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Inside This Issue:
Oklahoma City Disaster Frequencies
See Page 32

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Monitoring Times™

Vol. 14, No.6 June 1995

CONTENTS

Cover Story

Cruising the VHF Marine Band

By Kerry Holliday, WA6BJH/KL7

The FM band between 156 and 157.5 MHz is jumping with activity in the summertime, especially in a busy port city like Juneau, Alaska. With the S.S. *Universe* in the channel, *Regal Princess* (not pictured) at the dock, and float planes and tenders jockeying for position, the scanner listener can listen in to critical radio communications using the provided maritime channel chart. Photo by the author. *See page 9.*

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Responding to the Unimaginable

Following the bomb blast that shook Oklahoma City and destroyed the Alfred P. Murrah federal building, one of the first federal agencies on the scene was the Federal Emergency Management Agency (FEMA). Among other tasks, FEMA supports the work of federal, state, and local agencies in a major emergency with its multi-mode, mobile communications systems.

Courtesy KFOR-TV4, Oklahoma City

This month, Utility World (p.32) gives a complete profile of their HF, VHF, and UHF communications systems, plus all the FEMA station locations and callsigns. When the next emergency calls for FEMA support, you'll be ready to follow the action.

DEPARTMENTS

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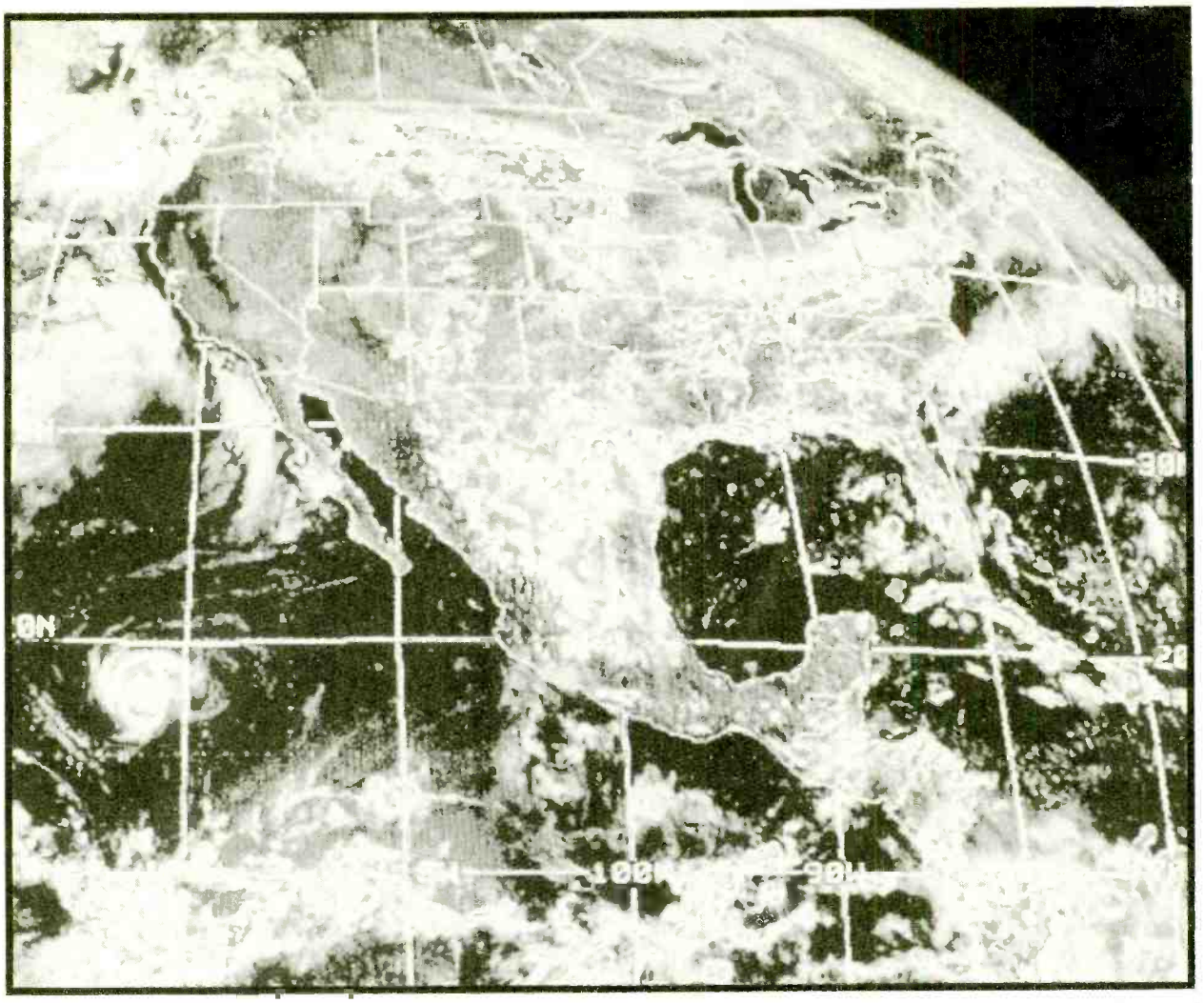

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LETTERS

The April issue generated good response from readers, but I know you won't begrudge our holding most letters until later to accommodate Utility World's special report on FEMA frequencies, which continues on Letters' second page.

Another timely article is on the Shuttle-Mir docking which takes place this month. Lynn Gilliland of Dahlgren, VA, logged a precursor to this event when he heard American astronaut Norman Thagard, on board the Russian Mir and using the call R0MIR, conversing with earthbound hams on 145.55 MHz NFM. The amateur radio connection is only one way to tune in to space operations. In addition to *MT*'s feature, check out "Shuttling to Mir" by Keith Stein in the May/June *Satellite Times*, available for $2 plus SASE to Grove Enterprises.

License-Free Communications?

■ Jock Elliott of Troy, NY, calls our attention to House Bill H.R.963, introduced by Rep. Fields of Texas. It proposes to amend the Communications Act of 1934 in order to permit recreational radio operations without radio licenses for the following services: (1) personal radio services (not including the amateur service), and (2) aviation or maritime radio service for aircraft or ship stations operated on domestic flights or voyages, when such aircraft or ships are not otherwise required to carry a radio station.

The bill has 22 current co-sponsors, and has been referred to the House Subcomittee on Telecommunications and Finance. In essence, this bill would allow operation of the General Mobile Radio Services (GMRS) without individual licenses. Good idea or bad? Tell us what you think: better yet, tell your representative.

A Proselyte for Radio

■ Philip Gebhart, Canadian shortwave listener and Ontario DX Association member, has found a way to win friends for the hobby and go on vacation, too. With the cooperation with the local Radio Shack store in Nassau, Bahamas, Phil gave three presentations on shortwave listening, and wrote a two-part article on SWLing for the Nassau *Tribune*.

Eddie Butler, manager of the Radio Shack store, is pictured with Phil reviewing a copy of *MT*, which, along with ODXA, and broadcasters RCI and CFRB, provided support materials.

Philip Gebhard delivers presentations on shortwave listening in Nassau, Bahamas (left). He is shown above with Eddie Butler, manager of the Radio Shack store there.

Still Not Satisfied

■ Fred Pierce of Oxnard, CA, sent a fax asking why Stephen Price did a comparison review of the Black Box MW antenna versus the Select-A-Tenna in the April issue. He says, "Only a couple of months ago *MT* ran a back cover editorial defending the publication from the fallout generated by a Grove review of a Grove product. That editorial response sounded convincing, but now comes your review of a Grove-offered product versus that of an advertiser.

"Granted, we were all curious about the difference and the review was interesting. So, I guess these two products are the only ones made or offered for this purpose? If your objective is to *review*, then it would seem appropriate to discuss however briefly the Kiwa air loop and so on. Hmm?"

As editor I can't pass up commenting on this one: *Grove review of a Grove product?* Stephen Price—an independent and experienced hobbyist—would greatly resent Pierce's insinuation. Nor does the Select-A-Tenna carry the Grove label; it gained its reputation long before Grove put it in their catalog. Is the writer implying we should review nothing Grove carries?

We compared these two antennas because, though their description sounded virtually identical, there was a substantial price difference. Readers wanted to know what the difference was and if it was significant. To compare two antennas that work on a similar principle is fair; to test either one against the $300+ Kiwa would not have been!

A Radical Thought

■ The bombing of the federal building in Oklahoma City indirectly brought some of the programming carried on shortwave radio into a critical public eye. I recognize that radio is only a tool which can be used or misused; it can open ears and minds, or it can close and indoctrinate; it can increase tolerance and understanding, or it can polarize and divide. By the broad coverage of *Monitoring Times* our editorial stance should be evident: We view radio as a hobby, but a hobby which has the potential to increase our readers' knowledge of the world around them.

The radio hobby can educate about the natural world of weather and propagation; the scientific and technical world of circuitry and computer chips; and the social world of human agencies—governments, cultures, religions, geographic divisions. From my association with them, I think all our writers would say this belief plays a major part in why they undertake to produce a well-written column every month!

Once in a while *Monitoring Times* or one of our columnists gets quoted on the air or in the press. As flattering as that may be, most of us have discovered what stars and politicians already know: more often than not, your quote (if indeed it is that) is being used to prove *someone else's* point. So, if you are ever incensed or puzzled by something an *MT* staff member is *said* to have said or done, please check it with us. What often sells papers is stirring up the mud, not clearing the air.

Saving the best for last, I want to thank the generous and kind-hearted donors among you, who respond whenever an appeal is made on behalf of someone down on their luck. There is nothing like radio for opening up the world around you and giving you a different perspective on your troubles. If you have a receiver you're not using, or if your club is looking for a worthy project to sponsor, why not open the ears of a youngster or oldster to another way of monitoring the times?

—Rachel Baughn, Editor

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LOW BATTERY IND.	NO	YES	YES	YES
ONE-SHOT & RESET	NO	OPTIONAL	YES	YES
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Reward for Stolen Call Boxes

■ There are 2,700 call boxes in the San Francisco Bay area and since November, over 100 of them have been broken into and their components stolen. The Metropolitan Transportation Commission and Bay area authorities can't figure out why the phones are such a hot commodity. The call boxes are programmed to call only the California Highway Patrol dispatcher and a phone maintenance center. Authorities believe thieves may be attempting to modify the phones to make phone calls on MTC accounts, but they're just not sure.

"It's amazing what people will do," said MTC Project Manager Vic Beauchamp. A $5,000 reward has been offered in the case.

Gotcha!

■ Halifax, Canada, Police surrounded a Price Club store early one Sunday morning after getting a tip from a scanner listener. The listener overheard a cellular conversation during which plans for breaking into the store were discussed. The listener called police, who discovered three men attempting a rooftop entry into the store. The three were taken into custody.

"Technology does not always work on the side of the criminal," said Halifax Police Constable Gary Martin.

More Cordless Channels

■ Not content with ten channels, the FCC has more than doubled the amount of airwaves available for cordless telephones. According to the Commission, the extra space means less interference and improved privacy. You'll have to buy a new phone to take advantage of the new channels, which will be able to operate on all 25 allocated frequencies.

FCC Engineer Anthony Serafini said that "the additional channels being made available for cordless phones are less congested" than the current ten. The new frequencies should be active within the next couple of months.

Because it is a violation of federal law, not to mention some state and local laws, we urge you to block the following new cordless phone base frequencies from your scanner:

43.72	43.92	44.18	44.40
43.74	43.96	44.20	44.46
43.82	44.12	44.32	44.48
43.84	44.16	44.36	

More Shacks

■ If there isn't a Radio Shack around the corner from you, don't despair; one may soon appear. The retail electronics arm of Tandy Corporation reported recently on its plans to expand its 6500 store chain with an additional 500 stores. The new stores should be in place by the end of the century. This will be the first major expansion in a decade for the Forth Worth-based company.

Getting the Air Force's Goat

■ Last August, ground radio traffic at Hill Air Force Base in Utah began experiencing static interference. The problem became so bad that Technical Sergeant Jeff Ingraham and several other base workers used radio-tracking equipment to find the area from which the interference was emanating.

Taking to their vehicles, the trackers headed out into the mountains between Odgen and Brigham City. Using binoculars they found the offender—a goat nicknamed Phyllis who was sporting the latest in fashionable radio collars. Wildlife biologist Randy Wood said that the state will change the radio collar, but isn't convinced that will solve the problem. "We're wondering if the static might be caused by an antelope on Antelope Island. Those animals have been there longer."

Prince Gives Up Mobile Phone

■ Prince Charles finally realized that if he's going to carry on secret assignations, he shouldn't do it over a mobile phone. The Prince of Wales recently awarded a Royal Warrant to Berkshire-based Vodapage for the use of a pager. This should put a hefty crimp in Chuck's conversations, but it should keep him out of the headlines.

Baby Monitor Catches More Than Cries

■ Karen Burris, caretaker of an apartment building in Shorewood, Wisconsin, came up with a rather novel way to catch a crook. Two storage lockers in the building had been broken into and Burris was sure that the burglar would return for more loot, so she bought a baby monitor, placed one in the storage locker and one upstairs in her apartment.

Sure enough, one evening she heard strange noises over the monitor, went downstairs, and saw the culprit filching her fishing rods. Rushing back to her apartment she dialed 911. Andrew J. Garner, 38, was arrested shortly thereafter carrying the fishing poles. Garner was already on probation for an earlier burglary and faces up to 24 years in prison.

Police Lt. Michael Meehan said that Burris' "initiative and involvement could very well save Shorewood residents thousands of dollars."

Cell Phone Glut at Motorola

■ Motorola, the cellular phone manufacturer based in Schaumburg, Illinois, said recently that it is experiencing a backlog of unsold cell phones. The company shipped a large number of phones in anticipation of holiday sales, and after a great fourth quarter, sales fell off. Motorola's stock has fallen due to investor fears.

Blocking 911

■ Statistics say that almost one out of every two cellular phones are purchased for emergency purposes. The access to 911 can be critical, but cellular companies are beginning to block 911 calls from nonsubscribers and callers who use their phones outside of subscriber areas, because of the potential for fraud. Blocking calls to emergency services from "roaming" mobile phones presents a real threat to safety, however.

The FCC is considering a proposal that requires cell providers to supply 911 access only to service-initialized users and sub-

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scribed-to roamers. This will definitely leave many users out in the cold if they need help while out of their area.

Smokey on the Air

■ Police in Warsaw, Poland, want their own radio station. Police Subcommissioner Jan Strzelnicki said, "Radio P, 24 hours a day, would have music plus advice concerning both adults and children, how to behave in dangerous situations, and also how to move around Warsaw during peak hours; also radio advice for drivers, and other components..." Now all they need is sponsorship to get the idea off the ground and on the air.

KCMO Police to Scramble Communications

■ They may be the first, but they're probably not the last. The Kansas City, Missouri, Police Department announced that they will completely encrypt their radio communications, allowing only police, fire, and city employees access. Police officials said that non-public safety groups such as certain private security, towing companies, and media would be able to monitor dispatched police calls via computer monitor. No audio will be available.

Many departments encrypt tactical and intelligence channels, but have found that total encryption for dispatch channels is too expensive. Kansas City's system encryption was approved by voters in 1988 as part of an $18 million radio system.

Laws, Laws, Laws

■ Law enforcement officers from New Hampshire lent their support to a bill before the House Corrections and Criminal Justice Committee. HB 171 will criminalize the possession of a scanner used to intercept police radio messages while committing a crime. If a criminal committed a felony while in possession of a scanner, they would be guilty of an added Class B felony. If they committed a misdemeanor while possessing a scanner, they would be charged with a second misdemeanor count.

"Perhaps criminals would have second thoughts about uisng these scanners and certainly criminals would be on notice that they will be punished if they use these electronic devices," said ManchesterPolice Lt. Philip Doherty. "The legal use of scanners poses no problem. A lot of people have them in their homes. And this law wouldn't change that."

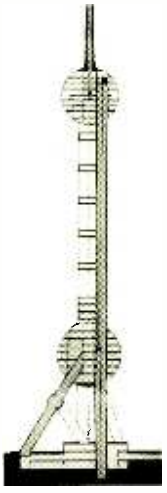
The 104th Congress is considering the Telecommunications Drug Enforcement Act, which would amend the Communications Act of 1934 "to establish procedures for the discontinuance of mobile radio services to persons engaged in drug trafficking, and for other purposes."

Live From Rome

■ Vatican Radio has been a mainstay on mediumwave for over 60 years, but early this year it made a great leap of faith to the airwaves of Massachusetts. Thanks to the efforts of Fathers Bob Reid and Robert Carr, funds were raised to buy local air time for Vatican Radio's English program. The hour-long show now airs on Boston's WEZE-AM and appeals to both Catholics and non-Catholics. Father Carr is hoping that the program will reach out to an audience of tens of thousands. Using Vatican Radio's slogan, Carr is advising people to listen "for heaven's sake!"

China's Pearl

■ It stands 460 meters high and looks like something from the 22nd Century. It's China's "Oriental Pearl," the Shanghai Radio and TV Tower on the eastern bank of the Huangpu River. Billed as the tallest tower in Asia and the third tallest in the world, after Toronto's CN Tower and Moscow's Ostankino Tower, the Shanghai Tower is designed to improve TV and FM radio reception for 13 million area residents. Two balls on the tower serve as hubs: the upper for broadcast and microwave equipment, the lower for the recreational center. Between the balls are 25 hotel suites. A 110-meter antenna tops the tower.



Antenna Tragedy

■ Ernie Rutledge was the epitome of the amateur radio operator. He went out of his way to help friends involved in the hobby. Unfortunately for the good-hearted Rutledge and colleague Steve Hunter, the 42-foot ham radio tower they were erecting got too close to a 7,200 volt power line. Rutledge died from his injuries, while Hunter was critically injured. According to one of the rescuers, Fire Captain Jasper Walker, "if there is a lesson to be learned here, it's that you don't have to be touching power for it to get you. Never raise anything near a power line."

SCARS Honors Marconi

■ The Somerset County Amateur Radio Society in Manville, New Jersey, will be holding a special event day in honor of Guglielmo Marconi. On June 11, NW2P will go on the air between the hours of 1300-2100 UTC from Marconi Plaza, the site of an early wireless station. Additional stations will be operating at other Marconi sites: Cape Cod, Newfoundland, and England. Stations that establish contact with any of these sites will be able to receive a special commemorative certificate. Frequencies of operation are voice and CW: 15M Novice, 17M and 20 M General, 2M and 6M SSB, 448.175 and 146.580 Simplex. To obtain your certificate send a QSL and 9x12 inch SASE to SCARS, P.O. Box 742, Manville, New Jersey 08835.

"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; Michael Barnette, Huntersville, NC; George Beard, Kansas City, KS; Roger Cravens, Atlanta, GA; Victor Garcia-Rivera, Fairfield, OH; Erling A. Gruel, Fond du Lac, WI; Hubert Harris, Macon, MO; Kevin A. Hecht, Devon, PA; Maryanne Kehoe, Atlanta, GA; Bob Mills, San Diego, CA; Richard A. Sklar, Seattle, WA; Bob Studer, Arlington, TX; Paul Swietek, Gilbert, AZ; and Walter Szczepaniak, Philadelphia, PA. We also consulted the following publications and we list their names in appreciation: *BBC World Broadcast Information, National Scanning, Radio World, W5YI Report.*

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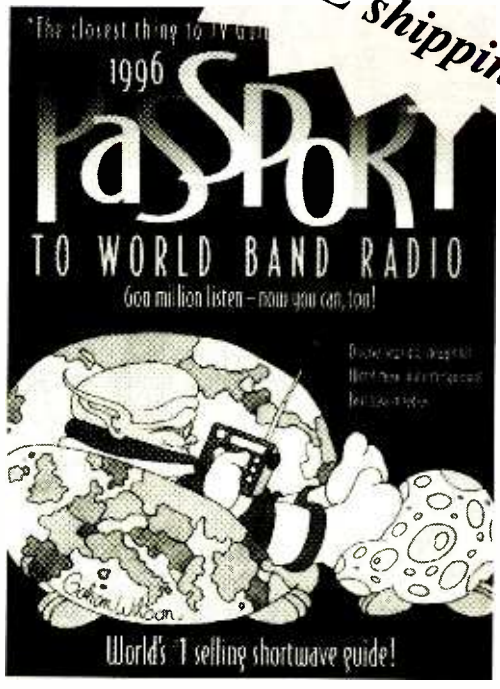

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Cruising . . .

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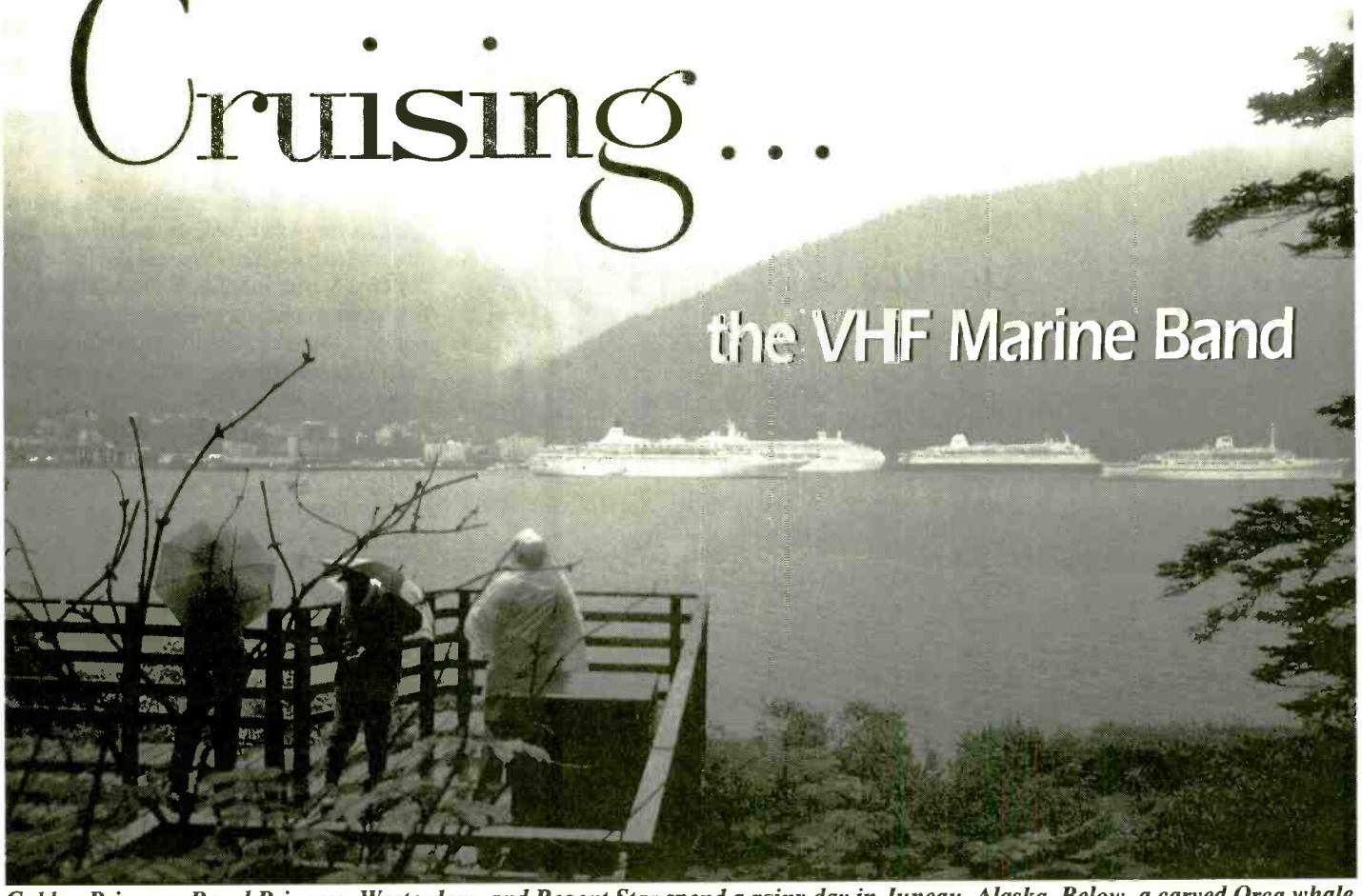

Golden Princess, Regal Princess, Westerdam, and Regent Star spend a rainy day in Juneau, Alaska. Below, a carved Orca whale is typical of the native art found in museums visited by the hoards of tourists arriving here each summer.

By Kerry Holliday, WA6BJH/KL7

"Crown Princess, Crown Princess, this is the Westerdam, over."

"Westerdam, this is the Crown Princess, go ahead."

"Good morning, Crown Princess, our captain sends compliments to your captain and asks if your soccer team would like to play our soccer team while we're in Juneau today, over?"

It's summertime in Juneau, Alaska, and with the influx of cruise ships and tourists, activity picks up on the VHF marine band.

On some days, four large cruise ships enter the harbor and their passengers crowd the streets and tour buses. Over thirty different ships visit Juneau during the summer; some carry fewer than 100 passengers and some almost 1,600.

On a Tuesday morning, ships from Princess Cruise Lines, Holland-America, and Regency Cruises arrive in Juneau's harbor. The *Crown Princess,* the *Westerdam,* the *Regent Star,* and the *Golden Princess* are prepared to turn almost 4,700 passengers loose on the town. In addition, off-duty crew members from a complement of 2,000 will also leave the ships.

The activity of all these ships, passengers, and crew members is coordinated on the VHF marine band. You can listen to everything the cruise ships and people need from medical appointments, to provisions, and replacement inner tubes—yes, inner tubes. It all happens on the VHF marine band.

The VHF marine band is an FM band between 156 and 157.5 MHz. The channels are spaced every 50 kHz, but the channels numbered 60 and above are interlaced with channels 1 through 28. That puts channel 1 at 156.05 MHz and channel 2 at 156.1 MHz. Channel 60 is at 156.025 MHz and channel 61 at 156.075 MHz, and so on. If you set your receiver to scan from 156.025 MHz through 157.425 MHz, you'll cover the VHF marine band and you'll be in on all the action.

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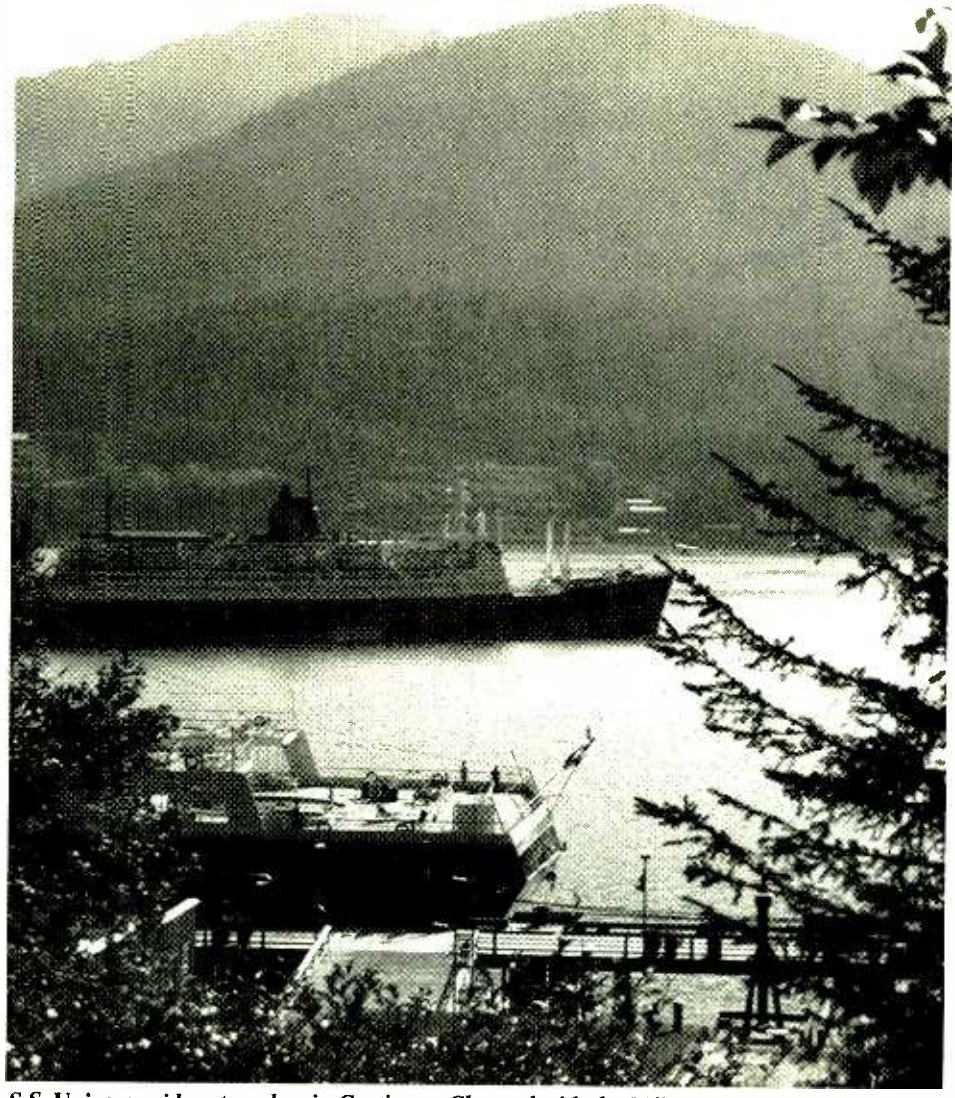

S.S.* Universe *rides at anchor in Gastineau Channel with the M/S* Noordam *tied at the dock. The activities of almost 400,000 tourists each summer is coordinated on the VHF marine band.

Each channel on the VHF marine band is a set of paired frequencies. Most of the activity takes place as simplex operation on the ship station frequencies. Coast stations, however, will use the other paired frequency. This is most common in ship-to-shore telephone calls. If you want to listen to these, monitor channel 16 and then change to the frequency that the operator directs. Remember, the coast station will not be on the ship frequency.

All passenger ships must carry a VHF marine band radio, and most other ships carry them as well. Many ships are required to monitor channel 13 so that the pilots on ships can talk to each other and avoid collisions. To ensure that the VHF marine band is used, ship stations cn't even get a license for high frequency single sideband until the ship has a VHF marine radio installed. All the activity in the harbors is coordinated on the VHF marine band. If the pilot or captain of the ship needs to talk to a tugboat or a garbage scow, the conversation is on the VHF marine band.

The action can be quite hectic on the marine band in Juneau. At 4:00 pm, the *Regent Star* prepares to leave.

"Securité, securité, securité," says the radio when the scanner stops on channel 16, "this is the cruise ship Regent Star, Charlie 6 Delta Yankee, C6DY. We'll be departing Juneau southbound down Gastineau Channel in approximately 15 minutes. We'll be standing by on channels 16 and 13 for any concerned traffic. Out."

The waterfront is a clutter of boats at 4:00 pm. As the *Regent Star* prepares to leave, the small day-cruise ships disembark their passengers at the Marine Park Float in downtown. Because the cruise ship dock is only big enough for two ships, *Regent Star* and *Golden Princess* ride at anchor in Gastineau Channel. Special lifeboats, called tenders, carry passengers and crew back and forth from the ships to the shore.

"Harbor traffic," my scanner blares as it stops on 123.05 MHz in the aircraft band. "This is Wings 92, we're the first of four aircraft departing downtown for Taku Lodge. We'll be departing across the bow of the Regent Star."

Yes, a true Juneau traffic jam has developed at the waterfront. In addition to the tenders from *Golden Princess* and the small day boat *St. Ruffina,* four de Haviland Otter float planes jockey for position in the cramped waters. They carry tourists to a lodge near the Taku Glacier for a salmon bake and a flight aross the Juneau icefield.

The pilot of Wings 92 does exactly what she said. The engine on the Otter roars to life and spray engulfs the plane. After a few hundred feet, it lifts into the air and, from my point of view, seems to brush the *Regent Star.*

Where should you listen on the VHF marine band? The first frequency to program into your scanner is 156.8 MHz. This is the international calling and distress frequency and it is designated as channel 16. All ships are supposed to monitor channel 16, and you should, too. Contacts on 16 are short; only long enough to establish contact and move to another frequency. One afternoon I heard the Coast Guard call a small cruise ship on channel 16.

"Yorktown Clipper, Yorktown Clipper, this is Coast Guard Station Juneau calling on 16, over."

"This is Yorktown Clipper, go ahead."

"This is Station Juneau, switch to channel 21, please."

The Coast Guard usually works on channels 20, 21, and 22. In Juneau, the Coast Guard activities vary from routine radio checks, rescue drills, to actual search and rescue missions. In this case, the Coast Guard wants to know why the *Yorktown Clipper* is anchored where it is.

"Yorktown Clipper, Station Juneau, you're anchored in an area that's clearly marked as a security area on the charts. You'll have to move."

"Roger, we'll only be here for a couple of hours."

"OK, captain, I'll check with the marine safety officer, and if you have to move, I'll call you back. You'll be monitoring 16, right?"

"Ah, no, we don't normally monitor 16, you can find us on channel 1."

"Roger. Station Juneau, out."

When you look at a cruise ship you don't often think of all the things that go on. In Juneau, channel 12, 156.6 MHz, carries a constant stream of traffic between the cruise

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line agency on shore and the ships in the harbor. Medical appointments, dental appointments, prescriptions, and trips to the emergency room crowd the airwaves. A number of passengers leave the cruises early and go back to their homes and you can listen as the ships' agents make reservations for travel all over the world. The ships request food, special food for passengers, and beverages. But not all the requests are common.

"Cruise Line Agency, this is the Golden Princess," I heard one afternoon at work.

"This is Cruise Line Agency."

"Yes, good afternoon," said the voice from the *Golden Princess*. "Are there any tire stores in Juneau?"

"Roger, we have several."

"Fine, could you get us two big inner tubes for the engineering department and charge them to the ship's s account?"

What do they need inner tubes for, I thought. The young woman at the agency wasn't sure, either.

"Roger," the young woman said, but then hesitated. "What size are the tires for the inner tubes?"

Of course, it turned out that *Golden Princess* just needed the rubber from the two tubes to repair something. The size of the tubes wasn't important.

But not all the requests are so obvious. One morning the cruise line agency called for help. It needed some strong backs to help load two tons of sand and cement onto the tenders. One of the ships anchored in Gastineau Channel needed the sand and cement—I never discovered why.

Channel use in your area will vary. In Juneau, for example, the harbor master monitors channel 73, but other channels are available for port operations and may be used in your area. If you listen to channel 16 for a

One standard destination for cruise lines in the Juneau area is Glacier Bay, where tourists witness "calving" of the forward glacier wall. (Photo by John Bailey)

Channel Table

Ch.	Ship Station	Coast Station	Use
1	156.050	160.650	Port operations
2	156.100	160.700	
3	156.150	160.750	
4	156.200	160.800	
5	156.250	160.850	Port operations
6	**156.300**		
7	156.350	160.950	Commercial
8	**156.400**		Commercial
9	**156.450**	**156.450**	Commercial and non-commercial
10	**156.500**	**156.500**	Commercial
11	**156.550**	**156.550**	
12	**156.600**	**156.600**	Port operations
13	**156.650**	**156.650**	Bridge-to-bridge
14	**156.700**	**156.700**	Port operations
15	**156.750**	**156.750**	
16	**156.800**	**156.800**	**Calling/distress**
17	**156.850**	**156.850**	Maritime control
18	156.900	161.500	
19	156.950	161.550	Commercial
20	157.000	161.600	Port operations
21	157.050	161.650	Coast Guard
22	157.100	161.700	Coast Guard
23	157.150	161.750	
24	157.200	161.800	
25	157.250	161.850	
26	157.300	161.900	
27	157.300	161.950	
28	157.400	162.000	
60	156.025	160.625	
61	156.075	160.675	
62	156.125	160.725	
63	156.175	160.775	Port operations
64	156.225	160.825	Commercial
65	156.275	160.875	Port operations
66	156.325	160.925	Port operations
67	**156.375**	**156.375**	Bridge-to-bridge
68	**156.425**	**156.425**	Non-commercial
69	**156.475**	**156.475**	
70	**156.525**	**156.525**	Digital Selective Calling
71	**156.575**	**156.575**	Non-commercial
72	**156.625**		Commercial and non-commercial
73	**156.675**	**156.675**	Port operations
74	**156.725**	**156.725**	
75	Channel 16 guard band		
76	Channel 16 guard band		
77	**156.875**		Port operations
78	156.925	161.525	Non-commercial
79	157.975	161.575	Commercial and non-commercial
80	157.025	161.625	Commercial and non-commercial
81	157.075	161.675	
82	157.125	161.725	
83	157.175	161.775	
84	157.225	161.825	
85	157.275	161.875	
86	157.325	161.925	
88	157.375	161.975	
88	157.425	162.025	Commercial

MAYDAY: A distress call; it indicates that a ship, aircraft, or other vehicle is threatened by grave and imminent danger and needs immediate assistance. Has absolute priority over all other transmissions. If you hear one, call the Coast Guard. Don't think that someone else might call. *Just do it.* It won't hurt for the Coast Guard to hear about it twice. According to Federal regulations, pronounced as the French word "m'aider."

PAN PAN: An urgency signal; it indicates that the calling station has a very urgent message about the safety of a ship, aircraft, or other vehicle, or someone on board or within sight. The words are pronounced like the French word "panne."

SECURITE: A safety signal; it indicates that the calling station has some information about the safety of navigation. Pronounced as the French word "securitè."

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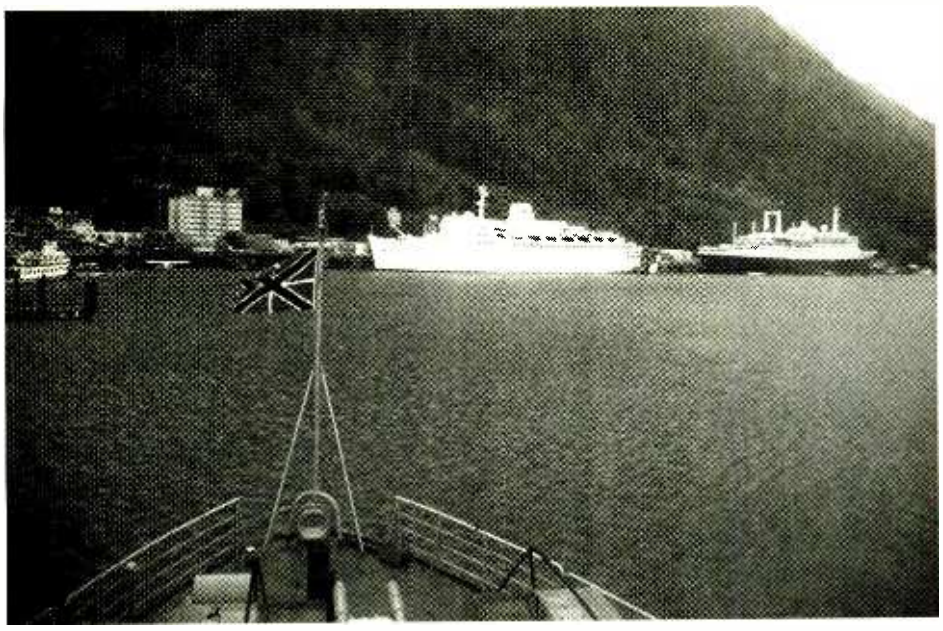

Not only cruise ships visit Juneau. Here two steamships, **Fair Princess** *and* **Rotterdam** *are seen off the bow of the visiting Russian icebreaker Anadyr.*

while you will learn what other frequencies are used and you can program those into your scanner. You can scan the band limits and find where the activity is, or you can go to a friendly marina and ask the operator. You will find that most activity is confined to a few channels and you can keep those programmed into your radio.

Even if you don't have cruise ships in your area, you can find interesting monitoring on the VHF marine band. Along the Great Lakes, the Mississippi River, and the coasts, you can find lots of activity. The Mississippi River system should provide lots of monitoring opportunities, as should the intracoastal waterways. In some areas, the Coast Guard controls ship traffic very much like control towers control air traffic. Frequencies can vary; scan the band or check a published frequency list.

The weather begins to turn in September; the summer rains turn to fall storms. On this day, a storm in the Gulf of Alaska is causing 30-foot seas, not something to go cruising in. The *Regent Star* has decided not to cross the gulf to Anchorage and it will disembark and reload with new passengers here in Juneau. The scurry of passengers increases along with the activity on the VHF marine band. Schedules, hotel reservations, charter flights, special needs; the band stays hot most of the day.

As each cruise ship leaves for the last time, it signals Juneau with its horn. Some just sound the horn a few times, but the *Nieuw Amsterdam* plays what seems to be a tune. When it comes back for the first time next summer, a band will meet it on the dock. And I'll be there with my scanner.

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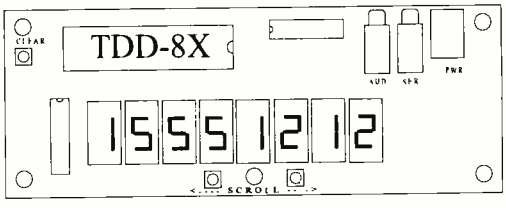

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By Dewey Bertolini

The day my radio fell silent was a sad day indeed.

I, like so many around the world, had come to depend upon Kol Israel, the "Voice of Israel," as my primary source of undiluted, up-to-the-minute news regarding a land and a people I deeply love. But Israel's voice was suddenly and sadly diminished, as far as many of its English international broadcasts are concerned.

Much to my chagrin, the one transmission that I was able to receive with any clarity and regularity—11603 at 2230 UTC—was abruptly, inexplicably, and completely canceled. I traveled halfway around the world in order to answer for myself the troublesome question, "Why?"

As I sat in the office of Shmuel Ben-Zvi, Director of Israel Radio International, I fully expected to be given the predictably bland, all-too-common, surface explanation, "Budget cuts." Instead, I was able to dig deeper and discover so much more about the inner workings of this station. Kol Israel provides us with a fascinating illustration of a radio station that is changing its philosophy as it adapts to changing times. Indeed, Kol Israel is experiencing a challenging, yet exciting metamorphosis of its mission in the marketplace of international shortwave broadcasting.

In many ways, the changes taking place at the studios of Kol Israel are but a microcosm of the rapid transformations that are occurring within the land of Israel itself. Both the station and the nation are striving to define themselves within the changing landscape of Middle Eastern politics.

Israel is certainly the crown jewel of the Middle East. If I could take you there, you would immediately realize that, due to its varied topographical features, the lay of the land presents to the pilgrim or tourist many breathtaking vistas. The radiant splendor of the Old City of Jerusalem is spectacular, viewed from the summit of the Mt. of Olives. As you gaze upon the northern reaches of this land from a lookout perch high atop the Arbel cliffs, you would behold the mighty peaks of Mt. Hermon rising majestically in the background, flanked by the now-famous Golan Heights. Or, peering down upon the silent and sparkling waters of the Sea of Galilee, you might be all too easily lulled into a false sense of serenity. From a distance, the land appears to be peaceful and tranquil. Yet, this thin veneer only camouflages a caldron of contention bubbling just beneath the surface.

Today, Israel is facing unprecedented challenges. From the ever-present threat of deranged suicide bombers to a struggling economy endeavoring to absorb the accelerated numbers of immigrants who come to this land desperately seeking a haven and a home in the wake of the recent collapse of communism, this is a land in transition.

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■ Spiritual, Cultural, Political Epicenter

As our world stands at the dawn of the twenty-first century, the land of Israel has become many things to many people. Israel Proper (excluding the so-called West Bank, Gaza Strip, and Golan Heights)—boasting a land mass equal in size to the state of New Jersey!—has become the physical home to some six million people, while attracting another six million visitors annually. Referred to by many as "The Holy Land," Israel is the spiritual epicenter of the world's three great monotheistic religions—Judaism, Christianity, and Islam.

This land-bridge that once linked the great ancient empires of Mesopotamia and Egypt has had a turbulent history. Countless armies have marched across its soil. In a tragic sense, both its past, and, unfortunately, its present, have been written in human blood.

Since the momentous fourteenth day of May 1948, when David Ben Gurion proclaimed the independence of the sovereign State of Israel, six wars have buffeted this land, leaving its citizens physically and psychologically battered and bruised. Who of us will ever forget the Spring of 1991 as we sat spellbound, in the comfort and security of our own homes, staring helplessly at our shortwave radios and television screens in utter disbelief? We heard via Kol Israel the wailing sirens from half a world away signaling yet another imminent scud missile attack. The ominous poison gas warnings punctuated the point that Israelis live with an inbred drive to *survive*. Literally millions of people around the globe, this writer included, pray daily for lasting peace finally to come to Jerusalem—the "City of Peace."

Jerusalem is center of three major religions, epitomized by the Moslem Dome of the Rock built on top of the Jewish Temple ruins (also shown on p. 14). Foreground of photo above shows remains of the Temple wall, called the Wailing Wall.

■ Station in Transition

Tucked away on a relatively quiet street located behind the hustle and bustle of Jerusalem's downtown Central Bus Station, sits the unpretentious complex of buildings that comprise the offices, newsroom, command center, and studios of *Kol Israel*. One hundred people serve on the staff of Israel's radio link to the world. Theirs is an unenviable and, at times, overwhelming task.

"We rarely have time to catch our breath," admits Ben-Zvi. "Everyday something new is happening somewhere in this land." Indeed, during my brief stay in Jerusalem, ketusha rockets launched from Southern Lebanon rained down upon a kibbutz in Northern Israel, a bus of Jewish settlers was ambushed in Hebron, and Vice-President Al Gore became Dr. Al Gore when he was awarded an honorary doctorate at the Mt. Scopus campus of the highly esteemed Hebrew University. There is no rest for the weary!

With the eyes of the world focused upon the fragile and floundering Middle East peace process, thousands of people worldwide have come to depend upon *Kol Israel* as their only daily reliable source of information regarding the inner goings-on of this marvelous land. The ten million Jews of the Diaspora (Jews living outside of the borders of Israel), including six million in the United States, desperately need this living link to the land. Millions of non-Jews like myself, who love and support the State of Israel and her precious people of all faiths, need and want to hear this nation's own perspective on the many complex issues that confront her every day.

From my home in McMinnville, Oregon, Jerusalem is a whopping seven thousand long miles away. I speak for many when I say that my only immediate connection to the Holy City is via the air waves of Kol Israel's international shortwave broadcast. Why then has Israel's voice been cut?

Despite the rumored in-fighting and punitive motivations hinted at in a recent *The*

The Garden of Gethsemane is a popular focus for Christian visitors to Jerusalem.

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Jerusalem Post article (and repeated briefly in *Monitoring Times*, April 1995), make no mistake about it—budget cuts have certainly played a devastating role in gutting Kol Israel's English international broadcast schedule. (See chart.) Shmuel Ben-Zvi explained to me that the combined costs for salaries and programming total only four to five million shekels ($1.3 - 1.6 million) per year, while *transmitter* costs alone exceed *ten million shekels* (approximately $3.3 million) annually. At a time when the leadership of *Kol Israel* wants to strengthen the ties between the land and the Diaspora, the money is just not there.

"We desire to be progressive in our programming," Ben-Zvi lamented. "We want to give the Diaspora the feeling that 'Israel is there for you." But in the 1990-91 fiscal year, the Jewish Agency and Foreign Ministry drastically cut its funding of Israel's international broadcasting effort. Some people in high places believed that international shortwave broadcasting was becoming obsolete. Others questioned the stated mission statement of the IBA, the Israel Broadcasting Authority. Though its charter states that the IBA must broadcast to the Diaspora, it does not specify how often and in which languages. Thus, in the author's opinion, regretful decisions were made.

Shmuel Ben-Zui (right), Director of Israel Radio International, stands with the author in front of Kol Israel's headquarters. Below is the Kol Israel Radio and Television Complex.

Some felt that because so many Russian Jews are immigrating to Israel, they should represent the priority market. Others suggested that this market is not viable since many from this target audience do not have access to shortwave radios. Still others wanted to jettison the whole thing in favor of satellite broadcasts; yet, not only does no satellite exist, but one must question how many potential immigrants have the technology at hand to tap in to this, either.

Since shortwave radio is a mobile medium, and inexpensive radios are readily available in most places in the world, there are many in the IBA who understand that a commitment to international shortwave broadcasting must be maintained. Thus, a quagmire of confusion has haunted the hallowed halls of the IBA. One can certainly sympathize with the sentiments expressed by Ben-Zvi as he clutched a cup of tea and glanced wistfully out of his office window, "The past three or four years have been the most interesting and difficult of my life."

All of this controversy notwithstanding, I am pleased to announce that hope burns eternal at Kol Israel! An obvious air of excitement radiated through Ben-Zvi as he spoke of Kol Israel's bright future. His commitment to English international shortwave broadcasting is unwavering. Indeed, the day after we spoke to one another (March 23, 1995), the IBA took its first steps toward implementing a brand new broadcasting strategy.

Borrowed Time

Under the auspices of the Jewish Agency (the international organizing and fundraising body that oversees projects affecting Jewry worldwide), a first-of-its-kind international radio broadcasters conference will be convened in Jerusalem some time next year. The IBA has high hopes for this conference, as they fully expect to attract between three and five hundred participants, representing some two hundred international shortwave stations from around the world.

Among other things on its agenda, the IBA will formally present to these representatives its desire to purchase time on *their* transmitters, allowing Kol Israel international broadcasts to blanket the world *regionally*, rather than from one transmitter site currently located on the outskirts of Tel Aviv. Verbal

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A striking view of Jerusalem from the Yemin Moshe neighborhood.

KOL ISRAEL
BROADCASTING SCHEDULE

BEFORE SCHEDULE REDUCTION

Time (UTC)	Frequency (kHz; NA in bold)
0500 -0515	**7465**/9435/17545
1100 - 1130	**15640**/15650/17575
1400 - 1425 (smtwh)	**15640**/15650
2000 - 2030	**7405**/**7465**/9435/**11603**/17575
2230 - 2300	**7405**/7465/9435/**11603**/15640

AFTER SCHEDULE REDUCTION

Time (UTC)	Frequency (kHz; NA in Bold)
0400 - 0415	**7465/9435**
1000 - 1030	15650/17575
1400 - 1425	CANCELED
1900 - 1910 (REDUCED)	**7465**/9435/**11603**/**11685**/15640
2230 - 2300	CANCELED

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From the Garden of Gethsemane in Jerusalem to the heights of Masada, south of the city (on which this flag flies) Israel is a land of contrasts.

commitments to this effect have already been given by stations in Moscow, Lithuania, Latvia, Poland, Romania, Spain, Argentina, and the VOA.

On the positive side of the ledger, the cost of such an operation is significantly less than the budget now required to service and maintain Kol Israel's transmitters. Reception would be much more reliable under this plan since the transmissions would be made from several points on the planet, rather than just one. (Those of us who alternately bless and curse daily ionospheric conditions will shout a hearty "Amen!" to that.) A more loyal listenership will most certainly result from this one factor alone.

Life being a matter of trade-offs, there is an admitted downside to this scheme. Kol Israel runs the risk of losing its journalistic freedom once it establishes its dependence upon other stations' transmitters. Will one station prefer more music and less news? Will another seek to limit the editorial content of Kol Israel's broadcasts? No doubt these concerns will be voiced and negotiated during the contracting process with each station in question.

Under this plan, the programming department will concentrate on producing first-rate radio journalism. Kol Israel readily understands that its role is *not* that of dispensing propaganda. Commentary will be kept to a minimum. The "Voice of Israel" will be just that—a radio service dedicated to informing the world of life and events within the cozy, sometimes confusing, and always controversial confines of this most important nation that sits at the center of the world.

It should be noted, by the way, that as a back-up to this plan, Israel is moving hastily toward the launch of its own state-of-the-art communications satellite, AMOS. The satellite is named after the Old Testament prophet whose message, interestingly enough, begins with the words, "The LORD roars from Zion, and his voice thunders from Jerusalem." Wishful thinking places the launch of this satellite sometime towards the end of this year.

In its publication, *Israel Radio -- Structure and Content of the Broadcasts*, Kol Israel's evolving philosophy is clearly stated: "Because of the needs of broadcasting hard news and in order to respond immediately to what is happening in the world, the (News) Division will establish a newsroom exclusively dealing with news from the Jewish world, for the Jewish world. These broadcasts will be aimed at this audience, providing them with the latest information about the situation in the Diaspora... Programming ranges from news to a wide range of programs whose purpose it is to strengthen the listener's link with Israel through regular features on the history of Zionism, tourism, Middle Eastern politics, and the immigrant absorption process."

Regarding English broadcasts specifically, it is the desire of Sara Manobla, Head of English Department Features, and of the management, that, "The subjects of feature programs in English on the External Service include letters from listeners, panel discussions on current events, immigration and absorption, news from the Jewish world, tourism, culture, philatelics, Israeli music, business and finance, a DX corner, Israeli Mosaic, a pre-Shabbat program and a weekly news magazine."

Those of us who have listened to Kol Israel on a regular basis know that many of these features have been axed of late. I join with others in applauding the efforts of Shmuel Ben-Zvi and other visionaries like him who are determined to reinstate these features as a part of their comprehensive strategy to reposition Kol Israel as a leader of innovative international shortwave broadcasting into the next century. We are profoundly grateful for him and others who have vowed that this most important voice cannot and will not be silenced.

Jaffe Gate into the Old City Wall sports a communications antenna above it, and the author's son David, waving below.

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The Shuttle's 'Mir'-acle Mission

An International Communications Challenge

View of the Russian space station Mir, taken by the space shuttle Discovery during a close fly-by last February.

Photo courtesy of NASA

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By Philip Chien, Earth News

June marks the beginning of a new era in international space communications. This month the space shuttle *Atlantis* will dock with the Russian space station Mir. Both of these spacecraft were designed in the 1970s, in a time when the United States and Soviet Union were in the middle of the Cold War. During that decade the first tentative step toward cooperation in space occurred: the joint Apollo-Soyuz mission. A spare Apollo spacecraft, left over from the Apollo moon program, and a Soyuz production line spacecraft, originally intended for use with the unsuccessful Salyut 2 space station, docked together in space and the crews briefly visited each other's spacecraft.

Now the world situation has drastically changed. The Cold War is over, and shrinking economies in both countries are resulting in cutbacks to space programs in general. The U.S. and Russia are pooling their resources, with the combined Shuttle-Mir program as a bridge to the upcoming international space station.

Bridging the Gap

Communications is just one of the problems between the two countries' spacecraft, but it's one of the most important. A large number of astronauts, engineers, and scientists in both countries are already studying each other's languages. However, the radio systems on the two spacecraft also use different frequencies and techniques. Figure 1 shows the ground to spacecraft links for each country.

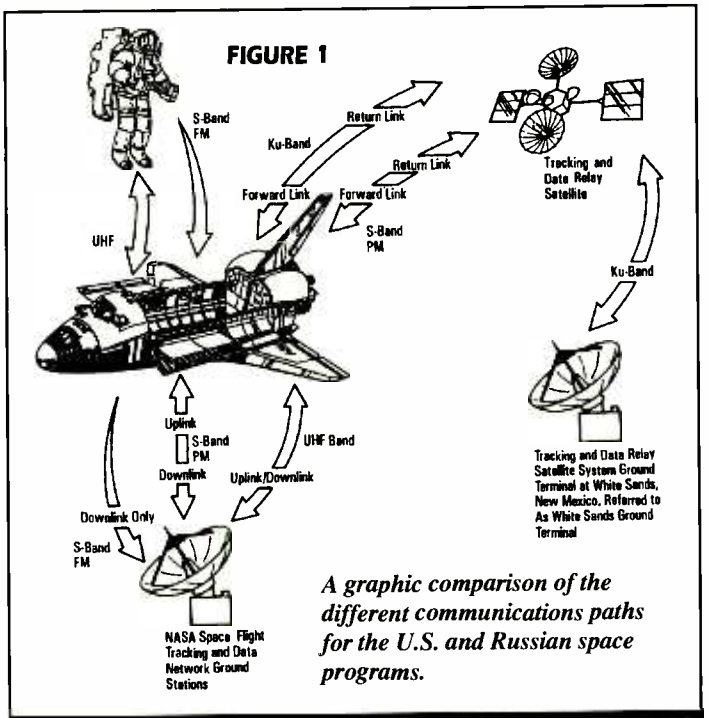
With its relatively short missions, Mission Control-Houston wants to keep in touch with the shuttle as much as possible on each flight. Experiments are generally designed to be interactive, with scientists on the ground monitoring data as the astronauts perform their tasks. To provide as much communications as possible with the ground, NASA uses two geosynchronous Tracking Data and Relay Satellites (TDRS) which can keep in contact with the shuttle for approximately 85% of each orbit. The two operational TDRS are located at 41 degrees West and 171 degrees West, about half way around the world (figure 2).

Both satellites can be viewed from the White Sands Ground Station in New Mexico. The only portion of the shuttle's orbit where it is out of view from the TDRS is a lens-shaped area centered over India. The shuttle transmits its data, video, and voice up to whichever TDRS is in view. The information is received at the White Sands ground terminal, to be retransmitted to Houston.

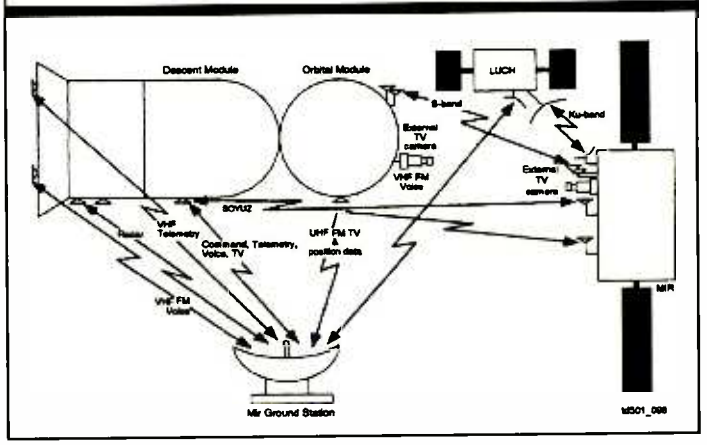
In comparison, the much longer Mir missions operate at a more sedate pace. Cosmonauts set their own schedules and operate more autonomously. Normally Mir's primary communications link with the ground is through seven Russian ground stations (figure 3). The Russians have recently placed two Satellite Data Relay Network (SDRN) satellites, Altair and Luch, into geosynchronous orbit, similar to the U.S. TDRS. They are located at 16 West and 95 East. The Russian SDRN are not normally used, however, because they require Mir's orientation to be changed.

Coordination on the Ground

Communications loops between the two mission control centers is even more complicated than the links between the two spacecraft. However, the two control centers are actually more alike than different. Each team uses specialized flight controllers with similar



A graphic comparison of the different communications paths for the U.S. and Russian space programs.



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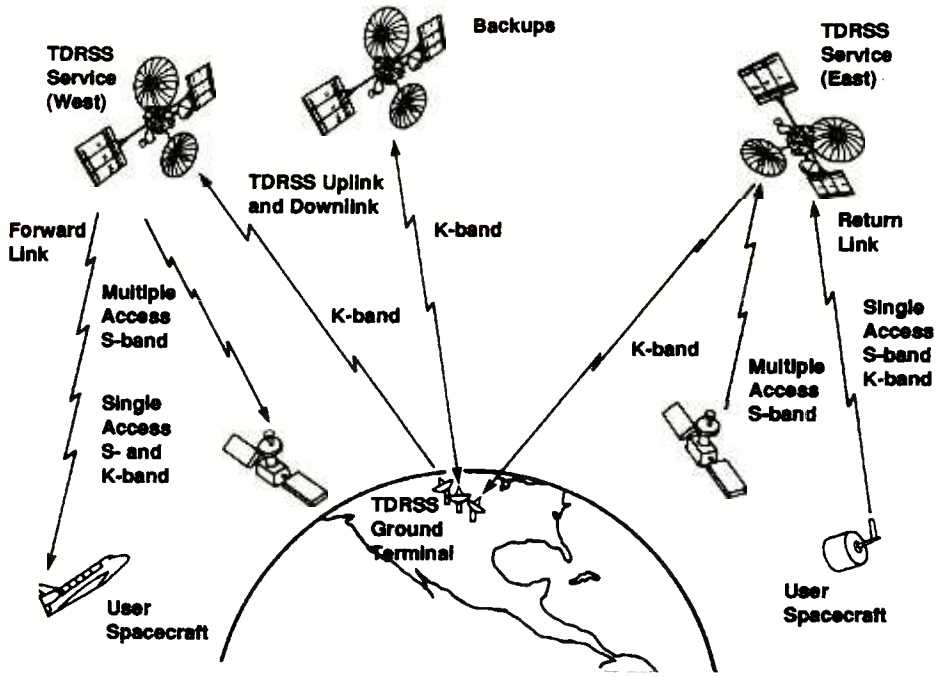


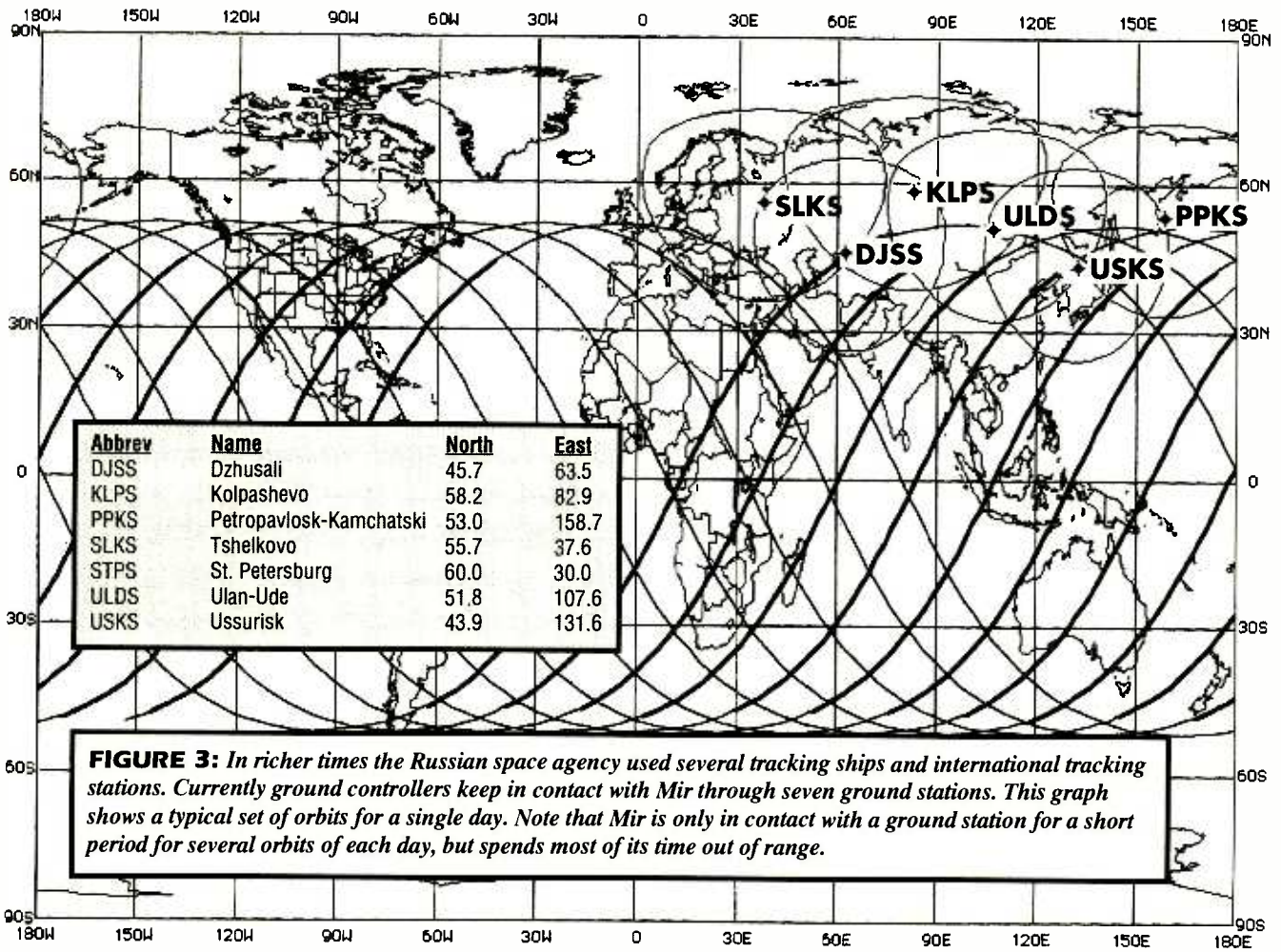
FIGURE 2: *A graphic showing how TDRS is used to transmit data back to the Earth.*

responsibilities. You may find it interesting to know that NASA's flight directors have commented that they can usually identify the controllers for different shuttle responsibilities by their personalities; it turns out that their corresponding Russian counterparts seem to have similar personalities!

An additional flight control engineer has been added to each team—the Russian Interface Officer. The RIO is responsible for coordinating activities between the Mission Control Houston flight team and the Russian Mission Control team for all joint tasks.

In addition, each mission control team will have a group of counterparts in each other's control center, serving as consultants. The guest consultants will advise the other's mission control center what they would do under similar circumstances. For example, during the STS-63 mission this past February in which *Discovery* came within 10 meters of Mir, four NASA mission control flight controllers were in the Kaliningrad mission control center to monitor and assist Russian flight controllers.

Continued on Page 24



Abbrev	Name	North	East
DJSS	Dzhusali	45.7	63.5
KLPS	Kolpashevo	58.2	82.9
PPKS	Petropavlosk-Kamchatski	53.0	158.7
SLKS	Tshelkovo	55.7	37.6
STPS	St. Petersburg	60.0	30.0
ULDS	Ulan-Ude	51.8	107.6
USKS	Ussurisk	43.9	131.6

FIGURE 3: *In richer times the Russian space agency used several tracking ships and international tracking stations. Currently ground controllers keep in contact with Mir through seven ground stations. This graph shows a typical set of orbits for a single day. Note that Mir is only in contact with a ground station for a short period for several orbits of each day, but spends most of its time out of range.*

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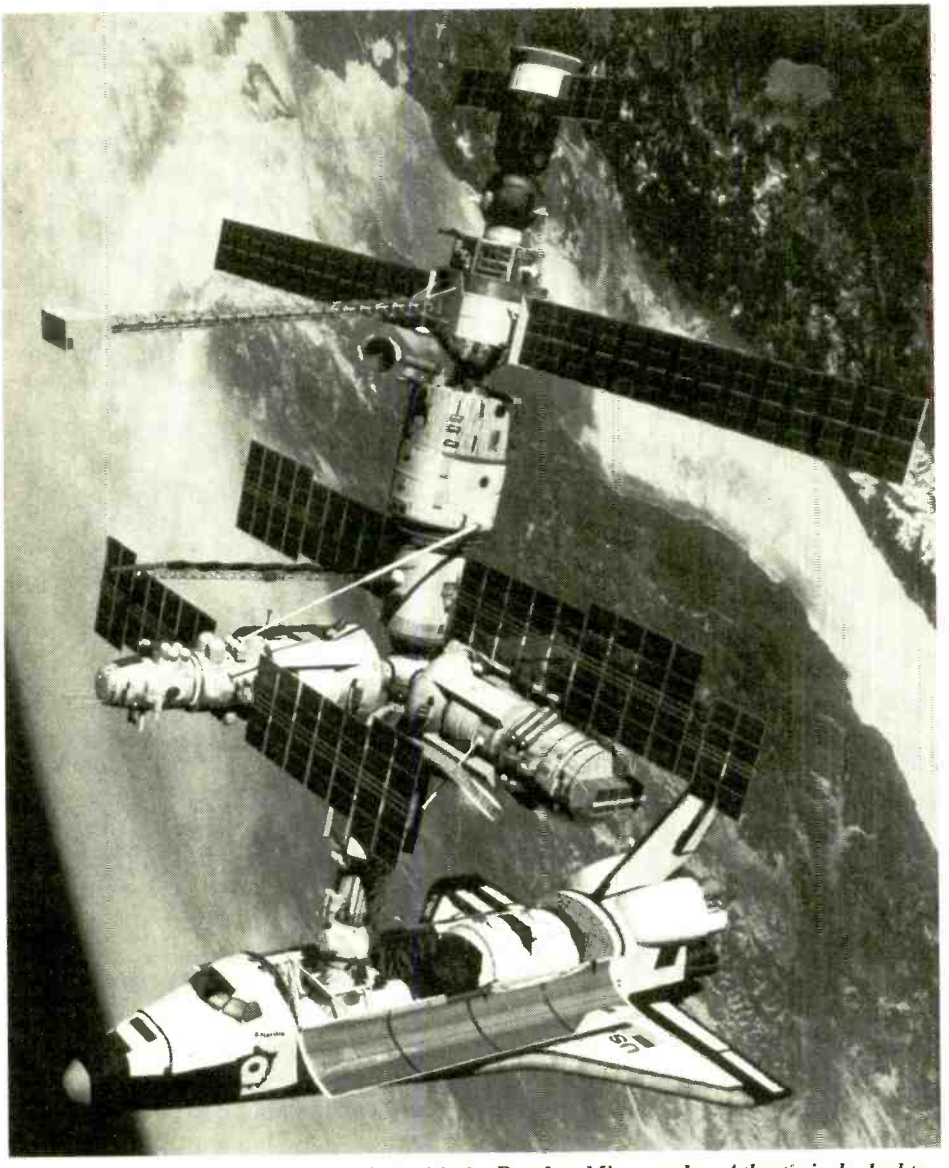

An artist's rendition of Atlantis docked with the Russian Mir complex. Atlantis is docked to the Krystall module. On Krystall's opposite side is the Mir core module, which has been in space for over nine years. Kvant is connected to Mir's aft end, and a Soyuz ferrycraft is connected to Kvant's docking port. The other modules connected to Mir's multi-port docking adapter are Kvant-2 and Spectr.

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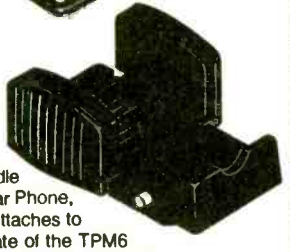

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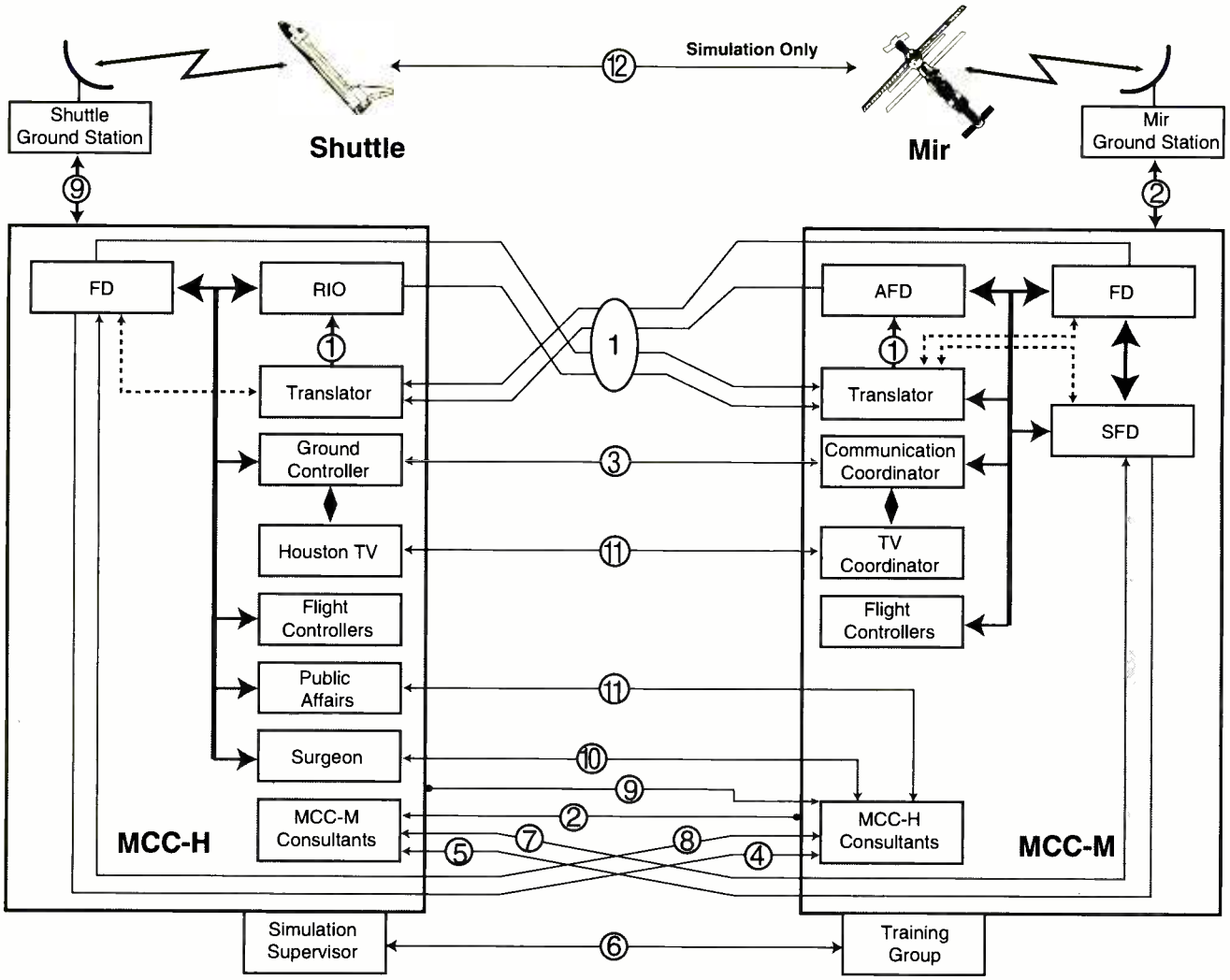

FIGURE 4: *MCCs—12 communications loops interconnect the Mission Control Houston and Mission Control Moscow centers.*

There are twelve voice loops between the two mission control centers (figure 4). Loop 1 is the Mir/Shuttle ops loop—the primary interface for status go/no-go decisions between the two centers. It's monitored by the translators, the RIO, and the flight directors on each side.

Loop 2 is the normal air-to-ground Mir communications channel, which will be monitored by the U.S. side.

Loop 3 is the ground control loop where the technicians coordinate the communications and data loops.

Loop 4 is the normal mission control flight director's loop. In addition to the mission control-Houston personnel who normally use the loop, the U.S. consultants in Moscow will also monitor this feed.

Loop 5 is the same loop for the mission control Moscow team, which will be monitored by Russian flight controller consultants based in Houston.

Loop 6 is used in training by the sim-sup (simulation supervisor). Sim-sups keep tossing potential problems at the flight control teams to give them tasks to solve. It isn't likely that those exact problems will occur during the mission, but the training helps the teams keep their edge and prepare for whatever does happen. All of the flight control teams and astronauts participate in the Joint Integrated Sims. During actual missions loop 6 is used by the principal investigators for the science experiments.

Loop 7 and 8 are used by the Moscow and Houston consultant groups for inter-control center coordination.

Loop 9 is the normal air-to-ground shuttle communications loop. This loop is normally the only mission control group which is transmitted over NASA TV, with the voices of the Capcom on the ground and the astronauts in space.

Loop 10 is used by the surgeon to coordinate medical matters and is normally considered privileged information.

Loop 11 is the public affair coordination loop where the NASA public relations people coordinate TV times and schedules.

Loop 12 is used during simulations for direct communications between the shuttle and Mir. During the actual mission this loop doesn't exist, since the VHF radio is used for direct contacts. The direct VHF communications are patched into the shuttle's air-to-ground channel and can be monitored via Loop 9.

Operating Procedures

It's important to note that neither side has overruling authority for any actions; all critical tasks will be agreed upon jointly. In space, the U.S. commander is responsible for the shuttle's safety and the Russian commander is responsible for Mir. In a worst-case scenario where the two commanders disagree on how to solve a problem, they can just retreat to their own spacecraft and close the hatches! If there is an emergency then each astronaut or cosmonaut knows to return to his or her "home spacecraft." For some of the joint crew exchange missions, an astronaut's home spacecraft may be Mir until the crew compartments are reconfigured, after which the

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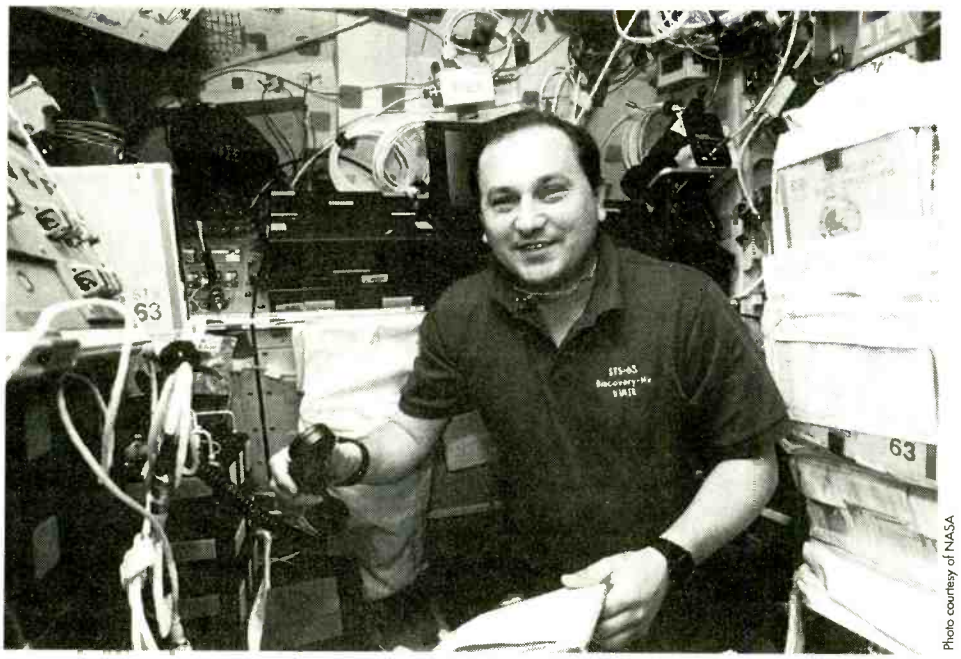

Photo courtesy of NASA

Cosmonaut Vladimir Titov flew aboard space shuttle Discovery on the STS-63 mission from February 3-11 1995. Here he's holding the handset for the Motorola URC-200 radio which was used to communicate with Mir.

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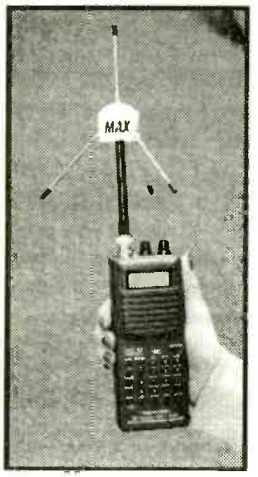

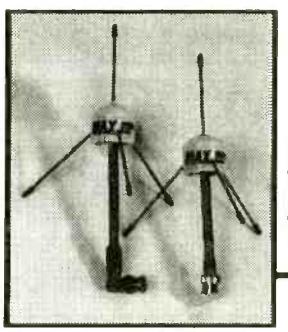

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shuttle will be "home" for the rest of the joint activities.

When the U.S. shuttle approaches Mir it will use the VHF frequencies used by the Russian Soyuz ferry spacecraft. *Atlantis* has a Motorola URC-200 radio for close range direct communications between the shuttle's commander and Mir's commander. This particular unit, designed for military applications, can operate from **115-173.9875** MHz and **225-399.9875** MHz at three power settings—100 milliwatts, 5 watts, or 10 watts.

A broadband helix, right-hand, circularly polarized antenna with a gain of 10 dB has been installed into *Atlantis*'s cargo bay. The antenna is mounted on the starboard side of the cargo bay, about halfway between the docking module and whatever payload *Atlantis* is carrying to Mir. A window-mounted antenna, similar to the antenna used for SAREX (Shuttle Amateur Radio Experiment) was tested on the STS-63 mission and will be used as a backup during the Mir docking missions.

Normally, the shuttle will transmit on **121.75** MHz FM—the frequency traditionally used by the Russian Soyuz ferry spacecraft—and Mir will transmit on **130.1625** MHz. Alternatively, **121.75** MHz simplex can be used. If the two spacecraft are over your area, you may want to try to listen for them on a scanner.

As with the Soyuz dockings, U.S. shuttle dockings will take place within range of a Russian ground station, which permits ground controllers to monitor Mir's critical systems. When the two spacecraft are approximately 60 km apart, the commanders will attempt to contact each other via radio and will exchange flight data during the approach.

Links Around the World

Communications links on the ground are even more challenging, with many more interfaces between the two countries. Transatlantic Gorizont geosynchronous satellites will be used to relay mission control loops between the Russian mission control center in Kaliningrad, near Moscow, and the Staten Island teleport, operated by IDB. From IDB the video signals are converted from the Russian SECAM format into the U.S. NTSC format, and retransmitted via a domestic commercial satellite to the U.S. mission control center in Houston, Texas.

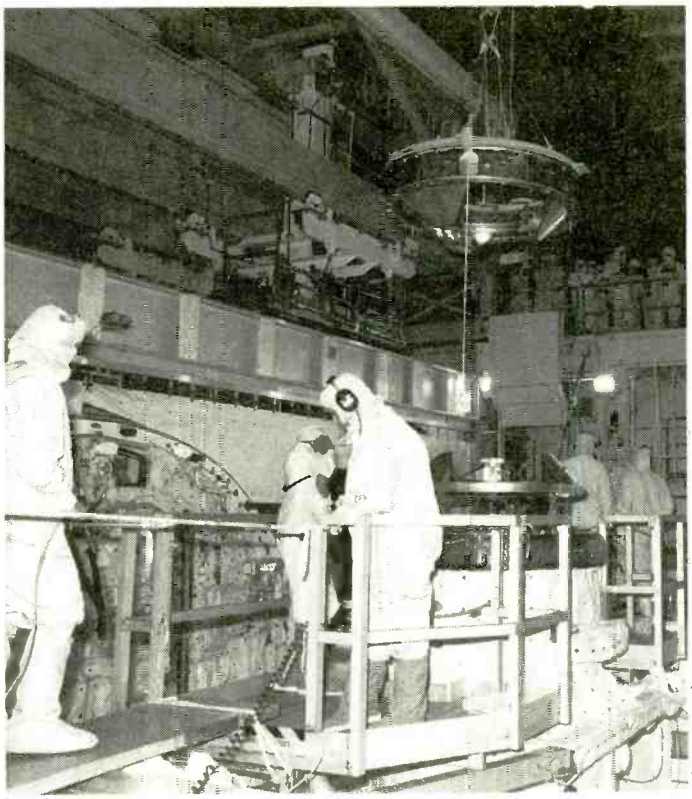


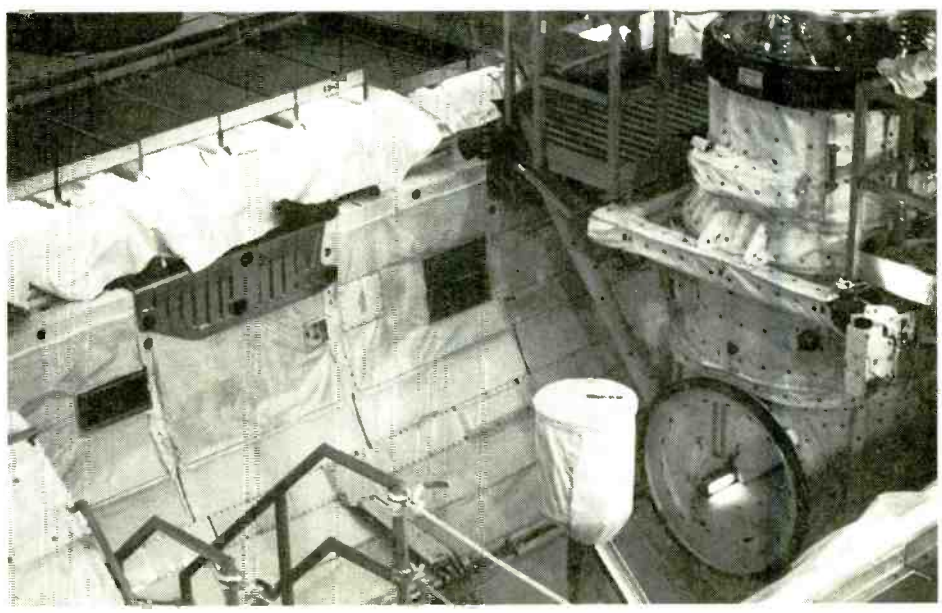
Photo courtesy of NASA

Kennedy Space Center engineers test the docking ring which will be used to mate shuttle Atlantis with the Russian Mir space station (above). The Shuttle's docking adapter is visible through the work platform which surrounds the shuttle's docking ring. The shuttle's crew cabin windows are visible on the left side of the photo. The author is somewhere in the bunch of people on top watching this operation.. Below, looking into the payload bay of the Shuttle, the docking ring is located in the upper right hand corner, while the Mir antenna is the covered object just right of center in the lower portion of the photo.

If the Kaliningrad control center needs to send a message to Mir while it's out of range, the ultimate long-distance phone call can be performed. From the control center in Kaliningrad the message is sent via microwave to the OSTANKINO switching center in Moscow, which routes it out to the Bear Lake uplink station. The signal is uplinked to a Russian geosynchronous satellite, either Gorizont 20 or 26. That signal is received by IDB in Staten Island, NY, and retransmitted via a domestic communications satellite. Mission control Houston receives the signal and it is transmitted to NASA's White Sands TDRSS ground station in New Mexico via a fiber optic line. From White Sands the signal is transmitted to one of the two Tracking Data and Relay Satellites, and received aboard the shuttle. The shuttle then retransmits the signal via the VHF radio to the Mir space station!

The total path is over 220,000 km. (137,000 statute miles)—three fifths of the way to the moon. The time delay, due to the speed of light, is almost a second. This is one case where you certainly don't want to reverse the charges on the call!

Note: For more, in-depth, frequency bandplans for this mission, send $2 plus SASE to Grove Enterprises for a reprint of "Shuttling to Mir" by Keith Stein in the May/June Satellite Times.



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1-2 pm	*Scanning Atlanta - Roger Cravens*
2 - 4 pm	*International Broadcaster's Forum, Ian McFarland, moderator*
7-7-:30	*Opening ceremony; greet VIPs (espec int'l broadcasters) w/Bob Grove host*
7:30-8:30	*MT Expert panel w/Rachel Baughn host*
8:45-9:45	*ST Expert Panel w/Larry Van Horn host*

Saturday, October 14, 1995

	SW Ute/BC	Scanner	Satellite
9:00 - 10:00	*Utility DX*	*Public Service*	*Satellite Monitoring*
	L.Van Horn	Bob Kay	K. Stein
10:15-11:15	*BC Developments*	*Listening Laws*	*Weather Sats*
	G.Hauser	J.Rodriguez	J.Wallach
11:15-1:00	*LUNCH*		
1:00-2:00	*Begin SW*	*Military VHF/UHF*	*Personal Com.*
	L. Magne	J.Sullivan	D. Dickerson
2:15-3:00	*SWBC Programs*	*Federal Monitoring*	*Begin Sats*
	J.Frimmel	J.Fulford	K. Reitz
3:15-4:15	*HF Aero*	*Scan Equip*	*Domestic TVRO*
	B.Evans	TBA	K. Reitz
4:30	*Bug Hunt (outdoors)*		
5:15	*Prize dawing*		
7:00	*Banquet*		

Post banquet Bug hunt, Listening post, special interest groups

Sunday, October 15, 1995

9:00-10:00	*AM DXing*	*Begin Scanning*	*Monitor NASA*
	G. Hauser	B.Grove	L. Van Horn
10:15-11:15	*HF Digital Modes*	*Trunking*	*Amateur Sats*
	B.Evans	Doug Graham	K.Baker
11:30-12:30	*Pirate/Cland*	*VHF Aero*	*Radio Astronomy*
	G.Zeller	J.Baker	J Lichtman
12:45	*Close w/Bob Grove host*		

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Chained to your Radio?

FM Kit Gives You Freedom to Roam

By Michael LeBlanc

Are you one of those lucky fellows with an ICOM R71 with infrared remote control? If so, you could be sitting in an easy chair, tuning around the world having a great time, when your wife requests that you take out the garbage, wash the dishes, and all that other voodoo you do best: CHORES.

What do you do? Do you switch off your favorite program that you waited all week for? Not I; I found a way to listen to shortwave and keep my wife happy at the same time. Here's one way to SWL with the freedom to roam.

A Simple Project

The first thing you need is the ability to transmit the audio from your R71 to any standard broadcast FM radio. This phase of the project will actually be useful for anyone with a not-so-portable base station, whether it works with a remote control or not.

Many small FM transmitters are on the market. I have tried several, but have found the Ramsey FM-10 stereo unit works great (see review starting on p.29). It features good audio quality, reasonable power, and is easy to assemble.

Follow the FM-10 directions and you will have a working transmitter in a couple of hours. I suggest you drill a hole in the top of the case for frequency adjustment. I'm using the FM-10 in the mono mode so you will have to jumper the two inputs together.

The transmitter connects to the R71 via the front panel record jack or the rear speaker jack.

Turn on the radio and FM-10. Tune the FM-10 according to the directions and adjust the audio level with R3 and R6 for good clean audio out of your stereo.

Now you can hear your R71 (or other audio source) anywhere you have an FM radio in your house or yard. If your FM-10 is on the second floor, you might hear it a lot farther.

Best of Both Worlds

Now you have audio throughout the house, but you're stuck on one frequency and not taking advantage of the ICOM's remote capability.

There's a neat little device on the market called a wireless remote control extender. A set consists of an infrared to RF transmitter that converts your IR remote signals to RF signals. This RF is sent to the receiver which converts the RF back to the infrared that is needed to operate the R71.

Several brands are on the market. The one I use is called Room Service IR100, shown at left. It converts infrared to RF at about 300MHz. Some units such as the Radio Shack version use the AC wiring in your home to transmit the signal. I haven't tried these, and don't know if they work on the same principle or not.

All you do now is put the infrared receiver in front of the R71 about ten inches from the IR widow. (At any closer range I found it produced errors.)

Take the transmitter to any part of the house or outside. Plug it into the AC outlet. Turn on your stereo Walkman to the frequency of the FM-10 transmitter, point your ICOM remote, and SWL to your heart's content. You can remotely control all functions of your ICOM R71 from wherever you are.

Using the Speech Option

If you thought you never had a use for the ICOM speech option, here it is. As you casually tune via your new remote system and hear a station to log, just press the speech button on your ICOM remote to hear what frequency you landed on. You will hear "three point eight nine eight zero megahertz" for 3.8980.

If you decide to use the record jack instead of the speaker jack, another modification is required to use the speech option. The speech board output is connected to the internal speaker and you have to move it to the record jack.

Remove the shielded speaker cable from the speech board and tape up the end so it won't short to the radio chassis. You won't be using it. Solder a ten-inch wire where the center lead of the shielded cable used to be on the speech board. Connect the other end to resistor R174 on the main board of the ICOM R71. Now the frequency will be announced through the record jack.

References:

Room Service by Recoton
46-23 Crane Street
Long Island City, NY 11101
(718) 392-6442

Ramsey Electronics, Inc.
793 Canning Parkway
Victor, NY 14564
(716) 924-4560

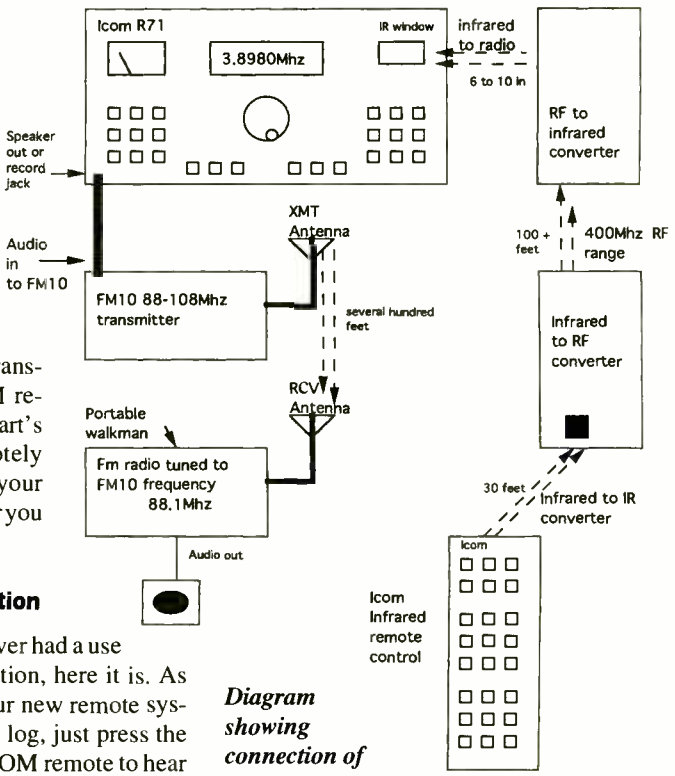

Diagram showing connection of components.

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Big Broadcasts From a Little Black Box?

By Karl J. Zuk

Doesn't everyone want to be a broadcaster? Unfortunately, unless you have hundreds of thousands of dollars to invest, professional stations are out of your grasp. Still, many of us would jump at the opportunity to be heard across a city block or part of a small village—and you can, legally! FCC regulation Part 15 allows operation of low-powered transmitters within the AM and FM broadcast bands. For about fifty dollars, you can buy a Ramsey FM-10A transmitter kit and be on the air in a couple of hours. But, how well does it work?

"Definitely not a toy, exceptional transmission range. Superb audio quality actually puts the 'big boys' to shame!" boasts the cover sheet of the assembly manual. Ramsey's portrayal is enticing, but unfortunately filled with hot air. The FM-10A is the most basic transmitter you can imagine. One integrated circuit produces the carrier, modulates it and adds stereo information. A tiny transistor amplifies the chip's output to a usable level. The end result is a small plastic box that contains the heart of an FM exciter. All the rest is up to you!

Beginners will find building the FM-10A a pleasant exercise. The 25-page assembly manual is worth the price of admission, guiding you through a couple of hours of easy construction reminiscent of Heathkit designs. The final pages include a fact-filled treatise on the basics of the FCC's Part 15 regulations and how to interpret them. This book is very well-written and educational even to a seasoned pro.

Serious flaws in the design make the FM-10A impractical, but aspiring young broadcast engineers-to-be will find it an excellent learning tool. You will quickly discover why a professional FM exciter incorporates a myriad of complicated circuitry. The FM-10A would be an admirable project kit if it could just stay on frequency!

A simple coil and capacitor are combined to form an oscillator that determines where you will broadcast on the FM band. The kit can be built to transmit on any frequency on the FM band, in three ranges: roughly 87-94 MHz, 94-101 MHz, and 101-108 MHz. (Be extremely careful not to broadcast above the highest FM broadcast frequency of 107.9 MHz. Critical aviation transmissions occur above 108 MHz, and any interference in this band can have serious consequences.)

The Ramsey FM-10A FM stereo transmitter kit..

Sadly, changes in temperature can make the transmitter drift wildly. On a hot summer day, you can start broadcasting at 91.9 MHz, and within an hour be at 92.1 MHz. Keeping yourself on frequency is annoying!

We Turn to Trouble-shooting

A call to Ramsey about this problem yielded this advice: make sure the temperature around the transmitter is extremely constant, and after a few hours it should be very stable. We put their suggestion to the test.

Inside a laboratory temperature-controlled chamber, using a 9 volt battery for power, the FM-10A was turned on and carefully tuned again to 91.9 MHz. The temperature was not allowed to vary more than one tenth of a degree. In one hour, we found the FM-10A at 91.82 MHz. At the end of four hours it had

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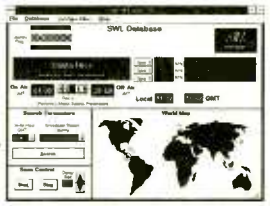

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rolled down to 91.76 MHz. The results were better, but still required retuning every now and then.

Temperature related problems are cured by crystal ovens and phase-locked-loop circuitry in professional equipment. A more stable PLL oscillator would do a world of good in the FM-10A, and should be included in future versions of this product. This small addition would make the whole project worthwhile.

The most valuable tip we can offer to owners of the FM-10A may be obvious. Forget the unit can be battery operated and substitute a regulated DC power supply with good A/C filtering to minimize hum. A simple 2.1 volt Zener diode regulator in the FM-10A's circuit works well. Little change in RF power output, or overall performance, was noticed when you operate with any voltage between 6 and 12 volts. Your transmitter will drift less, and you won't feel embarrassed when your battery gives out.

Keeping it Under Control

To maximize the performance of flea-powered gear, you must use every inch FCC regulations allow. You don't want to waste precious transmission power in long coaxial feedlines, so mounting the transmitter atop a tower would be the ultimate choice for installation. But, are you going to climb up a tower, or onto your roof every now and then to retune the frequency? The FM-10A does not produce enough field strength to trigger a frequency counter several feet away, and bringing the counter's antenna close to the FM-10A would slightly change the frequency of the transmission.

Unless you have an expensive RF spectrum analyzer to monitor your frequency adjustments, you must patiently tweak the coil, then tune around the FM band and see where you've landed. How frustrating! Ramsey aids the process by providing a plastic adjustment tool with each kit.

Here's how we found our frequency with some accuracy: The FM-10A produces harmonics that can be received with a scanner. Drop all modulation to the transmitter to create a silent CW carrier. Pick your operating frequency and multiply by five. Example: 91.9 MHz x 5 = 459.5 MHz. Tune your scanner to 459.5 MHz, then carefully adjust the FM-10A's oscillator coil until you catch the carrier's harmonic on 459.5 MHz. Now you should be fairly close to your 91.9 MHz operating frequency. It's unorthodox, but effective!

No tank circuit, or other method of matching an antenna to the transmitter, has been designed into this circuit. Experimentation proved that pruning the antenna for maximum output was worthwhile, but not highly critical. Our best advice: use a simple dipole antenna, as described in the project plans. Outdoors, an inexpensive omni-directional two-element turnstile antenna might prove useful. Get your antenna up as high and unobstructed as you can!

Audio Results

Students of broadcast engineering will also gain appreciation of sophisticated audio processing equipment after using the FM-10A. This mini-transmitter includes no limiting or filtering whatsoever. Your only handle on the audio are three miniature potentiometers: left, right, and balance.

Connect a compact disk player directly to the FM-10A, and you'll find that you must run your modulation extremely low to avoid obnoxious overdeviation distortion when musical passages become too loud. It's a fact of life: FM radio transmission can not handle the dynamic range possible from a CD. You have to compress the audio to find a usable happy compromise. Even a simple AGC circuit, like those used in cassette tape recorders, would be useful; but you'll need two of them. You're on the air in stereo!

The frequency response and stereo separation of the unit is exceptional. Our measurements found the FM-10A to be flat from 40 Hz to 11 kHz plus or minus one decibel; off only 2 dB at 15 kHz, with over 30 dB of stereo separation. Audio out to 30 kHz and beyond passed through the FM-10A easily. Professional FM transmitting equipment filters all audio components over 15 kHz to avoid interfering with the stereo pilot and other subcarriers—and to keep transmissions within a predictable bandwidth. The lack of a high pass filter in the FM-10A can lead to some interesting audio problems.

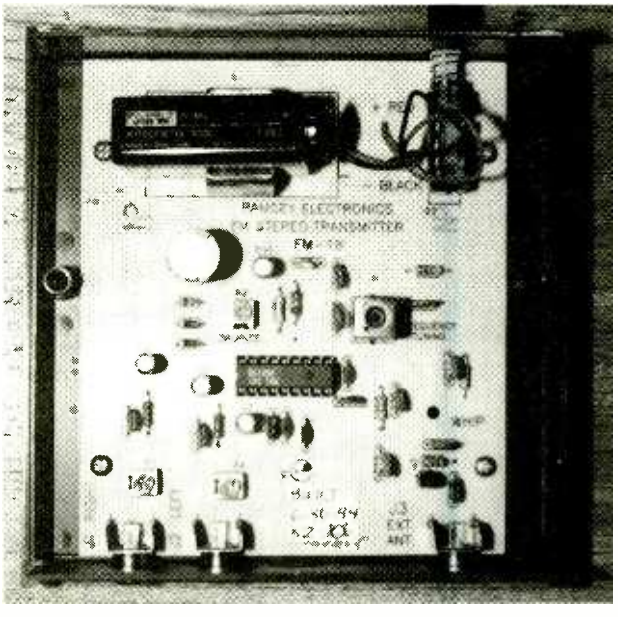
Do you remember the famous bluegrass instrumental "Dueling Banjos"? The FM-10A now provides the sequel: "Dueling Subcarriers!" For fun, we tried rebroadcasting television audio through Ramsey's unit. The FM-10A passed television's stereo at 15,734 Hz, and combined it with FM radio's subcarrier of 19,000 Hz. The result is an annoying ear-splitting heterodyne at 3,266 Hz making the FM-10A useless for this application.

Some compact disk recordings include enough high frequency information to cause nearly the same effect. The generation of the stereo subcarriers in the FM-10A are crystal-controlled, but the reference crystal suffers from slight drift and off-frequency operation, too.

When you purchase the FM-10A kit and assemble it, the end result is a cute toy transmitter you can hold in the palm of your hand. It is amazing that technology allows so much to be stuffed in one tiny integrated circuit that can be supported with just a handful of components. Transmission range is limited to about one square acre of real estate, using a common Walkman-type receiver. Concrete and steel city buildings will limit your coverage further.

Excellent receivers and receiving antennae may improve range, but don't expect miracles. Think of the FM-10A as the 90's version of a tube type AM radio phono oscillator. It's fun to build and experiment with, but don't expect it to be a "serious" piece of broadcast equipment. After all, it costs less than fifty bucks!

The FM-10A FM Stereo Transmitter kit can be purchased directly from Ramsey Electronics, 793 Canning Parkway, Victor, New York 14564. Phone them at 716-924-4560 or fax them at 716-924-4555. The kit is also carried by DX Radio Supply (610-273-7823) and other radio hobby suppliers.



A look inside the Ramsey FM-10A—simple and concise.

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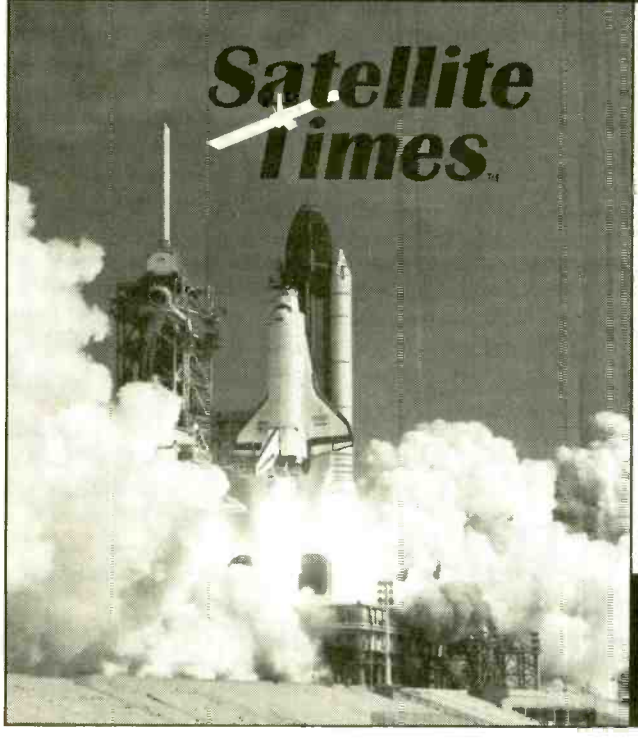

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Terror in the Heartland

On April 19th, the entire nation stopped and witnessed the tragic unfolding of events following the explosion of a car bomb at the Federal Building in Oklahoma City. On behalf of the entire *MT/ST* family, we send our deepest sympathy to the victims and families of this senseless tragedy. It will be difficult for this pain to pass quickly.

One of the first federal responders to the disaster in Oklahoma City was the Federal Emergency Management Agency, or FEMA. FEMA has comprehensive responsibilities in managing the civil aspect of emergencies affecting the United States. FEMA assists the national emergency management authorities and other key Federal decision makers by providing information and communications support in times of disaster or emergency.

The Alfred P. Murrah federal building in Oklahoma City, destroyed by a terrorist bomb in April. (Photo courtesy of KFOR-TV 4 in Oklahoma City, OK)

■ Federal Emergency Support Capability (FESC)

The FESC is the system that provides emergency management with the ability to keep information flowing when a federal response is required in any disaster or emergency. The FESC supports Federal, State, and local response efforts by providing communications of all kinds on the scene of a disaster, and is a link to the FEMA National Emergency Management System.

The FESC consists of the Mobile Emergency Response Support (MERS) detachments, the Mobile Air Transportable Telecommunications System (MATTS), the Information Display System (IDS), and the portable, private automatic branch exchange (PABX) systems from the National Network Operations Center (NWOC). These FESC resources may be deployed as a complete package or as stand-alone systems. We will only discuss the MERS and MATTS systems in this column.

■ FEMA Mobile Emergency Response Support

The MERS capability is the mobile extension of the fixed FEMA switched network (FSN) and is provided by five MERS detachments located at Bothell, Washington; Denton, Texas; Denver, Colorado; Thomasville, Georgia; and Maynard, Massachusetts. Each MERS detachment has a transportable disaster communications system composed of modular elements that can provide a Disaster Field Office (DFO) with voice, facsimile, message, and data communications over a variety of media in both secure and nonsecure message networks; HF, VHF, UHF radios (See Table 1 for a complete listing); microwave line-of-sight transmission systems; Ku-band satellite communications systems; and self-contained power generation and distribution systems.

■ FEMA Mobile Air Transportable Telecommunications System

MATSS is an air mobile system designed to provide communications for any emergency requirement. MATTS communications capabilities include voice and data landline, HF/VHF/UHF radio, and a variety of satellite systems in the secure and nonsecure modes.

An integral part of MATTS is the telephone switchboard which is capable of providing 48 trunks and a T-1 link to 88 subscribers. MATTS can also provide nonsecure voice, data, and video communications when used with its T-1 via a Ku-band satellite link. MATTS is self-contained, provides its own power source, and is air transportable on either C-130 or C-141 aircraft.

■ FEMA National Radio System (FNARS)

The FNARS is the nationwide HF (See Table 1 for a complete listing) radio network that links FEMA Headquarters, the regions, and State EOC's (Emergency Office of Communications). The system, approximately 75 percent complete, consists of Harris 10-kilowatt transmitters at the network control stations (See Table 2 for a listing) and FEMA regional facilities, and Harris 1-kilowatt transmitters at primary State EOC's. The FNARS is the primary HF network used to coordinate disaster response and recovery activities in the United States and other emergency management activities involving States and the Federal Government. This network also serves as a backup network for the FSN.

FEMA also sponsors State EOC's desiring to participate in the National Communications System (NCS) SHARES program (See March 1994 *Utility World* column). The FNARS net control stations maintain a 24-hour watch on the two nationwide calling channels (5212 and 10493 kHz). These net control stations also maintain a pool of contingency callsigns for distribution to other Federal agencies in support of their operations.

Tables 1 and 2 provide a complete profile of FEMA stations and their HF, VHF, and UHF frequencies. This material was prepared for the *Ute World* column by Roger Cravens in Atlanta, Georgia. We would also like to thank Roger and Mary Ann Eckspein of KFOR-TV channel 4 in Oklahoma City for their assistance in preparing this column.

If anyone has any further updates on FEMA, please forward them to our Brasstown address.

As we get deeper into hurricane season during these summer months, we ute monitors should keep FEMA's two nationwide calling channels in our receivers' memory channels. No one knows when or where the next disaster will strike, but you can bet that FEMA will be there.

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TABLE 1: Federal Emergency Management Agency (FEMA) Frequencies

FEMA National Radio System (FNARS) HF Frequencies

Foxtrot 06	2321.0	FEMA regions 8, 9 and 10
Foxtrot 07	2361.0	FEMA regions 6, 8, 9 and DOE
Foxtrot 08	2375.0	FEMA region 4 and NRC
Foxtrot 09	2446.0	FEMA regions 1, 3, 5, 9, 10 and DOE/NRC
Foxtrot 10	2659.0	FEMA regions 3, 4, 7, 8, 10 and DOE/NRC
Foxtrot 11	3342.0	FEMA regions 4, 5, 6, 7, 8 and NRC
Foxtrot 12	3380.0	FEMA regions 5, 6, 8, 9, 10 and DOE/NRC
Foxtrot 13	3390.0	FEMA regions 5, 6, 7, 8 and DOE/NRC
	4603.0	FEMA region 4 and DOE
Foxtrot 14	4781.0 (4)	FEMA regions 5, 8, 9, 10 and NRC
	5132.0	
	5137.0	
	5192.0	
Foxtrot 15	5212.0 (1)	Night Primary- all FEMA regions and DOE/NRC
	5378.0	FEMA region 4 and DOE
Foxtrot 16	5403.0	FEMA regions 9 and 10
Foxtrot 17	5822.0	FEMA regions 1 and 2
Foxtrot 18	5962.0	FEMA regions 1-6, 8-10 and DOE/NRC
Foxtrot 19	6050.0	FEMA regions 3, 5, 8, 10 and NRC
Foxtrot 20	6107.0	FEMA regions 3, 4, 6, 7, 8, 10 and NRC
Foxtrot 21	6109.0	All FEMA regions and KAL22/WAR42
Foxtrot 22	6152.0	FEMA regions 3-10 and NRC
Foxtrot 23	6177.0	FEMA regions 6, 8, 10 and NRC
Foxtrot 24	6180.0	
	6809.0	FEMA regions 9 and 10
Foxtrot 25	7349.0 (2)	FEMA regions 1, 4, 5, 6, 8, 9, 10 and DOE/NRC
	7357.0	
	7428.0	FEMA region 4 and DOE
	7533.5	
	7799.0	
	7802.0	
	7930.5	
	7929.0	
	8101.0	
	8177.0	
Foxtrot 26	9463.0	FEMA Regions 9 and 10
Foxtrot 27	10195.0	
Foxtrot 28	10494.0 (1)	Daytime Primary - All FEMA regions and DOE/NRC
Foxtrot 29	10589.0	FEMA regions 8, 9 and 10
	10793.0	FEMA region 9
	11000.0	
	11118.0	
	11407.0	
Foxtrot 30	11722.0	FEMA regions 1, 4, 6, 8 and NRC
Foxtrot 31	11802.0	FEMA regions 3, 6, 8, 9, 10 and DOE/NRC
Foxtrot 32	11958.0 (2)	FEMA regions 5, 7, 8, 9 and NRC
Foxtrot 33	12010.0	FEMA regions 9 and 10
Foxtrot 49	12129.0	
Foxtrot 34	12217.0 (2)	FEMA regions 5, 6, 8, 9, 10 and NRC
	13211.0	
	13247.0	
Foxtrot 35	14451.0	All FEMA regions and NRC
Foxtrot 36	14777.0	All FEMA regions and NRC
Foxtrot 37	14837.0	All FEMA regions and NRC
Foxtrot 38	14886.0	All FEMA regions and NRC
Foxtrot 39	14900.0	All FEMA regions and NRC
Foxtrot 40	14909.0	All FEMA regions and NRC
Foxtrot 41	16202.0	FEMA regions 9 and 10
Foxtrot 42	16431.0	FEMA regions 9 and 10
Foxtrot 43	17520.0	FEMA regions 9 and 10
Foxtrot 44	17650.0 (3)	FEMA regions 5, 8, 9, 10 and NRC
Foxtrot 45	18745.0	FEMA regions 9 and 10
Foxtrot 46	19758.0	FEMA regions 9 and 10
Foxtrot 47	19970.0	FEMA regions 9 and 10
Foxtrot 48	20028.0	All FEMA regions and NRC
Foxtrot 50	20063.0	
	20405.5	WGY903 and WGY983
	21866.0	
Foxtrot 61	21919.0	WGY908 and WGY912
	23533.5	
	25423.5	
	27850.0	WGY903 and WGY983

NOTES:
(1) Calling/Guard frequency - Primary
(2) Point-to-Point primary frequencies.
(3) Calling/Guard frequency - Secondary
(4) RTTY is 85 Hz shift/75 baud, normal

FEMA VHF and UHF Frequencies

27650.0	Low power simplex
27850.0	Low power simplex
27900.0	Low power simplex
138.100	
138.225 **	Nationwide primary repeater (repeats. 141.875)
138.575	
139.100	
139.225	
139.450	
139.825	
139.925	
139.950	
140.025	
140.900	
140.925	
141.725 **	Nationwide primary simplex
141.875	Repeater input to 138.225
141.950	
142.025	
142.200	
142.230	Repeater input 142.975
142.300	
142.350	Simplex and repeater input to 143.000
142.375	Simplex FEMA region 9 and 10, also repeater input to 143.000
142.400	Simplex FEMA region 4
142.425	Simplex and repeater input to 143.000
142.925	Simplex FEMA regions 2, 3 and 5
142.935	
142.950	
142.975	Emergency net portable repeater - simplex and repeater output for 142.230, also repeater input to 143.000
143.000	Emergency net portable repeater - simplex and repeater output for 142.350, 142.375, 142.425 and 142.975
143.050	
143.225	Mobiles
143.250	Repeater input to 139.250
143.600	
143.625	Simplex FEMA region 6
152.425	
153.225	Repeater output for 158.130
158.130	Repeater input to 153.225
163.100	DOE common, National Emergency Training Center and nationwide FEMA assignment
163.225	
164.8625	National Radio System - simplex (Channel 2)
	National Radio System - repeater output for 165.6625 (Channel 1)
165.6625	National Radio System- simplex and repeater input to 164.8625, emergency training
166.225	National Emergency Training Center and Nationwide FEMA assignment
166.6125	Repeater input to 168.400
167.925	National Emergency Warning System, regional EOC net 4 simplex
167.975	National Emergency Warning System, regional EOC net 2 simplex and repeater output for 173.1875 - regional EOC net 1; Also some DoD, DoE, NASA, NOAA, NRC facilities.
168.075	Emergency net portable repeater - repeater output for 170.425
168.100	Emergency net portable repeater - repeater output for 170.450
168.350	National Emergency Training Center and nationwide FEMA assignment
168.400	Emergency net portable repeater - repeater output for 166.6125
168.700	Emergency net portable repeater - repeater output for 170.975
169.250	
169.600	National Emergency Training Center and nationwide FEMA asignment
169.875	National Emergency Warning System, regional EOC net 3 - simplex
170.200	Federal Disaster Net
170.425	Repeater input to 168.075
170.450	Repeater input to 168.100
170.975	Repeater input to 168.700
171.1875	Repeater input to 167.975
173.1875	Repeater input to 167.975
266.050	FEMA/USAF coordination
273.700	FEMA/USAF coordination
305.550	FEMA/USAF coordination
322.750	FEMA/USAF coordination
336.800	FEMA/USAF coordination
382.350	FEMA/USAF coordination
397.050	FEMA/USAF coordination
399.750	FEMA/USAF coordination
409.125	

(See FEMA station information on Page 34)

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TABLE 2: FEMA Station Information

Callsigns
Stations **WGY900-WGY919** are used by FEMA offices and regional headquarters.
Stations **WGY920-WGY998** are staffed by state-level and local offices.

Region	Callsign	Location
Headqrtrs	WGY900	FEMA Operations/ECC, Warning and Support Division, FEMA Headquarters, 500 C St, N.W., Washington, D.C.
01		J.W. McCormick Post Office and Court House, 4th. Floor, Baston, MA 20109
COMSTA	WGY901	Maynard, MA
	WGY921	Concord, NH
	WGY931	Montpelier, VT
	WGY941	Augusta, ME
	WGY951	Hartford, CT
	WGY961	Farmington, MA
	WGY971	Providence, RI
02		26 Federal Plaza, New York, NY 10287
COMSTA	WGY902	New York, NY
	WGY932	St. Thomas, VI
	WGY942	Albany, NY
	WGY982	North Trenton, NJ
	WGY992	San Juan, PR
03		Curtis Bldg., 7th. Floor, Sixth and Walnut St., Philadelphia, PA 19106
COMSTA	WGY903	Olney, MD (Primary Net Control Station or NCS)
	WGY923	Harrisburg, PA
	WGY933	Pikesville, MD
	WGY943	Charleston, WV
	WGY953	Delaware City, DE
	WGY963	Richmond, VA
	WGY983	Washington, D.C.
	WGY993	Charlottesville, VA (HHS)
04		1371 Peachtree St, N.E., Suite 700, Atlanta, GA 30309
COMSTA	WGY904	Thomasville, GA. (3rd alternate NCS)
	WGY914	Balboa Heights, Canal Zone
	WGY924	Nashville, TN
	WGY934	Columbia, SC
	WGY944	Atlanta, GA
	WGY954	Montgomery, AL
	WGY964	Jackson, MS
	WGY974	Tallahassee, FL
	WGY984	Raleigh, NC
	WGY994	Frankfort, KY
05		300 S. Walker St., 24th. Floor, Chicago, IL60606
COMSTA	WGY905	Battle Creek, MI (4th alternate NCS)
	WGY925	Madison, WI.
	WGY935	St. Paul, MN.
	WGY945	Columbus, OH.
	WGY955	Springfield, IL.
	WGY965	Indianapolis, IN.
	WGY975	Lansing, MI.
06		Federal Regional Center, 800 N. Loop 2, Denton, TX 76201
COMSTA	WGY906	Denton, TX (2nd alternate NCS)
	WGY926	Oklahoma, City, OK
	WGY936	Santa Fe, NM
	WGY946	Baton Rouge, LA
	WGY956	Austin, TX
	WGY966	Conway, AR
07		Old Federal Office Building, 911 Walnut St., Kansas City, MO 64106
COMSTA	WGY907	Kansas City, MO
	WGY947	Des Moines, IA
	WGY957	Lincoln, NE
	WGY977	Jefferson City, MO
	WGY997	Topeka, KS
08		Denver Federal Center, Building 7, Denver, CO 80225
COMSTA	WGY908	Denver, CO (1st alternate NCS)
	WGY928	Pierre, SD
	WGY938	Cheyenne, WY
	WGY948	BismarK, ND
	WGY958	Helena, MT
	WGY968	Golden, CO
	WGY978	Salt Lake City, UT
09		211 Main St., Room 220, Building 205, San Francisco, CA 94129
COMSTA	WGY909	Santa Rosa, CA
	WGY929	Carson City, NV
	WGY939	Sacramento, CA
	WGY949	Phoenix, AZ
	WGY959	Honolulu, HI
	WGY979	American Samoa
	NPN	NAS Agana, Guam
10		Federal Regional Center, Bothell, WA 98011
COMSTA	WGY910	Bothell, WA
	WGY920	Boise, ID
	WGY930	Olympia, WA
	WGY940	Salem, OR
	WGY950	Unknown location
	WGY960	Soldotna, AK
	WGY970	Juneau, AK
	WGY980	Alcantra, AK
	WGY990	Moses Lake, WA
	WGY911	Telecommunications Management Division, Washington, D.C.
	WGY912	Special VIP Support Facility, Mt. Weather, VA
	WGY915	National Communications System, Arlington, VA (May use Ft. Myer or Warrenton/Remington facilities)
	WGY 916	FEMA, Unknown
	WGY 918	FEMA, Unknown
	WGY919	FEMA, Unknown
	WGY989	National Emergency Training Center, Emmitsburg, MD

Department of Energy (DOE) installations on this net:

KAL22	Savannah River Plant
KAL23	Oak Ridge, TN
KAL24	Washington, D.C. (Headquarters)
KGO45	Rocky Flats, CO
KLJ87	Los Alamos, NM

VIP Evacuation/Support facilities:

Ft. Meyer, VA	WAR21
Ft. Belvoir, VA	WAR22
Hagerstown, MD	WAR30
Mt. Weather, VA	WAR42
Mercersburg, PA	WAR45
Ft. Richie, MD	WAR46
Boonesboro, MD	WAR47

Notes:

Scheduled Nets
Each Monday, Thursday and Friday; WGY903 (NCS) for all regions on 10493.0 at 1600 UTC.
1st. Tuesday in January, April, July and October: WGY903 (NCS) at 1600 UTC.
1st. Tuesday in February, May, August and November: WGY906 (NCS) at 1600 UTC.
1st. Tuesday in March, June, September and December: WGY904 (NCS) at 1600 UTC.
2nd. Tuesday in March, June, September and December: WGY905 (NCS) at 1600 UTC.
Every Wednesday, open drill net with all regional stations participating. During any disaster or emergency the affected state is the net authority.

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Utility Loggings

Larry Van Horn

UTILITY WORLD

Abbreviations used in this column

AM	Amplitude Modulation	HF	High Frequency
ARQ	Synchronous transmission and automatic repetition teleprinter system.	IRNA	Islamic Republic News Agency
		KCNA	Korean Central News Agency
ARQ-E	Single-channel ARQ teleprinter system	Kyodo	Kyodo Tsushin
		LDOC	Long Distance Operational Control
ARQ-E3	Single-channel ARQ teleprinter system	MAP	Maghreb Arabe Presse
ASECNA	Agence our la Securite de la Navigation Aerienne en Afrique et a Madagascar	Meteo	Meteorology
		MFA	Ministry of Foreign Affairs
		PANA	Pan African News Agency
CanForce	Canadian Forces	RAF	Royal Air Force
CCG	Canadian Coast Guard	Red	Communications in the clear (not scrambled)
Comms	Communications		
Comsta	Communications Station	RTTY	Radioteletype
CW	Continuous Wave (Morse code)	ROU-FEC	Romanian diplomatic version of the forward error correction teleprinter system
Diplo	Diplomatic		
DoD	Department of Defense	SAM	Special Air Mission
DSN	Defense Switching Network	SITOR-A	Simplex teleprinting over radio, mode A
EAM	Emergency Action Message		
Fax	Facsimile	SITOR-B	Simplex teleprinting over radio, mode B
FF	French Forces		
GCCS	Global Command and Control (replaced by GHFS)	Unid	Unidentified
		U.S.	United States
GHFS	Global HF System	USB	Upper Sideband
GNA	Gulf News Agency	USS	United States Ship
Green	Scrambled communications	UTC	Universal Coordinated Time
		WUN	World Utility News
		Xinhua	New China News Agency

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

73.30 MTO21-Royal Navy Crimmond, England, with encrypted 75 baud RTTY at 1422. (Ary Boender-Netherlands)

117.4 DCF37-Offenbach Meteo, Germany, with fax surface chart at 1408. (Boender-Neth)

122.3 OUA-Danish Navy Stevns., Denmark, with V CW marker at 1420. (Boender-Neth)

134.2 DCF54-Offenbach Meteo, Germany, with various fax charts at 1426. (Boender-Neth)

147.3 DDH47-Hamburg Meteo, Germany, with 50 baud RTTY RY test tape at 1406. (Boender-Neth)

2500.0 WWV-Ft. Collins, CO, with time ticks and voice ID on the minute in AM at 0626. (Sue Wilden-Columbus, IN)

2616.0 Canadian Department of Fisheries and Oceans frequency (British Columbia coast) in USB confirmed on this frequency by the agency. (John B. Musgrave)

2710.0 RDFEI-Danish Army with 100 baud RTTY at 1840. (John Doe-London, UK)

2743.0 ULX-Israeli Mossad number station in USB at 2200. (Boender-Neth)

2764.0 DoD Radio working *USS Boone*, Bear Grass, King 01-03 with shuttle post-launch status reports until "release from tasking" at 0645 in USB. (Jeff Haverlah-Houston, TX)

2829.0 SPA-Gdynia Radio, Poland, with SITOR-B traffic list at 1757. (Guy-UK)

3038.0 OLGA-Swedish Navy with 50 baud RTTY 5-letter groups to FAPKD at 1930. (Boender-Neth)

3150.0 PCD-Israeli Mossad number station in USB at 1830. (Boender-Neth)

3172.0 IMB1-Rome Meteo, Italy, with 50 baud RTTY weather at 1808. (Guy-UK)

3196.0 Prague Meteo, Czech Republic, with 50 baud weather at 1812. (Guy-UK)

3330.0 CHU-Time station Ottawa, Quebec, Canada, with time ticks in AM at 0115. (Wilden-IN)

3460.0 Two unid stations noted here using old speech inversion type scramblers in USB at 0104. (Fernandez-MA)

4280.0 PBC-Dutch navy Goeree, Netherlands, with 75 baud message traffic at 1354. (Boender-Neth)

4286.0 VCS-CCG Halifax, NS, Canada, with V CW marker at 0124. (Wilden-IN)

4470.0 English female 3/2-digit number station in AM at 0104. (Tue UTC). (Fernandez-MA)

4520.0 Fisher working Trackstar in USB at 1345. (Harry Riddell-Rochester, NY)

4549.0 Unid 4SF calling 4FS for radio check in USB at 1640. (Boender-Neth)

4560.0 YHF-Israeli Mossad number station in USB at 1830. (Boender-Neth)

4880.0 ULX1-Israeli Mossad number station in USB at 1830. (Boender-Neth)

5011.0 Cape Radio calling *USS Boone* (shuttle operations) in USB at 0005. (Haverlah-TX)

5046.0 English female 3/2-digit number station in AM at 0123 (Tue UTC). Not simulcast of 4470 above. (Fernandez-MA)

5246.0 Fisher working Trackstar on 'Net 7' in USB at 1330. Moved to 4520. (Riddell-NY)

5437.0 ART-Israeli Mossad number station in USB at 1830. (Boender-Neth)

5532.0 Prague, Czech Republic, (LDOC) working unid aircraft in USB in Czech at 0325. (Fernandez-MA)

5693.0 U.S. Coast Guard Cape May Air, NJ, and Travis City Air, MI, working helos in their areas in USB at 1431. (Fernandez-MA)

5700.0 Blackboy calling Nightwatch 01, no reply, but WAR46 answers in USB at 1501. (Fernandez-MA)

5710.0 Lockheed 5 calling for radio check in USB at 1258, no reply. (Riddell-NY)

5711.0 Cape Radio calling *USS Boone* (shuttle operations) in USB at 0011. (Haverlah-TX) Fisher, Trackstar, and Barricks 21 on 'Net 8' in USB at 1305. Mentioned monitoring of 5246. Callsign C1A to 'Net 1' for radio check in USB. Cape Radio comms. (Riddell-NY)

6212.0 U.S. Coast Guard COMSTA Boston, MA, working *Rescue 6016* with a phone patch to Coast Guard District 1 operations at 1550. (Fernandez-MA)

6495.7 CFH-Halifax Miltary, NS Canada, with RTTY broadcast at 0049 and fax at 0505. (James Callaway-Imlay, NV)

6501.0 DAJ-Norddeich Radio, Germany, with voice marker in USB at 0658. (Richard Baker-Austintown, OH)

6637.0 807 working Cedar Rapids (Rockwell Collins), IA, in USB at 1145. (Riddell-NY)

6643.0 Lufthansa 770 working Berna Radio, Switzerland, with USB phone patch traffic at 1925. (Boender-Neth)

6651.0 Karup Rescue working Danish air force 291 in USB. (Doe-UK)

6683.0 SAM 27000 working Andrews (Mystic Star) in USB at 2210. (John Cobb-Roswell, GA)

6691.0 Boomtown working Snow Plow in USB at 1210. Mentioned going secure then RTTY followed. (Riddell-NY)

6693.0 S4JG (General call for any Navy aircraft) working T2P in the clear and in the green using USB at 0349. (Haverlah-TX)

6706.0 CHR-Trenton Military at 1912 working Regal 01 in USB with Link 11 interference. (Baker-OH)

6712.0 Nightwatch 01 calling Croughton GHFS in USB at 0624. (Haverlah-TX) Unid station at 0617 working aircraft in French in USB. (Baker-OH)

6715.0 CFH-Halifax Military working 9WG in USB at 1902. (Baker-OH)

6717.0 SAM 202 working Andrews (Mystic Star) on F-785 in USB at 1839. (Baker-OH)

6736.0 Warship *Halifax* working Sidecar with Alligator playground type chatter in USB at 0625. They switched to frequency designator G20 (?). In the *WUN* second issue, a logger states that G21 is 6736. I now wonder if G21 is 6715 (heard Sidecar on 6715, 6736, and 6745). (Haverlah-TX)

6738.0 Architect, RAF London, England, at 0400 with coded weather broadcast in USB. (Baker-OH)

6739.0 Snoop 14 working Ascension GHFS in USB at 0212. Link 11 interference on frequency. Also Tableland working Offutt with phone patch to DSN to 339-3944 (Aztec Art). At 0221 Tableland worked Thule GHFS. Placed patch to 339-3960 (Boomtown). Tableland describes himself as the "echo flight" and wants to setup a data circuit. Told to use "Charlie Alpha." (Haverlah-TX)

6750.0 Foxtrot Tango U.S. Navy Link-11 coordination voice coordination net at 0314 in USB. (Baker-OH)

6751.0 CFH-Halifax Military at 0642 working Sidecar in USB. (Baker-OH)

6754.0 CHR-Trenton Military at 0035 in USB with weather broadcast. (Baker-OH)

6758.0 MKL-RAF Edinburgh, England, at 0445 with CW weather. (Baker-OH)

6786.0 Spanish female 5-digit number station in AM at 0610 (Sunday UTC). (Haverlah-TX)

6840.0 Spanish female 4-digit number station in AM at 0237. (John Bellovich-Macclenny, FL)

6970.0 English female 5-digit number station in AM at 0355/0400 (Sat UTC). (Fernandez-MA)

7445.0 KPA2-Israeli Mossad number station in AM at 0453. (Bellovich-FL)

7470.5 English female 3/2-digit number station in AM at 1443. (Brookman-AK)

7512.0 ZRO2-Pretoria Meteo with 75 baud RTTY weather codes in 0650. (Robert Hall-Capetown, South Africa)

7536.0 AC4-Unid U.S. military at 2320 in USB working Hoppa 11 with check on radio 2. Heard for years, it's still a whoizit! (Baker-OH) *Yes sir, I agree. Anybody have any ideas?-Larry*

7850.0 Unid Caribbean police net working Charlie Golf/Juliet at 2127 in USB. (Baker-OH)

7862.0 Spanish female 5-digit number station in AM at 0401 (Sat UTC). (Fernandez-MA)

7865.0 SPW-Warsaw Radio, Poland, with USB voice mirror at 1635. (Boender-Neth)

8025.0 Third LAR Battalion; First Marines (Division); Seventh Marines; Eighth Marines; Eleventh Marines in a very active ground net in the clear and green in USB at 0122. Lots of HF datalink activity noted as well. (Haverlah-TX)

Continued on Page 114

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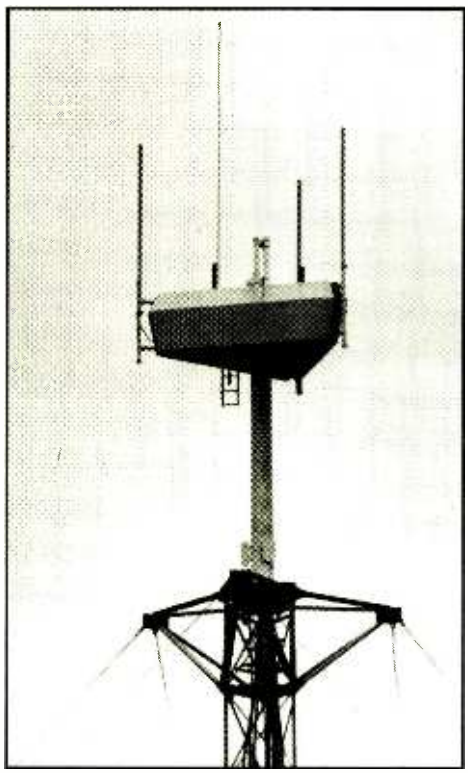
Bob Kay, c/o MT, P.O. Box 98, Brasstown, N.C. 28902

Scanning Challenge

To a scanner buff, a two-way radio transmitting antenna represents a challenge. It immediately dares you to discover and monitor the operating frequency. What you probably don't realize, is that there are perhaps a dozen or more "challenges" that are located within a mile or so from your home. Best of all, you can use these antenna challenges to help you to lose weight and improve your physical condition. Interested? Here's the challenge.

To find local transmitter sites in your area, draw a one or two mile radius around your listening post—this will be your search area. For the next step, you'll need a comfortable pair of shoes and a notepad. As you walk through your neighborhood, look for transmitting antennas that are mounted on towers or on buildings. Mark the location of each antenna on your map, and record the antenna's physical characteristics. During the initial search, limit yourself to a notepad and a pair of binoculars. Carrying a frequency counter, scanner radio, and other high tech gear will only slow your progress. The idea is to simply locate and record the identifying features of each antenna.



Locating transmitting antennas in your neighborhood can be an enjoyable challenge

The types of antennas that are included in your search are entirely up to you. You can limit yourself to commercial antenna sites, or you can expand your list to include ham radio and CB antennas that are spotted in backyards. Your search area can also be adjusted to suit your physical abilities. If you haven't been exercising on a daily basis, don't venture too far from home. When you're searching for antennas, it's very easy to walk considerable distances in a short period of time.

When you return home, it's time to examine your field notes. As most of you already know, the size and shape of an antenna can help you to identify the operating frequency. Here's the basic rule: Long antenna = low frequency; short antenna = high frequency. Whip antennas for the CB radio band are approximately 102 inches long. The CB radio frequencies are between 26.965 and 27.405. Cellular car phone antennas are approximately 3 inches long and are used to transmit and receive on the 800 megahertz band. Get the idea?

Antennas with multiple elements offer another visual clue as to the operating frequency. The elements on a UHF television antenna are approximately 6 inches long and the antenna is mounted horizontally. The frequency range of UHF TV channels is between 470 and 890 megahertz.

Can you guess the frequency range of a vertically mounted antenna that looks similar to a UHF TV antenna? If you said somewhere in the UHF band, you're beginning to understand the relationship between antenna's size and the operating frequency.

As already mentioned, the ability to place an antenna within a particular frequency band range can help you to locate the operating frequency. I'll be the first to admit that frequency bands are quite large. Identifying the band, however, is only the first step.

Suppose for a moment that you see a long, vertical whip antenna mounted on a building belonging to your local power company. The length of the antenna indicates the band of operation is the VHF low band. Your findings are further confirmed by the presence of long, mobile whip antennas mounted on the utility company's service vehicles. The next step is to check a frequency allocation chart (such as is found in *Police Call*), and look under "power and utilities." The chart will reduce your search to a few frequency groups that can be entered into your scanner radio and searched from home.

As with any rule of thumb, there are exceptions. Disguised antennas are made to defy detection. Unmarked patrol cars used by law enforcement agencies usually employ some type of disguised antenna to avoid visual detection. Such antennas are also available to the public to avoid advertising the presence of a scanner or cellular phone, for example. The electronics section of your local department store probably has several types of disguised antennas for a variety of applications.

For those scanner buffs who want to continue exercising, it's time to return to the antenna site. During this trip, high tech, frequency-finding gadgets are appropriate. Bring along as much as you can carry, but be mindful of the distance to be traveled. The alternative to hoofing it around with a frequency counter, scanner radio, and other related gear, is to mount it on a bicycle. With a little ingenuity, you can outfit a bicycle (See June 1992 issue of Scanning Report) with a variety of scanning equipment.

If your frequency catching attempts are not successful, here's a final suggestion: Simply walk into the building and ask for the operating frequency. The technique requires that you exercise a degree of common sense and diplomacy. It would be ridiculous for example, to walk into a government facility and expect to be handed a list of active frequencies.

Searching for antenna sites and discovering the active frequencies can be a lot of fun. And as we all know, there are numerous items at your disposal—including CD ROM frequency data bases. In another column, I'll explain what's out there and how to use it. For now, concentrate on identifying the transmitting antennas that are located within a few miles of your listening post.

Weight-loss programs often fail because of the drudgery; searching for local antenna sites will help keep your mind off the fact that

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you're getting in shape, while you also discover new frequencies. Sure, you could look up the frequencies in a database, but it's fun to see how much you can sleuth out from scratch. When you think about it, no other exercise program offers so many challenges and rewards.

■ Treasure Hunt

This is your last chance to win a reconditioned scanner radio from G&G Electronics. The Bearcat III and a Bearcat V are the two prizes. Both radios feature 8 channels across three bands—VHF Low, VHF High, and UHF. The radios are complete with power cord and inside antenna. You'll need to purchase crystals for your favorite frequencies, but there's no need to worry. G&G Electronics has a large supply of crystals for the more popular public service frequencies. Here are the clues:

1. The "Bearcat" scanner radio was named after an automobile. True or False?
2. Name the individual who invented the Bearcat scanner radio.
3. Name the present-day manufacturer that first produced a scanner radio called the COMP-100 (It required a look-up book).
4. The Bearcat BC210 was first introduced in 1977. True or False?
5. What type of external antenna plug was utilized in the early scanner radios?

G&G Communications repairs most types of scanner radios and pagers. They also modify scanner radios (sorry, no cellular modifications), and buy used scanner radios, working or not. For more information, write or call: G&G Communications, 9247 Glenwood Drive, Leroy, NY 14482, (716) 768-8151. Don't forget to mention *Monitoring Times*.

■ Frequency Exchange

Our first stop this month is **Savannah, Georgia**. Since the invitation was sent in anonymously, we can't stop in to say hello.

31.10 ..... Fish & Game
31.14 ..... Parks--Rangers
42.06 ..... South Carolina State Police
45.40 ..... Street Sweepers
47.32 ..... Highway Dept.
151.805 ... Memorial Med. Ctr.Sec.
153.74 ..... Chatham Co. Cor.Ctr.
153.83 ..... Fire Dept.
153.89 ..... Fire Dept.
154.025 ... State College Security
154.175 ... Savannah Int'l Airport. Sec.
154.68 ..... State Police
154.80 ..... State Police
154.905 ... Sheriff (Statewide)
154.935 ... Sheriff (Statewide)
160.29 ..... CSX Railroad
160.59 ..... CSX Railroad
160.80 ..... CSX Railroad
453.20 ..... Chatham Trans Auth.
453.875 ... Parking Police
460.20 ..... Savannah Police
460.325 ... Savannah Police
460.40 ..... Savannah Police
464.90 ..... Ogelthorpe Mall Sec.
464.925 ... Ogelthorpe Mall Sec.
467.975 ... LifeStar Helicopter

Jim Mann lives just across the state border in **Dorchester County, South Carolina**. According to Jim, the Sheriff's Department shares a trunked system with South Carolina Electric and Gas. Here are the frequencies that Jim monitors.

817.7875	860.2900	861.7875	864.7875	867.4125	868.0125
858.2900	860.7875	862.7875	865.7875	867.7875	868.4125
858.5625	861.6875	863.6875	866.0125	867.9125	868.7875

Rob Turner has been monitoring the Virginia State Police from his home in **Emporia, Virginia**. Here are Rob's favorite frequencies.

154.665 ..... Car to car
154.695 ..... Surveillance
154.845 ..... Bureau of Criminal Investigation
154.925 ..... Bureau of Criminal Investigation
158.985 ..... State Police
159.00 ..... State Police
159.135 ..... State Police
159.165 ..... State Police
460.2625 ..... Radio maintenance

There's an anonymous reader in **Broome County, New York**, who has been monitoring the following frequencies.

33.90 ..... Fenton fire
33.94 ..... Fenton fire
33.98 ..... Binghamton fire
39.46 ..... Maine Police
154.32 ..... Binghamton fire
154.80 ..... Binghamton Sheriff
155.37 ..... Binghamton Police
453.875 ..... Airport Operations

The following frequencies are for **Hutchinson, Kansas**, and were sent in by Adam Henson.

154.445 ..... Emergency Medical
154.95 ..... Local police
155.25 ..... Local police
155.58 ..... Sheriff
158.79 ..... State Fair

As we continue our journey across America, our next stop is **Roseburg, Oregon.** Here are the favorite frequencies that have been monitored by Michael Hale.

153.77 ..... Fire
154.145 ..... Police
154.25 ..... Fire
154.28 ..... Fire
154.37 ..... Fire
154.445 ..... Fire
154.815 ..... Police
155.37 ..... Police
155.55 ..... Police
155.70 ..... Police
155.805 ..... Police

Our final stop will also be visited by thousands of tourists during the summer vacation season. Welcome to Walt Disney World in **Lake Buena Vista, Florida**.

118.450 ..... Orlando Int'l Tower
124.300 ..... Orlando Int'l Tower
151.655 ..... Park Operations
151.745 ..... Mystery Fun House
151.775 ..... Sea World
151.805 ..... Sea World
151.865 ..... Yogi Bear's Campgrnd
157.740 ..... Park Operations
206.000 ..... Parade Audio
206.625 ..... Parade Audio, wireless mics
208.175 ..... Parade Audio, wireless mics
451.750 ..... Universal Studios
461.600 ..... Fort Wilderness
461.700 ..... MGM Studios
462.475 ..... Monorail
462.625 ..... Spoce Mountain
462.650 ..... Maintenance
462.675 ..... Maintenance
462.700 ..... Orlando Airport operations

Disney Trunked System

855.8875	855.1875
856.9125	851.3125
857.7875	855.6875
858.8125	855.7875
859.7875	852.2375

The above list was supplied by an anonymous Walt Disney World employee. The complete list contains eight pages and includes frequencies for the Baltimore Aquarium, Bush Gardens, Colonial Williamsburg, Disney Land in California, Virginia Beach, Las Vegas Casinos, Las Vegas Police, Sea World in Florida, and Universal Studios in Florida. To receive the complete list, send $3.00 dollars to Bob Kay, P.O. Box 173, Prospect Park, PA 19076. The three dollars will cover the copying costs and first class postage to your doorstep.

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Briefcase Satellite

Brian Thompson was parked at a rest stop on route #13 near Wilmington, Delaware. Brian observed two well-dressed men apprehend and handcuff an individual. The person taken into custody, repeatedly voiced his innocence and stated several times that it was a case of mistaken identity.

According to Brian, one of the arresting officers opened a briefcase that contained a wire-connected handset. Brian said that prior to making a call, the officer adjusted the position of the open briefcase as if it were some type of receiving antenna.

A few minutes later, the officer was talking to someone who obviously confirmed the identity of the person in custody. After terminating the call, the officers placed the individual into their car and drove away.

At this point, your questions are probably similar to Brian's: What was in the brief case? Although I can't be certain, I'd be willing to bet that the arresting officer confirmed the suspect's identity with a Magnavox briefcase satellite telephone system. The "Satphone" can provide mobile telecommunications in practically any location.

There's a high gain satellite antenna in the lid. Prior to making a call, the lid is positioned using a built-in compass, elevation angle indicator, and a signal strength meter. After the antenna is positioned, a handset is removed from a pull out door. The user listens for a dial tone and then simply dials the number. The call can be relayed via satellite to practically any location in the world.

Can it be monitored? Sorry, guys. The Satphone utilizes a digitalized signal that cannot be monitored. The unit can also send digital fax and data transmissions and has internal connections for a modem or printer.

Scanner Tips

A woman in Delphi, Indiana, used her cordless phone to negotiate a drug deal. A police officer monitored the woman's cordless phone on a scanner radio and charged the woman with possession of marijuana.

The arrest sparked a legal debate over the monitoring of cordless phones. The defendant's attorney argued that the monitored cordless phone call was "an invasion of privacy." But the superior court judge ruled that no laws were violated. The defendant's attorney will appeal the decision. (News clipping from the *South Bend Tribune*.)

Cordless Baby Talk

A citizen in Columbus, Ohio, discovered that he could monitor his neighbor's cordless phone on a baby monitor. When the citizen discovered that his neighbor was planning to kill him, he recorded the conversations and called the police.

The prosecutor said that as long as the neighbor didn't use a device specifically designed to scan phone calls, it was not a privacy issue. (News clipping from the Columbus *Dispatch*.)

Reaching Out

Several readers have inquired about extending the operating distance of their cordless phones. Ideally, the set-up would include a roof-mounted antenna connected by a short length of coax cable to your cordless phone.

The length of a half-wave dipole antenna can be determined by dividing 468 into the monitored frequency. For the cordless band, a vertical element of approximately 10 feet would be required. If you're skilled with hand tools, your cordless base unit could be modified to accept a coax connector. The easier alternative is to clip a 10-foot section of wire to your cordless base antenna. The wire can dangle out a window or be concealed behind a curtain.

Although I haven't tried it, a CB radio "Beam Antenna" would probably be capable of transmitting a cordless signal. The CB Beam antenna could also be used to monitor cordless phones with a scanner radio.

All of the above suggestions are offered with a note of caution. It is illegal to monitor and/or extend the operating distance of cordless phones. Your temporary modifications should be for "experimental purposes" only.

Summer Fun

The Goodyear Blimp is often seen at major sporting events throughout the nation. The frequencies to monitor are: 123.050, 132.000, 151.625, 465.9125, 465.9375, 465.9625.

The VHF Marine frequencies also become very active during the summer. Here are a few of the popular frequencies: 156.80, 157.10, 156.45, 157.05, 157.075, 157.15, 156.65, 156.375, 156.30, 156.85, 156.425, 156.45, 156.475, 156.575, 156.925.

Also try these low power commercial vessel repeaters: 457.525, 457.55 and 457.575.

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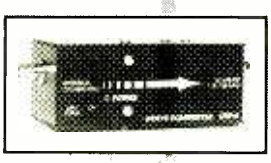

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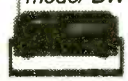

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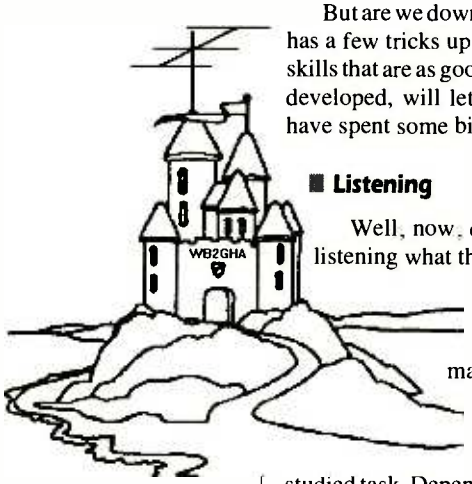
Free Monitoring Accessories

Don't you just love to flip through radio equipment catalogs? It seems you will always find something new. The engineering folks who cater to our monitoring lust are always ready to market a new gizmo just guaranteed to give us that rare signal we have been seeking for our whole listening career. The problem for all of us who are still waiting to hit the lottery is that we only have just so much cash we can devote to our hobby. Until that ship comes in, most folks are on a limited radio budget and much of the high buck equipment we see in catalogs remains fodder for daydreams.

But are we downhearted? Heck, no! Old Uncle Skip still has a few tricks up his sleeve. There are some monitoring skills that are as good as money in the bank. Skills that, once developed, will let you go head-to-head with folks who have spent some big bucks on their listening posts.



Listening

Well, now, doesn't that seem a bit obvious? Isn't listening what this hobby is all about? Sure, but there's listening and then there's *listening*. Just about everybody who drives to work each day listens to the radio. But how many of those folks know the joy of hearing a signal from further away than their local Top 40 or Country station?

For the radio monitor, listening is a studied task. Depending on your goals at any given point in your monitoring, listening can mean carefully moving through a band of frequencies in search of targets of opportunity. Or, it may mean dutifully parking yourself on one particular frequency waiting for the propagation gods to smile and allow a weak signal to rise out of the static to add to your log.

Listening can even mean being familiar enough with the sound of the static and background noise to begin to discern when a band might be opening or closing.

Listening can mean discovering that you can literally "hear" some things better with one ear than the other. If you use a single earpiece instead of a pair of headphones, try both ears out; you'll be surprised. You can start improving your listening by using your "good" ear to catch the hard ones.

Patience

As William Burroughs once said, "The first thing you learn is you gotta wait!" When you first start out at this hobby, the bands are full of fun things to hear. Your logbook entries come fast and furious for the first fifty stations or so. Then things start to slow down a bit. The missing stations on your country list become more difficult to catch. More and more, you find yourself depending on the above-mentioned listening skills.

The key to success is often simply waiting for the signals to come your way. Cultivating alert patience is the greatest skill a radio monitor can develop. Regardless of whether you're scanning a band or monitoring a single frequency, keep at it. There is a great deal of potential monitoring excitement lodged in between those periods of apparent boredom.

As time goes by you may even develop some techniques to make things less tedious. I do a lot of "camping" on certain frequencies. This can be done while accomplishing other tasks around the shack. For instance, while I'm cranking out these words of wisdom I have one receiver tuned to 6955 kHz—one of the currently popular pirate radio hangouts—and another tuned to 14060 kHz—the QRP CW calling frequency. If anything surfaces, I can turn away from my journalistic pursuits and participate in my hobby while the signals hold out.

Tenacity

When I look up the word *tenacity* in my thesaurus, two synonyms stick out: persistence and stubbornness. Tenacity costs absolutely nothing and it can give you the power to out-log a Watkins-Johnson user with a humble Sangean or Sony. If you listen long enough and hard enough, you can probably hear just about anything out there.

Tenacity lies at the very roots of the radio art. Marconi, Armstrong, Fessenden—these were tenacious people. They made radio out of nothing, and folks like us have been tenacious in our pursuit of radio signals ever since. As a beginning radio hobbyist, you stand in a tradition of folks who have been on the receiving end of many miraculous advances in electronics. You're in the position of experiencing the same excitement that your grandfather or great-grandfather may have known listening to an old Atwater-Kent or Crosley.

Organization

I must confess that I am not the most organized person in the world. However, even I have noticed that a little bit of organization can go a long way in the radio monitoring hobby. Whether it is developing a "hit" list of unheard stations or making sure you have a pen handy next to your logbook, any amount of organization before your monitoring session will pay off.

When it comes to tracking down those hard-to-log stations or extracting a QSL from some "difficult" country, organization can be the key. You can buy

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shelves full of resource materials full of helpful data. But only systematic research of these resources will put the data in a form that you can use. In this modern, computer-driven world, intense amounts of information are only as far away as a CD ROM. But without an organized plan of attack, you'll be doing little more than standing face first in the data stream.

Moreover, my way of organizing information may get me my next hundred countries, but be totally useless to your search. Success comes from developing systems of organization that work for you. This means a certain amount of down time. Then again, if you're "camping" on a frequency waiting for Radio Freedonia to pop up, you could be giving thought to your own personal DXing system.

Safety

Even if you have ignored my years of ranting about safety for the sake of yourself and your loved ones, think about the money that can be wasted—money that can go to buy some of those neat goodies.

If you don't think paying attention to safety is like money in the bank, head for your local emergency room and get the price tag on your typical broken arm. Pretty steep, huh? You could maybe buy yourself a nice Drake R8 with that cash. Throw in the aftercare and physical therapy and you're fast moving into Watkins-Johnson country. So care must be taken when climbing to high places to string antenna wire. Only climb using sturdy and safe ladders and never climb or mount antennas near power lines.

This is a hobby that involves electricity. Getting "zapped" can end your DXing career for good, and your family may have to hock your radio gear to pay for the funeral. Treat electricity with the respect it deserves. Handle all electrical equipment as "live," even if it is turned off and the plug is pulled from the wall socket. If you don't know how to work with the "innards" of electronic equipment, don't go poking around. If you do have a desire to learn about working on electronic equipment, enlist the services of someone experienced.

Experience

Every time you turn on your receiver, you are, of course, gaining in experience. The only difference between you and Mr. Hot Stuff Super DXer is that he has turned on his receiver many more times than you have over a long period of time. Use that patience I mentioned earlier to give yourself the time to grow in the hobby.

One of the things beginners often forget to do in the rush to hear everything there is to hear, is to record their experiences. Keep a notebook handy as you delve into the world of radio monitoring. Take a few minutes to write down things that seem important at the time and refer back to your notes throughout your listening sessions. Recording your experiences is often a great way to get a handle on the idiosyncrasies of subjects such as propagation.

Some folks like to make "preflight" checklists of tasks you need to perform when monitoring. Sometimes the apparently easy tasks get confused in the heat of a productive listening session. Make notes of control setting, tuning procedures, any common tasks you need to perform to get the most out of your listening. Eventually things like these will become second nature when you are more "experienced." But for now, give yourself all the help that you can.

Communication

Radio monitoring has the appearance of being a solitary hobby. True, you can probably get along for a long time alone with a few good books by your side. But if you really want to get the most out of the hobby, you'll want to hook up with other like-minded folks. Our hobby is populated with clubs on the various aspects of radio monitoring. These organizations give the beginner the opportunity to learn from the experiences of other folks. You can save a lot of time and effort by learning from other people's mistakes. Also, radio clubs and publications like *MT* allow folks to share what they are hearing so other folks can try listening in, too.

Those who may not be excited about joining clubs can connect in other ways. Computer bulletin boards and even The Internet have become places for sharing radio monitoring information. These on-line services offer information in very nearly real-time. This is often very useful to the dedicated listener.

Gatherings such as the Monitoring Times convention, the Kulpsville SWL Winterfest, and hamfests allow you to rub elbows with people who are as excited about radio as you are. Connecting with fellow radio hobbyists can allow you to form friendships that can last throughout your listening career.

Self-Examination

Face it, friend: few folks can listen every waking moment of every day. Few folks would want to. Family, friends, work, and other things that bring us pleasure do affect the time we get to spend in pursuit of rare radio signals. Nothing is wrong with "tweaking" your lifestyle a bit to accommodate your hobby. Where folks run into trouble is when they forget that this is a hobby.

If chasing down rare DX gives you the same burning sensation in the pit of your stomach that you get from listening to your boss, you need to throttle back and remember that this is all supposed to be fun. If your devotion to the hobby is skewing your perspective on the world around you instead of enhancing it, you risk bankrupting yourself emotionally, if not financially. All the free tips I can give you may help you catch a few new countries, but they can never replace playing a game of catch with your kid or a sunset stroll with your significant other.

Let the radio hobby enhance your life, not rule it, and you will reap great rewards.

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Radio Aum Shinrikyo English Broadcasts Cancelled

Aum Shinrikyo's English broadcasts, which were aired at 0430 and 2030 via multiple Voice of Russia frequencies, were canceled a few days after the Tokyo nerve-gassing. The group was paying $2000 a day for these, in addition to Russian and Japanese language broadcasts, according to Radio Netherland's *Media Network*. They paid Mayak $800K a year (Moscow NTV via BBCM) Steve Forrest of NASWA asks, tongue in cheek, does this mean I shouldn't scratch 'n' sniff my Aum QSL card? Joking aside, one does wonder if investigators are contacting SWLs on Aum's mailing list.

Diane Mauer reported hearing Brother Stair allying himself with Aum, as fellow fundamentalists persecuted by the authorities. Gigi Lytle reminds us that New Yorkers may drop by Aum's published branch address to see what's going on there now: 8 East 48th St., #2E, phone 212-421-3687. Thanks to Gigi Lytle and Glenn Durant for photocopies of Aum Shinrikyo's QSL.

ALASKA KNLS offers new seasonal QSLs, two designs per year, only 200 each printed; taped reports okay to Box 473, Anchor Point, AK 99556; OR fax 615-371-8791 (KNLS and via Guido Schotmans, FIDONET *SW Echo* via George Thurman)

ALBANIA R. Tirana in English news at 0145 on new 7160 (Kevin Hecht, PA) until 0230-0300, also on 6145 (Rumen Pankov, Bulgaria, via Wolfgang Büschel) 0030-0155* on 7270 in Albanian (Tim Hendel, FL) unID on 7271.5-7272v before and after 0200 turned out to be R. Tirana in Albanian to N.Am. ex-9760v, strong but rumble (Kevin Hecht, PA, *World of Radio*). Also new 5986.7 at 0200 in Albanian, domestic or external? (Hans Johnson, *Jihad DX* via HCJB *The Latest Catch*)

*All times UTC; All frequencies kHz; * before hr = sign on, after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; Z-95 = summer season*

ASCENSION R. Japan's new relays to Africa, complete: 0700-0900 on 17815; 0800-0900 on 15135; 1300-1400 on 15400, 21490; 1530-1600 on 15315, 17880 (R. Japan *Media Roundup* via Richard S. Jones, CA) Not 15315 but 15120 (ORF via Wolfgang Büschel, Germany)

AUSTRALIA RA's new E-mail address: raust3@ozemail.com.au (Radio Netherlands *Media Network*) It's raus3@ozemail.com.au (Adrian Sainsbury, RNZI *Mailbox*)

BANGLADESH Dhaka in Bengali to Mideast foreign workers, nominal 15520 at 1030-1730, heard irregularly on odd 15515.4 (Wolfgang Büschel, Germany)

BOLIVIA New station is R. Carlos Antonio, Guayaramerín, Beni, 4632.5, 5kW at 2130-0230 (REE *Amigos de la Onda Corta*) ¿Confused with Peruvian, q.v. on same frequency? (gh)

BRAZIL At least **RNB**, English to us at 1308 check was on 15445 instead of 15448, but flanked by FM-type spurs around 15537 and 15353 (gh, OK) **R. Progresso**, Porto Velho, with terrific spur around 4902, whilst listed 4945 clashes with **Illimani**. **R. Dif. 6 de Agosto**, Xapuri, listed on 3401, heard on new 3255, fair before sunrise, after sunset. (Henrik Klemetz, Colombia, HCJB *DX Partyline*) **Radio Aparecida** is now 24 hours on 11855, 9630, 6135, 5035, and my *Encontro DX* airs Sats 2200-2230 (Cassiano Alves Macedo, São Paulo)

BULGARIA R. Bulgaria, Z-95 simplifies English to an hour at 0400, 1900, 2100, 2300, all on 9700, 11720; 1130 to Asia on 17625, 15635 (RB via John Carson, Bob Thomas)

CANADA The government has ordered CBC to keep RCI going, but at what level had not been worked out (André Ouellet, Foreign Minister, RCI *Mailbag* via Diane Mauer and BBC Monitoring) Contrary to printed schedule, the Sun 2030 airing of *Mailbag* appeared at 2105 instead, on 15325, etc. (gh)

CHILE There have been unfortunate complications on the planned sale of Voz de Chile facilities to former KGEI programmer José Holowaty (John Stanley, HCJB *DXPL*)

COLOMBIA **Todelar Bucaramanga**, 1050, fair on 2x = 2100 at 1002-1035, folk music. **R. Alborada**, Santa Cruz, new station or harmonic heard on 6350 twice between 1041 and 1115, mentioned town of Urumani (?) and phone starting with 750- (Fernando Viloria, Venezuela) That phone prefix is for Norte de Santander; location may be Curomani. **Caracol Vélez** strong on 4231.1 = 3 x 1410.35 at 2300 (Henrik Klemetz, Bogotá, HCJB *DXPL*)

COSTA RICA RFPI plans to have satellite dish ready for downlinking by yearend; would like to carry live talk shows like *Jerry Brown*, *Jim Hightower*, but they are commercially owned by networks; meanwhile Hightower's own commentaries air Mon-Thu and Sat 1833, Fri 1830, Mon-Fri 2115 plus 8 and 16 hour repeats; optional weekend repeats Sat, Sun 1555, 2355, Sun 2100 plus 2 repeats. RFPI has new QSL showing schematic of homemade high-power transmitter. *This Way Out* is heard Wed 1900, Sun 2230; *Alternative Radio* Mon 2000, Thu 1900 + 8 and 16 hours (RFPI *VISTA* and *Mailbags*)

CUBA Manolo de la Rosa's DX program in Spanish on R. Rebelde heard after 0600 UT Sunday, not Saturday on MW 710 (Maryanne Kehoe, Atlanta) Also try SW 5025, maybe now 0500 for DST (gh) RHC testing USB with 12.5% pilot carrier on 11760 at 2200-2300 in English, maybe also 2100-2200, 20 kW PEP, rhombic 37 to 41°. May

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also try SSB on 49m (Arnie Coro RHC *DXers Unlimited* and via George Thurman)

DENMARK Radio Station EDXC '95 has been authorized for June 2-5, maximum 3 hours pers day, probably 0800, 1600, and 2200, requesting two frequencies each, in the 15735-14800, 7400-7600, and 3950-4000 kHz range, 100-500 watts, basic aerials, special QSLs for $2 or 2 IRCs (Stig Hartvig Hielsen, Denmark)

ECUADOR HCJB is reticent to publicize details of powers or antennas, but Rich McVicar revealed that through April, 9745 was beamed toward New York, instead of west of Chicago. This greatly deteriorated reception in central North America 0030-0500; other problems: RTTY QRM around 9747; once for 45 minutes during Wed DX programs, huge regular noises interrupting every few seconds, seemingly on feed rather than jamming; big band special ruined by wowing tape which was never corrected as if no one at station was listening; meanwhile, Spanish on 11960 is stronger than before until 1500, splattering all over RCI *Sunday Morning* 11955 (gh) Summer sked to Eu 0700-0830 on 11635 ex-6205 (John Norfolk, OK)

We contacted stations inactive on SW to find out their plans. **R. Antena Libre** will not be back, but sold transmitter to new station in San Lorenzo, Ondas del Norte, frequency unknown. **R. Oriental,** off 4780 a year due to fire, but back soon. **R. Cumandá**, 3350, is moving site farther out of town, hopes to be back by Mayend. **R. Interoceánica**, off 4840 for many months as transmitter will not accept high-voltage; interested in SW, but not if it costs much to fix. **Ecos del Oriente**, 3270, back soon when parts arrive from US. **R. Sucundío** (or Tucundío?) is in official list at Lago Agrio on 3300, but never heard; will have to visit. **Emisora Gran Colombia**, Quito, moved studio near HCJB, plans to resume 4910 when wired. **R. Municipal**, Quito, has 2 kW transmitter ready for 4750, awaiting approval, but already heard 3899.8, perhaps spur at 1149. **La Voz del Río Tarqui**, 3285, is evaluating whether to resume SW. **R. Popular Independiente**, 4800, is on occasionally due to power rationing; will be more active after hydro drought. **Ondas Quevedeñas** says 3325 is working daily 1000-1300, 2200-0300, but all I hear is the Guatemalan. **R. Católica**, Santo Domingo, 3395 was awaiting parts to resume in a month. **La Voz del Triunfo**, 3250, off awaiting tube not available in Ecuador, but is also trying to sell station. **R. Iris**, 3380, still listed by government and license does not expire until March 1996, but no plans to resume SW. Station on 4970 cancelled SW. **R. del Buen Pastor**, new station hoped to be on 4830 by Aprilend. **R. Alianza** on new 5848.35v ex-5453.9 Sunday 1204-1430+ in Quechua with gospel music. (Rich McVicar, HCJB *DX Partylines*) Similar findings on my visits; 4840 station has been operating at 1130-1230 only (Takayuki Inoue Nozaki, Ecuador, *Relámpago DX* via *Radio Nuevo Mundo*)

EGYPT Cairo in Arabic on 12050 produces strong spurs on 12000, 12099 (Wolfgang Büschel)

FINLAND YLE R. Finland on 15400, 11900 at 1130 Mon-Fri, 1230 Mon-Sat, 1330 and 1530 daily (*YLE Update* via Dave Jeffery) Finnish preempts English at a hatdrop (gh)

FRANCE RFI began summer sked by mistake with French not English on 13625 via Guiana at 1200; then English had annoying three-word pre-echo from unknown co-channel site, five words when David Page is speaking, still not fixed three weeks later (gh)

GREECE Macedonia used 7500 briefly, switched to 7490 which clashes with WJCR, 1600-2200. VOG to N.Am. at 1200-1350 on 15650, 17525 with English at 1335; 0000-0350 on 6260, 7448, 9935 with English at 0130, 0340; and *Learn Greek* Sun 0315-0330 (John Babbis, MD, *W.O.R.*)

HONDURAS *Southern Music Radio* is on R. Copan Int'l, 15675, every two months on the 2nd Sat, such as June 10, at 1900-2000, shifting in Dec to 2000-2100; stickers and a 7-inch record of jingles with Kiwi Radio, too, will soon be available (SMR) 15675 works to N. America evenings only in summer; want to get another transmitter for lower frequency at night (Jeff White, HRJA, HCJB *DXPL*)

INTERNATIONAL VACUUM *World of Radio* on World Radio Network moved to Sundays; 1600 to Europe on Astra 1B, channel 22, 11.538 GHz, vertical, VH-1, 7.38 MHz audio; 1900 to North America on Galaxy 5, 125°W, WTBS Tr. 6, 3.820 GHz, V, 6.8 MHz (via André Schmidt via Thurman)

ISRAEL IBA English until Sept. 2 time change: 0400-0415 on 9435, 7465; 1000-1030 on 17575, 15650, 15640; 1900-1910 on 15640, 11685, 11603, 9435, 7465 (Kol Israel) A slightly later version showed only 5 minutes at 1900 (Daniel Rosenzweig, USENET via Thurman) but that further cut had not happened by mid-April (gh) See *MT* feature, this issue (rb)

JAPAN With new fiscal year April 1, Radio Japan again turned over hosts of *Media Roundup*—new one is Mari Kishi (John Norfolk, Richard S. Jones) This *Week* on Sats in only one part instead of two (Jones) Evening direct frequencies to us: 01, 03, 05 on 9680; 0500 also 11885 and 6110-Canada; 0300-0330 Latin America on 15230, 11895, 11885 (via Bob Thomas) see also ASCENSION

JORDAN R. Jordan at 2130 on 9870 plus spurs 9660, 10000 (Bill Westenhaver, PQ)

KIRIBATI R. Kiribati, 9825 peaking to best-ever level 0925-0935* during commencement of geomag storm with high K-index in March (David M. Clark, Ont., *Fine Tuning*)

LIBERIA KGEI donated 1937-38 vintage GE 50 kW transmitter to ELWA, but will not ship until end of 1995 when building and programming ready for it (*SIM Bulletin* via HCJB DXPL)

LITHUANIA [non] For summer, R. Vilnius at 2300-2330 on 9530 via Russia (Kevin Hecht, PA) A bit of English weekdays, all-English weekends; maybe 11 MHz for deep summer (gh)

NETHERLANDS RN's alternate program on Sunday is now *Fifty Plus*, Pete Myers on the joys of middle age, 0235, 0835, 1035, 1235, 1435, 1835, 2035, 2235, 2335, Mon 0135. Documentaries in June: 7 and 14, *Borders*—are there abrupt changes when you cross? 21 and 28, *Minority Languages* Gaelic and Frisian; July 5 and 26, *Women into the 21st Century*; July 12 and 19, Aug 2, 9 and 16, a series on *Indonesia*; Wed at 0750, 0950, 1150, 1350, 1550, 1750, 1950, 2150, Fri 0050, 0250, 0350, 0850, 1050, 1250, 1450, 1850, 2050, 2250, 2350. Until Sept. 3, the 0730 Bonaire relay is on 9700 instead of 9720 (*On Target*)

NORWAY RNI's *Norway Now*, English only on Sundays, now to us at 1300 and 1600 on 11850, UT Mons 0100 on 7480 and 9560, 0400 on 7480 (via Bob Thomas, CT) Thailand blocks at 1300 (gh, OK)

PALAU KHBN calls retained despite independence last October; plans to split two 100 kW transmitters from HCJB into four 50 kW; also to install modern curtains; and KVOH in California also will split 100 kW into two 50s (Rutger Forester, AWR *Wavescan*)

PAPUA NEW GUINEA All tropical outlets now close at 1200* ex-1300*, but some are missing and may have been shut down: 3205, 3275, 3290, 3305, 3325, 3365 (Tony Ward, Hans Johnson, *Jihad DX* via *DX Ontario*)

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PERÚ Excerpts of extensive notes following a 40-day trip through Perú: 3260.1, **La Voz de Oxapampa** operates only evenings, 2300-0400. 3397.4, **R. Internacional del Perú**, San Pablo, licensed to 3270, is using the 3395 authorization of its Lima outlet. 3818.2, **Estación Laser**, Rioja, ex-4538 at 1000-0230v. 4238.1 is shared by two stations of same owner, mostly **Radio Cajamarca**, but sometimes **R. Nor Agricultura**, both in Baños del Inca. 4575-4565v **R. Latina**, Chiclayo, nom. 4580, 0900-1400 and 2100-0500. 4632.6v, ex-4663, **R. Soledad**, Parcoy, 1000v-0300v. 4763.3 ex-4785.4, **R. Chincheros**, 2300-0330. 4780.1, **R. Bahía**, Chimbote, new on SW heard mornings only around 1030-1300. 4826.3, **R. Sicuani** is cultural ex-commercial, 1000-0300. 4845.0, **R. Líder**, Cusco, ex-4860, 0900-0200 exc. Sun 1000-1700. 4875.0, **Sonorama Radio**, Huancaya to start SW with ex-**R. Pampas** transmitter which was really on 4855.6. 5046.3, **R. Integración**, Abancay, new on SW, relaying MW **Inti Radio** at 1050v-1400. 5056.2, **R. Onda Imperial**, Cusco, reactivated at 1200-2130 but only 150 watts. 5618.3v is **R. Ilucán**, Cutervo frequency when on generator power with 100 watts; otherwise on 5620.1 at 1100-0300, Sun 1030-0300 with 1 kW (Takayuki Inoue Nozaki, *Relámpago DX* via *Radio Nuevo Mundo*)

R. Jerusalén, Cajamarca, back on 3194.6, weak in morn, very poor around 0100, gospel in Spanish. **R. Soledad**, Parcoy, transmitter problems in April, varying around 4613. **Rdif. Huancabamba** testing 3370.3 (Henrik Klemetz, Colombia, HCJB *DXPL*) **R. Ayaviri**, **La Voz de Melgar**, back on 4606.5 at night, weak but crisp (Henrik Klemetz, Colombia)

PORTUGAL R. Portugal, English to us 0130-0200 Tue-Sat only on 9570 and new 6075 for Z-95 (Bob Thomas, John Norfolk) 6075 nice with DW absent (gh) Two weeks later shifted to 6175 (Ed Rausch, NJ) Confirmed, stupid move for nasty clash with BBC via Sackville, but then compounded by shifting to 6174, hardly a solution (gh)

PRIDNESTROVYE R. Dniester Intl, for Z-95 back on 11750 ex-9620 2030-2100 in English exc Fri, but co-channel BBC Ascension; expect 15290 again for deep summer (Kevin Hecht, PA)

RUSSIA V. of Russia made drastic cuts April 5, dropping seven Afro-Asian languages plus Swedish, and reduced time for 17 more, resulting in total of 30 languages running 546 hours per week, barely half the total of a year before (BBCM via RM*MN*, Büschel)

SLOVAKIA RSI summer sked in English: 0830-0900 on 11990, 15640, 17485; 1830-1900 on 5915, 6055, 7345; and to N. America 0100-0130 on 5930, 7300, 9440 (Edwin Southwell, UK) AWR retimed English to Europe from 0900 to 0600-0700 on 7215; still 2100-2200 on 6055 (Wolfgang Büschel) Those presumably contain *Wavescan*, Sundays (gh) Yes, but also at 0920 on 15620 (DSWCI *SW News*) And 1420 on 13595 (World DX Club)

SOUTH AFRICA Domestic SW until 23 Sept: Afrikaans Stereo, 0300-0545 and 1535-2300 on 3320, 0550-1530 on 6000; Radio 2000, 2300-0300 on 3320; R. Oranje, 1530-0550 on 3230, 0555-1525 on 5965. Channel Africa Z-95 in English reduced to: 0300-0500 on 5955, 3220, 0500-0600 on 5955, 9695, 1500-1800 on 3220, 7240, 1600-1700 on 9695 (SENTECH via Bill Westenhaver) SENTECH, which operates the transmitters, is no longer part of SABC but a common carrier; SENTECH now QSLs separately with 8 different cards for reports to Kathy Otto, SENTECH Shortwave Services, Private Bag X06, Honeydew 2040 (Felix Conrady?, RSA, HCJB *TLC*) Fax (011) 475-5112 (SENTECH)

TWR relay in English: 0400-0427 on 7165, 1600-1830 on 9500, 1830-1857 on 9525 (TWR Swaziland via Büschel)

TINIAN VOA is thinking about putting a new transmitter on this Mariana Island, but Congress may have other ideas (John Vodenik, *Spectrum*) Actually six SW transmitters for R. Free Asia (C. Ed Evans, WSHB, Internet via HCJB via WDXC, Büschel)

UKOGBANI [and non] BBC replaced 15 and 17 MHz outlets with 11 for Z-95 via relays: Antigua 11865 at 1200-1615, Canada 11775 at 1500-1715 (Kevin Hecht, PA)

USA VOA launched two new programs March 27; *VOA Today* has three live 2-hour broadcasts to different targets with different hosts, magazine of news and reports; and *Stateside*, reports on news from within America, 50 or 30 minutes (VOA press release) Do they bother to give the times? Of course not, but we found the latter starting at 1110 on 7405 (gh) *Communications World* for a while on all the Americas frequencies UT Suns 0030-0100, reduced to 6130, 9455, 11695 while the others run Spe-cial Eng-lish (Jim Moats, OH and gh) Transmitters removed from Bethany were shipped to warehouse in Brooklyn, NY, awaiting shipment to Sri Lanka; if they do get there, will be a nightmare to make operate again, needing costly solid state modulators (John Vodenik, OH, USENET and FIDONET via Thurman, NASWA *Journal*)

WWCR programming changes: *The Old Record Shop,* Sat 1000 on 5065, Mon 0400 on 7435; *President and Republicans*, Sat 2000 on 12160, 2245 on 9475; *World of Radio*, Fri 2115 on 15685 in June and July, Sun 0500 on 7435, 0930 on 5065, 2300 on 9475, Tue 1230 on 15685 (Adam Lock, WWCR) *World of Radio* on WHRI: Fri 2001 on 13760, Sat 0501 on 7315 and 9495, 1529 on 13760, 15105. On KWHR: Sat 1530 on 9930, Mon 0330 on 17510 (gh) *Mundo Radial*, gh's Spanish DX report, appears some Mondays at 2130 on WWCR 15685/9475. Al Weiner, but not other R. Newyork International people, planned to start a new DX program by May 1, UT Mons at 0400 or 0300 on 7435 (WWCR via Thurman)

Contrary to implied plans, "wormy" WRMI, 9955, shifted some programming an hour earlier by UT for DST; apparently, *La Voz de la Fundación* wanted to stay at the same local time in Cuba, so 0100, bumping *Viva Miami* back to 0000 UT weeknights when reception is better, anyway. The nickname "wormy" is a play on words in English and Spanish (gh) *Wavescan* retimed to Sat 2345, Sun 1130 and 1245, repeated next Sat 2200 (Jeff White, WRMI and via Ed Rausch) 9955 barely audible even when signal strong, due to extremely weak modulation (Ernie Behr, Ont) Subsequently audio with more punch, perhaps now processed (gh) April program revision showed additional *Viva Miami* times in English: Mon-Fri 2030 and 2300; Sat 2100, 2230; Sun 1330, 2200, 2300, 2400 with weekends being repeats (via Thurman)

WVHA's *DXtra* retimed to UT Tue after first Mon of month at 0230 on 7465, and at my request added repeat for Europe Tue at 1800 on 13720 (Daniel Atkinson, England) See SWGuide for full freq sked.

WRNO persuaded by Brother Stair to go all-night, UT Sat only on new 7415 at 0600-1400 (Diane Mauer, Ray Jennings, LeRoy Long, Ernie Behr)

WEWN's summer North American service uses only 7425 or 6000 the 24 hours; contrary to what you might expect, the lower frequency is scheduled for mid-day, 1100-2000, as well as 0400-0800, but Havana persuaded this to shift to avoid clash (Andreas Volk, USENET via Thurman; gh)

UZBEKISTAN R. Tashkent announces English as 1200-1230 and 1330-1400 on 7285, 9715, 15295, 17815; heard here on the last two, best on 15295 (Edwin Southwell, England)

VATICAN VR on 4010 USB at 0300-0730 (AMID via Büschel, DSWCI *SW News*) Up to 4015 at 1800, English at 2050 (Edwin Southwell, UK, *ibid.*) at 0330-0730 and 1730-2400 observed on 4005-USB (Büschel, Germany) 0606 in English on 4015 ex-4010 (Paul McDonough, MA) Close check of sked shows 3 transmitters within the City, 4010 with 10 kW 6245 with 80 kW, and another with 30 kW at 1355-1630; others at Santa Maria di Galeria (Andy Sennitt, *WRTH*, RN*MN*)

VIETNAM [non] VOV via Russia, English to us at 0400-0600 on 7360 ex-5940 (Kevin Hecht, Edwin Southwell)

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

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Broadcast Loggings

Gayle Van Horn

SHORTWAVE BROADCASTING

0000 UTC on 9445
TURKEY: Voice of Turkey. Turkish music program to cultural news update and discussion on the Koran. (William McGuire, Cheverly, MD; Bob Fraser, Cohasset, MA)

0003 UTC on 5745
UNITED STATES: WHRI. News bulletin at tune-in. *People to People* program at 0005, a live phone-in program of religious topics. (Jim Moats, Ravenna, OH) Audible at 0448 on 5745. (John Sedlacek, Omaha, NE)

0020 UTC on 9710
MALI: China Radio Int'l relay. Special program on China's legal system. (Fraser, MA)

0110 UTC on 7105
RUSSIA: Voice of Russia. Report on difficulties on the U.S./North Korean nuclear policy. *Mailbag* program discussing trolleys, national inflation and women's liberation. (Fraser, MA) Audible 1936 on 7205, with interview of Bangladesh's ambassador and blues song by the Silver Ruble Group. VOR also noted on 12015 at 1208-1235. (Harold Frodge, Midland, MI)

0117 UTC on 6299
HONDURAS: Sani Radio. Spanish. Latin vocals to "buena musical" promo, and mentions of Puerto Lempira. (Frodge, MI)

0133 UTC on 7205
GREECE: Voice of America relay. *VOA Today* program on U.S. politics and federal budget cuts. Fair to poor signal with amateur radio interference. **Voice of Greece** on 9375 at 2241. Slow speed news on Greek politics to ID. (John Bellovich, Macclenny, FL) Greek service on 6262 from 0307-0328. (Gerry Le Strange, East Brunswick, NJ; Frodge, MA)

0202 UTC on 7355
UNITED STATES: WRNO. Brother Stair's *Overcomer Ministry* with a phone interview about children's rights legislation pending in congress. More comments and criticism of the "New World Order." Fair signal quality. (Moats, OH)

0230 UTC on 7465
UNITED STATES: WVHA. *DX-TRA* show presented by Chief Engineer Gordon Simkin, with recent listener's letters as well as tips on reducing computer interference from shortwave receivers. (Moats, OH)

0231 UTC on 7285
GERMANY: Deutsche Welle. *European Journal* with news features on Turkish unrest in Germany, and Finland's political scene. Fair to poor signal. DW noted on 6100 at 0600; 17810 at 2030 with German newscast. (Sue Wilden, Columbus, IN)

0300 UTC on 9550
CUBA: Radio Havana Cuba. Interval signal/ID and frequency schedule. (McGuire, MD) Report on the Pan-American Games on 11720 at 2135. (Fraser, MA)

0305 UTC on 5950
UNITED STATES: Voice of Free China relay via Okeechobee, FL. Report on China's relations with Korea to update on Stock Exchange. (Le Strange, NJ; McGuire, MD) News at 0712 on 5950. (Wilden, IN)

0310 UTC on 15370
THAILAND: Radio Thailand. Program focus on Thailand's Royal Exposition this year. Interview with American scientist about hepatitus A symptoms, vaccinations during an epidemic, and where in Asia it is more prevalent. (Jerry Witham, Keaau, HI)

0313 UTC on 9645
COSTA RICA: Faro del Caribe. Rev. Billy Graham's *Hour of Decision* in progress at tune-in. Station ID at 0330, followed by *Focus on the Family*. Fair signal with adjacent channel interference from Deutsche Welle. (Moats, OH)

0315 UTC on 11895
FRENCH GUIANA: Radio Japan relay. *Viewpoint* show with commentary about the Kobe earthquake, as seen thru an American's eyes. *Japan Diary*, featuring two essays on earthquakes and their aftermath. Fair to good signal quality. (Moats, OH)

0325 UTC on 11895
JAPAN: Radio Japan. Regional news on city Kishima to saxophone music. Feature on women training to become jockeys, to Spanish news 0331-0338. (Le Strange, NJ) Japan's **Radio Tanpa** heard in Japanese on 3945 at 1020. (Frodge, MI)

0354 UTC on 7105
ASCENSION ISLAND: Voice of America relay. *VOA Sunday* program with topics from west Africa. Sign-off at 0359. (Sedlacek, NE) *International Recital* noted on 21660 at 1515. (Fraser, MA; Moats, OH)

0410 UTC on 3270
NAMIBIA: NBC. "NBC Radio" ID to lite pop tunes, no sign of // 3290. (Frodge, MI)

0420 UTC on 9730
CHINA: China Radio Int'l. *Travel Talk* show travels to one of China's southern provinces. Station ID at 0430 to *The Cooking Show*. (Sedlacek, NE) Spanish sign-on at 2158 on 6950, into newscast. (Frodge, MI; Witham, HI)

0502 UTC on 9540
SPAIN: Radio Exterior Espana. English newscast on Spanish fishing dispute with Canada. (Bellovich, FL) *People of Today* audible on 9540 at 0028. (Fraser, MA)

0504 UTC on 4770
NIGERIA: Radio Nigeria. Regional news broadcast to 0511 identification. National news update on Mandela's government policies in South Africa, and violence in Karachi, Pakistan. (Sedlacek, NE) **Voice of Nigeria** heard on 7255 at 0615 with celebrity interview and African music. (Bellovich, FL)

0546 UTC on 6025
CANADA: Radio Japan relay. *Media Round-up* show featuring Radio Budapest during the Cold War years. Schedule/frequency quote at 0548. *Viewpoint* discussing Japanese government policies on earthquake assistance. (Sedlacek, NE)

0620 UTC on 3396
ZIMBABWE: Radio 3. *Good Morning Zimbabwe* program of music, chat and commercial for a free give-away at Wimpy's for bastion wine, fortified with brandy. Music segment entitled *A Voice From the Past* featuring music of the Beatles. Wonderfully strong and clear signal. (Witham, HI; Frodge, MI)

0630 UTC on 6015
CANADA: Radio Austria Int'l relay. Austrian national news to program on the role of religions in solving international conflicts. Sign-off at 0655. (Bellovich, FL)

0640 UTC on 13715
SLOVAKIA: Adventist World Radio. Stories of inspiration, including one about a prisoner whose life was saved by a bible hidden in his shirt. The bible stopped a bullet fired by a prison guard thinking the prisoner was trying to escape. ID and close of English segment at 0700. (Witham, HI) **Radio Slovakia Int'l** heard on 9440 at 0129. (Frodge, MI; Loyd Van Horn, Brasstown, NC)

0700 UTC on 7115
MONACO: Trans World Radio. Station ID/address quote to *Search for Truth* program. (Bellovich, FL)

0708 UTC on 9860
AUSTRALIA: Radio Australia. International news at 0710, followed by Pacific region news update. // 9580. (Wilden, IN) *Fine Music Australia* on 9580 at 1145. (Fraser, MA)

0710 UTC on 7335
BULGARIA: Radio Bulgaria. World news, frequency schedule and report on Bulgarian relations with other European countries, Arab countries and the Americas. QRM from Canadian CHU. (Witham, HI) Additional monitoring on 9700 at 1930; 7305 at 1950 with *Questionline* segment on AIDS in Bulgaria. (Fraser, MA; Van Horn, NC)

0720 UTC on 7360
VATICAN STATE: Vatican Radio. Focus on African news headlines. Interval signal to 0730*. (Witham, HI)

0800 UTC on 6009
MEXICO: Radio Mil. Spanish. Station ID as, "la voz de Mexico." Commercial jingles to Mexican pop music program. (Bellovich, FL) Mexico's **Radio Educacion** heard on 6185 at 1201. (Frodge, MI)

0952 UTC on 4890
PAPUA NEW GUINEA: NBC. Pop music feature to "NBC national news" promo and regional music. **Radio Manus** heard on 3315 at 1027; pop music oldies to chimes at 1100. **Radio Northern** tentatively identified on 3345 at 1138. (Frodge, MI)

1002 UTC on 3280
ECUADOR: La Voz del Napo. Spanish. National anthem to 1004, sign-on ID and program announcements. Religious text and music at 1009. (Frodge, MI)

1050 UTC on 11835
SRI LANKA: SLBC. Religious program to 1100. Lady DJ's pop music program to 1130*. (Frodge, MI) SLBC noted on 4902 at 1710, with Asian music and announcements in presumed Sinhala. Multi-voiced religious text at 1715. (Witham, HI)

1125 UTC on 9700
NEW ZEALAND: Radio New Zealand Int'l. Program of pop/rock music, station ID and regional news in Maouri for five minutes. (Fraser, MA)

1130 UTC on 9715
BONAIRE: Radio Netherlands relay. Spanish. Interval signal/ID into Latin American news topics. (Fraser, MA) Madagascar relay site monitored on 11655 at 1932, with newscast and weather report. (Wilden, IN)

1200 UTC on 5965
CANADA: BBC relay. *Play of the Week*-Brighton Beach Memoirs. *Seeing Stars* on Mars exploration seeking supernovas, on 9590 at 2215. (Fraser, MA) Radio Canada Int'l audible on 6150 at 0610. (Wilden, IN)

1215 UTC on 17575
FRANCE: Radio France Int'l. Commentary on U.S. inconsistence in dealing with Iraq. (Fraser, MA) RFI noted on 12015 at 1600, with *Spotlight on Africa*. (Frodge, MI)

1215 UTC on 12005
ECUADOR: HCJB. *Morning in the Mountains* with environmental news. (Fraser, MA) QSL tips and *Ham Radio Today* heard on 15490 at 1733. (Wilden, IN)

1347 UTC on 11940
ROMANIA: Radio Romania Int'l. *Sunday Studio* pan flute feature to *Romanian By Radio*. (Frodge, MI)

1530 UTC on 9550
DENMARK: Radio Denmark. Danish. English ID at sign-on as, "you are listening to Radio Denmark", followed by Danish ID and programming. (Frodge, MI)

1940 UTC on 9575
ITALY: RAI. News item that computer service Internet now features fashion news and updates. // 11905. (Fraser, MA)

2003 UTC on 12015
RUSSIA: Radio Nadezhda. Russian. Lady taking calls and English pop music tunes. ID at the hour to brief news topics. (Frodge, MI)

2030 UTC on 11990
KUWAIT: Radio Kuwait. Readings from the Holy Koran by male/female announcers. (Fraser, MA)

2245 UTC on 4870
BENIN: ORT Du Benin. French. DJ's chatter and laughs. French pop/rock vocals show. Sign-off routine of IDs and national anthem at 2300. Fair signal quality. (Van Horn, NC)

2308 UTC on 3366
GHANA: GBC. African highife music and regional news. Fair signal quality. (Van Horn, NC)

2310 UTC on 3230
SOUTH AFRICA: SABC. Afrikaans.Easy-listening to pop oldies. Fair signal with SIO:332. (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.*

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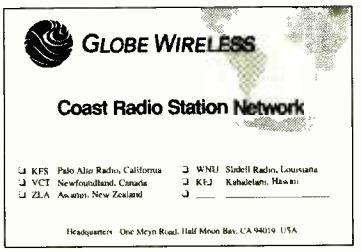
Globe Wireless Requests Your Help

You heard right, Radio Officers and Short Wave Listeners! Globe Wireless, a coastal station heard in the maritime HF bands on 4, 6, 8, 12, 16, and 22 MHz, is issuing QSL cards for valid reception reports.

"We find reception reports from listeners extremely useful," said Rod Deakin, Chief Engineer, Globe Wireless. "They include valuable technical information and we are happy to send QSL cards in return."



Every listener is eligible to receive one QSL card for each Globe Wireless coast station received and correctly reported. Reports are needed from ships at sea, as well as listeners on shore. Reception data from receiving locations, worldwide, is needed to confirm the coverage area of the network, especially the newer stations.

Globe Wireless is currently constructing a worldwide network of radio stations for maritime data communications. Coast stations are located in San Francisco (KFS), New Orleans (WNU), and Newfoundland (VCT) are on the air. New Zealand (ZLA) and Sweden are under construction, with more to follow.

Globe Wireless SITOR transmitters can be easily recognized. They broadcast a unique "free signal" pattern, followed by the station's call sign, when not otherwise in use. Similarly, CW transmitters broadcast a repetitive "wheel" including the callsign and other information.

Your report should include date and time of reception; callsign of station heard; frequency or channel heard; mode of transmission, signal strength and quality; interference; traffic (idle signal or station being worked); receiver and antenna used to receive; location of your station. Send to: Globe Wireless, One Meyn Road, Half Moon Bay, CA 94019. Tel: 415-726-6588/Fax: 4150726-8604.

AUSTRALIA

VHI, 8512.8 kHz USB. Date/frequency letter signed by J.W. Balcomb-Lt. RAN Officer in Charge. Received in 124 days for an English utility report, 1 IRC, prepared QSL card (not used) and an address label (used on reply). Station address: NAVCOMSTA Darwin, HMAS Coonawarra, Darwin, NT 0820, Australia. (Mike Hardester, Jacksonville, NC)

CANADA

Gander International Flight Service Station, 3485 kHz USB. Station verification letter signed by Wayne J. Lorenzen. Received in 36 days for a cassette tape. Station address: Gander Radio Transport Canada, Gander IFSS, P.O. Box 328, Gander, NFLD, A1V 1WF Canada. (Walter Szczepaniak, Philadephia, PA)

COSTA RICA

Radio For Peace Int'l, 7385 kHz. Full data QSL card signed by James Latham-Station General Manager. Program schedules and RPI brochures enclosed. Received in 50 days for an English report. U.S. QSL address: P.O. Box 20728, Portland, OR 97220. Fax: +1(503-255-5216) Main office address: Apartado 88, Santa Ana, Costa Rica. Fax: +1 506-(249) 1929. (Gerry Le Strange, East Brunswick, NJ)

GUAM

KTWR-Trans World Radio, 11830 kHz. Full data scenic postcard signed by Karen Zuck. Program schedule enclosed. Received in five weeks for an English report and 2 IRCs. Station address: Box CC, Agana, Guam 96910. (Greg Myers, Richmond, VA)

GUATEMALA

TGMI-Radio Buenas Nuevas, 4799 kHz. Full data station logo card signed by Manager. Station pennant and fact sheet enclosed. Received in six weeks for a Spanish report and one U.S. dollar. Station address: 13020 San Sebastian H. Huehuetenango, Guatemala. (Myers, VA)

LITHUANIA

Radio Vilnius, 7150 kHz. Full data station card unsigned. Received in 5 weeks for an English report and 2 IRCs. Station address: c/o Lietuvas Radijas, Konarskio 49, LT-2674 Vilnius, Lithuania. Fax: +370 (2) 66 05 26. (Myers, VA)

MEDIUM WAVE

Radio Vision Cristiana Int'l, 535-AM kHz. Full data blue station logo card signed by Wendell Seymore-Manager. Received in 42 days after an English AM follow-up report, one U.S. dollar, prepared QSL card (not used) and a souvenir postcard. Original report from Nov. 1994 was sent to Paterson, N.J. address (P.O. Box 2908, zip 07509) with no reply. QSL address: South Caicos Island, Turks & Caicos, British West Indies. (GVH/NC)

HCJB, 690-AM kHz. Full data *Andean Moonrise Over Quito* card signed by Rich McVicar. Received in 67 days for E-Mail (Internet) report of special DX Test. E-Mail address: Rmcvicar@mhs.hcjb.com.ec (Hardester, NC)

WBAL, 1090-AM kHz. Full data letter signed by Hank Volpe-Director of Engineering. Received in 19 days for a taped English AM report, address label (used), mint stamps (used on reply). Station address: Hearst Broadcasting, 3800 Hooper Ave., Baltimore, MD 21211. (Szczepaniak, PA)

WDUN, 550-AM kHz. Full data prepared QSL card signed by Brandy B. Aycock-Office Manager. Received in 12 days for an English AM report and mint stamps. Station address: P.O. Box 10, Gainesville, GA 30503. (Loyd Van Horn, Brasstown, NC)

WLAR, 1450-AM kHz. Personal letter and prepared QSL card signed by Randy Sliger-Operations/Asst. Engineer. Received in 9 days for an English AM report and mint stamps. Station address: P.O. Box 986, Athens, TN 37303. (Van Horn, NC)

NETHERLANDS ANTILLES

Radio Netherlands-Bonaire relay, 6165 kHz. Full data QSL card unsigned. *On Target* newsletter and Listener's Services catalogue enclosed. Received in 68 days for an English report. Station address: P.O. Box 222, 1200 JG Hilversum, The Netherlands. (Paul Jablonowski, Greenfield, WI)

SHIP TRAFFIC

Pol Baltic-SXBS, 156.65 MHz USB (Container Vessel). Full data prepared QSL card verified. Received in 37 days for an English utility report and one U.S. dollar. Ship QSL address: Costamare Shipping Co., 59 Akti Miaouli, 185 Piraeus, Greece. (Hank Holbrook, Dunkirk, MD)

Medallion-OYEK2, 2182/2206 kHz USB (Bulk Carrier). Full data QSL letter verified and photo of vessel. Received in 60 days for an English utility report and one U.S. dollar. Ship QSL address: c/o Moriensen & Lange, Kongevejen 2, DK-3480 Fredensborg, Denmark. (Holbrook, MD)

Cape Vincent-KAES, 500 kHz USB (Roll-On/Roll-Off). Full data QSL letter verified. Received in 26 days for an English utility report and mint stamps. QSL address: Maritime Administration, Mar 745-Room 2126, 400 7th Street SW, Washington, DC 20590. (Holbrook, MD)

UNITED ARAB EMIRATES

UAE Radio-Dubai, 13675 kHz. Full data verification on station letterhead signed by Aida Hamza-Director. Received in 86 days for an English report, 2 IRCs, and souvenir postcard,(please do not send cash to UAE, as requested in letter). Station address: c/o Ministry of Information & Culture, Dept. of Broadcasting, P.O. Box 63, Abu Dhabi, UAE. (Ernest T. Bagley, South Portland, ME)

UNITED STATES

WOO-Ocean Gate Radio/AT&T Co., 8749 kHz USB. Full data station card signed by Station Manager. Station info sheet, frequency list and photo enclosed. Received for a cassette tape and one U.S. dollar (returned with reply). Station address: c/o Station Manager, Beach Ave., P.O. Box 550, Manahawkin, NJ 08050. (Mark Burns, Terre Haute, IN; Szczepaniak, PA)

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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

More SWBC compiled by Glenn Hauser

R. Huyacocotla, Veracruz, Mexico, on 2390 was ordered off the air March 23 by Mexican authorities following an inspection resulting in trumped-up technical violations. As an advocate for the indigenous people of the area, the station has long been at odds with the government, which refused to let it operate on mediumwave, according to Claudia Guayardo-Yeo, Ontario, USENET via Pete Costello.

Solomon Islands on 5020 was completely blocked by jamming three different dates 0630-1130 UT; I phoned SIBC about this, but they were hesitant to comment, says Arthur Cushen in *New Zealand DX Times*.

During the 1430 broadcasts via Norway, the dissenting Democratic Voice of Burma announced its "morning" programs would be on new 7315, says BBC Monitoring.

BBCM keeps us informed about clandestines in the Mideast. Radio Message of Freedom, operated by the opposition party led by Golboddin Hekmatyar, was heard again six weeks after headquarters at Charasiab near Kabul were captured; it was heard at *0730 on 7090 saying it broadcasts for one hour also at 0230 on 7090 and 6145, both later confirmed.

Also heard again after several months' absence was Abkhaz Radio, from Sukhumi, capital of the Abkhaz region of Georgia, on 9504.74 at +0512-0550* broadcasting in Abkhaz, Russian and Georgian; said it was on Tue and Fri at 1500, repeated Wed and Sat at 0430; however, the 0430 broadcast was also heard on Sun, Mon, Tue.

For Chechnya, Radio Free Caucasus planned to start in May from Krakow, Poland, five hours per day in Russian, Chechen, Georgian, Armenian, Azeri, and possibly Polish, says a report in *Komsomolskaya Pravda* via BBCM, HCJB, but SW usage unknown.

Voice of the Worker, a left-wing station opposing the Iranian government which broadcasts in Persian , was back, too, after a lengthy absence, on 4190 at 1450-1515* with the *Internationale*; also on 4190 at 1700-1710*, and from *1430. It says it broadcasts at 1630, repeated next day at 1430 on 4200. Two other anti-government stations continue to share facilities: V. of the Iranian Revolution, in Kurdish on 3889 and 6420 until 1528. Then from *1700 on the same frequencies, V. of the Iranian Communist Party. All that from BBCM. Bob Thomas in CT says V. of the Islamic Republic of Iran—in English to us at 0030—has replaced 7100 by 7260; it's also on 9022. All poor.

BBCM tracks the Republic of Iraq Radio domestic service, which is on 17744 after 1600, announcing 17744 is used at 2000-2400 as well as 13650 and 11825, which have not been heard recently, though 13652 has been at 0900-1100; most regular frequency is 4615 kHz.

BBCM rounds up info on broadcasts for Kurdistan: V. of the Struggle of Iranian Kordestan was in Kurdish at 1500-1635+ on 4355, switching to 4345-4350 to avoid jamming. Following two stations are rivals: V. of the People of Kurdistan added 4015 to parallel 4085, and due to military activity extended one night until 0115. V. of Iraqi Kurdistan is around 4180 at 0345-0500, 1030-1200, 1545-1815, duration varying. It announced that the morning broadcast was also on the 49m band.

Since the beginning of this year, the two have on occasion been operating on the same or adjacent channels in the 4050-4090 range in an apparent effort to jam each other. Then the new 0345-0530 frequency was found, 5945, but all times should now be one hour earlier for summer. V. of Independent Kurdistan, the PKK station opposing Turkish forces in northern Iraq, operates around 0900-1000 and 1400-1500 on 7020-7030, but times vary as once the sign-on was at 1300; in Kurdish, some Turkish, jammed.

Concerning Europe: R. Yugoslavia resumed English at 0430-0457 on 7115; and R. Moldova International via Romania changed time and frequency to 1400-1425 Monday-Saturday in English on 11580, reports Eugene Gebruers, RVI *Radio World*.

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MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Dave Datko
California

Next Reporting Deadline
June 19, 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 (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (south as)
Canada (North-Quebec)
China Radio Int'l
Monitor Radio Int'l [T-A]
Radio Australia
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 America (as)
Voice of America (ca)
Voice of Russia
WWCR #1 [T-A]
WYFR [T-F]
0003
Radio Pyongyang
0010
China Radio Int'l*
Voice of America (ca) [T-A]*
0015
Radio Cairo
0030
All India Radio
Radio 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) (English)
Voice of Russia
0045
BBC (am)*
BBC (south as)*
0050
RAI Italy

0100 UTC
(9:00 PM EDT, 6:00 PM PDT)
BBC (am) (Newsdesk)
BBC (as pac)
BBC (south as) (Newsdesk)
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 Canada Int'l
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 America (as)
Voice of America (ca)
Voice of Indonesia
Voice of Russia
0110
Radio Australia [M-F]*
0130
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Netherlands Int'l
Radio Portugal Int'l [T-A]
Radio Sweden [T-A]
Voice of Greece
Voice of Russia [T-A]
0145
Radio Tirana
0152
Vatican Radio [S]
0155
Radio Canada Int'l [T-A]
Vatican Radio [W/F]
Voice of Indonesia

0200 UTC
(10:00 PM EDT, 7:00 PM PDT)
BBC (am) (Newsday)
BBC (as pac) (Newsday)
BBC (eu) (Newsday)
BBC (south as) (Newsday)
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 (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 Austria Int'l
Radio Budapest
Radio Havana Cuba [T-S]
Radio Netherlands Int'l
Radio Pakistan
Radio Sweden [T-A]
Radio Tirana
Voice of Russia

0300 UTC
(11:00 PM EDT, 8:00 PM PDT)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu) [S-F]
BBC (south as)
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
KVOH [T/W/H]
Monitor Radio Int'l [T-A]
Radio Australia
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 #3 [T-A]
0301
Voice of America (af) [M-F]*
0303
Voice of Free China
0310
China Radio Int'l*
0315
Radio Cairo
Voice of Greece [S/H]
0320
Radio Philipinas [M-A]
Vatican Radio
0330
BBC (eu) [A]
Radio Dubai
Radio Havana Cuba [T-S]
Radio de Venezuela [T-S]
Radio Prague
Radio Sweden [T-A]
VOA(af) [M-F] (English)
Voice of Russia
0340
BBC (af)*
Voice of Greece
0345
Radio Yerevan
0355
Radio Japan

0400 UTC
(12:00 PM EDT, 9:00 PM PDT)
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac)
BBC (eu) [S-F] (Newsdesk)
BBC (south as) (Newsdesk)
Canada (North-Quebec)
Channel Africa
China Radio 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 Norway Int'l [S]
Radio Romania Int'l
Radio Tanzania
Swiss Radio Int'l
Voice of America (af)
Voice of America (me)
Voice of Israel
Voice of Russia
WWCR #1 [T-A]
ZBC Zimbabwe
0403
Radio Pyongyang
0410
China Radio Int'l*
0425
RAI Italy
0430
BBC (af)*
BBC (eu) [A]
Radio Finland
Radio Havana Cuba [T-S]
Radio Netherlands Int'l
Voice of Russia
0431
Voice of America (af) [M-F]*

0500 UTC
(1:00 AM EDT, 10:00 PM PDT)
BBC (af) (Newsday)
BBC (am) (Newsday)
BBC (as pac) (Newsday)
BBC (eu) (Newsday)
BBC (south as)
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
HCJB
Monitor Radio Int'l [T-F]
Radio Australia
Radio Cameroon
Radio Canada Int'l [M-F]
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Int'l [S-F]
Spanish National Radio
Swiss Radio Int'l (eu)
Vatican Radio [T/F]
Voice of America (af)
Voice of America (me)
Voice of Russia
0510
China Radio Int'l*
Radio Australia [M-F]*
0530
BBC (af)*
Radio Austria Int'l
Radio Havana Cuba [T-S]
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 (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Havana Cuba [T-S]
Radio Korea
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [S]
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
0630
BBC (af)*
Radio Austria Int'l [T-S]
Radio Havana Cuba [T-S]
Radio Vlaanderen Int'l
Radio Yemen
Vatican Radio [H]
Voice of Nigeria [M-F]
Voice of Russia
0632
Radio Romania Int'l

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0645
Radio Finland
Radio Romania Int'l
Voice of Nigeria [M-F]*
0655
Voice of Med. (Malta) [M-F]

0700 UTC
(3:00 AM EDT, 12:00 PM PDT)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
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
HCJB
Radio Austria Int'l [T-S]
Radio Netherlands Int'l
Radio Pakistan
Radio Prague
Vatican Radio [M-F]
Voice of Greece [S/H]
Voice of Russia [M-A]
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 (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
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 Netherlands Int'l
Radio Yerevan [S]
Voice of Russia
0855
Voice of Indonesia [A-H]

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Papua New Guinea [M]*
Radio Australia
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
[S]
FEBC (Philippines)
Radio Austria Int'l [M-A]
Radio Netherlands Int'l
Voice of Russia
0940
Voice of Greece
0945
Deutsche Welle [M-F]*
0955
Radio Japan

1000 UTC
(5:00 AM EDT, 3:00 AM PDT)
All India Radio
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
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 America (ca)
Voice of Israel
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 Dubai
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 (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
BBC (south as) [H-T] (Newsdesk)
Canada (North-Quebec) [A-S]
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 (Newsdesk)
Radio Pakistan
Radio Singapore Int'l
Swiss Radio Int'l
Swiss Radio Int'l (eu)
Voice of America (as)
Voice of America (ca)
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-F]
Radio Korea
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 [S-F]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC (af) [M-A]
BBC (am)
BBC (as pac) [M-A]
BBC (eu)
BBC (south as)
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 Canada Int'l [M-F]
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]
WYFR [M-F]
1203
Radio Korea
Voice of Free China
1204
HCJB [M-F]
1210
China Radio Int'l*
1215
BBC (af) [M-A]*
BBC (eu)*
BBC (south as) [M-A]*
1230
HCJB [M-F]*
Radio Austria Int'l
Radio Bangladesh [S-M]
Radio Cairo
Radio Canada Int'l
Radio Finland [M-A]
Radio Netherlands Int'l
Radio Singapore Int'l
Radio Sweden [M-F]
Radio Vlaanderen Int'l [S]
Radio Yugoslavia
Voice of Russia [M-A]
Voice of Turkey
Voice of Vietnam
WYFR [M-F]
1231
Radio France Int'l [T]*
1240
Voice of Greece

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC (af) (Newshour)
BBC (am) (Newshour)
BBC (as pac) (Newshour)
BBC (eu) (Newshour)
BBC (south as) (Newshour)
Canada (North-Quebec) [S]
China Radio Int'l
KNLS
Monitor Radio Int'l [M-A]
Papua New Guinea
Radio Australia
Radio Canada Int'l [S]
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
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 Finland
Radio Netherlands Int'l
Radio Singapore Int'l
Radio Sweden [M-F]
Radio Tashkent
Voice of America (as) (Special English)
Voice of Russia
Voice of Vietnam
1355
Radio Singapore Int'l

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
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*
1415
Radio Nepal
1424
HCJB []
1430
FEBC (Philippines)
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Portugal Int'l [M-F]
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
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 (af)
BBC (am)
BBC (as pac) [A-S]
BBC (eu)
BBC (south as)
Canada (North-Quebec) [A-S]
Channel Africa
China Radio Int'l
Monitor Radio Int'l [M-A]
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 America (me)
Voice of Russia
WINB [M-W/F]
WRNO [W]
WYFR [A]
1503
Radio Pyongyang
1510
China Radio Int'l*
1525
Radio Veritas [T-F]
1528
BBC (af) [M]*
1530
All India Radio*
FEBA (Seychelles)
FEBC (Philippines)
Radio Austria Int'l
Radio Finland

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Radio Netherlands Int'l
Voice of Nigeria [M-H]
Voice of Russia [M-A]
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 M EDT, 9:00 AM PDT)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
Canada (North-Quebec) [A]
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Radio Australia
Radio France Int'l
Radio Jordan
Radio Korea
Radio Norway Int'l [S]
Radio Pakistan
Radio Prague
Radio Tanzania
Radio Tirana
Voice of America (af) [A-S]
Voice of America (as)
Voice of America (me)
Voice of Ethiopia
Voice of Kenya
Voice of Russia
WINB [M-F]
WRNO [M-F]
WYFR [A]
1604
HCJB [M-F]
1610
China Radio Int'l*
1612
Vatican Radio
1615
Radio Sweden
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 America (me) (Special English)
Voice of Ethiopia
Voice of Russia [S-F]
1638
Deutsche Welle [M-F]*
1645
BBC (am) [S-F]*
Radio Canada Int'l [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
Canada (North-Quebec) [A]
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 America (as)
Voice of America (me)
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 Austria Int'l
Radio Netherlands Int'l
Radio Romania Int'l
Radio Sweden [M-F]
Vatican Radio [F]
Voice of Russia
1740
BBC (af) [W-M]*
1745
Radio Yerevan
1755
Radio Japan [A]
Radio New Zealand Int'l [M-H]*
1758
BBC (af) [W]*

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC (af) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
BBC (south as) (Newsdesk)
Monitor Radio Int'l [M-A]
Radio Australia
Radio Cameroon
Radio Mozambique
Radio New Zealand Int'l [M-F]*
Radio Norway Int'l [S]
Radio Omdurman
Radio Tanzania
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
WHRI [M-F]
WINB [M-F]
WWCR #1 [M-F]
WWCR #3 [M-F]
1815
Radio Bangladesh
1830
BBC (af) [A-S]*
R Slovakia Int'l
Radio Kuwait
Radiol de Venezuela [M-A]
Radio Netherlands Int'l
Radio Tirana
Radio Yemen
Radio Yugoslavia
VOA (af) [A-S] (Special English)
Voice of America (me) (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]*
1858
BBC (af) [M-F]*

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

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC (af) (Newshour)
BBC (am)
BBC (as pac) [A]
BBC (eu)
BBC (eu) [S-F]*
China Radio Int'l
Deutsche Welle
KVOH [A-S]
Monitor Radio Int'l [M-A]
Radio Australia
Radio Canada Int'l
Radio New Zealand Int'l
Radio Portugal Int'l [M-F]
Radio Prague
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 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
2055
Radio Canada Int'l [M-F]
Voice of Indonesia [M]
2057
Radio Kuwait

2100 UTC
(5:00 PM EDT, 5:00 PM PDT)
All India Radio
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
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 Romania Int'l
Radio Ukraine Int'l
Radio Vlaanderen Int'l [M-F]
Radio Yugoslavia
Spanish National Radio
Voice of America (af)
Voice of America (as)
Voice of America (me)
Voice of Russia
WWCR #3 [M-F]
2110
China Radio Int'l*
Radio Damascus [S-M]
Radio New Zealand Int'l [S-H]*
2112
Radio Damascus [F]
2115
BBC (af)*
BBC (eu)*
Radio Damascus [T]
2120
Radio Cairo
2130
Radio Cairo
Radio Finland
Radio de Venezuela [M-A]
Radio Sweden [M-F]
Voice of Russia [M-F]
2140
Voice of Greece [S-F]
2145
Radio Damascus [W]
Radio Korea
2155
Radio Japan [A]

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
China Radio Int'l
Monitor Radio Int'l [M-A]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Korea
Radio Yerevan
RAI Italy
Spanish National Radio
Voice of America (as)
Voice of Russia
Voice of Turkey
WWCR #3 [S]
2203
Voice of Free China
2210
China Radio Int'l*
2215
Radio Cairo
2230
Radio Canada Int'l [A-S]
Radio Finland
Radio Yerevan
Voice of America (as) (English)
Voice of Russia
2240
Radio Cairo
Voice of Greece [S-F]
2245
Org. of American States [M-F]*

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
All India Radio
BBC (af)
BBC (am) [S-F]
BBC (as pac)
BBC (eu)
Canada (North-Quebec) [A]
Deutsche Welle
Monitor Radio Int'l [M-A]
Radio Australia
Radio Bulgaria
Radio Canada Int'l [A-S]
Radio Japan
Radio New Zealand Int'l
Radio Vilnius
Voice of America (as)
Voice of Russia
2303
Radio Pyongyang
2315
Radio Cairo
2330
Radio Netherlands Int'l
Radio New Zealand Int'l [S-H]
Radio Vlaanderen Int'l
Voice of Russia
2335
Voice of Greece [S-F]
2355
Radio Japan

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- All Modes Usable Simultaneously
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0000 UTC SHORTWAVE GUIDE 8:00 PM EDT 5:00 PM PDT

FREQUENCIES

0000-0030	Australia, Radio	9610as	13605pa	13745as	17750as
0000-0100 vl	Australia, VL8A Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100	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, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, China Radio Intl	9710na	11715na		
0000-0100 mtwtf	Costa Rica, AWR Alajuela	5030ca	9725am	11870ca	
0000-0027	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		
0000-0004	Lithuania, Radio Vilnius	7150na			
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM/Kota Kinab	5980do			
0000-0100	Malaysia, RTM/Kuching	7160do			
0000-0100	Netherlands, Radio	6020na	6165na	9840na	
0000-0100	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0100	Palau, KHBN/Voice of Hope	15140as	17630as		
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	4780na	6055na	7180na	9620eu
		9810na	11870na		
0000-0100	United Kingdom,BBC London	5965as	5970sa	5975na	6175na
		7325na	9590na	9760as	9915sa
		11750na	11955as	15280as	

0000-0015	United Kingdom,BBC London	6195as	7110as	7180as	9580as
		11945as			
0000-0100	USA, KAIJ Dallas TX	5810am			
0000-0100	USA, KTBN Salt Lk City UT	15590am			
0000-0100	USA, KVOH Los Angeles CA	9785am			
0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	USA, Monitor Radio Intl	7535na	9430am		
0000-0100	USA, VOA Washington DC	5995am	6130am	7215as	7405am
		9455am	9770as	9775am	
		11695am	11760as	13740am	
		15185au	15205am		
		15290as	17735as	17820as	
0000-0100 vl	USA, WEWN Birmingham AL	5825eu	7425na	15695eu	
0000-0100	USA, WHRI Noblesville IN	5745am			
0000-0100	USA, WINB Red Lion PA	15715na			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100 m	USA, WRMI/R Miami Intl	9955am			
0000-0030 twhfa	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WVHA Green Bush ME	7465eu	9852eu		
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	9580pa	9660pa	11795as	
		13605pa	13755as	15240pa	
		15365pa	5415as		
		15510as	17795pa	17860pa	
0030-0100	Ecuador, HCJB Quito	6205am	9745am	15540am	
21455am					
0030-0100	Iran, VOIRI Tehran	7260na	9022na	9670na	
0030-0100	Netherlands, Radio	5905as	7305as		
0030-0100	Russia, Voice of	7105na	7165na	13640as	
0030-0100	Sri Lanka, SLBC Colombo	15425as			
0030-0100	Sweden, Radio	6065sa	9810sa		
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

0024 Radio Exterior de Espana: Distance Unknown. A program for shortwave listeners and DXers.
0025 Radio Netherlands: EuroPress Review. Five-minutes of EuroPress news.
0030 HCJB (am): Musical Mailbag. HCJB staffers have a good time reading listener letters and playing music.
0030 Voice of America (am/ca): Communications World. A look at the people, technologies, economics, and politics involved in modern telecommunications.
0038 Radio Netherlands: Newsline. Correspondent reports, interviews, and commentaries on current events.
0052 Radio Netherlands: Sounds Interesting. Robert Chesal takes listener feedback and incorporates their ideas into the show.

Mondays

0025 Radio Netherlands: Music Break. See S 0225.
0030 HCJB (am): Mountain Meditations. See S 1330.
0036 Radio Netherlands: Happy Station. See S 0137.

Tuesdays

0000 WWCR #3: The Intelligence Report (live). Economic news and investment opportunities from Viking International.
0005 WWCR #1: The Golden Age of Radio Theater. See S 0605.
0025 Radio Netherlands: Press Review. See M 1225.
0030 HCJB (am): Focus on the Family. See M 1330.
0038 Radio Netherlands: Newsline. See S 0038.
0053 Radio Netherlands: Research File. See M 1153.

Wednesdays

0000 WWCR #3: The Intelligence Report (live). See T 0000.
0005 WWCR #1: The Golden Age of Radio Theater. See S 0605.
0025 Radio Netherlands: Press Review. See M 1225.
0030 HCJB (am): Focus on the Family. See M 1330.
0038 Radio Netherlands: Newsline. See S 0038.
0053 Radio Netherlands: Mirror Images. See T 1153.

Thursdays

0000 WWCR #3: The Intelligence Report (live). See T 0000.
0005 WWCR #1: The Golden Age of Radio Theater. See S 0605.
0025 Radio Netherlands: Press Review. See M 1225.
0030 HCJB (am): Focus on the Family. See M 1330.
0038 Radio Netherlands: Newsline. See S 0038.
0053 Radio Netherlands: Documentary. Borders (22nd,29th). See W 1153.

Fridays

0000 WWCR #3: The Intelligence Report (live). See T 0000.
0005 WWCR #1: The Golden Age of Radio Theater. See S 0605.
0025 Radio Netherlands: Press Review. See M 1225.
0030 HCJB (am): Focus on the Family. See M 1330.
0038 Radio Netherlands: Newsline. See S 0038.
0053 Radio Netherlands: Media Network. See H 0152.

Saturdays

0000 WWCR #3: The Intelligence Report (live). See T 0000.
0005 WWCR #1: The Golden Age of Radio Theater. See S 0605.
0025 Radio Netherlands: Press Review. See M 1225.
0030 HCJB (am): Focus on the Family. See M 1330.
0038 Radio Netherlands: Newsline. See S 0038.
0052 Radio Netherlands: Bats,Balls & Baselines. Sports results, news, issues, features, personality profiles, and quizzes.

HAUSER'S HIGHLIGHTS:

USA: WVHA, PROPHECY COUNTDOWN

Summer schedule

Sunday:

0000-0200	9852.5
0200-0300	7465
0900-1000	9870
1000-1100	11930
1100-1200	13770
1300-1400	15745
1500-1700	15665
1700-1900	13720
1900-2000	15745
2200-2400	9852.5

Monday/Wednesday/Friday:

0000-0200	9852.5
1600-1700	15665
1700-1800	17612.5
1800-1900	15745
2200-2400	9852.5

Tuesday and Thursday:

0000-0200	9852.5
0200-0300 Tue only	7465
1300-1400	15745
1500-1700	15665
1700-1800+	13720
1900-2000	15745
2200-2400	9852.5

Saturday:

0100-0200	9852.5
0300-0500	7465
0700-1000	9870
1000-1200	13770
1200-1500	11695
1500-1700	15665
1700-2200	13720
2200-2400	9852.5

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FREQUENCIES

0100-0200	Australia, AF Radio	13525as			
0100-0200	Australia, Radio	9580pa	9660pa	13605pa	13745as
		13755as	15240pa	15245as	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, CHNX Halifax	6130do			
0100-0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Canada, RCI Montreal	6120am	9535am	9755am	11940am
		13670am			
0100-0130	Costa Rica, AWR Alajuela	5030ca	6150sa	7325am	
0100-0200	Costa Rica, R Peace Intl	7385am	9400am	15050am	
0100-0200	Cuba, Radio Havana Cuba	6000na	9830na		
0100-0127	Czech Rep, Radio Prague	7345na	9405na		
0100-0200	Ecuador, HCJB Quito	6205am	9745am	15540am	21455am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9555na
		9640na	11740na	11865na	
0100-0200 m	Guatemala, Radio Cultural	3300do			
0100-0130	Hungary, Radio Budapest	9835na	11910na		
0100-0130	Iran, VOIRI Tehran	7260na	9022na	9670na	
0100-0110	Italy, RAI Rome	9645na	11800na		
0100-0200	Japan, NHK/Radio	5960na	9565na	9680as	11840as
		11860as	11900as	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	
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0130 m	Norway, Radio Norway Intl	7480na	9560na		
0100-0200	Palau, KHBN/Voice of Hope	15140as	17630as		
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
		15180as	15580as	17890as	
0100-0127	Slovakia, R Slovakia Intl	5930na	7300na	9440na	
0100-0200	South Korea, R Korea Intl	7550eu	11810na	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			
0100-0200	USA, KTBN Salt Lk City UT	7510am			
0100-0200	USA, KVOH Los Angeles CA	9975am			
0100-0200	USA, KWHR Naalehu HI	17510as			
0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	USA, VOA Washington DC	5995am	6130am	7405am	9455am
		9775am	13740am	15170as	15205am
		15250as	17740as	21550as	
0100-0200	USA, WEWN Birmingham AL	5825eu	7425na		
0100-0200	USA, WHRI Noblesville IN	5745am			
0100-0200	USA, WINB Red Lion PA	11950na			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	USA, WVHA Green Bush ME	7465eu	9852eu		
0100-0200	USA, WWCR Nashville TN	5065am	5935am	7435am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na		
0100-0130	Yugoslavia, Radio	6195eu			
0130-0150	Greece, Voice of	6260na	7448na	9935na	
0130-0200	Netherlands, Radio	9860as			
0130-0200 twhf	Portugal, Radio	6075na	9570na		
0130-0200	Sweden, Radio	9895au	11695as		
0140-0200	Vatican State, Vatican R	5980as	7335as		

SELECTED PROGRAMS

Sundays

0100 WWCR #1: The Old Record Shop. Thirty minutes of selections of music from the days of the 78 rpm record. Recommended.
0109 HCJB (am): DX Partyline. Rich McVicar and Karen Schmidt share 35 minutes of DXing updates.
0124 Radio Exterior de Espana: Distance Unknown. See S 0024.
0125 Radio Netherlands: Program Info. Summary of upcoming program schedules.
0137 Radio Netherlands: Happy Station. Jonathan Groubert hosts this 66 year old program of family entertainment and talks to listeners around the world.
0145 HCJB (am): What in the World. Reflections on happenings in the news.

Mondays

0109 HCJB (am): Saludos Amigos. An international friendship program with listener contributions.
0125 Radio Netherlands: Music Break. See S 0225.
0136 Radio Netherlands: Fifty Plus. See S 0236.
0145 HCJB (am): Quest. A service of HCJB and the Far East Broadcasting Corporation.
0154 Radio Netherlands: Weekend. See S 0253.

Tuesdays

0100 HCJB (am): Studio 9. World news, features and interviews with Ralph Kurtenback and Curt Cole.
0110 HCJB (am): Features and Interviews. Twenty minutes of magazine programming on Studio 9.
0125 Radio Netherlands: Program Info. See S 0125.
0130 HCJB (am): You Should Know. Len Kinzel looks inside and beyond world headlines.
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

0100 HCJB (am): Studio 9. See T 0100.
0110 HCJB (am): Features and Interviews. See T 0110.
0125 Radio Netherlands: Program Info. See S 0125.
0130 HCJB (am): El Mundo Futuro. The world of science and technology and a "Computer Corner" segment.
0135 Radio Havana Cuba: DXers Unlimited. See S 0234.
0138 Radio Netherlands: Newsline. See S 0038.
0153 Radio Netherlands: Sounds Interesting. See S 0052.

Thursdays

0100 HCJB (am): Studio 9. See T 0100.
0110 HCJB (am): Features and Interviews. See T 0110.
0125 Radio Netherlands: Program Info. See S 0125.
0130 HCJB (am): Ham Radio Today. John Beck with features, tips, news, and helps for radio amateurs.
0138 Radio Netherlands: Newsline. See S 0038.
0152 Radio Netherlands: Media Network. Jonathan Marks and Diana Janssen look at the world of broadcasting. Top-rated.

Fridays

0100 HCJB (am): Studio 9. See T 0100.
0110 HCJB (am): Features and Interviews. See T 0110.
0125 Radio Netherlands: Program Info. See S 0125.
0130 HCJB (am): What's Cooking in the Andes?. Peruse the foods, cooking, and culinary cultures of Latin America with Karen Schmidt.
0138 Radio Netherlands: Newsline. See S 0038.
0153 Radio Netherlands: Research File. See M 1153.

Saturdays

0100 HCJB (am): Studio 9. See T 0100.
0110 HCJB (am): Features and Interviews. See T 0110.
0125 Radio Netherlands: EuroPress Review. See S 0025.
0130 HCJB (am): Musica del Ecuador. Jorge Zambrano presents a unique mix of Ecuadorian music (highly rated).
0138 Radio Netherlands: Newsline. See S 0038.
0154 Radio Netherlands: Documentary. Borders (24th,1 July). See W 1153.
0154 Radio Netherlands: Documentary. See W 1153.

HAUSER'S HIGHLIGHTS:

CZECH REPUBLIC: Radio Prague

To North America
0000-0027 5930, 7345
0100-0127 7345, 9405
0300-0327 5930, 7345
(R. Prague, USENET via George Thurman)

Evening programs, local days of week:
Mon-Fri *News, Current Affairs*
Mon *Magazine 95*
Tue *Talking Point*
Wed *Calling All Listeners*
Thu *Letter from Prague, From the Archives*
Fri *From the Weeklies, I'd Like You to Meet...*
Sat *News, Week in Politics, Economic Report, The Arts*
Sun *News, Musical Feature*
(Pete Costello, via George Thurman)

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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	15240pa	15365pa
		15415as	15510as	17750as	17795pa
		17860pa			
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, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6120na	9535am	9755am	11940am
		13670am			
0200-0300	Costa Rica, R Peace Intl	7385am	9400am	12150am	
0200-0300	Cuba, Radio Havana Cuba	6000na	9820na	9830na	
0200-0300	Ecuador, HCJB Quito	6205am	9745am	15540am	21455am
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	7285as	9615as	9640as	9690as
		11945as	11965as	12045as	
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	New Zealand, R NZ Intl	15115pa			
0200-0300	Palau, KHBN/Voice of Hope	15140as	17630as		
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	13645as
		15180na	15425na	15455na	15580as
0200-0230	Sri Lanka, SLBC Colombo	15425as			
0200-0300	Taiwan, VO Free China	5950na	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			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0300	USA, KVOH Los Angeles CA	9975am			
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
		17740as	21550as		
0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am
		13740am	15120am	15205am	
0200-0300	USA, WEWN Birmingham AL	5825me	7425na		
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	Austria, R Austria Intl	9655na	9870sa	13730sa	
0230-0300	Hungary, Radio Budapest	9835na	11910na		
0230-0245	Pakistan, Radio	7290as	15190as	17705as	17725as
		21730as			
0230-0300	Russia, Voice of	5905na	9850as		
0230-0300	Sweden, Radio	7120na	9850na		
0250-0300	Vatican State, Vatican R	6095na	7305na	9605na	

SELECTED PROGRAMS

Sundays

0200 HCJB (am): Sounds of Joy. Contemporary Christian music.
0225 Radio Netherlands: Music Break. Five-minutes of music at the end of an hour's program.
0230 HCJB (am): Solstice. A musical program from New Zealand for young people.
0234 Radio Havana Cuba: DXers Unlimited. Arnie Coro discusses the technical aspects of shortwave listening.
0236 Radio Netherlands: Fifty Plus. NEW! Pete Myers launches a show that celebrates the joys of being middle-aged.
0253 Radio Netherlands: Weekend. NEW! Maggie Ayre joins colleagues from BBC World Service, Radio France International and Deutsche Welle for a weekly look at issues and themes important throughout Europe.

Mondays

0200 HCJB (am): Radio Reading Room. Readings from new Christian books.
0225 Radio Netherlands: Music Break. See S 0225.
0230 HCJB (am): The Headlines of the Week. Happenings in Ecuador and HCJB.
0235 HCJB (am): HCJB Today. HCJB missionaries share experiences, catch up on events, and play music.
0236 Radio Netherlands: Happy Station. See S 0137.

Tuesdays

0200 HCJB (am): Master Control. A magazine program of current topics, lifestyle issues, and Christian themes.
0205 WWCR #3: Radio Free America (live). Tom Valentine hosts this talk/interview program.
0225 Radio Netherlands: Music Break. See S 0225.
0230 HCJB (am): Classical Favorites. Dawn Lowther and Bill Rapley play popular classical music.
0238 Radio Netherlands: Newsline. See S 0038.
0252 Radio Netherlands: Research File. See M 1153.

Wednesdays

0200 HCJB (am): Unshackled. Pacific Garden Mission's radio drama.
0205 WWCR #3: Radio Free America (live). See T 0205.
0225 Radio Netherlands: Music Break. See S 0225.
0230 HCJB (am): Blues, Rags, and All That Jazz. Bill Rapley selects some of the best in traditional jazz.
0238 Radio Netherlands: Newsline. See S 0038.
0253 Radio Netherlands: Mirror Images. See T 1153.

Thursdays

0200 HCJB (am): The Latest Catch. Richard McVicar presents a midweek update of the latest in shortwave listening.
0205 WWCR #3: Radio Free America (live). See T 0205.
0215 HCJB (am): The Book Nook. A new book-reading program hosted by Marita Regier.
0225 Radio Netherlands: Music Break. See S 0225.
0230 HCJB (am): Sounds of Joy. See S 0200.
0238 Radio Netherlands: Newsline. See S 0038.
0254 Radio Netherlands: Documentary. Borders (22nd,29th). See W 1153.
0254 Radio Netherlands: Documentary. See W 1153.

Fridays

0200 HCJB (am): Unshackled. See W 0200.
0205 WWCR #3: Radio Free America (live). See T 0205.
0225 Radio Netherlands: Music Break. See S 0225.
0230 HCJB (am): Woman to Woman. Focus on topics of concern.
0238 Radio Netherlands: Newsline. See S 0038.
0252 Radio Netherlands: Media Network. See H 0152.

Saturdays

0200 HCJB (am): On-Line. A magazine program of music, politics, arts, and science in Europe.
0205 WWCR #3: Radio Free America (live). See T 0205.
0225 Radio Netherlands: Music Break. See S 0225.
0230 HCJB (am): On Track. Good comtemporary music and helpful thoughts.
0238 Radio Netherlands: Newsline. See S 0038.
0252 Radio Netherlands: Bats,Balls & Baselines. See A 0052.

THANK YOU ...

ADDITIONAL CONTRIBUTORS TO THIS MONTH'S SHORTWAVE GUIDE:

John Babbis, Silver Spring, MD; Jeff Demers, Manchester, NH; Paul R. Donegan, Glendale, CA; Bob Fraser, Cohasset, MA; Clyde Harmon, Anniston, AL; Rev. Michael G. Mayer, Dover, DE; Robert E. Thomas, Bridgeport, CT; Loyd Van Horn, Brasstown, NC; BBCMS; *BBC Worldwide*; BBC *Summary of World Broadcasts*; Grove Enterprises BBS; Internet Shortwave Newsgroup via Larry Van Horn.

HAUSER'S HIGHLIGHTS:

GUAM:

KTWR (via HCJB *DXPL*)
Summer schedules in English:

0755-0915	Far East 15200
0855-1000	S. Pacific 11830
1500-1615 mt	S. Asia 11580
1500-1630 whas	

KSDA (via Bill Flynn, CA)
0900-1000 9530
1600-1700 9370
2300-2400 11980

RadioMap™

Transmitter sites in your area are researched and marked on a beautiful 8-1/2 x 11 full color plot. See FCC licensed sites from VLF through microwave including police, fire, cellular phone sites, business, industrial, broadcasters and selected FAA transmitter sites. Callsigns, frequency assignments, and names provided. Ham radio stations not included.

You choose the map center location–your neighborhood, near your office, around sports stadiums–anywhere within the United States. We adjust map coverage for best readability, depending on transmitter site density.

Invaluable to radio professionals and hobbyists for identifying towers, sources of radio interference etc. Send nearest street intersection and check for $25.95 payable to Robert Parnass.

Robert Parnass, M.S.
Radio Electronics Consulting
2350 Douglas Road, Oswego, IL 60543

www.americanradiohistory.com

FREQUENCIES

0300-0400	Australia, Radio	9580pa	9660pa	15240pa	15245as
		15365pa	15510as	17750pa	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, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9710na	11715na	
0300-0400	Costa Rica, R Peace Intl	7385am	9400am		
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0400	Cuba, Radio Havana Cuba	6000na	9820na	9830na	
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB Quito	6205am	9745am	15540am	21455am
0300-0330	Egypt, Radio Cairo	9475na			
0300-0330	Germany, Deutsche Welle	6085na	6185na	9535na	9615na
		9640na	11750na		
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Japan, NHK/Radio	9680na	11840as	11885na	11895na
		15230na	17810as		
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	New Zealand, R NZ Intl	15115pa			
0300-0400	Palau, KHBN/Voice of Hope	15140as	17630as		
0300-0400 vl	Papua New Guinea, NBC	4890do	9675do		
0300-0400	Russia, Voice of	5905na	5940na	6035eu	7105na
		7180na	7225na	7270na	9825na
		12050na	13645na	15180na	15425na
0300-0400	S Africa, Channel Africa	3220af	5955af		

0300-0400	Taiwan, VO Free China	5950na	9680na	11745as	11825as
		15345as			
0300-0400	Thailand, Radio	11890na			
0300-0400	Turkey, Voice of	9445na			
0300-0400	Ukraine, R Ukraine Intl	4870na	6055na	7180na	9810na
		11790na	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	9975am			
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, WHRI Noblesville IN	5745am			
0300-0400	USA, WINB Red Lion PA	11950eu			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400 vl	USA, WRNO New Orleans LA	7355am			
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	Greece, Voice of	6260na	7448na	9935na	
0320-0350	Vatican State, Vatican R	5865af	7360af	9725af	
0330-0357	Czech Rep, Radio Prague	9480as			
0330-0400 fas	Mongolia, R Ulan Bator	7290na	12000na		
0330-0400	Swaziland, Trans World R	7215af	9500af		
0330-0400	Sweden, Radio	7120na	9850na		
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

0300 HCJB (am): Sports Spectrum. News from the world of sports.
0319 Radio Havana Cuba: Feature Report. In-depth coverage of a news item from another country of the hemisphere.
0330 HCJB (am): Songtime Weekend. Evangelical teachings and music from Boston.
0336 Radio Havana Cuba: Feature Report. See S 0319.

Mondays

0300 HCJB (am): The Sower. Michael Guido presents music and inspiration.
0300 Radio Havana Cuba: Sunday Edition. RHC's two-hour magazine of features, reports, and music.
0314 Radio Havana Cuba: The Mailbag Show. Listener letters and E-mail are reviewed and answered.
0315 HCJB (am): The Word Today. A discussion of Biblical themes.
0330 HCJB (am): Sounds of Joy Worldwide. Dave Freeland hosts a program of Christian music.
0331 Radio Havana Cuba: The Jazz Place. A half-hour of the best of Cuban jazz.

Tuesdays

0300 HCJB (am): Chords of Love. Music to encourage you.
0305 WWCR #3: Radio Free America (live). See T 0205.
0315 HCJB (am): Rendezvous. Dick Saunders presents Bible study and evangelism.
0318 Radio Havana Cuba: Spotlight on the Americas. Comments by the RHC editorial desk.
0330 HCJB (am): Let My People Think. See M 1100.
0336 Radio Havana Cuba: Feature Report. See S 0319.

Wednesdays

0300 HCJB (am): Psychology for Living. Christian advice on issues of today.
0305 WWCR #3: Radio Free America (live). See T 0205.
0315 HCJB (am): Rendezvous. See T 0315.
0318 Radio Havana Cuba: Spotlight on the Americas. See T 0318.
0330 HCJB (am): Stories of Great Christians. Radio drama with Christian theme from the Moody Bible Institute.
0335 Radio Havana Cuba: DXers Unlimited. See S 0234.
0345 HCJB (am): Wonderful Words of Life. Messages from the Salvation Army.
0350 Radio Havana Cuba: Feature Report. See S 0319.

Thursdays

0300 HCJB (am): CBF Presents. Christian activities in the Caribbean.
0305 WWCR #3: Radio Free America (live). See T 0205.
0315 HCJB (am): Rendezvous. See T 0315.
0318 Radio Havana Cuba: USA Report. Events such as strikes, crime, and unrest are played up.
0330 HCJB (am): The Living Word. See T 1100.
0336 Radio Havana Cuba: Feature Report. See S 0319.

Fridays

0300 HCJB (am): Connecting Points. See S 1530.
0305 WWCR #3: Radio Free America (live). See T 0205.
0315 HCJB (am): Rendezvous. See T 0315.
0319 Radio Havana Cuba: Spotlight on the Americas. See T 0318.
0330 HCJB (am): Christian Brotherhood Hour. See S 1130.
0335 Radio Havana Cuba: Feature Report. See S 0319.

Saturdays

0300 HCJB (am): Science, Scripture and Salvation. Proving scientific principles with the Bible.
0305 WWCR #3: Radio Free America (live). See T 0205.
0315 HCJB (am): Rendezvous. See T 0315.
0316 Radio Havana Cuba: Feature Report. See S 0319.
0330 HCJB (am): Adventures in Odyssey. Lively childrens' dramas from the "Focus on the Family" team.
0335 Radio Havana Cuba: Feature Report. See S 0319.

The 1995 Spring/ Summer staff for Radio Netherlands includes a lot of new voices. Jonathan Marks, Director of Programming is on the left, 3rd row.

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

FREQUENCIES

0400-0500	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415pa	15510pa	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	9700na	11720na		
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	9650me	11835me	11905me	15275me
0400-0500	China, China Radio Intl	9730na			
0400-0500	Costa Rica, R Peace Intl	7385am	9400am		
0400-0500	Cuba, Radio Havana Cuba	6000na	6180na	9820na	9830na
0400-0430	Ecuador, HCJB Quito	6205am	9745am	15540am	21455am
0400-0450	Germany, Deutsche Welle	6015af	6120af	6185af	7150af
		7225af	9565af	9765af	11765af
0400-0500 twtfa	Guatemala, Radio Cultural	3300do			
0400-0415	Israel, Kol Israel	7465na	9435na		
0400-0500	Kenya, Kenya Broadc Corp	4885do	4935do		
0400-0500 s	Lebanon, Wings of Hope	9960me			
0400-0500 smtwh	Malaysia, Radio	7295do			
0400-0458	New Zealand, R NZ Intl	15115pa			
0400-0430 m	Norway, Radio Norway Intl	7480na			
0400-0500	Palau, KHBN/Voice of Hope	15140as	17630as		
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	9620eu
		9705na	9825na	12050na	15180na
		15295na	15425na		
0400-0500	S Africa, Channel Africa	3220af	5955af		
0400-0427	S Africa, Trans World R	7165af			
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
		7160as	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	9975am			
0400-0500	USA, KWHR Naalehu HI	17780as			
0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	USA, VOA Washington DC	3985eu	5995eu	6010eu	6040eu
		6140af	6873af	7170me	7200eu
		7340af	9885af	11965me	15205me
0400-0500	USA, WEWN Birmingham AL	6000na			
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	Netherlands, Radio	6165na	9590na		
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	7280af	7405af	9575af	15300af
0430-0457	Yugoslavia, Radio	7115eu			
0455-0500	Nigeria, FRCN/Voice of	7255af			
0459-0500	New Zealand, R NZ Intl	9570pa			

SELECTED PROGRAMS

Sundays

0400 HCJB (am): Joni and Friends. Joni Erickson-Tada presents help and advice especially for the disabled.
0405 HCJB (am): Hour of Decision. Evangelist Billy Graham's radio program.
0417 Radio Havana Cuba: Feature Report. See S 0319.
0430 HCJB (am): Afterglow. Don Johnson plays religious music.
0434 Radio Havana Cuba: DXers Unlimited. See S 0234.
0438 Radio Netherlands: Newsline. See S 0038.
0453 Radio Netherlands: Sounds Interesting. See S 0052.

Mondays

0400 HCJB (am): Songs in the Night. See S 1100.
0400 Radio Havana Cuba: Sunday Edition (from 0300). The second hour of RHC's two-hour magazine of features, reports, and music.
0400 WWCR #1: The Old Record Shop. See S 0100.
0430 HCJB (am): Afterglow Classics. See S 1630.
0430 Radio Havana Cuba: Breakthrough. Arnie Coro's weekly science and technology update.
0435 Radio Havana Cuba: From Havana. A showcase of Cuban music.
0436 Radio Netherlands: Happy Station. See S 0137.

Tuesdays

0400 HCJB (am): Insight for Living. See M 1130.
0400 WWCR #3: The Hour of the Time (live). William Cooper talk show.
0413 Radio Havana Cuba: Spotlight on the Americas. See T 0318.
0430 HCJB (am): Nightsounds. See M 1100.
0433 Radio Havana Cuba: Timeout. Five minutes of Cuban sports coverage.
0438 Radio Netherlands: Newsline. See S 0038.
0439 Radio Havana Cuba: Feature Report. See S 0319.
0453 Radio Netherlands: Research File. See M 1153.

Wednesdays

0400 HCJB (am): Insight for Living. See M 1130.
0400 WWCR #3: The Hour of the Time (live). See T 0400.
0417 Radio Havana Cuba: Feature Report. See S 0319.
0430 HCJB (am): Nightsounds. See M 1100.
0436 Radio Havana Cuba: Timeout. See T 0433.
0438 Radio Netherlands: Newsline. See S 0038.
0441 Radio Havana Cuba: Feature Report. See S 0319.
0453 Radio Netherlands: Mirror Images. See T 1153.

Thursdays

0400 HCJB (am): Insight for Living. See M 1130.
0400 WWCR #3: The Hour of the Time (live). See T 0400.
0418 Radio Havana Cuba: Feature Report. See S 0319.
0430 HCJB (am): Nightsounds. See M 1100.
0435 Radio Havana Cuba: Timeout. See T 0433.
0438 Radio Netherlands: Newsline. See S 0038.
0453 Radio Netherlands: Documentary. Borders (22nd,29th). See W 1153.
0453 Radio Netherlands: Documentary. See W 1153.

Fridays

0400 HCJB (am): Insight for Living. See M 1130.
0400 WWCR #3: The Hour of the Time (live). See T 0400.
0417 Radio Havana Cuba: Feature Report. See S 0319.
0430 HCJB (am): Nightsounds. See M 1100.
0436 Radio Havana Cuba: Timeout. See T 0433.
0438 Radio Netherlands: Newsline. See S 0038.
0441 Radio Havana Cuba: Cuba Today. A slice of life in Havana.
0453 Radio Netherlands: Media Network. See H 0152.

Saturdays

0400 HCJB (am): Insight for Living. See M 1130.
0400 WWCR #3: The Hour of the Time (live). See T 0400.
0420 Radio Havana Cuba: Latin America Newsline. News from the countries of Central and South America.
0430 HCJB (am): Nightsounds. See M 1100.
0435 Radio Havana Cuba: Timeout. See T 0433.
0438 Radio Netherlands: Newsline. See S 0038.
0440 Radio Havana Cuba: Feature Report. See S 0319.
0453 Radio Netherlands: Bats,Balls & Baselines. See A 0052.

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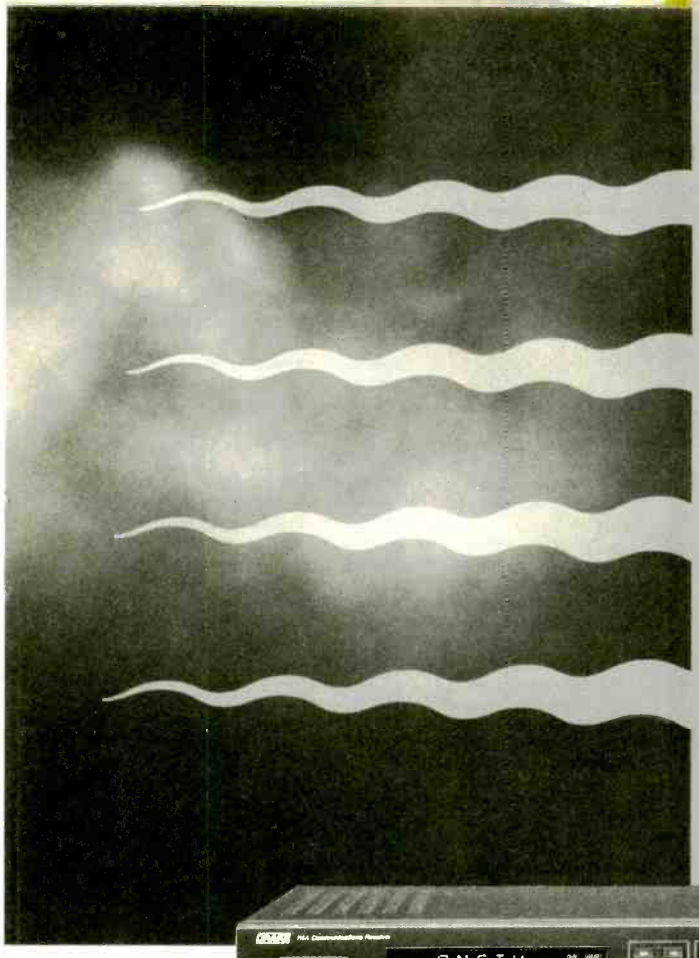

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0500 UTC SHORTWAVE GUIDE 1:00 AM EDT 10:00 PM PDT

FREQUENCIES

0500-0600	Australia, AF Radio	13525as			
0500-0600	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15245as	15365pa	15415as	17715pa
		17795as	17860pa		
0500-0600 vl	Australia, VL8A Alice Spg	4835do			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Bahrain, Radio	6010do			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0530 mtwhf	Canada, RCI Montreal	6050eu	7295eu	15430af	17840af
0500-0600	Costa Rica, AWR Alajuela	6150am			
0500-0600	Costa Rica, R Peace Intl	7385am	9400am		
0500-0600	Cuba, Radio Havana Cuba	9820na	9830na		
0500-0600	Ecuador, HCJB Quito	9745am			
0500-0600 as	Eqt Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	6175na	6185na	9515na
		11705na			
0500-0600 mtwh/vl	Italy, IRRS Milan	7125va			
0500-0600	Japan, NHK/Radio	5975eu	6110na	7230eu	9680na
		11740as	11885na	11955as	17810as
0500-0600	Kenya, Kenya Broadc Corp	4885do	4935do		
0500-0600 s	Lebanon, Wings of Hope	9960me			
0500-0525	Netherlands, Radio	6165na	9590na		
0500-0600	New Zealand, R NZ Intl	9570pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4990do		
0500-0600	Nigeria, FRCN/Voice of	7255af			
0500-0600	Palau, KHBN/Voice of Hope	15140as	17630as		
0500-0600 vl	Papua New Guinea, NBC	4890do	9675do		
0500-0600	Russia, Voice of	5905eu	5930eu	7105na	7175eu
		7270na	7345na	9705as	9850na
		9865as	9895as	12010na	12050na
		17890as			
0500-0600	S Africa, Channel Africa	5955af	9695af		
0500-0545 f	Seychelles, FEBA Radio	15555me			
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	6165eu	9535eu		
0500-0502	Uganda, Radio	4976do			
0500-0600	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	7160as
		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	9975am			
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	9575af
		9630af	11965af	12080af	15205me
		15600af			
0500-0600	USA, WEWN Birmingham AL	6000na			
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, WVHA 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	15510as	15565as	17880as	
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Finland, YLE/Radio	6120eu	9635af	11755me	
0530-0600	Romania, R Romania Intl	11810af	15250af	15340af	17745af
		17790af			
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

0500 WWCR #1: World of Radio. Glenn Hauser's communications program for shortwave radio listeners.
0509 HCJB (am): DX Partyline. See S 0109.
0511 Radio Exterior de Espana: Spanish Golden Oldies. Popular music classics of Spain.
0524 Radio Exterior de Espana: Distance Unknown. See S 0024.
0534 Radio Exterior de Espana: A Gallery of Spanish Voices. The great Spanish opera singers and the light operas of Spain.
0545 HCJB (am): What in the World. See S 0145.

Mondays

0509 HCJB (am): Saludos Amigos. See M 0109.
0512 Radio Exterior de Espana: Visitors Book. Who's visiting Spain this week.
0522 Radio Exterior de Espana: Spain Step-by-Step. A journey to all corners of Spain, both present and future.
0545 HCJB (am): Quest. See M 0145.
0545 Radio Exterior de Espana: Radio Club. Listener letters are answered and music requests played.

Tuesdays

0500 HCJB (am): Studio 9. See T 0100.
0510 HCJB (am): Features and Interviews. See T 0110.
0515 Radio Exterior de Espana: Panorama. A magazine program focusing on everything that's happening in Spain.
0523 Radio Exterior de Espana: Press Review. Review of the Spanish press.
0527 Radio Exterior de Espana: Sports Spotlight. Summary of the weekend's sports results.
0530 HCJB (am): You Should Know. See T 0130.
0538 Radio Exterior de Espana: Cultural Encounters. Highlighting cultural interaction between Spain and North America.
0549 Radio Exterior de Espana: Spanish Course by Radio. A course in Spanish with English commentary.

Wednesdays

0500 HCJB (am): Studio 9. See T 0100.
0510 HCJB (am): Features and Interviews. See T 0110.
0516 Radio Exterior de Espana: Panorama. See T 0515.
0522 Radio Exterior de Espana: Press Review. See T 0523.
0529 Radio Exterior de Espana: Review of the Spanish Economy. Spain's status in financial matters.
0530 HCJB (am): El Mundo Futuro. See W 0130.
0535 Radio Havana Cuba: DXers Unlimited. See S 0234.
0536 Radio Exterior de Espana: Entertainment in Spain. Current favorites from the world of stage and screen.
0549 Radio Exterior de Espana: Spanish Course by Radio. See T 0549.

Thursdays

0500 HCJB (am): Studio 9. See T 0100.
0510 HCJB (am): Features and Interviews. See T 0110.
0516 Radio Exterior de Espana: Panorama. See T 0515.
0522 Radio Exterior de Espana: Press Review. See T 0523.
0529 Radio Exterior de Espana: As Others See Us. Review of the foreign press.
0530 HCJB (am): Ham Radio Today. See H 0130.
0539 Radio Exterior de Espana: The Natural World (biweekly). Ecological and environmental news and developments.
0541 Radio Exterior de Espana: Science Desk (biweekly). Developments in science and technology.
0549 Radio Exterior de Espana: Spanish Course by Radio. See T 0549.

Fridays

0500 HCJB (am): Studio 9. See T 0100.
0510 HCJB (am): Features and Interviews. See T 0110.
0516 Radio Exterior de Espana: Panorama. See T 0515.
0522 Radio Exterior de Espana: Press Review. See T 0523.
0528 Radio Exterior de Espana: People of Today. Focus on a Spaniard of note.
0530 HCJB (am): What's Cooking in the Andes?. See F 0130.
0538 Radio Exterior de Espana: Cultural Clippings. What's going on in Spain.
0549 Radio Exterior de Espana: Spanish Course by Radio. See T 0549.

Saturdays

0500 HCJB (am): Studio 9. See T 0100.
0500 WHRI: World of Radio. Glenn Hauser's communications program for shortwave radio listeners.
0510 HCJB (am): Features and Interviews. See T 0110.
0516 Radio Exterior de Espana: Panorama. See T 0515.
0522 Radio Exterior de Espana: Press Review. See T 0523.
0529 Radio Exterior de Espana: Window on Spain. A different region of Spain is described each week.
0530 HCJB (am): Musica del Ecuador. See A 0130.
0539 Radio Exterior de Espana: Arts in Spain. A review of cultural activities.
0549 Radio Exterior de Espana: Spanish Course by Radio. See T 0549.

HAUSER'S HIGHLIGHTS

SWITZERLAND: SWISS RADIO INTERNATIONAL

Summer schedule still shows only feature broadcast is 0430-0500 on 9905 via French Guiana.
English to N.America
0100-0130 on 9885, 6135, Brazil 5885 (5888)
0400-0430 on 9905, 9885, 6135
Also try to Africa
2000-2030 on 9885, 11640, 13635, Guiana 9770.
(PTT)
UN Radio testing 10460 at 1805 giving phone and fax
(Al Penney, PQ, CIDX *Messenger*)

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FREQUENCIES

0600-0630	Australia, AF Radio	13525as			
0600-0700	Australia, Radio	11910pa	13605as	13755pa	15510as
		17715as	17795as		
0600-0630	Australia, Radio	15240pa	15415pa		
0600-0700 vl	Australia, VL8A Alice Spg	4835do			
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0700	Bahrain, Radio	6010do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0630 mtwhf	Canada, RCI Montreal	6050eu	6150eu	9760eu	11905me
0600-0700	Costa Rica, R Peace Intl	7385am	9400am		
0600-0700	Cuba, Radio Havana Cuba	9820na			
0600-0630	Czech Rep, Radio Prague	7345eu	15640eu		
0600-0700	Ecuador, HCJB Quito	9745am			
0600-0700 as	Eqt Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	11915af	11960af	13790af	15185af
		15205af	17820af	17875af	21680af
0600-0615	Ghana, Ghana Broadc Corp	3316do	4915do		
0600-0700 mtwh/vl	Italy, IRRS Milan	7125va			
0600-0700	Japan, NHK/Radio	11955as	17810as		
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 mtwhfa	Malta, V of Mediterranean	9765me			
0600-0635 s	Malta, V of Mediterranean	9765me			
0600-0700	New Zealand, R NZ Intl	9570pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4990do		
0600-0700	Nigeria, FRCN/Voice of	7255af			
0600-0630 m	Norway, Radio Norway Intl	15175pa			
0600-0700	Palau, KHBN/Voice of Hope	15140as	17630as		
0600-0700 vl	Papua New Guinea, NBC	4890do	9675do		
0600-0700	Russia, Voice of	5905eu	5930eu	7175na	7270na
		7345na	9850as	9895as	11710na
		12010na	12040na	12050na	17620as
		17890as			
0600-0700 vl	Slovakia, AWR	7215as			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, R Korea Intl	7205na	11945na		
0600-0700	Swaziland, Swazi Radio	6155af			
0600-0700	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0600-0630	Switzerland, Swiss R Intl	6165eu	9885af	13635af	15340af
0600-0615 s	Uganda, Radio	4976do	7110do		
0600-0700	United Kingdom,BBC London	3955eu	6005af	6190af	6195eu
		7160af	9410af	9600af	9640na
		11760as	11780eu	11940af	11955as
		12095me	15070af	15280as	15310as
		15360me	15400af	15420af	15575af
		17790as			
0600-0630	United Kingdom,BBC London	6180eu			
0600-0700	USA, KAIJ Dallas TX	5810am			
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	3985eu	5995eu	6035af	6040eu
		6060eu	6140af	6873eu	7170me
		7325me	7405af	9530af	11805af
		11965eu	12080af	15205me	15600af
0600-0630	USA, VOA Washington DC	6035af	7405af	9630af	9665af
		11950af	12035af	12080af	
0600-0700	USA, WEWN Birmingham AL	6000na			
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		
0630-0700	Australia, Radio	5995as	6020pa	6080pa	9580pa
		9860pa	15245as		
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Belgium, R Vlaanderen Int	5985eu	9925au		
0631-0640	Romania, R Romania Intl	7225eu	9550eu	9665eu	11810eu
0640-0700 mtwhfs	Monaco, Trans World Radio	7115eu			
0640-0700	Vatican State, Vatican R	5865af	7360af	9660af	11625af
0645-0700	Romania, R Romania Intl	15205pa	17720pa	17805pa	
0645-0700 s	Romania, R Romania Intl	11775pa	15335pa		

SELECTED PROGRAMS

Sundays
0600 HCJB (am): Solstice. See S 0230.
0605 WWCR #3: The Golden Age of Radio Theater. Relive the golden moments of radio's yesteryear.
0630 HCJB (am): Musical Mailbag. See S 0030.
0634 Radio Havana Cuba: DXers Unlimited. See S 0234.
0635 Radio Vlaanderen Int'l: Radio World. Updates to international broadcasting schedules.
0640 Radio Monte Carlo: Evidence.
0645 Radio Monte Carlo: Christian Brotherhood Hour.

Mondays
0600 HCJB (am): Radio Reading Room. See M 0200.
0630 HCJB (am): The Sower. See M 0300.
0640 Radio Monte Carlo: Arise!
0645 HCJB (am): Glorious Intentions. Paul Bell of HCJB examines principles to guide you in facing life in our times.
0645 Radio Monte Carlo: Bible Focus.

Tuesdays
0600 HCJB (am): Master Control. See T 0200.
0600 WWCR #1: Sound Currents of the Spirit. James Bean.
0630 HCJB (am): Classical Favorites. See T 0230.
0640 Radio Monte Carlo: Arise!
0645 Radio Monte Carlo: Bible Focus.

Wednesdays
0600 HCJB (am): Unshackled. See W 0200.
0630 HCJB (am): Blues, Rags, and All That Jazz. See W 0230.
0640 Radio Monte Carlo: Arise!
0645 Radio Monte Carlo: Bible Focus.

Thursdays
0600 HCJB (am): The Latest Catch. See H 0200.
0600 WWCR #1: Rock the Universe. Rich Adcock's selections of rock recordings includes some rare treats.
0615 HCJB (am): The Book Nook. See H 0215.
0630 HCJB (am): Sounds of Joy. See S 0200.
0640 Radio Monte Carlo: Arise!
0645 Radio Monte Carlo: Bible Focus.

Fridays
0600 HCJB (am): Unshackled. See W 0200.
0630 HCJB (am): Woman to Woman. See F 0230.
0640 Radio Monte Carlo: Arise!
0645 Radio Monte Carlo: Bible Focus.

Saturdays
0600 HCJB (am): On-Line. See A 0200.
0630 HCJB (am): On Track. See A 0230.
0640 Radio Monte Carlo: Arise!
0645 Radio Monte Carlo: Family Bible Hour.

Donald Michael Choleva of Euclid, Ohio sends MT this QSL from Radio Sweden.

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FREQUENCIES

0700-0800	Australia, Radio	6020pa	6080pa	9580pa	9710pa
		15240pa	15565as	17695as	
0700-0730	Australia, Radio	13605as	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, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R Peace Intl	7385am	9400am		
0700-0800	Ecuador, HCJB Quito	6135pa	6205as		
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	11850as
		11955as	15335me	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	9570pa			
0700-0759 as	New Zealand, R NZ Intl	9570pa			
0700-0800	Palau, KHBN/Voice of Hope	9830as	17630as		
0700-0800 vl	Papua New Guinea, NBC	4890do	9675do		
0700-0715 s	Romania, R Romania Intl	11775pa	15335pa		
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	9785am			
0700-0800	USA, KWHR Naalehu HI	9930as			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	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		
0702-0800 as	New Zealand, R NZ Intl	6100pa			
0703-0710 mtwhfa	Croatia, Croatian Radio	5895eu	7370eu	9830eu	13830eu
0717-0800 mtwhf	New Zealand, R NZ Intl	6100pa			
0730-0800	Australia, Radio	9660pa	9710pa	17880as	
0730-0800	Austria, R Austria Intl	6155eu	13730eu		
0730-0800 mtwhfa	Austria, R Austria Intl	15410me	17870me		
0730-0757	Czech Rep, Radio Prague	15640af			
0730-0800	Georgia, Radio	11805eu			
0730-0745	Greece, Voice of	9375au	9425eu	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		
0755-0800	Guam, AWR/KTWR	15200as			

0800 UTC

0800-0900	Australia, AF Radio	15607af	18193af		
0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	17715as	21725as
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R Peace Intl	9400am			
0800-0830	Ecuador, HCJB Quito	6135eu	6205eu		
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 mtwhfs	Monaco, Trans World Radio	7115eu			
0800-0805 a	Monaco, Trans World Radio	7115eu			
0800-0825	Netherlands, Radio	9720pa	11895pa		
0800-0900	New Zealand, R NZ Intl	6100pa			
0800-0830 m	Norway, Radio Norway Intl	15220me			
0800-0850	Pakistan, Radio	15625eu	17900eu		
0800-0900	Palau, KHBN/Voice of Hope	9830as	17630as		
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	13670me		
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	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	9425pa		
0800-0900	USA, WEWN Birmingham AL	5965sa	7425na		
0800-0900	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		
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	Netherlands, Radio	9720pa	9895pa	13700pa	
0830-0857	Slovakia, R Slovakia Intl	11990au	15640au	17485au	
0855-0900	Guam, TWR/KTWR	11830pa			

Joe Bernard, Radio for peace Inernational's Program Coordinator.

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RF systems

High quality, high performance antennas and accessories from the Netherlands.

Magnetic Longwire Balun *(shown at right)* — Effectively isolates the antenna element from the coaxial feedline to reduce electrical noise. MLB available separately, or with 12.5 or 20 meter longwire antenna.

DX-7 Active Antenna *(shown at left)* — Comapct helical HF receiving antenna covers 50 kHz — 35 MHz. Elliptical polarization helps minimize selective fading distortion. Mount indoors or outdoors. Optional power supply/control unit adjusts gain.

DX-1 PRO Active Antenna— The ultimate low-noise HF active antenna. Designed for professional receiving applications, covers 20 kHz—54 MHz with +50 dBm 3rd order ICP, vertical and horizontal polarization. Includes control unit w/power supply.

DX-10 Active Antenna — Low cost, high quality active antenna for SW, MW & LW. Helical antenna element for high sensitivity. A perfect choice for mid-priced tabletop and portable receivers.

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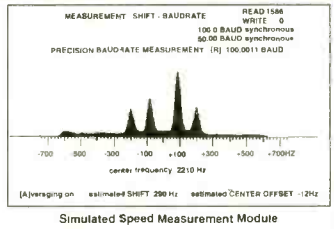
Many radio amateurs and SWLs are puzzled! Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amtor you'll know - but what about the many other signals?



Simulated Speed Measurement Module

There are some well known CW/RTTY Decoders but then there is CODE-3. It's up to you to make the choice, but it will be easy once you see CODE-3. CODE-3 has an exclusive auto-classification module that tells YOU what you're listening to AND automatically sets you up to start decoding. No other decoder can do this on ALL the modes listed below - and most more expensive decoders have no means of identifying ANY received signals! Why spend more money for other decoders with FEWER features? CODE-3 works on any IBM-compatible computer with MS-DOS with at least 640kb of RAM, and a CGA monitor. CODE-3 includes software, a complete audio to digital FSK converter with built-in 115V ac power supply, and a RS-232 cable, ready to use.

CODE-3 is the most sophisticated decoder available for ANY amount of money, and the best news of all, is that it is available from a United States dealer.

26 Modes included in standard package include:

- Morse
- RTTY/Baudot/Murray
- Sitor CCIR 625/476-4
- ARQ - Navtex
- AX25 Packet
- Facsimile all RPM (up to 16 gray shades at 1024 x 768 pixels
- Autospec - Mk's I and II
- DUP-ARQ Artrac
- Twinplex
- ASCII
- ARQ6-90/98
- SI-ARQ/ARQ-S
- SWED-ARQ-ARQ-SWE
- 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 • FEC100 Simplex
- Sports info 300 baud ASCII
- Hellschreiber-Synch/ASynch
- Sitor • RAW (Normal Sitor but without Synch
- ARQ6-70
- Baudot F788N
- Pactor
- WEFAX

Available as extra options

Option 3 Piccolo ...$85.00
Option 4 Coquelet ...$85.00
Option 5 4 special ARQ & FEC systems TORG-10/11, ROU-FEC/ RUM-FEC, HC-ARQ (ICRC) and HNG-FEC.....$115.00
Option 8 SYNOP decoder..$85.00

- All modes in typical baud rates with possibility of changing to any desired value of speed and shift.
- All options are available from the main menu, saving or loading to and from hard/floppy drive in bit form, means no loss of unknown signals!
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- CYBERSCAN function allows scan file tracking control of systems employing frequency hopping techniques.
- Spectrum log at speeds in excess of 1300 channels a minute, generate a real time histogram of activity and create scan database file automatically.
- Birdie log during frequency search automatically characterizes your R7000, then locks out those frequencies.
- Activity log function continuously monitors and logs all frequencies of a scan database while displaying active, was active and never active channels.

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

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FREQUENCIES

0900-1000	Australia, AF Radio	15607af	18193af		
0900-1000	Australia, Radio	7240as	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	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa		
0900-1000	Costa Rica, R Peace Intl	9400am			
0900-1000	Ecuador, HCJB Quito	6135pa			
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	17715as	17780as	21600af
		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	11850au	15190as	
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	6100pa			
0900-1000 mtwtf	Nigeria, FRCN/Radio	3326do	4990do		
0900-1000	Nigeria, FRCN/Voice of	7255af			
0900-1000	Palau, KHBN/Voice of Hope	9830as	17630as		
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	15620as			
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	9430as	13615pa
0900-1000	USA, WEWN Birmingham AL	5965sa	7425na		
0900-1000	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		
0930-0945 s	Armenia, Radio Yerevan	15275eu	15370eu		
0930-1000 mtwhfa	Austria, R Austria Intl	6155eu	13730pa	17870pa	
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		

1000 UTC

1000-1100	Australia, AF Radio	13525as			
1000-1100	Australia, Radio	7240as	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, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa		
1000-1100	Costa Rica, R Peace Intl	9400am			
1000-1100	Ecuador, HCJB Quito	6135as			
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			
1000-1030	Israel, Kol Israel	15640na	15650eu	17575eu	
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	6100pa			
1000-1100	Nigeria, FRCN/Radio	4990do	7285do		
1000-1100	Nigeria, FRCN/Voice of	7255af			
1000-1100	Palau, KHBN/Voice of Hope	9830as	17630as		
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	
1000-1030	Switzerland, Swiss R Intl	6165eu	9535eu		
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, 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	9840as	12020as	15010as	
1003-1010 s	Croatia, Croatian Radio	5895eu	7370eu	9830eu	13830eu
1020-1030 mtwtfa	Vatican State, Vatican R	11740af	15210af	17585me	
1030-1100	Austria, R Austria Intl	17870pa			
1030-1100	Czech Rep, Radio Prague	7345eu	9505eu		
1030-1100	Malaysia, RTM/Kuching	7160do			
1030-1100	Netherlands, Radio	7260pa	9810pa		
1030-1100	South Korea, R Korea Intl	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850au	
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605me

HAUSER'S HIGHLIGHTS
AFRICA

R. Amahoro: 9560 kHz. Sent no-data thank-you letter from Rue du Noyer 322, B-1040 Brussels, Belgium; fax 32-02-736-3916, reports Jerry Berg in *Fine Tuning*.

R. Voice of Peace: humanitarian service for Somalia, via R. Ethiopia
1100-1200 on 11800, 9560
R. Ethiopia: external service
Freqs: 7165, 9560
1200-1300 Somali
1300-1400 Afar
1400-1500 Arabic
1500 break
1600-1700 English
1700-1800 French
News in English is at 1630.
The separate national service also has English weekdays at 1030-1100.
V. of the Tigray Revolution, Mekele, northern Ethiopia
Heard on 7515 from 0400 and 1600, previously in the 7450-7485 range, and on 6770. (BBCM) Ed Rausch first reported 7515 as an unID from 0356.

TWUMVE
RADIO AMAHORO
mu gitondo 31m 9790 khz
saa 12 - saa 1 (Africa n° 1)
nimugoroba 31m 9560 khz
saa 1 - saa 2 (Voice of Peace)
Mutwandikire kuri "Centre Amani"
Rue du Noyer 322 - 1040 - BRUXELLES - BELGIQUE

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FREQUENCIES

1100-1200	Australia, AF Radio	13525as			
1100-1200	Australia, Radio	7240as	9510pa	9580pa	9710pa
		9860pa	13605as	15170as	15530as
		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, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200 mtwhf	Costa Rica, AWR Alajuela	5030ca	9725am		
1100-1200	Costa Rica, R Peace Intl	9400am			
1100-1130	Ecuador, HCJB Quito	6135pa			
1100-1200	Ecuador, HCJB Quito	12005am	15115am	15540am	21455am
1100-1200 as	Eqt Africa, R East Africa	9585af			
1100-1130	Georgia, Radio	11815eu			
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af
		17800af	17860af		
1100-1110 as	Ghana, Ghana Broadc Corp	3366do	4915do		
1100-1200	Iraq, Radio Iraq Intl	13680eu			
1100-1200 mtwh/vl	Italy, IRRS Milan	7125va			
1100-1200	Japan, NHK/Radio	6120na	9610as	15350as	
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	6100pa			
1100-1105	Nigeria, FRCN/Radio	4990do	7285do		
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1120	Pakistan, Radio	15625as	17900as		
1100-1200	Palau, KHBN/Voice of Hope	9830as	17630as		
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	13635as	15545as
		17515as			
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	9645as	9760as
		11720as	11915am	15160as	15425as
1100-1200	USA, WEWN Birmingham AL	6000na			
1100-1200	USA, WHRI Noblesville IN	6040am	9850am		
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1100-1130	Vietnam, Voice of	7285as	9732as		
1130-1200	Austria, R Austria Intl	13730na			
1130-1200	Bulgaria, Radio	15635as	17625as		
1130-1200	Iran, VOIRI Tehran	11745as	11790as	11930me	
1130-1155 s	Monaco, Trans World Radio	7115eu			
1130-1200 a	Monaco, Trans World Radio	7115eu			
1130-1200	Netherlands, Radio	6045eu	7130eu	7160eu	
1130-1200	Russia, Voice of	11655na			
1130-1200	Sweden, Radio	13775au	15120as	15240as	
1130-1200 s/vl	USA, WRMI/R Miami Intl	9955am			
1145-1200	Rwanda, Radio	6055do			

SELECTED PROGRAMS

Sundays

1100 HCJB (am): Morning Song. Music and thoughts to start the day.
1100 HCJB (pa): Songs in the Night. Music and inspiration from Chicago's Moody Church.
1130 HCJB (am): The Christian's Hour. Christian messages of inspiration.
1136 Radio Netherlands: Happy Station. See S 0137.
1145 Radio Bulgaria: Weekly Spotlight. The major political developments of the week with talks by prominent political figures.

Mondays

1100 HCJB (am): Let My People Think. Addressing questions of today's thinking Christians.
1100 HCJB (pa): Nightsounds. Christian music and thoughtful words from Bill Pearce.
1110 Voice of America (ca): Stateside. NEW! Focus on life in the United States. Although not billed as such, it should be great for Americans abroad.
1130 HCJB (am): Insight for Living. Chuck Swindoll applies the Bible to life today.
1138 Radio Netherlands: Newsline. See S 0038.
1145 Radio Bulgaria: Answering Your Letters. See S 2315.
1153 Radio Netherlands: Research File. A program of science and technology.

Tuesdays

1100 HCJB (am): The Living Word. A sermon from Southeast Christian Church.
1100 HCJB (pa): Nightsounds. See M 1100.
1110 Voice of America (ca): Stateside. See M 1110.
1130 HCJB (am): Insight for Living. See M 1130.
1138 Radio Netherlands: Newsline. See S 0038.
1145 Radio Bulgaria: Today. See M 2315.
1153 Radio Netherlands: Mirror Images. Weekly magazine of music, the arts, culture, and European festivals, produced and presented by David Swatling.

Wednesdays

1100 HCJB (am): Back to God Hour. The Christian Reformed Church looks at life in light of the historic Christian faith.
1100 HCJB (pa): Nightsounds. See M 1100.
1110 Voice of America (ca): Stateside. See M 1110.
1130 HCJB (am): Insight for Living. See M 1130.
1138 Radio Netherlands: Newsline. See S 0038.
1145 Radio Bulgaria: Today. See M 2315.
1153 Radio Netherlands: Documentary. An in-depth treatment of one subject or a short series.
1153 Radio Netherlands: Documentary. Borders (21st,22nd,23rd,28th,29th,30th). Comparing the status of Gaelic in Scotland to English and Frisian to Duty in the Netherlands.

Thursdays

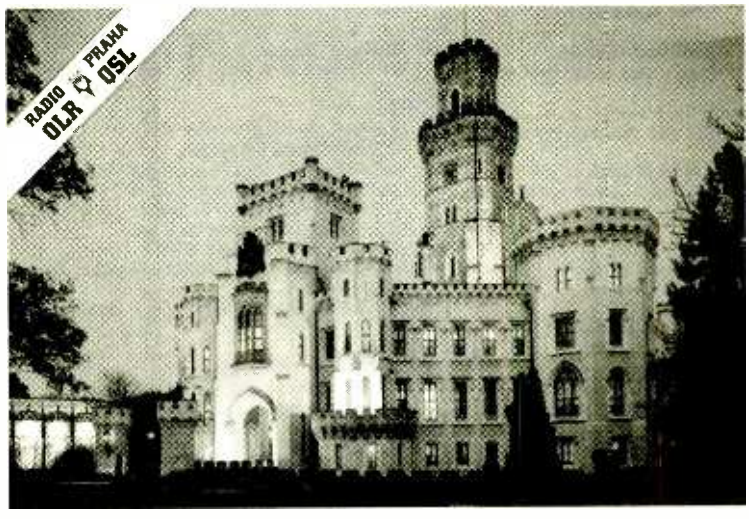
1100 HCJB (am): Christian Brotherhood Hour. See S 1130.
1100 HCJB (pa): Nightsounds. See M 1100.
1110 Voice of America (ca): Stateside. See M 1110.
1130 HCJB (am): Insight for Living. See M 1130.
1138 Radio Netherlands: Newsline. See S 0038.
1145 Radio Bulgaria: Today. See M 2315.
1153 Radio Netherlands: Media Network. See H 0152.

Fridays

1100 HCJB (am): Haven of Rest. Evangelizing and The Haven Quartet.
1100 HCJB (pa): Nightsounds. See M 1100.
1110 Voice of America (ca): Stateside. See M 1110.
1130 HCJB (am): Insight for Living. See M 1130.
1138 Radio Netherlands: Newsline. See S 0038.
1145 Radio Bulgaria: Weekly Spotlight. See S 1145.
1153 Radio Netherlands: A Good Life. See M 1253.

Saturdays

1100 HCJB (am): Hour of Decision. See S 0405.
1100 HCJB (pa): Afterglow. See S 0430.
1130 HCJB (am): We Kids. A fast-moving program for children.
1137 Radio Netherlands: Newsline. See S 0038.
1145 Radio Bulgaria: Answering Your Letters. See S 2315.
1152 Radio Netherlands: Sounds Interesting. See S 0052.



Thanks to Donald Michael Choleva of Euclid, Ohio for this lovely QSL from Radio Praha.

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1200 UTC SHORTWAVE GUIDE

8:00 AM EDT
5:00 AM PDT

FREQUENCIES

1200-1300	Australia, Radio	5995pa	6060pa	6080pa	7260as
		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	15635as	17625as		
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, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300 mtwhf	Canada, RCI Montreal	9635am	11855am	13650am	
1200-1300	China, China Radio Intl	9715as	11660as	11795pa	15440pa
1200-1300 mtwhf	Costa Rica, AWR Alajuela	5030am	9725am		
1200-1300	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1200-1300	Ecuador, HCJB Quito	12005am	15115am	15440am	21455am
1200-1300 as	Eqt Africa, R East Africa	9585af			
1200-1300	France, Radio France Intl	11615na	13625na	15530na	17575sa
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	6100pa			
1200-1230	Nigeria, FRCN/Radio	4990do	7285do		
1200-1230 s	Norway, Radio Norway Intl	13800as	15170as		
1200-1300	Palau, KHBN/Voice of Hope	9830as	9965as	17630as	
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	7180as			
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 vl	USA, WEWN Birmingham AL	6000na	9540sa	15695eu	
1200-1300	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	
1206-1300 occsnal	New Zealand, R NZ Intl	6100pa			
1220-1229 vl	Ghana, Ghana Broadc Corp	4915do			
1230-1300	Austria, R Austria Intl	15450as			
1230-1300	Bangladesh, Radio	9548as	13615as		
1230-1300 s	Belgium, R Vlaanderen Int	13670na			
1230-1300	Canada, RCI Montreal	9660as	11855na	15195as	
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	9640as	13670eu	
1230-1300	Sweden, Radio	11650na	15240na		
1230-1300	Switzerland, Swiss R Intl	6165eu	9535eu		
1230-1300	Turkey, Voice of	9675as			
1230-1300	Vietnam, Voice of	9840as	12020as		
1230-1300	Yugoslavia, Radio	11835au	11865au		
1240-1250	Greece, Voice of	15650af			

SELECTED PROGRAMS

Sundays

1200 HCJB (am): Kids' Corner. Mr Lizard and friends present a program for children.
1225 Radio Netherlands: Program Info. See S 0125.
1230 HCJB (am): Your Story Hour. Dramatized children's stories.
1235 Radio Vlaanderen Int'l: Radio World. See S 0635.
1236 Radio Netherlands: Fifty Plus. See S 0236.
1253 Radio Netherlands: Weekend. See S 0253.

Mondays

1200 HCJB (am): Morning in the Mountains. Magazine program of music, features, news, and inspiration hosted by Allen Graham and Leonard Kinzel.
1216 HCJB (am): Insight. Fifteen minutes of discernment from Joel Niederhood.
1225 Radio Netherlands: Press Review. Summary of items in the Dutch media.
1230 HCJB (am): Latin News. Regional news summary.
1238 HCJB (am): A Reading from God's Word. A short break for bible reading.
1238 Radio Netherlands: Newsline. See S 0038.
1246 HCJB (am): Guidelines. A five-minute commentary on living from Harold Sala.
1253 Radio Netherlands: A Good Life. NEW! Ginger da Silva hosts a program about development in both rich and poor countries.

Tuesdays

1200 HCJB (am): Morning in the Mountains. See M 1200.
1210 Voice of America (as): Stateside. See M 1110.
1216 HCJB (am): Insight. See M 1216.
1225 Radio Netherlands: Press Review. See M 1225.
1230 HCJB (am): Latin News. See M 1230.
1230 WWCR #1: World of Radio. See S 0500.
1238 HCJB (am): A Reading from God's Word. See M 1238.
1238 Radio Netherlands: Newsline. See S 0038.
1246 HCJB (am): Guidelines. See M 1246.
1253 Radio Netherlands: From Sapphire to Laser. Robert Green introduces a new half-hour format to this program about the people who make, record and sell music.

Wednesdays

1200 HCJB (am): Morning in the Mountains. See M 1200.
1216 HCJB (am): Insight. See M 1216.
1225 Radio Netherlands: Press Review. See M 1225.
1230 HCJB (am): Latin News. See M 1230.
1238 HCJB (am): A Reading from God's Word. See M 1238.
1238 Radio Netherlands: Newsline. See S 0038.
1246 HCJB (am): Guidelines. See M 1246.
1253 Radio Netherlands: Sounds Interesting. See S 0052.

Thursdays

1200 HCJB (am): Morning in the Mountains. See M 1200.
1216 HCJB (am): Insight. See M 1216.
1225 Radio Netherlands: Press Review. See M 1225.
1230 HCJB (am): Latin News. See M 1230.
1238 HCJB (am): A Reading from God's Word. See M 1238.
1238 Radio Netherlands: Newsline. See S 0038.
1246 HCJB (am): Guidelines. See M 1246.
1252 Radio Netherlands: Research File. See M 1153.

Fridays

1200 HCJB (am): Morning in the Mountains. See M 1200.
1216 HCJB (am): Insight. See M 1216.
1225 Radio Netherlands: Press Review. See M 1225.
1230 HCJB (am): Latin News. See M 1230.
1238 HCJB (am): A Reading from God's Word. See M 1238.
1238 Radio Netherlands: Newsline. See S 0038.
1246 HCJB (am): Guidelines. See M 1246.
1253 Radio Netherlands: Documentary. Borders (23rd,30th). See W 1153.
1253 Radio Netherlands: Documentary. See W 1153.

Saturdays

1200 HCJB (am): A Visit With Mrs. G. Bible stories for children.
1215 HCJB (am): Critter County. Christian Wyrtzen and her friendly critters present a children's program.
1225 Radio Netherlands: EuroPress Review. See S 0025.
1230 HCJB (am): Adventures in Odyssey. See A 0330.
1230 Voice of America (as): Communications World. See S 0030.
1238 Radio Netherlands: Newsline. See S 0038.
1253 Radio Netherlands: Bats,Balls & Baselines. See A 0052.

HAUSER'S HIGHLIGHTS
GERMANY: DEUTSCHE WELLE

DW engineering schedule shows two sites for some frequencies, but unclear whether either-or, or simultaneous.

English to North America:

Time	Freq	Transmitter
0100	6085	Germany & Malta,
	6145	Germany & Germany;
0300	9615	Germany & Portugal;
0500	5960	Germany & Portugal;

N. America secondary target:

0200 9640 Portugal to Asia
0400 6120, 7225, 9565 Rwanda to Africa
(via Bob Thomas, Kevin Hecht, Wolfgang Büschel)

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FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240as	9560pa	9610as
		11800pa			
1300-1330	Australia, Radio	6060pa	6080as	9510pa	
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	13670na			
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, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955na	17820na		
1300-1400	China, China Radio Intl	9715as	15440pa		
1300-1400	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1300-1400	Ecuador, HCJB Quito	12005am	15115am	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	
1300-1400 occsnal	New Zealand, R NZ Intl	6100pa			
1300-1350	North Korea, R Pyongyang	9345as	11740as		
1300-1330 s	Norway, Radio Norway Intl	9590eu	11850na		
1300-1400	Palau, KHBN Voice of Hope	9830as	9965as	17630as	
1300-1400	Palau, KHBN/Voice of Hope	9830as	9965as	17630as	
1300-1400 vl	Papua New Guinea, NBC	4890do	9675do		
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	
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	7480as	13635as	15545as	17515as
1300-1400	United Kingdom,BBC London	5990as	6190af	6195na	7110as
		7180na	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	11715as
		15160as	15425as		
1300-1400 vl	USA, WEWN Birmingham AL	6000na	15695eu		
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	15745eu			
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			
1330-1400	Austria, R Austria Intl	6155eu	13730eu	15450as	
1330-1357	Canada, RCI Montreal	9535as	11795as		
1330-1400	Canada, RCI Montreal	15315eu	15325eu	17820eu	17895eu
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	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605me
1330-1400	Uzbekistan, R Tashkent	6025eu	9715eu	13785eu	
1330-1400	Vietnam, Voice of	9840as	12020as	15010as	
1335-1345	Greece, Voice of	15630na	17525na		
1345-1400	Vatican State, Vatican R	11625as	12050as	15585pa	

SELECTED PROGRAMS

Sundays

1300 HCJB (am): Telling the Truth. Stuart Briscoe presents a religious program.
1330 HCJB (am): Mountain Meditations. A mixture of music and devotional thoughts in an Andean setting.
1336 Radio Netherlands: Happy Station. See S 0137.

Mondays

1310 Voice of America (as): Spotlight on Business and Finance. NEW! An examination of economic issues and events of regional or global concern.
1330 HCJB (am): Focus on the Family. Psychologist James Dobson on everyday family matters.
1330 Radio Sweden: Sixty Degrees North. Reports, interviews and analysis from Stockholm and other Nordic capitals.
1338 Radio Netherlands: Newsline. See S 0038.
1346 Radio Sweden: Sports Scan. A weekly review of all the news in sports
1353 Radio Netherlands: Research File. See M 1153.

Tuesdays

1305 HCJB (am): Towards Tomorrow. Science program produced in New Zealand.
1310 Voice of America (as): Inside USA. NEW! An in-depth look at political or social issues of major concern in the United States.
1330 HCJB (am): Focus on the Family. See M 1330.
1330 Radio Sweden: Sixty Degrees North. See M 1330.
1338 Radio Netherlands: Newsline. See S 0038.
1349 Radio Sweden: Media Scan (1&3). Satellite news 85%; medium wave and shortwave news 15%.
1353 Radio Netherlands: Mirror Images. See T 1153.

Wednesdays

1310 Voice of America (as): International Focus. NEW! A look at international issues and developments of regional or global interest and impact.
1330 HCJB (am): Focus on the Family. See M 1330.
1330 Radio Sweden: Sixty Degrees North. See M 1330.
1338 Radio Netherlands: Newsline. See S 0038.
1347 Radio Sweden: Money Matters. Economic and financial trends.
1353 Radio Netherlands: Documentary. Borders (21st,28th). See W 1153.
1353 Radio Netherlands: Documentary. See W 1153.

Thursdays

1330 HCJB (am): Focus on the Family. See M 1330.
1330 Radio Sweden: Sixty Degrees North. See M 1330.
1338 Radio Netherlands: Newsline. See S 0038.
1346 Radio Sweden: Green Scan. Environmental concerns and solutions.
1346 Radio Sweden: Horizon (4). Science and technology in Sweden.
1353 Radio Netherlands: Media Network. See H 0152.

Fridays

1330 HCJB (am): Focus on the Family. See M 1330.
1330 Radio Sweden: Sixty Degrees North. See M 1330.
1335 Radio Sweden: A Review of the Newsweek. Looking back at the week's news events.
1338 Radio Netherlands: Newsline. See S 0038.
1353 Radio Netherlands: A Good Life. See M 1253.

Saturdays

1300 HCJB (am): Children's Bible Hour. Songs and stories for children.
1300 WWCR #1: Focus on the Family (Weekend Edition). See M 2300.
1330 HCJB (am): Morning in the Mountains. See M 1200.
1330 Radio Sweden: People and Ideas. A magazine program about the Swedish people and the arts.
1338 Radio Netherlands: Newsline. See S 0038.
1353 Radio Netherlands: Bats, Balls & Baselines. See A 0052.

This beautiful QSL from Radio Norway was sent to MT from Bob Fraser of Cohasset, Mass..

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

FREQUENCIES

1400-1500	Australia, AF Radio	8743af	10623af		
1400-1430	Australia, Radio	5995pa	7240pa	9560as	9610pa
		11695pa	11800pa		
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			
1400-1500 vl	Australia, VL8T Tent Crk	2325do			
1400-1500	Bahrain, Radio	6010do			
1400-1500 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, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955na	17820na		
1400-1500	China, China Radio Intl	7405na	9535as	9785as	
1400-1500	Costa Rica, R Peace Intl	6200am	9400am	15050am	
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	11705na	11895as	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 mtwhfa	Malta, V of Mediterranean	11925me			
1400-1435 s	Malta, V of Mediterranean	11925me			
1400-1425 mtwhfa	Moldova, R Moldova Intl	11580eu			
1400-1500 s	Morocco, RTV Marocaine	17575af			
1400-1500	Netherlands, Radio	9890as	13700as	15150as	
1400-1500 occsnal	New Zealand, R NZ Intl	6100pa			
1400-1405	Nigeria, FRCN/Radio	4990do	7285do		
1400-1500	Palau, KHBN/Voice of Hope	9830as	9965as	17630as	
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	13595af			
1400-1500	United Kingdom,BBC London	5990as	6190af	6195as	7110as
		7180as	9410eu	9515na	9660as
		9740na	11750as	11865af	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	15255as	15395as	15425as
1400-1500 vl	USA, WEWN Birmingham AL	6000na	15695eu		
1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500	USA, WINB Red Lion PA	15715eu			
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WVHA Green Bush ME	11745eu			
1400-1500	USA, WWCR Nashville TN	12160am	13845am	15685am	
1400-1500	USA, WYFR Okeechobee FL	9705na	11550na	11830na	17750ca
1400-1500	Zambia, R Christian Voice	4965af			
1415-1500 mtwtfa	Bhutan, Bhutan BC Service	5025do			
1430-1500	Australia, Radio	6060pa	6080pa	7260as	9710pa
		11660as	11695pa		
1430-1500	Canada, RCI Montreal	9555me	11915eu	11935me	15315eu
		15325me	17820af		
1430-1500	Ecuador, HCJB Quito	6080am	12005am	15115am	15540am
		21455eu			
1430-1500	Finland, YLE/Radio	15400na	17740na		
1430-1500 s	Ghana, Ghana Broadc Corp	3366do			
1430-1500	Myanmar, Radio	5990do	7185do		
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1445-1500	Mongolia, R Ulan Bator	7290na	12000na		

SELECTED PROGRAMS

Sundays
1400 HCJB (am): Moody Presents. Christian messages from the Moody Bible Institute.
1425 Radio Netherlands: Music Break. See S 0225.
1430 HCJB (am): The Heaven and Home Hour. Jim Christianson discusses the Christian life.
1436 Radio Netherlands: Fifty Plus. See S 0236.
1453 Radio Netherlands: Weekend. See S 0253.

Mondays
1400 HCJB (am): Key Life. Steve Brown presents religious advice.
1415 HCJB (am): Our Daily Bread. A daily devotional program from Radio Bible Class.
1425 Radio Netherlands: Music Break. See S 0225.
1430 HCJB (am): Back to the Bible. A mix of music and daily Bible study.
1438 Radio Netherlands: Newsline. See S 0038.
1453 Radio Netherlands: A Good Life. See M 1253.

Tuesdays
1400 HCJB (am): Key Life. See M 1400.
1415 HCJB (am): Our Daily Bread. See M 1415.
1425 Radio Netherlands: Music Break. See S 0225.
1430 HCJB (am): Back to the Bible. See M 1430.
1438 Radio Netherlands: Newsline. See S 0038.
1453 Radio Netherlands: From Sapphire to Laser. See T 1253.

Wednesdays
1400 HCJB (am): Key Life. See M 1400.
1415 HCJB (am): Our Daily Bread. See M 1415.
1425 Radio Netherlands: Music Break. See S 0225.
1430 HCJB (am): Back to the Bible. See M 1430.
1438 Radio Netherlands: Newsline. See S 0038.
1453 Radio Netherlands: Sounds Interesting. See S 0052.

Thursdays
1400 HCJB (am): Key Life. See M 1400.
1415 HCJB (am): Our Daily Bread. See M 1415.
1425 Radio Netherlands: Music Break. See S 0225.
1438 Radio Netherlands: Newsline. See S 0038.
1453 Radio Netherlands: Research File. See M 1153.

Fridays
1400 HCJB (am): Key Life. See M 1400.
1415 HCJB (am): Our Daily Bread. See M 1415.
1425 Radio Netherlands: Music Break. See S 0225.
1430 HCJB (am): Back to the Bible. See M 1430.
1438 Radio Netherlands: Newsline. See S 0038.
1453 Radio Netherlands: Documentary. Borders (23rd,30th). See W 1153.
1453 Radio Netherlands: Documentary. See W 1153.

Saturdays
1406 WWCR #1: Sound Currents of the Spirit. See T 0600.
1425 Radio Netherlands: Music Break. See S 0225.
1430 HCJB (am): Jungle Jam and Friends. A program for children.
1438 Radio Netherlands: Newsline. See S 0038.
1452 Radio Netherlands: Sounds Interesting. See S 0052.

USAF Thunderbirds Schedule

(courtesy of Norm Pihale, Northfield, MN)

June

3	Sat	Holloman AFB, NM
4	Sun	Durango, CO
10-11	Sat/Sun	Hanscom AFB, MA
14	Wed	Whiteman AFB, MO
17-18	Sat/Sun	Hamilton, Canada
24-25	Sat/Sun	Davenport, IA

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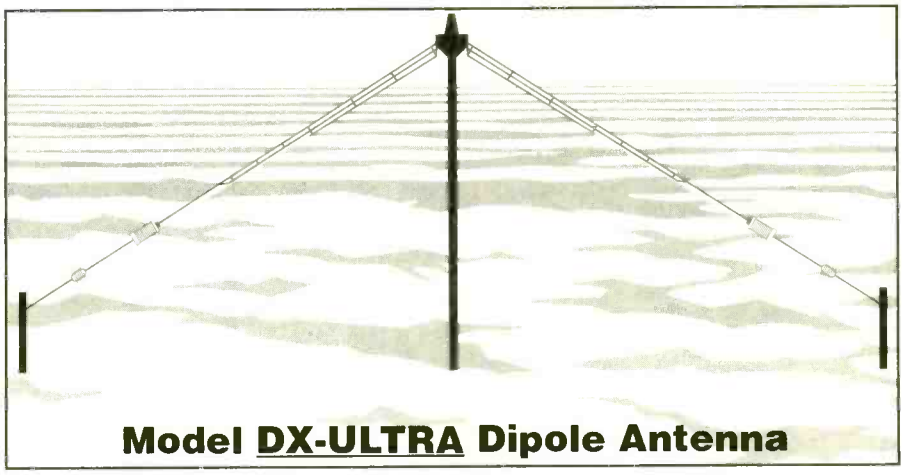

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- The DX-ULTRA design provides extremely low-noise performance for maximum sensitivity to weak DX signals.
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1500 UTC SHORTWAVE GUIDE 11:00 AM EDT 8:00 AM PDT

FREQUENCIES

1500-1600	Australia, AF Radio	8743af	10623af		
1500-1600	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9615as	11660as	11695pa	
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, CHNX Halifax	6130do			
1500-1600	Canada, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955na	17820na		
1500-1600	China, China Radio Intl	7405na	9785as		
1500-1600	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1500-1600	Ecuador, HCJB Quito	6080am	12005am	15115am	15540am
		21455eu			
1500-1600 as	Eqt Africa, R East Africa	9585af			
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	11915as	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			
1500-1515	Mongolia, R Ulan Bator	7290as	12000na		
1500-1525	Netherlands, Radio	9890as	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	9830as	9965as	17630as	
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as	
1500-1600	Russia, Voice of	4940as	6035eu	7115na	7345na
		7490as	9600eu	9820eu	12015eu
		12065me	15465eu		
1500-1600	S Africa, Channel Africa	3220af	9695af		
1500-1600 mtwhfa	Seychelles, FEBA Radio	9810as	11870as		
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600	Sri Lanka, SLBC Colombo	9720as	15425as		
1500-1530	Switzerland, Swiss R Intl	12075as	13635as	15545as	
1500-1600	United Kingdom,BBC London	5990as	6190af	6195eu	7180as
		9410eu	9515na	9660as	9740na
		11705eu	11750as	11775as	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 vl	USA, WEWN Birmingham AL	6000na	15695eu		
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	USA, WVHA Green Bush ME	15665eu			
1500-1600	USA, WWCR Nashville TN	12160am	13845am	15685am	
1500-1600	USA, WYFR Okeechobee FL	11705na	11830na	15215na	17750na
1500-1600	Zambia, R Christian Voice	4965af			
1520-]530 mtwtf	Estonia, Estonian Radio	5925eu			
1530-1600	Austria, R Austria Intl	11780as			
1530-1545	India, All India Radio	7140as	7412as	9910as	11585me
		11670me			
1530-1600	Iran, VOIRI Tehran	9575as	11790as		
1530-1600	Netherlands, Radio	9890as	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
1500 HCJB (am): The Urban Alternative. A program for inner-city America from Dallas.
1525 Radio Netherlands: Music Break. See S 0225.
1530 HCJB (am): The Methodist Hour. No information available.
1536 Radio Netherlands: Happy Station. See S 0137.

Mondays
1500 HCJB (am): Gateway to Joy. Contemporary women's issues from a Biblical perspective.
1515 HCJB (am): Hope for the Heart. See S 1530.
1525 Radio Netherlands: Press Review. See M 1225.
1530 HCJB (am): Thru the Bible. J. Vernon McGee presents a book-by-book study of the Bible.
1538 Radio Netherlands: Newsline. See S 0038.
1553 Radio Netherlands: Research File. See M 1153.

Tuesdays
1500 HCJB (am): Gateway to Joy. See M 1500.
1515 HCJB (am): Hope for the Heart. See S 1530.
1525 Radio Netherlands: Press Review. See M 1225.
1530 HCJB (am): Thru the Bible. See M 1530.
1538 Radio Netherlands: Newsline. See S 0038.
1553 Radio Netherlands: Mirror Images. See T 1153.

Wednesdays
1500 HCJB (am): Gateway to Joy. See M 1500.
1515 HCJB (am): Hope for the Heart. See S 1530.
1525 Radio Netherlands: Press Review. See M 1225.
1530 HCJB (am): Thru the Bible. See M 1530.
1538 Radio Netherlands: Newsline. See S 0038.
1553 Radio Netherlands: Documentary. Borders (21st,22nd,23rd,28th,29th,30th). See W 1153.
1553 Radio Netherlands: Documentary. See W 1153.

Thursdays
1525 Radio Netherlands: Music Break. See S 0225.
1538 Radio Netherlands: Newsline. See S 0038.
1553 Radio Netherlands: Media Network. See H 0152.

Fridays
1500 HCJB (am): Gateway to Joy. See M 1500.
1515 HCJB (am): Hope for the Heart. See S 1530.
1525 Radio Netherlands: Press Review. See M 1225.
1530 HCJB (am): Thru the Bible. See M 1530.
1538 Radio Netherlands: Newsline. See S 0038.
1553 Radio Netherlands: A Good Life. See M 1253.

Saturdays
1500 HCJB (am): Words of Hope. David Bass provides the message.
1500 WWCR #3: The Home Education Network (live). Hosted by Terry and Vicki Brady.
1525 Radio Netherlands: Music Break. See S 0225.
1530 HCJB (am): Family Foundations. Interviews and discussions about issues affecting today's family.
1538 Radio Netherlands: Newsline. See S 0038.
1553 Radio Netherlands: Bats,Balls & Baselines. See A 0052.

Looking for a Good Antenna Handbook?

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

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ERT S.A.

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ELLINIKI RADIOPHONIA TILEORASSI
HELLENIC RADIO TELEVISION

«Η ΦΩΝΗ ΤΗΣ ΕΛΛΑΔΑΣ»
«THE VOICE OF GREECE»

MT thanks John C. Wells of New York State for this QSL from Voice of Greece.

www.americanradiohistory.com

FREQUENCIES

1600-1615	Albania, R Tirana Intl	7155eu	9760eu		
1600-1700	Australia, Radio	5995pa	6060pa	6080pa	6090pa
		7260as	9710pa	9770as	9860pa
		11660pa	11695pa	11800pa	
1600-1700 vl	Australia, VL8A Alice Spg	2310do			
1600-1700 vl	Australia, VL8K Katherine	2485do			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			
1600-1700	Bahrain, Radio	6010do			
1600-1700 vl	Canada, CBC N Quebec Svc	9625do			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, China Radio Intl	11575as	15110af	15130af	
1600-1700	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1600-1627	Czech Rep, Radio Prague	5930eu	17485af		
1600-1700	Ecuador, HCJB Quito	6080am	12005am	15115am	15540am
		21455eu			
1600-1700	Ethiopia, Radio	7165af	9560af		
1600-1700	France, Radio France Intl	6175eu	9485me	11615af	11700af
		12015af	15530af	17795af	
1600-1700	Germany, Deutsche Welle	9735af	11965af	17800af	
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	13690as
		15595as	17810as		
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	7275do			
1600-1700	Malaysia, Radio	7295do			
1600-1625	Netherlands, Radio	9895as	15150as		
1600-1649 occsnal	New Zealand, R NZ Intl	6100pa			
1600-1700	Nigeria, FRCN/Radio	4990do	7285do		
1600-1700	Nigeria, FRCN/Voice of	7255af			
1600-1630 s	Norway, Radio Norway Intl	11850na			
1600-1630	Pakistan, Radio	9435af	9470af	11570af	13590af
		15555af	15675af	17660af	
1600-1700	Palau, KHBN/Voice of Hope	9830as	9965as	17630as	
1600-1700	Russia, Voice of	5905eu	5950eu	5965eu	6015as
		6035as	7205na	7345na	7370eu
		7490eu	9550na	11920na	15105af
		17780eu			
1600-1700	S Africa, Channel Africa	3220af	9695af		
1600-1700	S Africa, Trans World R	9500af			
1600-1700	Singapore, SBC Radio One	6155do			
1600-1700 vl	Slovakia, AWR	9455af			
1600-1700	South Korea, R Korea Intl	5975as	6480eu	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 Londor	3915as	6190af	6195eu	7180as
		9410af	9515na	9740as	11750as
		11775as	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	12040af
		13710af	15225af	15395as	15410af
		17785af			
1600-1700 vl	USA, WEWN Birmingham AL	6000na	15695eu		
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	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	11705na	11830na	15215na	15566eu
		17750ca	21525af	21745eu	
1600-1630	Vietnam, Voice of	9840eu	12020eu	15010eu	
1600-1700	Zambia, R Christian Voice	4965af			
1615-1700	United Kingdom,BBC London	5975as	9510as	9630af	15420af
1615-1630	Vatican State, Vatican R	7250eu	9645eu		
1630-1657	Canada, RCI Montreal	7150as	9550as		
1630-1700 mtwhfa	Liberia, Radio ELWA	4760do			
1630-1700	Russia, Voice of	6110eu	7150na	7380as	9800eu
1630-1700	USA, VOA Washington DC	6040eu	15245me	15445af	17735af
		17895af	19379me		
1630-1700	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do	
1640-1650 s	Rwanda, Radio	6055do			
1645-1700 mtwhf	Canada, RCI Montreal	9555eu	11935eu	15325eu	17820eu
1645-1700	Tajikistan, Radio	7245as			
1650-1700 mtwhf	New Zealand, R NZ Intl	6145pa			

SELECTED PROGRAMS

Sundays

1600 HCJB (om): Songtime Weekend. See S 0330.
1600 WWCR #1: Latin Catholic Mass. Gommar De Pauw.
1630 HCJB (om): Afterglow Classics. Don Johnson plays classical religious music.

Mondays

1600 HCJB (om): Morning in the Mountains. See M 1200.
1610 Voice of America (as/eu): Spotlight on Business and Finance. See M 1310.
1615 HCJB (om): Insight. See M 1216.
1630 HCJB (om): Latin News. See M 1230.
1638 HCJB (om): A Reading from God's Word. See M 1238.
1646 HCJB (om): Guidelines. See M 1246.

Tuesdays

1600 HCJB (om): Morning in the Mountains. See M 1200.
1610 Voice of America (as/eu): Inside USA. See T 1310.
1615 HCJB (om): Insight. See M 1216.
1630 HCJB (om): Latin News. See M 1230.
1638 HCJB (om): A Reading from God's Word. See M 1238.
1646 HCJB (om): Guidelines. See M 1246.

Wednesdays

1600 HCJB (om): Morning in the Mountains. See M 1200.
1610 Voice of America (as/eu): International Focus. See W 1310.
1615 HCJB (om): Insight. See M 1216.
1630 HCJB (om): Latin News. See M 1230.
1638 HCJB (om): A Reading from God's Word. See M 1238.
1646 HCJB (om): Guidelines. See M 1246.

Thursdays

1600 HCJB (om): Morning in the Mountains. See M 1200.
1610 Voice of America (as/eu): Reporter's Notebook. NEW! A look inside major news stories from a reporter's perspective.
1615 HCJB (om): Insight. See M 1216.
1630 HCJB (om): Latin News. See M 1230.
1638 HCJB (om): A Reading from God's Word. See M 1238.
1646 HCJB (om): Guidelines. See M 1246.

Fridays

1600 HCJB (om): Morning in the Mountains. See M 1200.
1610 Voice of America (eu): Perspectives. NEW! Delving into religion, spiritual values, ethics, or morality.
1615 HCJB (om): Insight. See M 1216.
1630 HCJB (om): Latin News. See M 1230.
1638 HCJB (om): A Reading from God's Word. See M 1238.
1646 HCJB (om): Guidelines. See M 1246.

Saturdays

1600 HCJB (om): Morning in the Mountains Weekend. Magazine program of music, features, news, and inspiration hosted by Karen Schmidt.
1629 WHRI: World of Radio. See A 0500.

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A QSL from Radio South Africa also sent from John C. Wells, New York State.

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FREQUENCIES

1700-1800	Australia, Radio	6060pa	6080pa	6090pa	7260as
		9580pa	9710pa	9860pa	11660pa
		11695pa	11880pa		
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800	Azerbaijan, Voice of	7160eu			
1700-1800	Bahrain, Radio	6010do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	7405af	9535as	11575af	
1700-1800 as	Costa Rica, AWR Alajuela	5030am	9725am		
1700-1800	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1700-1727	Czech Rep, Radio Prague	5930as	15640af		
1700-1800	Ecuador, HCJB Quito	6080am	12005am	15115am	15540am
		21455eu			
1700-1730	France, Radio France Intl	9485as	11700af		
1700-1800 mtwh/vl	Italy, IRRS Milan	7125va			
1700-1800	Japan, NHK/Radio	6150na	9535na	9580as	11840as
		11930as			
1700-1730	Jordan, Radio	9560eu			
1700-1800 vl	Liberia, Radio ELBC	7275do			
1700-1800	New Zealand, R NZ Intl	6145pa			
1700-1800	Nigeria, FRCN/Radio	3326do	4990do		
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu
1700-1750	Pakistan, Radio	7485eu	11570eu		
1700-1800	Palau, KHBN/Voice of Hope	9830as	9965as	17630as	
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	3220af	7240af		
1700-1800	S Africa, Trans World R	9500af			
1700-1715	Swaziland, Trans World R	7120af			
1700-1730	Switzerland, Swiss R Intl	9885af	9905eu	12075me	13635me
1700-1720	Uganda, Radio	4976do			
1700-1800	United Kingdom,BBC London	3955eu	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9510as
		9630af	9740as	11750as	11775as
		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	3980eu	5900as	5990eu	6045as
		6110as	7150as	7170as	7215as
		9525as	9645as	9690af	9700eu
		9760af	9770af	11870as	11895af
		11920af	11945af	12040af	13710af
	15205as	15410af	15445af	17895af	
	19379me				
1700-1800 vl	USA, WEWN Birmingham AL	6000na	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	17612af			
1700-1800	USA, WWCR Nashville TN	12160am	13845am	15685eu	
1700-1800	USA, WYFR Okeechobee FL	13695na	15566eu	17750ca	
1700-1800	Zambia, R Christian Voice	4965af			
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	Austria, R Austria Intl	9665me	11780as		
1730-1800	Moldova, R Moldova Intl	7235eu			
1730-1800	Netherlands, Radio	6020af	9605af	11655af	
1730-1800	Romania, R Romania Intl	11830af	15340af	15365af	17805af
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	Armenia, Radio Yerevan	4810eu	4990eu	7480eu	
1745-1800	Bangladesh, Radio	7190eu	9683eu		
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	Algeria, R Algiers Intl	11715eu			
1800-1900	Australia, Radio	6060pa	6080pa	6090pa	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			
1800-1845	Bangladesh, Radio	7190eu	9683eu		
1800-1830	Belgium, R Vlaanderen Int	5910eu	9925af		
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1800-1900	Ecuador, HCJB Quito	6080am	12005am	15115am	15540am
		21455eu			
1800-1830	Ghana, Ghana Broadc Corp	3366do	4915do		
1800-1845	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	6145pa			
1800-1830	Nigeria, FRCN/Radio	3326do	4990do		
1800-1830 s	Norway, Radio Norway Intl	5960eu	13805af	15220af	
1800-1900	Palau, KHBN/Voice of Hope	9830as	9965as	17630as	
1800-1900	Russia, Voice of	4940eu	5905me	5950eu	6065as
		7180as	7345eu	7370eu	7490eu
		9550eu	9860eu	9890eu	11945as
		13670af			
1800-1830	S Africa, Trans World R	9500af			
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	9355me	15665eu	21640af	
1800-1900	USA, VOA Washington DC	3980eu	4875af	6040eu	9760eu
		9770af	11920af	12040af	13680af
		13710af	15205af	15410af	15580af
		17895af	19379me		
1800-1900 vl	USA, WEWN Birmingham AL	6000na	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	17612af			
1800-1900	USA, WWCR Nashville TN	12160am	13845am	15685am	
1800-1845	USA, WYFR Okeechobee FL	15566eu			
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1800-1900	Yemen, Yemeni Rep Radio	9780as			
1800-1900	Zambia, R Christian Voice	4965af			
1800-1900	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do	
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			
1830-1857	S Africa, Trans World R	9525af			
1830-1900	Slovakia, R Slovakia Intl	5915eu	6055eu	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	11645af	15650af		
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995d	
1850-1900	New Zealand, R NZ Intl	11910pa			

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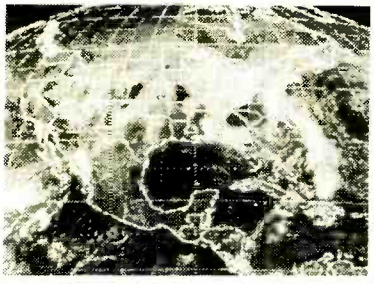

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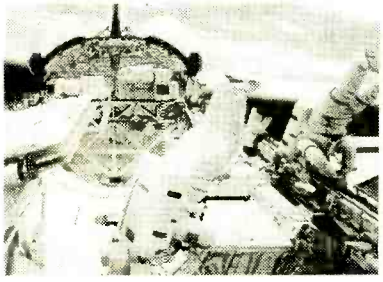

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FREQUENCIES

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			
1900-2000	Brazil, Radiobras	15268eu			
1900-2000	Bulgaria, Radio	9700eu	11705eu		
1900-2000	Bulgaria, Radio	9700eu	11720eu		
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000 mtwhf	Costa Rica, AWR Alajuela	5030am	9725am		
1900-2000	Costa Rica, R Peace Intl	6200am	15050am	17910am	
1900-1930	Cote D' Ivoire, RDTV	11920do			
1900-2000	Ecuador, HCJB Quito	6080am	12005am	15115am	15540am
		21455eu			
1900-1950	Germany, Deutsche Welle	7170af	9670af	9735af	11740af
		11785af	13690af	13790af	
1900-1930	Hungary, Radio Budapest	3955eu	6140eu	7130eu	9835eu
1900-1945	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as	15075me	
1900-1910	Israel, Kol Israel	7465na	9435eu	11603na	11685na
		15640af			
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			
1900-1925	Netherlands, Radio	6015af	6020af	9605af	9860af
		9895af	15315af	17605af	
1900-2000	New Zealand, R NZ Intl	11910pa			
1900-2000	Nigeria, FRCN/Voice of	7255af			
1900-2000	Palau, KHBN/Voice of Hope	9830as	9965as	17630as	
1900-2000 vl	Papua New Guinea, NBC	4890do	9675do		
1900-1930	Philippines, R Pilipinas	11890as			
1900-2000	Romania, R Romania Intl	9690eu	9750eu	11810eu	11940eu
1900-2000	Russia, Voice of	6110eu	7170eu	7205eu	7345eu
		7370eu	7490eu	9550eu	9800na
		9890eu	11630eu	11675eu	11825as
		12030af	13645af	13665eu	15205af
1900-1915	Rwanda, Radio	6055af			
1900-2000	South Korea, R Korea Intl	5975eu	6480eu	7275as	
1900-2000	Spain, R Exterior Espana	9675af			
1900-2000	Swaziland, Trans World R	3200af	3240af		
1900-1930	Switzerland, Swiss R Intl	6165eu			
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	9355me	15665eu	17510af	
1900-2000	USA, VOA Washington DC	3980eu	6040eu	7375af	7415af
		9525pa	9760af	9770af	11870as
		11920af	12040af	15180as	15205af
		15410af	15445af	15580af	19379me
1900-2000 vl	USA, WEWN Birmingham AL	13695eu	15695eu		
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu		
1900-2000	USA, WINB Red Lion PA	15715eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000 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	12160am	13845am	15685am	
1900-2000	USA, WYFR Okeechobee FL	17760af			
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1900-2000	Zambia, R Christian Voice	4965af			
1900-2000	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do	
1930-2000	Austria, R Austria Intl	5945eu	6155eu		
1930-2000 mtwhfa	Austria, R Austria Intl	9665me	13730af		
1930-2000	Finland, YLE/Radio	6120eu	9730eu	11755eu	
1930-2000	Iran, VOIRI Tehran	7260af	9022eu		
1930-2000	Mongolia, R Ulan Bator	13670eu	17900eu		
1930-2000	Netherlands, Radio	6020af	9605af	9860af	9895af
		11655af	15315af	17605af	
1930-2000	Poland, Polish R Warsaw	6000eu	6135eu	7285eu	
1930-2000 a	Uganda, Radio	4976do	5026do		
1935-1955	Italy, RAI Rome	7275eu	9575eu	11905eu	
1945-2000 t	Belarus, Radio Minsk	5940eu	7105eu	7210eu	7405eu
1950-2000	Vatican State, Vatican R	4010eu	5882eu		
2000-2100	Algeria, R Algiers Intl	11715eu	11745eu		
2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7260as
	9580pa 9860pa	11660pa	11695pa	1180pa	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, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	Canada, RCI Montreal	5995eu	7235eu	11985eu	13650eu
		13670eu	15150eu	15325eu	17820eu
2000-2100	China, China Radio Intl	6950eu	9440af	9920eu	11715na
		15110af			
2000-2100	Costa Rica, R Peace Intl	6200am	9400am	15050am	
2000-2027	Czech Rep, Radio Prague	5930eu	11640pa		
2000-2100	Ecuador, HCJB Quito	6080am	12005am	15540am	
2000-2050	Germany, Deutsche Welle	7170eu	9615eu		
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
2000-2010	Greece, Voice of	9375eu			
2000-2050	India, All India Radio	7170eu	9615eu		
2000-2100	Indonesia, Voice of	9675as			
2000-2030	Iran, VOIRI Tehran	7260af	9022eu		
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	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	Palau, KHBN/Voice of Hope	9830as	9965as		
2000-2100 vl	Papua New Guinea, NBC	4890do	9675do		
2000-2025	Poland, Polish R Warsaw	6000eu	6135eu	7285eu	
2000-2030 mtwhf	Portugal, Radio	6130af	9780eu	9815eu	
2000-2100	Russia, Voice of	6085eu	7135eu	7170eu	7205eu
		7345eu	9530eu	9550eu	9800na
		9890na	11675as	12030eu	12050as
		15385na			
2000-2030	Russia, Voice of	5920eu	6110me	7400na	
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do		
2000-2045 s	Swaziland, Trans World R	3240af			
2000-2030	Switzerland, Swiss R Intl	9770af	9885af	11640af	13635af
2000-2100	Turkey, Voice of	9445eu			
2000-2015	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, KWHR Naalehu HI	11980as			
2000-2100	USA, Monitor Radio Intl	9355eu	13770eu		
2000-2100	USA, VOA Washington DC	6040eu	7375af	7415af	9760af
	9770af 11855af	13710af	15205me	15410af	15445af
	15580af 17725af	17755af	19379me		
2000-2100 vl	USA, WEWN Birmingham AL	7425na	15695eu		
2000-2100	USA, WHRI Noblesville IN	9495am	13760eu		
2000-2100	USA, WINB Red Lion PA	15715eu			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100 as	USA, WRMI/R Miami Intl	9955am			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100	USA, WWCR Nashville TN	12160am	13845am	15685am	
2000-2100	USA, WYFR Okeechobee FL	17845eu	21525eu		
2000-2030	Vatican State, Vatican R	7355af	9645af	11625af	
2000-2030	Zambia, R Christian Voice	4965af			
2000-2100	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
2005-2100	Syria, Radio Damascus	12085eu	15095na		
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	11750eu	15290eu		
2030-2100	Netherlands, Radio	9860af	9895af		
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 mtwhf	USA, WRMI/R Miami Intl	9955am			
2030-2100	Vietnam, Voice of	12020eu	12025as	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15225pa		
2051-2100	New Zealand, R NZ Intl	15115pa			

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FREQUENCIES

2100-2200	Australia, Radio	6060pa	6080pa	7240pa	7260as
		9580pa	9660pa	11660pa	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	9700eu	11720eu		
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2130	Canada, RCI Montreal	5995eu	7235eu	11690eu	11865eu
		13650eu	13670eu	15150eu	15325eu
		17820eu			
2100-2200	China, China Radio Intl	6950eu	9920eu		
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica, R Peace Intl	7385am	9400am	15050am	
2100-2200	Cuba, Radio Havana Cuba	11720eu			
2100-2150	Germany, Deutsche Welle	7115as	9670as	9735af	9765as
		11765af	11785as	15135af	
2100-2130	Hungary, Radio Budapest	3955eu	5935eu	7250eu	9835eu
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	9580af	11850as	11865as
2100-2115	Japan, NHK/Radio	9660as	11915as		
2100-2200 mtwhfa	Liberia, Radio ELWA	4760do			
2100-2125	Netherlands, Radio	9860af	9895af	11655af	
2100-2200	New Zealand, R NZ Intl	15115pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4990do		
2100-2200	Palau, KHBN/Voice of Hope	9830as	9965as		
2100-2200 vl	Papua New Guinea, NBC	4890do	9675do		
2100-2200	Romania, R Romania Intl	7195eu	9690eu	9750eu	11940eu
2100-2200	Russia, Voice of	5905eu	5920eu	5965eu	7135as
		7170eu	7205na	7330as	7350as
		7380eu	9550eu	9890eu	11730am
		11750eu	15580na		
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			
2100-2200	Syria, Radio Damascus	12085eu	15095na		
2100-2110	Uganda, Radio	4976do	5026do		
2100-2200	Ukraine, R Ukraine Intl	4820eu	5940eu	6020eu	7205eu
		7240eu	7320eu	7405eu	
2100-2200	United Kingdom,BBC London	3255af	3915as	3955eu	5975na
		5990as	6005af	6160as	6180eu
		6195eu	7325eu	9410eu	9740as
		11750sa	11955as	12095eu	13660af
		15070eu	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	9355na	13770eu		
2100-2200	USA, VOA Washington DC	6040eu	6160eu	7375af	7415af
		9535af	9760eu	11870pa	13710af
		15185pa	15205me	15410af	15445af
		15580af	17725af	17735pa	19379me
2100-2200 vl	USA, WEWN Birmingham AL	7425na	15695eu		
2100-2200	USA, WHRI Noblesville IN	9495am	11980am		
2100-2200	USA, WINB Red Lion PA	15715eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2130 a	USA, WRMI/R Miami Intl	9955am			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200	USA, WWCR Nashville TN	12160eu	13845am	15685am	
2100-2200	USA, WYFR Okeechobee FL	17845eu	21515eu		
2100-2110	Vatican State, Vatican R	5882eu			
2100-2130	Yugoslavia, Radio	6100na	6185eu		
2100-2200	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130	United Kingdom,BBC London	6110am	15390am	17715am	
2130-2200	Australia, Radio	9610as	9645as	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	Belgium, R Vlaanderen Int	9935sa			
2130-2200	Iran, VOIRI Tehran	9670au			
2130-2200	Liberia, Radio ELWA	4760do			
2130-2200	Russia, Voice of	7150na	7400na		
2130-2200	Sweden, Radio	6065eu	9655eu		
2200-2300	Australia, Radio	9580pa	9610as	9645as	9660pa
		11660pa	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, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5960am	9755am	11705as	11895am
		13670am	13740am	15305am	
2200-2230	China, China Radio Intl	3985eu	7170eu		
2200-2300	Costa Rica, R Peace Intl	7385am	9400am	15050am	
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	7215va			
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	New Zealand, R NZ Intl	15115pa			
2200-2205	Nigeria, FRCN/Radio	3326do	4990do		
2200-2300	Palau, KHBN/Voice of Hope	9965as	15140as		
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			
2200-2235 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2230	South Korea, R Korea Intl	5965eu			
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
		7325na	9410eu	9590na	9915sa
		11695as	11750sa	11955as	12095eu
		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, KWHR Naalehu HI	17510pa			
2200-2300	USA, Monitor Radio Intl	13625as	13770am	15405as	
2200-2300	USA, VOA Washington DC	7215as	9705as	9770as	11760as
		12080af	13710af	15185au	15290as
		15305as	17735as	17820as	
2200-2230 mtwhf	USA, VOA Washington DC	7340af	7375af	7415af	
2200-2300 vl	USA, WEWN Birmingham AL	7425na	11820eu	15695eu	
2200-2300	USA, WHRI Noblesville IN	13760am			
2200-2300	USA, WINB Red Lion PA	15715eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300 as	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300	USA, WVHA Green Bush ME	9852eu			
2200-2300	USA, WWCR Nashville TN	9475am	12160am	13845am	
2200-2245	USA, WYFR Okeechobee FL	17845eu	21525eu		
2203-2210	Croatia, Croatian Radio	5920eu	7370eu	9890eu	13830eu
2223-2256	Eqt Guinea, Radio Africa	15189af			
2230-2300	Russia, Voice of	9890as			
2230-2300	Sweden, Radio	6065eu			
2240-2250	Greece, Voice of	6260au	9375au		
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
2245-2300 mtwhf	USA, VOA Washington DC	9670am			
2245-2300 mtwhf	USA, Voice of the OAS	9670na	11835na	15155na	
2245-2300	Vatican State, Vatican R	6150as	7305as	9600au	11830pa

"As a beginner in SW listening, I have a lot to learn, so let me start with *Monitoring Times*. ... I picked up a broadcast from Madrid, Spain, I think, that criticized your publication ... I found it a bit weird to play a small part in the transworld criticism. It was enjoyable."
Paul Menzenski, Mehopac, NY

www.americanradiohistory.com

2300 UTC SHORTWAVE GUIDE 7:00 PM EDT 4:00 PM PDT

FREQUENCIES

2300-2315	Armenia, Radio Yerevan	7480eu	9480eu		
2300-0000	Australia, Radio	9610as	9660pa	11660pa	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	Bulgaria, Radio	9700na	11720na		
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, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000	Canada, RCI Montreal	5960am	9755am	11940am	13670am
		15305am			
2300-0000 mtwhf	Costa Rica, AWR Alajuela	5030am	9725am		
2300-0000	Costa Rica, R Peace Intl	6200am	9400am	15050am	
2300-0000	Ecuador, HCJB Quito	6080am	12005am	15155am	15490eu
2300-0000	Egypt, Radio Cairo	9900na			
2300-0000	Germany, Deutsche Welle	7235as	9690as	11705as	
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	5965eu	6155eu	7140eu	9580as
		11850as			
2300-2330 sm	Lithuania, Radio Vilnius	7150na			
2300-0000	Malaysia, Radio	7295do			
2300-0000	Malaysia, RTM/Kota Kinab	5980do			
2300-0000	New Zealand, R NZ Intl	15115pa			
2300-2305	Nigeria, FRCN/Radio	3326do	4990do		
2300-2350	North Korea. R Pyongyang	11700na	13650na		
2300-0000	Palau, KHBN/Voice of Hope	9965as	15140as		
2300-0000 vl	Papua New Guinea, NBC	4890do	9675do		
2300-0000	Russia, Voice of	7300na	9620na	9685na	13640as
		15425na	17665na	17890as	
2300-2317	Sierra Leone, SLBS	3316do			
2300-0000	Singapore,R Singapore Int	9530as			
2300-0000	UAE, Radio Abu Dhabi	9605na	9770na	11710na	
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	13815am			
2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	USA, KWHR Naalehu HI	17510pa			
2300-0000	USA, Monitor Radio Intl	7510eu	13625pa	13770eu	15405am
2300-0000	USA, VOA Washington DC	7215as	9705as	9770as	9890as
		11760as	15185au	15290as	15305as
		17735as	17820as		
2300-0000 vl	USA, WEWN Birmingham AL	15695eu			
2300-0000	USA, WHRI Noblesville IN	5745am			
2300-0000	USA, WINB Red Lion PA	15715eu			
2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000 as	USA, WRMI/R Miami Intl	9955am			
2300-2330 mtwhf	USA, WRMI/R Miami Intl	9955am			
2300-0000	USA, WVHA Green Bush ME	9852eu			
2300-0000	USA, WWCR Nashville TN	5065am	9475am	13845am	
2325-2336	Lebanon, Voice of	6550eu			
2330-2345	Armenia, Radio Yerevan	9685na	11920na	11970na	
2330-0000	Australia, Radio	9645as	9850as	13605as	15240pa
2330-2355	Belgium, R Vlaanderen Int	6035na	9925sa		
2330-0000	Finland, YLE/Radio	5990na	6015na	9680as	
2330-0000	Netherlands, Radio	6020na	6165na	9840na	
2330-0000	Russia, Voice of	7125na			
2330-0000	Sweden, Radio	11910as			
2330-0000	Vietnam, Voice of	9840eu	12020eu	15010eu	
2335-2345	Greece, Voice of	9375sa	11595sa	11645sa	

SELECTED PROGRAMS

Sundays

2300 WWCR #1: World of Radio. See S 0500.
2315 Radio Bulgaria: Answering Your Letters. Replies to listener letters and requests.
2330 Radio Bulgaria: Plaza Bulgaria. Thirty minutes about Bulgaria and things Bulgarian.
2335 Radio Vlaanderen Int'l: Radio World. See S 0635.
2338 Radio Netherlands: Fifty Plus. See S 0236.
2353 Radio Netherlands: Weekend. See S 0253.

Mondays

2300 WWCR #1: Focus on the Family. James Dobson.
2315 Radio Bulgaria: Today. Reports and analysis of current events in Bulgaria and the World. Press reviews from the weeklies on Monday.
2330 Radio Bulgaria: Business and Finance. Economic news briefs and financial developments in Bulgaria.
2338 Radio Netherlands: Newsline. See S 0038.
2341 Radio Bulgaria: Sports Roundup. A review of seasonal sporting events over the past weekend.
2348 Radio Bulgaria: Timeout for Music. A wide variety of Bulgarian classical, pop and folk music is played.
2353 Radio Netherlands: A Good Life. See M 1253.

Tuesdays

2300 WWCR #1: Focus on the Family. See M 2300.
2330 Radio Bulgaria: Cultural Review. A 30-minute summary of cultural events in Bulgaria, cultural newstips, and regional music.
2338 Radio Netherlands: Newsline. See S 0038.
2353 Radio Netherlands: From Sapphire to Laser. See T 1253.

Wednesdays

2300 WWCR #1: Focus on the Family. See M 2300.
2315 Radio Bulgaria: Today. See M 2315.
2330 Radio Bulgaria: Cultural Review. See T 2330.
2338 Radio Netherlands: Newsline. See S 0038.
2350 Radio Bulgaria: Questionline. Ten minutes of answers to listeners' questions.
2353 Radio Netherlands: Sounds Interesting. See S 0052.

Thursdays

2300 WWCR #1: Focus on the Family. See M 2300.
2315 Radio Bulgaria: Today. See M 2315.
2330 Radio Bulgaria: Lifestyle. A look at everyday life in Bulgaria.
2338 Radio Netherlands: Newsline. See S 0038.
2345 Radio Bulgaria: Timeout for Music. See M 2348.
2353 Radio Netherlands: Research File. See M 1153.

Fridays

2300 WWCR #1: Focus on the Family. See M 2300.
2315 Radio Bulgaria: Today. See M 2315.
2330 Radio Bulgaria: Folk Studio. Myths, legends, customs, and rituals associated with Bulgarian holidays.
2338 Radio Netherlands: Newsline. See S 0038.
2345 Radio Bulgaria: Radio Bulgaria Calling. DX program for radio amateurs and shortwave listeners.
2353 Radio Netherlands: Documentary. Borders (23rd,30th). See W 1153.
2353 Radio Netherlands: Documentary. See W 1153.

Saturdays

2315 Radio Bulgaria: Rocking Chair. A look at Bulgarian rock, pop, jazz, youth subculture, favorite hangouts, and entertainment.
2330 Radio Bulgaria: Cultural Review. See T 2330.
2338 Radio Netherlands: Newsline. See S 0038.
2353 Radio Netherlands: Bats, Balls & Baselines. See A 0052.

This interesting QSL from BRT in Belgium comes to us also from Donald Michael Choleva, Euclid, Ohio.

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.

www.americanradiohistory.com

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

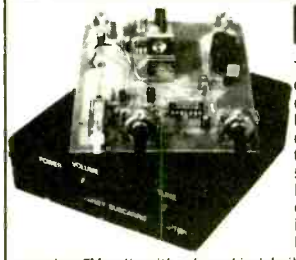
DSP FILTER

FULLY WIRED & TESTED

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

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

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 Krt	$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

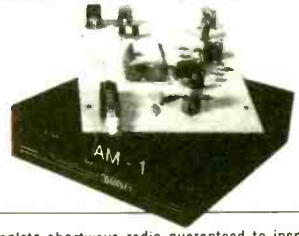
INTERCEPTOR

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.



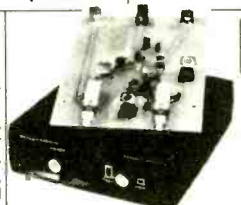
AM-1 Transmitter kit	$29.95
CAM Matching case set	$14.95

FOXHOUND DIRECTION FINDER

Locate hidden or unknown transmitters fast. The Foxhound direction finder connects to theantenna 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

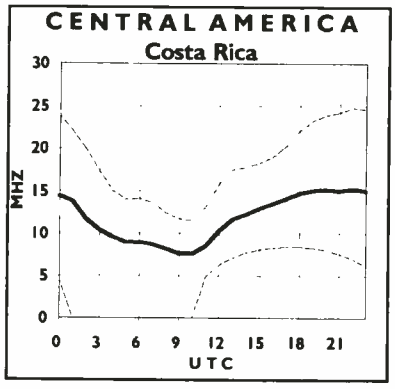
TERMS: Satisfaction guaranteed. Examine for 10 days. If not pleased return it in original form for refund. Add $4.95 for shipping, handling and insurance. For foreign orders add 20% for surface mail. COD (U.S. only) add $5.00. Orders under $20 add $3.00 NY residents add 7% sales tax. 90-day parts warranty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

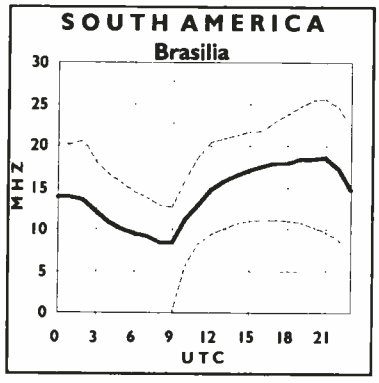
RAMSEY ELECTRONICS, INC.
793 CANNING PARKWAY, VICTOR NY 14564

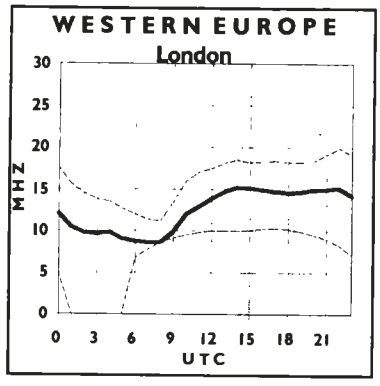
www.americanradiohistory.com

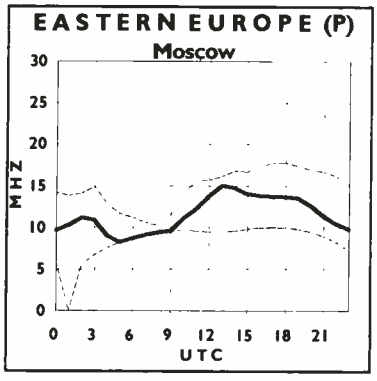
Propagation conditions: Eastern United States

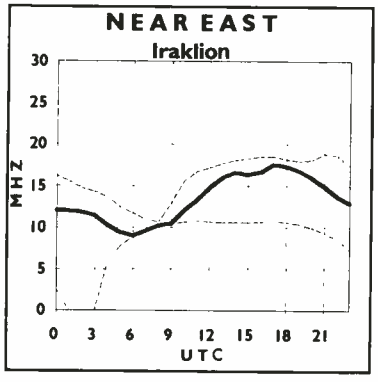
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear. The Sun Spot Number used this month for forcasting purposes is 11.

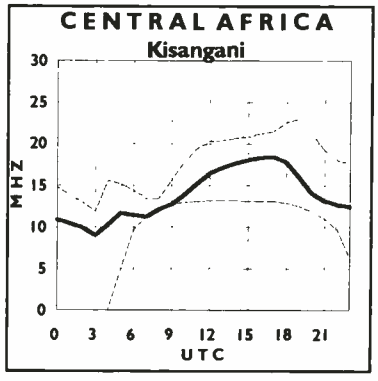


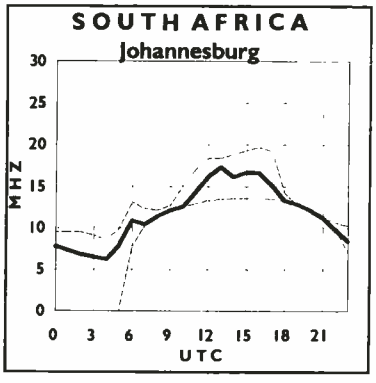


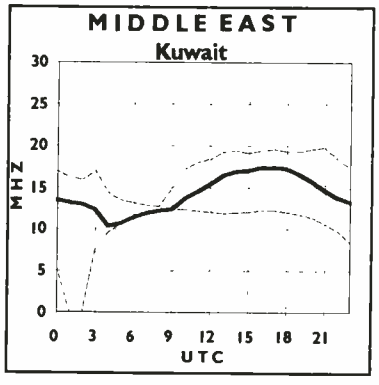


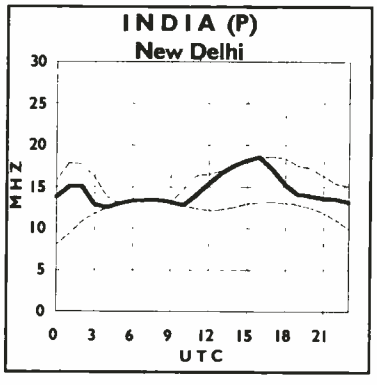


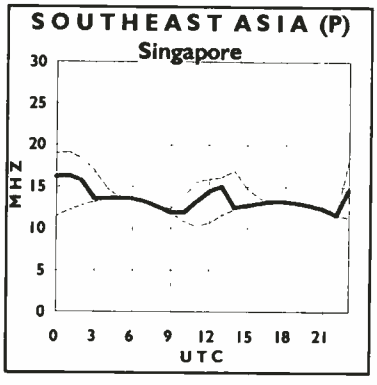


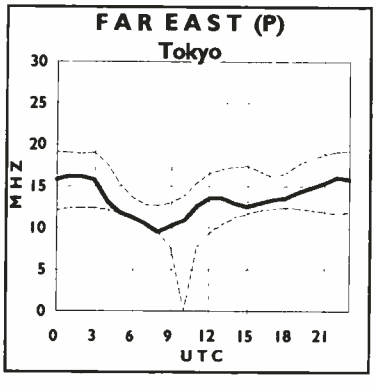


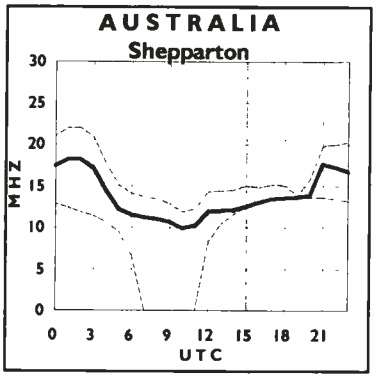












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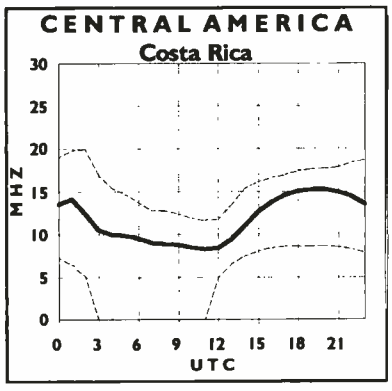
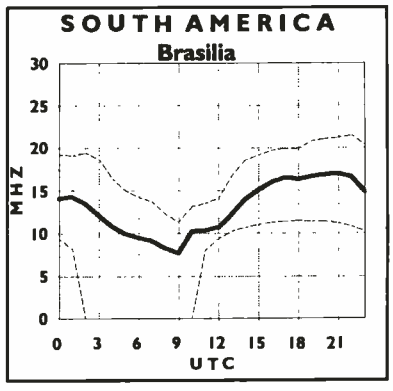
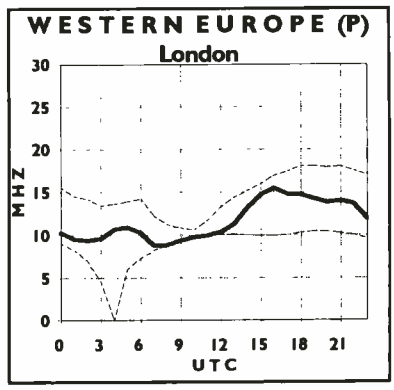
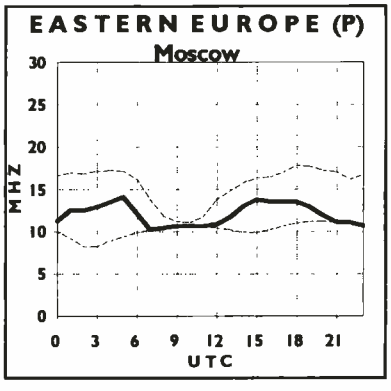
Propagation Conditions: Western United States

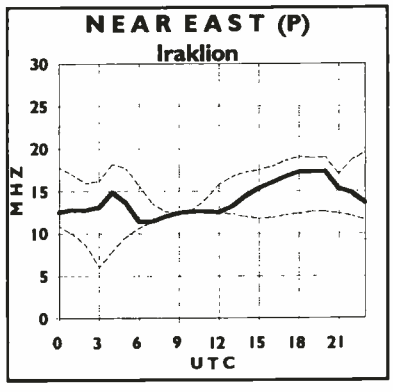
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.

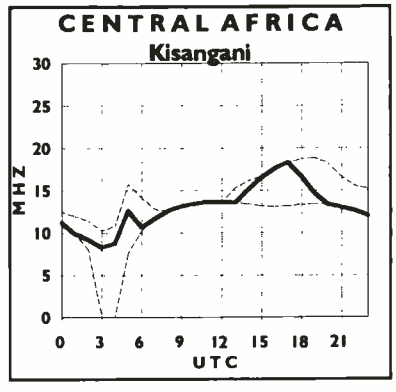


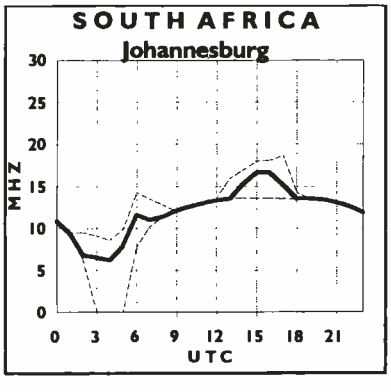


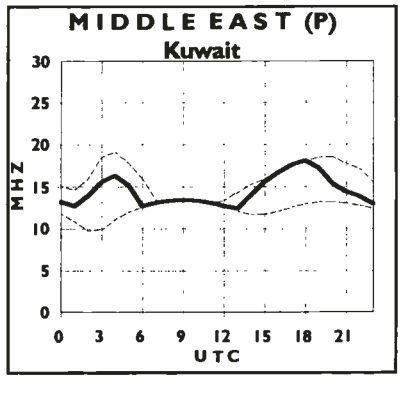


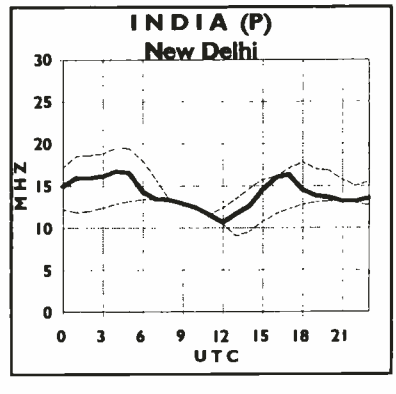


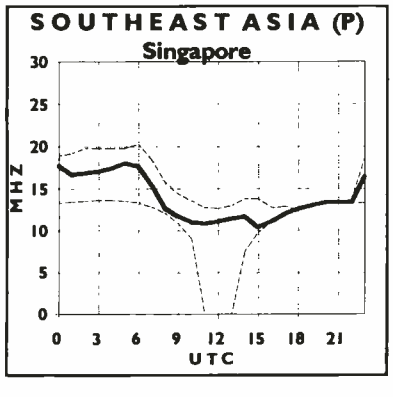


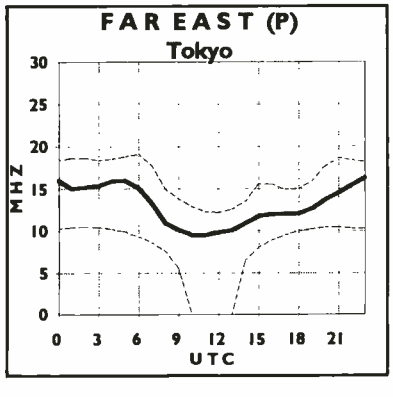


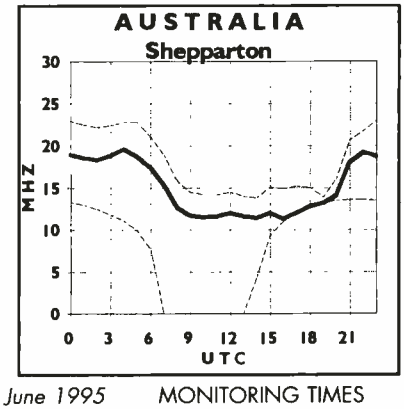












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The Rite of Spring

By Jim Frimmel

I'm writing this column in late April, just after the rite of spring in the world of shortwave listening. This annual event is called Daylight Savings Time, and is like a pagan holiday to those who pursue this hobby of ours. But, instead of virgins, the radio broadcasters, like so many high priests, seem to sacrifice their broadcast times and frequencies to appease the Sun God. As a result, we listeners scramble about the radio spectrum in search of those elusive signals.

We had a more hectic time than usual during this last time-shifting passage.

BBC Slipstreaming (Splish-Splash)

If there were an award for "Most Confusing Broadcast Schedule" it would have to go the British Broadcasting Corporation for "streamlining" the World Service on April 1st. The plan was noble in its concept, intent on providing programs to different regions of the world at more appropriate local times. Drama programs, for example, would be offered during evening family hours when listeners would be happier to receive them.

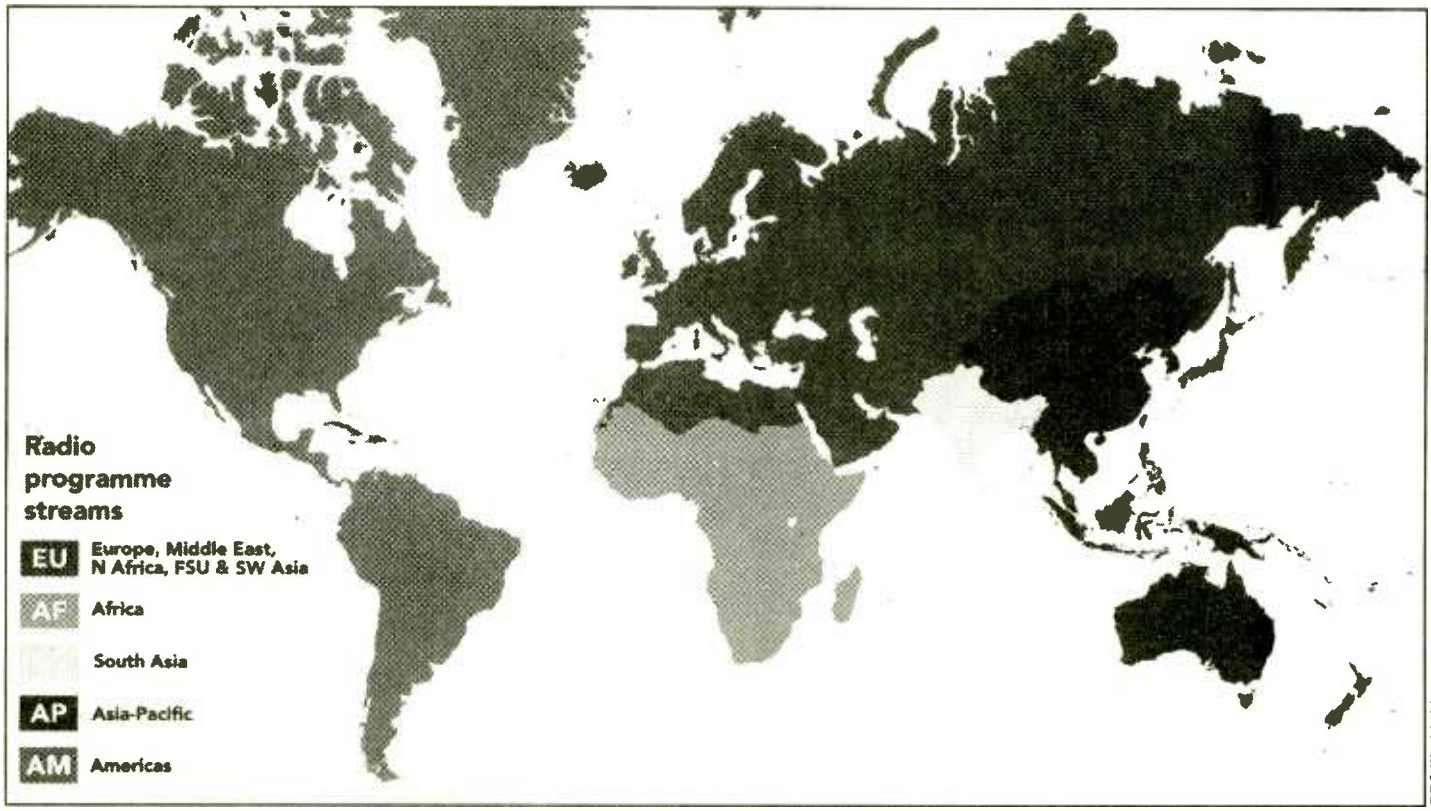
The BBC calls its new strategy "Slipstreaming" and insists that the World Service is still intact, even though it is now divided into five timestreams (see the selected program listings in the "Shortwave Guide" of the May *MT*, and the frequency listings in this issue). These five streams are called:

Stream	Target Area
EU	Eu/ME/NAf/former Soviet Union/ South-West Asia
AF	Africa
SA	South Asia
AP	Asia Pacific
AM	The Americas

BBC Worldwide

While the BBC was playing semantics with the World Service, subscribers to *BBC Worldwide*, the Beeb's radio and TV guide, had to wait for the specific details of the reorganization. In a poorly-timed move, publication of the North American edition of the magazine was moved from England to North America effective with the April edition. This change was intended to improve delivery, but distribution was delayed due to late shipment of negatives from Bush House to the printer. Instead of readers receiving it about ten days in advance, the first U.S. issue began arriving about five days late.

BBC listeners who are not subscribers to *BBC Worldwide* were not so lucky. The full-featured magazine now sells for $49— a price more than twice that of its predecessor, *London Calling*. Its high cost deterred many potential readers from renewing their subscriptions. Consequently, most BBC listeners in North America were left in the dark on April 1st. Some long-used frequencies were no longer heard, and favorite programs disappeared from their old time slots. Some of the comments found on the Internet in the first few weeks of April are probably typical of the frustrations felt by these listeners.



BBC Worldwide

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Bernhard Jatzeck, an official BBC monitor in Canada, still hadn't received *BBC Worldwide* as of April 9th. He wrote: "My main beef is not that they switched times, but that it was done before the regular listeners had their program schedules on hand. The whole thing was a right royal goof-up and certainly not up to the standards we've come to expect from them."

Scott Gibson of Milwaukee reported that the same frequencies are being used for different programming (on different transmitters) four times a day.

Karen Chartier, a Seattle listener, reported that Americas stream frequencies were inaudible from 1200-1715 UTC and she had to resort to South Asia and Asia Pacific streams.

A New Orleans listener reported that the feature program she wanted to hear was listed in the Americas stream at a time when there were no shortwave frequencies listed. (These listings appear to be included for the benefit of those listening via satellite and other rebroadcasters.)

Steve Goldman (USA) wrote: "I find that I don't automatically choose the BBC for long-term listening because of the heavy news load. I'll be back to tuning around for an hour of R. Netherlands, and hour of Germany, etc."

An Australian listener wrote: "It is an increasingly bizarre looking schedule—I have absolutely NO idea why they have decided to move *Newshour* to 1900 hours, and then put hour long transmissions on some frequencies from 2100-2200!"

Mark Fine of Virginia reported finding the Americas stream schedule on BBC's page of the Worldwide Web (WWW) on the Internet. He noted that all programs were listed one hour earlier than the actual broadcast! The BBC's home page can be found at
http://WWW.BBCNC.Org.UK/

The popularity of Alistair Cook's *Letter from America* program was confirmed by the number of listeners who were having trouble finding its broadcast times.

Glenn Hauser also accumulated some listener comments for his broadcast column, which we'll add to the discussion here. Will Martin of Missouri gave the opinion that "splitstreaming" the BBC means the destruction of the World Service. He felt it was an important factor that all over the world—whether in San Francisco, Singapore, or Sarajevo—people heard the same programming simultaneously.

Martin says times are *not* more convenient now, for which he gave the example of *Waveguide*, which was perfect for N.Am. at its previous airing of Thu 0130, now gone. Non-news programming seemed to him to be relegated to inferior status. Glenn Hauser added that another bad move is that *Science in Action* is aired to N.America only at 0430 Sun—too late for East and Central time zones.

Said Tim Hendel from Florida: No one asked for it; no one wants it; still, some bureaucrat decided to go ahead with it.

iac@bbc-ibar.demon.co.uk (BBC audience correspondence dept), are you listening?

Famous Last Words

In the November 1992 premier issue of *BBC Worldwide*, Editor Steve Weinman, in referring to the emergence of this new magazine, wrote: "Never let it be said that we don't do our research thoroughly before embarking on a new venture."

Mr. Weinman gets high praise for his redesign of *BBC Worldwide* to accommodate the changes heaped upon it. Greater effort should have been made, however, to provide advance information to subscribers.

The official planners at Bush House should have anticipated the impact that the reorganization would have on listeners globally and found a way to inform them far enough in advance of implementation to provide a smooth transition.

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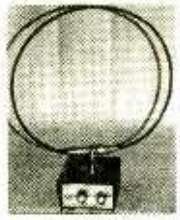

shown with NSW-130 Loop

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The NXL-250A base unit is $79.95 (limited-time introductory price). It requires one or more of the following loops: NSW-130 SW loop (covers 1 to 30 MHz and down to 540 kHz w/reduced sensitivity): $29.95; NXM-220 (520 kHz to 1700 kHz): $79.95; or the NUL-999 super wide-range Ultraloop (covers approx. 350 kHz to 29 MHz, thus replacing all of the above loops): $105.95. NXL-250A options: Antenna switch: $20.00, or dual output: $25.00; AC adapter: $9.95 (otherwise use a 9-volt battery); PL-259, BNC, 1/8th-inch phone or PAL output adaptors: $2.95 each (unit comes with RCA-plug output cable) **Add $5.00 for shipping ($8.00 Canada).**

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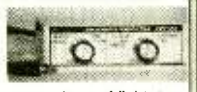
FEATURED ACCESSORY OF THE MONTH:
THE SHORTWAVE PROTECTOR



If you use an outside antenna, then you need the Shortwave Protector! It will effectively protect your radio against lightning-induced surges (the most common form of lightning damage), knock out interference from local AM, FM, and TV stations as well as paging and international broadcasters, and provide a 20-dB antenna amplifier and attenuator. All functions are switchable from the front panel of its strong, yet attractive, metal case. Covers 100 kHz to 200 MHz. Protect your radio and improve its reception with the Shortwave Protector! Only $79.95 + $4.00 shipping. Florida residents add 6% tax. We accept Mastercard, Visa, check or Money order. All products covered by 30-day any-reason return policy (purchase price less 5% if not damaged). Free catalog sent w/order or send a 32-cent stamp for one.

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DOUG SMITH, W9WI

Digital Radio — On the Way?

You don't have to be a DXer to be annoyed by the static crashes, strange buzzes, and interfering squeals that plague reception of all but the strongest AM signals. Even FM, despite its "static-free" reputation, is affected by man-made interference. It's all part of the ambience of DXing—but even the most dedicated DXer occasionally wants to sit back and listen to a program, ballgame, or some music.

A new type of radio broadcasting is under development, a system that will totally eliminate static and audible interference—digital radio. At the same time, digital radio will allow your radio to deliver more than just high-fidelity sound: short (and maybe not so short) text information can also be transmitted.

To understand the advantages of digital radio, you first have to understand how existing AM and FM broadcasts work. Both start with a pure, steady "carrier wave." This is a signal of just one frequency and strength. The carrier wave is very easy to generate, but it doesn't carry any information. If you were to tune it in on a receiver, all you'd hear is a lack of noise. (Occasionally, you'll hear a pure carrier wave, usually when a DJ makes a mistake and doesn't have the next song ready when the first one ends. In the industry, this is known as "dead air.")

If the carrier wave is to actually do something useful, you have to "modulate" it—that is, to somehow change it in step with the information you want to transmit. In the earliest days of radio, the intensity of the signal was varied—between no signal at all and full strength—by connecting a code key in a critical circuit and turning the transmitter on and off. Of course, you could only transmit Morse Code this way. While it was a good way of summoning help for ships in distress, only a limited number of hams actually enjoy listening to Morse Code for entertainment!

AM was the next logical development. Amplitude Modulation is the process of using the sound signals to vary the strength, or amplitude, of the carrier wave. The methods of achieving AM have changed over the years. For many years, a high-power audio amplifier was used to add to or take away from the transmitter's high-voltage power supply. Today, various digital schemes are used, but the idea is the same: to make the carrier signal vary in strength along with the audio to be transmitted.

AM suffers from several interference problems. Radio transmitters aren't the only things that generate AM signals; lightning crashes and other manmade and natural sparks generate these signals as well. Also, when two or more AM signals appear on the same frequency, the listener hears all of them, mixed together.

For these reasons, FM was developed in the 1930s. In FM, instead of changing the strength of the carrier wave, we change its frequency. At the time, special circuits known as "reactance modulators" were used; today, phase-locked loops and varactor diodes are used, but the end result is the same.

The FM receiver can be designed to ignore lightning crashes and most manmade interference. Also, because of a phenomena known as the "capture effect," when two or more FM signals share a frequency you generally hear only the strongest signal. For over 50 years, FM was considered the ultimate in high-quality radio.

Enter digital radio

Despite FM's high quality and noise immunity, some noises still exist. Atmospheric "white noise" increases as the frequency response of an FM receiver increases. The enormous popularity of the compact disc and its incredible noise immunity left many disappointed with the noises still inherent in FM broadcasting.

Unlike regular AM and FM, digital radio doesn't directly and continuously vary the carrier wave in step with the audio. Instead, numbers are transmitted that correspond, in some way, to the audio. These are binary numbers—that is, the only two numbers used are 0 and 1. By arranging these zeros and ones in particular sequences, larger numbers can be represented, and these numbers can signify certain sounds, letters, or even pictures.

Because the only two possible numbers are 0 and 1, the receiver has much less uncertainty as to what was transmitted. Imagine someone yelling instructions across a busy freeway. If they could use any word in the English language, there's a pretty good chance you'll hear something wrong. But if the only words they can use are "Yes" and "No," you'll either hear the instruction correctly or you won't hear it at all.

Effects on the future of DX

The question on the lips of most DXers, intent on hearing the most distant signal, has to be "can you DX digital radio?" We don't have enough receivers yet to know for certain, but it certainly seems probable that digital stations can be DXed. If the in-band, on-channel (IBOC) digital system favored by existing broadcasters is used, we'll still have the regular AM/FM signal to DX.

Other digital schemes will share the DX characteristics of whatever frequencies they may utilize. If IBOC doesn't catch on, UHF frequencies will most likely be used. As TV DXers will tell you, UHF *can* be DXed, and over considerable distances. Fading will take on a different characteristic on digital radio, however. Unlike AM, where signals mix together, or FM, where the noise level climbs and rises, digital radio signals will either be there or will not be there. Therefore, a fading signal will intermittently disappear and reappear.

A DX Target

Unfortunately, plans weren't announced until well after *MT*'s deadline for the April issue, but a demonstration IBOC station in Las Vegas, Nevada, has been widely heard

WHAS-AM is a common daytime DX target in the eastern U.S., thanks to their 50,000 watt signal on 840 kHz.

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WPLN-FM's classical music programming would certainly benefit from any future digital radio standard.

by eastern DXers. This station operated on 1660 kHz during, and for a few days before, the 1995 National Association of Broadcasters convention in early April.

The special station used 10kW of power, simultaneously transmitting a regular AM signal and a digital signal. Programming was to consist of top-40 and adult contemporary records. If you heard strange goings-on on this frequency, this may be what you heard.

By the way, a demonstration IBOC station was also operated on FM, but as it used the transmitter of existing Las Vegas station KWNR-FM, no new DX targets were created.

Incidentally, 1660 kHz seems to be a popular frequency for such experiments; other such stations have operated in at least three other cities over the last few years. Keep an eye on this channel!

Bits and Pieces

• Dave Alpert in New York City forwarded two Associated Press stories about unique radio stations. We start in Telluride, Colorado, where mountainous terrain leaves listeners only one choice on the dial: public radio KOTO-FM. This is one of a small number of "community" radio stations, with a diverse choice of music and information programmed by volunteers. The May "Communications" column carried an item on their unique fund-raising. Few other stations can claim a format that includes country, rock, jazz, reggae, and classical music ...

And in Pendleton, Indiana, WIRP is also a community station, but in a very different community! WIRP broadcasts to the inmates of the Indiana Reformatory. It isn't a "real" radio station—instead of a transmitter, wires deliver the signal to headphone jacks in each prison cell. But the programming, which includes jazz, rap, and rock, is quite popular among the inmates. Interestingly, the most popular style of music on WIRP is gospel.

WIRP is not the only radio station at a state penitentiary. Back in 1986 the FCC granted a license for a regular non-commercial FM station at the Louisiana State Penitentiary in Angola. 100-watt KLSP-FM broadcasts a similar mix of music. The station's listing in the *Broadcasting and Cable Yearbook* gives their executive personnel: Hilton Butler, warden and general manager; Roger Thomas, assistant warden and station manager.

• DXer Chuck Porter of Troy, New York, wrote via the Internet. He comments on my remarks in April about 600-mile daytime reception. In the early 1960's, Chuck lived in Williamstown, Massachusetts, and says he regularly heard WSM Nashville—over 1000 miles distant—at midday. This is pretty impressive reception!

• Two of the DXer references I mentioned in March have announced new editions. Dajja Enterprises (608-423-4159) has new AM, FM, and TV *Journals*, available both in printed form and on computer floppy disk. Prices are $16.95 (AM and TV, printed) and $19.95. (FM, or computer disks) And, the 1995 edition of the aforementioned *Broadcasting and Cable Yearbook* is now available for $169.95. Call 800-521-8110.

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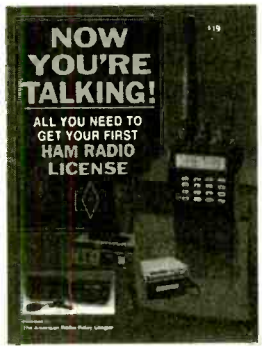

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John Fulford, WA4VPY

A Fed with Your Fries, Sir?

Sometimes you find the strangest things in the strangest places. The FCC allocated a few frequencies for low power wireless communications. These are licensed under the low power itinerant group. The biggest user of these frequencies are the drive thru windows. Throughout the country, one can listen to McDonald's. Recently I was down in the Ft. Lauderdale area monitoring the 169-172 MHz region for new federal users when I picked up the local McDonald's drive thru window on 169.445 MHz.

I listened to the drive thru ordering for a few minutes, when, just as I started to tune away, the capture effect on my radio kicked in. Remember the capture effect? In frequency modulation radio systems, the stronger of the signals is "captured" by the receiver circuitry. The weaker of the signals is ignored—only the strong survive (sorry...). This is one of primary reasons aircraft use AM mode—there is no capture effect to block out the weaker of the signals, just in case the weaker signal is an emergency location transmitter.

But, back to our story. The drive-in window conversation was being blocked out by a conversation between two people discussing—shall we say—recreational pharmaceuticals. Needless to say, this conversation was a lot more interesting than the golden arches monologue.

What I had discovered was a body bug—an electronic surveillance transmitter—operating on one of the itinerant low power channels. I never did find out what agency was doing the undercover operation, but reliable sources have indicated that it was probably the FBI. I just hope they never do an operation using McDonald's as a meeting point. For your records, here is the itinerant business band group.

Itinerant Business Frequencies

169.445	169.505	170.245	170.305
171.045	171.105	171.845	171.905

■ Wireless TV Remotes

The FCC has allocated numerous frequencies under Part 74 for low power transmissions. You can see the best example of these in use by watching the local news crew in action. The on-air personality usually is using a wireless microphone. The receiver is attached to the video camera. The camera will have a whip antenna sticking out of it.

Among radio signals to be found in unexpected places is the wireless audio for on-scene TV broadcasts, which can often be found on unused television channels (photo by Harry Baughn)

The frequencies allocated are between 174 and 216 MHz. These are the television channels 7-13. They can be easily heard by using a cheap, tunable, TV sound-only radio to find the signals. Look in the areas around the unused television channels in your area.

■ Presidential Appearances

President Clinton was down here visiting a few weeks ago. He stayed overnight in Palm Beach Gardens and then went on to Haiti. The Secret Service channels were quiet, as is normal. The main channel (Charlie - 165.375) showed the most activity, but it was scrambled. The best information was obtained by monitoring the local sheriff's operational channel for the north end of Palm Beach County. This frequency was 154.845 MHz. The Secret Service had a couple of units on it which were not scrambled.

The most interesting channel was 119.1 MHz. Yup—the approach channel at Palm Beach International Airport. The Secret Service Surveillance helicopter was carrying on a running commentary on this channel. The callsign of this 'copter is HUNTSMAN.

Once Air Force 1 took off from Palm Beach International, they used the tower frequency of 119.1 MHz. They then switched over to the departure of 124.6 and then contacted Miami on 133.4 using the callsign of Air Force 1.

From Miami air space down to Haiti, the frequencies used were not available. No high frequency transmissions were heard while in the Palm Beach Area. Also, no uplink satellite links in the 295 MHz band were heard. Missing as well was the wideband multiplex signal in the upper 300 MHz range from the circling aircraft that accompanies the Presidential detail.

The Presidential limousine carried the two VHF antennas normally found on it. One is for the Secret Service channels; the other is for the Yankee/Zulu channel pair, 162.6875/171.2875 MHz. This is the SECURE telephone patch from Air Force 1 to and from the limousine. I did not hear this circuit pair come up during the visit.

There were also two 800 MHz antennas on the limousine. These are for the cellular telephones in the limo. The cellular telephones are Group B (Bell System) and are STU-3 equipped (Secure Telephone Unit). My sources told me that there was a lot of 800 MHz cellular traffic from the White House Detail during the visit—all unencrypted.

What I did hear that was interesting was the Echo/Foxtrot channel. I cannot hear the uplink to the aircraft on 407.850 MHz , but I did hear the 415.700 MHz downlink to the AT&T site near Miami. With all of the millions and millions of dollars spent on the aircraft and its associated electronics, they could not get a working fax machine on the aircraft. I would have hated to have been the electronics tech that met the plane down in Haiti to fix the unit—tempers were hot.

■ Diplomatic Protection

I received a message from a reader who wishes to remain anonymous regarding unusual voice traffic in the New York City area on March 13, 1995. It all started around 1900 hrs., local New York Time. The content of the traffic was that of diplomatic protection using the frequency of 170.6250 MHz—which is an

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FBI frequency in the greater New York City area.

The traffic was both encrypted and in the clear. The frequencies of 171.5500, 170.5500, 170.8250, and 170.9000 MHz were also being keyed up, along with the 170.6250 MHz channel—but no voice traffic was heard on these frequencies. (Remember, from the column a few months ago, the four FBI channels I found being keyed simultaneously, late at night in the South Florida area.)

The following base stations were heard: AMERICA CP, EAGLE-1, and EAGLE ADVANCE. No concurrent traffic was heard on either the Secret Service or the Department of State Diplomatic Protection Service frequencies. Usually the State Department channel of 409.625 MHz is heard with just about any type of dignitary visiting the area.

It is the belief of this writer and others that the person being protected was Gerry Adams, the leader of Sinn Fein, the political wing of the Irish Republican Army. He just happened to be visiting the New York City area during the above occurrence. The last time he visited the United States the callsign of PEACOCK was used, but it was not heard on this trip.

Upcoming Federal Monitoring

I just received some E-mail from Edward Griffin out in the San Francisco area. Ed reminds us that the 50th anniversary of the United Nations charter signing will be held this summer. The activities will peak on June 26th, when President Clinton flies in for the ceremony. It is a reasonable assumption that there will be a *lot* of federal traffic to monitor.

Intelligence reports have indicated that the anti-nuke folks will be holding a big protest at the Lawrence Livermore Laboratory to protest the dropping of the Atomic Bomb on Japan. Demonstrations are also planned at the Concord Naval Weapons Station. Frequencies are shown in table 1.

TABLE 1

Concord Naval Station Complex

Freq	Use
150.0250	CIVIL ENGINEERING
139.5000	FIRE DEPARTMENT
148.3750	PAGING
140.8000	PAGING
140.1250	MUNITIONS
140.3250	MUNITIONS
140.00	DISASTER NETWORK
142.0250	MEDICAL NETWORK--RPTR OUT
149.4000	MEDICAL NETWORK--RPTR IN
140.6000	PUBLIC WORKS
149.3500	SECURITY SIMPLEX
149.0750	SECURITY SIMPLEX
140.8500	SECURITY SIMPLEX
140.1750	SECURITY SIMPLEX
150.1000/149.0250	SECURITY RPTR OUT/IN
149.3750/148.2750	SECURITY RPTR OUT/IN
149.4250/148.4000	SECURITY RPTR OUT/IN
313.8000	TOWER
341.0000	TOWER
140.4600	UNKNOWN USE
140.8200	UNKNOWN USE

Dept of Energy

The Department of Energy Weapons Research Laboratories, within which I assume Lawrence Livermore Labs would be included, uses the following frequencies (MHz):

172.0750	411.0250	411.0750
411.1500	411.6000	

The Department of Energy uses the frequencies of 167.8500 (Ch.1) and 168.4500 (Ch.2) for its security operations around the Department of Energy Headquarters at 1000 Independence Avenue SW, Washington, D.C. They might use the same frequencies out in California.

Other Oddities

- For those of you up in the Washington, D.C., area, the Defense Intelligence Agency is using the following frequencies in a trunked system (referred to on some bulletin boards as the Military District of Washington):

406.2000	406.3000	407.5250
407.9500	409.2500	

- Be sure to check your simplex channels for indications of repeater use. As an example, the frequency of 166.5875 MHz has always in the past been Channel 4 simplex in the Customs Service radios. A couple of weeks ago I started hearing repeater traffic on it. As it turns out, it is now channel A-8 of the Operation Exodus program. The input is 169.5500 MHz. There is a repeater at the Port of Miami using this channel pair running some very sensitive traffic out in the clear.
- We have a mystery here in South Florida. (So what else is new?) There is a telephone patch on 166.9000 MHz. This patch is up just about 24 hours every day. It seems to be a repeater output. It is using some form of speech scrambling. It is not digital: it is some type of rolling code speech inversion. It sends the Morse Code identifier of "GFF."

According to all records, and confirmed by the 1994 edition of the *Frequency and Intelligence Directory* by Jay Harris, plus numerous hours of off-the-air monitoring, it is allocated to the U.S. Customs Service, and is listed as a phone patch channel.

The problem? Customs says it is not theirs, and they do not use this channel in the South Florida area. Somebody is running a very wide area phone patch. It has an effective radius of at least 75 miles from Miami. I can make out enough of the speech to determine that the primary language is Spanish—well, that narrows it down.

Now a new phone patch has appeared on 166.7000 MHz. It has the same parameters as the 166.9 channel, but it runs different traffic. No one, including well placed (and trusted) sources at Customs, can identify the site or users. Any ideas?

Moving to Miami

It was announced by President Clinton, while he was visiting Florida, that the Miami area has been chosen for the headquarters of the military command for Central and South America. The U.S. Southern Command is moving from Panama to the former Coast Guard station at the Richmond Heights site south of Miami.

This is the present site of the C3I complex, which has been the topic of this column several times before. It is located next door to the old KKN39 receive site, which was the location of Zenith Technical Enterprises. For those of you with a historical background, *Zenith Technical Enterprises* was the cover name for the CIA base at Miami which hosted the Bay of Pigs invasion.

As I have reported in previous columns, the KKN receive site has a lot of activity going on around it. Well-placed intelligence sources have reported that the KKN39 transmitters, which were removed from their Krome Avenue transmitting site several months ago, are being set up again south of the C3I site. As of this writing, the final site has not been identified. Maybe KKN39 will return to the air once again.

It is kind of interesting observing the history of intelligence operations in the South Florida area. If you stand in one place long enough, history will pass by you again.

That's it for this month. 73 de John, WA4VPY

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Jean Baker, KIN9DD

Long Distance Operational Control (LDOC)

By Larry Van Horn

Most VHF civilian aircraft monitors are probably familiar with the term "company" frequencies. Hopefully, most of you have had an opportunity to scan the company frequencies in the 128.8 to 132.0 MHz range of the VHF civilian aeronautical band on your scanner. "Company" traffic can provide the monitor with some of the most interesting communications in the entire aeronautical bands. In a nutshell, company frequencies are where you hear airline companies pass operational voice message traffic to their aircraft in flight.

There is one small problem with VHF aero company frequencies, however; they are line-of-sight. Have you ever wondered how the airlines pass company traffic once their aircraft get outside normal VHF range, say, on a transoceanic flight? The solution is a simple one for the airlines. They use the long-haul frequencies of the shortwave spectrum.

So where do you hear company traffic on high-frequency radio? On a special set of frequencies that have been allocated just for this purpose called Long Distance Operational Control (LDOC) frequencies.

LDOC HF allocations are available to all international carriers for long-haul company operations and communications. Transmissions typically monitored on LDOC frequencies include arrival and departure times, passenger and fuel loads, flight progress reports, aircraft maintenance problems, and crew scheduling. Frequencies are often shared by more than one carrier, and some carriers even provide communications services to other airlines that do not have their own LDOC facilities. The majority of traffic on LDOC frequencies is in English as well as in the national language of foreign airlines.

TABLE 2

ACARS VHF Frequencies

131.550	Primary ACARS channel U.S. and Canada
130.025	Secondary ACARS channel for busy areas in the U.S.
129.125	Tertiary ACARS channel for busy areas in the U.S.
131.475	Proprietary company channel for Air Canada
131.725	Primary channel for ACARS in Europe

TABLE 1

Common LDOC and Common Carrier Frequencies

3007	3010	3013	3494	3497	4654	4687	5529	5532	5535	5538	5541	5544	6637
6640	6643	6646	8921	8924	8927	8930	8933	8936	10027	10030	10033	10069	10072
10075	10078	11342	11345	11348	11351	11354	13324	13327	13330	13333	13336	13339	13342
13345	13348	13351	17916	17919	17922	17925	17928	17931	17934	17937	17940	21940	21943
21946	21952	21955	21958	21961	21964	21967	21973	21976	21979	21982	21985	21988	21994
21997													

All transmissions are normally upper sideband (USB)

Common Carrier

For some airlines the cost of setting up and operating LDOC facilities can be cost prohibitive. Due to the competitive nature of the airline business, some airlines do not rent out their LDOC facilities to other airlines. So, just what is a long-haul airline suppose to do? Many companies rely on common carriers such as ARINC (Aeronautical Radio, Inc, stations in San Francisco, New York, and Honolulu), Houston Radio (Universal Aviation in Houston, Texas), Rainbow Radio (Tors Cove, Canada), Portishead Radio (England), Berna Radio (Switzerland) and Stockholm Radio (Sweden).

Airlines subscribe to these message-handling services and are charged by the message. Phone patches to airline company dispatch offices and engineering information comprise the majority of the traffic monitored on these frequencies. Corporate business and private aircraft are also regular visitors on common carrier frequencies.

Where to Listen

Table 1 is a list of the most-used LDOC and common carrier frequencies that have been monitored recently in the HF spectrum. There are over a couple hundred frequencies that have been identified as carrying LDOC traffic and it would be outside the scope of this column to provide a complete list. An extensive list of LDOC frequencies and stations can be found in two books available from Grove Enterprises. If you are interested in LDOC listening then the *Worldwide Aeronautical Communications Frequency Directory* by Robert Evans or *Bob Grove's Shortwave Directory* edited by this month's guest columnist, are must for the bookshelf.

Most company and common carrier stations have multiple frequencies in different portions of the HF spectrum to carry out their communications mission with civilian aircraft. This allows the stations a variety of frequencies from which to choose to accommodate the changing propagation conditions of the shortwave spectrum.

During the 1980s, I monitored critical communications associated with several aircraft hijackings (especially from the Middle East) on LDOC frequencies. I often knew what was happening on board the aircraft and its next destination long before the news media announced it to the public. You just never know what you will hear on the LDOC and common carrier frequencies.

New HF Datalink Being Tested

Another form of company communications that has become popular to monitor is the Aircraft Communications Addressing and Reporting System (ACARS). This system is an air/ground network which enables aircraft to function as mobile computer terminals linked to a ground-based command and control management system. Information collected from sensors onboard ACARS-equipped aircraft are automatically transferred by VHF radio link to ACARS ground stations. These messages are then relayed via the ground stations to a central computer processor where the data is converted into inter-airline operational messages through the ARINC electronic switching system (ESS).

Listeners equipped with a scanner that covers 118-136 MHz and a proper decoder (i.e. Universal M-400, M-1200, or M-8000v5 decoders) can decode these operational messages. Table 2 lists the current VHF ACARS frequencies in use.

Like the previously mentioned company frequencies, ACARS channels are VHF line-of-sight. Once the aircraft gets outside VHF range, ACARS no longer works. So to the

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TABLE 3

Atlanta Area Airports Frequencies

Dekalb-Peachtree			
Unicom	122.950		
ATIS	128.400		
Atlanta App./Dep.	119.300	381.65	
Peachtree Tower	120.900	228.300	120.000
Ground Control	121.600		
Clearance Delivery	125.200		
Dobbins ARB			
Pilot-to-Dispatcher	372.200		
ATIS	271.600		
Atlanta App./Dep.	121.0	254.250	
Tower	120.750	397.200	
Ground Control	125.300	275.800	
Command Post	381.300 (Daper Dan/700 TAS)		
Army Nat'l. Gd.Ops	47.000		
Metro	342.500 (After hours Robins AFB Metro 344.600)		
Fulton County Airport - Brown Field			
Unicom	122.950		
ATIS	120.175		
FSS Macon Radio	122.200	122.450	122.600
	122.100R	255.400	
Atlanta App./Dep.	121.000	254.250	
County Tower	118.500	120.700	257.800
Ground Control	121.700	348.600	
Clearance Delivery	123.700		
William B. Hartsfield Atlanta International			
Unicom	122.950		
ATIS	119.650 (Ar) 125.550 (D)		
FSS Atlanta Radio	116.900T		
	122.100R		
Atlanta Approach	118.350127.900 (090-269 deg)		
	126.900 127.250 (270-089 deg)		
	379.900		
Atlanta Tower	119.100 (Rwy 09R-27L and 09L-27R)		
	119.500 (Rwy 08L-26R and 08R-26L)		
	123.850 (Rwy 09L-27R) 348.6		
Atlanta Ground	121.750 (Rwy 09R-27L and 09L-27R)		
	121.900 (Rwy 08L-26R and 08R-26L)		
	348.6		
Atlanta Departure	125.0 (090-269 deg)		
	25.7 (270-089 deg)	284.7	
Clearance Delivery	121.650		

rescue comes AlliedSignal in Redmond, Washington. AlliedSignal is winding up development work on a new high-frequency datalink (HFDL) system that will complement the current ACARS VHF system. The system is currently being tested in North America and parts of South America using a network of three ground stations: St. John's, Canada; Reykavik, Iceland; and Stockholm, Sweden. A total of eight to ten fixed-based HFDL stations must be built or existing HF voice facilities modified, to achieve worldwide coverage.

Currently Delta has nine 767's equipped with the HFDL units. That will soon increase to fourteen. American Airlines began HFDL operations in October, 1992, and its sole HF equipped HFDL 767 has been flying South American routes. United has one 767 operational with 12 more planned. USAir also has a 767 flying with datalink, but that aircraft crosses the North Atlantic infrequently.

Delta Air Lines and United Airlines (U.S. air carriers) are preparing for focused evaluations in cooperation with Transport Canada and other civil aviation authorities. The trials are expected to begin later this year.

Applications of HFDL include automatic dependent surveillance over oceans and remote areas, which means the aircraft can be automatically tracked where radar cannot reach. Airlines will also be able to use HFDL to exchange weather, maintenance, and other messages with their en-route transports.

Several monitors have reported to *MT* Plane Talk the reception of ACARS-type signals on 13339 kHz. The only noticeable difference of HFDL from its VHF ACARS counterpart is transmission speed. Officials of AlliedSignal have confirmed that HFDL is using 1200 baud transmission rates.

Plane Talk will continue to follow the development and implementation of HFDL as details become available.

■ Atlanta Aero Frequencies

Are you planning to attend the *Grove Communications Expo 95*? If you're an aero scanner buff, you'll love the location of the convention. Hartsfield International Airport is the next-door neighbor of our convention hotel, the Airport Hilton. To put it mildly, the listening is great.

Tables 3 and 4 are lists of aero frequencies for the Atlanta area to get those of you who attend the convention started—in case all those Delta flights leaving runways 26R-L and 27R-L cause a aero scanner attack. As a reminder, if you are interested in Atlanta scanning and will be joining us in "Hotlanta," you won't want to miss Roger Cravens "Scan Atlanta" forum on Friday afternoon, October 13. Roger has some great information, including more aero channels to pass out to all of us. This seminar is in addition to the ever-varied, information-packed session always brought to us by Jean Baker.

In the August column, Jean will return to present information on the Concorde. It's been a pleasure to stand in for her while she was temporarily seperated from her word processor.

TABLE 4

Atlanta Center Paired Frequencies

Ultra Low Altitude	125.150/263.000	127.500/316.050	133.800/353.700	134.800/307.900
Low Altitude	119.575/257.900	120.450/357.600	120.550/270.250	121.350/377.050
	123.950/273.600	124.450/254.350	127.050/370.900	127.850/371.850
	128.200/323.000	128.800/379.200	132.050/353.800	132.250/297.400
	132.900/319.900	133.100/360.750	133.150/251.100	133.600/254.300
	134.050/261.500	134.550/290.200	134.950/306.200	135.350/319.250
High Altitude	120.425/327.150	120.725/354.150	121.275/239.350	124.375/380.350
	124.425/343.800	125.625/269.100	125.925/236.700	126.675/363.100
	128.000/371.950	128.025/307.150	128.425/335.650	128.725/306.250
	132.975/307.350	133.175/299.200		
Ultra High Altitude	124.325/380.150	124.875/270.600	125.025/291.750	125.875/319.100
	126.825/354.050	128.775/301.400	134.075/236.500	

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Ken Reitz, KC4GQA

World Satellite Yearly

The 1995/96 *World Satellite Yearly* by Dr. Frank Baylin is the definitive work on compiled global satellite information. Published by Baylin Publications, this recently released updated book is one of a series of Baylin books which would put a serious strain on any shelf.

Weighing in at just under four pounds, the massive 752-page book is a virtual encyclopedia of satellite information. Though the 8-1/2 x 11 format is easy on the eyes, better read it on a desk—it's a load for the lap! Easily a third larger than my previous edition, Baylin has delivered the goods on an ambitious project. It's not easy to write on such a technical subject and still be easily understood, but Baylin does it well.

Easy Access

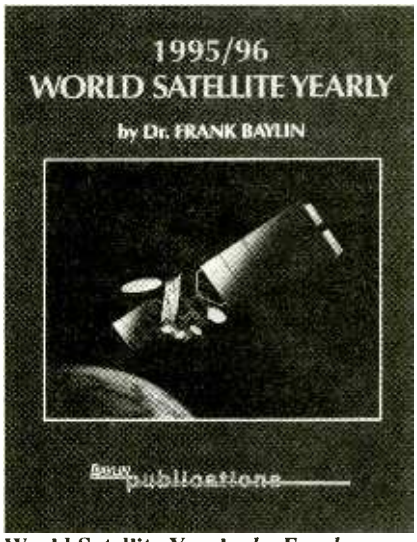
The production of this book is well thought out. Even the Table of Contents takes up four pages of small print! Thick stock, tab dividers separate the work into four categories which are clearly labeled: Technical, Programming, Satellites, and Companies. He even has one page entitled "How To Use This Book."

Taking advantage of the use of those tabbed dividers, Baylin has sold the space to advertisers. The covers are also up for sale, and the final twelve pages are a catalog of Baylin publications and products. And why not? Such advertising helps defray the production costs on a book this big. Now let's take a closer look.

Technical

The technical section explains everything you've ever heard about satellite technology but didn't understand. Packed with charts and diagrams, the book explains such mysteries as satellite footprint charts and how to read them, spot, zone, hemispheric, and global beams. Charts for the various satellite frequency bands in all ITU regions are listed. Circular and linear polarization schemes are explained.

Baylin breaks down satellite reception with more charts and diagrams showing parabolic Antenna Geometry. Low Noise Block downconverters (LNBs) and their noise temperatures are talked about in depth. There are pages on how to aim a satellite dish, on video compression, encryption, transmission, and High Definition Television (HDTV).



World Satellite Yearly, ***by Frank Baylin***

Programming

The *World Satellite Yearly* devotes 47 pages of very fine print to the complete listing of every satellite in orbit as of publication date—from Intelsat 508 at 180 degrees East to Satcom C5 and 139 degrees West. Each channel on each satellite is listed, giving frequency, polarity, beam type, programming type, transmission format (PAL, NTSC, etc.), subcarriers, and primary language. This is a tremendous amount of information in such a small space.

In my location, given the tree line to the East, Intelsat 513 at 53 degrees East is as far as I can see. The listing in the *World Satellite Yearly* tells me to look for programming on channel 14, using circular polarization, I should be able to see news feeds from the UK to Australia in the PAL format in English with subcarriers at 6.13, 6.30 and 6.60 MHz. Indicating that the beam is global and the signal left hand circular polarized also tells me that the signal will be very noisy.

The Satellites

The bulk of this book, some 463 pages, is devoted to this section. Here every single satellite in orbit or even under construction is given a page. Using the handy listing at the front of this section I looked up Intelsat 513 to get some more background on this bird. Two pages are given to this satellite, the first of which is a footprint map showing the general areas each beam should fall on the part of the Earth at which it's aimed.

The adjacent page has a wealth of information regarding the actual satellite. An address and phone number for the Owner/Operator are listed; it was launched on May 17, 1988 via an Ariane V23 rocket, and its present status is "operational." Actual details of the satellite such as stabilization, inclination, launch weight, dimensions (it's 52 feet by 21 feet with solar panels extended), transponder output power (8.5 or 4.5 watts C band), and the telemetry beacon frequencies for both C and Ku band are listed.

Other information listed under "Communications Payload" include the type of service (TV, data, voice, etc.), number of C and Ku transponders, channel bandwidth, polarization and more. In short, I can learn everything I want to know about any given satellite in the entire Clarke Belt. That's neat!

Companies

The section under this heading is a compilation of addresses, phone and FAX numbers for programmers (American programmers alone comprise 300 listings), Spacecraft Manufacturers, Satellite System Operators, Equipment Manufacturers, and Trade Publications and Publishers—an incredible amount of information.

WSY Bottom Line

The *World Satellite Yearly* is intended as an industry reference book, but its usefulness exceeds that narrow target. It's important for this information to be available to the satellite TV enthusiast; while the price tag ($90) is steep by hobby standards, it remains a relative bargain in the industry.

As an educational tool it's worth more than one might get out of an industry seminar costing twice that amount. True, it's not the kind of book you just can't put down, but if you're looking for an inexpensive education from a top grade teacher, plus a great reference book, this is it.

A work this extensive needs a thorough index. A great table of contents is still not a substitute for an index. Mark Long's *World Satellite Almanac* (now published by Phillips Publishing) had two indices and it made all

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the difference in using the book for quick referencing. The few pages that an index would take up would be well worth the minimal effort.

The *World Satellite Yearly* is available directly from the publisher: Baylin Publications, 1905 Mariposa, Boulder, CO 80302 (telephone 303-449-4551 or fax 303-939-8720).

MAILBAG

• Thanks to Walter Smith of Tanner, AL, for a clipping from *The Huntsville Times* on their local Skywarn Storm Spotter program. The article, he notes, makes no mention of weather satellites. And it's a good point, Walter; in spite of the latest technology, weather satellites, and Doppler RADAR, there's no substitute for a trained observer on the ground. If you are interested in the Skywarn Spotter program contact your local NOAA weather service or Amateur Radio Club. Skywarn classes are held at different times in every locality.

• Greg Gilbert of Marietta, GA, asks, "...With the new 18" dish receivers, are they broadcasting any SCPC signals or other types? Can I receive them with a R-7100 receiver and the right kind of high frequency splitter?"

Sorry, Greg, but it's no to both questions. The DSS, USSB and Primestar services use proprietary digital encryption systems for the transmission of all of their signals. SCPC and FM subcarriers are one advantage of having a C/Ku satellite system. The reason is actually because the direct broadcast satellites are intended solely for the reception of the paying audience. There is no "work" space on those satellites. The C/Ku satellites are all "work." They are intended for paying audience, businesses, cable systems, and all transponder space is for sale.

• Mike Tivnan of Woodbridge, VA, writes, "...I am primarily interested in audio, what is the smallest diameter dish I can get started with?...I really don't want to start wrestling with a ten-footer. Can I get anything with a three, four or five-footer, or are they a waste of time? And once I have a minimum size dish erected, do I have to spend $400 on that audio receiver I see advertised or are there cheaper alternatives?"

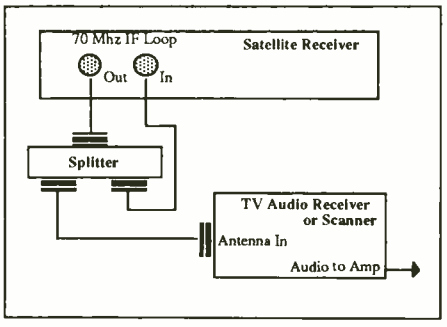
Well, Mike, these are all good questions, and ones that almost always come into mind when anyone is just starting out in this hobby. Here's the answer in a nutshell: Buy the biggest dish you can afford or have room for. Here's why: Take your typical portable shortwave radio, extend the telescoping whip antenna and tune the CW portion of the 40 meter band. With luck you'll hear a few stations. Now attach a decent outdoor antenna instead of the whip and you'll hear dozens of signals. The radio has not changed, it still has the same ability. What made the difference was the antenna. The dish is the satellite antenna and the results will be the same.

I've hooked up an SCPC receiver to my four-foot dish and was able to get a fair number of signals with decent levels. But when I hook that same receiver up to the ten-foot dish the difference is staggering. While four feet is really pushing it, especially for narrowband SCPC reception, a great improvement will be found using a six-foot dish. Why? There'll be several dB of gain between the four and six-foot dishes and that translates to much better signals. You should be able to get a six-foot dish with polar mount shipped for about $250.

Now, as to the question of receivers. Again, I'll compare it to the shortwave listening experience. Take the same portable shortwave radio hooked up to the outdoor antenna. Tune around the same bands and you'll hear dozens of signals. Now replace the portable with a great (expensive) shortwave radio (still hooked up to the outdoor antenna) and you'll be amazed; the signals are much stronger, there are many more stations and things you never heard before that can be heard clearly. Now the difference is the receiver. You've made the receiver as efficient as possible and it matches the very efficient antenna. The same with satellite. Provide a decent six foot dish and a decent SCPC receiver, and you'll enjoy what you're hearing.

Yes, there is a cheaper alternative. While it is considerably less satisfactory, it will work. Go to your local satellite dealer and buy an old, used satellite receiver. It needs to be in working order and have a set of "F" connectors on the back labeled "70 MHz I.F. In and Out" or "T.I. Filter In and Out." This is not the LNB connection, but a secondary IF loop (there'll usually be a 2 or 3 inch long piece of coax connecting the two "F" connectors). Remove the end labeled "IN" and attach it to the top leg of a standard UHF splitter with "F" connectors.

Take a second short piece of coax and attach it to one of the remaining two legs of the splitter and attach the other end to the antenna of a TV band radio which tunes the audio of channels 2 through 13. Take a third short piece of coax and attach it to the remaining leg of the splitter and back to the "IN" "F" connector on the back of the satellite receiver, thus completing the loop.



SCPC Via 70 MHz.

Now, set the satellite receiver to Galaxy 4 channel 3. Turn the TV radio on and start tuning the radio up from channel 2 on its dial. Every now and then you'll hear FM SCPC signals. You'll appreciate that it won't sound as good as the expensive SCPC receiver you're trying to avoid buying, but it does work. I used a set-up like this with a Uniden 7000 receiver for several years before consumer-grade SCPC receivers were finally on the market. I took the audio output from the TV band radio and fed it into a graphic equalizer and put it on simulated stereo. I fed the output of the equalizer into the stereo and ended up with quite a nice sound for such a Rube Goldberg contraption.

The used receiver will cost about $100, the TV band radio about $50 and the splitter and coax about another $10. This, with your $250 antenna, will give you an ersatz SCPC system.

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Kevin Carey, WB2QMY

Name That Sound!

The longwaves are known for being a bit out of the mainstream—partly because of the propagation characteristics, and partly because of the signals you'll hear there. Some signals, however, seem to be just noise. This month we'll take a look at some of these mystery sounds and sort out their origins.

Location is Everything

The clickety-clack pulses you'll hear at 100 kHz (+/- 20 kHz) come from the LORAN system (Long Range Radio Navigation). The system is run by the U.S. Coast Guard and includes several sites along the U.S. coastlines, plus other locations around the world.

The basic principle of Loran is to measure the small, but significant, time differences in the pulses received from three or more land-based transmitter sites. A Loran receiver analyzes this data and computes the latitude, longitude, range, and compass bearing of the receiving station.

True, it's no match for the hairsplitting accuracy of GPS, but Loran has been around a lot longer and the cost is not as high as for GPS receiving equipment. The Coast Guard has stated its intention to maintain the Loran system even in the presence of GPS—at least for the time being.

What's the Buzz?

Between 150 and 175 kHz, you'll often hear the raspy sounds of the Ground Wave Emergency Network (GWEN). These short bursts of noise are actually encrypted data packets carrying military traffic. The system is run by the U.S. Air Force and includes powerful, nuclear-hardened sites all around the country. At night, you can often hear many GWEN signals on the air at once.

Stop the Music

A common problem on the longwaves, especially if you live near a large city, is AM broadcast overload. Sometimes these signals are so strong that they can plow right through the front end of your receiver and appear on the longwave dial, usually showing up as garbled voices. The solution is to install either a wave trap which shunts the unwanted signal to ground, or use a tuned preselector between your receiver and the antenna.

Taking a Dim View

Perhaps the most notorious of all longwave noise comes from light dimmers. Even the newer ones that are advertised as being "RFI-filtered" (or something similar) seem to be pretty bad on LF. Setting them to full brightness will reduce the noise, but the only sure fix is to turn them off during listening sessions.

Fluorescent lights, too, are capable of ripping up the band, and sound very much like light dimmers. The good news here is that many of the newer models produce far less static than their predecessors.

Inside Job?

One of the signals you may hear could be coming from right inside your set. Are you hearing a signal near 455 kHz? It's very likely the Intermediate Frequency (I.F.) of your receiver or another nearby radio.

Another "internally-generated" signal could be from the oscillator crystal used in a VLF converter. These are typically set for 3.5 or 4.0 MHz. When you tune the receiver to within a few kHz of the crystal frequency, you will hear a *very* strong beat note in the speaker. This is usually the limiting factor in how low you can tune with a VLF converter.

Q LONG BEACH, CA

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NNNN

Fig 1: Example of NAVTEX reception on 518 kHz by Dennis Hanley (CA)

MAILBAG

• NAVTEX listener Dennis Hanley (CA) wrote in with some interesting printouts from various NAVTEX stations he's heard on 518 kHz. (See Figure 1.)

• Dennis says the best thing about NAVTEX is that you can DX all night without losing any sleep! He explains: *"Instead of turning the receiver off at night, I just park it on 518 kHz, and then see what shows up the next day."*

• All that's required to receive NAVTEX is a computer, and an RTTY decoder capable of handling either AMTOR or SITOR Mode B (broadcast). If you live near any of the coasts, you should be able to hear at least one of the NAVTEX stations. For more details on NAVTEX, check out the July 1994 *Below 500 kHz* column.

• What do you do if your neighbors don't like big antennas? Mike Elder (TX) has an excellent solution. He uses a 1000 foot roll of #12 insulated wire strung out across the ground, and is having excellent luck receiving stations below 500 kHz. A Kenwood TS-940-S ham rig serves as his main receiver. Mike says the big benefit of the on-ground receiving antenna is its low noise characteristic. Several of his loggings appear in Table 1.

• Oops! A correction is in order for George Zeller's logging of Lowfer DCH (1 87.335 kHz). I incorrectly listed the location as "Berlin, PA" in the April issue. The correct location for DCH is Berlin, MD.

• Paul Smith, N9ESD (WI) has taken the plunge below 500 kHz using military surplus. His rig is an old R-1449/WLR-6(V) receiver which he purchased from Fair Radio Sales. Paul would like to obtain a manual for this set, or at least a schematic diagram. If anyone has any ideas for him, drop me a line at *MT* and I'll pass it along.

Loggings

We have an excellent selection of loggings this month. The list in Table 1 is courtesy of the following *MT* readers: Don Tomkinson (CA), Frank Carson (MD), Hank Holbrook (MD), Mike Elder (TX), Peter Warncke (CA), and Robert Follett (UT). Thanks to each of you for your contributions.

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End Notes

Some readers who built the Homespun Longwave Loop (September 1992 column) experienced some difficulty in finding the fine gauge wire for the loop windings. I've now been advised that Grove Enterprises has a quantity of suitable wire on hand, and will sell 250 feet for $5.00 including shipping. When ordering, you must ask for Sue or Bob. The regular order desk won't know anything about it. By the way, reprints of the loop construction article may still be ordered for $2.00. Write to *MT* at the address given at the beginning of the magazine.

TABLE 1

Longwave Loggings

Freq.	Identity	Location	By
198	DIW	Dixon, NC	F.C. (MD)
201	EDX	Edna, TX	M. E. (TX)
203	RED	Red Lodge, MT	R. F. (UT)
205	COR	Corcoran, CA	D.T. (CA)
206	GLS	Galveston, TX	R. F. (UT)
209	AEC	Mercury, NV	R. F. (UT)
211	ORG	Orange, TX	M. E. (TX)
212	DBX	Washington, KS	R. F. (UT)
214	K8	Nemiscau, QUE.	H. H. (MD)
220	IHM	Mansfield, MA	H. H. (MD)
222	FDR	Frederick, OK	R. F. (UT)
227	ASE	Aspen, CO	R. F. (UT)
230	BI	Bismark, ND	R. F. (UT)
233	EY	Chesapeake, VA	H. H. (MD)
236	GNI	Grand Isle, LA	P.W. (CA)
237	EZF	Fredericksburg, VA	F. C. (MD)
245	CRR	Circle, MT	P.W. (CA)
249	LYD	Houston, TX	M. E. (TX)
254	RA	Rapid City, SD	R. F. (UT)
264	RLS	Westerly, RI	H. H. (MD)
265	SXD	Springfield, VT	H. H. (MD)
278	BST	Belfast, ME	H. H. (MD)
281	CXO	Conroe, TX	M. E. (TX)
290	AOP	Rock Springs, WY	D.T. (CA)
290	YYF	Pentiction, BC	D.T. (CA)
294	BMC	Brigham, UT	D.T. (CA)
300	YOG	Ogoki Post, ONT	H. H. (MD)
310	F	Sabine Pass, TX	M. E. (TX)
318	HFY	Indianapolis, IN	H. H. (MD)
320	HTN	Miles City, MT	D.T. (CA)
323	UT	Cameron, LA	M. E. (TX)
330	CZM	Cozumel, MEX	P.W. (CA)
333	STI	Mtn. Home, ID	D.T. (CA)
344	XX	Abbotsford, BC	D.T. (CA)
344	JAS	Jasper, TX	M. E. (TX)
350	NY	Enderby, BC	D.T. (CA)
353	LWT	Lewiston, MT	D.T. (CA)
353	F7	Perry Sound, ONT	H. H. (MD)
353	CY	Cheyenne, WY	R. F. (UT)
356	ZF	Yellowknife, NWT	P.W. (CA)
356	PTT	Pratt, KS	P.W. (CA)
359	BO	Boise, ID	D.T. (CA)
368	SX	Skookum, BC	P.W. (CA)
370	PAI	Pacoima, CA	P.W. (CA)
371	TOX	Siler City, NC	H. H. (MD)
373	2R	Deseronto. ONT	H. H. (MD)
379	BRA	Asheville, NC	F.C. (MD)
428	EEJ	Sanford, NC	F. C. (MD)
435	IIY	Washington, GA	F. C. (MD)
500	3EXH4	Cargo ship (400 mi. East of St. Augustine, FL.)	H. H. (MD)
526	ZLS	Stella Maris, BAH	R. F. (UT)

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Ike Kerschner, N3IK

Are You Ready?

The June VHF contest takes place the second weekend of this month. The bands from 6 meters to microwaves will be loaded with signals. This is your opportunity to work those rare grids needed for VUCC (VHF operating award), or maybe to log that last state for six meters. One thing's for certain: this contest is a lot of fun for the VHF operators.

Many hams make mini-DXpeditions to high locations and to rare grid squares specifically to make the most of this operating event.

The majority of operation will be on SSB and CW, but the FM operator can also participate in this event—simplex only. Repeater QSO's are not allowed. Just pick a simplex freq and have a ball (do not operate on the national simplex calling freqs. 146.52 or 52.525 for contest QSO's). If you find a nice hill and use a simple gain antenna the number of stations and distances you work will amaze you. For example, on two meters a good location plus a three or four-element yagi will let you work many stations in a wide area even with a low-powered, hand-held rig. Try it; you'll like it!

Reasonable cost and reliable performance make the Atlas 400X a Best Buy

Field Day

This is without doubt the best-known ham radio event in North America. Field Day is supposed to be a non-contest event, but the competition can be fierce between individual groups. A club I used to belong to wagered a pizza party with a neighboring club; the lowest scoring group picked up the tab.

Field Day is basically a test of emergency preparedness. Clubs all over North America take to the fields using emergency power in an attempt to work as many other stations as possible. Most clubs plan for this event all year long. It becomes a picnic, family gathering, and media event for most of us, although a lot of good technical/operating information can be picked up during this event.

Clubs form committees to set up various operating positions, cook food, locate a site, provide power, contact the media and prepare news releases, and perform other functions for Field Day.

There is more news coverage about ham radio during this weekend than at any other time of the year. It's the time when non-hams hear about us, so let's make the most of it.

Hambrew

Do you like to build ham gear? If so, then *Hambrew* is for you. *Hambrew* is a magazine devoted to the ham who likes building his own gear. I saw an ad for this magazine some time ago, and wrote off for a copy of it. When it arrived I spent several hours reading it and trying to decide which project to build first. The first project I built was a 40 meter QRP rig called the Pip-Squeak, the second was a 20-meter rig called the One-der, and the third was a crystal-controlled signal generator.

This slick magazine is crammed with detailed information on how to build receivers, transmitters, and accessories, and contains kit and product reviews. Advertisements provide a lot of sources for hard-to-find parts and high quality kits.

Hambrew is published quarterly and is available for only ten dollars a year (a real bargain) from Hambrew, PO Box 260083, Lakewood, CO 80226-0083.

More Books

Being an avid collector of older receivers and transmitters I was very interested in an advertisement for a book called *Communications Receivers, The Vacuum Tube Era: 1932 - 1981*, so I sent off for a copy. Author Raymond Moore has produced a work that details every communication receiver of that age with full descriptions and photos of each. The communications receivers covered are superheterodyne HF receivers built in North America, and offered for sale as a communication receiver to commercial or amateur radio communities.

Especially interesting is a history of several of the manufacturing companies (Hallicrafters, Collins, National, and Hammarlund), along with anecdotes and interesting facts about the radios and their builders.

The book is not just for collectors, but for those interested in the history of communications as well.

Communications Receivers is available for $19.95 plus s/h from RSM Communications, PO Box 1046, Key Largo, FL 33037-1046.

Antique Electronic Supply

This company specializes in parts for older radio gear. Their 38-page catalog is a treasure trove for those of us interested in older, tube-type gear. In it you will find listings for hundreds of tubes, capacitors, transformers, and other hard-to-find items for building and maintaining tube equipment.

The publication section of this catalog is pure gold: dozens of books on the history of radio, and how to build, restore and maintain older gear is included. Tube kits for receivers and wireless transmitters are also available at reasonable prices.

The catalog is free and worthwhile for anyone in radio. The address for Antique Electronic Supply is 6221 S. Maple Ave, Tempe, AZ 85283.

Best Buy!

Need a new rig? Are you having trouble deciding which to purchase? You might want to consider the ATLAS 400X transceiver. It is one of the best buys on the ham radio market today. This 150-watt (power is variable down to 5 watts), CW, SSB, AFSK transceiver covers 160 to 10 meters with a super-sensitive and selective receiver.

The 400X is only 9 x 3.4 x 9.5 inches in size with a total weight of 7 lbs. At this size

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Atlas rigs will go anywhere—and they have. For example, Thor Heyerdahl used the Atlas 215X on the reed ship *Tigris* during its 144-day, 4200-mile voyage. A French mountain-climbing team used the 215 at 20,000 feet under terrible weather conditions to provide reliable communications during an assault on Mt. Everest. The *Double Eagle II* used the Atlas 210 during their crossing of the Atlantic—the Atlas was the only communication gear that did not fail during the flight (it is on display in the Smithsonian Institute). During the Falkand War the lighthouse keeper in Stanley maintained regular communications with England using a 210X and makeshift antennas in clandestine operation to provide information on Argentine troop movements.

With a history like this and a price of only $799.00, the 400X has to be one of the best buys in ham radio today. For more information call Atlas at (619) 259-7321 or write to ATLAS RADIO CO. 722-G Genevieve St., Solana Beach, Ca 92075-7321 (see photo 1).

That's all for June, gang, see ya during Field Day. 73 de Ike Kerschner, N3IK

Rob Kessel's Ham DX Tips

This is a month of new beginnings, such as weddings and graduations; why not make it a new beginning in your DXing habits? If you have never tried the ham bands, give them a try; if you are an amateur but have never tried VHF DX, why not try that? Here are a few tips to get you started...

ALBANIA ZA1AJ has been logged operating on 14285 kHz at 1630 UTC most days. QSL requests go to his manager: OK2PSZ Vit Kuncar, Havrice 293, CS-68801 Uhersky Brod, Czech Republic. **AUSTRALIA** One of the strongest signals on the Pacific Rim DX net—which meets daily at 1100 UTC on 7083 kHz SSB—is VK3EW (David McAulay, P.O. Box 54, Cranbourne, Vic 3977, Australia), one of the net controls. US hams should note that the DX stations which meet on this net, "listen up" into the US "phone sub-band" after they have made their DX to DX contacts. **CANADA** In June the amateurs of Cape Breton Island in Nova Scotia Province will be celebrating, with a special amateur callsign prefix, the 282nd anniversary of the founding of Ft. Louisbourg by French settlers, and the 250th anniversary of capture of the same fort by a British army made up mostly by colonial troops from New England in "King George's War." This was one of the many "Wars" the French and English fought for control of the N. American continent. Roy Blakeburn, *MT* reader and Cape Breton amateur, reports that the special prefix authorized for use by amateurs on the island might be VF1L. Also, Roy mentions that, this summer, amateurs on the island will also be honoring the 100th anniversary of the Louisbourg to Sydney railroad line—another possibility for a special use prefix and special event stations. **CONTESTS** The annual *ARRL June VHF contest* will start at 1800 UTC on June 10th and ending at 0300 UTC on June 12th UTC. This is THE VHF/UHF contest of the year, with more amateurs on the bands and being held at the time of the year when propagation on those bands is best. Also check for regional and local amateurs operating on FM simplex frequencies. Exchange will be four-character Maidenhead Grid Square. You have a chance to log an *MT* columnist; look for N9LAG, me, in this contest on 6 and 2 meters, 70 and 125 cm. Starting at 1800 UTC on June 24th and ending 24 hours later is the *ARRL's annual Field Day*. Though not exactly designed as a contest, this annual exercise is to test the ability of amateurs to operate on short notice in an emergency. Exchange will be callsign and class of operating station, depending upon type of power used and number of transmitters used. Operations will be on *all* the HF bands, SSB, CW, and RTTY, and many groups will earn extra points by placing VHF stations on the bands of 6 and 2 meters SSB and CW. Also, look for packet stations. On July 1st Canada celebrates its national holiday, *Canada Day*. And the Radio Amateurs of Canada sponsor an annual contest on this day. Look for special prefixes and special events stations on: 40, 20, 15 and 10 meters SSB and CW. **FRANZ JOSEPH LAND** NT2X has reportedly been told by Russian amateurs that the Arctic research base on this island may be closed after this summer due to financial reasons. The good news is that you still have some time to add this DXCC country to your log books before it becomes really rare. Look for R1FJL on 10110 kHz CW at 0230 UTC. QSL's should be requested from QSL manager JA3AFR, Nagasaki, 6-24 Wagmi, Nishimomiya 662, Japan. Also operating on CW regularly is RX1OX/FJL who has been on 14005 kHz at 1330 UTC most days. His QSL manager is DL6YET, Nikolai Pfanenstiel, Pfarrer-Mueller-Str 10, D-48268 Greven-Reckenefeld, Germany. **FRENCH GUYANA** FY5GJ is on 14025 kHz CW, starting at 0100 UTC. His QSL manager will respond to your QSL requests, write to: F2YT, Paul Herbet, 9 Rue de l'Alouette, Estree Cauchy, F-62690 Aubignyen Artois, France. **GREENLAND** OX3XR can be found on 18070 to 18075 kHz CW daily at 1600 UTC. QSL to: OZ3PZ, Preben Banke Thomsen, Skalkend rup 17, DK-5800 Nyborg, Denmark. **POLAND** SP9WZJ (Leszek Wiecorek, ul Skalna 15, 44-270 Rynik 10, Poland) inhabits 18145 kHz almost daily starting at 1415 UTC. **ROMANIA** YO9ALY Mircea Sandulache, Box 2, R-0700 Alexandria, Romania) likes to operate RTTY around the frequency of 14085 kHz at 1330 UTC.

This is the month when you can get out enjoy the fresh air and sunshine as well as the DX! *73 de Rob.*

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Don't Panic...

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

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

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Pirate Jams Iran

Most pirate stations attempt to be good operators that do not cause interference to other broadcasting services. But, during the last year a couple of stations have created controversy by jamming other pirates. **Hello Radio** and **Radio USA (fake)** have been notorious offenders.

MT reader Jeff Richardson of Dover, DE, reports a highly unusual pirate jamming incident on March 4. He was listening to **IRIB**, the international voice of Iran, on 9022 kHz at 1945 UTC with a decent signal in English. However, a clandestine jammer broke in on the frequency. The jammer's male announcer made numerous profane remarks about Iranians and their alleged carnal habits. Some of the jammer's remarks were pro-Kurdish, so perhaps we should actually classify this jammer as a clandestine broadcaster.

Jeff reports that the jammer never gave a clear ID, although he had a whopping signal in Delaware. Has anybody else heard programming similar to this?

■ Aum Shinrikyo

Japanese government and police sources have been blaming a religious cult known as Aum Shinrikyo for a widely publicized poison gas attack in the Tokyo commuter rail system that caused numerous passenger fatalities. Strangely enough, Aum Shinrikyo has been leasing time on shortwave transmitters owned by the **Voice of Russia!** Following the accusations from Japanese authorities, **Radio Aum Shinrikyo** began political broadcasts that were semi-clandestine in tone. According to BBCMS, the station denounced "false information" in the media about the sect, urging members of the group to be prepared to "face death without any regrets."

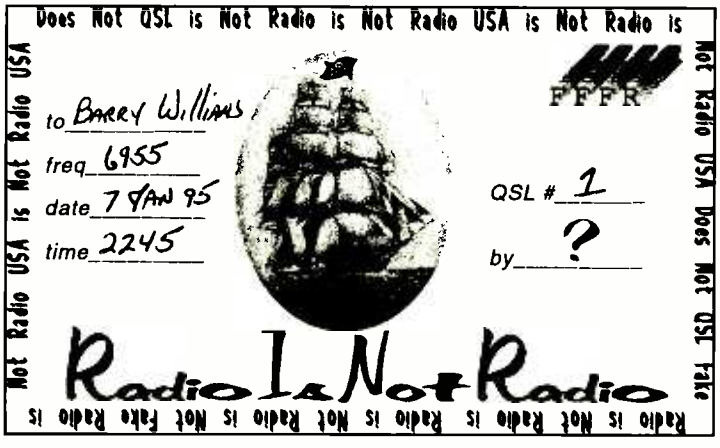
The Aum Shinrikyo broadcasts came from a medium wave transmitter on 1476 normally used to broadcast Mayak programming in Russia. BBCMS reports that half hour shows ran at 2030 and 0430 UTC, with a three hour Japanese program at 1500 UTC. However, Mayak says that it has dropped its relay service of this programming, which had been generating revenues of $800,000 annually. BBCMS has not noticed the relay since March 22.

■ Current Pirate Propagation

I picked up a copy of the new Super DX Edge (version 2) computer software through the Grove Enterprises catalog. In addition to sunrise, sunset, and greyline analyses that we have come to expect from the traditional analog plastic DX Edge, the computer edition contains a Maximum Usable Frequency propagation analysis capability. If you're looking for an inexpensive tool to analyze propagation paths, this program is worth checking out.

I ran the MUF software between my Cleveland home and various pirate maildrop locations on various dates during the winter and spring of 1995. Given the extremely low level of solar activity that we have seen lately, with WWV solar flux readings in the low to mid 70's, this software predicts that the Maximum Usable Frequency to Cleveland is usually below 7 MHz after sunset.

Many readers have written in this year to report erratic reception of pirates. Station operators need to think about propagation paths on 41 and 43 meters during the current bottom of the sunspot cycle. On many days, transmitters in eastern North America will not have an open path on 41 or 43 meters to receivers east of the Mississippi during hours of darkness. Two solutions would be daylight operations, which we see in several station loggings this month, or a move to lower frequency ranges such as 90 meters. It's food for thought.



Barry Williams' #1 QSL from Radio Is Not Radio

■ Southern Music Radio

David Miller of this New Zealand free radio station sends in a schedule for their licensed station relays. Their next two broadcasts via **Radio Copan** will be on June 10 and August 12 at 1900 UTC on 15675 kHz. They also expect intermittent relays this summer via the **Swedish Shortwave Relay Service** on 3925 and 6258 kHz, as well as occasional relays by North American pirate transmitters. **KIWI** in New Zealand anticipates occasional relays on 7445 kHz around 0800 UTC.

Miller verifies reports reliably via the Wellsville maildrop. He points out that Europirate **Radio Marabu**, not SMR, was probably the first pirate heard over Jeff White's Caribbean transmitter at Copan.

■ Spectrum

Several *MT* readers heard the March 19 edition of the *Spectrum* DX magazine program that was broadcast live for the second consecutive year from the Winter Shortwave Listeners Festival in Kulpsville, PA. Your columnist George Zeller was a guest on this show, so a discussion of pirates naturally took place. According to NASWA "Listener's Notebook" editor Chris Lobdell in MA, the *Spectrum* pirate segment was then retransmitted during the 2200 UTC April Fool's Day broadcast by the parody pirate **XEROX, Radio Duplicado,** which uses the Wellsville maildrop.

■ Micropirates

After a California federal judge refused an FCC request for an injunction that would have silenced him, Stephen Dunifer of **Radio Free Berkeley** has been generating plenty of media coverage. Don Bishop of Kansas City, MO, sent in a long analysis printed in the *W5YI Report*. *MT* reader John Shafer of Suisun City, CA, cut out a very lengthy article on Dunifer that was printed in the *Sacramento Bee*. But, when John got home from work and

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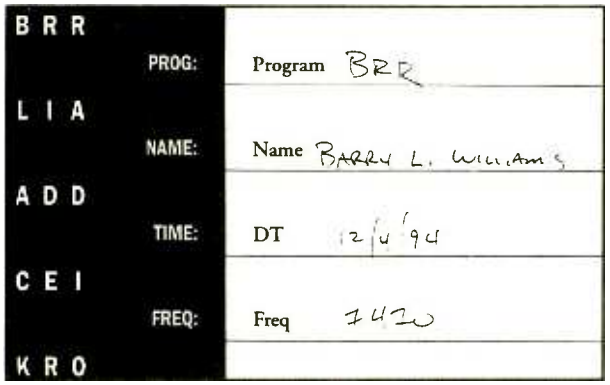

Williams proves Black Rider Radio is verifying

prepared to mail the article to Brasstown, he found *Monitoring Times* in his mailbox with more coverage of Dunifer. At this writing, the Bay Area FM pirate is still broadcasting.

Meanwhile, former *Monitoring Times* columnist Karl Zuk reports that he has been hearing an FM pirate regularly near New York City on 91.9 MHz. For listeners in the New York metropolitan area, Karl says that this is the "favorite" local pirate frequency.

Advance Tip

Regular *MT* reporter Gigi Lytle of Lubbock, TX, received a tip that at least one Europirate would be active with a test to North America on June 3 at 2300 UTC near 6285 kHz. This may be too early for anything except East Coast locations, but the frequency range is worth checking out on this day and the early evening of June 4 UTC. Let us know if you hear anything!

What We Are Hearing

Maildrop addresses used by North American pirate broadcasters logged this month include PO Box 452, Wellsville, NY; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; and PO Box 293, Merlin, Ontario N0P 1W0. We'd like to see your loggings here; send them in to PO Box 98, Brasstown, NC 28902. All frequencies are in kHz, with times in UTC.

Black Rider Radio- 6965 at 2315. This relatively new rock station is now verifying with the nice QSL card that we picture this month. Barry got his very rapidly after sending in a reception report. Addr: Wellsville. (Barry Williams, Enterprise, AL)

DC Radio- 7470 at 0145. This heavily political station transmits exclusively in CW Morse code mode. Their latest slogan is, "Newt's program, wheeling, dealing, and stealing." An anonymous contributor also heard them on 5850 kHz at 0130. Addr: None, but verifies loggings in *The ACE*. (Michael Jones, Falls Church, VA)

Fake Radio USA- 6955 at 2200. Similar to (but different from) Radio Is Not Radio, this parody imposter makes fun of Radio USA (fake). I know all of this is confusing, but goofy situations like this make pirate DXing fun. Addr: None. (Dick Pearce, Brattleboro, VT)

He Man Radio- He Man, a self-professed "manly dude," writes in direct to point out that the station now has T-shirts in large and extra large sizes. They are available for $12 postpaid via the Blue Ridge Summit address. He didn't mention if they are designed for males or females, but presumably either could wear them. (Harold Frodge, Midland, MI; Direct from the station)

K-2000- 6955 at 0115. This one came in third in the 1995 "Pirate Popularity Poll" sponsored by *The ACE*. Their DX parody format is exceptionally clever, so if you log this one, you're in for a treat. Addr: Stoneham. (Jesse Rose, Hampton, VA)

KULP- 1700 at 2200. Three pirates broadcast in association with the Kulpsville Winter SWL Festival this year. Our own Uncle Skip Arey heard this one both on mediumwave and on various FM frequencies with its own programs and relays of stations such as **KIWI.** Addr: Blue Ridge Summit. (Skip Arey, Waterford Works, NJ)

Laser Hot Hits- 7415 at 1615. Despite the demise of **NAPRS** earlier this year, it's still possible to hear North American relays of Europirates like this one from time to time. They feature a slick rock format with plenty of slogans and jingles. Addr: Merlin. (Rose)

Radio 69- 103.5 MHz FM at 2230. Skip suspects that the aforementioned KULP relay may have been the source of this strange program that he heard at the Winterfest. They claimed to be the "mutual satisfaction station." Addr: Blue Ridge Summit. (Arey)

Radio Airplane- 6955 at 2345. Captain Eddy has been programming nasty material about the FCC and the ancestry and foul nature of its employees. Actually, the agency isn't very popular with *any* pirate station. Addr: Wellsville. (Richardson; Frodge; Williams)

Radio Azteca- 6875 at 1430. Bram Stoker continues to produce some of the funniest shows heard on shortwave radio today. His satire pokes fun with everybody involved in DXing. Addr: Wellsville. (Frodge)

Radio Doomsday- 6957 at 1800. Nemesis' activity level has been erratic lately, but from time to time he gets on the air with rock music and pirate radio commentary. Addr: Wellsville. (Frodge; Williams)

Radio Garbanzo- 6955 at 2215. Fearless Fred, a longtime veteran pirate broadcaster, remains popular because he produces shows that are just plain funny. Among his recent original jokes was an ad for Harris transmitters, which allegedly outsmoke all others. Addr: Wellsville. (Pearce; Williams; Frodge)

Radio Is Not Radio- 6955 at 0330. To refresh our memories, this one is the original parody of Radio USA (fake), featuring a funny computer-generated tape loop announcement. The news is that they are now issuing the QSL that we picture here. (Williams; Pearce; Frodge; direct from the station)

Radio USA (fake)- 6955 at 2130. This is the original phony version of Radio USA, now identifying as "The Real Radio USA." They fortunately are doing less jamming and more programming lately, perhaps flattered by their imitation parody stations. Addr: Still none. (Pearce)

unidentified- 6912 at 0300. Harold heard what he calls the "singing Japanese fishermen" back on this frequency after an absence of a month or two. Sometimes the singing appears to be in French, but nobody has ever heard an ID from this one. The frequency is worth checking out from time to time. Addr: None. (Frodge)

Up Against the Wall Radio- 6955 at 0045. Owsley still plays 60's and 70's political rock music, but recent broadcasts have added swing and big band tunes. This well-produced station is easy to spot from its "oogah" horn interval signal. They still require comments on their programming for a QSL. Addr: Wellsville. (Rose; Richardson; Williams; Pearce)

Voice of the Garlic- 6957 at 1900. We don't know much yet about this new operation, but Barry heard them with a strange shouting and preaching format mixed with rock music and phony ads. Addr: Wellsville. (Frodge; Williams)

Voice of Pancho Villa- 7415 at 0500. Pancho rode again at the Winter SWL Festival in Kulpsville, PA. This year he and a young lady paid a visit to the Enid, OK, residence of *MT*'s Glenn Hauser. You'll have to log the station to find out the ending. Addr: Blue Ridge Summit. (Arey)

WKND- 6956 at 2230. Barry says that a show featured "Take This Ball and Shove It," dedicated to Cleveland sports fans. I heard this broadcast in my car on a Philips DC-777 while returning from a Cleveland Indians replacement game, so the song was appropriate. Addr: Blue Ridge Summit. (George Zeller, Cleveland, OH; Williams)

WLIS- 6955 at 0100. Jack Boggan still programs interval signals of shortwave broadcasters in a highly unusual format. Most shows use tunes from international broadcasters, but one program consisted exclusively of pirate station interval signals. Ian MacFarland, whose picture is on all WLIS QSL's, said at the Winter SWL Festival that he is not associated with the station. Addr: Blue Ridge Summit. (William Hassig, Mt. Prospect, IL; Nick Terrance, Huntington, NY; Pearce; Williams)

WSWL- 1620 at 0400. From a booth at the Kulpsville Winter SWL Festival, this station relayed at least a dozen different pirate programs via a low power transmitter that was certainly not audible outside the hotel. Perhaps this will stimulate thought about an Atlanta hotel in October? Addr: Wellsville. (Arey)

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WHAT'S NEW?

BOOK REVIEWS AND NEW PRODUCTS

by Larry Miller

Guest reviewer: Bob Grove

JPS NIR-12

JPS Noise Reducer

In today's noisy environment, signals take a beating, whether from natural or man-made sources of interference. JPS Communications, Inc., announces another in their line of accessories designed to reduce or eliminate most types of interference from voice, CW, or data transmissions.

The NIR-12 Noise and Interference Reducer uses two Digital Signal Processors (DSP) for noise reduction (accessible via RS-232 if desired) and bandpass operation, a spectral notch filter to eliminate multiple tone interference, and an automatic function which recognizes speech, CW, or data, and suppresses signals not a part of those patterns.

The unit may be used in all data modes, and its filters—of variable bandwidths and center frequencies—are well suited to all data and SSTV reproduction. Just plug in your receiver's speaker output (or line output or headphone jack), and the NIR-12 provides volume-adjustable processed audio from its own built-in amplifier to be sent to an external speaker of 3 to 8-ohm impedance. A power supply is required; mating connectors are provided, or you may order an adapter from JPS.

The NIR-12 is available for $349.95 from JPS or your radio dealer. For more information contact JPS Communications, Inc., P.O. Box 97757, Raleigh, NC 27624; (919) 790-1011.

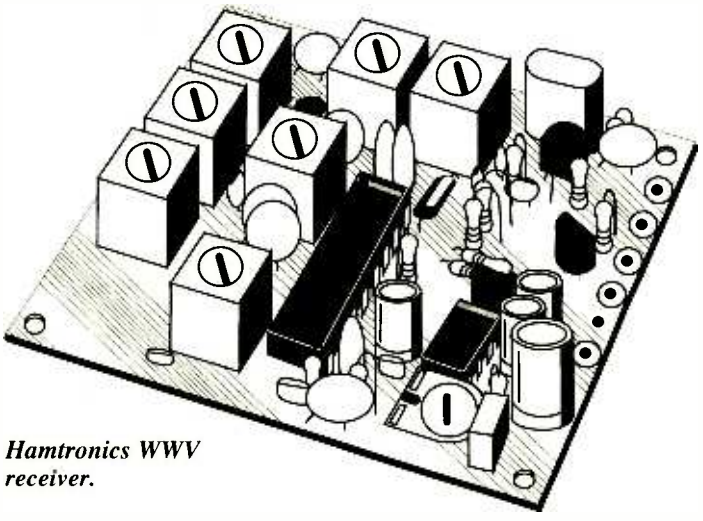
Time to Celebrate WWV

Every once in a while (often on very slow days), I think about WWV. Here it is, this giant radio clock, brimming with information. Not only can you set your watch to a multi-million dollar atomic clock, but you can check on solar terrestrial indices, marine storm warnings, and the current status of GPS and Omega. Additionally, it's a perfect "beacon" of propagation conditions that comes in five different frequencies from 2500 to 20000 kHz.

Hamtronics has answered the desires of WWV fans everywhere with a dedicated unit that they say "receives [WWV] as well as any $1000 receiver." It's a very sensitive and selective AM superhet receiver pcb module that's crystal-controlled on 10 MHz.

Did I mention that this is a kit? It is. But don't let that throw you. The manufacturer says that it's fun to build and easy to align, even if you're a beginner. The model RWWV operates on either a 9-12 VDC power supply or a 9V battery and has a 50 ohm input to connect to any type of HF antenna. You can even get great audio with just a length of wire. The RWWV has a speaker amplifier and a squelch circuit for those times that the signal fades into the noise. What more could you ask?

Oh, the price: $59 for the kit or $99 for a wired and tested module. Write Hamtronics, Inc., 65-F Moul Road, Hilton, New York 14468-9535, or call 716-392-9430 for more information, a complete catalog, or to order. Tell 'em you heard about it here!



Hamtronics WWV receiver.

Serious Scanning

I remember my first scanner. It was a big tabletop Lafayette rig with a row of red lights that blinked like chasers as it scanned—probably at some incredible speed like 10 channels a minute. As time went on, scanners grew more sophisticated and so did scanner listeners—no longer satisfied with tuning in the local police dispatch channel. When portable frequency counters hit the market, a whole new era began. Now scanner listeners could, with skill and a little luck, find the frequency of almost anything.

Another tool for the arsenal of the ultra-serious scanner listener has been introduced by Radio Engineers: the VHF radio direction finder now helps you find the physical location of a transmitter. The Vector-Finder series of antennas are compact, light-weight, and active, suitable for use with handheld transceivers and scanners. The design allows for easy stowing for transport in any vehicle. All units operate on the phase-shift technique and interface with any FM receiver or transceiver via the antenna jack and earphone jack.

Several models are available, ranging from the $139.95 VF-142 covering 144-230 MHz with audible response only, to the $289.95 VF-142Q covering 144-500 MHz with audible and LED left/right direction indicator. Interested? Detailed specification sheets are available from Radio Engineers, 7969 Engineer Road, Suite 102, San Diego, CA 92111 or call (619) 565-1319.

900 Phone Action

Scanning, as you know, is necessarily a local affair. It's not like shortwave. You'll likely hear only what's going on in your local area. But what about all that scanning action going on in the rest of the country? You can always hope for low-band skip, but now there may be an easier way.

A company called Code Red is attempting to solve the problem with a 900 number. Through a network of nationwide monitors, Code Red records, edits down, and produces start-to-finish tapes of actual emergency transmissions from 20 major cities.

The tapes are well-produced, and $1.99 a minute. (I must confess that I am not a 900 number consumer so I have little with

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CODE•RED™

which to compare.) The tape I heard lasted about six minutes. The number is 900-454-CODE.

The producers of Code Red, the 900 number, are also producing "Code Red," the reality-based cop-action TV show, as well. According to the company, the new show will air in 20 markets by the end of the year.

There is a regular and usually hot-tempered debate about 900 numbers. *MT*'s own Glenn Hauser took an inordinate and unfair amount of heat when he agreed to provide information for one a year or so ago. Others may question the legality of profitting from recorded communications. My opinion? Vote with your wallet. If you don't like 'em, don't call. If you do, enjoy.

Scanner Repair

Whether you are a veteran do-it-yourselfer when it comes to repair, or fix scanners for a living, Ken Touhey's 58-page *Orange Book of Scanner Repair* offers repairs, modifications, diagnoses and improvements for scanners of every description. Also includes notes on servicing garage door openers and remote controls.

No illustrations, heavy on text, but easy to follow. Price: $25 from Ken's Electronic Parts, 2825 Lake Street, Kalamazoo, MI 49001; phone 800-456-KENS.

—BG

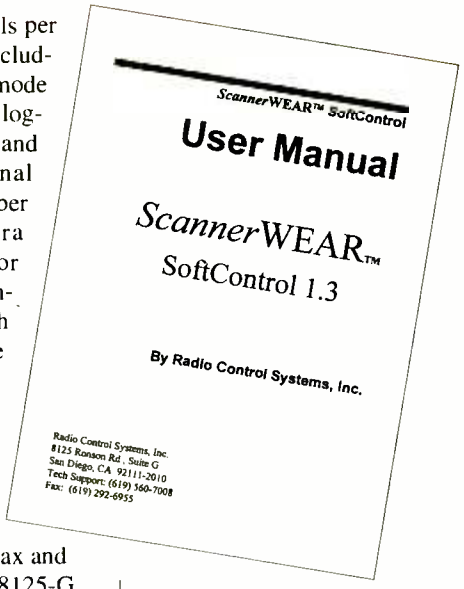
Pennsylvania Frequency List

The best frequency books often come directly from hobbyists' own printers. When you combine a hobbyist with a police radio communications specialist, you have an unbeatable combination. Tim Shingara, with the Pennsylvania State Police communications division, has compiled a booklet called the *WB3EYB Frequency List*. According to the cover, this is the 16th annual edition. My only question is: why haven't we seen this before?

Shingara presents the info that area scanner listeners need with no fanfare. You get frequencies, and lots of them, in order from 30 MHz straight through to 960 MHz. This allows a listener to simply look up and identify the frequency he hears quickly. The 5-1/2 x 8-1/2 inch booklet is the perfect resident next to your base scanner or along for the ride with your handheld. To order, send $4.00 plus $2.50 shipping and handling to Tim Shingara, 2857 Rumson Drive, Harrisburg, PA 17104.

WINDOWS Control for Scanners

San Diego-based Radio Control Systems, Incorporated, has introduced ScannerWEAR SoftControl 1.3. The software allows Windows control of your OptoScan456/535 enhanced PRO-2005/6, ICOM R7000/R7100, or AOR 3000/3000A scanner. Some of the great features include: memory banks with 100 channels per bank; search ranges including frequency, step, mode and description; data logging to a file with date and time stamp of signal strength, tone, and number of hits; spectra analysis; provisions for CTCSS and DCS controlled scanning with Opto 456/535; birdie control file, unlimited file size; and the ability to import the PerCon FCC database.

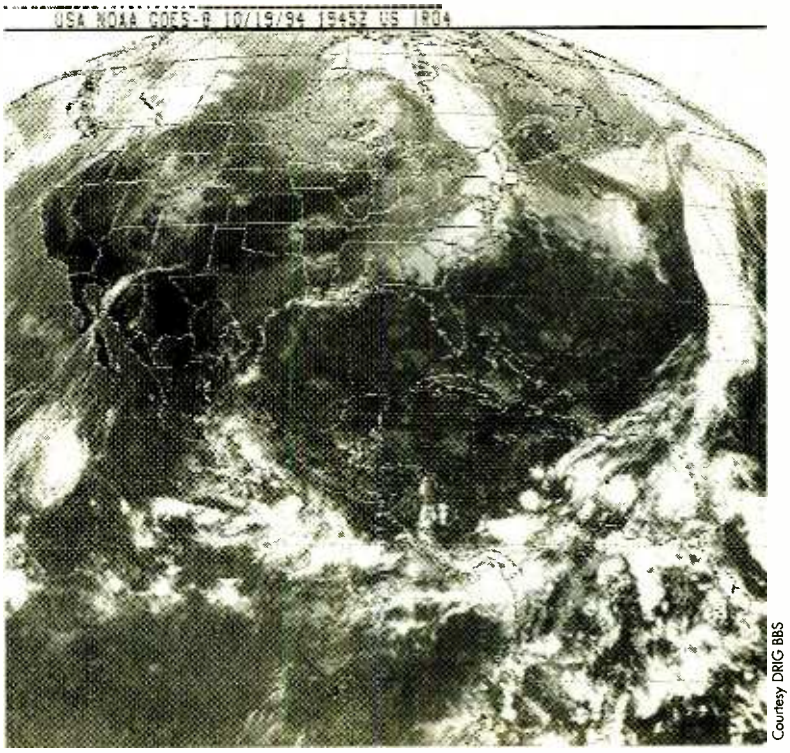


The RCSI ScannerWEAR Soft-Control 1.3 is $99.00 plus tax and shipping from RCSI, 8125-G, Ronson Road, San Diego, CA 92111 or call 800-560-7234.

PC GOES/WEFAX 4.0 Released

Version 4.0 of PC GOES/WEFAX software/hardware system has been released by Software Systems Consulting of San Clemente, California. The program runs under MS-DOS or MS Windows, and allows users to receive GOES, MeteoSat, NOAA, Meteor, Feng Yung, Okean, and C-band GOES-Tap for weather photos and press services. Weather satellite images are received as 256 levels of grayscale, pseudo-color, or multi-special color imagery. The software allows an overlay of lat/long grids and geo-political boundaries.

The package also includes remote sensing of sea and land surface temperatures from NOAA IR satellite images, plus plotting of isothermal curves. Multiple satellite images can be



Courtesy DRIG BBS

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composed into time-lapse animation to show weather systems evolving and moving.

Suggested retail price for the program is $250, available through radio dealers or direct from SSC. Upgrades from earlier versions are available. For more information or to order, call 714-498-5784 or write SSC, 615 S. El Camino Real, San Clemente, CA 92672.

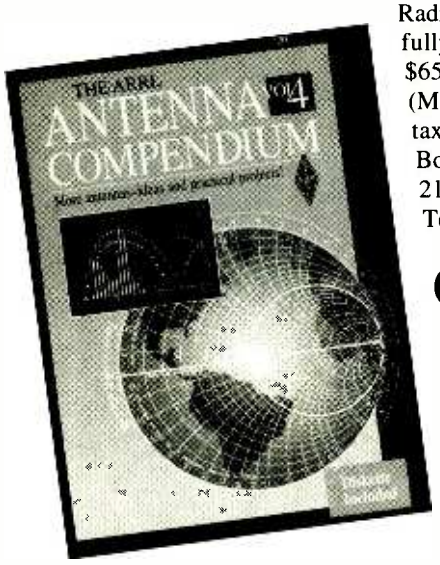
Antenna Compendium Series

The American Radio Relay League has proudly announced the fourth volume in the popular ARRL *Antenna Compendium* series. Thirty-eight articles cover antenna related subjects and detail simple, yet practical antenna projects. Antennas for mobile work are covered, too, as well as portable and temporary antennas. There are even six articles devoted to computer modeling of antenna arrays.

As if all that isn't enough, for the first time ARRL has packaged a 3.5 inch diskette with the book, which contains source data file and the resulting pattern plot files created by the authors to model their antennas. Also included is PLOT, a program to view pattern plots.

The ARRL *Antenna Compendium, Volume 4*, is $20.00 (s/h $3.00 for mail, $4.00 for UPS) and is available from dealers or from ARRL Publication Sales, 225 Main Street, Newington, CT 06111-1494 or call 203-666-1541.

—BG



Shortwave Guide: The Computer Program

If you like the idea of obtaining shortwave broadcast schedules from your computer database, think about getting your hands on LeProgram's Shortwave Guide: The Computer Program (SWG TCP). The program features a modifiable shortwave broadcast schedule, LUF and MUF predications, gray line, logging, remote radio control for the Drake R8, NRD-535 and Kenwood R5000, and world time. The broadcast schedule can be updated, changed, initiated or maintained from scratch.

SWG TCP is designed to operate with the Macintosh Color Classic or newer model Mac computers. The program runs best on a 25 MHz 68030 or faster Mac. Minimum requirements are 2.2 MB of hard disk space, 2 MB of RAM, Mac System 6.5 or newer and 256 or more colors.

A demonstration version is available free of charge from LeProgram or through America Online or Compu-Serve's Ham Radio and Military areas. The fully operational version is $65.00 plus $2.50 shipping (MD residents add $3.25 sales tax) from LeProgram, P.O. Box 850, Eldersburg, MD 21784, phone 410-781-6182. Tell them we sent you!

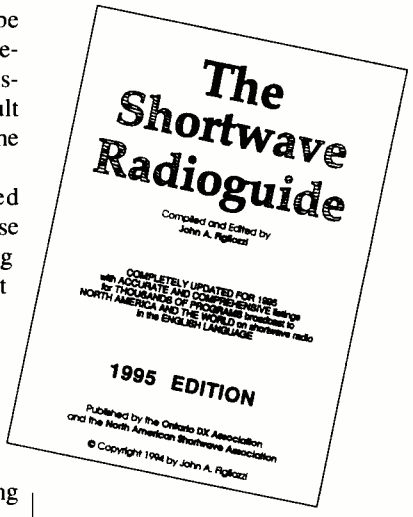
CD Records Modulation Types

Newcomers to shortwave listening and old-timers alike are understandably bewildered by the siege of strange whistles, beeps and buzzes to be heard throughout the high frequency spectrum. Data transmission of every description assault our ears as we tune through the shortwave range.

All of this transmitted cacophony can be copied by those with corresponding decoding equipment, although much of it is non-standard, and some is purposefully encrypted. But how can you even identify the nature of the transmission?

With Joerg Klingenfuss's CD *Recording of Modulation Types*, that's how. Featuring 71 different emission recordings, ranging from the simplest to the most complex, the two-CD set is listenable on any conventional CD player. A printed descriptive key is included, as is a list of common data abbreviations. Cost is approximately $70 from *MT* advertisers.

—*BG*



Shortwave Radio Guide

John A. Figliozzi has made tracking what's on the shortwave dial much easier. His seventh edition of *The Shortwave Radio Guide*, published by the Ontario DX Association and North American Shortwave Association presents programming information the way it should be listed: in time order beginning at 0000 UTC. Also listed is station ID, days broadcasting, program description, target, type, and frequencies.

I sat down at my receiver with this one and loved how easy it was to identify what I was hearing and to plan what I wanted to listen to in the coming hours. The 1995 edition is 105 pages packed full of information. Now that the BBC has upset the applecart with their new split stream programming, a 17-page addendum updates the BBC schedule.

Get your copy today: $16.00 from the NASWA Company Store, 705 Gregory Drive, Horsham, PA 19044; or, for $17(Cdn) + shipping and 8% tax from ODXA, P.O. Box 161, Stn A, Willowdale, Ontario M2N 5S8.

RMA Electronics Company

Bob Ahern has some interesting ideas cooking at RMA Electronics. Besides being heavily involved in satellite gear, he also specializes in "computer equipment, software, shareware, and freeware for the communications arena aimed specifically at the satellite, scanner, SWL, and HF Utility buff."

Specifically, Mr. Ahern plans to provide "low cost alternatives to expensive computer hardware, frequency publications, and software control programs for the communications hobbyist."

Want to learn more? Call RMA Electronics at 603-434-7445 or write them at 32 Mountain Home Road, Londonderry, NH 03053-2605. Mention Larry Miller's "What's New" column in *MT* and Bob will sign you up for his free, monthly newsletter.

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 300 S. Hwy 64 West, Brasstown, NC 28902.

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AR 8000

The New Concept - AR8000 shocks the market. AOR made every effort to incorporate the latest technology in to this new scanner.

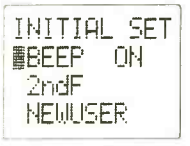
• SPECIFICATIONS •

- **Range:** .5 - 1900MHz usable to 100kHz
- **Modes:** AM/NFM/WFM/USB/LSB/CW
- **Stepsize:** 50Mz to 999.995kHz
- **Sensitivity(μV):** 30 to 1000MHz **SSB** .2 **AM** 1.0 **NFM** .35 **WFM** 1.0
- **Filters:** (kHz) **SSB** 4 **AM/NFM** 12 **WFM** 180
- **Memories:** 50 ch. x 20 banks=1000 total
- **Size/Wt.:** 6.1 x 2.8 x 1.6 inch. 20 oz. batt. incl.

* Cell blocked for all, but Approved agencies.

- Covers .5-1900MHz*
- Ferrite Rod antenna below 2MHz
- Only portable scanner on U.S. market to have true SSB, both LSB & USB. Others attempt SSB using a BFO, but are difficult to tune and produce poor SSB audio.
- 4 level alpha numeric LCD read out frequency, mode, signal strength, band scope spectral display, battery low, remote and more
- Computer control up/down load data, will add a new dimension to the world of scanning.
- Clone your memory banks with a friend, load 1000 memory channels in seconds

.1 - 1900MHz*



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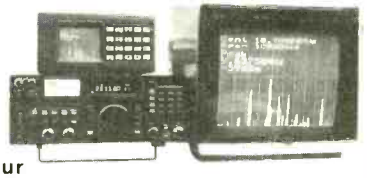
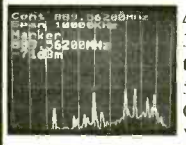
SDU 5000

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
- Δ No Drain on the batteries in the radio
- Δ Light weight, perfect for Laptop use
- Δ As small as a DB-25 Connector
- Δ Hi-Tech Surface mount design for reliability
- Δ 100% Shielded cable to receiver for reduced interference
- 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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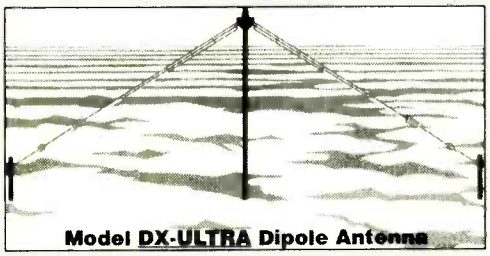
Alpha Delta DX-Ultra Dipole

by Bob Grove



Well-respected for high quality and high performance, Alpha Delta Communications has just released their DX-Ultra shortwave receiving antenna, designed for continuous-coverage 530 kHz-30 MHz applications. Its heavy-duty construction will also allow transmitting up to 2 kilowatts (transmatch required). It includes the professional Delta-C center insulator which has an integral gas-discharge lightning arrester. The Delta-C is available separately from the manufacturer and participating dealers for antenna experimenters who prefer to "roll their own."

While the advertising hype is rather ambitious ("Absolutely remarkable performance...," "extremely low noise...," "The difference on your S-meter can be phenomenal," "knock-your-socks-off performance with an absolutely no-compromise attitude"), the fact is, the DX-Ultra is a good antenna.

Actually a hybrid between a three-dipole cluster and a trap dipole, the DX-Ultra shows several resonances (low SWR) throughout its intended range. We installed our unit on a 35-foot mast with elements (80 feet total length) slightly drooping to nearby treetops—a reasonable configuration.

Frequencies (kHz) and minimum SWR were measured as follows: 7170 (1.3:1), 9820 (1.1:1), 14932 (1.6:1), 20122 (2:1), 21250 (1.8:1), 24450 (2.5:1), 27950 (2.5:1), and 29850 (2:1). At other frequencies, SWR rises considerably.

What does this mean? At or near the listed frequencies, coax cable losses will be minimal; most of these frequencies intentionally correspond to major international broadcasting bands. At other frequencies, depending upon the quality of cable chosen, losses will be higher. Will cable losses in competitive antennas be any worse? Not at the same SWRs.

■ Our Field Test

The DX-Ultra is not fully assembled; it is a semi-kit, but no soldering is required. The elements are all connected to the center insulator, but you will have to thread and space the spreaders, and cut and twist 24 wire ties to the spreaders. Plan on between two and three hours' installation, depending upon your experience, tools, available assistance, and site preparation. The 12-gauge wire is quite stiff to work with, especially when wrapping it on the insulators. Most antennas are supplied with stranded wire, which is more flexible in the wind and easier to manage.

No height recommendations are given in the instructions, but established measurements show that a dipole must be at least one-quarter wavelength (and preferably one-half wavelength) above the ground to avoid serious signal degradation through ground reflections, absorptions, and impedance fluctuations.

Is this antenna overkill for receiving? At $119.95 it is one of the most expensive dipoles on the market, outpricing Alpha Delta's own sloper, the long-standing Eavesdropper, and the Grove Skywire, among virtually all others. But it is made of superior materials, and its reception—the bottom line—was unsurpassed in our field tests. Using the DX-Ultra for transmitting—with a transmatch—we received excellent signal reports.

We intend to leave the DX-Ultra in place as our primary HF antenna, both for receiving and transmitting.

DX-Ultra, $119.95 from Alpha Delta Communications, PO Box 620, Manchester, KY 40962; phone 606-598-2029. Also available from *MT* advertisers.

Free Radio Berkeley

By Larry Miller

There's little doubt that the micropower FM broadcast movement is riding the crest of a wave. Mabana Kantako, the man who runs Black Liberation Radio from a housing project in Springfield, Illinois, has done so for the past three years, ignoring FCC threats and sanctions. In California, Steve Dunifer's Free Radio Berkeley won a critical victory in January when a federal judge ruled, in essence, in favor of the station in its battle with the FCC. Free Radio Berkeley now operates 24-hours a day, in open defiance of the government. Two other stations have come on the air in San Francisco, one of which operates seven-nights-a-week.

Dunifer, who has become something of the patron saint of the movement, has offered to advance the movement by offering for sale a number of low-powered and very illegal transmitter kits. As mentioned in last month's *Monitoring Times*, they range from units similar to the (legal) Ramsey FM 10A to (illegal) 125-watt monsters capable of regional coverage.

Last issue we said that we'd check one of these units out and report back to you. Using the assistance of a highly trained and very well-known (but very anonymous, for obvious reasons) technical type, we purchased and put together the 5-watt transmitter ($55.00) and the 25-30 watt RF amplifier ($60.00).

The results? According to our tech friend, the units are *very* crude. "You're not actually going to put this on the air, are you?" he asked. "Don't," he begged. "This thing is a menace." There are problems with frequency stability, spurious signals, and more. The instructions are poor, and in parts, non-existent.

While Dunifer may be trying to do his part in advancing the "free radio" movement by making these transmitter kits available to the general public at a reasonable price, it's my opinion that these transmitters will have the exact opposite effect on the acceptance of low-power, unlicensed, community broadcasting, by giving the government a perfectly legitimate reason to fight the idea of low-power community radio—bad technical performance. The first transmitter that, through proper or improper construction, interferes with other users—especially the vulnerable aero bands—will cause a government crackdown that will set the movement back decades.

It is this reviewer's suggestion that you stay away from the Free Radio Berkeley transmitters at this time. Instead, try your hand at one of Ramsey's classic FM-10A's broadcast band transmitter kits. (Also frequency-unstable, but of low enough power render it harmless—see this month's feature by Karl Zuk.)

I am a supporter of free radio. I believe deeply in the concept—but it must be done responsibly. There is no reason why low-cost, near-broadcast-quality transmitters cannot be produced at a reasonable cost.

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The FCC Frequency Almanac©

Finest Set Of Frequency Books Available

Scanner frequency directories have entered a new generation of sophistication with the introduction of The FCC Frequency Almanac©. With one book for each state the publishers are able to give the scanner hobbyist more frequencies than other directories.

The simplified frequency format is also unique. First frequencies are listed by county. Each county then lists public safety by state, county and city agencies, including 800MHz. As if this were not enough, businesses and ***all other services*** are then listed. This makes for an incredibly large and complete frequency source for the scanner hobbyist (see table 1).

All data comes direct from the FCC data files and covers all land mobile and fixed, between 30MHz and 2GHz.

Compare The Page Counts To Other Directories

State	Pages	State	Pages
AK	96	MT	136
AL	208	NC	334
AR	184	ND	115
AZ	176	NE	206
CA	829	NH	88
CO	224	NJ	272
CT	100	NM	94
DC	See MD	NV	96
DE	48	NY	504
FL	472	OH	480
GA	336	OK	230
HI	56	OR	127
IA	272	PA	464
ID	128	PR/VI	116
IL	520	RI	56
IN	320	SC	164
KS	252	SD	121
KY	223	TN	261
LA	212	TX	840
MA	231	UT	104
MD(DC)	152	VA	270
ME	120	VT	72
MI	365	WA	172
MN	292	WI	288
MO	280	WV	136
MS	170	WY	128

Table 1

Prices depend on the size of the state:

CA, FL, IL, NY, and TX are **$24.95** for each state.

AK, AL, AR, AZ, CO, CT, GA, ID, IN, IA, KS, KY, LA, MA, MD, MI, MN, MO, MS, MT, NC, ND, NE, NJ, NM, NV, OH, OK, OR, PA, SC, TN, UT, VA, WA, and WI are **$19.95** each state.

DE, HI, ME, NH, PR&VI, RI, SD, VT, WV, and WY are **$9.95** each state.

Shipping and handling is $3.95 per book for 4th class or $5.95 for priority mail (CA, FL, IL, NY, and TX are $6.95). Add $1.00 per book for more than one book.

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Subscription rates are 1yr $18, 2yr $32, 3yr $46, Canada $49 1yr. A sample copy is available for $1 by 3rd class or $3 by 1st class.

These directories and magazine are published by **U.S. Scanner Publications, PO Box 14923, Portland OR, 97214. 800–890–6999, Fax 503–233–5176.**

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Bob Parnass, AJ9S

The Uniden/Bearcat BC-890XLT and Radio Shack PRO-2036 Scanners

If a rose by any other name would smell the same, does the same scanner with a different cover perform the same? This month we look at a couple of scanners that are not new releases, but which you may not realize are the same scanner with different front panel labeling and coloring—the Uniden/Bearcat BC890XLT and Radio Shack PRO-2036. Other minor differences are that the squelch controls work in opposite directions and the Owner's Manual for the PRO-2036 is more comprehensive than the BC890XLT manual. This review examines a BC890XLT with serial number 45005251 and a PRO-2036 with serial number 45000175 (date code 4A4).

Both models cover the following frequency ranges:

29 - 54 MHz FM	in 5/12.5/25 kHz steps
108 - 136.975 MHz AM	in 5/12.5/25 kHz steps
137 - 174 MHz FM	in 5/12.5/25 kHz steps
216 - 224.9875 MHz FM	in 12.5/25 kHz steps
225 - 399.9875 MHz AM	in 12.5/25 kHz steps
400 - 512 MHz FM	in 12.5/25 kHz steps
806 - 823.9875 MHz FM	in 12.5/25 kHz steps
849.0125 - 868.9875 MHz FM	in 12.5/25 kHz steps
894.0125 - 956 MHz FM	in 12.5/25 kHz steps

Notice that tuning step sizes of 12.5 and 25 kHz in the 222 - 225 MHz ham band do not match the 20 kHz channel spacing for ham repeaters. AM and FM modes are not selectable so these scanners also won't receive FM mode military satellites well in the 225 - 400 MHz band using AM detection.

A large, comfortable tuning knob can be used to select memory channels or "tune around" in VFO mode.

Memory Features

The BC890XLT has 200 conventional memory channels divided among 10 banks. Any one channel in each bank can be designated as a priority channel and sampled at 2 second intervals. A lithium battery, soldered to the front panel circuit board, provides memory retention during a power loss for up to five years.

In a giant leap backwards, the two-second rescan delay is global and cannot be selected for individual channels. The delay should be *off* while scanning trunked or two-frequency simplex systems and *on* when scanning one frequency simplex systems. The logical conclusion is that the BC890XLT and PRO-2036 do not optimally scan both types of systems at the same time.

Two peas in slightly different pods.

A 99-event counter is associated with each channel and counts the number of squelch openings on each channel since the scanner was last powered on.

Using the AUX feature, each channel can be programmed to actuate a tape recorder when activity is detected on the channel, but the PRO-2036 owner's manual erroneously confuses the AUX function with the Priority function. The older Electra/Bearcat scanners used an open collector transistor to control the recorder, but the BC890XLT and BC9000XLT use a reed relay instead. Tinkerers will find other uses for the AUX function. Back when such things were legal, the same AUX function in the Electra/Bearcat BC-300 was useful for switching on a speech inversion descrambler.

Scanning and Searching

We didn't verify the scan and search rates, specified at a maximum of 100 channels per second and 100 steps per second, respectively. A SPEED key permits slower scanning and searching, but the slowdown doesn't appear useful. Memory channels programmed with 0.000 are automatically locked out and no time is wasted scanning them.

The BC890XLT has only one pair of search limits. Unlike the top line BC9000XLT and inexpensive BC860XLT, the BC890XLT provides no way to lock out frequencies while searching. That's too bad, because these radios have plenty of images and birdies which beg to be locked out.

The Auto Store feature is well implemented, and stores active frequencies into empty channels in one or more banks. Duplicate frequencies are not stored.

CTCSS Option

Both the PRO-2036 and BC890XLT can be fitted with an optional CTCSS module. In simple terms, CTCSS (Continuous Tone Controlled Squelch System) is a feature which lets the user listen only to stations transmitting with one of 38 tones. We wish more scanners had a CTCSS squelch facility.

We installed the BC002 CTCSS module inside the BC890XLT. It is built around an MX-COM MX355P IC, and operates well—neither "falsing" nor missing transmissions sent with the programmed tone.

A different CTCSS code can be programmed into each memory channel. Each channel is initially programmed for a code of 000.0, which is shorthand for no CTCSS—i.e., signals will be heard whether or not they have a CTCSS tone. The BC002 supports 38 different CTCSS codes, but not 69.3 (WZ), 206.5 (8Z), 229.1 (9Z), or 254.1 (0Z).

The BC890XLT provides no quick and easy way to determine whether a station is transmitting with CTCSS or with which code. Some ham radio transceivers permit the user to "tune" through the various CTCSS codes until the receiver unmutes, and the transmitting station becomes audible.

One could theoretically program the same frequency and a different CTCSS code into 38 different memory channels, a tedious process, then scan the 38 channels to see on which one the BC890XLT stops.

Physical Design

Both scanners are built in a two-piece, steel clamshell cabinet. Two large, hinged feet, padded with rubber, allow the scanner to tilt.

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The front panel is plastic. On the PRO-2036, the channel numbers are printed above the corresponding bank keys, making it easier to determine the association between banks and channels. The faded lettering on the PRO-2036 front panel and keys is very difficult to read due to poor contrast with the gray background. The labeling on the BC890XLT is much brighter.

Keys are of ample size and spread out, making them easy to use. The large tuning knob rotates comfortably, with a slight detent feel.

Other Considerations

The backlight for the LCD (liquid crystal display) may be dimmed or turned off completely.

The BC890XLT and PRO-2036 contain a preprogrammed WX (weather) search and a Weather Alert feature. The Alert keeps the scanner muted until it receives a severe weather signal, at which time the scanner emits a very loud sound, resembling a cross between a cow and a siren! One can test the Alert alarm circuitry by holding down the PRIORITY key for three seconds while in the Alert mode.

As usual, Radio Shack technical writers deserve praise for the PRO-2036 owner's manual. It is easier to read and more comprehensive than the Uniden manual. The Radio Shack manual explains images, and specifies the IF frequencies, RF sensitivity, and squelch sensitivity. Every receiver manual should contain this information, and the Uniden manual is incomplete because of these omissions.

We could continue discussing the manuals and scanner features, but there's no use to keep on beating around the bush—our BC890XLT and PRO-2036 work miserably.

Intermod, Images, and Birdies

Back when crystal-controlled scanners and monitor receivers were in vogue and synthesized models were just appearing, there was considerable variation in sensitivity among different brands and models. Sensitivity to weak signals was used as a litmus test for performance evaluation.

As manufacturers scrambled to attain higher sensitivity and wider spectrum coverage, consumers found store shelves stocked with more sensitive scanners, many of which suffered from overload, intermodulation, and poor image rejection. Older scanners didn't handle weak signals and many newer models can't handle strong signals!

If you want a modern scanner which behaves well in strong signal environments, get a Radio Shack PRO-2006 or Uniden/Bearcat BC9000XLT. Our BC890XLT and its PRO-2036 clone behave poorly in this rural-becoming-suburban area when connected to an outdoor scanner antenna at 20 feet elevation. A 158.7 MHz paging signal mixes with the audio from TV channel 38 (619.75 MHz) and causes intermod on 461.0375 MHz. Paging interferes on several frequencies from 406 to 460 MHz and in other ranges, too. For comparison, the PRO-2022 and PRO-2006 on our test bench are hardly bothered by the same paging.

Signals from the 460.525 MHz Sheriff's repeater are heard on 442.55 MHz, a favorite ham frequency. While using the telescoping whip antenna, a cellular phone signal often mixed with a data signal and the wretched combination was heard throughout the entire 853 - 860 MHz range, making normal reception there impossible.

An addendum sheet for the BC890XLT lists 57 birdies, while the PRO-2036 manual lists only 11 birdies, but there are lots more, especially in the 406 - 420 MHz band coveted by federal listeners. Many of the birdies are wide, audible over a 25 kHz segment. We logged birdies at 8 MHz intervals starting at 112 MHz and at 4 MHz intervals starting at 408 and 409.6 MHz and up, e.g., 408, 412, 416, ... and 409.6, 413.6, 417.6, ... and so on.

To add insult to injury, TV audio from channels 7, 23, and 26 pop up all over the 406 - 420 MHz band.

Today's top line scanners employ up conversion, with a first IF of several hundred of MHz. The mid-line BC890XLT and PRO-2036 are dual conversion, with a 10.8 MHz first IF and a 450 kHz second IF. The 10.8 MHz first IF and poor front end selectivity cause aggravating image problems from signals 21.6 MHz away from the frequency to which our BC890XLT and PRO-2036 are tuned. We hear aircraft signals in the VHF-high public safety band, UHF ham repeaters in the UHF business band, cellular phone signals in the 902 - 928 band, and so on.

Conclusion

Our BC890XLT and PRO-2036 perform poorly. The Auto Store, tuning knob, weather Alert, and CTCSS option are all good features, but they are overshadowed by unacceptable overload and image performance, even when using an indoor antenna. Even the newer double-conversion 100-channel BC860XLT is a better performer, and it costs significantly less money.

King of the Hill

SPECTRA Scanner Antenna

Proclaimed "King of the Hill" in a review by Bob Grove (Dec '92 Monitoring Times), the 4-band SPECTRA brings unparalleled VHF-Low, VHF-High, UHF, and 800-1000mHz reception. The review goes on to "recommend the SPECTRA in any application where high reliability and fringe area reception (and transmission) are vital". Used by news networks and state & fed agencies, this is the ONE!

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New Developments in Drake Receivers

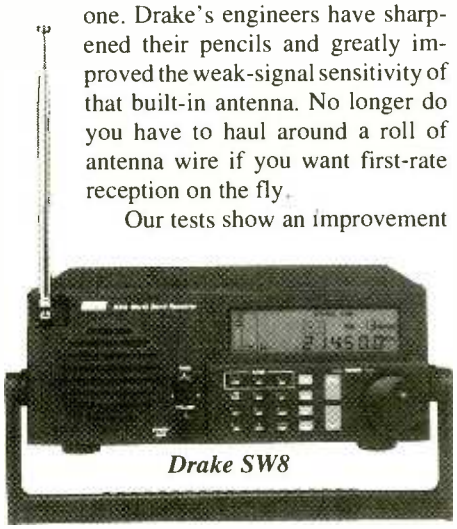
Portatops are the Great Promise of world band radio. At a price between worthy portables and tabletop supersets, they allow for nearly tabletop-quality performance, yet can be carried around the house, or used outdoors and on car/RV trips.

Yet, the reality always seems to fall a bit short of the promise. Lowe's HF-150, for example, needs a good outboard speaker to be fully enjoyed, and, for some, an outboard preselector is also a near-must. With these additions it can be an outstanding tabletop receiver—lovely audio!—but it will be a bit cumbersome as a portable.

The Drake SW8 is slightly handier for portable use and, unlike the Lowe offering, also receives FM broadcasts. Yet, its synchronous detector is a far cry from what it should have been, and when used with its built-in telescopic antenna it has been relatively insensitive to weak signals.

Now those two disadvantages are down to one. Drake's engineers have sharpened their pencils and greatly improved the weak-signal sensitivity of that built-in antenna. No longer do you have to haul around a roll of antenna wire if you want first-rate reception on the fly.

Our tests show an improvement of over 9 dB, sometimes as much as 12 dB, as compared to the original version. In plain English, what this means is that the SW8 is now as good a field DXing machine as you can find. When we compared actual listening results between the two versions, the difference was consistently noticeable on weak signals, and even some signals of moderate strength. It makes all the difference in the world.



Drake SW8

If you already have an SW8, it may already be fitted with this improvement. Any SW8 reportedly has the improved antenna if its serial number starts with 5B on up. The first digit stands for the year, the second digit for the month, so any unit made during or after February 1995 should be covered.

Natch, there's a catch: The list price of the SW8 has been raised by $100 to $699.00. If you already own a pre-February SW8, the Drake Service Department will retrofit this improvement, along with making a software upgrade and various small other changes for an as-yet-undetermined fee. To arrange for this, call Bill Frost, Service Manager, at (513) 746-6990, or fax (513) 743-4576.

■ Drake replaces R8 with R8A

When it comes to all-round SWL and DX performance, nothing does it quite so well as the Drake R8. But all that's about to change, as it is being replaced by the new R8A.

It will be some weeks before we lay hands on one of these, as it hasn't as yet gone into production. However, the R8A promises much. Basically an improved version of the R8, it is said to come with a veritable shopping list of improvements. Among them, according to Drake: much-improved signal-to-noise ratio (nominally 50 dB quieting *vs.* 35 dB); improved dynamic range/TOIP with and without the preamp on, including an active mixer; related to this, a much-improved AGC, including attack-time constant; faster synthesizer lock-up time, reducing "chugging" during bandscanning; cooler operation, thanks in part to the use of invisible pulsing with the LEDs; improved ergonomics, including elimination of the former "carousel" scheme for choosing mode and bandwidth; improved station display, including selectable kHz or MHz frequency readout/entry and alphanumeric station names; improved front-end protection; improved frequency stability; 440 memory presets, instead of 100; faster and more-sophisticated scanning; metal tilt bail, instead of adjustable plastic feet; two timers, rather than one, and more-accurate clocks; permanent display of the clock; more-practical up/down frequency slewing; much-improved and faster computer interface; along with several minor changes, including slightly improved tone control, elimination of squelch tones during FM reception, and a detachable line cord.

Drake R8A

Price? $1,099.00 list, $100 more than the R8. Look for the first units to go on sale before June.

MAGNE'S PRODUCT SUMMARY

■ Sangean drops ATS-803A

Sangean continues to slip from its once-proud standing in shortwave radio manufacturing. The ATS-803A, their first and best portable, was recently discontinued. The manufacturer's reasoning is that their ATS-818 portable is similar, and by discontinuing the '803A they simplify inventory and production, which right now is strained by heavy demand.

That may appeal to accountants and production managers, but it's bad news, indeed, for shortwave consumers. That ATS-818—also sold as the Radio Shack DX-390—is bulkier, more expensive, and one of the worst models we've tested for bandscanning.

■ Grundig to alter North American lineup

After having promoted two forthcoming new analog portables, the Yacht Boy 207 and Yacht Boy 217, Grundig's North American branch, Lextronix, has had a change of heart. "Analog radios aren't what we want to emphasize anymore," said Lextronix's CEO

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Esmail Hozour, so they won't be brought into the North American market. However, these inexpensive Chinese-made radios will be sold in some other parts of the world.

On the other hand, the Yacht Boy 305—a single-conversion compact portable which probably will retail for under $140—will be brought in, probably around June. This represents a delay of some months, but when it is introduced Grundig is expected to have enough production on hand to cope with the anticipated vigorous demand. According to estimates kept at *Passport to World Band Radio*, Grundig has now become the largest seller of world band radios in North America—an amazing feat, considering it wasn't even in the market over here until the late Eighties.

Also down the road is the Satellit 900, which reportedly will feature sophisticated tuning—the type of technology Sony has been moving towards with some of its recent digital models. No introductory date has been set, but possibly the 900 will appear around fall of this year.

■ El cheapo still available

Heartland America continues to offer the $19.99 (plus $4.95 s/h) Elektro AC 100 we alluded to last month. During the Gulf War, newcomers, reacting to press reports about the virtues of world band radio, bought hundreds of thousands of these analog Chinese junkers. But now, with a certain measure of street wisdom having set in, analog radios and even junky digital models have become a drag on the market. That's why Grundig has decided to steer clear of new analog models, but at these fire-sale prices you may find something like the AC 100 useful for knocking around on trips and the like. Heartland can be reached at (800) 229-2901.

■ Watkins-Johnson continues to promise improvements

Probably the longest-running saga this side of the O.J. Simpson affair is What Will Watkins-Johnson Do to Improve the HF-1000? Bits and pieces of this pricey model have been upgraded over the past year or so, but most of the major changes continue to elude.

However, Watkins-Johnson claims to be on the cusp of implementing several worthy changes. Among them: software control by Windows; newer-yet on-ROM software, with a number of needed changes; new digital board, which, among other things, has been designed to reduce some of the RFI that plagues this receiver, especially within the tropical bands; and, somewhat farther down the road, synchronous selectable sideband, instead of the ordinary double-sideband synchronous scheme currently used. For existing owners, some plug-in outboard devices may be offered to reduce RFI, plus the improved ROM will be made available—all for free or at nominal cost.

It's easy to fall into the trap of cynicism, seeing all this as radio's answer to "Windows 96." Yet, Watkins-Johnson seems to be genuinely anxious to get the HF-1000 into shipshape, to the extent they can find the R&D staff time not tied up by projects for their usual clientele.

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

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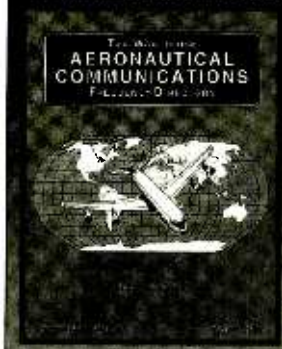

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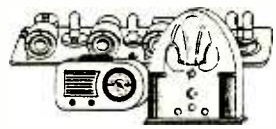

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John Catalano, PhD

Dr. Computerstein Creates a Monster

You're probably expecting us to finish talking about Computer Aided Technology's product line, and so we will—later. But sometimes events *compel* us into other directions. It all started when I got a telephone call from my old friend Jim, which began a train of thought that really bothered me for quite a few days.

I'll work through my troubled thinking with you. See if you agree (or disagree) with my observations and conclusions. The topic is: The Internet—an alternative to the hobby of radio communications?

Computer VS Radio—who's winning?

■ Startling News from an Old Friend

Jim and I started our high school amateur radio club so many years ago it hurts just thinking about it! Jim has been a friend over the eons and miles of travel that my life has taken me. We get in touch maybe two, or three, times a year. Phone call topics can range from our kids to the latest radio equipment. Jim was such a diehard radio fanatic that he maintained that vacuum tube ("valve" if you are in Europe) receivers were still the only way to *really* enjoy radio—too conservative a view for me. The comparison between my R-71 and his R-390 kept the telephone company's profits high over the years.

Our latest conversation started out in a familiar track. Then I brought up the topic of continued poor propagation on the shortwave bands. The reply from Jim, the old radio purist, left me speechless. "Propagation?" he questioned. "I really don't know, or care, about shortwave propagation!"

Was this the guy who would dream all year about working the world from the highest mountain during amateur radio's annual spring field day? Had his zeal for radio been replaced by a mystical eastern religion? Had his wife stopped his allowance? What could be the cause of this dramatic change of life's priorities?

■ Caught By My Own Words

The answer, Jim explained was simple. "The Internet. I've discovered modem communication; no propagation problems, antenna construction or equipment maintenance. When I can fit it into my day's activity the 'band' is always open," he happily replied. "After all," he continued, "you are the zealous missionary of the power of computers and radio. After all these years I finally took your advice and made the computer an important element of my radio passion. But now I think I can communicate better with just the computer."

In that instant I knew exactly how Dr. Frankenstein must have felt!

Jim, of course, was talking about using the computer to communicate over bulletin boards and commercial services such as GENIE and Compuserve. His new communication discovery kept on bothering me over the next few days. I related the story to family and friends, trying to sort it out. Was this the future? The way forward? Was I just feeling resistant to change? Or was there a more objective basis to my rejection of data screens in lieu of voice communication?

I'm sure some of you, as well, have been wondering why the *MT* computer columnist doesn't have an E-mail box or service address. Well, here is your answer; and how it affected my sorting out this crisis of conscience.

■ In the Beginning...

In the early 1980's, during the formative stages of the development of the home computer, I found myself living and working in Europe. By 1984 I communicated with many of my business associates via British Telecomms Gold, really the Daddy of the 1990's information highway. This was a subscription service with individual mailbox addresses and many features available today with on-line services.

In 1984 we accessed BT Gold via Apples, C-64s, Ataris, Sinclairs and Acorns. For people away from the home or office, the Tandy (Radio Shack) TRS-100 was popular. Even with the speed limitations of eight-bit machines, most towns in Europe had at least one bulletin board. Some larger cities had five or more. Night or day, the data traffic was so heavy that you could not get into them for hours.

Information and programs, so I'm told, ran all over western Europe. The UK would have the latest German version of a program within hours of its release in German. Instructions in French, German, and English were almost commonplace on bulletin boards. The first time I met a worm program (the forerunner of the computer virus) was during this period, with disastrous results.

Europe was so far advanced in consumer telecommunications concepts that it was not uncommon to own a Teletext television capable of displaying hundreds of screens of information, want ads, news, stock results, and exchange rates. The latest of this information, some updated hourly, was available at the touch of your TV remote. The year we bought our Teletext TV was 1983, more than a decade ago. Most US consumers have never even been offered such a service!

■ Paying For My Vice

During the years of 1983 to 1985 I spent many hours on-line for both business and pleasure. One day my fuming wife presented me with the equivalent of an eight hundred dollar telephone bill; and it was for only *one* month. Clearly I was addicted and only cold turkey—total abstinence—could cure me. The modem went into the garbage. (Actually it was sold as a sign of healing and to help pay the telephone company.)

But BT Gold, and my business data communications, continued and grew. In 1986 the company I was with had corporate E-mail connecting almost all continents. Each morning I would arrive at my office and be told by my secretary that the E-mail department had called and that my 150-plus daily messages had to be cleared immediately. The junk, internal E-mail communications got so bad I had to hire a secretary just to sort through my daily E-mails, finding the five per cent or so that really mattered.

Even now I wince at that wonderful, high-tech invention of E-mail. Like cellular phones

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(which, by the way, Europe had in place in the 1980's), it is often marketed to make people feel important and part of the high-tech revolution of the 90's,—even though they're a decade late to qualify.

So, when my friend told me of his new love of the Internet, and his forsaking of radio communication, all these images poured back from my experiences. Do I think the Internet is bad? Absolutely not. It's great to be able to access the latest orbital parameters of the space shuttle so we can monitor their communications with NASA and earthbound hams. Discovering new active monitoring frequencies, trying demo programs of radio-rated software, and many more useful features make the Internet and its services an invaluable information resource.

Being "Gored/Bored" by the Net

I am sure the information highway will have a major impact on civilization's usage, storage, and sharing of information. For example, the facts and events that go into making up history will be widely known and catalogued, making it much more difficult for political leaders or other entities to twist the truth to suit their ambitions. If the old saying, "Knowledge is power," is true, then the knowledge which will be available to everyone will make the individual a more powerful force, with resources at hand previously available only to large corporations and government agencies.

BUT—and it's a big but—it should not be mistaken for a substitute for human communication. The written language is best suited to transmitting facts and utilizes a very small part of our communications skills. The spoken language carries so much more information than the written word. In some languages the meaning of most words can be greatly changed by the intonation of the speaker. Let's face it. The art of communication relies on subtleties, and the written word filters out the subtleties of the speaker. Letters formed on an impersonal CRT screen by the best writer are no match against words delivered by a good orator.

To make my point, just watch the communication between some hams using RTTY or AMTOR. If for some reason they then switch to voice communications, it seems the first thing they talk about is clarification of what had been previously sent in the form of data.

Add to all this the ease with which E-mail messages can be copied to hundreds, thousands, and even millions of people without a thought to who the receiver is. The quality of the communications takes a huge nose dive. Junk mail lives and travels the information highway! I'm sure if this happens on voice mail systems, it is to a lesser degree.

Radio was considered a major step forward from the newspaper when it was developed. Are we going backwards?

Fitting the Tool to the Task

After days of troubled thought I have come to the conclusion that there is a difference between communication of information and personal communication. The first is for retrieval and dissemination of facts, news events, and technical data. The content of this type of communication stands alone and is not directed to a singular person or group of people for any specific purpose.

But personal communication is quite different. Its purpose is to elicit a full range of human responses from the target of its transmission. It uses and refines the content of the general communication. For this reason I believe that, although computer communication will continue to grow, it does not mean the extinction of radio communication, especially voice modes.

Consider it similar to using a large screwdriver as a hammer. Sure, it can do that job. But it is better suited for its intended and designed purpose. Leave the hammering to the hammer. Leave the personal communication to people talking to people.

What do you think? Send your comments on this topic to me care of *MT*. Meanwhile, I promise next month we will continue with our product reviews.

Bits and Bytes

Karl Meyer, a long-time shortwave listener, recently sent a letter in which he discusses the problems he is having finding non-encrypted digital modes on shortwave. He says, "The little HF RTTY that is left seems to be *all* encoded and unreadable." He is also worried about the future of shortwave.

Well, Karl, perhaps this is just a cyclic phenomena brought on by the Sun's evolution and its effect on propagation in the shortwave spectrum. But, then, maybe the last spark-gap station thought the same thing! Spark-gap was used to generate radio waves by the early radio pioneers around the turn of the century. In their day, they thought longwave (100 to 400 kHz) was the only place for radiocommunications.

Karl also is concerned about the tightening of regulations on scanners in the USA. Although some other countries have a more liberal use of the radio spectrum, some are even tougher than in the USA. I've experienced both ends of the spectrum (!), having lived in England and the Netherlands for a number of years.

The Dutch government prides itself on being open-minded about *everything*—use of the radio spectrum being just one of many loosely, but adequately-controlled subjects. The English government, although a bretheren to the Dutch in the European community, is quite different. During the time I lived in England people were demanding Citizens Band Radios (CB). Well, first the government banned all CB radios. Then they outlawed the almost-universally used AM (amplitude modulation) CB radios. A legal United Kingdom CB had to use FM (frequency modulation).

As a good friend, who happened to be a solicitor (lawyer) in England told me, "The government looks for things where the people have a chance of having enjoyment and either outlaws it, controls to the point where the enjoyment is taken out of it, or taxes it!" So don't feel picked on, Karl. The US government is just evolving into the same pattern that its older European brothers have gone through hundreds of years ago.

Humm, if there is nothing really new, just recycled methods, that may leave room for a new magazine—*SGT: Spark Gap Times* . . .

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Dealing with Man-Made Noise

Short-wave listeners and radio amateurs contend with a host of man-made electrical noises when trying to sift weak signals out of the QRN (man-made and atmospheric noise). The problem is usually worse when the SWL lives in an urban area where power lines and appliances spew out electrical pulses that spoil reception. This month we will explore various ways to reduce or eliminate electrical noise that can enter our receivers via the antenna and ac power service.

Antennas and their Placement

Power lines and internal house wiring are transmitting antennas for man-made noise pulses such as those from leaky pole insulators and overload circuit breakers. The ac wiring inside the walls of our homes radiates pulse noise from such appliances as food blenders, vacuum cleaners, furnace motors, fish-tank thermostats, electric blankets, and such. Our antennas and their feed lines pick up these unwanted radiations and allow them to enter our receivers. I have seen ambient QRN levels as great as 20 dB over S9 at some home locations.

The physical placement of the short-wave antenna is critical in most urban settings. It should be as far away from power lines, service drop lines, and telephone cables as possible. When the antenna must be relatively close to these radiating wires (never directly above or below power lines, for safety reasons), it should be erected at a right angle to the power line to minimize what is known as mutual coupling.

Whenever practicable, use a coaxial feed line between the antenna feed point and the house to discourage noise pickup on the feeder. Most man-made noise is vertically polarized and many feed lines are erected vertically, thereby making them especially receptive to the transfer of vertically polarized noise.

In this context, vertical antennas are especially prone to picking up man-made noise. Use a horizontal antenna whenever possible. Loop antennas are the quietest of the receiving antennas and discriminate rather well against man-made noise. For example, my 160-meter full-wave horizontal loop antenna is only 100 feet from the 10-kV power line that passes through my farm. I do not detect line noise on any MF or HF band. But, when I use my 160-meter inverted-V dipole (same distance from the high line), the S meter registers a steady S8 noise level.

Dealing with TV "Birdies"

TV receivers emit numerous spurious signals that can interfere with reception, especially from the standard BC band through 4 MHz. Particularly troublesome are the birdies from the 15.750 kHz horizontal oscillator that appear every 15.750 kHz across the receiver tuning range. These manifest themselves as strong, raucus buzzing noises that shift in tone as the video level in the picture changes. Generally, the ac lines in the house, plus the TV feed line, radiate this energy, and it is picked up by our antennas.

The cure for this common annoyance must be handled directly at the TV receiver. A high-pass filter can be installed where the TV antenna or cable service attaches to the TV set. This allows TV signals to pass, but blocks the passage of low-frequency energy that can be radiated by the TV feeder and/or antenna. A "brute force" ac line filter (see Figure 1) should be added between the TV line cord and the wall outlet. The metal case of the filter needs to be attached to an earth ground in order for the filter to be effective.

In my home I use a filter between the hi-fi gear, VCR, and TV receiver. I can no longer tell when the TV set is operating because the crud from it can't enter the ac line and radiate to my antennas. A secondary advantage of the brute-force filter is that my amateur radio signals no longer interfere with the TV receiver and hi-fi equipment.

Reducing Noise with Chokes

Electromagnetic impulses (EMI) can often be suppressed at their sources. This is the ideal approach to eliminating man-made noise—before it is allowed to radiate from the house wiring. Depending upon the severity or amplitude of the noise pulses, we can often suppress the interference at the source. Noisy brushes in electrical motors can be toned down by placing a 0.1µF capacitor between each brush terminal and the frame of the motor. The capacitor must be rated higher than the ac voltage that is present (1000-volt capacitors recommended).

Appliances which generate noise can frequently be quieted down by wrapping their ac cords around a ferrite rod (see Figure 2) and taping the winding to the rod. A 7-1/2 x 1/2 inch rod with a permeability of 850 (Amidon Assoc., Inc. no. 43 material rod) is okay. The line cord, when coiled, provides an inductance that acts as an RF choke. The ferrite rod increases the inductance substantially to make the choke more effective.

Large ferrite toroids may be used in a like manner when wound as shown in Figure 2. The toroids are less expensive than the rods

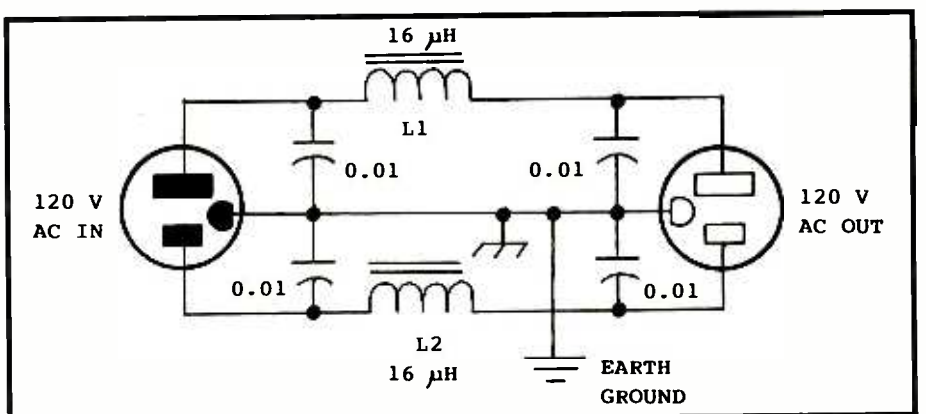

Figure 1: Schematic diagram of a brute-force line filter. Capacitors are 0.01µ at 1000 VDC. L1 and L2 have 16 turns of no. 14 enamel wire on Amidon FT-140-61 ferrite toroids. Wrap the cores with teflon pipe-joint tape (two layers) before winding the coils. You may add 150-volt MOVs (metal oxide varistor) from each side of the ac line to the filter chassis, and one MOV across the ac line, to provide spike protection for your TV and hi-fi gear.

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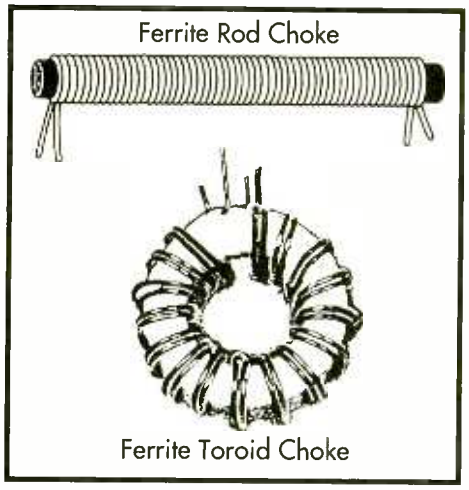

Figure 2: Illustration of a ferrite rod (top) and a toroidal RF choke (bottom) that can be used to suppress noise pulses (see text). Insulated wire is required for both styles of choke.

and are more compact. A 2-1/2-inch ferrite toroid of no. 43 material is frequently used for this purpose.[1] These chokes permit the 120-volt ac current to flow, but they block the passage of noise pulses. All that is necessary when winding these chokes is to use as much of the ac cord as possible, thereby filling the core to capacity. The more inductance the better.

Dealing with Power Line QRN

Always call your power company and ask for help in curing a line-noise problem. They have special troubleshooters who are equipped with directional antennas and a mobile multifrequency receiver. These specialists can pinpoint the source of the noise, then have it corrected by a lineman. Do not thump the power poles with a sledge hammer, as some have done, in an effort to locate the noise source. A loose insulator could fall on you and cause bodily harm. The thumping could also disrupt the power service in your neighborhood. The power company folks take a very dim view (pun not intended!) of such actions.

You may, however, be of service in locating the noisy pole by tracking the noise with a transistor AM radio and noting where it peaks. This will help the troubleshooter to locate the noise source more quickly.

Station Ground Important

Unwanted noise can be eliminated more effectively if the station receiver is connected to a quality earth ground. The shorter the connecting lead between the receiver and the ground terminal the better. This minimizes inductance in the lead, the former of which introduces unwanted ac/RF resistance and degrades the quality of the grounding. A wide connecting strap is best, such as the shield braid from RG-8 coax cable, in order to further minimize inductance.

The cold-water pipe system can serve as a suitable grounding point if copper plumbing exists. Four 8-foot ground rods driven into the soil near the radio room are effective also. They should be spaced three feet apart, in a square, and joined by RG-8 shield braid or some other wide conductor.

Closing Comments

The process of eliminating man-made noise is anything but casual. There may be two or more "noise generators" in your home, and this will require the process of elimination. Furthermore, your neighbor may have an appliance or furnace that is causing pulse noise. This requires a tactful approach on your part if you want him or her to allow you to install a noise suppressor in his home.

Note

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Accurate Bearing/Distance Spreadsheet

There are plenty of "*Great Circle*" programs for hams and shortwave listeners that compute distance and direction between one's base station and the target station. Most are passable for hobby work, but can sometimes be quirky, erroneous, and no fun, especially if you're a modern computist with Windows, OS/2, Unix, or other operating system capable of running several different tasks simultaneously.

Well, I have a Great Circle tool for almost *any* computer and almost any operating environment. It's a piece of cake to run, and you may already be an expert with the basic software—a spreadsheet. *Any* spreadsheet, no less!

This very precise, easy-to-use, spreadsheet model instantly calculates Great Circle distances between any two points on earth and reciprocal bearings (directions) from each other. I developed it with Microsoft EXCEL 5.0 and tested it on Microsoft WORKS 3.0, so it will work with either. It will also work with most other spreadsheets with little or no alteration from that given here.

The variety of computers and operating system you use is irrelevant. You only need a spreadsheet program (VisiCalc, Lotus1-2-3, Quattro, Excel, MS-Works, AppleWorks, ClarisWorks, A-Lite, etc.), and to enter the labels and formulas exactly as given.

130-Year-Old Process Still Standard

A fellow by the name of Clarke determined in 1866 that the Earth is not a perfect sphere; rather it bulges slightly in the Southern Hemisphere. It is rather astonishing that the *Clarke Spheroid of 1866* (the mathematical process) remains the basis for precise geodetic computations to this day.

While Clarke's calculations and corrections for the eliptical deviation of the Earth's shell from sphericity are rather complicated, I have simplified the procedure so anyone can run the spreadsheet model and get extremely accurate results. Just type the formulas into your spreadsheet, character-for-character. It beats the socks off Great Circle programs, and couldn't be easier. You don't even have to know what you're doing.

If you hate typing, you can download the necessary file from the free file area on the **Hertzian Intercept BBS,** (619) 578-9247, 5:30pm-1:30pm, PST, for import into your spreadsheet, easy as you please. The filename is SPRED.ZIP and contains the MS-WORKS 3.0 and EXCEL 5.0 spreadsheets as well as delimited ASCII text files suitable for importing into the majority of spreadsheets.

Here's How it Works

Open a spreadsheet, 5 columns by 53 rows. **Columns** are labeled from left to right, A-E. **Rows** are numbered top to bottom, 1-53. Direct your attention to Table 1: the Formula Entries Table is the meat of this dynamo. Formulas, numbers, and interim calculations from this table are to be entered into cells A6-A53, B2-B5, C52-C53, D52-D53, and E47-E53. Be sure to enter them, line for line, character for character, exactly as you see them depicted in the Formula Entries Table. Non-critical label/header cells are A1-A5, B1-E1, C6-E6, B6-B53, B52-B53, C51-E51, C47-C50, and D47-D50. You can do with these as you please. Cells C7-C48, D7-D48, and E7-E48 should be left blank. Cells B6-B51 are descriptive terms for math activities in Cells A6-A51.

Refer to the Formula Entries Table to enter the critical math portions. *Do NOT copy cells B2-B5, A6-A53, C52-C53, D52-D53, nor E47-E53 from the Spreadsheet example in Table 2!* Refer to the example only for the non-critical labels and headers. Then you need only enter your latitude in degrees, minutes and seconds in cells C2-E2 and your longitude in degrees, minutes and seconds in cells C3-E3. Enter the target's latitude in cells C4-E4 and its longitude in C5-E5. Results appear in E47-E50, C52-E52, and C53-E53.

Background Math

It's beyond the scope of this article to dwell on spreadsheet math. Most of the first ten functions are concerned with averting a mathematical error produced when both sites are on the same latitude.

Personal computers don't work in *degrees*. For some mystical reason, they work in *radians*. Since we work in degrees, all cells with trigonometric functions must have a conversion for radians-to-degrees. That takes up several of the remaining actions in the A column. By the way, spreadsheets use pi (π) as spelled-out followed by open and closed parentheses: PI()—*no spaces* and nothing within the parentheses.

If you are not a spreadsheet expert, don't worry; just enter your formulas exactly as I show them, (*with no spaces anywhere!*) and there won't be a problem, unless your spreadsheet does things a little differently than Microsoft's. Any needed changes will be few and fairly self-evident after consulting your spreadsheet documentation. Most spreadsheets, however, are similar and I

TABLE 1

FORMULA ENTRIES

CELL	FORMULA	CELL	FORMULA
A6	=1E-20	A37	=A34-A36
A7	=-1*B4	A38	=IF(A15=1,-1*A21,A21)
A8	=B2+A7	A39	=(A37-A38)+180
A9	=IF(A8=0,A6,A8)	A40	=A39-720
A10	=IF(A9<0,1,0)	A41	=360+A40
A11	=ABS(A9)	A42	=IF(A41<0,A41+360,A41)
A12	=-1*B5	A43	=SIN(PI()/180*A33)
A13	=+B3+A12	A44	=1/A43
A14	=IF(A13=0,A6,A13)	A45	=A44*A27
A15	=IF(A14<0,1,0)	A46	=A45*69.17147736
A16	=ABS(A14)	A47	=SQRT(A25)
A17	=B2+B4	A48	=IF(E50>=180,E50-180,E50+180)
A18	=A16/2	A49	=A38*2
A19	=A17/2	A50	=A48+A49
A20	=SIN(A19*PI()/180)	A51	=A50-720
A21	=A18*A20	A52	=360+A51
A22	=A20^2	A53	=IF(A52<0,A52+360,A52)
A23	147 7397736	B2	=C2+D2/60+E2/3600
A24	=A22/A23	B3	=C3+D3/60+E3/3600
A25	=+1-A24	B4	=(C4+D4/60+E4/3600)
A26	=COS(A19*PI()/180)	B5	=C5+D5/60+E5/3600
A27	=A26*A16	C52	=TRUNC(E49)
A28	=A25*A27	C53	=TRUNC(E50)
A29	=1/A23	D52	=TRUNC((E49-TRUNC(E49))*60)
A30	=1-A29	D53	=TRUNC((E50-TRUNC(E50))*60)
A31	=A28/A30	E47	=A46/A47
A32	=A31/A11	E48	=1 609344*E47
A33	=ATAN(A32)*180/PI()	E49	=IF(A53<0,A53+360,A53)
A34	=IF(A10=1,0,180)	E50	=IF(A42<0,A42+360,A42)
A35	=IF(A10=1,-1*A33,A33)	E52	=(((E49-TRUNC(E49))*60)-D52)*60
A36	=IF(A15=1,-1*A35,A35)	E53	=(((E50-TRUNC(E50))*60)-D53)*60

NOTE: If your spreadsheet does not recognize the TRUNC function, use INT instead
No spaces in these lines; "0" is a zero; "*" is an asterisk. "-" is a minus sign.
Other symbols: comma "," plus "+" parentheses "()" divide by "/" carets "^ < >"

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TABLE 2

GREAT CIRCLE BEARING & DISTANCE SPREADSHEET

	A	B	C	D	E
1	Data I.D.	DECIMAL Degrees	DEGREES	MINUTES	SECONDS
2	Latitude Site A	32.9175	32	55	3
3	Longitude Site A	117.0956	117	5	44
4	Latitude Site B	34.1597	34	9	35
5	Longitude Site B	118.0583	118	3	30
6	1E-20	Division by 0 protection	^^ ENTER COORDINATES ABOVE ^^		
7	34.1597	Change sign	SITE INFORMATION BELOW		
8	-1.242222222	Math	Site A Name > The Herzian Institute, San Diego, CA		
9	1.242222222	Logic	Site B Name > NOAA Weather Station, Mt. Wilson, CA		
10	1	FLAG-0 - Logic	Engineer > [redacted] (619) 578-9247		
11	1.242222222	Absolute value	Date > 01-24-1995 12:02:09 PM		
12	118.0583	Change sign			
13	0.9627778	Math			
14	0.9627778	Logic			
15	1	FLAG-1 - Logic			
16	0.9627778	Absolute value			
17	67.0772222	Math			
18	0.4813889	Math			
19	33.5386111	Math			
20	0.5524968	Sine			
21	0.2659668	Math			
22	0.3052549	A20 squared			
23	147.7397736	N. America correction			
24	0.0020662	Math			
25	0.9979338	Math			
26	0.8335137	Cosine			
27	0.8024885	Math			
28	0.6008304	Math			
29	0.0067687	1/x			
30	0.9932313	Math			
31	0.8062879	Math			
32	0.6490689	Math			
33	32.9863504	Arc Tangent			
34	0	Logic			
35	32.98635038	Logic - Change sign			
36	-32.98635038	Logic - Change sign			
37	32.98635038	Math			
38	0.265966787	Math & logic			
39	147.2796164	Math & logic			
40	572.7203836	Math & logic			
41	212.7203836	Azimuth Logic, B-A			
42	147.2796164	Sine			
43	0.544439222	1/x			
44	1.836752311	Math			
45	1.473972526	N. America correction			
46	101.9568572	Square root			
47	0.998966383	Logic	Miles - Miles	Path Distance (mi)	102.06
48	327.2796164	Math	Kilometers	Path Distance (km)	164.25
49	0.531933575	Math	Direction/Bearing	Azimuth, A to B (°N)	326.75
50	326.7476828	Logic	Direction/Bearing	Azimuth, B to A (°N)	147.28
51	393.2523172	Logic	DEGREES	MINUTES	SECONDS
52	33.25231716	Azimuth A to B (°N) >	326	44	51.66
53	326.7476828	Azimuth B to A (°N) <	147	16	46.62

avoided super-complicated commands that might wreak havoc.

When completed, your spreadsheet should look like the one shown here. The variables are the twelve data input cells: C2-C5 for DEGREES only; D2-D5 for MINUTES only; and E2-E5 for SECONDS only. In other words, you should enter *only* latitude and longitude data in these twelve cells. The spreadsheet will take care of everything else for you in a flash, including the calculated decimal equivalents in Cells B2-B5.

The spreadsheet cannot easily work with latitude/longitude coordinates in the form in which we enter them into Columns C, D, and E, but there's no sense in manually converting them into decimal form when the spreadsheet can do it. Latitude and longitude are almost always found in the form of DDD° MM' SS", so conversion into a decimal is necessary. If you should ever need to enter coordinates in decimal form, do it only in Cells C2-C5. For example: C3 117.0956.

By the way, the spreadsheet formulas contain the Clarke Spheroid corrections for ellipticity in North America and produce results that agree with data taken from US Geological surveys. You can even enter decimals of seconds in E2-E5 (assuming you know them), but this is not necessary unless you're doing serious engineering or survey work. For instance, the latitude for Site B could just as readily be entered as: 34° 09' 35.459". Data entries must be *all positive values* for North Latitudes and West Longitudes; and *all negative values* for South Latitudes and East Longitudes. *When negative numbers are required, **each** cell data entry must be negative.* For example, the latitude for Rio De Janeiro, 22° 57' 09"S is entered as: -22° -57' -09"

You might wonder how to acquire geographical coordinates for your location as well as those for your intended targets. FCC databases like those sold by Grove Enterprises (800-438-8155; fax 704-837-2216) and PerCon Corp (716-386-6015; fax 716-386-6013) contain coordinates for each licensee of record. Those who own GPS receivers can display position fixes accurate to within about 30-300 ft. One of the best resources for latitude and longitude are USGS topographical maps in the *7 Minute* or *15 Minute Quadrangle* series. Latitude and longitude data can even be derived from road maps where there is a marking for every degree of latitude and longitude. You won't get extremely accurate data from this source, but it's better than nothing.

■ Testing Your Math

Using the distance/bearing spreadsheet is a snap. To test your set-up, type in *my* Site A and Site B coordinates, as given in cells C2 through E5 in Table 2. Then page down to the bottom of the spreadsheet where the results will be waiting for you....unless you have a slow computer or need to manually recalculate, in which case you might have to blink a few times before the calculations are done. You should have obtained the same results as I did.

If not, follow the chain of calculations from A6 thru A53, comparing to the Table 2 example, to see where you made an error. And that's all there is to making this baby work, folks. It's useful, extremely accurate, and amply meets even serious engineering needs. What's more, it will be useful for a project I might introduce later this summer, assuming you like this little side trip down "adventure lane." Please let me know. Happy Great Circling!

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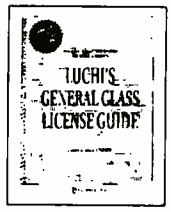

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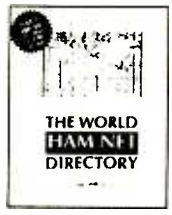

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GROUNDS: Real, Radio, Substitute, and Artificial

An electrical ground is an electrical connection to the earth. But, for the radio hobbyist this electrical connection can be:

1) a safety feature to help reduce the likelihood of electrical shock when the "hot" power-line conductor accidentally contacts the case of some piece of equipment,
2) a means to allow RF currents in the antenna system to flow to ground as a part of a receiving antenna's or transmitting antenna's normal functioning,
3) a return (to the earth) circuit for any radio frequency currents from a transmitter that were not properly conducted out of the operating room to the antenna system, or
4) a path to earth for lightning energy flowing in a lightning arrestor connected to a receiving or transmitting antenna.

Electrical Ground vs. Radio Ground

Usually an electrical ground devised for electrical power line safety is not adequate for radio antenna systems. This is because plain earth is not necessarily a good conductor of electrical current; dry, rocky, or sandy earth is even worse. In many locations, when radio waves encounter the earth's surface, they do not find sufficient conductivity to allow them to conduct or reflect as they ideally would do if the earth were a good conductor. In such cases the waves behave as if they encounter a conductive earth at some distance *below* the actual surface of the earth.

At these times we talk about "true ground" or "radio ground" to indicate that we are not referring to the surface of the earth, but to the depth at which the action of the radio waves suggests that a conductive ground has been encountered.

Substitute Grounds

As radio technology developed, the sensitivity of receivers increased greatly and, in most cases, receivers no longer needed antenna systems dependent on having an earth ground. It became common practice to construct radio receivers on a sheet-metal chassis, shaped as a rectangular box. This chassis was utilized as a common return-path for the receiver's circuitry, and usually the chassis itself was connected to an earth ground; thus connections made to the chassis were said to be "grounded."

When receivers were developed with transformer-less alternating-current power supplies, it was no longer safe to have the receiver's chassis exposed where it could be touched by the operator or connected to an earth ground. Nevertheless the terms "ground" and "chassis ground" remained popular for connections made to a receiver's chassis.

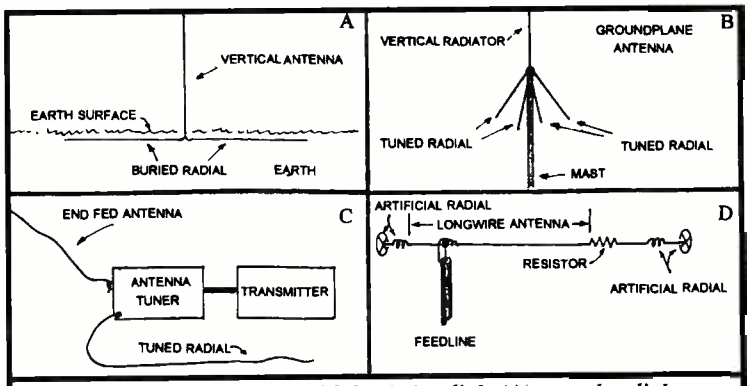

Figure 1. Vertical antenna with buried radials (A), tuned radials on elevated groundplane antenna (B), tuned radial as substitute ground (C), artificial radials on a terminated longwire antenna (D).

Later, as modular and then printed-circuit construction came into vogue, ground busses—wire or printed-circuit strips that were placed conveniently throughout the circuitry—took the place of the chassis as a common-return path. The non-earth ground tradition was continued by calling these bus lines "ground" connections, but very few of today's receivers actually require an earth-ground connection.

Substitute Grounds for Use with Antennas

Although today's receivers may not require an earth ground, the proper operation of many of today's antenna systems depends heavily upon connection to the earth and/or interaction between the earth and radio waves of the desired frequency. The fact that the earth is considerably less than an ideal conductor has led to the development of several substitutes for earth grounds.

Two kinds of radials have been devised as ground substitutes. One type is comprised of wires which surround the base of a grounded, vertical antenna to allow return current to flow with minimum loss. They are usually a quarterwave long; however, they may be any length, even considerably shorter than a quarterwave. This kind of radial is sometimes buried in the ground around the antenna, radiating out from the base of the antenna as spokes radiate from the hub of a wheel (fig. 1A). Recently, non-buried, above-ground radials in the same patterning have been shown to be more efficient than buried radials.

The other kind of ground-substitute radials might be called "tuned" radials because they must each be a quarterwave in length at the operating frequency. This kind of radial, which is never buried, comprises the groundplane on groundplane antennas (fig. 1B). Tuned radials can also be used as a substitute for an earth-return path to isolate radio cases, outside conductors of coaxial cable, etc. from unwanted RF currents as shown in fig. 1C.

In addition to tuned radials there are other tuned circuits which can be made to substitute for an earth ground at times; one consists of a coil and capacitive-hat in series (fig. 1D). Either a tuned radial or this artificial-radial circuit can be useful for such applications as "grounding" a terminating resistor (used to make some antennas unidirectional) without having need for an actual connection to earth.

At least one manufacturer, MFJ Enterprises (800-647-1800), makes an Artificial RF Ground device which can be used to substitute for an earth ground connection. Circuits serving as earth ground substitutes usually consist of a capacitor-inductor tuned-circuit connected to one or more lengths of wire; the capacitor and/or inductor is adjusted such that the overall circuit approximates the electrical action of a quarterwave radial at the frequency being utilized.

One good substitute for an ideal conductive ground would be coating the surface of the earth beneath an antenna with a highly conductive material. Nature sometimes does this for us, as many have noted improved functioning of their grounded vertical antennas after a rain.

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Since this is due to the increased conductivity of wet soil as compared to dry soil, some operators simulate the effect by watering the area under and around their grounded vertical antennas.

For a more permanent approximation to increased earth conductivity we may use an antenna "counterpoise," sometimes called a "ground screen." A counterpoise is a wire, or a system of wires, located below the antenna but somewhat above and insulated from ground. It provides a good ground connection for the antenna via its capacitative coupling to earth. Ground-substitute screens (reflectors) can also be used far above ground where there is little coupling to the earth; this is more practical at VHF and higher frequencies than at lower frequencies.

RADIO RIDDLES

Last Month:

Last month I told you that there are antennas called "mute," "dummy," "phantom," and "artificial" antennas. Such antennas do essentially no radiating nor receiving of signals, and are used to test transmitters or receivers. Then I asked if there are also "mute, dummy, phantom and artificial grounds" for use in such situations?

Well, any of the pseudo-antennas I've seen has not only an "antenna" terminal but also a "ground" terminal, so we could say that any of these devices is also a pseudo-ground. Of course, this month's column discusses several "artificial grounds," but from a different perspective.

Still, the most interesting (and most misled) technique I have ever heard of for making an artificial ground for an antenna system occurred when an assistant to the famous radio pioneer, Lee DeForest, was setting up a wireless transmitter in a hot-air balloon. The assistant, having hooked up the wireless set to an aerial on the balloon realized that, once the balloon was aloft, he would have no earth-ground connection. Not to worry—he dashed off, to return shortly with a flower in a pot. Setting it in the balloon's basket, and quickly implanting the ground lead into the potting soil, he declared the flight ready to start!

This Month:

Speaking of grounds, what would happen to your reception if you took down your HF, MF, or LF antenna, insulated it, and buried it in the earth?

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

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ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ

In our March, 1995, column, we noted that most electrical interference caused by switch contacts (thermostats, electric switches, aquarium heaters, electric blanket controls, etc.) can be reduced significantly by the addition of a capacitor across the contact terminals.

In the case of remote thermostats which operate on low voltage, capacitors rated at only 100 volts or so are adequate; one of our readers who is in the interference-troubleshooting business, however, reminds us to prompt our readers that most switches operate at higher voltages.

To be safe, always select a capacitor with a rating of at least 400, and preferably 600, volts.

Q. *As a service technician for Motorola, I have a lot of test equipment which can scan the cellular frequencies. Is it still legal for me to own? (Mark Malm, Bismarck, ND)*

A. Absolutely. The new law makes it unlawful to manufacture or import any cellular-capable or cellular-restorable scanners, but it does not retroactively prohibit previously-legal equipment, nor does it cover test equipment—only scanners which are intended for the consumer marketplace.

Cellular service providers may still import or manufacture such scanners, as may government agencies, and test equipment which is capable of scanning the cellular frequencies remains lawful to be manufactured or imported by anyone.

Q. *Recently, while tuning through the shortwave spectrum I heard on 2.67 and 4.005 MHz (FM mode) the distinct sounds of children playing—in MY kitchen! Since I don't have a cordless phone, I began a search of the premises to see if I was bugged. I discovered the culprit: my Panasonic KX-T1470 answering machine!*

Not only did it continue to transmit for all the neighborhood to hear, but it continued to do so even when it was switched off! The only way I could stop it was to unplug it from the wall. Is it legal? Is it defective? Is it common? (Thomas W. Story, Oakley, CA)

A. From time to time we hear of electronic telephone appliances that have this problem; a short time ago it was an AT&T phone. The problem is usually related to the time base oscillator for the microprocessor; it becomes frequency-modulated when the microphone picks up nearby audio.

The engineers don't bother to prevent it because it doesn't affect the operation of the unit, and they apparently aren't intuitive enough—or care enough—to realize what would happen if someone tuned in.

Is it legal? Yes. Is it defective? No, unless original design inadequacy counts; Is it common? No. A simple filter capacitor added to the supply voltage lead to the oscillator should cure it.

Q. *A friend of mine is loaded with shortwave and scanner equipment, but lives in a mobile home park with restrictions against outside antennas. There are no trees, light posts, power poles, patio fences or awnings. Any suggestions? (Wes Parker, West Richland, WA).*

A. Has he considered stamp collecting? Sometimes it almost seems as though some residential covenants are specifically worded to thwart the radio hobby.

Assuming that he is in a strong-signal area,

Bob's Tips of the Month

Image Reception of Cellular Frequencies

(Note: It is unlawful to listen to cellular telephone conversations)

Ever since the illegalization of importing or manufacturing cellular-capable or cellular-restorable scanners or converters, listeners have been trying to find ways to "trick" scanners into receiving the prohibited 869-894 MHz cellular frequency range.

A quirk of receiver design actually provides cellular reception in most 800-MHz-capable scanners, even though the cellular portion of the spectrum has been removed.

Superheterodyne circuits (used in all modern receivers) generate a second frequency, called the second image, which allows reception of a signal on a frequency not originally intended. Because of the potential of causing interference to desired signals, image frequencies are attenuated as much as possible but, in the case of cost-compromised scanners, they are often quite audible.

In double-conversion Radio Shack and Uniden scanners (BC200XLT, BC220XLT, SC150, PRO-51, etc.), the image frequency is displaced by 21.4 or 21.6 MHz, allowing reception of most of the cellular frequency range by searching 895-912 MHz.

Triple-conversion scanners use a much higher first intermediate frequency (IF), and frequency displacement of the image can be hundreds of megahertz. These are the cellular image frequencies for several current models (be sure to select NFM mode, 5 or 10 kHz steps):

AOR AR8000: 1419.9-1444.9 MHz
BC2500/3000XLT: 1005-1030 kHz
BC8500/9000XLT: 360-385 kHz
PRO-2035: 1105-1114 MHz

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he might try using the metal framework of his mobile home as an antenna. Try connecting the center conductor of a length of coax (attached to the external antenna jack of the scanner and/or shortwave receiver) to a variety of screws around the inside of the mobile home, and to points on the undercarriage as well. Tune in several weak signals to make the tests, leaving the coax attached to the best point for loudest signal(s).

The Grove ANT-20 "NoTenna" is ideally suited for this application, since it is designed for use with a variety of scanners and shortwave radios, and includes a ferrite-bead decoupling device for optimum performance.

Finally, he may opt to mount an antenna on his automobile, using a long coax extension into the mobile home for listening. This ploy has worked successfully for hams, especially on the VHF/UHF bands.

***Q.** Why do plug-in VHF/UHF converters for shortwave receivers not include the 88-108 MHz FM broadcast band? (Jack Belck, Glen Carbon, IL)*

A. Even if the shortwave set has an FM mode, it is for narrowband modulation (15 kHz bandwidth) as used by the land mobile two-way services; trying to hear wideband FM (150 kHz) as used by the broadcast services would produce nothing but severe distortion.

***Q.** On older TV sets, UHF channels go up through 83. What were those frequencies? (Heather Peel, Oakville, ONT)*

A. Channels 70-83, 806-890 MHz, were reassigned from broadcasting to the land mobile services many years ago. Modern TV sets and VCRs only show UHF channels through 69.

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Utility Loggings *(Continued from Page 35)*

8090.5 Link 11 data transmission noted here in USB at 0618. (Haverlah-TX)
8190.0 Spanish female 5-digit number station in AM at 0805. (Brookman-AK)
8520.0 UUI-Odessa Radio, Ukraine, with 50 baud RTTY traffic at 1510. (Boender-Neth)
8530.0 UJE-Moscow Radio, Russia, with CW traffic at 1514. (Boender-Neth)
8541.0 LYL-Klapeda Radio, Lithuania, with CW marker at 1515. (Boender-Neth)
8556.0 SAB44-Goteborg Radio, Sweden, with SITOR-A traffic at 1519. (Boender-Neth)
8557.0 SPE41-Szczecin Radio, Poland, with CW marker at 1519. (Boender-Neth)
8570.0 TBA6-Turkish Navy Anakara, Turkey, with CW marker at 1522. (Boender-Neth)
8574.0 LGB-Rogaland Radio, Norway, with CW marker at 1527. (Boender-Neth)
8610.0 UCE5-Arkhanglesk Radio, Russia, with CW marker at 1529. Also on 12795 at 1600. (Boender-Neth)
8638.5 DAM-Norddeich Radio, Germany, with CW marker at 1835. (Fernandez-MA)
8650.0 IAR-Rome Radio, Italy, with CW marker at 1532. Also noted 8670. (Boender-Neth)
8682.0 EAD3-Madrid Radio, Spain, with CW marker at 1535. Also noted on 12887.5 at 1606. (Boender-Neth)
8698.0 UDK2-Murmansk Radio, Russia, with CW traffic at 1536. Also on 8700 in CW, 8788-UMN in USB, and 13050 in CW. (Boender-Neth)
8968.0 Sidecar with Alligator playground chatter in USB at 1921. He is now a heavy user of 8968.0 for his Canadian comms during local afternoons. Paramount working Hickam GHFS in USB at 0408 looking for Nightwatch 01 frequencies. Given P381, W100, and S310 (big spread). (Haverlah-TX) Sidecar working Halifax in USB at 0125. (Gordon Levine-Anaheim, CA)
8977.0 Australian Air Force Sydney at 0609 in USB working Trenton (?). At 0647 Royal New Zealand Air Force Auckland working Sydney. (Baker-OH)
8983.0 Coast Guard Comsta Honolulu, HI, working Coast Guard *Rescue 1602* in USB at 0328. (Levine-CA)
8992.0 Tallcorn working MacDill GHFS with DSN phone patch to 339-3944 in USB at 2319. (Haverlah-TX)
9007.0 CHR-Trenton Military at 0158 in USB working CanForce 6428. (Baker-OH)
9016.0 Molecule working MacDill GHFS in USB at 1831. Also on 8992 with phone patch from Command Post (Sunburst) for connectivity check. Prior to these comms. Offutt GHFS had made an all frequency request for Molecule. Also strong Link 11 transmissions noted in USB at 0240. (Haverlah-TX)
9017.0 Notebook working a weak Nightwatch 01 in USB at 1749. (Haverlah-TX)
9023.0 Olympus working Dolphin 70 in USB at 0105. Pelican 8 working Dolphin 70 in clear and in green using USB at 1516. Bandsaw Golf working Dragnet Yankee and calling Northern Lights in USB at 1428. (Haverlah-TX)
9043.0 SAM 306 working Andrews (Mystic Star) at 2056 in USB. (Baker-OH)
9104.0 Egyptian Embassy Boustan Ottawa to Khargia Cairo in 5-letter groups SITOR-A at 2100. (Fernand Vaillancourt-St. Pamphile, PQ Canada)
9955.0 Spanish female 4-digit number station in AM at 0235. (Robert Thompson-Kilgore, TX)
10033.0 Egyptian Embassy, Washington, D.C., with 5-letter groups SITOR-A traffic for Khargia Cairo at 2035, (Vaillancourt-PQ)
10197.0 RFTJ-FF Dakar, Senegal, with ARQ-E3 traffic at 1730. (Guy-UK)
10215.0 HZN48-Jeddah Meteo, Saudi Arabia, with 100 baud RTTY weather at 1847. (Guy-UK)
10344.0 Radio Moscow shortwave broadcast feeder in USB at 0825 carrying Russian programming. (Hall-RSA)
10407.0 6VU-ASCENA Dakar, Senegal, with 50 baud RTTY at 1840. (Guy-UK)
10584.0 KUL-Russian Diplo (?), 5-letter groups via 75 baud RTTY at 1420 and 1525. (Boender-Neth)
10750.0 Unid station C37A with ARQ-E traffic at 1835. (Guy-UK)
10780.0 S4JG calling Cape Radio for ground radio check, but raising Bear Grass and *USS Boone* in USB at 2309. (Haverlah-TX)
11175.0 Cody 151 (a.k.a. 60151 on the QENR10374 mission—the hit support mission) working MacDill GHFS with a phone patch to Davis Monthan command post in USB at 1902. (Haverlah-TX)
11192.0 CSY-Santa Maria Air, Azores, with flight safety messages using 50 baud RTTY at 1845. (Boender-Neth)
11229.0 Ironman sending data to Nightwatch 01 in USB at 2016. Doolittle working Nightwatch 01 here and on 9017.0 in USB at 1806. (Haverlah-TX)
11232.0 CHR-Trenton Military at 1836 in USB working CanForce 381. (Baker-OH)
11243.0 Offutt GHFS working Stateroom (deliberate use of this frequency) in USB at 1515. SAM 29000 working Andrews with phone patch traffic in USB at 1643. Sentry 51 calling Bangor Control for radio check in USB at 1420. (Haverlah-TX)
11244.0 Offutt GHFS with a EAM repeated twice then repeated twice again as a "more to follow" EAM broadcast in USB at 2206. Firedome starting at 0025 periodically calling McClellan GHFS with flash traffic and finally raises Andrews GHFS at 0051 in USB. Phone patch to DSN 339-3946 (Java Jive) and passes a '369' message. Elmendorf GHFS with a 'Foxtrot' message broadcast, not repeated in the lower 48 in USB at 0222. Scripture calling Nightwatch 01 on S393 in USB at 2032. (Haverlah-TX) *Very unusual and interesting, Jeff-Larry.*
11246.0 Titanium calling MacDill GHFS with request in USB at 2007. No answer of course. Interesting that a daily tactical callisgn would be using a pre-June 1992 GCCS MacDill frequency (Haverlah-TX) *Preset maybe?-Larry*
11264.0 Firebolt calling either X02 or E02 in USB at 1916. (Haverlah-TX)
11264.5 P0P (female operator) working 20V, 8ZJ, and G6O in USB at 1846. Then at 1936 P0P (male operator now) working 0LV. Said he had a D B O one for that station then HF datalink noted. (Haverlah-TX)
11267.0 X7W working 6WY in USB at 1806. At 1821 Newhouse passed three EAMs: QJ4QGP, QJEVXS, and QJ4QGP (repeat of preamble) in USB. (Haverlah-TX) *Second report that the old HICOM channels still carry some EAM traffic, interesting-Larry.*
11270.0 Russian male number station in USB at 0820 (Sat/Tue UTC). (Boender-Neth)
11279.0 Aeroflot 6 working Baffin Radio at 2059 in USB (Brookman-AK)
11460.0 Spar 76 working Andrews GHFS with phone patches (Mystic Star) in USB at 2005. (Haverlah-TX)
11466.0 SAM 681 working Andrews GHFS (Mystic Star) in USB at 2059. Also on 11460. (Haverlah-TX)
11476.0 HMF52-KCNA Pyongyang, North Korea, with 50 baud RTTY bulletins at 1746. (Boender-Neth)
11494.0 Billyclub working Ligament in USB at 2232. Omaha 3 (a.k.a. Omaha 3 CC) working Hammer in USB at 0005. Paramount entering a massive net containing: Nightwatch 01/02, Claybird, Blindfold (aircraft), Rockaway, Zanzibar, Beehoney, Prologue (USN operator in constant secure comms with Nightwatch 02), Devilfox (receiving VLF traffic from Blindfold), WAR46, WGY912, and WGY913 (via phone patch from WGY912, a.k.a. Doolittle pre-0000 UTC and Fastball after 0000 UTC) in USB. Also heard on 9017, 13211, 11220, 11229, and 12070 (for secure comms). (Haverlah-TX)
11536.0 HMF49-KCNA Pyongyang, North Korea, with 50 baud RTTY news bulletins at 1748. (Boender-Neth)
11606.0 BZS21-Xinhua Beijing, China, with 75 baud RTTY at 1500. (Boender-Neth)
12193.0 KUL-Russian Diplo (?), 5-letter groups using 75 baud RTTY at 1420. (Boender-Neth)
12228.0 BZR62 Xinhua Beijing, China, with 75 baud RTTY at 1457. (Guy-UK)
12693.0 UGC-St. Petersburg, Russia, with CW marker at 1550. Also noted on 12855 at 1602 with CW traffic. (Boender-Neth)
12940.0 LZW53-Varna Radio, Bulgaria, with CW marker at 1609. (Boender-Neth)
13055.0 UTQ7-Kiev Radio, Ukraine, with CW marker at 1610. (Boender-Neth)
13200.0 Reach 40620 working McClellan GHFS in USB at 1951. (Haverlah-TX) Baker 71 at 1921 working Offutt GHFS with phone patch to North Island meteo. At 1930, Beta 56 (HC-130) working Thule GHFS with phone patch to Battlestar (910th ALG command post Youngstown, OH) in USB. (Baker-OH)
13208.5 226 (a.k.a. 80226 - C5 aircraft) working a very strong command post (probably Stewart) regarding Ontario, Trenton, HF checks, and Stewart in USB at 1525. (Haverlah-TX)
13528.0 RUW53-Moscow Meteo, Russia, with 50 baud weather at 1455. (Guy-UK)
13978.0 Swiss Embassy Mexico City, Mexico, with SITOR-A traffic for HBD20-MFA Berne, Switzerland at 1609. (Vaillancourt-PQ)
14573.0 JANA Tripoli, Libya, with 50 baud RTTY Arabic news broadcast at 1734-1828. (Guy-UK)
14633.5 MFA Bonn, Germany, sending umpteen pages of crypto in ARQ-E at 1603. (Hall-RSA)
14663.5 MFA Bonn, Germany, with ARQ-E German traffic to the German embassy in Lima, Peru. at 1624. (Hall-RSA)
14681.0 MFA Bucharest, Roumania, with encrypted ROU-FEC message traffic to V5G at 1535. (Boender-Neth)
14764.2 A9M70-GNA Manama, Bahrain, with English 72 baud RTTY news bulletins at 1541. (Hall-RSA)
14801.0 RFVI-FF Le Port, Reunion, with ARQ-E traffic at 1525. (Guy-UK)
14842.0 ATV65-Dehli Meteo, India, with poor fax chart at 1230. (Hall-RSA)
14890.0 Russian male number station in USB at 0800. (Sat UTC). (Boender-Neth)
14912.0 DFZG-MFA Belgrade, Serbia, using 75 baud RTTY at 1440. (Guy-UK)
14982.5 RBV76-Tashkent Meteo, Uzbekistan with fair weather fax chart at 1530. (Hall-RSA)
15016.0 Nutmeat (very powerful signal in deadband conditions) reading an EAM (maybe simulcast on 8968) in USB at 0652. (Haverlah-TX) SAM 61683 working Offutt GHFS in USB at 2024. (Levine-CA)
16117.2 6VK317-PANA Dakar, Senegal, with 50 baud RTTY English news bulletins at 1752. (Hall-RSA)
16270.0 9VF207-Kyodo Singapore, with fax of Japanese newspaper, very clear at 1711. (Hall-RSA)
16829.0 USU-Mariupol Radio, Ukraine, with CW marker at 1400. (Boender-Neth)
17432.0 CW number station with 5-figure groups at 1400. (Boender-Neth)
17477.0 CW 5-letter groups at 1401. (Roger Parmenter-Hyannis, MA)
17976.0 Jayhawk 11 calling any Global, no answer in USB at 1636. Also Offutt GHFS calling Molecule, no answer in USB at 1720. (Levine-CA)
18173.0 STK-Kartoum Air, Cameroon, with 50 baud RTTY at 1512. (Guy-UK)
18646.7 PCW1-MFA Den Haag, Netherlands, with an idling SITOR-A signal at 1652. (Hall-RSA)
19160.0 CLP1-Havana, Cuba, with 50 baud RTTY traffic to MFA Congo at 2015. (Vaillancourt-PQ)
19171.0 CNM85X11-MAP Rabat, Morocco, with 50 baud RTTY news bulletins at 1548. (Guy-UK)
19200.2 9BC32-IRNA Tehran, Iran, with 50 baud RTTY English news bulletins at 1230. (Hall-RSA)
19697.5 SPH-Gdynia Radio, Poland, with SITOR-B traffic list at 1203. SPB-Szczecin Radio, Poland with SITOR-B traffic list at 1200. (Hall-RSA)

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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.
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North American SW Assoc.: Bob Brown, 45 Wildflower Lane, Levittown, PA 19057, (215) 945-0543. Worldwide; Shortwave broadcast only. *The NASWA Journal.* Regional meetings.
North Central Texas SWL Club: Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. North Central TX area; All bands.
Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities. Check for new meeting sked.
Northeast Scanner Club: Les Mattson, P.O. Box 458, Rio Grande, NJ 08242, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN).* $29 annual.
Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (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.
Sandy River SW Radio DXers Assoc: Duncan or Brenda Steele, R.R. 1, P.O. Box 1560, Norridgewock, ME 04957. Worldwide. *The QSL* - irregular. No dues.
Scanning Wisconsin: Ken Bitter, Dept. MT, S. 67 W. 17912 Pearl Dr., Muskego, WI 53150-9608, (414) 679-9442. Wisconsin. VHF/UHF. *Scanning Wisconsin* ($2 for sample)
Signal Surfer DX Club: Darcy Jabs, RR2, Burns Lake, BC, Canada, V0J 1E0; (604) 694-3760. Canada and worldwide. MW and SW DXing.
Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.
Susquehanna Co Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801-0023. PA area; Scanning. Meets irregularly.
Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur. Meets 3rd Thursdays 7pm Holland Big Boy.
Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.
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.
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.
Worldwide Ute News: Rick Baker, ae411@yfn.ysu.edu for info - worldwide membership; non-broadcast under 30 MHz. Free electronic newsletter WUNNEWS, join by sending e-mail to majordomo@phoque.info.uqam.ca with following in e-mail message: "subscribe wunnews." Through World Wide Web: http://sun-gabriel.aero.org:8800/. For paper version: $14.50/yr to Tim Braun, 15915 Smithey Dr., Haymarket, VA 22069.

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 DX Association: Bedanta Das, 1 - No. Galiahati, Near Night School, Barpeta - 781301, Assam, India.
International Listeners Organization: Kalab Abbas, St. No. 1, H, No.231 Waris Rd, Sheikhupura, Pakistan 39350 South Asia. Broadcasting. *Listener Times.*
International Radio Youth Club: G.M. Mostafa Kamal, Amla Wapda Colony-1, Kushtia-7032, Bangladesh
National Society of Pakistani DXers: Mr. Liaqat Ali, E-161/1, Iqbal Park, Opposite Adil Hospital Defence Housing Society Road, Lahore Cantt., Pakistan. Worldwide. All wave. Has library, meets fortnightly 1400-1800 UTC at library. 4 IRCs for more info.
New Zealand 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.

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.

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SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
June 2-4	Seaside, OR	Northwestern Division Convention / Al Berg WB7SIC, 2256 SE Oak Crest, Hillsboro, OR 97123, 503-640-5456.
June 3	Teaneck, NJ	Bergen ARA / Bruce Lemken WG2Y, 47 Furman Dr, Emerson, NJ 07630, 201-967-7041.
June 3	Rome, NY	Rome Radio Club / Russell Schorer KB2MAS, PO Box 327, Clark Mills, NY 13321, 315-853-8739.
June 3	Wilmington, NC	Azalea Coast ARC / Bill Murrell AD4DN, PO Box 221, Wilmington, NC 28402, 910-452-2145.
June 3	Loveland, CO	Northern Colo. ARC Superfest / Randy Long WB6AVV, 303-226-1529, Location: Larimer County Fairgrounds, Talk-in 144.515/145.115. 8am-3pm. Admission $3.
June 4	Princeton, IL	Starved Rock Radio Club / Debbie L. Burton N9DRU, 1153 Union St, Marseilles, IL 61341-1710, 815-795-2201 Location: Bureau County Fairgrounds, Princeton, IL, 1 mile west on RT 6 from RTS 34 and 26, Talk-ins 146.355/955 Open 8am, Admission $5.
June 4	Salina, KS	Central Kansas ARC / Mitch Johannes KA0IFW, 877 South 11th St., Salina, KS 67401, 913-827-2027.
June 4	Butler, PA	Breezeshooter ARC / Bob Ferrey N3DOK, 9821 Presidential Dr, Apt 304, Allison Park, PA 15101, 412-367-2393.
June 4	Manassas, VA	Ole Virginia Hams ARC / Kenneth L. Moan KM4UH, 12019 Bradley Forest Rd, Manassas, VA 22111, 703-369-5287.
June 4	Chelsea, MI	Chelsea Amateur Radio Club / Gary R. Widmayer, PO Box 325, Manchester, MI 48158, 313-428-9398, Location: Chelsea Fairgrounds, Talk-in 146.980, Open 8am, Admission $3.
June 9-11	Arlington, TX	Texas State Convention / John Fleet WA5OHG, PO Box 25028, Dallas, TX 75225-1028, 214-522-5003.
June 10	Winston-Salem, NC	Winston-Salem Hamfest and Computer Fair, Forsyth Amateur Radio Club / Bill Patterson KD4RGB, PO Box 11361, Winston-Salem, NC 27116, 910-723-7388. Location: Dixie Classic Fairgrounds. Talk-in 146.04/64. 8am-3pm. Admission $7.
June 10	Goshen, CT	Southern Berkshire ARC / Sid Shore K1SS, 205 Sharon Valley Rd, Sharon, CT 06069, 203-364-0480.
June 10	Athens, GA	Athens RC / George Kelley WB4VNT, 4275 Atlanta Hwy, Bogart, GA 30622, 706-546-7713.
June 11	Somerset, NJ	Somerset County Amateur Radio Society / SCARS, PO Box 742, Manville, NJ 08835, 908-562-6117, Special Event honoring Guglielmo Marconi NW2P on the air 1300-2100 UTC from Marconi site, other sites on Cape Cod, Newfoundland and England. Stations working any sites eligible for commemorative certificate; QSL & 9 x 12 SASE to above address. CW/SSB 15M, 17M, 20M, 2M, & 6M SSB, 448.175-, 146.58 Simplex.
June 11	Darien Center, NY	Lancaster Hamfest, Lancaster Amateur Radio Club / Nick Mueller WA2CJJ, 5645 Genesee St, Lancaster, NY 14086, 716-681-6410, Location: Darien Center Firehall, near Darien Lake Fun Country, Talk-in 147.255 +600/433.850 +5MHz, 6am-3pm, Admission $5.
June 11	Queens, NY	Hall of Science Amateur Radio Club Hamfest / Arnie Schiffman WB2YXB, 81-22 250th St, Bellerose, NY 11426, night only, 718-343-0172, Location: New York Hall of Science parking lot, Flushing Meadow Park, 47-01 111th Street, Queens, NY, Talk-in 444,200 WB2ZZO Repeat 146.52 Simplex, Open 9am, Admission $5.
June 11	Hanover, PA	Pleasant Hill Computer and Hamfest, Hanover Area Hamming Assoc / Rodger Gibson N3ICJ, PO Box 820, Hanover, PA 17331, 410-239-8451. Location: Pleasant Hill Fire Co., 5 miles south of Hanover on Rt. 94. Talk-in 146.895-. Open 8am. Admission $5.
June 11	Willow Springs, IL	Six Meter Club of Chicago / Joseph Gutwein WA9RIJ, 7109 Blackburn Ave, Downers Grove, IL 60516-3925, 708-963-4922.
June 11	Erlanger, KY	Northern Kentucky ARC / Robert Blocher N8JMV, 2061 St. Rte. 125, #10, Amelia, OH 45102, 513-797-7252.
June 11	Winfield, PA	Susquehanna Valley ARC & Milton ARC / David Welker AA3BO, 229 Ridge Ave, Sunbury, PA 17801. 717-286-0787.
June 16-17	Albany, GA	Albany GA ARC / John Crosby K4XA, 308 Residence Ave, Albany, GA 31701, 912-883-7373.
June 17	Dunellen, NJ	Raritan Valley Radio Club "95 Hamfest" / John Weber WA2C, 51 Stanton Ave, Piscataway, NJ 08854, 609-584-9300. Location: Columbia Park (old location), near intersection Route 529 and 28.Talk-in 146.625(r)/146.520(s). 7am-2pm. Admission $5.
June 17	Milford, OH	Milford ARC / Bob Otto N8NGA, 9398 Kempergrove Ln, Loveland, OH 45140, 513-677-2783
June 17	Hermon, ME	Pine State ARC / Roger Dole KA1TKS, RR 2, Box 730, Bangor, ME 04401, 207-848-3846
June 17	Cortland, NY	Skyline ARC / Regina Canfield KB2AED, 3673 S Pendleton St RD #5, Cortland, NY 13045, 607-756-6550.
June 17	Nashville, TN	Nashville ARC / O. D. Keaton WA4GLS, 141 Medearis Dr, Old Hickory, TN 37138, 615-758-2329.
June 17	Rutland, VT	Vermont State Convention / Justin Barton WA1ITZ, 3 Crab Apple Ridge, Randolph, VT 05060-9709, 802-728-4034.
June 17	Bluevield, WV	East River ARC / Jim Perdue KC8NG, Rt 5 Box 457, Bluefield, WV 24701, 304-325-3058.
June 18	Santa Maria, CA	Satellite ARC / Rick Laird KB5OO, 813 Via Esmeralda, Santa Maria, CA 93455, 805-937-8337.
June 18	Walkersville, MD	Frederick ARC / Eric Gammeter N8AAY, 10494 Balmoral Pl, New Market, MD 21774, 301-865-0865.
June 18	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
June 18	Monroe, MI	Monroe County Radio Communications Assn / Fred Lux WD8ITZ, 5742 Parkside Dr, Monroe, MI 48161, 313-243-1053.
June 18	Macedonia, OH	Cuyahoga ARS / Rich James N8FIL, 7620 Crestwood Ln, Northfield, OH 44067, 216-468-2035.

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
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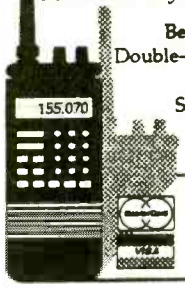

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CLOSING COMMENTS

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Freedom from the Press

We Americans covet our freedoms, and with just cause. We can say just about anything we want in print and get away with it; more, we have a constitutional guarantee that protects us. A casual walk by the grocery checkout counter reveals how this privilege is often stretched to excess by the preposterous yellow-journalism tabloids: *Hillary Clinton Pregnant with Alien's Baby, Monkey Glands Extend Life to 200 years*, and so on.

BBS "flame mail" is another annoying source of unaccountable and imaginative rumor mongering. Imagine my surprise (and amusement) recently when I read an off-the-wall posting that I had been fined for selling non-FCC-approved scanners! News to me. We've never even carried uncertified equipment.

But even the legitimate press is vulnerable. In a recent speech at the University of Nevada, former White House Press Secretary Dee Dee Myers encapsulated her impressions of the four rules of news journalism: *(1) Be first rather than right; (2) Never let the facts stand in the way of a good story; (3) When in doubt, analyze; (and 4) Good news is no news, so create conflict.*

But it isn't just unethical news reporting that deserves a swift kick in the annals; it's even worse in advertising. While we have the Pure Food and Drug Act in place, Truth in Labeling laws, and a host of other consumer-protective legislation, advertising claims still stretch credibility to the limit.

How can two or more competitive products be "the best"? How can an electrically-short antenna element have gain? (It can't.) How can vehicles containing substantial off-shore assembly be "American made"? How can a beverage containing alcohol be advertised as non-alcoholic?

With America's understandable bewilderment with technology, many manufacturers are having a heyday. Some critics are accusing Motorola of exaggerating the merits of their 800 MHz trunking systems, even accusing them of unethical trade practices and misrepresentation.

They cite the sad plight of Florida's dysfunctional $160 million statewide systems, San Francisco's proposed $40 million system (selected without competition by Mayor Jordan from the Motorola representative—Jordan's former campaign manager), and Minnesota's estimated $100 million-or-more statewide system. This project is riding a wave of misinformation, such as the mythical discontinuation of present frequencies, the imaginary overload of present frequencies, and the untrue obsolescence of present equipment.

Technology and the information age are moving at much faster pace than most of us are capable of following. Does this mean that we will become increasingly vulnerable to scams, confidence schemes, consumer fraud, and other exploitations of our trusting nature? Probably so.

Recent cowardly bombings by zealots illustrate just how insulated we have been from the stark realities of life faced for eons by residents of other countries under strife. Freedom of speech—a precious First-Amendment Constitutional right—is now under scrutiny due to its frequent abuse, promulgating violence and disobedience.

Fanatical rantings from tunnel-visioned extremists at both ends of the political spectrum blame anyone—New World Order, Trilateral Commission, Council of Foreign Nations, Right-Wing Conservatives, Left-Wing Liberals, Planned Parenthood, Right to Life, KKK, Neo-Nazis, Posse Comitatus—or any other convenient scapegoat for the logically challenged. Some broadcasters, hiding behind the pretense of religion and thus protected by law, cater to radical fundamentalism.

Is it possible that the media can exercise good judgement and balance before freedom of the press is restricted for the "common good"? So far I'm not encouraged by what I've seen or heard.

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