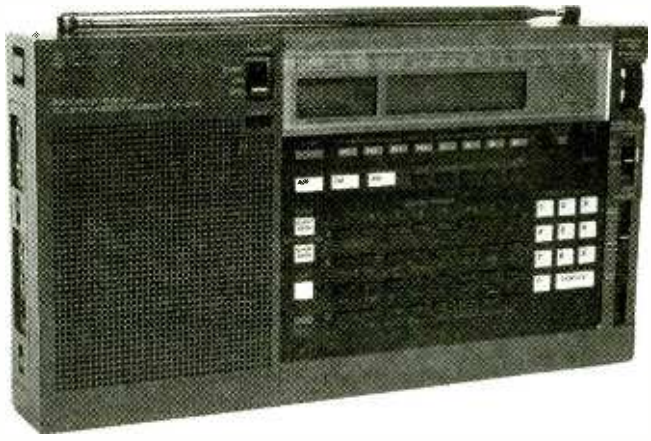
Hidden BC3000XLT Commands

By experimentation, we found that pressing and holding down various keys while simultaneously turning on the BC3000XLT produced interesting results not documented in the operating guide.

LHT key:	forces dial light to stay lit instead of timed operation.
DLY key:	changes the rescan delay to 4 or 2 seconds.
AUTO key:	disables the sorting of frequencies within each bank while scanning, but slows scan rate.
E(nter) key:	disables keypad confirmation beep.
SCAN key:	displays the message "ON dir" or "OFF dir." What do these messages mean? The operating guide provides no clue and we couldn't discern the effect of this sequence except an up arrow icon is displayed while scanning.
2, 9, MANUAL:	resets scanner and zeroes all memory channels.
2, 9, L/O:	tests all display segments.
2, 9, SCAN:	loads test frequencies into channels 1-14 and 21-30.
2, 9, DLY:	turns off delay for all channels.
2, 9, Key Lock:	displays "EEECH," then "USA 0.09" (perhaps the firmware version).

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

▪ Sony ICF-2010—the Champion of Portables



Who would believe it? After eleven years, Sony's ICF-2010 is still the top shortwave portable on the market! Granted, there are a handful of other models nipping at its heels, but to date none—including from Sony—does it all quite so well as the venerable '2010.

The marketplace has cast its vote. According to unofficial sources, the '2010, usually sold abroad as the ICF-2001D, has been Sony's best-selling shortwave radio. Indeed, it may well be the single best-selling shortwave radio of any make in history.

■ Controls Aplenty

The first thing you notice about the '2010 is that its front panel verily bristles with controls: no less than 76 in all! You would think this would make for complicated operation, but the opposite is the case. Instead of having to remember arcane codes, function choices and other DOS-like control variables, in everyday usage you simply look at the control, use it, and that's that.

Among these are 32 dedicated channel presets in neat rows and columns. It's not quite so flexible as Sony's newer "pages" approach, found on a few digital models, but it is much simpler to use. Just touch a button; if your station is audible, it's there. That's it!

Chances are that if the '2010 had been designed today, it wouldn't have had the luxury of one-touch tuning. That's because all those buttons cost money to manufacture and install. But extra cost or not, this feature comes back, year after year, to shower Sony with sales.

■ Excellent Synchronous Selectable Sideband

When the '2010 first came out, it set the industry on its head by featuring synchronous selectable sideband. This greatly improves adjacent-channel rejection, and also helps to reduce selective-fading distortion. You don't need it with every station, or even most. But when you do need it, the improvement can be dramatic.

The '2010 does this by selecting one sideband over the other via phase cancellation, with the unwanted sideband being rejected by about 20 dB. That's not the order of depth you'll find on premium tabletop receivers, which use discrete IF filters to slice sidebands apart. But it's more than adequate for listening to most world band stations.

The synchronous detector's lock-in depth is top-drawer: fully 50 dB, provided you've tuned the set precisely to the carrier frequency. (The radio tunes in 0.1 kHz increments, which helps.) Slight detuning can reduce this to 25 dB, which is still better than that of some other detectors when they are tuned exactly!

This is important, because when a synchronous detector loses lock, it not only ceases to improve signal quality, it can sometimes degrade quality by generating rumbling sounds. With the '2010, there's virtually none of this.

■ Bandwidths Help Avoid Sideband Audio Disparity

It can be argued, with justification, that the '2010's two bandwidths are broader than they should be. (In our laboratory, these measure 4.3 kHz "narrow" and 9.4 kHz "wide," with 1:1.9 and 1:2.4 shape factors, respectively.) Yet, this provides the advantage of a given sideband's not being received as much narrower than the other.

In reality, all Sony portables with synchronous selectable sideband tend to suffer from at least some factory misalignment, plus post-manufacture alignment drift (from temperature, voltage and the like). The result is that the received width of one sideband can be audibly less than that of the other from the same signal.

On Sony's compact new ICF-7600G, for example, this can be quite annoying, as it has only a single and relatively narrow bandwidth. Our '7600G almost always tunes in one sideband with all the midrange and some higher sounds intact, whereas the other sideband invariably lacks high-end response. So it sounds bassy and muffled. With the '2010, this disparity is much less apparent.

■ Shortwave Tail Wags AM-Stereo Dog

For all the genuflection about Japanese teamwork, the truth is that Sony world band receivers are typically designed by just one engineer. I had the pleasure of meeting with the '2010's engineer at his hotel in Cherry Hill, New Jersey, a dozen years ago. His name has vanished from both my memory and files, and he long since has moved on to other departments and projects. But during that interesting meeting, he divulged the unusual way the '2010's successful synchronous-detection circuit came into being.

One day, the engineer was talking shop with a colleague over noodles and sushi in the company cafeteria. That colleague was working on a chip for AM stereo, which then seemed to have enormous growth potential. If you recall that far back, you may remember that the Federal Communications Commission had taken a "market" approach to AM stereo technology, so a number of systems were being tested and put on the air. Sony's approach to this was to bring order out of chaos by designing its AM stereo chip to work with all the various available technologies.

Among those was the Kahn system, which used one sideband for the left channel, the other for the right. Of course, this meant sideband selection, so our '2010 engineer decided to use this single function of that multi-function chip for his shortwave synchronous selectable sideband circuit. (World band and AM stations both operate in the same mode, making this easy.) After all, Sony expected to be producing mountains of those

chips for the forthcoming Brave New World of AM stereo, so why not use a few for the relatively piddling number of '2010's they expected to sell?

Of course, you know the rest. The Motorola AM stereo system won out, but AM stereo as such has been virtually a flop. So there was no real need for any AM stereo chip, much less one which could handle any number of now-defunct AM stereo transmission systems.

Yet, the '2010, just by itself, was such a huge success that the chip turned out to be a worthy investment, after all—thanks to the vigorous and growing sales of that supposedly tired old medium, shortwave. Thus is the tale of how the tail was a success, but the dog had to be buried.

■ Other Useful Features, Too

The '2010 may be a portable, but it also includes such useful features as frequency/memory scanning facilities, SSB demodulation, numeric keypad for direct-access tuning, two-speed tuning knob with speed dimple, dial light, four-event timer, sleep switch, the aforementioned dual IF bandwidths, clock (24/12 hour format, user-selectable) and digital signal-strength indicator. That clock, by the way, is visible at all times—not just when the radio is off.

The entire shortwave spectrum is covered, as are the usual AM and FM bands, plus the VHF aeronautical band. The FM, mono only, is sensitive to weak signals—it's great if you're out in the bush—but it also tends to overload badly in strong-signal areas. The aero band also likes to overload, and is relatively insensitive, to boot.

AM reception, though, is a different story. It's not only pretty good by the usual standards, it is also aided greatly by the '2010's synchronous selectable sideband. That's because at twilight, and within the hours of darkness, fringe AM stations—typically 30-100 miles away—are received simultaneously via ground and sky waves. The rub is that the skywave takes a skootch longer than the groundwave to arrive, as it has to travel up to the ionosphere, then back to your radio on the ground. This timing mismatch creates now-and-again phase cancellation of the received station's carrier, which causes gross distortion that can go on for many seconds or even minutes at a clip before going away, only to return later to haunt your ears. But synchronous detection gets rid of this mess—Shazam!—virtually bringing dead signals back to life.

Overall, shortwave performance is clearly superior by portable standards, both as measured in our lab and after several years of hands-on use. Yet, it's not quite the equal of the best tabletop models, such as the Drake R8, so don't fool yourself.

■ SWLing vs. DXing

Scratch most veteran DXers, and you'll find them using the '2010 for bird-dogging tough catches while on the road. There simply isn't another portable out there that cuts the mustard the way the '2010 does, especially when a hank of wire is alligator-clipped onto the radio's telescopic antenna.

For the casual SWL who listens to only a few favorite world band stations, the '2010's advantages are less singular. True, the '2010 brings in and cleans up signals at least as well as do competing models, but there is a catch: audio quality. While the '2010 sounds okay, its audio quality is not in the same league as that of at least two other models, the Grundig Yacht Boy 400 and Grundig Satellit 700.

Too, the '2010 is larger than a compact model, and much larger than such mini models as the Sony ICF-SW100. If you're into flying with only carry-on baggage, you may find the '2010's size to be a bit much, regardless of its other virtues.

That's why casual SWLs make a bee line for the circa $200 Yacht Boy 400. It's also why serious SWLs have to do a lot of head-scratching before deciding between the '2010, with a street price around $350, and the $400-up Satellit 700.

■ The Bottom Line

The Sony ICF-2010 was designed technologically so far ahead of its time that it *still* is ahead of the rest of the portable pack. Yet, having been designed years ago, before the yen went through the roof and Japanese production costs rose, it incorporates features that would be considered too costly in a Japanese radio designed nowadays. That's why people who say, "I'll wait until it is redesigned," are likely to be disappointed if and when that ever happens.

If you're "into" radio, the '2010 is nothing less than the Big Enchilada among world band portables. Its performance is clearly superior, and its ergonomics, especially with preset stations, is fine. For a radio of this caliber, its $350 street price represents exceptional value.

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.

World Band Portable Now $24.49

If you already have a top-notch tabletop receiver and want a portable only for a few powerful stations, then you might want to consider the bargain-basement SoundTronic Multiband Receiver—$19.99 plus $4.50 shipping as Item #J8-5216 from Heartland America (800/229-2901). Actually, that's just another name for the junky Chinese-made Elektro AC 100 we reviewed in *MT* over two years ago.

Indeed, when we ordered the advertised SoundTronic, what actually arrived *was* the AC 100! However, there was one small difference from the one tested back then: VHF-FM coverage has been expanded from the usual 87.5-108 MHz to 87.5-136 MHz.

John Catalano, PhD

"Winning may not be everything, but losing is nothing"

—Quote from Snoopy The Dog

Over the past years we have seen how computers have become a major part of monitoring. When I started this column, the word *computer* only appeared in these pages: nowhere else in *MT*. "Boy, times have changed," I thought as I looked through the February 1995 issue of *MT*. No fewer than five other columns mentioned the use of computers—a real testimony to the far-sightedness and accurate, technical intuitiveness of yours truly. Please, no applause; just throw money.

Scanned image of MT cover logo.

And speaking of technical intuitiveness, this month we are going to look at a use of computers which I have long been interested in exploring with you for the past few years. BUT, I must warn you, as in life, not all attempts at new ideas succeed.

If you read some of my earlier columns you'll remember the risk I ran of domestic violence (*Duck, here comes another frying pan!*) whenever I asked my wife to read me frequency lists so I could quickly tune my shortwave receiver. Well, the advent of computer monitoring put a peaceful end to all that. No longer would I have to plead with my wife or daughter to read out frequencies every time I wanted to do some monitoring—only when *MT*, with its new frequency lists, appeared in the mailbox.

Now, although their task (and my pleading), was reduced to a single session per month, it still was not a popular time in my home. As I recall, *MT* seemed to arrive at different times each month with no regularity. (*Hey, I just realized I should have checked the bottom of the needlepoint basket!*) The fact remains that, to this day, with each major change of frequencies we still have a lot of tedious manual work to do.

A Theoretical Fix

"So how can computers fix the problem?" I pondered a few years ago. The most promising answer I came up with was—optical scanning! No, it's not a new cellular band. Optical scanning converts an image, or text, into a digital field of ones and zeros, which our computers can then read and store. Then, in theory, using a special optical character recognition (OCR) program, the "text image," which is just patterns of light and dark, is converted back into alphanumeric text.

The sensing circuit is fairly simple in concept, using a light source and a single line array of light sensitive resistor elements. Light reflects off a page of text onto the resistors, or sensor elements. Dark areas (ink) absorb more light than white areas, which reflect more light to the sensors. In this manner one narrow line of light-dark images are sensed by the light-sensitive elements. As our paper with the printed text that we want to "read" is moved past the sensor, a new line is added and a digital image is stored by the computer. This is not unlike the concept and operation of a modern fax machine.

In practice, two methods for moving the paper are used. In industry, where cost is not an issue, flatbed page scanners, which look like copying machines, are used. Here the page is held steady and the sensors are moved. In less expensive optical scanners, the sensors are held fixed and the paper is moved past, as in a fax machine.

Real World Technology

I can hear some of you now: "Hey John, we don't want to know how a watch works, we just asked you the time!" Good point. But with new technology we have become too complacent and assume everything will work just as the marketing and advertising people have led us to believe. New technology never lets us down, and watches always keep the right time, right!? We-e-ll, not necessarily (and thus the reason for this column).

Back to the domestic dilemma of frequency list reading. About four years ago I thought that if the *MT* frequency lists could be optically scanned, this would relieve all monthly updating hassle. A quick test on an industrial, $10,000 flatbed page scanner proved a real success. But purchasing one at this price was insane.

However, a few years later another optical scanner hit the consumer market: the hand scanner. Looking like a calculator with a horizontally elongated top, hand scanner prices started at a low $250. The low price was possible due to a simplified mechanical scanning arrangement in which the light source and sensors were pulled by hand across a page. A roller, or wheel under the scanner, gives the computer positional page information, much like a mouse. But at the price of a good portable shortwave receiver, I still was not ready to buy. The monthly problem of getting someone to read the frequency lists, or doing without updates, continued.

Then last month two things happened. First, Larry Van Horn turned my whole utility word upside down with the news of aeronautical mobile frequencies. Not just a few new frequencies to read, but a whole page full! I could hear the pans clanging already! But then, while in an office supply store, I saw optical hand scanners priced at $89.99! Included was imaging and OCR software. As I scooped one up and paid for it I thought, "Saved in the nick of time. Yesss!" I could just see those *MT* frequency pages flying underneath my hand scanner, into the OCR program, into my Scancat database and finally appearing on the display of my receiver—a technical triumph worthy of sharing with you in the column.

So much for theory.

The next two days were not happy ones. The hand scanner, which is capable of resolutions to 400 dots per inch, came with a small card which installed in my PC. It looks exactly like a bus mouse card. Into this the hand scanner is plugged. That ends the hardware installation. The software ScanKit Grey and Perceive Personal (the latter being the OCR program), was included and installed in minutes.

The user must choose a number of settings before an image can be scanned. The resolution can be set to 100, 200, 300 or 400 dots per

inch. The image type must be set to large lettered text, medium text, medium pictures or fine detail pictures. The image contrast control has to be adjusted. There are lots of combinations—a fact that would come back to haunt me over the next 48 hours.

Setting the controls to a general medium position, and scanning what was at hand, resulted in Figure One. I'm sure you will recognize this as the cover logo of *MT*. Not bad for a first try. Some might say beginners' luck. But we were just looking at a scanned image and not yet using the OCR program to read text. Flipping to Larry's column, I felt the thrill of a scout blazing a trail for others to follow, or a general returning to wrest victory from the jaws of defeat.

The scanner was large enough to scan two of the four columns of Larry's February 1995 frequency list (page 33). It looked good on the screen. Then I clicked on the RECOGNIZE command of the OCR program and all hell broke loose. Less than 50% of the information was translated to text correctly.

I thought I must be doing something wrong or had the wrong settings. Adjusting the controls I tried again. And again. And again.... Six hours later I was no closer to reading the frequencies without errors than the US Congress is to balancing our budget. Well, at least I *could* read *some* numbers. Scanning one column, not two as we started out, the best I was able to achieve was 23 correct frequencies out of almost 70 (see Figure Two). Totally useless in my book.

The next day I started anew with creative ideas. Trained as a physicist, I am quite familiar with the saying, "if a theory doesn't work, make up a new one." You'll recognize this as the international motto of economists and politicians as well. Maybe I pulled the scanner too fast. No better results. Maybe I had the wrong scan speed to settings. No better results.

After two days of frustration two parameters become important. The skew, or tilt from a perfect horizontal really screws up the OCR software. Just a few degrees, which is almost unavoidable with a hand scanner, destroys any hope of correct results.

By scanning one quarter of a column at a time, keeping the scanner absolutely parallel to the top of the page, moving with a constant speed, and praying a lot, a fifty percent correct frequency read was achieved. That meant that the one page had to be very carefully scanned almost ten times, stored and OCRed. The results would still require more than thirty percent of the frequencies to be manually corrected. This, of course, requires that all numbers be checked manually by—you guessed it—reading off the list. Do you hear those pans clanging now?

FIGURE 2

Comparing Optical Character Recognition Output to Actual Frequency (the best author could get after hours of trying). From *MT* Utility World FEB 95.

OCR	ACTUAL	COMMENTS
5705.C	5705.0	ALMOST CORRECT
S708.C	5708.0	S=5, C=0
571 1.0	5711.0	EXTRA SPACE
5714.0	5714.0	CORRECT
571'7.0	5717.0	ADDED '
5720.0	5720.0	CORRECT
5723.0	5723.0	CORRECT
5726.0	5726.0	CORRECT
b685.O	6685.0	b=6, O=0
db88.O	6688.0	d&b=6, O=0
6691.a	6691.0	ALMOST CORRECT
6694.0	6694.0	CORRECT
66P7.O	6697.0	P=9, O=0
6iTQO.O	6700.0	TOTAL MESS
d703.Q	6703.0	d=6, Q=0
6706.0	6706.0	CORRECT

SCORE: 8 correct or almost correct out of 16 = 50%

Maybe it was the software, the scanner, my computer, me, the phase of the moon.... Sorry, but the $100-$200 optical scanner is not yet the useful tool that the marketing hype and enclosed software would have you believe. It's still a toy, and in my opinion, not even worth the $89.99 for our frequency copying purposes.

Mark this milestone! We have just been through this column's first unqualified failure. Thinking new technology products will always perform as advertised is the mark of an uneducated consumer. Eventually, optical scanners will be developed that can reliably convert character images to text and sell for under $100. But not yet.

Something I have not tried, and which may work better than a cheap hand scanner, is using a FAX machine. Connect your fax to your modem, or just dial your modem from the FAX using a different phone. FAXing your frequency data page to your modem should get the document into the computer without all the hand scanner problems. If this is done on the Fine resolution setting of the FAX, perhaps you would have an even better text conversion success rate. If anybody has tried this, let me know all the details and I'll pass them along.

Of course, you'd have to rip out or photocopy the *MT* frequency pages that you wanted to scan, since the FAX machines pull the paper through themselves. But that would be doing nothing new to *MT*s in this house. *Duck*!

Next month we will visit Computer Aided Technologies' new 1995 catalog and see what new products and new versions of old standards this major player in monitoring software has been developing.

Use Op Amps to Aid Reception

Some short-wave receivers are not equipped with narrow filters for CW and RTTY reception. Others do not have notch filters for eliminating troublesome beat notes (heterodynes) that interfere with reception.

The high expense of installing commercially made filters that can narrow the effective receiver bandwidth or attenuate unwanted heterodynes is prohibitive for some hobbyists. A low-cost solution to these problems is found in the use of inexpensive op amps (operational amplifiers).

These marvelous ICs can accept many circuit assignments. For example, they can amplify audio, RF energy or dc current. This makes them useful in S-meter circuits, as microphone amplifiers or RC active audio filters. Op amps are being manufactured these days for use at frequencies as high as 1000 MHz.

This article covers two active filters that use the generic 741 op amp. An active filter (or any active circuit) is one that requires an operating voltage. Conversely, passive filters do not require an operating voltage. An example of a passive circuit is an audio filter that consists of only inductors (coils) and capacitors.

Passive filters are lossy (some signal energy is lost in the filter—known as "insertion loss"), whereas an active filter can be designed to have gain. Active filters are known also as RC active filters. The RC stands for resistor-capacitor. These components replace the coils that are used in passive filters.

An Active Peak Filter

Figure 1 shows the circuit for a peak filter that uses one op amp. The accompanying computer-generated response curve (via NOVA software[1]) shows how sharp the peak can be at 700 Hz, which makes it ideal for CW reception.

The greater the circuit Q (quality factor), through adjustment of R1, the narrower or sharper the filter response. At low-Q settings the filter is suitable for SSB or AM reception. The narrower response helps to eliminate unwanted QRM from nearby signals. Also, the narrower-response settings help to lift the weaker signals out of the noise.

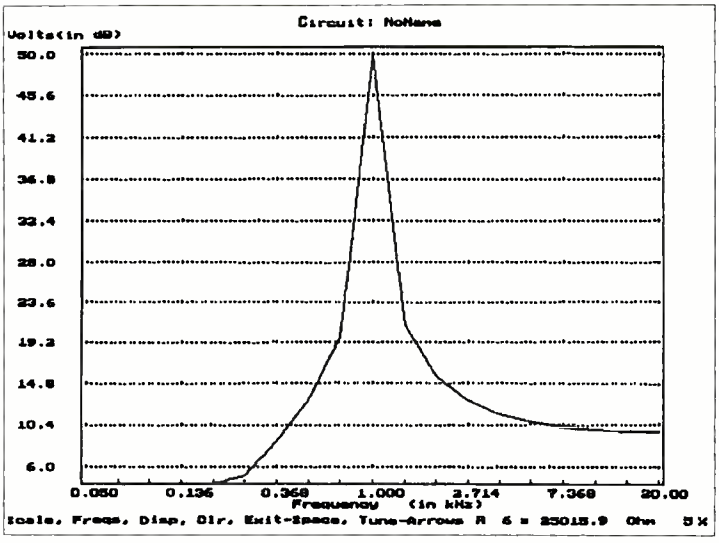
Control R2A/R2B sets the peak frequency of the filter over a range of 100 to 3000 Hz (0.1 to 3 kHz).

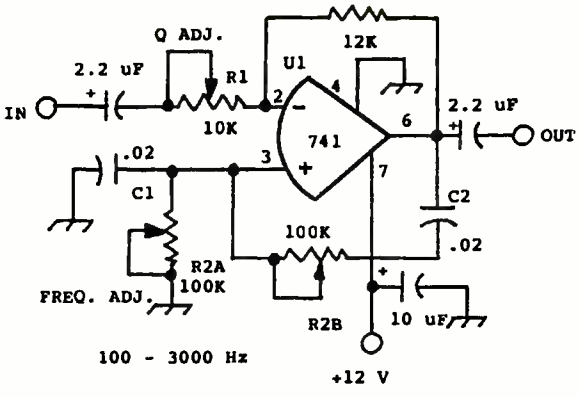
The active filters described in this article are inserted in the receiver audio line. They operate at audio frequencies, but not in the RF or IF sections of the receiver. The filter is connected between the receiver audio gain control and the first audio amplifier (see Figure 3).

It is impractical to use these filters in the headphone or speaker lines of the receiver because (1) the low impedance of those lines is not compatible with the filters and (2) because the receiver audio output power is too great for the op amp. The IC would overload and cause distortion if it were connected to the receiver audio output jacks.

A dual-section potentiometer, R2A/R2B, is required for the Figure 1 circuit. These controls and most of the other parts are available from an electronics mail-order house.[2] The C1 and C2 capacitors should be high-Q units, such as polystyrene or mylar types. They need to be as closely matched in value as possible to ensure optimum filter performance (known as "tracking").

FIGURE 1: Peak Filter





Circuit and response curve for an RC active peak audio filter.

Op Amps Create Noise

Although the noise that is generated in op amps (caused by the internal flow of current) is not troublesome in some audio circuits, it may cause an annoying hiss in the speaker or headphones. This problem can be minimized by substituting BIFET op amps for the 741 units. These quieter op amps have FETs (field effect transistors) rather than bipolar transistors at the input port. FETs draw very little gate current (microamperes) and, therefore, generate less noise.

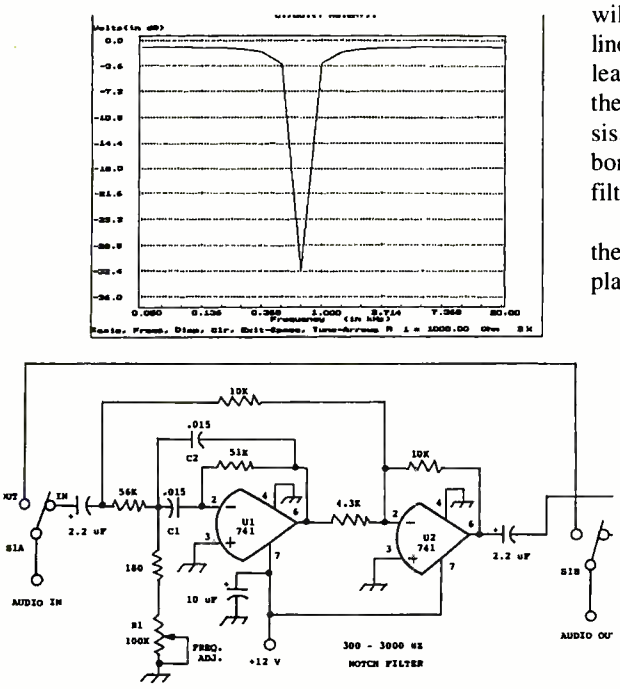
A direct substitute for the 741 is a TL071CD, which is specified as a low-noise BIFET. These are available for 89 cents at Hosfelt Electronics.[3] No other circuit changes are necessary. BIFETS may be used also in the Figure 2 circuit.

Op Amp Notch Filter

Figure 2 contains a practical circuit for an active notch filter, along with a computer-generated response curve that clearly shows how deep the notch can be when a single audio tone is rejected. The notch can be moved from 300 to 3000 Hz by means of control R1.

Two op amps are required for this circuit. Note also that a switch-around circuit is shown in Figure 2. S1A/S1B allows the operator to remove the filter from the circuit when it is not needed. A

FIGURE 2: Notch Filters



A two-stage RC active audio notch filter and a response curve that illustrates how an interfering beat note is attenuated, or notched out.

relay may be used in place of the switch if remote control from the receiver front panel is desired. This switching circuit may be used also with the peak filter in Figure 1.

C1 and C2 in Figure 2 must be high-Q, closely matched capacitors for best performance. Again, polystyrene or mylar capacitors are recommended. TL071CD op amps may be substituted directly for the 743s to minimize the filter output noise.

Construction Tips

Short, direct connecting leads are important for reducing unwanted hum pickup. Shielded audio cable or miniature RG-174 coxial cable may be used if long runs of input and output wiring are needed for the S1A/S1B circuitry. The shield braid for these cables should be grounded to the receiver chassis at each end of each cable. In a like manner, if a long cable is used between the main circuit and R1 it should be the shielded type also.

Perforated construction board may be used when assembling the circuits of Figure 1 and 2. The "dead bug" wiring method is satisfactory also. The neatest layout would result, of course, if the builder designed a PC board upon which to mount the components.

Installation and Use

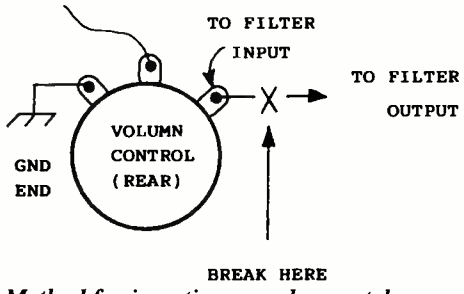
The peak and notch filters can be placed in a metal cabinet and used outboard from the receiver if desired. If this is done it will be necessary to break the audio line in the receiver and bring shielded leads out to a pair of phono jacks on the rear apron of the receiver chassis. A third jack may be added to borrow the +12-volts needed by the filters.

If the filters are mounted inside the receiver cabinet they should be placed as close to the receiver audio circuit as practicable. This will ensure short connecting leads and prevent hum pickup. The on-off switch and frequency control potentiometer can be mounted in a separate box (connected to phono jacks at the rear of the receiver) in order to negate the need to drill holes in the receiver front panel.

Figure 3 shows how to install the filters. This requires merely unsoldering the lead from the high end of the audio gain control and inserting the filter at that point in the receiver circuit.

When using the peak filter in Figure 1 it is necessary to tune in the desired CW or voice signal before activating the filter. Turn on the filter and adjust R2 for maximum intelligible signal quality. Next, adjust the Q control, R1, for a narrow response, as noted by a reduction in background noise and QRM. Use the highest Q setting that permits acceptable voice-signal quality. Maximum Q (narrowest bandwidth) is generally preferred for CW reception.

FIGURE 3: Installation



Method for inserting a peak or notch filter in the audio amplifier circuit of a receiver. Installation requires unsoldering one lead from the volume control and placing the filter in that line. The filter requires an operating voltage of +12 at 3 mA of current.

The notch filter is adjusted by setting R1 for minimum volume of the interfering heterodyne. The unwanted beat note may not vanish completely (depending upon its strength), but it will be minimized sufficiently to allow the desired signal to be copied more easily.

Closing Comments

The filters discussed in this article are inexpensive and easy to build. One or both of them can be assembled and made operational in a couple of evenings. Needless to say, better performance can be had by using one of the expensive commercial DSP filters, such as the MFJ Super DSP Filter, but reception can be enhanced significantly with the circuits described here.

Notes

1 — NOVA design software for use with DOS is available from RF Engineering, RD #1, Box 587, Chenango Lake Rd., Norwich, NY 13815. Phone: (607) 334-8911

2 — Mouser Electronics, 2401 Hwy. 287 N., Mansfield, TX 76063-4827. Phone: 1-800-346-6873 for a catalog or when ordering.

3 — Hosfelt Electronics, 2700 Sunset Blvd., Steubenville, OH 43952-1158. Phone: 1-800-524-6464 for a catalog or when ordering.

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Battery Backup & Memory Preservation

Memory is a wonderful commodity if you have it. When it takes a leave of absence, you can be left feeling unsettled and shaken. When your computer, scanner, or shortwave receiver suffers a memory lapse, the results are a trifle more than unsettling: sometimes they are disastrous.

Modern electronic equipment takes great pains to protect against routine and typical disruptions of memory. Most scanners and shortwave radios can be disconnected from power for months on end without loss of program contents.

Computers are a little different because of the type of memory, operating system, and high current demands. However, high speed hard drives, disk caching, and well-designed power supplies go a long way toward minimizing serious problems with memory glitches. "Uninterruptible power supplies" (UPS) take care of the more serious concerns.

The electronic hobbyist and the experimenter have largely been left out with respect to battery backup circuits and memory preservation techniques. I will attempt to fill a portion of that gap this month and enhance the power of your workbench with some basic circuits and techniques for a small UPS or battery backup circuit and a related gizmo. Let's dig in with a close look at a very simple battery backup idea.

Figure 1 shows how a 25 cent diode and a 9v battery can serve as an uninterruptible power supply. This is about as elementary as it gets, so let's dissect Figure 1 in detail.

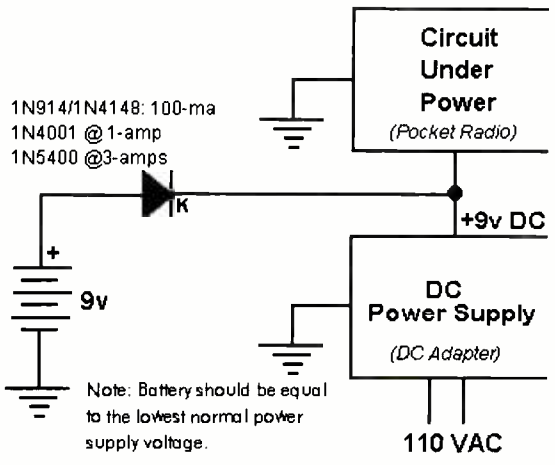
The battery and diode do absolutely nothing so long as the main power supply performs as designed. But when its voltage drops to zero, as in the case of an AC power outage or if its voltage drops below a certain level, then the battery assumes the role of primary provider of power. This action is automatic and completely hands-off. The battery will even return to standby status if and when normal power returns. It will not recharge, however, so replace or at least test it occasionally.

The diode keeps the battery from providing power to the circuit so long as the normal power supply functions properly. Remember that a silicon diode **cannot conduct** unless the forward bias across it is about 0.6-volts. This means that there are two conditions under which the diode cannot conduct: (1) when the voltage on the cathode (K) of the diode is *more positive* than the anode, and (2) when the voltage on the cathode is more negative than the anode by 0.6v or less.

If the anode is at +9v, then Condition 1 is when the DC power supply voltage is +9v or greater. Condition 2 is when the DC power supply voltage is between +8.4 and +9.0 volts. Since the cathode of the diode is connected to the power supply's output, whatever voltage is there is also the cathode voltage (same point).

Now we come to a third condition. The diode conducts only when the cathode is at least 0.6v more negative than the anode, so Condition 3 (diode conducting) exists only when the DC power supply voltage falls below +8.4 volts. This, then, becomes the basic building block for an automatic battery backup circuit. In fact, this one works as shown, without alteration, for almost any 9-volt application where current requirements do not exceed about 80-100 ma. If greater current is required, I suppose a pair or trio of 9-volt batteries in parallel could be pressed into service, but any more than that, and a slightly different design might be better.

FIGURE 1
SIMPLE BATTERY BACKUP



If you use this circuit, be sure to assess your peak current demands and select a silicon diode properly rated for the task. For instance, you can use a cheap switching diode (1N914 or 1N4148) where maximum current will not exceed about 75-100 ma. The 1N4001 is rated at 1-amp (1000-mA) at 50-volts, or about right for most 12-v receiver circuits.

In fact, you could use the circuit in Figure 1 with a 1N5400 (3-amp/50-v) diode and a 12-v gel cell or 12-v automotive battery as a battery backup for medium duty 12-volt applications! A prime example would include a burglar/security alarm that should be fully operable, even when AC or main DC power is down. Likewise, ham repeaters, baby monitors and transmitters, cordless telephone base units, alarm or security transmitters, and many other applications around shop and shack can benefit from a battery backup system, especially one that costs next to nothing and which can be assembled and implemented in a few minutes!

The Next Step Up

Now let's take a look at a more versatile version of Figure 1. Remember our Adjustable, Regulated DC Power Supply? (June 1994 issue) We have a great use for it as shown in Figure 2.

This enhanced version of the battery backup circuit is really the same as the simple version, but with the addition of an adjustable voltage regulator. This allows one battery to meet the needs of a range of power and voltage requirements. A large 12v gel cell, for example, can provide user-selectable backup power for anywhere from just under 3v to about 9.5-volts.

The limitation and primary disadvantage of this circuit is that the battery must be about 3-volts higher than the highest required backup voltage. A 12v gel cell (actually 12.6v) can therefore provide a maximum of about 9.6 volts to a protected circuit. This is because the voltage regulator consumes about 2.2-to-2.5 volts and the series diode drops another 0.6 volts.

Realistically speaking, the circuit in Figure 2 is best suited for backups of standard voltages of 3, 5, 6, 8, and 9 volts, where current demands can be as high as 1-amp or so. 12-volt backup may best be provided by

FIGURE 2
VERSATILE BATTERY BACKUP

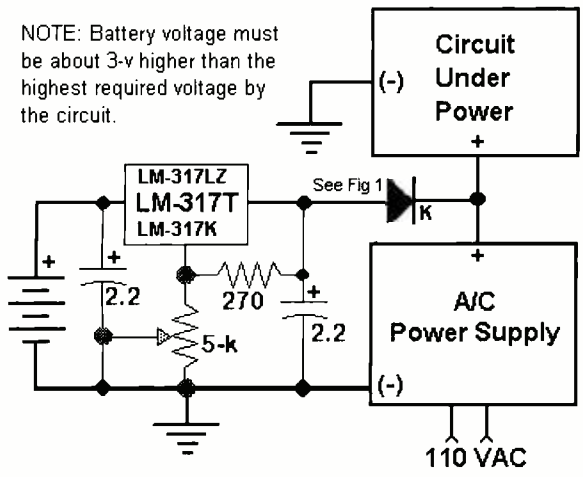


Figure 1, but now you get the idea of how uncomplicated this kind of circuit can be.

If your current requirements are greater than 1-amp, you can use the LM-317K regulator for a 3-amp maximum. If current requirements are less than 100-ma, you can use the LM-317LZ.

■ Get Smart

The above two battery backup circuits are effective and useful, but not smart. For instance, the battery will cut in anytime there is a difference in potential of 0.6-v or more across the diode. The power supply might well be functioning perfectly okay, but just a little low in voltage, due either to brownout conditions or unusually high current demands by the circuit under power.

Low power supply voltage is not always a bad thing, considering that some equipment or circuits can operate to 100% capacity over a range of voltage variation, such as the PRO-2004/5/6 scanners. Powered from the external DC jack, these scanners, and probably most others, will perform just fine with a supply of anywhere from 10 to 15 volts. You might not want your battery backup cutting in just because the feed supply has momentarily dropped to 11 volts.

This is where "intelligence" or logic enters the picture! Figure 3 presents the simplest of logic circuits that can be used to "make decisions" and perform control functions based on external "data."

Figure 3 is properly called a "comparator," the heart of which is a specially designed operational amplifier chip (op-amp). The LM-339 is carried by Radio Shack (part #276-1712), and has four separate comparators on one chip. We're just using one section in this example. A comparator performs a function similar to its name: it compares one signal to another and makes a "decision" based on which signal is greater.

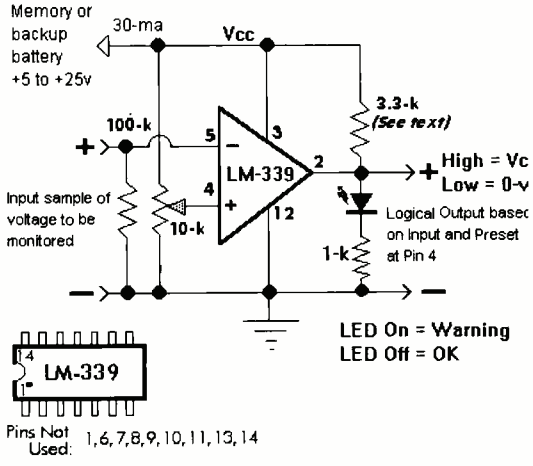
The inputs are at Pins 4 and 5 and the "intelligent" output is at Pin 2. The circuit, when used as a decision-maker for power failures, is powered by a memory battery at Pins 3 and 12. The reference voltage is adjusted and set by the trimmer potentiometer at Pin 4, and the sample test voltage is taken from the power supply to be monitored and applied to Pin 5. Connected as shown, the output at Pin 2 is "low," or 0-volts, when the test voltage at Pin 5 is greater than the reference voltage at Pin 4.

Should the external power supply fail or drop its voltage for any reason, to where the sample at Pin 5 is lower than the reference at Pin 4, then the output at Pin 2 will shift from low to high (same voltage as V_{cc})! The enormous applications of Fig 3 range from a simple warning LED, as shown, to a trigger for a shrill audible warning device, to the control of a transistor or CMOS switch, which can do other things that you might want done in case of power failures or brownouts.

Figure 3 is not suited for direct control of a backup battery, but it is an ideal controller for the thing that does the actual switching of a backup battery (or power supply).

Construction and setup are simple. Build Fig-3 as shown, with or without the optional LED and 1-k resistor. Attach a voltmeter between ground and Pin 4, and adjust the trimmer potentiometer for the desired reference voltage. More on this in a sec...

Figure 3
INTELLIGENT VOLTAGE SENSOR



Connect the voltage you want to monitor to Pin 5. If this is a 12-volt system, you might want to adjust the trim pot for 11 volts at Pin 4. If it's a 5-volt system, perhaps the reference should be 4.5 volts. This trigger point is your option, see? Now, when the sample voltage drops below the reference, (whatever you choose), the output at Pin 2 goes high to do whatever you need it to do: maybe light a warning LED or trigger a 120-dB blast from a siren, or even kick start your diesel generator plant!

As is typical with low power chips, this circuit will not do much work by itself. The idea is to use its logical output to trigger the actual control device, typically a transistor switch, a thyristor, an SCR, or other component that can handle the current and voltage demands of your application. For example, Fig-3 can turn on a transistor switch which in turn can activate a solenoid to start the aforementioned diesel generator. Overkill? Maybe, but you get the idea.

Let me know if you like this month's fodder. We can explore the subject a little deeper, if you want. Cheers: Spring has sprung!

W. Clem Small, KR6A, CET

Selecting an Antenna, Part 2

In the first part of this series we discussed antenna gain, antenna directionality, antenna polarization and signal polarization. We continue this month with several other important antenna parameters; next month we will discuss how all these factors can help us in selecting antennas for specific applications.

BANDWIDTH: Most antennas operate at their optimum efficiency over a relatively narrow range of frequencies which is centered around their design frequency. This range of frequencies is called their "bandwidth." An antenna's bandwidth is often less wide than the width of a shortwave-broadcast band or amateur band; typical bandwidths for ordinary wire antennas are on the order of five percent of the antenna's design frequency.

For an ordinary wire dipole antenna designed for 10 MHz we might find a bandwidth on the order of 500 kHz; for a design frequency of 100 MHz the antenna's bandwidth would be more on the order of 5 MHz.

BROADBAND ANTENNAS: A broadband antenna is an antenna which functions efficiently over a wider band of frequencies than does an ordinary antenna. A broadbanded wire dipole, instead of having a bandwidth on the order of five percent of its design frequency, might have a bandwidth of 8 to 10 percent or more.

There are various techniques for making an antenna broadbanded; these include using thicker elements, using multiple elements of slightly different lengths, and adding compensating circuits at the antenna's feedpoint.

WIDEBAND ANTENNAS: Although a "wideband" antenna is sometimes given the same definition as a broadband antenna, for our discussion we will define a "wideband" antenna as one which functions efficiently over a much wider bandwidth than even a broadband antenna. Thus, a wideband antenna functions efficiently over a range that is sizable compared to the antenna's design frequency, as when the antenna's bandwidth is on the order of 20 percent or more of the antenna's design frequency.

Using this definition, a broadband antenna designed for 10 MHz would have a bandwidth of 2 MHz or more. There are some discone and log-periodic antennas which have a bandwidth on the order of 10 times their design frequency.

MULTIBAND ANTENNAS: Most antennas will function efficiently and retain their intended radiation pattern over only one band or one portion of a band. If we want good antenna efficiency and the same radiation-pattern shape over more than one band we must utilize a "multiband antenna" design.

Multiband antennas can be designed to operate efficiently on a number of bands. Operation on true multiband antennas can be changed from any of the bands which they cover to any other, without the need for switching elements or changing any connections on the antenna. Antenna designers utilize various techniques, including trap coils and multiple elements, to make an antenna cover multiple bands.

ANTENNA TUNERS: The use of an antenna tuner between the antenna feedline and the receiver or transmitter can broaden the overall response of an antenna system. In this manner the antenna system might qualify as a broadband, wideband or even multiband antenna; however, this approach is more useful for transmitting antennas than for receive-only antennas.

TABLE ONE

Some Sources of Electrical Noise Which Can Cause Interference to Radio Signals

TYPE	TYPICAL SOURCE
ATMOSPHERIC	LIGHTNING DISCHARGES, MAY ORIGINATE THOUSANDS OF MILES FROM POINT OF RECEPTION.
MANMADE	ELECTRIC MOTORS, HIGH-POWER ELECTRIC LINES, LIGHT DIMMERS, NEON SIGNS, VEHICLE IGNITIONS
GALACTIC	THE SUN, VARIOUS COSMIC SOURCES, USUALLY OF LITTLE CONCERN BELOW 18 MHZ.

On HF and lower frequencies, where the signal-to-received-noise ratio (see below) can override the importance of receiving-antenna bandwidth, the use of antenna tuners for receiving is of questionable value.

■ Signal vs. Received-Noise on Different Bands

When electrical noise signals (see table one) have the same wavelength as that of a desired signal, then our antenna responds to these noise signals in the same way that it does to the desired signal. At the receiver both the desired signal and the noise are detected, and we hear their combination as a signal with some accompanying noise. The greater the noise the less well we are able to detect the desired signal.

Due to the competition between signal and noise, we find that, on bands where received noise is significant, the quality of reception is usually determined by this signal-to-received-noise ratio. Depending on location and conditions, somewhere around the middle or the top of the HF band we usually find that received noise becomes low enough that it no longer competes significantly with received signals. Higher in frequency than this—especially in the VHF band and higher—noise generated in the receiver itself becomes the major noise of importance in the signal-to-noise ratio for reception.

The difference in noise levels on the different bands as just described gives a different importance to antenna bandwidth on the various bands. On HF and lower frequencies, where received noise determines signal-to-noise ratio, we find that received-noise—not antenna bandwidth—is often the factor which determines how much of the spectrum can be heard with a decent signal. That is, signals within the antenna's bandwidth do not have a better signal-to-noise ratio and thus do not necessarily give better quality reception.

Due to this, the reception obtained using ordinary antennas may be relatively constant across the entire HF band. If the antenna is long, high, and in the clear, it may give essentially as good reception as if its bandwidth covered the en-

tire HF band! At VHF and higher frequencies, where we find very low received-noise levels, the increased responsiveness of an antenna operated within its bandwidth becomes an important determiner of signal strength—signal-to-noise ratio is higher (better) for signals inside the antenna's bandwidth. Antenna bandwidth is then obviously a significant factor in the quality of reception.

Next month we'll discuss putting the various antenna parameters which we've discussed in this series to work in helping you select the antennas you need for your monitoring and scanning applications.

R A D I O R I D D L E S

Last Month:

Last month I wrote:" Speaking of aerials. what three fields are present near a radiating antenna, two of them being quite strong very near the antenna?" Well, these fields are the electrostatic, the inductive, and the radiation fields. Close to the antenna the electrostatic and inductive fields are collectively known as the "near field," and while they are still close-in they predominate in strength over the radiation field as it leaves the antenna on its way to becoming the "far field." But since the electrostatic field diminishes inversely as the 6th power of distance from the antenna, and the inductive field diminishes inversely as the 4th power, within a few wavelengths from the antenna they are a great deal weaker than the radiation field, which diminishes inversely only as the second power of its distance from the antenna.

As an example of the amazing effect these different rates of decay make in the strength of these three fields at various distances from the antenna, consider the following: if all three fields are equal at a point very near the antenna (say, 1 ft.) then, when the induction field has moved out only a bit less than half a mile from the transmitting antenna, it is already as weak as the radiation field will be at 1000 miles from the antenna! Even more remarkably, at less than 200 ft. out from the antenna the electrostatic field will have dropped to a level equal to the radiation field at 1000 miles out! It's easy to see why the radiation field is the one which supports the pleasures of radio monitoring.

This Month:

"If it were not for the presence of radio noise, the useful radio paths expressed in miles would have no limit. Furthermore, if it were not for radio noise being present in all radio circuits, the magnitude of the transmitter power would be of no great consequence, and there would be no necessity for using large values of power." This statement appears in *TV and Other Receiving Antennas*, by Arnold B. Bailey (1950, John F. Rider Publishers, New York). Do you find fault with it?

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.

ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ

CORRECTION

In my February, 1995, column, I stated that the Restricted Radiotelephone Operators Permit had been discontinued; Fred Maia (The W5YI Group), informs me that the program is still very much alive, with 5000 permits per month being issued by the FCC! His book on commercial radio, available at Radio Shack, tells all about it.

According to Fred, the permit is still needed to operate 2-30 MHz ship-to-shore communications, VHF international ship-to-shore communications, 2-30 MHz air-to-ground communications, and to install, maintain or repair AM/FM/TV broadcast stations (including international).

While no examination is required as in the old days, a $45 fee made out to the FCC, accompanied by an FCC Form 753, must be sent to the Mellon Bank at: FCC-Restricted Operator Permits, PO Box 358800, Pittsburgh, PA 15251-5800.

Thanks, Fred.

Q. *My daughter, in Portland, Oregon, was hearing cellular*

Bob's Tip of the Month

Upside-Down Antennas

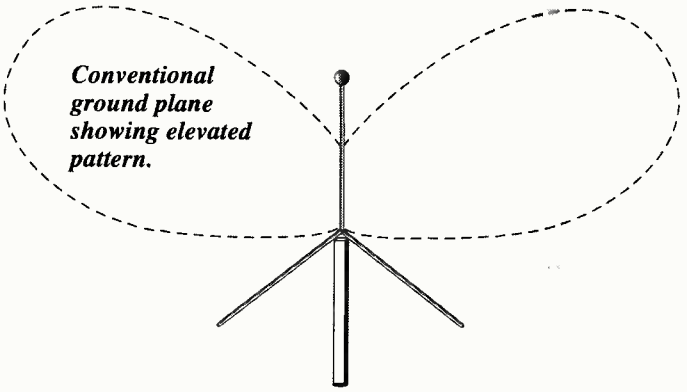
We have a tendency to visualize any vertical antenna as having a central element sticking upward into the air. But what if the antenna stuck downward? Would that create problems? Not necessarily; in some cases, it can be an advantage.

Biomedical telemetry and paging in hospitals often require a network of small whip antennas to be strategically located throughout the facility. Rather than pointing them upward above the ceilings, they frequently point downward, often below the ceilings.

An in-plant communications system can benefit by mounting the whips against the underside of a metal roof or beam support, pointing downward, using the metal surface as a reflective ground plane. This can produce a very uniform and dependable radiation pattern, both for transmitting and receiving.

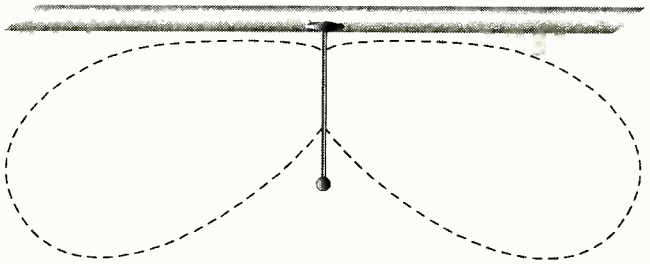
When whips are traditionally pointing upward above a ground-plane surface, the radiation pattern lifts slightly above the horizon, but when the same antenna is pointed downward from the ground-plane surface, the pattern also points downward slightly, flooding the local area with signal—a distinct advantage for reliable, close-in communications.

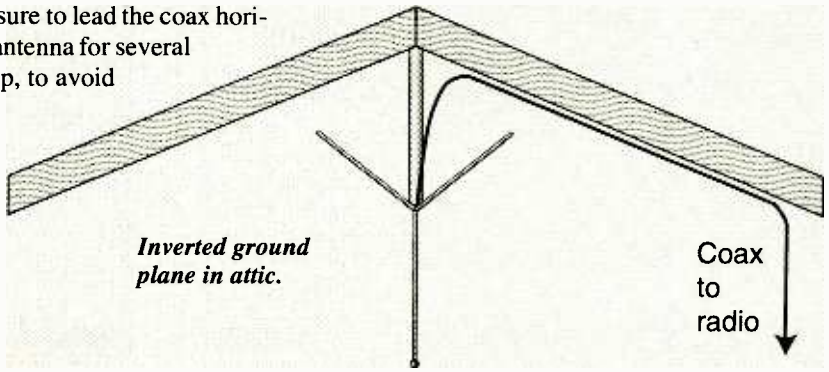
For the VHF/UHF listener or communicator with limited antenna space, such an inverted ground plane could be suspended from the underside of a roof in an attic with minimum intrusion. Be sure to lead the coax horizontally away from the antenna for several feet before letting it drop, to avoid reflections.



Conventional ground plane showing elevated pattern.

Inverted ground plane effect of whip mounted against metal surface, showing downward pattern.





Inverted ground plane in attic.

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*.

phone conversations on 89.1 MHz FM, when suddenly her own telephone (with memory) automatically dialed me. Does it have a mind of its own? (David Huey, Silver Springs, FL)

A. Before you call an exorcist, it is likely that your daughter's dilemma was caused by a nearby cordless telephone, possibly the same model she has. Some of these are always on, even when cradled, allowing them to sense another nearby phone handset, becoming activated when the other handset's preset memory button was pressed.

There have been reports of individuals accessing neighbors' cordless phones by using the same model, but turning off their own base units, allowing them to dial long distance on their neighbor's lines.

So far as being heard on the FM radio, most entertainment radios leave a lot to be desired in the selectivity and overload-immunity department. Images, intermod and other types of spurious signal responses are common.

***Q.** What is the purpose of the coiled section on cellular phone antennas? (Heather Peel, Oakville, Ont.)*

A. A naturally-resonant (impedance-matched) antenna for the cellular band is only 3-1/2 inches in length. By making a longer antenna, we can increase the aperture (signal-capturing area) for greater reception range, and by adding the coil, we can improve the pattern of the antenna's performance toward the horizon.

LETTERS

(Continued from page 4)

and his Workmen's Compensation after being beaten by two supervisors when he would not lie about an incident. She reports it has led to physical problems and depression, compounded by his inability to provide for his family of five children. Her request is for a scanner which includes 800 MHz channels or a decent shortwave receiver—something to take his mind off his troubles and his continuing dispute with the system. Again, you may contact Rachel Baughn, editor, if you have a piece of new or used equipment to offer.

Photo Corrections

■ Though readers will immediately recognize the wonderful photography in our March SAREX feature as originating from NASA, we regret they did not receive appropriate credit in the issue. We apologize for the oversight. Another picture which should have received credit is the antenna array on p.27, which was shot by John Strand.

In the February feature on Shortwave radio in Botswana, the buildings on page 24, identified as Radio Botswana, are actually those of the VOA. Colin Miller supplied a picture of another VOA facility, shown here—the maintenance/storage building at the VOA site in Morocco. Now, that looks like a really sizzling assignment!

The VOA maintenance building in Morocco. Photo courtesy of VOA.

Selected Shorts

■ "In the 2/95 issue, Rachel asks for opinions about how to handle the yearly index. Frankly, I think the Index has much broader interest than convention articles."

—Bruce Frederick, Burlington, MA

"Thanks so much for covering the *MT* convention, especially the pictures—next best thing to being there."

—Leslie Edwards, Doylestown, PA

Thanks to all of you who wrote; the only way we could be sure of the value of the Index to our readers was for you to write in for them, and it is obvious you really use it! We'll continue in future years to publish the annual index of articles, but it will shift to the January issue instead of the December, and the convention report (now renamed the Communications Expo) will appear in December.

—RB

■ "I really enjoyed the article about the FEMA Multiple Radio Vans in the Jan 95 issue, and this most useful spending of our taxpayer dollars. I was impressed by the utilization of the radio spectrum. With so much government spending waste, these are some of our best spent dollars."

—J.Mike Waylonis N3KFT, Erie, PA

■ "A new catalog, Howard W. Sams and Company's 1995 annual Index, is a fantastic collection of information concerning older radios and TVs. Just call 800-428-7267 for a copy."

—Martin Wishnewitz, Jackson Heights, NY

■ "Why not include a column that lists telephone BBS's devoted to radio listening? One criteria I would like to see would be that any net in the list has free access."

Zack Schindler, Ferndale, MI

Many clubs have bulletin boards which we publish under their club listing when we know about them, but many of the most active and useful radio-related exchanges are actually "echoes" that are carried on many local BBSs. Though it is not feasible for MT to try to maintain a list of such BBSs across the U.S.—there are so many, and they come and go as sysops have the time and/or money to maintain them—any BBS is, of course, welcome to advertise on the Grove BBS—RB

■ "I am now head of the radio broadcasting unit for UN protection force in former Yugoslavia, where we continue to push our radio effort in Serbia, Croatia, and Bosnia Herzegovina. You can try to receive our SW broadcasts on 7108 at 15:30 UTC. Very much appreciate your help in furthering United Nations broadcasting. I find the magazine not just a utility to my work, but also a comfort here in Croatia."

—Jeffrey Heyman, UNPROFOR, Zagreb

From the Editor

■ *Monitoring Times*' global reach is still relatively small and has always suffered long delays and damage in its overseas, surface delivery. Our experiment in February using an air-mail delivery service was so successful (delivery in 10-15 days) that we are discontinuing the surface mail option for new subscriptions outside North America. (Surface delivery will be honored on current subcriptions.) This policy is in line with many other magazines, and is consistent with the time-sensitiveness of much of *MT*'s coverage. The faster delivery time should make *MT* a much more effective monitoring tool.

April is that crazy month when some countries have shifted to Daylight Savings Times and some haven't, some have changed frequencies and schedules and some haven't, and only a handful of them have notified us of their intentions. Meanwhile, house-bound hobbyists are emerging and checking the winter damage to antenna systems. (Any excuse will do to get on the roof and soak up the rays on a sunny spring day!)

You tune and tweak your system, as we do our publication—to wrest the very best from our monitoring times.

—Rachel Baughn, editor

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FEATURES

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LOW BATTERY IND.	NO	YES	YES	YES
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MT is exceedingly sorry to note the demise of two venerable radio clubs: ADXR and SPEEDX. Clubs, which can serve a narrower geographic or special interest, have a very worthwhile function: support your favorites before it's too late!

Memphis Area Shortwave Hobbyists (MASH): P.O. Box 3888, Memphis, TN 38173, Jim Pogue (901)873-4291 or Brandon Jordan 373-8046. Memphis area; SW, MW, FM, TV, utilities, pirates, etc.
Metro Radio System: Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. *M.R.S. Newsletter.*
Michigan Area Radio Enthusiasts: Bob Walker, P.O. Box 81621, Rochester, MI 48308. E-mail via Internet MARE/Ken Zichi ab415@leo.nmc.edu. Great Lakes Region. All bands. *Great Lakes Monitor.* $9.50 annual US & Canada. $1 sample.
Minnesota DX Club: Greg Renner, P.O. Box 10703, White Bear Lake, MN 55110, 612-822-1186 for meeting info. Minnesota. All bands. *MDXC Newsletter.* $10 annual.
Monitoring the Long Island Sounds: Ed, 2134 Decker Ave, North Merrick, NY 11566. Primarily scanner, some SWL. 50 mi. radius of LI. Net Tues 8pm 146.805. *Monitoring the Long Island Sounds.*
MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 Third St., West Chester, OH 45069-2212, (513)777-2909. SW Ohio, SE Ind., N Ken; All bands. Meets 2nd Sats 7pm at VOA Bethany station. Net Thurs 9:30 146.835/6.235. No dues.
Mountain NewsNet: James Richardson, P.O. Box 621124, Littleton, CO 80162-1124, (303) 933-2195. Colorado statewide. Public Safety notification group. *Mile High Pages.*
National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711, (913)266-5707. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp. Annual Labor Day convention.
National Radio Club - DX Audio Service: Ken Chatterton, P.O. Box 164, Mannsville, NY 13661-0164, (315) 387-3583. Worldwide. North American Broadcasters. *DX-Audio Service* (90-min.tape). Sample $3.
North American SW Assoc.: Bob Brown, 45 Wildflower Lane, Levittown, PA 19057, (215) 945-0543. Worldwide; Shortwave broadcast only. *The NASWA Journal.* Regional meetings.
North Central Texas SWL Club: Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. North Central TX area; All bands.
Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities. Meet 3rd Tuesdays.
Northeast Scanner Club: Les Mattson, P.O. Box 458, Rio Grande, NJ 08242, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN).* $29 annual.
Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice & fax, (416) 444-3526 DX-Change information svce; (905) 841-6490 BBS. Predominantly Province of Ontario; All bands. *DX Ontario.* Meet 3rd Wednesdays, Toronto; bi-monthly, Ottawa.
Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. Pacific NW and BC Canada. DXing all bands. *PNBCDXC Newsletter.* Irregular meetings.
Pitt Co SW/Scanner Listeners Club: L. Neal Sumrell, P.O. Box 1818, Winterville, NC 28590-1818. Eastern NC; All bands. *The DX Listener.* Irregular meetings.
Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749, (808) 982-9444; Puna, HI; SW and MW. Meet 1st Tuesdays. No dues.
Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland, (410) 239-7366; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD.* Meet irregularly.
RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *RCMA Journal.*
Regional Communications Network (RCN): Jay Delgado or Public Information Unit, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.#10 SASE for info.
Rocky Mountain Radio Listeners: Mike Curta, P.O. Box 470776, Aurora, CO 80047-0776. Metro Denver, Colorado. All bands. Meets monthly 2nd or 3rd Sundays 1-4pm, Aurora Central Library.
Scanning Wisconsin: Ken Bitter, Dept. MT, S. 67 W. 17912 Pearl Dr., Muskego, WI 53150-9608, (414) 679-9442. Wisconsin. VHF/UHF. *Scanning Wisconsin* ($2 for sample)
Signal Surfer DX Club: Darcy Jabs, RR2, Burns Lake, BC, Canada, V0J 1E0 (604) 694-3760. Canada and worldwide. MW, SW DXing.
Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.
Susquehanna Co Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801-0023. PA area; Scanning. Meets irregularly.
Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur. Meets 3rd Thursdays 7pm Holland Big Boy.
Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.

Worldwide TV/FM DXers Association (WTFDA): P.O. Box 514, Buffalo, NY 14205-0514. Worldwide membership; TV DX, FM BC, VHF utilities. *VHF-UHF Digest.* Annual convention. $20 annual in U.S. $2 for sample.

Monitoring Clubs Outside North America

Associazione Italiana Radioascioto (AIR): C.P. 873, 34100 Trieste, Italy. Broadcasting all bands, utilities, pirates. *Radiorama* (Italian) 70,000 lira. April 25 annual mtg.
Australian Radio DX Club Inc: P.O. Box 227, Box Hill, Victoria 3128, Australia. SW, MW, Utilities. *Australian DX News.* Sample 2 IRCs or $2US cash.
British DX Club: Colin Wright, 126 Bargery Road, Catford, London, SE6 2LR, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine. *Communication.* L10 UK, L12 Eur, L16 ww. Sample 3 IRCs or $2 US cash. Meets monthly in Twickenham (London).
DX Australia: P.O. Box 422, Moonee Ponds, Victoria 3039, Australia. MW, SW. *DXers Calling.*
DX Club of India: Navin Patel, 1-Dutt Niwas, 809 - M.G. Road, Mulund, Bombay-400 080, India. India; MW/SW/Ham. DX World (quarterly) Rs 50/-, 30 IRCs outside India. 3 IRCs sample.
DX Club Paulista: Marcelo Toniolo Dos Anjos, C. Postal 592, Sao Carlos - SP (Brasil), 13560-970. South America. Shortwave, including utilities. *Actividade DX* (in Portuguese).
Finnish DX Association: Mr. Arto Mujunen, Suomen DX-Liitto, P.O. Box 454, FIN-00101 Helsinki, Finland; +358-0-842146 fax. Finland and worldwide. SW and BCB. *Radiomaailma.*
Friendship DXers Club: Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. Venezuela and Caribbean. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 kHz. Venezuelan membership free.
International Listeners Organization: Mohsin Abbas, St. Nisar Ali Shah Ahamed Pura, Sheikhupura, Pakistan, 1-(50359) 2-(50561). South Asia. Broadcasting. *Listener Times.*
International Radio Youth Club: G.M. Mostafa Kamal, Amla Wapda Colony-1, Kushtia-7032, Bangladesh
National Society of Pakistani DXers: Mr. Liaqat Ali, E-161/1, Iqbal Park, Opposite Adil Hospital Defence Housing Society Road, Lahore Cantt., Pakistan. Worldwide. All wave. Has library, meets fortnightly 1400-1800 UTC at library. 4 IRCs for more info.
New Zealand Radio DX League: P.O. Box 3011, Auckland, New Zealand. MW, SW, FM, TV. *New Zealand DX Times.*
New Zealand DX Radio Association: Mr. R. Dickson, 88 Cockerell St., Brookville, Dunedin, New Zealand. MW, SW, amateur and utilities. *Tune-In.*
North Ontago Radio Listener's Club: P.O. Box 179, Oamaru, New Zealand.
Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhupura , 39350 Pakistan; Pakistan; SWBC.
QSL Club de France: Patrick Frigerio, 40 Rue de Haguenau, 67700 Saverne, France. SWBC, pirates, CB-DX, hams, etc. Courrier (in French). 6 bulletins, 72 FF, EEC=16 IRCs, elsewhere 20 IRCs.
Shortwave Radio Communications Club: Atiqur Rehman, Dawood Street, Khalid Road, Sheikhupura, P.C. 39350 Pakistan. South Asia; MW/SW. *The Amateur* (Urdu language). Meets 1st Fri on SW Complex, S.K.P.
South African DX Club (SADXC): P.O. Box 18008, Hillbrow 2038, South Africa; MW, SW, utilities. $46 annual airmail to US; *The South African Shortwave Listener.*
Southern Cross DX Club Inc.: Stephen Newlyn, G.P.O. Box 1487, Adelaide, SA 5001, Australia. Worldwide and Pacific. All bands. *DX Post.* $25 annual in Australia. Meets last Fridays, 8pm, Thebarton.
Stichting ScanSearch Military Aircraft Communications (SC-MAC): Gerbrand Diebels, Roer 29, 5751 TJ Deurne, Netherlands. Military aviation NW Eur (VHF/UHF) and worldwide (HF). *Airlift* (Dutch) bi-monthly. FL 35, up to FL 45 outside Netherlands.
Universal DX League: Mr. Kanwarjit Sandhu, 408, Krishna nagar, Ludhiana 141 001. India. India and Int'l; SW/MW/AM/FM/TV DXing/Pirate and Clandestine. *DX Post* bi-monthly, sample 4 IRCs. Annual 24 IRCs or US$10. SWL net: Sun 0300 UTC on 7080 / 1600 on 14150 SSB, VU3SIO net control.
Viamão DX-Club: Alencar Aldo Fossá, P.O. Box 101, Cunhas Road 1286, Jaguaribe Residential Park, 94400-970 Viamão, Rio Grande Do Sul, Brazil, South America. SWBC. Meets occasionally; multi-lingual.
World DX Club: Arthur Ward, 17 Motspur Drive, Northampton, England NN2 6LY (in USA-Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610). Worldwide. All bands with emphasis on SW. *Contact.* $20 overseas airmail. Meets every 6 weeks in Reading, UK.

Umbrella Organizations
Association of North American Radio Clubs (ANARC): Richard d'Angelo, 2216, Burkey Drive, Wyomissing, PA 19610. 18 member clubs across North America.
European DX Council (EDXC): Michael Murray, P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE, England. 16 member clubs across Europe.
South Pacific Association of Radio Clubs (SPARC): Arthur Cushen, 212 Earn Street, Invercargill, New Zealand.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Mar 31-Ap 1	Little Rock, AR	Little Rock Hamfest: "Integrated Communications in Emergencies" / Jim Blackmon KB5IFV, 1008 Pine St, Arkadelphia, AR 71923-4949, 501-246-6734. Location: The Outlet Mall, Little Rock Expo Center, Exit 126, I-30.
Apr 1	Warner Robins, GA	Central GA ARC & Macon ARC / Bob Scott AD4DK, Lot 300 Elaine Dr, Warner Robins, GA 31088, 912-953-9495
Apr 1	Columbus, IN	Columbus ARC / Marion Winterberg WD9HTN, 11941 W. Sawmill Rd, Columbus, IN 47201, 812-342-4670
Apr 1	Lebanon, PA	Appalachian Amateur Radio Group / Homer Luckenbill WA3YMU, 105 Walnut St, Pine Grove, PA 17963, 717-345-3780. Location: Lebanon Area Fairgrounds south of Lebanon, PA. Talk-in 146.04/64. Open 8am. Gen Admission $4.
Apr 1-2	Spokane, WA	Inland Northwest Hamfest Assoc / Warren Kelsey KJ7BB, 1405 So Crestline, Spokane, WA 99203, 509-534-8443
Apr 2	Trenton, NJ	Del Valley Radio Assoc / Edward Vickner K2SNK, 21 Running Brook Rd, Trenton, NJ 08638-2009, 609-883-5318
Apr 2	Madison, WI	Madison Area Rptr Assoc / Jim Waldorf KB9AQQ, P.O. Box 8890, Madison, WI 53708-8890, 608-249-7579
Apr 7-9	Atlanta, GA	Georgia State Convention / Verne Fowler W8BLA, 4343 Shallowford Rd, Suite E-6, Marietta, GA 30062, 404-518-7376
Apr 8	Portland, ME	Portland Amateur Wireless Assoc / Ronald Levere KA1F1, 2 Meadow Rue Court, Yarmouth, ME 04096, 207-846-9090
Apr 8	Fergus Falls,MN	Lake Region ARC / Bill Morgan AA0AX, Rte 6 Box 43, Fergus Falls, MN 56537, 218-736-4448
Apr 8	W Orange, NJ	Irvington-Roseland Amateur Club / James Howe N2TDI, 5 Iroquois Ave, Lake Hiawatha, NJ 07034, 201-402-6066
Apr 8	Lawton, OK	Lawton Ft. Still ARC / Paul Wardell, HC 30 Box 180, Lawton, OK 73501, 405-492-5743
Apr 8	Bowling Green,KY	KY Colonels ARC / Don Meredith N4THE, 1711 Glendale Dr, Bowling Green, KY 42104, 502-781-6600. Knight of Columbus Hall, 911 Searcy Way. Talk-in 146.25/85 or 147.93/33. 7am - 3pm. Gen admission $4.
Apr 8	Green Bay, WI	Ashwaubenon HS Tech Club & Brown Co ARES / Chad Stiles N9PAY, 2171 Barberry Ln, Green Bay, WI 54303, 414-497-1807. Location: Ashwaubenon High School, 2397 South Ridge Rd, Hwy 41 Exit Oneida St, North to Andersen Dr, West to Ridge. Talk-in 147.075+ Gen admission $4.
Apr 9	Raleigh, NC	Raleigh ARS / Chuck Littlewood K4HF, 2005 Quail Ridge Rd, Raleigh, NC 27609, 919-872-6555
Apr 15	Muskegon, MI	Muskegon Co ARES & RACES / Greg Hoffman N8RXB, 2017 Lakeshore Dr, Muskegon, MI 49441, 616-759-8786. Location: Pulaski Lodge, 871 Pulaski, off Henry St. Talk-in 146.82(-) 8am-2pm. Admission $4.
Apr 15	Virginia Bch, VA	Chesapeake AR Service, Preston Ipock N4SHI, 1026 Calloway Ave, Chesapeake, VA 23324, 804-543-4610
Apr 16	Cambridge, MA	MIT Radio Soc & MIT Electronics Research Soc / Steve Fineberg W1GSL, PO Box 397082 MIT Branch, Cambridge, MA 02139-7082. Tailgate electronics, computer, amateur radio FLEA MARKET - 9am-2pm. Albany & Main St. Admission $2. Free parking. Talk-in 146.52, 449.725/444.725 - pl 2A - W1XM/R
Apr 21-23	Visalia, CA	Int'l DX Conv / George Allan WA6), 668 Chemeketa Dr, San Jose, CA 95123, 408-225-1819
Apr 22	Talladega, AL	Talladega RAC / Janet Smith AD4DB, 730 Whitson Rd, Talladega, AL 35160, 205-761-1263.
Apr 23	New Castle, DE	Penn-Del ARC / Harold Frantz KA3TWG, 950 Ridge Rd Suite C-27, Claymont, DE 19703, 610-485-4844
Apr 23	Arthur, IL	Moultrie ARK / Ralph Zancha WC9V, PO Box 55, Lovington, IL 61937, 217-873-5287
Apr 23	Madison, WI	Communications Research Group Spring Mtg / Scott Miller, 122 Greenbriar Dr, Sun Prairie, WI 53590-1706, 608-837-7666. Location: Fitchburg Fire Station on Lacy Rd. Talk-in 462.700. 12 noon - 4pm
Apr 28-30	Dayton, OH	Dayton Hamvention / Ken Allen KB8KE, Box 964, Dayton, OH 45401-0964, 513-276-6930
Apr 29	Gastonia, NC	Gastonia Area ARC / Mike Jackson N4AYO, 2568 Devon Dr, Dallas, NC 28034. Location: Karyae Park, I-85 Exit 13, follow signs. Talk-in 146.805/205, 444.15/449.15.

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

DX Radio Tests

These special test broadcasts provide a unique opportunity to hear and identify the following stations. If you hear their broadcasts, please let the engineer know at the address provided. More information on DXing the broadcast band can be found in *DX Monitor*, the publication of the International Radio Club of America (IRCA, P.O. Box 1831, Perris, CA 92572-1831, USA) and *DX News*, the publication of the National Radio Club (NRC, P.O. Box 5711, Topeka, KS 66605-0711). For a sample of either publication, send one 32 cent stamp ($1 US or 1 IRC overseas) to the addresses above. The following tests were arranged by J.D. Stephens for IRCA unless otherwise noted. Last chance! These are the last DX tests for the season.

Saturday April 1 - Radio Vision Cristiana-535, South Caicos, Turkos and Caicos Islands will conduct a rescheduled DX test between 2-4am EST. The test will include both contemporary and jazz music, Morse code, test tones and voice IDs. Reception reports may be sent to: Mr. Bob Janney (KA4NYO) Chief Engineer, c/o WWRV-AM, P.O. Box 2908, Paterson, NJ 07509-2908.

Monday April 3 - KWEY-1500, P.O. 587, Weatherford, OK 73096, will conduct a rescheduled DX test between 1-1:30am EST. The test will include Morse code, voice IDs, and an unspecified selection of music. Reception reports may be sent to: Mr. Ray Bagby, Chief Engineer.

Saturday April 8 - WWOL-780, 1263 West Main, Forest City, NC 28043, will conduct a rescheduled DX test between 3-4am EST. The test will include voice IDs, Morse code IDs, and march music. Power will be 10 kW using a nondirectional antenna pattern. Reception reports may be sent to Mr. Julius Blanton, Engineer.

Monday April 10 - KGYN-1210, P.O. Box 130, Guymon, OK 73942, will conduct a rescheduled DX test between 2-2:30am EST. The test will include voice IDs and Morse code IDs. Power will be 10 kW. Reception reports may be sent to Mr. Bill Weldon.

INDEX OF ADVERTISERS

STOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

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SURVEILLANCE/PRIVACY SECURITY PROTECTION. Catalog $5. Spy Emporium, 6065 Hillcroft, Suite 414, Houston, TX 77081. (713) 774-1000.

SONY 2010 shortwave, $235 – PANASONIC RF-4900 shortwave, $260 – ICOM R-7000 scanner, $1600. All in excellent condition. Popular Communications September 82 (premier issue) through March 91, $200. John (914) 592-6451 – After 5 PM EDT.

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THE ANARCHIST'S BBS is a resource for anarchists, investigators, researchers, computer hackers and phone phreaks. Categories include: Computer hacking, Investigation techniques, Telecommunications Technology and Surveillance. Call 214-289-8328 for free trial access

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FOR SALE: Bearcat 2500XLT, unblocked, outside antenna, mobile antenna, accessories. $369. John (203) 254-9549.

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Scanner, AOR AR-2500, mint, includes software package, first $395. PRO-43, full 800MHz, first $195. (407) 651-5410.

FOR SALE: Weather scanner – BC142XL modified by SSC for satellite reception $80; PRO-2005 unmodified, excellent condition $275; Christner, 306 Woodview Ave., Cortland, OH 44410.

AOR AR 1000, mint condition, with warranty until 10/95, only 4 months old. .5 to 1300 MHz, no gaps, only $390. (718) 849-4897.

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ICOM IC-72 Communication Receiver; Optoelectronics R-10 Interceptor (FM Demodulator); Optoelectronics CF-802 Cellular Band-Pass Amplifier; Optoelectronics 800-900 MHz Antenna; GRE 9001 Super Converter, 800MHz. FOR SALE: All or separate, MINT CONDITION. Contact "Dobbie" (704) 888-4798.

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For Sale: ICOM R71A and ICOM R-7000 both in mint condition, full coverage, both for $1350 shipped, also BC2500 full coverage, mint condition $285 shipped. Call Gary (212) 536-3346 (9 to 5 PM).

McIntosh MR-78, considered "Simply the Best" FM tuner ever made. (MT July, 93, p. 48) walnut case, $995; matching MX-2205 amplifier, $1150; Onkyo T-9060, $170, Magnum-Dynalab FT101 with full "Etude" upgrade, $675, Magnum Dynalab "Signal Sleuth" F-205, $165. Bill (412) 243-1569.

Sony ICF-SW55 $220; Grundig Yachtboy 500 $195; Realistic DX390 $135; New in boxes – used only to evaluate – $500 takes all three. (410) 658-2260.

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FOR SALE: ICOM R7100. Mint Condition, full coverage, 10 months old, $1200. Call Billy (704) 878-3900 (days).

CLOSING COMMENTS

Bob Grove
Publisher

The Passing of the Clubs

It has been more than a decade since the Newark News Radio Club, one of the oldest shortwave listening clubs in existence, finally shut down its operations. It was regrettable to see it disappear; its publications went back into the earliest days of radio and its leadership was legend.

More recently we witnessed the near-disintegration, then reorganization and redirection, of the Association of North American Radio Clubs (ANARC), which now sponsors a number of committees as a supplement and a resource for its member clubs.

Last year Les Mattson ceased publication of *North East Scanning News*. Although the official entity still appears as a supplement to Larry Miller's *National Scanning,* its writers were splintered between that publication and the All Ohio Scanner Club's *American Scannergram.*

As recently as January, two more prominent listeners' clubs ceased operation: the Association of DX Reporters (ADXR), founded in 1982 and spawned by the demise of the Newark News Radio Club; and SPEEDX, founded in 1971.

Clubs have always sprung up in support of hobbies; those with charismatic, competent leadership have flourished. Such clubs serve best when they address a specialty not covered in depth by the wide-coverage, professionally-prepared magazines like *Monitoring Times* and *Popular Communications.* But there is a limit here, too; how many specialty club newsletters are necessary to cover any particular topic?

As with any voluntary organizations, success is ultimately dependent upon the whims, schedules, talents, and willingness of their members. Internal squabbling seems endemic among volunteer groups, with egos often taking priority over the good of the membership, discouraging the more productive individuals who leave and contribute their valuable talents elsewhere.

Competition also arrived with the growth of desktop publishing—pulling potential membership in all directions from a relatively small base of individuals. Soaring printing and mailing costs have taken their toll as well.

When most of the clubs began, there were no major commercial publications with wide-spectrum coverage catering to the recreational monitor; *MT* and *PopCom* have filled that void. While I would hate to think that we have contributed to the demise of these clubs, some attrition is bound to have occurred as a result. But we don't believe the passing of the clubs is due to a "passing of the baton." The local or specialty radio clubs still have a definite role to play, and *MT* will continue to support their efforts in our pages.

We would like to pay tribute to those former publications and their hard-working staffs. We know how difficult it is to maintain quality and quantity, month after month, year after year. To the founders and supporters of these publications, congratulations on a job well done. We share your disappointments and we honor your successes.

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- ☐ Doppler Compensation Function
- ☐ 10 designated Satellite Memories
- ☐ Data Jack for Packet Ops. (9600 bps)
- ☐ New Modulation Limiter Circuit
- ☐ 2 VFO's each for VHF and UHF Bands
- ☐ 50 Memory Channels
- ☐ Stereo Headphone Jacks
- ☐ 2 Antenna Connectors
- ☐ Noise Blanker
- ☐ RIT Function
- ☐ Memory Allocation Function
- ☐ Attenuator
- ☐ Programmed/Memory/Mode Select Scan
- ☐ CW Semi-Break In and Side Tone
- ☐ AF Speech Compressor (audio)
- ☐ Auto Repeater and One-Touch Functions
- ☐ Separate Main and CW Filters
- ☐ CW Narrow Filter (optional)
- ☐ Tone Scan (optional)
- ☐ 45 W (FM, CW), 35/6 W (SSB) VHF
- ☐ 40 W (FM, CW), 30/6 W (SSB) UHF

IC-820H 2 M/440 MHZ Dual Band All Mode Transceiver

The IC-820H isn't your typical base station transceiver. This all mode dual bander has compact and lightweight dimensions offering operating versatility other base stations just can't match. Mobile and field operations are ideal with this rig. But don't let its size fool you. This is a high performance transceiver with state-of-the-art construction, circuit design and cutting edge features.

ICOM's **Newly Designed I-loop DDS** (digital direct synthesizer) is employed in the PLL circuit of the IC-820H. Previous PLL circuits for 10 Hz resolution transceivers contained 2-loop circuits. The new I-loop has a single loop and **Generates a Signal with Superior 1 Hz Resolution**. ICOM's DDS PLL also contains a normal PLL as the main-loop and a DDS as the sub-loop.

Satellite operation with the IC-820H's **Built-In Satellite Functions** has never been this easy. These include **Normal and Reverse Tracking** for different modes of satellite communications; **Independent Uplink/Downlink Control** for Doppler shift compensation; **Separate Satellite VFO** and **10 Dedicated Satellite Memories** provide quick switching from normal to satellite operation as well as easy recall of satellite and downlink frequencies.

With **Independent Controls and Indications for Both Bands**, this dual bander is as easy to operate as most single band transceivers – and exchanging the main and sub bands is just a switch away. In addition, while simultaneously receiving signals on each band, **Separate S-Meters** indicate their respective signal strengths.

The **Sub Tuning Function** can be assigned to the **RIT** or **SHIFT** control and allows you to tune automatically at variable tuning speeds. This is especially useful when searching for signals over a wide frequency range – eliminating the need for excessive rotations of the main dial.

The IC-820H's **Compact Size** enables easy installation in a shack as well as a vehicle. Overall dimensions may be small, but important points such as LCD size and space between switches are more than adequate.

An important consideration in all mode transceivers is the interference reduction circuit. The IC-820H's **IF Shift Circuit** shifts the center frequency of the receiver passband electronically to evade interfering signals.

The IC-820H's **DATA Terminal** (in ACC socket) is connected to its modulator circuit directly. This **Data Jack supports Packet Operation** at up to **9600 bps**. A newly designed **Modulation Limiter Circuit** is employed in the modulator circuit to prevent you from exceeding the maximum deviation – even with large amounts of data.

Call (206) 450-6088 for FREE Product Literature!

View a video demonstration of this product
VHS
at your participating ICOM dealer today!

ICOM America, Inc. Corporate Headquarters
2380-116th Ave. N.E., Bellevue, WA 98004

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