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Vol. 14, No.2 February 1995

CONTENTS

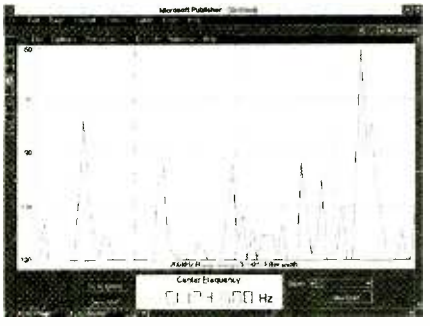
Cover Story

Shadowing Houston's Traffic

by Haskell Moore

You're stuck in traffic, when overhead you hear the flying traffic reporters. If only you had their bird's eye view! You can, of course, tune in to their reports on your radio, but there's a lot more to hear if you have your scanner along.

Houston's Shadow Broadcast Services is proof that traffic reporting is big business, requiring sophisticated equipment and coordination. Coordination means radio communications, and that means good scanner listening. You'll be surprised; there is more to traffic management in Texas than meets the eye. Cover photo by Haskell Moore. *See page 9.*



What's in a kHz or two?

Some substantial changes took place without much fanfare in December in aeronautical frequencies—substantial in terms of across-the-board changes, not actual frequency shift.

Check out Van Horn's "Utility World" column for the full story on the new Off-Route bandplan, complete with frequencies.

Reviews:

This month, *MT* reviews the new PRO-62 (left) from Radio Shack® (p.100), the Optoelectronics Scout® frequency counter (p.98), and offers help to those trying to choose between shortwave receivers (p.102).

DEPARTMENTS

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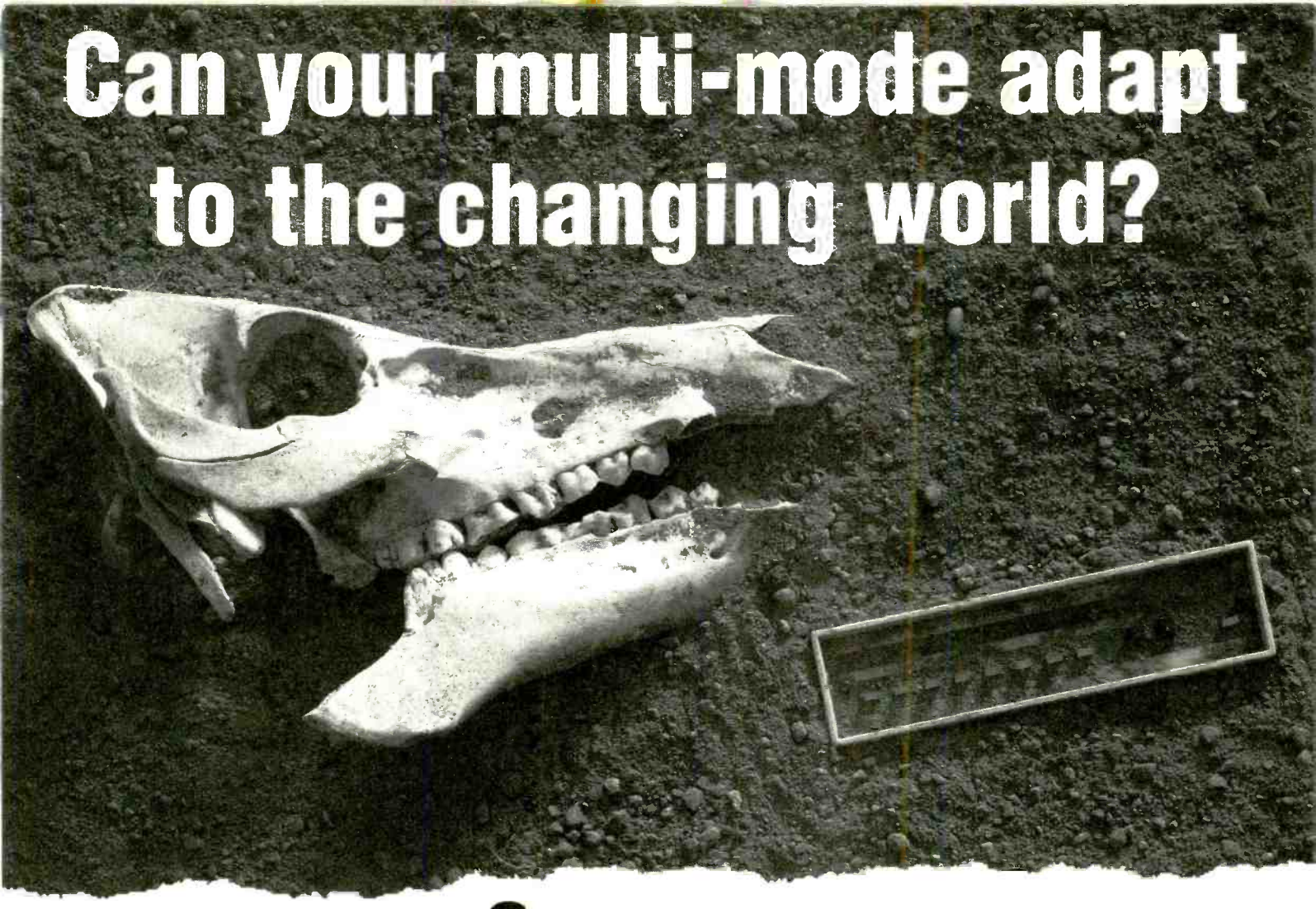

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Someone Else's Ox

■ With a number of good letters on hand, we'll jump right into it and save the editor's comments until last.

"I have always found it disturbing that the monitoring community did not object to someone else's ox being gored with the passage of the Cable Act of 1984," begins Robert Thompson, KC8MI, of Tornado, West Virginia. "This was the legislation which broke the precedent established by the Wireless Act of 1910 that the airwaves belong to the public. For the first time, it became illegal under federal law to intercept unencrypted radio signals for private use. That satellite television viewers were the target afforded no outcry from radio hobbyists.

"Now, with the ECPA and Telephone Disclosure and Dispute Resolution Act on the books, we wonder how we ever got to this point. However, the Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations may provide the solution to our dilemma.

"Any signatory nation that is being economically damaged by the cellular-capable scanner ban may file a complaint with the Dispute Settlement Body of the General Council of the World Trade Organization under the Uruguay Round! Any nation that is being harmed may file — including Cuba!

"The offending provisions of the Telephone Disclosure Act may be challenged, or even all FCC type acceptance! We could have MARS-capable ham rigs again. And 10 meter linears. If the challenged law is found to constitute a non-tariff trade barrier, the government is then forced to pay perpetual trade fines or rescind the law! State and local prohibitions of scanners and radar detectors are susceptible to the same challenges.

"Let us all rally around our less friendly global neighbors!"

Clean Living

■ Jacques d'Avignon, *MT* propagation columnist, gets "on his soapbox" this month regarding "dirty" transmitters. He says, "If you recall, during the last *MT* convention, one broadcaster did admit that many SW transmitters around the world are 'dirty' and cause splatter and interference on the band(s). He himself admitted that his transmitters are not as clean as much as they should be."

George Zeller, in his December "Outer Limits" column, observed WEWN's signal on an R-9000's spectrum display generating splatter interference between 7395 and 7455 kHz. Jacques says, "I understand that the manufacturer of the transmitters denies that they are 'dirty,' but to me, if you splatter over 60 kHz in the 7 MHz band, *you are dirty!* and WEWN splatters on the bands anywhere it transmits. Where I live (Ontario) the objectionable splatter is 'only' 40 kHz."

"If a station cannot clean up its act, maybe it should be charged a license fee for each 5 kHz that it occupies in the band(s), be it by a bona-fide signal or by unintentional splatter over a certain level."

"At the convention, I was also reminded that the shortwave broadcaster in the US, unlike the amateur radio operator, is required to use a certain minimum level of power in order to obtain a license. I have no major problem with this approach; it may help weed out those individuals that have a dream but no real money. But, I still maintain there should also be a maximum ERP allowed. No one can tell me that it is necessary to operate with 250 or 500 kW into a 20 dB gain antenna! This is a waste of energy."

Power Grab

■ December's lead "Communications" story concerned some stations failing electrical inspections because their transmitters did not bear UL (Underwriter Laboratory) stickers. Bill Naylor, a retired electrical inspector from San Antonio, has some comments to add.

"In my opinion, the county electrical inspector erred. I do not believe he had jurisdiction over the *internal* wiring. I would refer him to article 90-2 Par "B"; sub-par 4; under Not Covered. It says, 'Installation of communication equipment under the exclusive control of communication utilities, located outdoors or in building spaces used *exclusively* for such installation.' Further, article 800 (Communications Systems) specifically exempts radio. Article 810 (Radio and TV Equipment) applies to amateur stations only."

Naylor adds, "While the U.L. is a good organization, it is only one of several testing labs. If you check the label on pool equipment, you would see a C.S.A. decal. It is the Canadian equivalent of U.L."

Whoa, Whoa!

■ "Your news item in the December 'Communications' about the coming change in ownership of WOWO is curious," says Tom Seller of Harrison, Michigan, who wonders why columnist Larry Miller called it a "sordid ordeal."

"Why is the FCC approval of the change in ownership 'an unusual move'? Aren't radio stations bought and sold frequently? Second, did ICBC use strong-arm tactics to gain acquisition of WOWO? Doesn't WOWO's ownership have its own good reasons for selling to ICBC?

"I've listened to WOWO for many years. Its signal is always loud and clear here in the wilds of central Michigan, and I will miss its evening and early morning broadcasts. However, I certainly respect WOWO's owners' right to sell the station to whomever it wants and for whatever reasons it has. Your report implies that the station was somehow forced to be sold to ICBC, which is untrue."

Your objective view is to be commended, Tom; some of us have a more emotional and nostalgic reaction to the sacrifice of a long-standing, clear channel station that covered a good portion of the United Station and Canada just in order to allow a regional music station to broadcast at night. But you're right: That's business.

The Super Skyrider Rolls Royce

■ Derick Ovenall N3EGR of Wilmington, Delaware, really enjoyed the November "Radio Reflections" by Linton Robertson on the Hallicrafters Super Skyrider SX-28. "I have

(Continued on page 114)

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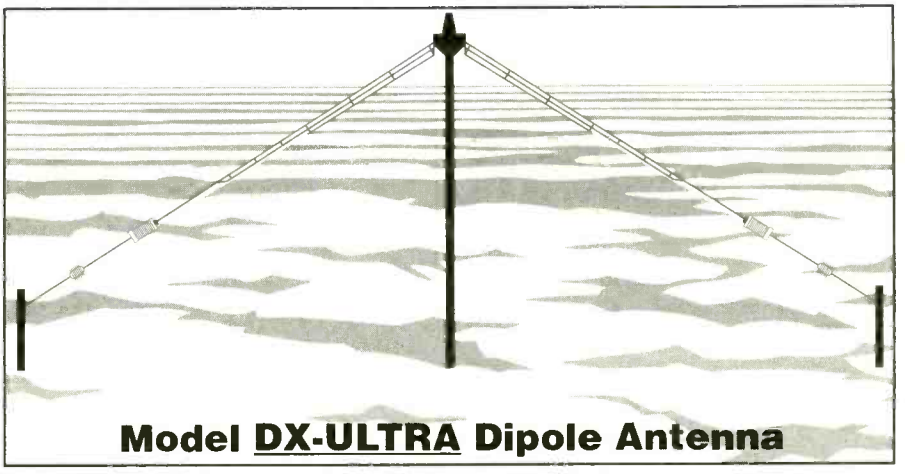

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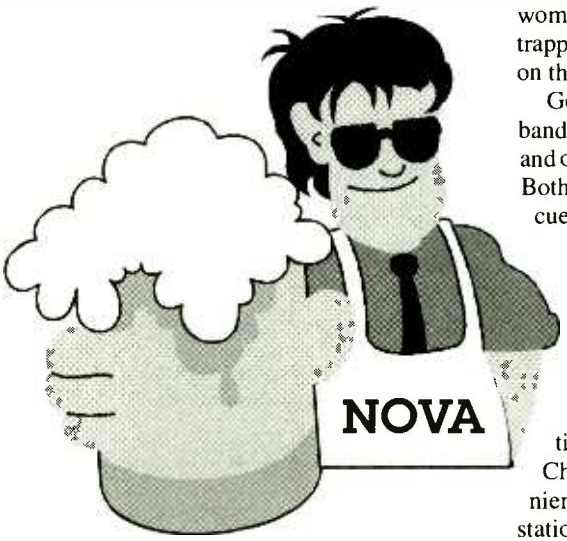
Let's Talk About Sex

■ She's 20-years old, a former honors high school student and every parent's dream. Somewhere between graduation and the real world, however, Tabatha Cash of Paris, France, sashayed into the world of X-rated films.

After doing her time as a porn star, she found a new career—on the airwaves, advising young people about sex on France's Skyrock Radio. The 7-10pm program has been described as "frank" by some, "raunchy" by others.

Cash's show airs opposite another sex-oriented talk show called "Lovin' Fun" on Fun Radio. The two shows have drawn the attention of government censors, but listener support is strong. "Nowadays, listeners are interested in talking about sex over the air," said Cash.

Apparently so, "Lovin' Fun" is rated Number One among Paris radio shows, with an estimated listenership of 1.3 million.



Tastes Great, Less Filling

■ Nova, the private TV channel of the Czech Republic, has been fined the equivalent of $33,000 by the Council for Radio and TV Broadcasting for airing advertisements for alcohol. The ads are in direct violation of Nova's licensing agreement, which specifically bans alcohol-related advertising. Meanwhile, the CTK news agency in Prague "tried to take a survey of people's reaction to the fine," but "in the early evening did not find anyone sober enough to comment."

The "On-the-Go" Phone

■ US West Cellular has apparently broken new ground with its "cell phone in a box." The company recently unveiled "Talk Along," a $29.95 phone kit that can be purchased off the shelf at retail stores. Instead of choosing from complicated calling plans and signing year-long contracts, buyers complete a simplified agreement form and call an 800 number to activate service. Service charges are a mere $19.95 a month plus 39 cents a minute for calls.

You'd Better Answer It

■ Firefighter Eric Williams had the Hurst Tool—the Jaws of Life—in place, ready to pry apart the roof of the overturned car and free the woman and child trapped inside. Power was applied and the car lifted six inches before the woman shouted out to rescuers, "Stop! Stop!"

Williams immediately shut down the Hurst Tool and asked the woman what the problem was. "My phone is ringing," she said. She wasn't kidding. It was her husband and he wanted to know where she was. "Here's this woman, hanging upside down, with a kid trapped in the car with her...and she's talking on the cell phone."

Gee, what exactly do you tell your husband? "I'm a little tied up right now, honey and oh, by the way, dinner might be a bit late." Both mother and son were successfully rescued and treated.

Battle of the WAWAs

■ The battle lines were clear—sort of. Wawa, the owner of 500 convenience stores in the northeastern United States, took on 2500 watt WAWA, an AM station operating on 1590 kHz out of blighted Chester, Pennsylvania. Wawa, the convenience store chain, claims that WAWA, the station, has violated state and federal trademark laws with its call letters.

To make matters even murkier, the station is actually located less than a mile from the town of Wawa, from which the convenience store chain got its name. The town, it is reported, took the name from the Indians who first inhabited the area. According to legend, Wawa (the Indian word) means "Wild Geese."

According to WAWA (the station) president Lloyd Roach, WAWA's (the convenience store) lawyer "told my lawyer that if we didn't change our call letters immediately, they would shut us down..."

Roach said that he tried, offering WOWO, WOWA, WAWO, and even WYWY. "Nope," said Roach. "They don't want anything that even closely resembles WAWA."

WAWA, the radio station, was previously called WCZN. Before that, the author worked at the station as program director when it was WQIQ and as news director when it was WEEZ. Lloyd Roach was Sales Manager of WIFI in Philadelphia when the author worked there during the 1970s. Small world. Confusing, too.

Call 911

■ Albany, New York's newly inaugurated 911 system has been getting from seven to thirteen non-emergency calls a day, said Sgt. Paul Hulslander. Some are beginning to wonder about the people who make them.

"A woman called 911 to get basic phone service to get her phone reconnected. She wanted us to call NYNEX for her. We told her that 911 is only for emergencies but she kept calling back and tying up the line."

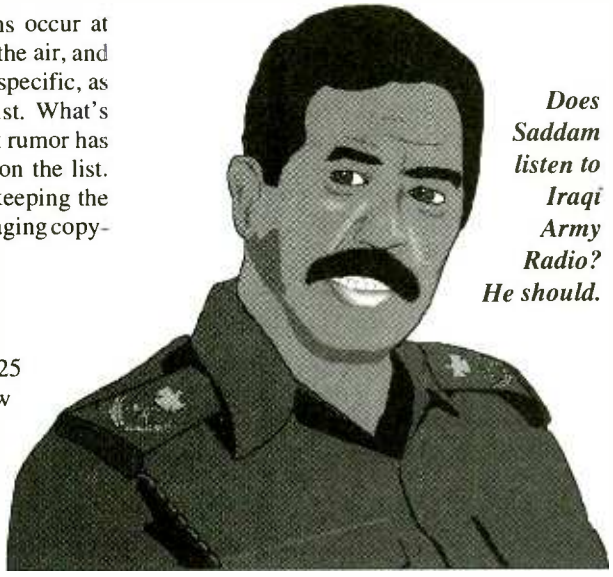
When a member of Oprah Winfrey's studio audience suffered a heart attack on the air, the talk show host asked for someone to call 911. Unfortunately, the show is taped a week in advance in Chicago. When it aired in Albany—you guessed it—the city's 911 operators bore the brunt.

Even hang-ups cause problems, since a patrol is automatically dispatched, just in case. "We always have two-man responses because it's unknown," says Sgt. Paul Hulslander. "We do it for the safety of the officers and of those who could be in a real emergency ... we don't know and we have an obligation to respond."

Transmitter Theives

■ A series of highly organized thefts of transmitter equipment have Long Island

authorities puzzled. The break-ins occur at radio transmitter sites that are on the air, and the parts taken appear to be quite specific, as if the thieves have a shopping list. What's going on here? No one is sure, but rumor has it that FAA tower sites are next on the list. Police and station managers are keeping the thefts quiet in the hopes of discouraging copy-cat occurrences.



Does Saddam listen to Iraqi Army Radio? He should.

Radio Grab

■ Yes, the Voice of America's 625 acre Bethany relay station is now history. And sure, the VOA is sad about it all. "It's never easy to make cuts because peole's livelihoods are at stake," said Joe O'Connell, VOA's director of public affairs.

That doesn't mean that the government is letting any moss grow under its feet, though. The shut-down was immediately followed by a press release announcing that the whole facility was up for grabs.

First dibs go to other federal agencies. If they don't want it, then it's offered for use by health and educational facilities, parks and recreation, correctional facilities and the homeless. Surplus properties not disposed of through transfer to public agencies or institutions, are offered for sale on a competitive basis.

Want more information? Call the General Service Administration at 617-565-5700. Tell them that *MT* sent you.

This is a Test

■ Federal regulators have announced a new emergency broadcast system for radio, TV and cable television to replace the forty year old system now being used. The new system will provide vital information on tornadoes, floods, hurricanes, chemical spills and other emergencies, as well as incorporating special features to assist the visually and hearing impaired. Stations will have the ability to issue warnings in several different languages and to send out, as well as receive, alert information.

Called EAS, for Emergency Alert System, the equipment will be automated and will eliminate the weekly 25-second binary tones. Instead, an eight second tone will be used and tested once per month. The FCC will require most, if not all, of the 11,000 cable systems in operation to install the new emergency system by 1996 or 1997.

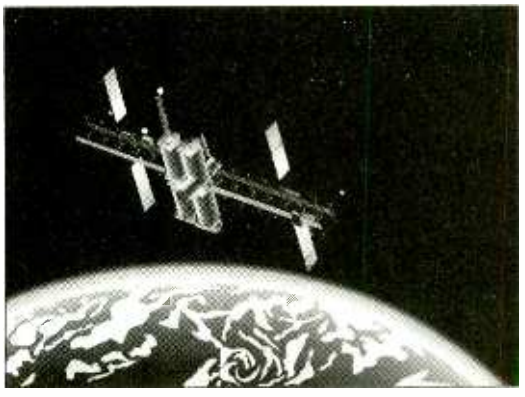
Message from Abdul

■ Iraqi Army Radio—an anti-Saddam Hussein station heard occasionally throughout the region—calls out to the "sons of the brave Iraqi army." Each broadcast includes Koran recitations and commentary on the sad conditions and humiliations suffered by Iraqi troops in the field. Soldiers are kept up to date on the latest purges within Saddam's military and intelligence organizations.

A special "Messages and Codes" segment devotes time to such messages as "from Abu Adil to Mahdi. The engagement is completed. Await the letter." Apparently, the phones weren't working that day. Another message from Abu Rabi advised that "Ma'dhun harms the sheep." Baaaaa?

Hamming it Up

■ Cosmonauts on the Russian space station Mir were ordered to conserve electricity recently due to an unexpected battery drain. A piece of electrical equipment self-activated, discharging four of Mir's six solar batteries and forcing partial shutdown of the station. It will be mid-1995 before new batteries can be delivered to the Russian space station.



The problem caused German Astronaut Ulf Merbold, DP2MIR, who was aboard Mir, to reduce his amateur radio activity. The power supply problem caused the high flying ham to miss a few 2-meter contacts over Europe.

***"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; J. R. Berry, Columbus, OH; Scott Glicker, Tamarac, FL; Les Mattson, Idyllic, NJ; Dr. Ivan Mesmer, Croton-On-Hudsom, NY; Ricardo Molinar, NJ; Gary Porter, Ruthven, ON; Ed Roberts, Hilderbrandt, ND; Doug Rogers, Wantage, NJ; Eric Sanford, Wasilla, AK; John Shafer, Suisan City, CA; Richard Sklar, Seattle, WA; Dick Sharp, Oklahoma City, OK and Phil Yasson, Vancouver, WA. We also consulted the following publications and we list their names in appreciation: National Scanning, Radio World, BBC World Broadcast Information, and W5YI Report.*

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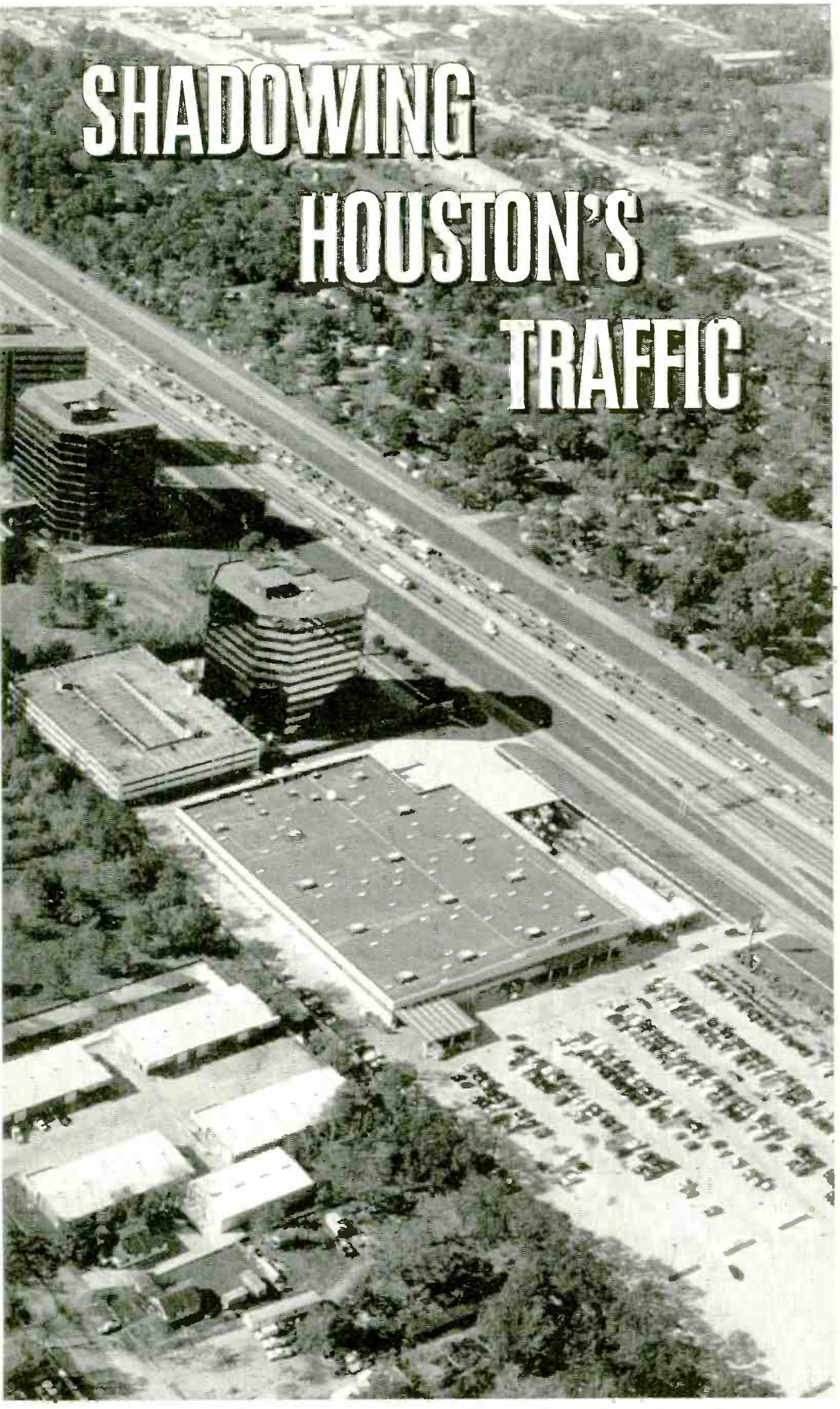
SHADOWING HOUSTON'S TRAFFIC



A traffic reporter's airborne view of an accident with traffic starting to back up.

Reporting traffic conditions in Houston may not sound like a high-stress occupation, but...

Story and photos by Haskell Moore, KB5WIX

It's Monday morning, 5:00 am in Houston, Texas, and the majority of Houstonians are still sound asleep. Light rain showers are forecast for the morning and patchy fog lingers throughout the Houston area. Already an eighteen-wheeler full of fuel has jackknifed on the city's East side and a four-car pileup on the Southwest freeway has caused traffic to be diverted to the access road. Shadow Broadcast Services producer Lyndon Joslin settles down in front of his computer, the primary link to eighteen affiliate stations, and gets ready for what promises to be a long morning.

Most folks probably dream of doing something less stressful when they retire; fishing, refinishing furniture and playing with the grandchildren. Lyndon is probably no different than anyone else, longing for the days of a less stressful existence. Something like air traffic controller at LAX, working the bomb squad in Northern Ireland, or perhaps fighting oil well fires in the desert. One thing's for certain—he'd have to look long and hard to find a job more demanding!

Two scanners, a two-way radio, a telephone that rings incessantly, and even a closed circuit television camera atop their office building provide a steady flow of data, all making its way to the producer. His job is to assimilate this tidal wave of disjointed data and condense it down to one screen of meaningful information. This information is then

Producer Lyndon Joslin and KTRH anchor Garth Maien (foreground) doing the morning traffic.

sent to all eighteen affiliate radio and TV stations via modem at a rate of once every two minutes.

So where does all this information come from and how does it get out to the stations so quickly? To find out, let's take a look at what goes on behind the scenes of a traffic reporting operation in one of the nation's largest metropolitan regions.

Shadow Broadcast Services maintains offices at eight metropolitan areas around the nation. At the Houston office is an impressive variety of high-tech tools that feed information from various sources directly to their studio. However, Shadow's chief source of information is the mobile traffic reporters. It's the reporter's job to get to the scene as soon as possible and give a first-hand account of the delay, along with an estimate of when traffic should again be flowing.

The number of reporters varies throughout the day, but there are typically four that patrol the freeways by car and two who travel in aircraft. Needless to say, getting around Houston's eighteen hundred square miles is a lot quicker at 130 miles per hour. When the cloud ceiling is above 1,200 feet, the two airborne reporters each travel in a Cessna 172. When the ceiling is lower than 1,200 feet, the Cessnas cannot fly due to FAA regulations, and two Bell Jet Ranger helicopters are used instead.

When a major problem does occur, the traffic reporters will often suggest alternate routes. Information regarding the viability of the alternates is usually verified by one of the aircraft to ensure that the alternate is not already backed up from others fleeing the original problem. Armed with this information, motorists can then decide if they want to take alternate routes around the delay or just sit it out.

In addition to dispatching reporters to where accidents have occurred, reporters are sent to areas where conditions are ripe for problems to develop. Since Houston is so large, there can be a violent storm on one side and clear weather on the other. Shadow closely monitors changing weather conditions with a NOAA weather receiver and a Doppler radar satellite downlink directly to the studio. Then, when inclement weather moves into the area, reporters can already be in place to keep track of the traffic.

The reporters in the field stay in touch with the studio via conventional UHF radios through a repeater. The producer uses the two-way to obtain driving conditions from the field and to dispatch reporters to any situations that he may become aware of from another source. Many of the reporters also carry scanners so they can quickly start moving toward a scene as soon as they hear emergency services being dispatched.

Reports from the field may be transmitted back to the Shadow studio by one of two different types of radios. For those affiliate stations who prefer a higher quality audio report from the field (usually from the airborne reporters), Marti FM wide-band transmitters are used. Other affiliates may prefer the sound of the standard FM narrow-band radios because of the perceived sense of realism. The reports from the field are recorded on tape cartridge, then transmitted to selected affiliate stations via phone line.

For local radio station KTRH, live broadcasts are periodically produced at the Shadow studio. The link from Shadow to KTRH is accomplished via a wideband (eight kilohertz) dedicated phone line, so voice audio quality is remarkably good. As the announcer at Shadow makes his report, he can listen to the producer at the affiliate station in his headphones over a conventional phone line referred to as a "haulback."

Traffic reporting has been typically geared to radio, for obvious reasons. However, many television stations have discovered that viewers may want to check the traffic situation before venturing out, and now include traffic reports as part of the news. To fill this need, Shadow provides traffic information with computer generated graphics to local television stations. Since Shadow already has the traffic details available, it's just a matter of updating a graphic depiction map of Houston on an Amiga computer. The images are then transmitted to the TV stations via microwave link.

Scanners/CB/Ham/Shortwave

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Frequency Coverage: 29.000 - 54.000, 118.000-174.00, 406.000-512.000, 806.000 - 823.9875, 849.0125 - 868.9875, 894.0125 - 956.0000 MHz.

Recently, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz. cellular telephone service. The Electronics Communications Privacy Act prohibits the intentional interception of cellular telephone transmissions. Supplies of scanners that are capable of being easily modified to receive full 800 MHz. coverage such as the Bearcat 200XLT are in *critically* short supply. Today could be your last chance to buy your Bearcat 200XLT scanner. Signal intelligence experts, public safety agencies and people with inquiring minds that want to know, depend on the Bearcat 200XLT *handheld* scanner to intercept just about any radio transmission. You can also program frequencies such as police, fire, emergency, race cars, marine, weather, and other broadcasts into 10 banks of 20 channels each.

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Uniden GRANTXL-K SSB CB Mobile $139.95
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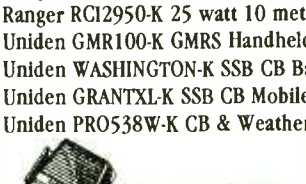

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The Weather Monitor II (7440-K) comes complete with anemometer with 40 feet of cable, external temperature sensor with 25 feet of cable, junction box with 8 feet of cable, AC-power adapter, detailed instruction booklet and one year limited factory warranty.

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The highway 59 and 610 interchange is not your average traffic cloverleaf, and accidents are frequent occurrences here.

Keeping Texas on the Move

In the early eighties, Houston was experiencing one of the largest growth spurts ever. With the oil industry booming in Texas and the auto industry on the decline up North, the population was growing by leaps and bounds. Too many cars on a freeway system already at near-capacity created unprecedented traffic jams. Realizing that something had to be done soon, the Texas Department of Transportation began a program of accelerated freeway renovation. However, it has only been in recent years that the really high-tech hardware came on the scene.

In order to help alleviate the congestions, the Texas Department of Transportation (DOT) established the Traffic Management Center. Under the direction of Mr. Carlton Allen, the latest in traffic monitoring and flow control technology is being implemented.

At the Operations Center, data is gathered with fifty-three high-resolution closed-circuit cameras placed at strategic locations along Houston's busiest freeways. From the Center, the operators can control the pan, tilt, and zoom of each camera. The signal is transmitted from the cameras to the Center via fiber optics, and the resolution of the picture is nothing less than incredible. To demonstrate, Mr. Allen zoomed in on a distant street sign with lettering approximately 3" high. Even from its lofty perch high above the freeway, the name of the street was easily discernible. With the help of the cameras, the operators can quickly pinpoint problems along the freeway system and the appropriate emergency services can be dispatched in a matter of minutes.

Houston's traffic woes are by no means limited to the freeways. At the Astrodome, events like football games, rodeos or concerts may draw a crowd of over 60,000. For such events, Metro buses using the "park and ride" concept are often utilized to alleviate the congestion. To ensure that the buses keep moving, an array of ten

The tiny E2 tag transponder expedites traffic through toll booths

closed-circuit cameras monitor traffic around the Astrodome. Coordinators stationed at the Traffic Management Center are then able to guide the buses and other event traffic to and from the dome via the least congested route.

For those motorists who frequently travel Houston's toll roads, an electronic device called the EZ Tag may be leased to expedite the trip through the toll booth. The EZ Tag is a small transponder, about the size of a pack of cigarettes, only half as thick, which attaches to the windshield. Whenever the motorist drives through a toll gate, the EZ Tag is interrogated automatically and the appropriate account is debited for the toll.

By taking advantage of the EZ Tag transponders, the Texas DOT has implemented another piece of impressive traffic-tracking technology. At 135 freeway locations around Houston, the EZ Tags are interrogated as they drive past a reader, usually mounted on an overhead traffic sign. Computer tracking of the vehicle is begun as it passes the first reader and is updated as it passes subsequent readers. Back at the Center, the average speed for those vehicles with an EZ Tag is computed and graphically depicted on a Houston freeway map. By glancing at the thirty-five inch Mitsubishi monitor, the average speed for a given segment of a freeway can quickly be determined.

The only problem with the system, admitted Mr. Allen, is at off-peak when there is sometimes not enough traffic with EZ Tags to keep the system updated with real-time information. However, with over thirty-eight thousand EZ Tags in use, and more being issued every day, the quality of data from this system should only become better and more reliable.

Another innovative program, a joint effort of the Texas DOT and Metro, is the Motorist Assistance Program (MAP). Nine MAP vans, which are manned by Harris county sheriff's deputies, patrol the freeways from six in the morning until ten at night, five days a week (excluding holidays).

The ultimate objective of the Motorist Assistance Program is to improve mobility and keep traffic flowing on the freeway system by rendering aid to stranded motorists. One duty the officers are not charged with is traffic enforcement. To a motorist stranded on the freeway, this is one time they'll be glad to see flashing lights in the mirror!

Motorists can summon assistance by dialing "CALL MAP" (225-5627) or by placing

Closed circuit TV control console at Texas Dept of Transportation's Traffic Management Center.

a toll-free call (*627) from their cellular phone. The MAP vans are dispatched and report problems back to the Traffic Management Center using the county's 800 MHz trunked system.

Gathering all of this information is great, but how is it disseminated to the motorists trying to get across town? Various media, including Shadow, are allowed to station reporters at the Traffic Management Center during peak traffic periods. There is then a two-way sharing of information between personnel at the Center and the traffic reporters. So in essence, the Traffic Management Center becomes a clearing house for traffic information in the Houston area. The Texas DOT also keeps motorists apprised of traffic conditions with changeable traffic information signs which are updated from the Center via phone line.

■ Scanning Traffic Reporters In Your Area

The list of frequencies in Table 1 should be of interest to those who live in Houston. However, if you live in another region of the country, the following tips should be helpful in finding the traffic reporters in your area.

Traffic reporting is usually done on frequencies allocated for remote media broadcasts. On the VHF band, search between 161.640 and 161.760 MHz. On the UHF band, the repeater output is usually between 450 and 451 MHz. The input frequency to the repeater is five megahertz up, between 455 and 456 MHz. Also, it is not unusual for simplex transmissions to be conducted on the repeater input frequencies, especially remote-to-base traffic reports used to feed the affiliate stations.

As you search these frequency ranges for activity, you may find a lot more than just traffic reports. There is usually an abundance of interesting activity here if you live in an area where radio or television broadcasts originate. I strongly suggest you locate and log the frequencies for future use. Then, in the event of a disaster in your area, you will have the unedited news long before it reaches the general public.

Though broadcast services such as Shadow are usually better equipped to provide quality traffic information, some radio and television stations prefer to do their own traffic reporting and production. Often the larger stations which already have aircraft for their news services may opt to customize the traffic reports for their own format. Again, look for these services in the same frequency ranges.

When listening to the various traffic reporting agencies, you'll usually hear more than just mobile reporters posting traffic conditions. Often you will hear the studio feeds as a mobile reporter broadcasts overall traffic conditions for the region. So by monitoring these reports with your scanner, you'll have crucial traffic information long before it reaches the general public!

TABLE 1

Houston Traffic Reporting Frequencies:

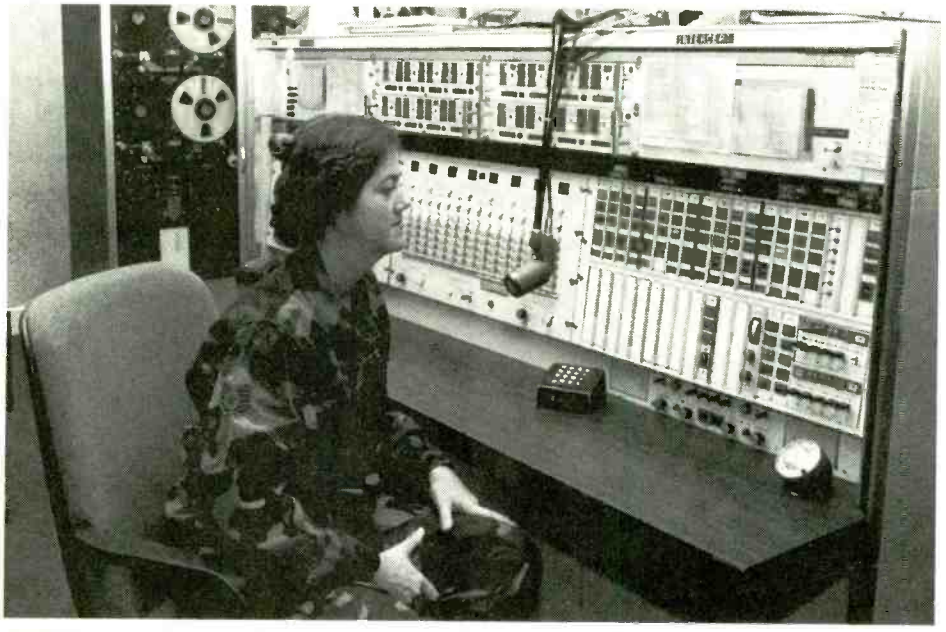
Marti FM Wideband	450.675
Metro Traffic	450.550
Radio Station KIKK	450.4125
Radio Station KKBQ	161.730
Radio Station KKHT	450.2125
Radio Station KRBE	450.3125
Radio Station KZFX	450.1875
Shadow Broadcast Services	450.4875

How MacDill GHFS Station Achieves . . .

The Global Touch

Story and photos by John T. Ward

When Iraqi president Saddam Hussein recently threatened the tiny nation of Kuwait, U.S. Air Force transports loaded with troops and equipment began making the long flights from bases here and in Europe to the Persian Gulf. Reliable communications are critical when making such long overseas flights. Aircrews around the world count on the USAF's Global High Frequency System to provide the secure, dependable communications they need to complete their tactical missions and to ensure the safety of the flight.



Staff Sergeant Carolyn Donegan mans the SCOPE Control supervisor's console at the USAF Global High Frequency System station at MacDill Air Force Base in Tampa, Florida. The GHFS allows U.S. and allied aircraft—and occasionally ships and land stations—to communicate worldwide.

Utilizing frequencies from 3 MHz to 30 MHz, GHFS operators at 15 sites in the U.S. and abroad can communicate with aircraft worldwide, relaying information, or in most cases providing direct telephone links to weather stations, command posts and other military facilities.

There are no communications zones or areas of specific responsibility for each station.

"Our standard statement is, we are to provide rapid, reliable communications between DoD aircraft and ground agencies regardless of their locations," said Technical Sergeant Raymond Allen, the training noncommissioned officer at the GHFS site at MacDill Air Force Base in Tampa, Florida.

"We just talk worldwide, depending upon propagation," said Technical Sergeant Bryan Howell, the NCO in charge of the station.

For the novice HF utility listener wanting to monitor the GHFS, the frequency of 11.175 MHz is a good place to start. All but two of the GHFS sites monitor 11.175 MHz, so it's one of the busiest frequencies.

Airborne VIPs, Freight Haulers, and Hurricane Hunters

In addition to having a GHFS station, MacDill is also a Mystic Star communications system remote site. Operators at Andrews Air Force Base, just outside Washington, D.C., can remotely control some of the base's receivers and transmitters. The Mystic Star network is used by the president and vice-president aboard Air Force 1 and Air Force 2, as well as by other cabinet-level officials and high-ranking military commanders.

Although most tactical information is handled by encrypted satellite transmissions, there's still plenty to listen to on the GHFS and Mystic Star networks. Several days after the peaceful invasion of Haiti by U.S. troops, Gen. John Shalikashvili, chairman of the Joint Chiefs of Staff, was heard discussing strategy in Haiti with a member of the White House staff while Shalikashvili was flying back to Washington D.C. after visiting the island.

The GHFS network control hub is at Offutt Air Force Base in Nebraska, while Andrews AFB in Maryland, and McClellan AFB in California, serve as alternate hubs. Other GHFS sites include Albrook Air Base, Panama; Hickam Air Force Base, Hawaii; Andersen AFB, Guam; Ascension (Island) Aux. Air Field; Croughton Royal Air Force Base, England; Elmendorf AFB, Alaska; Incirlik Air Base, Turkey; Lajes Field, Azores; Thule Air Base, Greenland; Yokota Air Base, Japan; and, of course, MacDill. A part-time GHFS site is located at Bayonne, New Jersey.

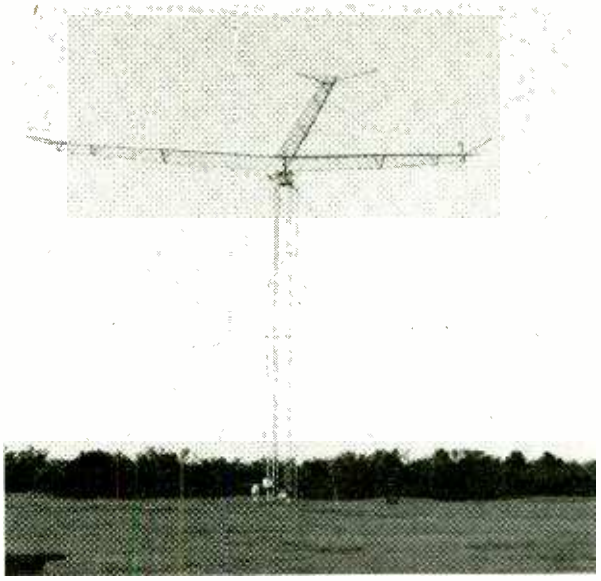
The GHFS was formed in 1992 when the USAF Global Command and Control network was merged with the Strategic Air Command's "Giant Talk" system. Any U.S. military and certain other government aircraft, as well as the aircraft from allied nations, may use the GHFS, primarily to request phone patches with ground facilities.

The aircraft heard most often on the GHFS belong to the Air Mobility Command (AMC). The AMC is the successor to the Military Airlift Command. The AMC is the military's airline, freight hauler and air ambulance service, plus it operates KC-135 and KC-10 tankers—filling stations in the sky, so to speak.

Most AMC aircraft use "REACH" callsigns, followed by either five numerals, or three numerals and two letters, depending upon their mission. Typical communications include arrival times and destinations, weather reports and cargo manifests.

The National Oceanic and Atmospheric Administration with its weather research aircraft, as well as the Air Force Reserve's "hurricane hunter" C-130s, make frequent use of the GHFS, said Sgt. Allen. NOAA now bases its two P-3 aircraft and several smaller aircraft at MacDill.

"We were one of their first orders of business when they came on the base. They came over and asked what we can do for



A Defense Communications System antenna sits just outside of the GHFS station at MacDill. The two systems are not related, although both use HF.

Using a SCOPE Pattern console Staff Sergeant Johnny Davis sets up a phone patch between an aircraft and a ground station. A SCOPE Pattern coordinator's console is on Davis' left.

them. Because they do fly into these storms you might want to track an aircraft like that a little more than the average, so we worked up a thing where we can take a report from them every hour. We have a good relationship with NOAA and we're glad we're here for them on the system. The more the merrier," said Sgt. Howell.

In 1993 MacDill did a live phone patch with ABC's Ted Koppel and the commander of an Air Force hurricane recon aircraft as it was exiting the eye of Hurricane Emily.

"Thank goodness we did keep a good, readable, loud and clear frequency that was good enough for them to go on the air with it," he said.

■ *Other System Users*

While not heard quite as often as the "Reach" aircraft, U.S. Navy aircraft frequently use the system, and even Coast Guard and U.S. Customs Service aircraft do occasionally pop up on the GHFS frequencies.

MacDill processes few messages for foreign aircraft.

"We can't turn down traffic if they have an official use for the system. In the GCCS system we had a lot—Israeli, Egyptian, Pakistani, Colombian, Panamanian, and the RAF. We're still providing to our allies, but I've only heard the RAF on the system recently," said Sgt. Allen.

Occasionally you'll even hear non-aircraft communications on the GHFS. U.S. Army ships in Haiti have been heard recently using 6.739 MHz to communicate with their headquarters here in the U.S. Typical messages include personnel scheduling, maintenance requests, and in one case, a request for "a big box of sports magazines."

■ *Monitoring GHFS Communications*

It doesn't take a lot of sophisticated equipment to monitor the GHFS. Digital tuning is a must, as is sideband capability. But even an inexpensive portable like the Sangean 803 that sells for under $200 will fill the bill.

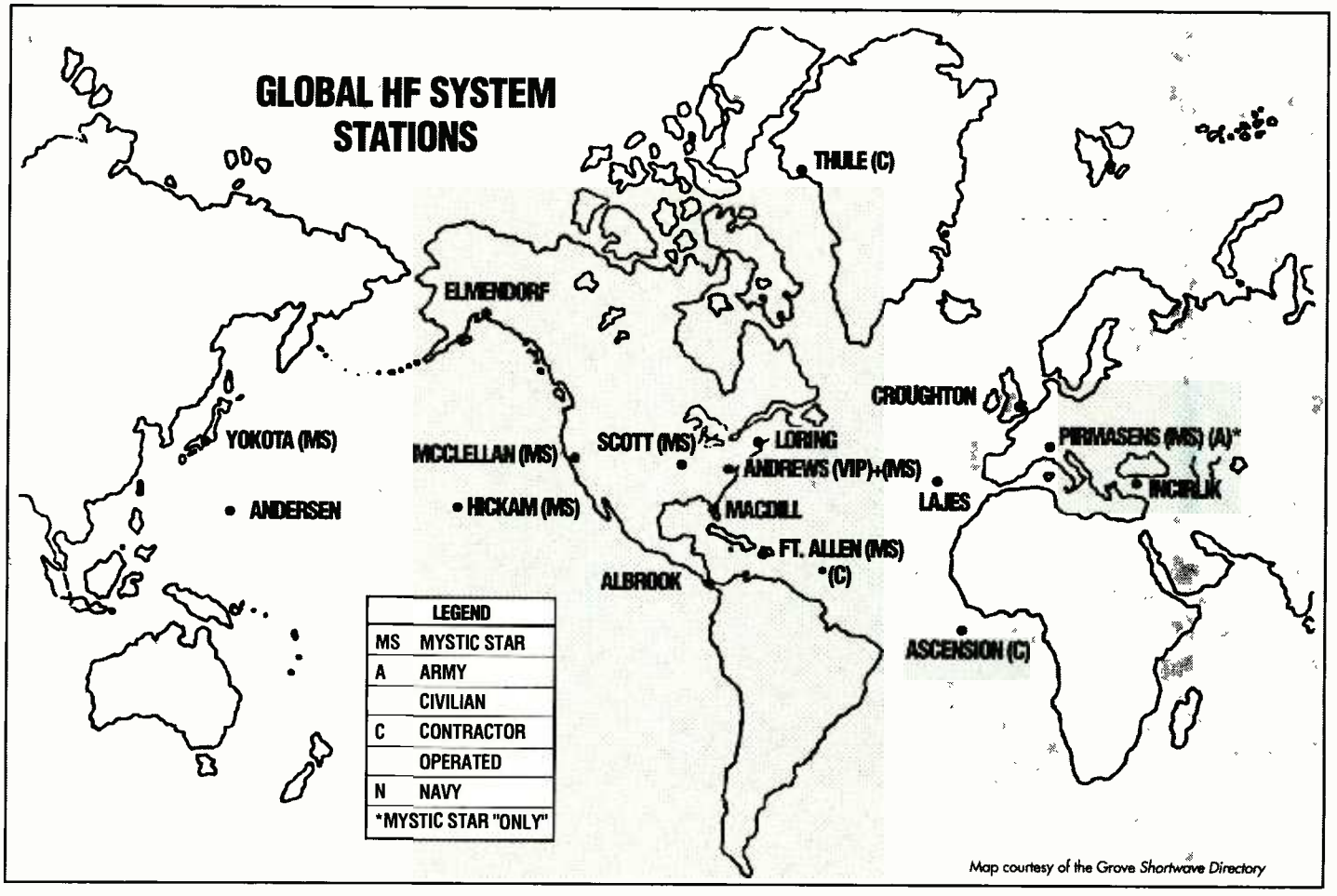
Using a Radio Shack DX-390 with just the built-in whip, I've listened to the operators at the GHFS site at Ascension Island off the coast of Africa talking to B-1 bombers over a Utah test range, and the bombers talking to their squadron command post in Louisiana via a phone patch through Hawaii. An outside antenna, even if it's just a simple length of wire, will help pull in some of the weaker signals.

Painted the same beige and brown as most of the other buildings on base, the single-story building that houses the GHFS control room at MacDill Air Force Base is particularly unassuming. But the giant receiving antennae just outside are a clue that this isn't just another office building.

The station uses an omni-directional mono-cone antenna as its primary receiving antenna. The operators can also select an electronically-switchable 90-foot-high log periodic rosette for more directional gain. A rotatable log periodic located several miles away in a remote area of the base handles the transmit chores.

Inside, the offices are spotless, and even the floor in the maintenance room shines with a fresh coat of wax.

Twenty operators and technicians are assigned to the unit, which is part of the Sixth Communications Squadron, Sixth Air Base Wing, Ninth Air Force. MacDill is one of the few sites to have both the older SCOPE Pattern consoles as well as a newer SCOPE Control console.

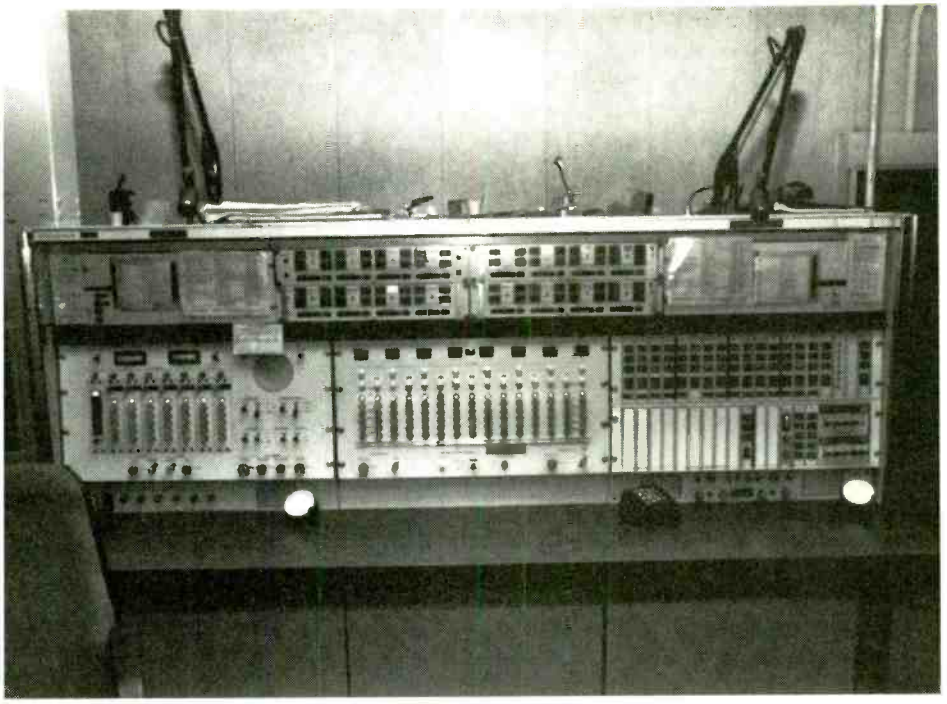


The four SCOPE Pattern consoles are fixed frequency consoles. Two operators are always on duty, each monitoring two of the base's published HF frequencies. A third operator/supervisor mans the SCOPE Control console. Should an aircraft need more than routine assistance—say for a particularly long phone patch—then the supervisor handles the call on one of about 30 discrete frequencies. The SCOPE Control console also controls the encrypted RTTY receivers.

MacDill currently uses Rockwell/Collins 28U10 10,000-watt transmitters with Rockwell/Collins receivers. Most of the hardware was built in 1969.

"SCOPE stands for System Capable of Programmed Expansion. 'Pattern' is the type of console they came out with. Then they moved to SCOPE 'Control,' then 'Signal 3' came up, built up the system, and now they're going to a new system, which is called SCOPE 'Command.' That's what's in the works. SCOPE 'Signal 3' is the highest of the technology used right now," said Sgt. Allen.

SCOPE Pattern and Control consoles are analog, while SCOPE Signal 3 uses some digital technology.



A SCOPE Control console. Most of the hardware in use at MacDill's GHFS station was built in 1969. From this console an operator/supervisor can communicate on about 30 discrete frequencies, plus control the station's RTTY receivers.

"They have a thing called the 'turret' where the operator sits and everything is run out of the turret. They have the capability to patch up to 24 telephone lines together at one time.

Sgt. Allen explained that the SCOPE Signal 3 console is designed to internally link different sites and maintains constant accessibility since it can override any level in the system.

"In other words, I could talk to you instantaneously," he said.

Radio Activity

A recent three-month-long utilization survey found that MacDill is one of the busiest GHFS sites, logging more than 2,000 contacts per month, Sgt. Howell said.

While there are nine published GHFS frequencies, MacDill's operators normally monitor four frequencies. They have the capability of monitoring up to ten, he said.

The frequencies normally used at MacDill during the daytime are 8.992 MHz, 11.175 MHz, 15.016 MHz, and one non-published frequency—11.244 MHz. At night 6.739 MHz is also used.

Other GHFS sites monitor 4.724 MHz, 6.750 MHz, 8.968 MHz, 13.200 MHz and 17.976 MHz. (Note: If you find the frequencies quoted in this article don't quite match previously published lists, it is because widespread changes in military HF allocations went into effect a few days before Christmas. For more on that story, see this month's "Utility World.")

While the system is built on the use of HF, some GHFS stations, including MacDill, have UHF line-of-sight capability out to about 200 miles. MacDill's UHF frequency is 292.1 MHz.

Here in central Florida, MacDill GHFS can be monitored thanks to its surface wave. But signals from Albrook, Ascension, and Andrews typically come in much stronger after bouncing off the ionosphere.

"The aircraft can either call us by the geographical callsign of MacDill, or they can call the general call sign of any Global station which is "Mainsail," Sgt. Howell said.

Any station can answer the Mainsail call, he said.

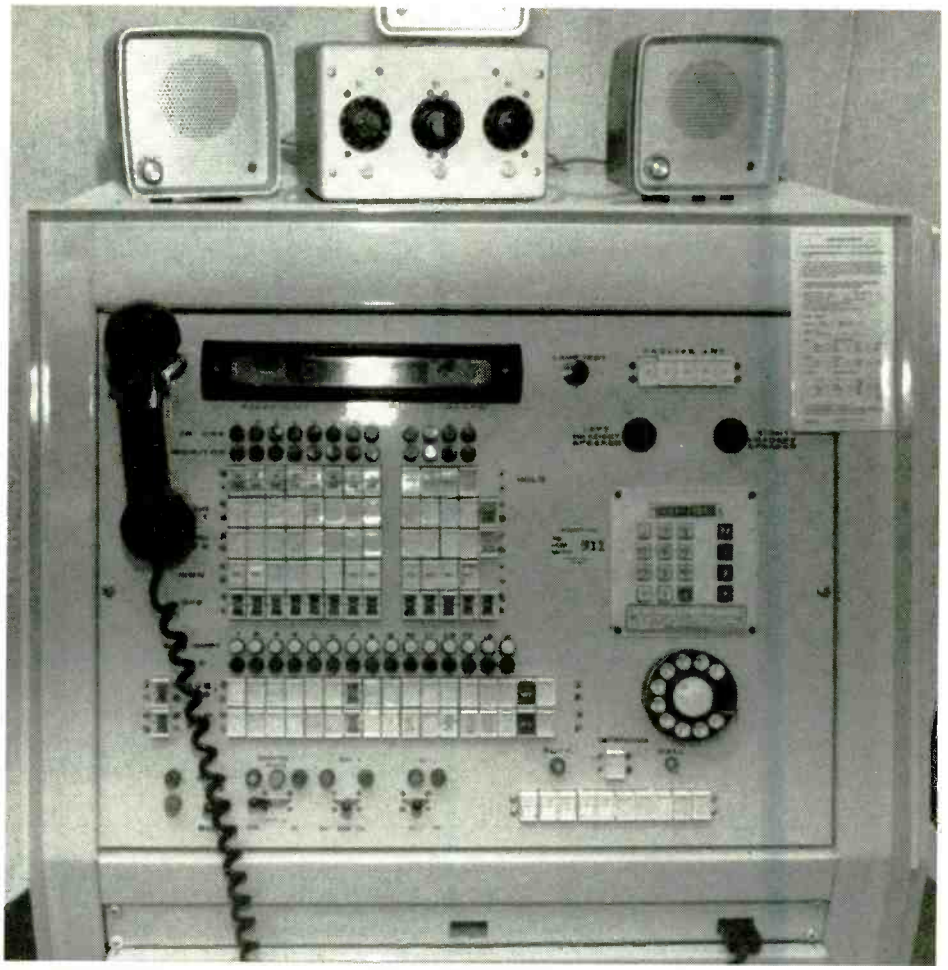
"In the military we have certain things that go by precedence so that we can knock one another, because of urgency. Routine is your lowest. It goes to Priority, then Immediate, then Flash and Flash Override," Sgt. Allen said.

"We run everything out of here as Immediate unless we're told otherwise," he said. "We don't process morale phone patches on a usual basis."

MacDill does respond to QSL reports, although they don't have a prepared card.

"We get post cards and letters from all over the world, so we have that interaction with those folks. If we confirm the reports, we're glad to respond. We appreciate the interest," Sgt. Howell said.

To file a reception report for the MacDill GHFS station, write to: NCOIC, 6th Comm. Squadron/SCSRO, 8004 Cypress Stand Street, MacDill AFB, Tampa, Fl, 33621-1454.



MacDill GHFS operators use two of these SCOPE Pattern consoles, plus two coordinators' consoles, to handle more than 2,000 messages a month. Each operators' console can control either directional or omni-directional antennae, plus five receiver/transmitter pairs and up to 15 telephone lines.

AR 8000

The New Concept - AR8000 shocks the market. AOR made every effort to incorporate the latest technology in to this new scanner.

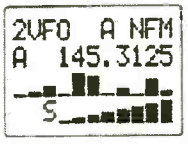
• SPECIFICATIONS •

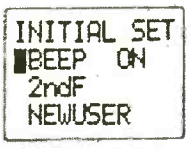
- **Range:** .5 - 1900MHz usable to 100kHz
- **Modes:** AM/NFM/WFM/USB/LSB/CW
- **Stepsize:** 50Mz to 999.995kHz
- **Sensitivity(μV):** 30 to 1000MHz
  SSB .2 **AM** 1.0 **NFM** .35 **WFM** 1.0
- **Filters:** (kHz) **SSB** 4 **AM/NFM** 12
  WFM 180
- **Memories:** 50 ch. x 20 banks=1000 total
- **Size/Wt.:** 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*



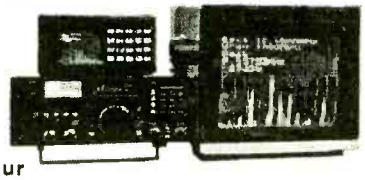


The Latest From AOR Products

Available at a Dealer Near You!

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.

AOR

Electronic Distributors Co.
325 Mill Street, N.E.
Vienna, VA. 22180
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Radio—A Force for Unity in BOTSWANA

ZNB, Botswana's first broadcaster, was owned by Bechuanaland Police and used for government communications. Today, ZND broadcasts on four 100 kW transmitters with additional FM and medium wave facilities.

By Colin Miller

Who are considered to be the first inhabitants of Southern Africa? No, not the Black races, but the semi-nomadic Bushmen. These people live in small groups in the Kalahari Desert, a large area of the country of Botswana.

Botswana is located in Southern Africa. It has an area of 220,000 square miles, somewhat smaller than Texas. Its population of 1.4 million consists mainly of the Tswanas (71%), of which there are eight main tribes. The rest consists of minority Bantu people, as well as Bushmen and Europeans. Some 80% of the population is confined to the eastern border with South Africa, in the catchment area of the Limpopo River. Here there is usually sufficient rainfall for good pasture and agriculture. The only railroad line links South Africa with Zimbabwe.

The Kalahari Desert, supporting 35,000 nomadic Bushmen as well as wildlife, spreads over the southwest. The Bushmen speak more than 40 languages and dialects. There are swamplands and farming areas in the north, and rolling plains in the east, where livestock are grazed. However, drought and famine are commonplace.

First inhabited by Bushmen, then by Africans, the region became the British Bechuanaland Protectorate in 1886, halting the encroachment by the Boers and Germans from the south and southwest. Bechuanaland became fully independent on 30 September 1966, changing its name to Botswana. Cattle raising is the chief economic activity. Many workers have become migrant laborers on the gold mines in South Africa, and much of Botswana's export meat is destined for that country. Botswana has one of Africa's most stable governments, and is working hard to lessen dependence on South Africa for trade and employment.

Bechuanaland had the distinction of being administered from outside its own borders, from the former South African town of Mafeking—now part of Bophuthatswana and renamed Mafikeng—located a few miles across the southern border. The town was originally a kraal (an African village surrounded by a stockade) of the Baralong tribe, who gave it the name meaning "among the stones." It

gained world fame through its successful defense under General Sir Robert (later Lord) Baden-Powell in the Anglo-Boer War of 1899-1902. (You may remember Baden-Powell as the founder of the Boy Scouts movement.)

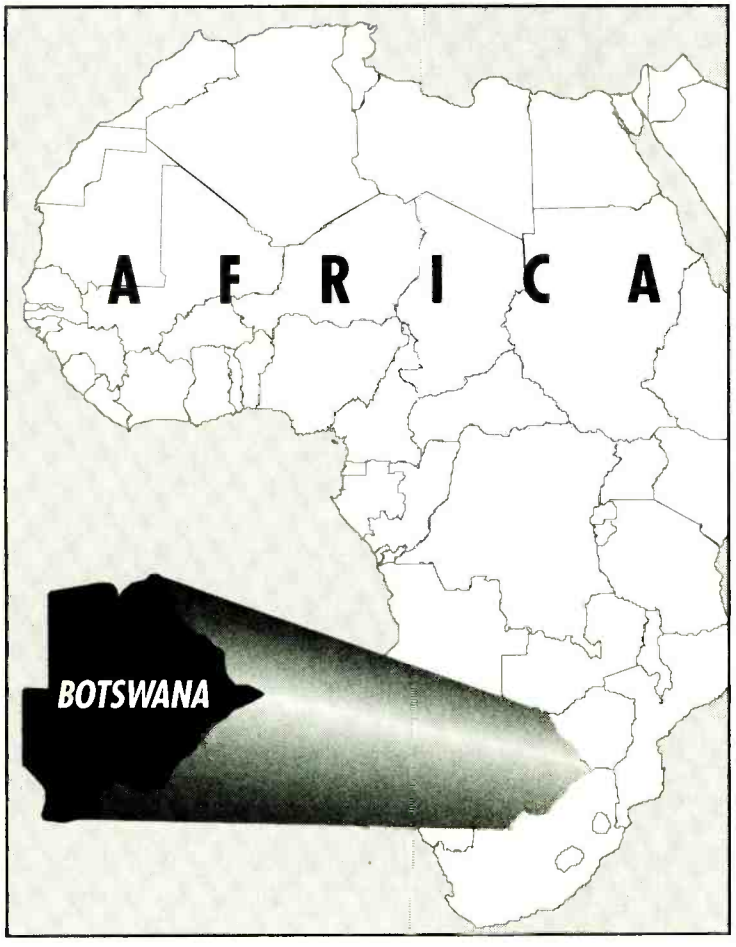
The Accidental Broadcaster

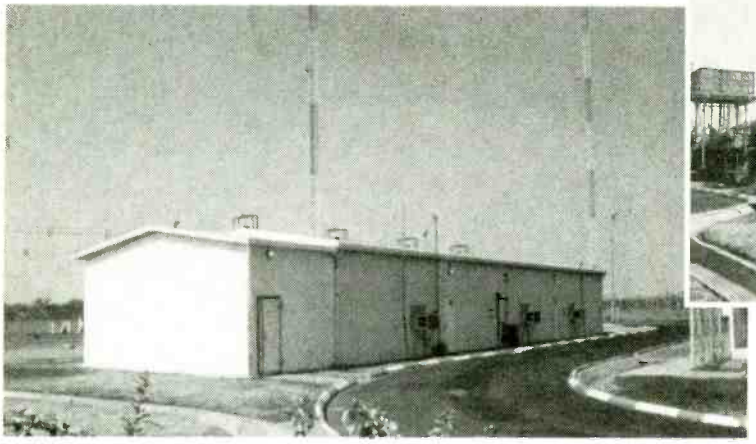
Mafeking was once the site of a small radio station with the call letters ZNB. The transmitter was owned by the Bechuanaland Police and operated from the Imperial Reserve. ZNB was never intended to be a public radio station. It was built purely and simply to provide a means of communication for the Bechuanaland Protectorate Government through the largely telephoneless territory. The engineers who installed the equipment tested the transmission with a few borrowed phonograph records. The records must have hit the right spot, for hundreds of requests from radio listeners as far away as Japan, Norway, and the United States poured in by mail, asking for a fixed series of programs.

A snag came, however, in the form of performing rights for broadcast material, and ZNB temporarily went off the air. There was an immediate howl of protest from many parts of South Africa. Within a matter of weeks the South African Broadcasting Corporation (SABC) offered to assume financial and administrative responsibility for providing programs, and so ZNB was back in business. It broadcast music programs for about an hour at lunch time and three hours during the evening in the 49 meter band with a power of only 1 kW. News was relayed from the SABC twice a day. When the station was not broadcasting, it was used to carry police messages and other traffic.

Officials of the Bechuanaland Protectorate administration cast around for a suitable announcer and tested, among others, a young Mafeking pharmacist, Wally Coombes. Then came the War. The popularity of ZNB zoomed, and shy, self-effacing Wally Coombes became the country's first heart-throb disc-jockey.

The popularity of ZNB declined after the War. One reason was that its relatively weak signal strength was pretty well drowned by the big stations that came to dominate the





At left, Radio Botswana's shortwave transmitter building. Shown above is the station's administration building at the shortwave site near Gaborone.

shortwave bands. ZNB finally closed on 30 September 1963, three years before independence. The seat of administration moved from Mafeking to Gaberones (now Gaborone) in 1965.

Radio Botswana Takes Root

The year 1963 saw the inauguration of the forerunner of Radio Botswana. This was a 700 watt station with the call letters ZNE55, later ZND, which broadcast from an unused prison cell in Lobatsi, about 50 miles north of Mafeking. It is interesting to note from the 1965 edition of the *World Radio TV Handbook* that the station used 3356 kHz, one of Radio Botswana's current frequencies. ZND broadcast for about two hours each evening in English and Setswana.

Towards the middle of 1965, ZND was replaced by a higher powered transmitter of 2 kW (upgraded to 10 kW only a year later), located at Sebele, near the present capital of Gaborone. The antennas used were vertical incidence arrays consisting of two folded dipoles fed in phase, a quarter of a wavelength above the ground. A 1 kW medium wave transmitter and low power FM transmitter were also installed. In 1972 the mediumwave transmitter was replaced by one of 50 kW. The 10 kW shortwave transmitters were in use for over ten years, but were replaced in 1984 by four 50 kW units. An expansion program is now underway to extend FM coverage to the populated areas of the country.

Radio Botswana is on the air from 0300 to 2200 UTC in Setswana and English with the frequency usage listed in Table 2. Look for their distinctive cowbell interval signal at 0255 on either 3356, 4830 or 7255 kHz. Be careful with this last frequency, as it is also used by Radio Nigeria later in the evening.

Programs are simulcast on shortwave, mediumwave, and FM, and consist of news bulletins, and cultural and current affairs programs. *Newsreel* and *Around the World Today* air daily, Monday through Friday, and *Round Table* is a one-hour weekly discussion on a current issue. Transmitters are located in Sebele, Selebi-Phikwe, Maun, Orapa, Francistown, Serowe, Mahalapye, Lobatse, Ghanzi, Jwaneng, and Mopipi.

A new commercial, FM channel, Radio

TABLE 1

VOA Botswana Relay Station Schedule

UTC		Language	kHz	Target
0430-0500		Portuguese	7200	AfE
0300-0500		English	7265	AfE
0300-0500		English	7280	AFEC
0430-0500		Portuguese	7415	AfW
0500-0530		Hausa	7415	AfW
1900-2130		English	7415	Af
2130-2200	Su-F	English	7415	Af
0300-0400		English	9885	AFEC
0400-0415		Somali	9885	AFEC
0300-0400		English	11965	AfE
0400-0415		Somali	11965	AfE
0500-0630		English	12080	Af
0630-0700	SS	English	12080	Af
1830-2030	M-F	French	12080	AfW
2030-2100	SS	French	12080	AfW
2030-2100	M-F	French/Hausa	12080	AfW
2100-2130	M-F	French	12080	AfW
1600-1630	SS	English	13710	Af
1630-2130		English	13710	Af
2130-2200	Su-F	English	13710	Af
1630-1700	M-F	Swahili	15165	AfE
1700-1730		Swahili	15165	AfE
1630-1700	M-F	Swahili	15360	AfE
1700-1730		Swahili	15360	AfE
0500-0530		Hausa	15375	AfW
0530-0630	M-F	French	15375	AfW
1600-1630	SS	English	15445	AFEC
1630-1800		English	15445	AFEC
1800-1900		Amharic	15445	AFEC
1730-1830		Portuguese	15505	Af
0500-0630		English	15600	AFEC
0630-0700	SS	English	15600	AFEC
1830-2030		French	15625	AfW
2030-2100	SS	French	15625	AfW
2030-2100	M-F	French/Hausa	15625	AfW
2100-2130	M-F	French	15625	AfW
0530-0630		French	17650	AFEC
1630-1700	M-F	Swahili	17705	AfE
1700-1730		Swahili	17705	AfE
1730-1830		Portuguese	17705	AfE

This postcard from Botswana features the town of Mochudi, which lies about 25 miles northeast of Gaborone on the country's one railroad.

Botswana II (RB2) can be found on FM 103, catering to the 15 to 45 age group. It broadcasts five hours during the week and eight hours on the weekends. Radio Botswana's address is Private Bag 0060, Gaborone, Botswana (Fax: +267 (31) 371 588 or 357 138).

Playing the Radio Relay Game

Great Britain may have made a special arrangement with Botswana in late 1965, when the British Government established a powerful mediumwave transmitter in Francistown near the then Rhodesian border. This installation—intended chiefly to make **BBC** programs easier to receive in Rhodesia where unilateral independence had been declared—operated for three years. Apparently the British maneuver was effective, for Rhodesia jammed the Francistown transmitter whenever the BBC dealt with Rhodesian affairs. The station also used shortwave frequencies in the 60 and 41 meter bands. The 10 kW transmitter was then relocated to Sebele to supplement the existing facilities there.

As already mentioned, the Francistown station is no longer on the air, but in 1981 the Voice of America installed a 50 kW medium wave transmitter at Selebi-Phikwe, an important nickel and copper-mining center not far from Francistown. This station is jointly owned by VOA and Radio Botswana, and relays the VOA African service from 0300 - 0430 and 1700 - 2200 UTC on 621 kHz. During the day Radio Botswana is relayed.

TABLE 2

Radio Botswana Broadcast Schedule

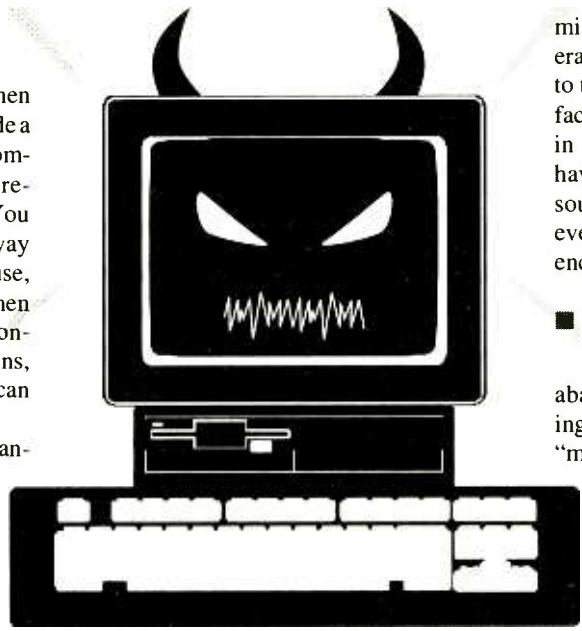
3356 kHz from 0300 - 0600
3356 kHz from 1530 - 2200
4830 kHz from 0300 - 2200
5965 kHz from 0700 - 1500
7255 kHz from 0300 - 1800
9600 kHz from 0600 - 1530

In 1991, following the destruction by rebels of the **VOA** facility near Monrovia, Liberia, two 100 kW shortwave transmitters were brought into service for listeners in Africa by VOA at the Selebi-Phikwe site. The following year two more 100 kW transmitters were inaugurated. Although subject to change without notice, the schedule in Table 1 is what you could expect to hear in the fall of '94 from the VOA's four shortwave transmitters in Botswana.

Radio plays an important role in the development of a country like Botswana. Because of poor facilities, a number of remote FM stations must relay Radio Botswana's shortwave off air signal in order to increase coverage. "In sparsely populated areas of the country," says a R. Botswana brochure, "communication is difficult in that there are no telephones or newspapers. Radio broadcasting is the only regular link connecting those areas to the rest of the country."

Exorcising Computer RFI

By John Catalano



Computers, hailed as the savior of drudgery, can be the very devil when paired with your radio

Can you remember a time when listening shacks didn't include a computer? Now we use our computers for logging station information—a replacement for the flying paper log. (You know; the one that would always fly away from your desk to strange places in the house, especially whenever you needed it.) When used with a radio capable of computer control, the "log" becomes a database of stations, frequencies, and program times which can also control the radio.

Or, if we have a computer-controlled scanner, such as a Yaesu FRG-9600, ICOM R7000/R7100 or Realistic PRO-2006, we can scan for information about that fire siren we just heard by having our computer find frequencies listed for the local fire department. These are downloaded to the receiver and it is tuned automatically—no more furious page flipping and button pushing as the critical moment passes, leaving us behind. And don't forget the added benefits of decoding and displaying radio teletype (RTTY) and other modes such as Morse code, SITOR and AMTOR.

■ The Devil Within

Yes, computers are tools which greatly expand our monitor capabilities and enjoyment, but it's a mixed blessing. In the *MT* "Computers and Radio" column, I receive many letters asking for advice on the subject of reducing signals that are generated by the computer system itself. Computers are, after all, high-speed digital circuits with bits of data running around in its circuits at radio frequencies. Uh-oh! The invaluable tool is starting to look like a major monitoring problem.

Add to this radio interference the cathode ray tube (picture tube) in the computer monitor's drive circuitry which is controlled at radio frequencies by the computer. This generates more radio interference—though of a different frequency and type.

Printers have their own internal microcontrollers (I think you can guess)—more radio interference potential. Finally, we have serial, parallel, video and power cables connecting it all together and acting like antennas for these interfering signals! Mother Nature is cruel, giving and taking at the same time.

To further complicate matters, keep in mind that no two computer systems will generate exactly the same set of interference, due to the fact that every piece of the system is a factor. Every revision a manufacturer makes in printed circuit boards and hardware can have a major effect on what the system will sound like on our receivers. In some cases, even the house wiring and grounding influences the result.

■ Girding for Battle

Other than trading in our computers for abacuses, we'll have to fight this evil interfering force. With all the different frequencies, "modulations," and strengths of these signals the concept of removing *all* the interference is not realistic. Interference in professional and military computer-controlled communications equipment is reduced to nearly zero by custom designing the whole system from scratch specifically to minimize radio frequency interference (RFI)—right down to the design of the circuit boards and enclosures. But since consumer computer systems are a mixed bag of plastic-cased, cost-conscious components from various manufacturers, the resulting RFI is not surprising.

Still, there are some problem areas that are common to almost all computer systems; so, instead of just complaining, let's start reducing the RFI by removing their antennas, so to speak. While we cannot just disconnect the offending cables, we can inductively load the cables so that they will look like short circuits to the RFI—well, almost. This is most easily done using the clip-on inductors available at Radio Shack and other radio equipment suppliers. Since the quality of the cable used for computers varies widely, make sure you have high quality cables with a full, continuous ground shield. Likewise, the connectors at each end should have metal covers. This remedy is common knowledge and easily implemented, but it results in only a limited reduction of RFI.

Some RFI-generating peripherals, such as printers, can be shut off while we do our

radio listening. However, in the majority of the PCs I have owned or worked on, the monitor has been a major contributor of RFI in the medium and shortwave spectrum. One could temporarily shut the monitor off every time you want to listen to a specific station, but this is not really a good idea if you want your monitor to last. Power transients during the turn-on/off cycles stress the monitor's components and are the most likely times for component failure.

So how else can we tame this destroyer of RF spectrum tranquility? The theoretically ideal answer is **containment of the monitor within a Faraday shield composed of a perfect conductor.** This says that if we surround an electromagnetic field (i.e., signal) with an electrically-grounded, high conductivity metal enclosure, the field will not radiate beyond the shield.

Lining the inside of the case with aluminum foil may come to mind, but this should NOT be attempted due to the possible electric shock hazard if it moves and comes in contact with high voltage. At the very least, the monitor could be destroyed. A second reason not to try the foil trick is heat. Wrapping the interior of the monitor in foil will block the ventilation holes and contribute to early component failure due to overheating. (Like wrapping the Thanksgiving bird in foil, turkey!)

In the past, painting the monitor case with "conductive" paints has been tried with very limited success due to the relatively poor conductivity of these materials (remember, the theory calls for an *ideal* conductor). Add to this the poor adhesion (stick-to-it-iveness) of most of these paints to a monitor's plastic case and it is clear why is has not been a great success in dealing with RFI.

But recently a new material—RFI 822—has been developed which has extremely high conductivity (copper is the base metal), and is designed to bond to most plastics. In fact, it was designed for a major computer manufacturer specifically for reducing computer interference to communications systems. It's not as cheap as regular paint by a long shot, but the dramatic effect it can have on your monitoring makes it an excellent value.

■ After Conversion: Peace

If you were in my monitoring shack we could listen to various frequencies in the shortwave, medium and long wave bands with the monitor on. Then we could turn off the monitor and notice the difference. But since I don't have room for all of you in the shack, I have noted the difference in the receiver's S meter reading with the monitor off and then on.

TABLE 1

Computer/Monitor generated interference (CGI) before and after Radio Accessories' RFI 822 coating

Frequency MHz	Before RFI Coating (S Meter)	(Ear)	After RFI Coating (S Meter)	(Ear)
0.247	3	LOUD BUZZ	0	CLEAN NO CGI HEARD
1.1735	4	FREQ WIPED OUT	0.5	CLEAN STATIONS NOW HEARD!
3.9144	4	JUST CGI HEARD	0	CLEAN & STATIONS HEARD
13.598	3	NOISE/BUZZ/WOW	0.25	ALMOST NO CGI HEARD
14.096	5	UNUSABLE	0.5	CLEAN
15.770	5	SWARM OF BEES	0.1	RAID!! CLEAN STATIONS NOW
21.449	5	VERY NOISY	0.5	VERY LITTLE CGI AUDIBLE
135.005	4	CGI BLOCKS A/C	1.5	NOISY AIRCRAFT NOW HEARD

For example, in Table 1, under the "Before" S Meter column and in the row which shows a frequency of 0.247 MHz, you will see a "3". This indicates that before the RFI "paint job," while monitoring on 0.247 MHz, the receiver's S meter jumped up (and stayed) three S units. This is not exactly a measurement worthy of the National Bureau of Standards, but it is a good relative indicator of the computer-generated RFI on this frequency.

You'll notice under the "After" S Meter column, which shows the results of the same monitor on-off test after RFI coating, the results are dramatic! Frequencies which showed an increase of 5 S units when the monitor was turned on, dropped to less than one-tenth that value after coating!

■ Hearing is believing

Sure, all these figures make good reading, but what does the good ole' Mark One Ear hear? I listed my before-and-after auditory impressions in the appropriate columns on Table 1. The "before" observations range from some frequencies being so badly interfered with that they were unusable, to loud buzzing which only allowed very strong signal through with a great amount of interference.

And after? Well, the S meter numbers didn't lie! In most cases the interference was reduced so much that I had to turn the monitor on and off a number of times before I could identify any audible effect. A number of frequencies were completely clean of any audible monitor interference! Thank you, Faraday.

You can see by Table 1 that these eight frequencies had pretty significant monitor-generated signals before the RFI coating. They certainly were not the only ones. About twenty frequencies were monitored with similar before and after results.

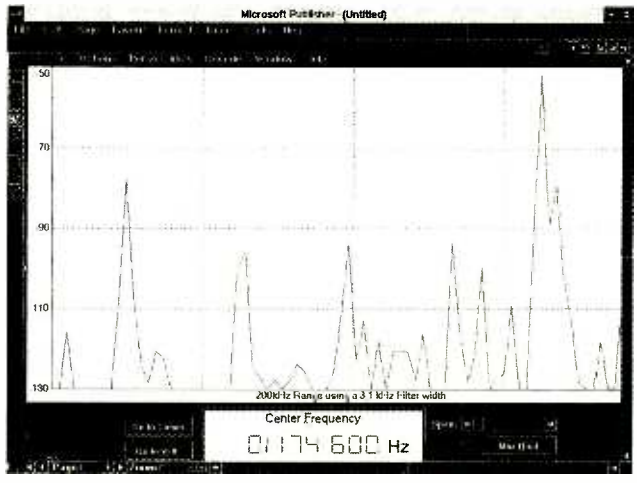


FIGURE 1—*Frequency spectrum before RFI coating, centered at 1.1736 MHz. Note number and size of peaks generated by computer system/monitor.*

■ A Picture Is Worth a Thousand Words

But in order to tell the whole story we have to look at Figure 1, the screen of a spectrum analyzer. This happens to be for 1.1746 MHz before the RFI coating. However, it could just as well have been for most of the other frequencies listed. The screen shows a range of frequencies along the horizontal axis (left to right). In Figure 1 the center of the screen is 1.1746 MHz with 0.150 MHz shown on either side.

The vertical axis displays the strength of any signals which are heard at the corresponding frequency. You can see a number of peaks, not just at the center frequency. These are all the products of this monitor, before the RFI-busting method. Keep in mind that the annoyance factor of any interference is a combination of its strength on a single frequency and how "rich" it is with close multiple interference frequencies. Therefore, the number, as well as the strength of individual RFI signals, really determines how bothersome they are to us listeners.

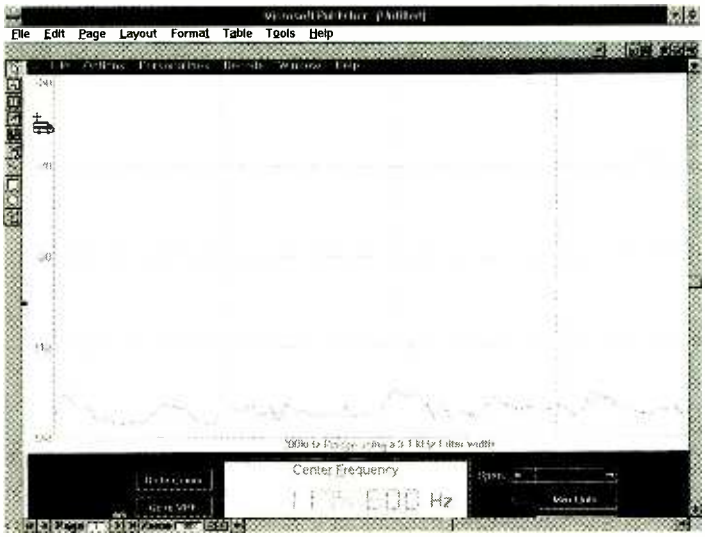


FIGURE 2—*And the mountains will be made low. Same frequency spectrum after Radio Accessories RFI coating. typical of results throughout long medium and short wave spectrum.*

Figure 2 is taken at the same frequency and band with as Figure 1. No peaks. Well, some baby peaks in the noise. Figure 2 was taken after the RFI coating, further confirming our S meter results.

If you look back at Table 1 you will notice that I did some measurements at 135 MHz. The RFI coating improvement was noticeable at this frequency, but not enough to get excited about. I suspect that the majority of this VHF RFI is from the computer's clock and not the monitor. If you are wondering exactly how this RFI coating was applied and connected to achieve these results, read on.

■ *Making Plastic Look Like Metal*

Now before we go any further, I must issue a disclaimer and warning. Opening the case of your monitor and performing the following procedure will void your warranty. Lethal electrical voltages exist within the monitor and therefore the following method is presented for your information only. Neither this author, *MT*, nor any materials supplier mentioned will be responsible for any damage to equipment, self, or other persons resulting from your undertaking (pun intended) this procedure. (Alternatively, Radio Accessories provides a service in which they will perform the entire process to your monitor and return it to your door.)

The procedure I used was simple:

1. Disconnect all power from the monitor.
2. Disconnect the monitor from the computer.
3. Remove screws which hold monitor case together. Usually they are located in three places on the case; top back, near where the cables exit, and also on the underside of the case. Don't force; If it does not come apart easily, then check for more screws.
4. Being very careful not to come in contact with the large picture tube at ANY location, completely remove the case (usually one piece which includes the back, bottom, and sides). Even with the power disconnected lethal high voltage can be present in the monitor.
5. Remove all labels and sticky stuff from inside of the piece you just removed. This can be done with mild dish-washing soap and water. Then a final wipe-down with a clean cloth with alcohol.
6. Lay out a paper-covered work area in a well ventilated area and put on rubber gloves (dish washing or hair dyeing type).
7. Mix RFI coating "paint" well with clean stick until one color and no lumps can be seen or felt.
8. Using a new, clean 1 to 1.5 inch paint brush, put a thin, but continuous, coat of RFI coating over entire inside of case. Make sure all corners and interior edges are well covered. Also make sure that the coating is continuous and completely surrounds all holes from which we removed assembly screws. I was careful not to put on too thick a coating that could plug up the vent holes. I kept the majority of them clear by running a wire through them.
9. Let dry for 24 hours at room temperature.
10. Re-coat within 36 hours, applying second coat slightly thicker. Let dry for 24 hours and, with a clean, soft, cloth *lightly* brush out any loose paint.

The second coat really makes a tremendous difference. After the first coat only about 40% of the case indicated connection using an ohmmeter. The lowest resistance from one side of the case to the other was in the 1,000 ohm range. After the second coat, connection coverage was over 90% and the maximum resistance measured was well below 20 ohms!

Okay. We have just transformed the plastic case into acting like it's metal. We now have to find one or two locations which are connected to the monitor's electrical ground, or chassis, to which we can mechanically connect a wire. Although it sounds like a major hunting expedition through uncharted territory, it's not that bad. All the monitors I have worked on in the past 25 years have metal pieces mounting the large picture tube to the front of the case. See Figure 3, which shows the opened monitor lying on its face. These mounting spots are usually in the top corners and already have a grounding wire attached to one or both. Figure 4 shows a close-up of the target location.

Now carefully, without touching the surface of the picture tube, partially unscrew a picture tube/front-of-case mounting screw. Cut a piece of insulated strained wire long enough to go from this screw to an easily accessible case assembly screw hole. These screws have already been removed in order to get the case apart. Are you with me? Almost

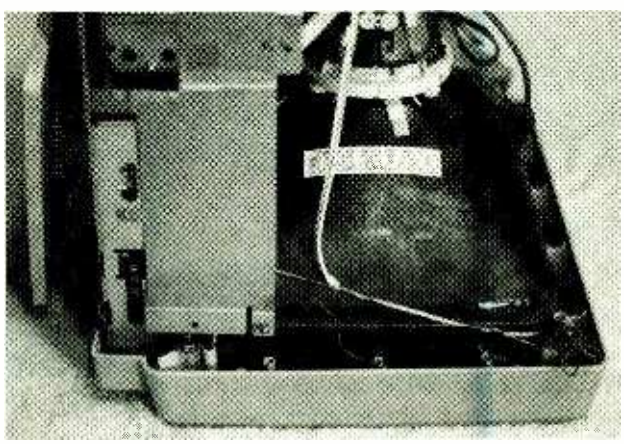


FIGURE 3—*Opened monitor lying face down*

done. Just keep thinking of the sweet sounds of radio silence once you're done.

■ Home Stretch

Leaving the wire a bit longer than needed may make life a bit easier. The ends of the wire are then stripped of about 3/4-inch of insulation; one end is wrapped around the partially unscrewed picture tube/case mounting screw. The screw is then tightened back in place. Onto the other end of the wire a small terminal eyelet is crimped, making a good electrical connection (see Figure 4). The diameter of the hole must be a bit larger than the case assembly screw. This terminal eyelet is held in position while the assembly screws are reinserted into the RFI-coated case; thus, the eyelet is sandwiched between the front of the case and the coated back, making the electrical connection to the coating.

If holding the eyelet in position is difficult due to its location, it can be held with tape, as long as you make sure that the tape does not get between the eyelet and the RFI coating. We need them to be in physical contact, thereby electrically connecting "metal" case to ground.

Replace the remaining case screws, and we are done. Initially, I turned on the monitor without connecting it to the computer as a precaution. No smoke. Good. I shut it off and connected it to the computer to complete the job.

It's actually harder to describe than to perform. Although not really necessary, I added a second wire in order to reduce the resistance between any case location and ground. Both wires can be seen in Figure 5—one connected to the mounting screw and the other attached to the chassis. It also adds a back-up ground connection to our Faraday shield. Again, this procedure is described primarily for information purposes and you perform them at your own risk.

■ Relax and Finally Enjoy Computer Aided Monitoring

Is there any RFI fix that will remove all RFI? Not easily. But the results we obtained with RFI 822 are dramatic enough to allow hams to once again use the low end of 20 meters; make longwave beacon monitoring a reality once more; and generally clean up a major, and widely dispersed, source of RFI in the 0.1 to 50 MHz spectrum.

■ Counting the Cost

The high conductivity, plastic-adhering, RFI coating, RFI 822, is available from Radio Accessories, P.O. Box 168, Melvin Village, NH 03850. The price is $27 plus $4.95 shipping and handling for enough quantity to cover most 14-inch monitors with two coats. (Radio Accessories also offers the service of performing the whole RFI coating job on a 14 to 16 inch monitor for $89.50 plus $17 shipping, insurance and handling.)

It's not real cheap. I have never seen this product available elsewhere except in gallon quantities at unaffordable prices. And, considering the primary alternative is a professional/military version of an RFI quiet monitor starting around $1300, it's not bad at all! Although each brand and model of monitor may vary in its frequency and intensity of interference, the interference reduction we have seen here is typical for the vast majority of consumer computer VGA/SVGA monitors.

You may have enough "paint" left over to coat the plastic parts inside your computer case. Many computers have plastic fronts which greatly reduce the effectiveness of the remaining metal case parts as far as RFI containment is concerned.

Yet another use which I found for the 822 material is coating the inside of scanner cases. I found that when this was performed on a scanner which seemed to stop on lots of dead signals, many of these "birdies" disappeared, allowing normal scanning.

I'm sure you'll find other radio-related uses for this new material. But for now I'm enjoying "getting a buzz" from computer-aided monitoring, instead of just listening to the buzz!

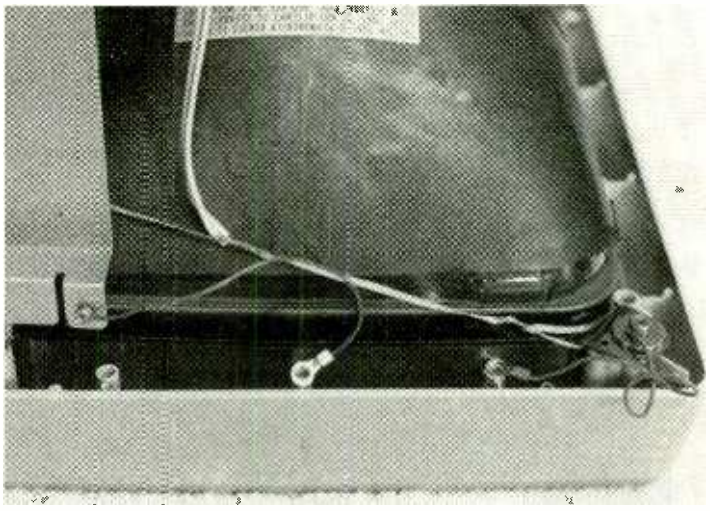


FIGURE 5— *Monitor with two ground connections —one to corner mounting screw and the other to chassis —ready to reassemble*

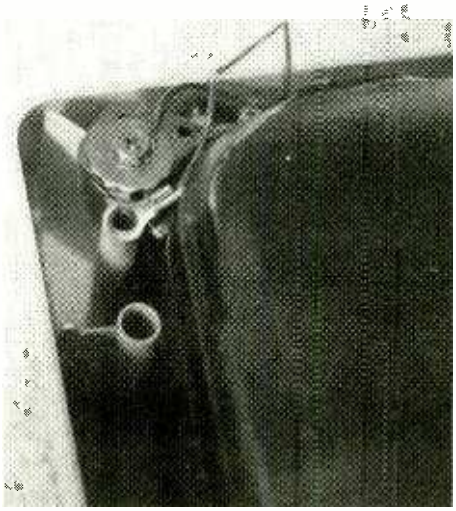
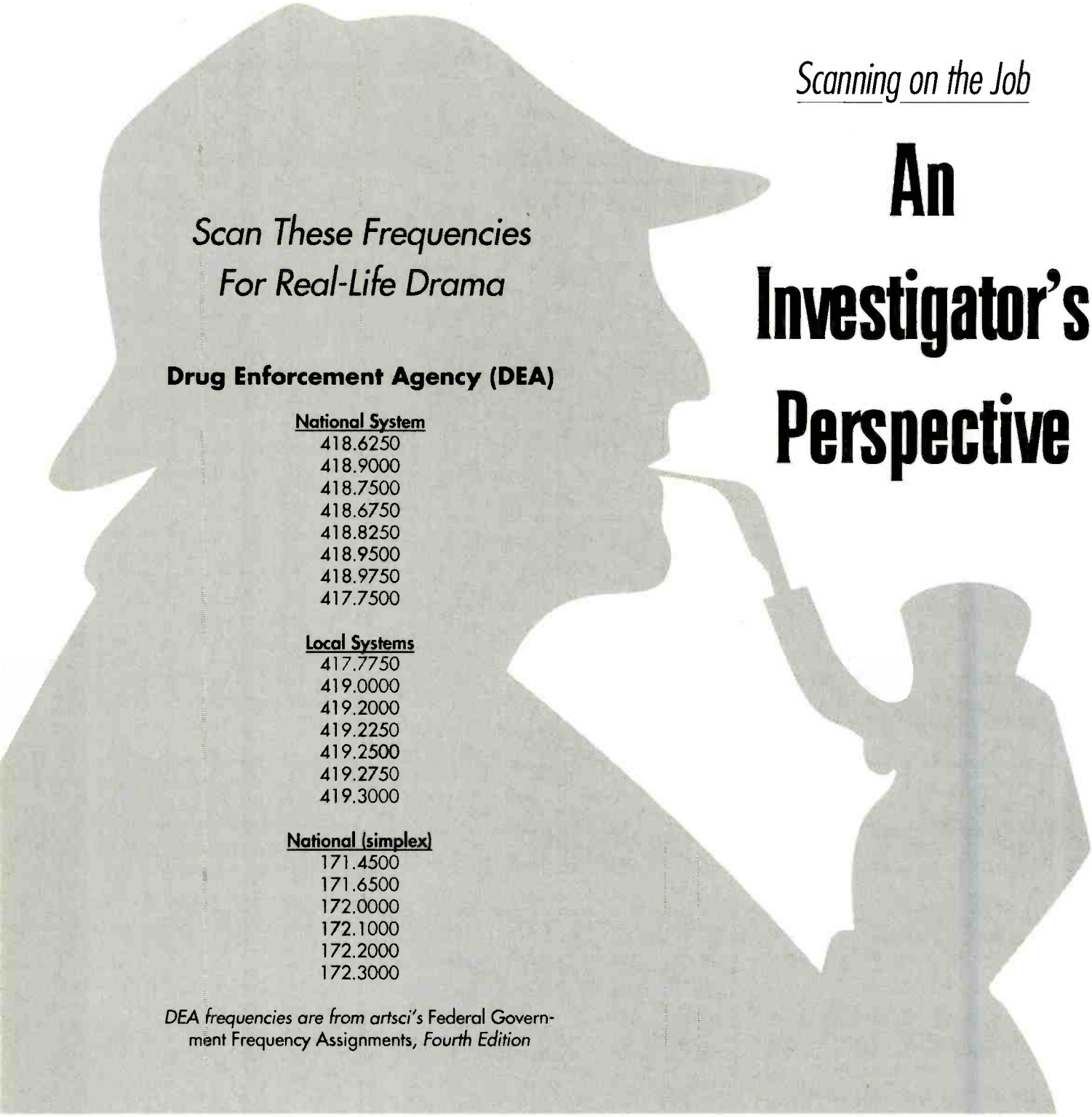


FIGURE 4—*Close-up of picture tube—Case mounting screw used as ground connection*

The new material described in this feature so impressed the author with its ability to tame RFI in his own equipment, that for a limited time he is making it available in consumer quantities to other radio hobbyists through his compay, Radio Accessories. Details are in the article.

Scanning on the Job

An Investigator's Perspective



Scan These Frequencies For Real-Life Drama

Drug Enforcement Agency (DEA)

National System
418.6250
418.9000
418.7500
418.6750
418.8250
418.9500
418.9750
417.7500

Local Systems
417.7750
419.0000
419.2000
419.2250
419.2500
419.2750
419.3000

National (simplex)
171.4500
171.6500
172.0000
172.1000
172.2000
172.3000

DEA frequencies are from artsci's Federal Government Frequency Assignments, *Fourth Edition*

By Douglas R. Dickson

Working as a surveillance investigator in Orange County, CA, who specializes in insurance and workers compensation fraud, I have a rare and golden opportunity to use my scanner while at work. As I am required to spend each and every workday in my car, I readily look for any stimulus to pass the long and often boring hours. My Radio Shack PRO 2006 has become a valuable tool for my work as well as becoming a beloved "distraction."

My scanner works almost as hard as I do. From the moment I enter my car in the early a.m. hours until I return home (usually late), my scanner is hard at work providing me with valuable information, entertainment, and sometimes lifesaving warnings.

■ Getting a Head Start

Thanks to the NOAA weather broadcasts monitored before retiring to bed, I know how the weather should be as my day begins. While warming up my car I check the air traffic reports for freeway conditions, monitoring both Airwatch and Metro Traffic Control, in addition to CHP (California Highway Patrol) and React GMRS (General Mobile Radio Service) frequencies. I often find that getting the information first hand rather than through delayed radio broadcasts as other commuters do, allows me to react to the situation before slowing traffic catches me between off-ramps.

As soon as I arrive in the vicinity of my surveillance, I switch over to the local police, sheriff, and fire frequencies to get a feel for the neighborhood. This is particularly handy as I sometimes find that *I* am the subject of a 925 or 925V (suspicious person or vehicle) call, by a concerned neighbor! This affords me the opportunity to call the police and inform them as to the nature of my surveillance, thus saving them the valuable time of checking me out and possibly blowing my cover.

■ Breaking the Boredom

As the day wears on, I often just program the scanner to perform "limit" searches, picking out various businesses bands and sniffing for special law enforcement operations on both new and well-known frequencies.

This procedure often produces some astonishing results! I am continually amazed at the information that is still disseminated "in the clear." I often find that I am sitting right in the middle of a stakeout with DEA agents, police or sheriff's officers within one or two blocks, and occasionally right next to me!

Once, as I proceeded to a surveillance, I found myself driving right next to a suspect's vehicle in an ongoing DEA surveillance. One air unit and four ground units were following the subject. As I proceeded down the freeway I overheard the air unit describing (in the clear) the landmarks and vehicles the subjects were near. They even described my car as they passed just to my left! I nearly fainted when we all arrived at the same five-unit apartment complex, and the subjects exited the vehicle and entered the apartment just two doors down from my subject's apartment!

Needless to say, I was not at all bored as I sat there for the duration of my surveillance monitoring my scanner. Believe it or not, I even found the DEA's subjects making and receiving calls on a cordless telephone! (I couldn't help but wonder if the DEA uses scanners.)

By the way, I managed to get some 40 minutes of video of my "bad back" subject working on his car, oblivious to the presence of either DEA or myself.

One definition of success is finding out what you would do for free and then get paid to do it. I love getting paid while I monitor!

■ A Test of Scanning Skill

I also enjoy the scanner during my off hours.

On Saturday, February 5, 1994, I had just completed a surveillance and was headed home when I picked up a CHP pursuit in progress on my scanner. They were following a stolen tractor trailer which refused to stop. I later learned that the big rig had been stolen the previous day and the company's owner had the foresight to install a Lojack stolen vehicle recovery transmitter.

Once the system had been activated the CHP had located the vehicle in a Santa Ana shopping center parking lot. They placed the vehicle under surveillance and when the suspect arrived back at the vehicle with a woman and a small child the pursuit began. He smashed into a telephone pole and two parked cars early on in the chase. The thief then dropped off the woman and child and pulled onto the freeway with the CHP in hot pursuit!

As the chase drew closer, I noticed three helicopters paralleling the freeway. Soon traffic thinned as the CHP and local police blocked the freeway on ramps ahead of the determined thief to thin the traffic and reduce the chance of a collision. As he closed behind me I slowed slightly and soon saw the rig in the rear view mirror, being followed by five or six CHP units with their lights flashing and sirens wailing.

I quickly locked out all the unneeded frequencies and kept an eye on the action in my rear view mirror. The thief was not driving at an excessively high rate of speed but would not yield despite the repeated attempts to pull him over. Soon he pulled off the freeway in Anaheim and led the police on a 50 minute chase, reentering the various freeways and then pulling off again back onto the surface streets.

After a while, I noticed several television trucks were "dogging" the pursuit in an effort to get the all-important finale shot. Knowing the area well and having a video camera, I thought it might be fun to see if I could ace the "newsies" for some video shots.

Rather than interfere with the pursuit or follow blindly, I opted to parallel the subject by working the side streets. I not only know them well, it also kept me out of harm's way and able to traverse more ground with fewer stop signs and red lights. Interestingly enough, as the semi would enter and exit the freeway, the CHP would take over the chase or pass it off to the various cities through which the subject was driving. This kept my fingers busy as I tried to follow all the different agencies, switching banks and unlocking frequencies.

Red channel 460.025 MHz was monitored during the truck chase in addition to CHP frequencies. 42.400 was the Santa Ana base, and 460.050 was Anaheim's PD.

Approximately one hour and many, many miles later, the suspect pulled the big rig over just past a major intersection in Anaheim. Seconds later I pulled right up to the scene of the stop facing the truck only a few hundred feet away and was able to shoot several minutes of video of the arrest with the scanner providing real time audio of the radio traffic while the officers arrested the suspect at gunpoint.

Minutes later, after the suspect was in custody in the back of a police unit, an Orange County News vehicle pulled up and begin to shoot the scene. I had already called the newsroom and had made arrangements to provide the film crew with my footage. Later that evening, I smiled as I watched the video being shown on the news.

With all the information that a scanner can provide, I am never forced to sit "in the dark" in a rough neighborhood while on surveillance or potentially travel into harm's way during my off hours!

Tomorrow I'll be out on another surveillance, watching...and listening!

The author has worked as a Private Investigator for years, specializing in insurance fraud surveillance. He is also a partner in an electronic countermeasures firm, specializing in electronic privacy. His equipment includes a Realistic Pro 2006 with computer interface, Bearcat 200 XLT (both modified), Universal M 400, and a cellular data interface.

Larry Van Horn, N5FPW

Aeronautical Mobile Band Standardizes

In 1992, a World Administrative Radio Conference (WARC) was conducted by the International Telecommunications Union (ITU) in Malaga, Spain. Diplomats from around the world gathered at this conference to establish the rules and regulations that govern the radio frequency spectrum.

Some of you about right now are probably saying, "Hey Larry, they hold these conferences every few years. What's so important about WARC 92?"

More than we knew. All of us that listen in the utility bands overlooked an appendix in the final acts of WARC 92 that made a significant change to the shortwave spectrum. This conference finally channelized the one remaining aeronautical sub-band not previously addressed in previous WARC conferences.

For folks new to the utility world, the aeronautical frequencies located in the high frequency spectrum are divided into two distinct sub-bands. The first sub-band is most familiar to HF aviation buffs—the 'R' or routed frequencies. This sub-band carries communications associated with aircraft (civilian and military) that are flying on established aeronautical routes anywhere in the world. Communications in these frequencies consist of air traffic control, weather information, and private airline company traffic. The "routed" sub-band was rechannelized several years ago and spacing was established at 3 kHz between frequencies.

The other aeronautical mobile sub-band traditionally has been more obscure to all but military monitors. Dedicated readers to the yearly Klingenfuss *Guide to Utility Stations* books will recognize the term "OR," which stands for off-route. Military listeners have prowled the OR sub-bands for years listening to the heavy concentration of military aeronautical traffic that occurs there. The military does a lot more off-route flying than the civilian aviation population.

In the final acts of WARC 92, Appendix 26, the aeronautical mobile 'OR' band was channelized and standardized to a frequency spacing of 3 kHz like its cousin, the routed frequencies. Administrations had until December 15, 1997, to implement this change. But, in the middle of November 1994, something happened to change all that. One source I talked to said that NATO and European military officials decided to implement the change early. The results of only one region implementing this change would be chaotic—The rest of the world would have to execute their changes as well.

On November 10, 1994, *SPEEDX Utility Notes* editor Richard Baker and Utility World regular, Jeff Haverlah, both noted that US Coast Guard air to ground frequencies in the 'OR' sub-bands appeared to have changed frequency. Several other regular reporters on the Grove BBS Utility World message conference also noted a change in Canadian military or Canforce 'OR' frequencies. At this point it was obvious something was up; we just didn't know what. While it looked like a change to standard channel spacing was being attempted by these agencies, the two biggest users in this part of the world—the U.S. Air Force and U.S. Navy—had not changed their frequencies.

The big break came on December 22, 1994, when the Global HF System (GHFS) changed to its new OR frequencies. Listening to the GHFS frequencies on that evening was indeed a treat to all those that participated. (Advance notice of the event was posted in the Utility World message conference. I hope you regularly check in to the BBS to find out the latest hot scoop.)

As I write this column, not all organizations have changed their frequencies to the new bandplan, but my sources indicate that by the time this column reaches you, everyone will be on board with the required changes. The frequency ranges that are affected are listed below.

3025 - 3155 kHz	43 + 1 channels (3023 is used for worldwide common use)
3900 - 3950 kHz	16 channels (Used in ITU region 1 only)
4700 - 4750 kHz	16 channels
5680 - 5730 kHz	15 + 1 channels (5680 is used for worldwide common use)
6685 - 6765 kHz	26 channels
8965 - 9040 kHz	25 channels
11175 - 11275 kHz	33 channels
13200 - 13260 kHz	20 channels
15010 - 15100 kHz	30 channels
17970 - 18030 kHz	20 channels

Those are 256 channels of great listening and exploring you can be doing over the next few months. Table One on the next page reflects the assignment of frequencies in ITU region 2, North America only. Currently we do not know what has happened in Central or South America and the other two ITU regions. This column is extremely interested in reports of activity throughout the newly organized OR frequency sub-bands and I hope to fill in some of the holes with your intercepts in the months to come.

For the latest information on all of this, why not join the crowd on the Grove BBS message conference 10, Utility World and leave your thoughts and observations? Information on the Grove BBS can be found in the staff box in the front of this issue of *MT* or in the latest Grove catalog.

Now it's time to see what you have been hearing this month in the Utility World. 73 de N5FPW SK.

TABLE 1 — U.S./Canada Military Allotment Arrangement for the Aeronautical Mobile (OR) Service

3023.0 ..... Worldwide Common
3026.0 ..... Air Force (A)
3029.0 ..... Air Force
3032.0 ..... Air Force
3035.0 ..... Navy
3038.0 ..... Navy
3041.0 ..... Air Force
3044.0 ..... Air Force (B)
3047.0 ..... Navy (B)
3050.0 ..... Navy
3053.0 ..... Coast Guard
3056.0 ..... Coast Guard
3059.0 ..... Air Force
3062.0 ..... Air Force
3065.0 ..... Air Force
3068.0 ..... Air Force
3071.0 ..... Air Force
3074.0 ..... Air Force
3077.0 ..... Air Force
3080.0 ..... Navy
3083.0 ..... Navy
3086.0 ..... Navy
3089.0 ..... Navy
3092.0 ..... Navy
3095.0 ..... Navy
3098.0 ..... Navy
3101.0 ..... Navy
3104.0 ..... Navy
3107.0 ..... Navy
3110.0 ..... Air Force
3113.0 ..... Air Force
3116.0 ..... Air Force
3119.0 ..... Coast Guard
3122.0 ..... Coast Guard
3125.0 ..... Navy
3128.0 ..... Navy
3131.0 ..... Navy
3134.0 ..... Air Force
3137.0 ..... Air Force
3140.0 ..... Air Force
3143.0 ..... Air Force
3146.0 ..... Air Force
3149.0 ..... Navy
3152.0 ..... Navy

4700.0 ..... Navy
4703.0 ..... Navy (C)
4706.0 ..... Navy
4709.0 ..... Navy
4712.0 ..... Navy
4715.0 ..... Navy
4718.0 ..... Air Force
4721.0 ..... Air Force
4724.0 ..... Air Force (D)
4727.0 ..... Air Force
4730.0 ..... Coast Guard
4733.0 ..... Coast Guard
4736.0 ..... Navy
4739.0 ..... Navy
4742.0 ..... Air Force
4745.0 ..... Air Force

5680.0 ..... Worldwide Common
5684.0 ..... Air Force (A)
5687.0 ..... Air Force
5690.0 ..... Air Force
5693.0 ..... Navy/C. Guard (E)
5696.0 ..... Coast Guard (J)
5699.0 ..... Coast Guard
5702.0 ..... Air Force
5705.0 ..... Air Force
5708.0 ..... Air Force
5711.0 ..... Air Force
5714.0 ..... Navy
5717.0 ..... Navy (F)
5720.0 ..... Navy
5723.0 ..... Navy
5726.0 ..... Navy

6685.0 ..... Air Force (A)
6688.0 ..... Navy
6691.0 ..... Navy
6694.0 ..... Navy
6697.0 ..... Navy
6700.0 ..... Navy
6703.0 ..... Navy
6706.0 ..... Navy (C)
6709.0 ..... Air Force
6712.0 ..... Air Force (D)
6715.0 ..... Air Force (C)
6718.0 ..... Navy
6721.0 ..... Navy
6724.0 ..... Navy
6727.0 ..... Air Force
6730.0 ..... Air Force (I)
6733.0 ..... Air Force
6736.0 ..... Air Force
6739.0 ..... Coast Guard (D)
6742.0 ..... Coast Guard
6745.0 ..... Navy
6748.0 ..... Navy
6751.0 ..... Air Force
6754.0 ..... Air Force (G)
6757.0 ..... Air Force
6760.0 ..... Air Force

8965.0 ..... Air Force
8968.0 ..... Air Force (D)
8971.0 ..... Navy
8974.0 ..... Navy
8977.0 ..... Navy
8980.0 ..... Coast Guard
8983.0 ..... Coast Guard (J)
8986.0 ..... Air Force (A)
8989.0 ..... Air Force
8992.0 ..... Air Force (D)
8995.0 ..... Navy
8998.0 ..... Navy
9001.0 ..... Navy
9004.0 ..... Navy
9007.0 ..... Navy (C)
9010.0 ..... Navy
9013.0 ..... Air Force
9016.0 ..... Air Force (H)
9019.0 ..... Air Force
9022.0 ..... Air Force
9025.0 ..... Air Force
9028.0 ..... Navy
9031.0 ..... Navy
9034.0 ..... Navy/Coast Guard (E)
9037.0 ..... Navy/Coast Guard (E)

11175.0 .... Air Force (D)
11178.0 .... Air Force
11181.0 .... Air Force (A/H)
11184.0 .... Navy
11187.0 .... Navy
11190.0 .... Navy
11193.0 .... Navy
11196.0 .... Coast Guard
11199.0 .... Coast Guard
11202.0 .... Coast Guard (J)
11205.0 .... Navy
11208.0 .... Navy
11211.0 .... Navy
11214.0 .... Air Force (H)
11217.0 .... Air Force (H)
11220.0 .... Air Force (I)
11223.0 .... Air Force (K)
11226.0 .... Air Force (I)
11229.0 .... Air Force (I)
11232.0 .... Air Force (A)
11235.0 .... Air Force
11238.0 .... Air Force (K)
11241.0 .... Air Force
11244.0 .... Air Force (H)
11247.0 .... Air Force (B)
11250.0 .... Air Force (A/B)
11253.0 .... Navy
11256.0 .... Navy
11259.0 .... Navy
11262.0 .... Navy
11265.0 .... Navy
11268.0 .... Navy
11271.0 .... Air Force (B)

13200.0 .... Air Force (D)
13203.0 .... Air Force
13206.0 .... Air Force (C)
13209.0 .... Air Force (A)
13212.0 .... Air Force
13215.0 .... Air Force
13218.0 .... Coast Guard
13221.0 .... Coast Guard
13224.0 .... Navy
13227.0 .... Navy
13230.0 .... Navy
13233.0 .... Navy
13236.0 .... Navy
13239.0 .... Navy
13242.0 .... Air Force (H)
13245.0 .... Air Force
13248.0 .... Air Force
13251.0 .... Navy
13254.0 .... Navy
13257.0 .... Navy (C)

15010.0 .... Air Force (B)
15013.0 .... Air Force
15016.0 .... Air Force (D)
15019.0 .... Navy
15022.0 .... Navy
15025.0 .... Navy
15028.0 .... Navy
15031.0 .... Air Force (B)
15034.0 .... Air Force (G)
15037.0 .... Air Force
15040.0 .... Air Force
15043.0 .... Air Force
15046.0 .... Air Force
15049.0 .... Navy
15052.0 .... Navy
15055.0 .... Navy
15058.0 .... Navy
15061.0 .... Navy
15064.0 .... Navy
15067.0 .... Navy
15070.0 .... Navy
15073.0 .... Navy
15076.0 .... Navy
15079.0 .... Navy
15082.0 .... Coast Guard
15085.0 .... Coast Guard
15088.0 .... Coast Guard
15091.0 .... Air Force
15094.0 .... Air Force (H)
15097.0 .... Air Force

17970.0 .... Navy
17973.0 .... Air Force
17976.0 .... Air Force (D)
17979.0 .... Navy
17982.0 .... Navy
17985.0 .... Navy
17988.0 .... Coast Guard
17991.0 .... Coast Guard
17994.0 .... Air Force (C)
17997.0 .... Air Force
18000.0 .... Air Force
18003.0 .... Air Force
18006.0 .... Air Force
18009.0 .... Air Force
18012.0 .... Navy
18015.0 .... Navy
18018.0 .... Navy (B)
18021.0 .... Air Force (A)
18024.0 .... Air Force
18027.0 .... Air Force

Notes:

(A) U.S. Air Force ALE (Automatic Link Establishment) frequency
(B) Canadian military forces (CANFORCE) primary
(C) Canadian military forces (CANFORCE) secondary
(D) U.S. Military Global High Frequency System (GHFS) house frequency
(E) U.S. Navy (primary)/U.S. Coast Guard (secondary) (Shared)
(F) Canada Search and Rescue
(G) Canadian military forces (CANFORCE) Military Aeronautical Communications System (MACS) weather frequencies
(H) U.S. Air Force GHFS discrete frequencies
(I) Mystic Star frequency
(J) U.S. Coast Guard air to ground frequency
(K) Canada/Alaska Primary

ITU Regional 1 frequencies in the 3900 - 3950 kHz sub-band are:
3900 3903 3906 3909 3912 3915 3918 3921 3924 3927 3930 3933 3936 3939 3942 3945

Utility Loggings

Larry Van Horn

UTILITY WORLD

Abbreviations used in this column

AFB	Air Force Base	MWARA	Major World Air Route Area
AFRES	Air Force Reserve		
AFTN	Aeronautical Fixed Telecommunications Network	NAS	Naval Air Station
		NASA	National Aeronautics and Space Administration
ALS	Airlift Squadron		
AM	Amplitude Modulation	NORAD	North American Aerospace Defense Command
ARQ	Synchronous transmission and automatic repetition teleprinter system	Ops	Operations
		PIREP	Pilot Report (pertaining to weather conditions)
ARQ-E	Single-channel ARQ teleprinter system		
ARQ-M2	Multiplex ARQ teleprinter system with two data channels	RAF	Royal Air Force
		RTTY	Radioteletype
ATC	Air Traffic Control	SAM	Special Air Mission
Canforce	Canadian Military Forces	SAR	Search and Rescue
		SEA-3	South East Asia 3 MWARA
COMSUBLANT	Commander Submarine Force-Atlantic	SITOR-A	Simplex teleprinting over radio, mode A
CW	Continuous Wave (Morse Code)	SOF	Safety of Flight
		Southcom	Southern Command
ETA	Estimated Time of Arrival	Tanjug	Telegrafska Agencija Nova Jugoslavija
FAA	Federal Aviation Administration	TACAMO	Take Charge and Move Out aircraft
FAX	Facsimile	U.S.	United States
FEMA	Federal Emergency Management Agency	USAF	U.S. Air Force
		USB	Upper Sideband
FF	French Forces	USCG	U.S. Coast Guard
GANTSEC	USCG Greater Antilles Section, San Juan, PR	USMC	U.S. Marine Corps
		USN	U.S. Navy
INO-1	Indian Ocean 1 MWARA	USSTRATCOM	U.S. Strategic Command
LDOC	Long Distance Operational Control	UTC	Coordinated Universal Time
Meteo	Meteorology	VOLMET	Meteorological information for aircraft in flight
Metro	Pilot to Metro voice callsign		

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

2716.0 A1S working Foreclose 47 at 0312 in USB. (Rich Baker-Austintown-OH)

2869.0 San Francisco ATC, CA, working Continental 2 in USB at 0401. (Gerald Brookman-Kenai, AK) S.F. working Northwest 924 at 0345. (Gordon Levine-Anaheim, CA)

2962.0 Aeroflot 332C working Santa Maria ATC, Azores, in USB at 0633. (Robin Hood-UK)

3016.0 Gander ATC working Shanwick ATC in USB at 0605. (Harry Ferguson-Philadelphia, PA)

3029.7 RDFBH, presumed to be a Danish military outfit with "ALL DE RDFBH TESTING..." RYs and QBF test tape in 50 baud RTTY at 1838. (Hood-UK)

3039.0 USN FT network in USB at 0505. (Ferguson-PA)

3369.0 USAF weather broadcast using 75 baud RTTY at 0047. (J.L. Metcalfe-KY)

3487.0 New York VOLMET radio with aviation weather in USB at 0232. (Sue Wilden-Columbus, IN)

4029.0 Spanish female 5-digit number station in AM at 0500 (Fri UTC). Spanish female 5-digit number station at 0600 (Sun UTC). (Tom Mazanec-Maple Heights, OH)

4055.0 Charlie 1 working Charlie 2 in USB at 2115. Switched to LSB at 2300 due to interference from a data signal. (Fernandez-MA)

4845.0 RAF Buchan, Scotland, working 4KR and I7D for aircraft tracking exercise. Buchan also called by 9GJ, a female operator with a Dutch accent, in USB at 0814. (Hood-UK)

5320.0 NOY8-USCG Group Corpus Christi, TX, at 0012 working W4A in USB. (Baker-OH)

5400.0 GANTSEC at 2327 working G5V for urgent SAR alert in USB. (Baker-OH)

5529.0 Santo Domingo, Dominican Republic, working several aircraft in USB at 0238. (Bill Fernandez-MA) *This is an Iberia LDOC station-Larry.*

5547.0 San Francisco ATC, CA, working Qantas 17 in USB at 2207. (Levine-CA)

5574.0 San Francisco ATC, CA, working Delta 15 in USB at 0253. (Brookman-AK)

5598.0 New York ATC, NY, working Springbok 202 in USB at 0129. (Levine-CA)

5628.0 Honolulu ATC, HI, working Dynasty 005 in USB at 0554. (Brookman-AK)

5629.0 MIW2-Israeli Mossad number station in AM at 0115. (Tue UTC). (Fernandez-MA)

5643.0 Honolulu ATC, HI, working New Zealand 8 in USB at 1659. (Brookman-AK)

5687.0 Plantation working Shado flight in USB at 0600. (Jeff Haverlah-Houston, TX) *New OR bandplan frequency-Larry.*

5718.0 Spanish female 5-digit number station in AM at 0600/0700 (Thu UTC). (Mazanec-OH)

5763.0 Spanish female 5-digit number station in AM at 0600 (Sat UTC). (Mazanec-OH)

6552.0 Madras ATC, India, working Singapore 442 in USB at 1755. (Hood-UK)

6556.0 Perth ATC, Australia, working Quantas 71 advising contact with Jakarta on 11396 in USB at 1250. Ujung Pandang ATC, Indonesia, calling unidentifed aircraft in USB at 1412. SEA-3 MWARA. (Gary Russell-Urbana, IL)

6637.0 Quantas Control-Sydney, Australia, working New Zealand 016 in USB at 1304 (LDOC). (Russell-IL)

6640.0 Honolulu ATC, HI working Polar (Air Cargo) 85 in USB at 0715. (Levine-CA)

6683.0 Air Force One working Andrews on F-731 with F-732 (15011) as secondary in USB at 0108. (Paul Swietek-Gilbert, AZ)

6730.0 SAM 200 working Andrews in USB at 2349. (Swietek-AZ)

6731.0 Spar 84 (EC-137E Commander Southcom) enroute Homestead AFB with phone patch to Southcom headquarters Panama via MacDill Global in USB at 0045. (Russell-IL)

6754.0 Trenton Military with weather broadcast in USB. (Fernandez-MA) Noted same at 2250. (Metcalfe-KY) *New OR bandplan frequency for Canforce weather, old was 6753-Larry.*

6780.0 S3 working B4 (shorten trigraphs) and Blackhawk 2 (SH-60 Lamps helo) at 0608 in USB with simulated wargame communications. (Baker-OH)

6788.0 Unidentified station broadcasting, "Yellowblood, Yellowblood, do not answer, break, OW2." Repeated by female operator at weaker station in USB at 0055. (Haverlah-TX) *O.K. folks, I give up, what is this Navy comms all about?-Larry* Red 89 working Darkstar in USB at 0545. (Gary Beck-Florence, AL)

6796.0 Spanish female 5-digit number station in AM at 0500 (Thu UTC). (Mazanec-OH)

6825.0 Spanish female 5-digit number station in AM at 0300 (Wed UTC). (Wilden-IN)

6830.0 Andrews working SAM 050, SAM 28000 and SAM 27000 on F-867 at 0226 in USB. (Swietek-AZ)

6860.0 Spanish female 5-digit number station in AM at 0800 (Sat UTC). (Mazanec-OH)

6950.0 RJK78-Kiev Meteo, CIS, with poor fax chart at 1654. (Robert Hall-RSA)

6993.0 Andrews working SAM 28000, SAM 27000 and SAM 050 at 0448 on F-117 in USB. (Swietek-AZ)

7320.0 Spanish female 5-digit number station in AM at 0200 (Tue UTC). (Deane Johnston-Everett, MA)

7481.0 Spanish female 5-digit number station in AM at 0306. (Fri UTC). (Wilden-IN)

7527.0 Spanish female 5-digit number station in AM at 0500 (Sat UTC). (Mazanec-OH)

7643.0 Spanish female 5-digit number station in AM at 1000 (Sat UTC). (Mazanec-OH)

7658.2 YZD-Tanjug Belgrade, Serbia, with English RTTY news bulletins at 1722. (Hall-RSA)

7682.0 Spanish female 5-digit number station in AM at 0400 (Wed UTC). (Mazanec-OH)

7731.6 KNY29-Egyptian Embassy, Washington, D.C., with 51 groups of SITOR-A traffic at 2141. All messages were from Ambassador Ahmed Maher Elsyead. (Metcalfe-KY)

7763.0 English female 4-digit number station in AM at 0131 (Tues UTC). (Fernandez-MA)

7778.0 USN FT network in USB. (Crossbow-GA)

7863.0 Spanish female 5-digit number station in AM at 0400 (Sun UTC). (Mazanec-OH)

7997.0 Andrews calling Navy 676 for a conference in USB at 0058. (Haverlah-TX)

8025.0 USN or USMC stations Wildcat and 38 Special in USB at 1513. One station gave an offshore location. (Metcalfe-KY) *Only thing I have seen here is some Mystic Star activity; bet it's USMC-Larry.*

8088.0 Spanish female 5-digit number station in AM at 0700 (Sun UTC). (Mazanec-OH)

8095.0 Berry 1017 working unidentified station with SECAL check and instructions to pass arrival time in Rio de Janeiro to Atlas operations. (Crossbow-GA)

8136.0 Spanish female 5-digit number station in AM at 0400/0900 (SAT UTC). (Mazanec-OH)

8140.0 Czech female 5-digit number station in AM at 1903 (Thu UTC). (Fernandez-MA)

8188.0 Spanish female 5-digit number station in AM at 0800 (Sun UTC). (Mazanec-OH)

8879.0 Antananarivo ATC, Madagascar, working Lufthansa 436 in USB at 1255. Dar Es Salaam ATC, Tanzania, working Cathay 748 in USB at 1337. INO-1 MWARA. (Russell-IL)

8903.0 Aircraft registration URUAP (an Antonov 4R) working Kinshasa ATC, Zaire, in USB at 1818. (Hood-UK)

8951.0 Tokyo ATC, Japan, working Japan Air 1 in USB at 0351. (Brookman-AK)

8967.0 MacDill Global with 400-450 character EAM (DF preamble) in USB at 2030. (Tim-Wales)

8993.0 Juice 106 with phone patch to USSTRATCOM headquarters, Offutt AFB via MacDill Global with immediate precedent exercise simulating lost communications at 1705. Cody 465 working Gunrunner (AFRES headquarters Dobbins AFB, GA) with mission update for tail #40645 (C-141B aircraft) all via MacDill Global at 1655. The 756th ALS seems to use the last three digits of the tail number with the callsign Cody. Cody call has also been used by 815 ALS at Keesler AFB, MS. All communications in USB. (Russell-IL)

9007.5 MacDill working Holesaw regarding setting up tactical communications for aircraft 1331 and 3151 for a mission. Also Mercedes 142 and 144 in communications about the same thing in USB at 0229. Mentions getting the birds up and Grumman aircraft. (Fernandez-MA) *USN-Larry.*

9014.0 Hawk 91 working Raymond 7 with phone patch to Dyess weather in USB at 1930. (Haverlah-TX)

9017.0 Songbird working unidentified station with "Do you want to go to a TACAMO frequency? Yes, let's go to Alpha One, negative let's use a lampsend (????) frequency." Have also heard other USSTRATCOM airborne command post doing phone patches to COMSUBLANT recently. (Crossbow-GA)

9032.0 Bluecrab working Guardian, Deerhunter and Oakie Sam, all with radio checks in scrambled mode in USB at 0143. Bluecrab then went on land-line with Guardian. (Fernandez-MA)

9197.0 WWJ40 net control working several other WWJ stations and WTDL and KWB406 in USB at 2002. Heard something like "Federal Highway Exercise." Identified this frequency as F4 and 10891 as F5. (Fernand Valliancourt-St. Pamphile, PQ Canada) *These are Federal Highway Administration emergency communication system frequencies-Larry.*

9251.0 English female 5-digit number station in AM at 1927 (Thu UTC). (Fernandez-MA)

10048.0 Honolulu ATC, HI, working Northwest 27 in USB at 0430. (Brookman-AK)

10054.0 New York VOLMET radio with aviation weather in USB at 2250. (Wilden-IN)

10493.0 WGY914 mobile calling WGY912-FEMA Mt. Weather, Berryville, VA, in USB at 1908. (Metcalfe-KY)

10780.0 Crown 86 working Cape Radio in USB with phone patch traffic. (Don Storck-Hemlock, MI)

10820.0 SYN1-Israeli Mossad number station with callup (4D07D082P) in AM at 2000 (Thu UTC). (Fernandez-MA)

10855.0 0 Charlie and 0 Delta with very weak USB transmissions at 2120. Possible US military. (Metcalfe-KY)

11176.0 Acid Test working Mailfan (USSTRATCOM headquarters) with failed communications test at 1812. Cougar 39 with phone patch to Raymond 09 (Howard AFB, Panama) via MacDill Global with ETA passed to 310th SOF (310 ALS Howard) at 1752. Moose 97 with phone patch to Andrews Metro via Andrews Global with PIREP and advised they where a C-17A aircraft, probably from 17th ALS Charleston AFB, SC at 1809. All communications in USB. (Russell-IL)

11179.0 Radio maintenance with a test count at 2152 in USB. (Metcalfe-KY)

11181.0 McClellan Global working Chalice Charlie with phone patch at 2147 in USB. (Haverlah-TX)

11182.0 Delta 22 calling any station for radio check in USB at 2150. (Metcalfe-KY)

11217.0 COD44 (C-2A, VR-40 NAS Norfolk, VA) with phone to COD Base via MacDill Global advising "COD44 stuck on deck, have you advised carrier?" At 1624 in USB. (Russell-IL)

11226.0 Nightwatch 01 working Deckboat, Oversleep and WAR46 on X-905 with net checks. Oversleep and Deckboat moved to S-310 for T-Quad cicruit training at 1700. Net later moved to 13211. (Swietek-AZ)

11229.0 SAM 206 working Andrews at 1800 in USB. (Haverlah-TX) Dragrace calling Nightwatch on X-210 at 2056 for radio checks in USB. (Swietek-AZ)

11232.0 Gonzo 06 Alpha working Trenton military at 2058 in USB. (Beck-AL) *New frequency in OR bandplan for Canforce (primary)-Larry.*

11243.0 Sidecar and 5RY checking various Golf frequencies and acknowledging XAA, XAC, XAD, etc transmissions. Went to Golf 24 at 1845 in USB. NORAD communications. (Russell-IL) *Great, now we have Golf designators to track. Anybody know what the XA- series of signals are?-Larry*

11253.5 P5Y working Habitat un clear and green using USB at 1952. (Haverlah-TX)

11460.0 SAM 972 on F-295 working Andrews at 1753 in USB. (Valliancourt-PQ)

11476.0 Big A 326 working Silver Radio with message "on the ground at Guantanamo" in USB. (Crossbow-GA)

11494.0 Endowment working Nightwatch in USB at 1911. (Haverlah-TX)

11565.0 Unidentified station, female with long series of letters phonetically in USB at 1738. (Vaillancourt-PQ)

13207.0 Tbone 11 checking 'hotel fox' in USB at 2059. (Haverlah-TX)

13208.5 Pazz 82 calling Rick Ops 'on 13 upper' in USB at 1942. (Haverlah-TX)

13211.0 Royal Gem calling Uppercut and Nightwatch in red/green using USB at 2200. (Haverlah-TX) Overlord working Nightwatch 01 on S-312 with X-210 (11226) as secondary in USB at 2059. Nightwatch 01 working WAR46 on S-312 moved to P-381. Perimeter working Nightwatch moved to 5381. (heard nothing there). (Swietek-AZ)

13242.0 MacDill Global working SAM 27000 in USB at 1509. (Haverlah-TX) *New OR bandplan frequency-Larry.*

13247.0 Andrews working SAM 972 in USB at 2135. (Haverlah-TX)

13288.0 Honolulu ATC, HI, working United 190 in USB at 1836. (Brookman-AK)

13457.0 N66-FAA aircraft at Oklahoma City, OK, calling KCP63-FAA Longmont, CO, at 2020 in USB. Later heard N66 working WHZ78-FAA Sacramento, CA. (Metclfe-KY)

14563.8 4XZ-Haifa Naval Radio, Israel, with V CW marker at 0549. (Hall-RSA)

14585.5 RFVAD-FF N'Djamena, Chad, using ARQ-M2 idling at 0555. (Hall-RSA)

14732.1 RFVITZ-COMSUP St. Denis, Reunion Island, with French ARQ-E message traffic to RFGW-MilFrance Antananarivo at 0600. (Hall-RSA)

14732.2 RFVITZ-COMSUP St. Denis, Reunion Island, with French ARQ-E message traffic to RFVIT-Reunion at 1155. RFFAX-Gendarmerie Paris, France, with French ARQ-E messages to St. Pierre et Miquelon at 1159. (Hall-RSA)

14937.5 TTL-AFTN N'Djamena, Chad, with ARQ-M2 weather and aero traffic at 0617. (Hall-RSA)

16038.3 Zaire bank circuit with SITOR-A French message traffic. (Hall-RSA)

16125.0 RFQPJV-*Jules Verne* with French message traffic to RFVICF-La Boudeuse (Reunion) using ARQ-M2 at 1341. (Hall-RSA)

16192.9 RFQP-Dircomiy Djibouti with urgent French message traffic using ARQ-M2 to Airinfra Paris at 1316. (Hall-RSA)

16334.3 FSZ63-St. Denis Meteo, Reunion Island, with 75 baud RTTY weather codes at 1246. (Hall-RSA)

17904.0 Honolulu ATC, HI, working Air Mike 995 in USB at 2120. (Brookman-AK)

17946.0 Honolulu ATC, HI, working N300QW in USB at 0214. (Brookman-AK)

18393.0 Andrews working SAM 27000 in USB at 2135. (Haverlah-TX)

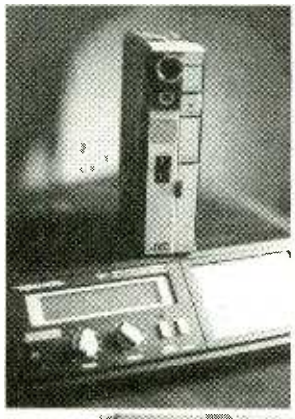
18881.0 English female 5-digit number station in AM at 1700 (Sat UTC). (Mazanec-OH)

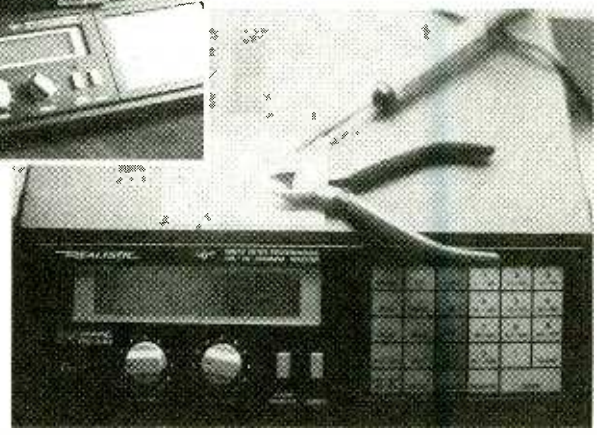
20186.0 NASA space shuttle audio in USB at various times during shuttle mission. (Storck-MI)

23120.1 Italian Embassy-Lagos, Nigeria, with ARQ-E Italian message traffic at 1126. First time heard. (Hall-RSA) *Congratulations, Robert; nice catch-Larry.*

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

Scanning Savvy





Thinking about making a tape recording or modifying your equipment? You might want to think twice.

Scanning is a hobby that is governed by a variety of rules and regulations. Whenever I mention the laws that govern our hobby, most folks don't listen. Think about it for a moment. When someone mentions the Electronic Communications Privacy Act or the Telephone Disclosure and Dispute Resolution Act, the hairs on the back of your neck begin to bristle and you feel a compulsive urge to say something like, "The current scanning laws are ridiculous and nearly impossible to enforce."

I'll be the first to admit that the new laws are ridiculous, unfair, and violate our listening freedom. I don't like them any more than you do. And I won't try to make you like them, nor will I try to explain them. My best advice is to forget the new laws and replace them with your common sense.

No, I haven't lost my mind. Nor am I suggesting that the current laws are not important. I'm merely trying to emphasize that many of us seem to have placed our common sense or maybe I should call it, "Scanning Sense," on the back burner. Or call it scanning savvy or smarts, if you like. Here are a few examples of what I'm talking about:

It's illegal to share what you've heard with a third party. It doesn't take too much "scanning sense" to realize that it's also a violation of the law to send tape recordings of scanner conversations to fellow hobbyists and/or the news media. The majority of local news papers, television and radio stations have not presented the scanning hobby in a positive light. If you send a recorded audio tape to the news media, don't expect to be treated like a hero. The news media will probably twist the entire scenario into a very embarrassing situation.

The third party rule is not new. It's been around since 1934 and is commonly referred to as the "Communications Act." And, although it's a lengthy document, it can be summarized in one sentence: "Don't repeat what you hear." If you observe this rule, you can forget about the Electronic Communications Privacy Act, the Telephone Disclosure and Dispute Resolution Act, and any other federal or state scanning law. It may sound overly simplistic, but it's the perfect model of how to exercise your scanning sense.

Are you recording cellular phone calls? If so, your scanning sense isn't working too well. Tape recordings are nothing more than ticking time bombs. A cassette tape, filled with cellular phone calls between 870 and 890 megahertz, can easily fall into the wrong hands. It's also very easy to mislabel a tape or to simply give someone the "wrong" tape!

The same logic or scanning sense, can be applied to cordless phone recordings (46.61 to 46.97 MHz). Sure, it's fun to listen in, but don't record what you hear. In the wrong hands, cordless phone tapes could be more lethal than a loaded gun.

Your scanning sense should warn you if you feel the urge to respond to a medical emergency. (See Table 1.) Scanner buffs who physically respond to medical dispatch calls are taking a tremendous risk. Your response, although well intended, may result in a law suit that could be financially devastating.

Sharing new frequencies with a fellow hobbyist is not illegal. However, your scanning sense should be waving a red flag. Why? If you've been listening to an elusive frequency that has been providing hours of intrigue, keep it to yourself. Don't share it until the monitored action begins to slack off. *Monitoring Times* and similar publications are closely read by a variety of law enforcement agencies. Elusive, local frequencies that are published for all to see, often go "silent" for extended periods.

Modifying a scanner radio that is under warranty is a prime indicator that your scanning sense isn't working. The warranty has nothing to do with the current scanning laws, but the warranty does contain rules and regulations that cannot be violated. Opening the case to add or remove a component will void the warranty. The manufacturer won't care if the problem is unrelated to your modifications. If you've removed the case and snipped a wire or added a component, the warranty is useless. The problem is especially frustrating if you've paid extra money to extend the warranty.

How you choose to enjoy the hobby is a personal choice. There are scanning hobbyists who enjoy talking to the media. Others have no reservations about responding to monitored emergencies. Many others enjoy recording conversations and making internal modifications to their equipment. If you choose to do the same, be aware of the choices you're making, and use some savvy when it comes to scanning.

TABLE 1

Medical Emergency Allocations

Med Channel	Base	Mobile
1	463.00	468.00
2	463.025	468.025
3	463.05	468.05
4	463.075	468.075
5	463.10	468.10
6	463.125	468.125
7	463.15	468.15
8	463.175	468.175
9	462.95	Dispatch
10	462.975	Dispatch

■ Treasure Hunt

The brand new, 1995 edition of *Police Call* can be yours. Gene Hughes, publisher of *Police Call*, has provided two complete sets for our January/February Treasure Hunt. The complete nine volume set places the frequencies for all 50 states at your finger tips. Here are the clues:

1. Provide the high and low frequency range for the VHF low band.
2. What is the bandwidth of the VHF high band?
3. What is the "IF" frequency for your scanner radio?
4. In the 453 MHz UHF Police band, repeaters are offset 5 MHz from mobile units. True or False?
5. In what year did Ronald Reagan prohibit the release of federal frequencies?

Our two lucky winners will receive the completely revised, 1995 edition of *Police Call*—more than 300,000 frequencies! Good luck.

And the 1994 Treasure Hunt Winners were ...

Month	Prize	Winner
Jan/Feb	Antenna Stick	Bob Powell, Ind. IN
Mar/Apr	Loop Yagi Antenna	Russell Poore, Boothwyn, PA
May/Jun	HTS-2 Speaker	Michael Reeb, Lehigh, FL
July/Aug	Grove No-tenna	Linda Curtis, Frazier Park, CA
Sept/Oct	CTCSS Decoder	Mike Burch, Berkley, MI
Nov/Dec	Frequency chart	Free to everyone

■ Frequency Exchange

Our first invitation is from **Stockton, California.** A scanner buff who calls himself "Shawn" sent in the following:

San Joaquin Sheriff

460.125	Sheriff
460.1625	Delta College
460.225	Tactical
460.2875	Delta College
460.35	Record checks
460.475	Tactical
464.975	Pacific Univ. Sec.

Crack Net

154.20	Crack net
154.46	Crack net
154.635	Crack net
154.665	Surveillance
154.67	Crack net
154.68	Operations
154.695	Surveillance
154.905	Special events
155.04	Special events
156.075	Calcord

Lincoln School District

151.625	Police
154.515	Pagers
155.175	School bus

San Joaquin Fire

154.07
154.13
154.265
154.28
154.295

Stockton School District

453.425	Police
464.425	Police
464.475	Security & maintenance
464.675	School bus
464.925	Police
469.475	Police
469.925	School security

Auto Service

150.815	Reed & Son Towing
150.845	Vern's Towing
150.935	Triple A, Modesto
154.54	Nicora Auto Service
452.575	Triple A, Stockton
463.325	Pacific Towing

Wes Helena, is brewing a fresh pot of coffee in **Wichita City, Kansas.** And as you probably already guessed, it's our next stop.

Wichita/Sedgwick County Sheriff

856.2625	857.7375	859.2625	860.4625
856.4625	858.2625	859.4625	860.7375
856.7375	858.4625	859.7375	860.9625
857.2625	858.7375	859.9625	
857.4625	858.9625	860.2625	

Wichita Rail Frequencies

160.26	Santa Fe
160.335	Santa Fe
160.41	MO Pacific
160.47	MO Pacific
160.605	MO Pacific
160.65	Santa Fe
160.68	Union Pacific
161.10	Burlington Northern

Wichita Trunking System Failure Plan

856.4625	Police West
857.4625	Police East
858.4625	EMS
859.4625	Dispatch
860.4625	Jail
860.7375	Paging

We've all been invited to the home of Leon Labrasca. Leon lives in **Mount Pleasant, South Carolina,** and here are his favorite frequencies.

39.18	Trash Collection
42.14	Highway Patrol
47.22	Highway maintenance
140.05	Naval Base Security
140.07	Naval Investigative Services (NIS)
140.35	Naval Base Security
140.575	Naval Base Public Works
143.575	Naval Base fire
148.35	Naval Base Tug boats
148.80	Naval Base hospital
151.235	Forest Service
153.605	Mount Pleasant Waterworks

154.98 ..... School Buses
155.64 ..... Dept. of Corrections
155.67 ..... Goose Creek Police
156.425 ..... City Marina
156.975 ..... Ross Marine Boat yard
158.46 ..... Blue Flame Gas Company
159.96 ..... Bulldog Trucking Company
161.475 ..... NIS
168.525 ..... VA hospital
450.25 ..... WCIV TV remote broadcast link
460.875 ..... North Trident Hospital Security
461.125 ..... Airport Limo Service
464.125 ..... Wild Dunes Resort Golf Shop
464.175 ..... Wild Dunes Resort Security
464.675 ..... Citadel Mall Security

Leon's complete list contains more than 400 frequencies for the Mount Pleasant area. The list is free, but you must provide a #10 SASE. Send your request to the Frequency Exchange, P.O Box 98, Brasstown, NC 28902.

Things will get a little colder at our next stop. Ed Muro lives in **Cedarhurst, New York**, and his invitation included the following:

Nassau County Police

477.2125		478.7125	Detectives
477.2375		478.9125	
477.262	Highway	478.937	Surveillance
477.3875			

If you're looking for frequencies in **Wilkes Barre, Pennsylvania,** drop by and say hello to Kevin Edwards. Kevin lives in Shamokin, and here are his favorite monitoring targets.

153.845 ..... Wilkes Barre buses
154.085 ..... Nanticoke buses
154.74 ..... Wilkes Barre Police
154.77 ..... Wilkes Barre Police
154.89 ..... Wilkes Barre Police
155.16 ..... Kingston Memorial Hospital

Since we're already in **Pennsylvania,** let's take advantage of an anonymous invitation that was sent in from **Philadelphia.**

Conrail

160.245	160.56 .... Police	160.86
160.335	160.68 .... Police	160.98
160.35	160.80	160.995
160.41		

Amtrak

160.515	161.07	161.295 ... Police
160.80	161.205 ... Police	161.505

The Frequency Exchange is always looking for new and exciting places to visit. Send your frequency invitations to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

■ Cellular Recording

In Snohomish County, Washington, a scanner buff who tape recorded a cellular phone call may have recorded a murder suspect bragging about a killing. In the tape-recorded conversation the person stated how he shot the victim and where he threw the gun afterwards.

The County prosecutor said that monitoring and tape recording cellular phone conversations raises "substantial questions." The prosecutor also said that if the recording is illegal, the conversation cannot be used in court. (News clipping from the *Daily Herald.*)

■ More Cellular Headaches

A former North Carolina state Supreme Court Justice and two supporters were sentenced to six months probation and fined for monitoring and taping cellular phone conversations.

The trio listened to the cellular phone conversations between a political candidate, his son, campaign advisers and supporters. The monitored information was used to attack the opposing political party during an election year.

Prior to passing sentence the judge said, "I am embarrassed for you. I am embarrassed for my party and I am embarrassed for my state. You all have enjoyed a rather privileged background, an excellent education and high station in life. None of that is honored by what I've seen here." (News clipping from Ray Walton, Rocky Mount, NC.)

■ Cordless Phone Recording

A teenage girl in Albany, New York, tape recorded her teacher's cordless phone conversations. The high school teacher was taped as she talked about a tentative student walkout in support of the Teachers Association, which was working without a contract. Problems developed when the teenager took the tape to school officials.

A New York City lawyer is attempting to bring felony charges against the teenager for allegedly violating a ruling by the Appellate Division of the state Supreme Court. The court states that eavesdropping on a cordless phone call is a crime, assuming it is done intentionally.

■ Trooper Cellular

An Oklahoma State Trooper has filed a federal law suit against his supervisors. The suit charges that on Dec 17, Trooper Howard talked on his cellular phone to another trooper while off duty. Minutes after the conversation, Howard's State Police supervisor called and reprimanded Howard for the conversation.

The supervisor received a disciplinary transfer and a complete investigation is currently in progress. (News clipping from Dick Sharp, Oklahoma City.)

■ Bidding for PCS

Personal Communication Services (PCS) will offer many new cellular-type phone services to the general public. At the very least, the new service will introduce several new competitors into the cellular phone market. It is expected that the new competitors will force cellular phone companies to lower the price of owning and operating a cellular phone.

Prior to offering PCS to the public, the corporate giants must bid on the available frequencies. The FCC required companies to make advance payments based on population figures.Advance payments:

Sprint Corporation ... $123.8*	Bell Atlantic $54.7
AT&T $78.4	GTE $50.0
Pacific Mobile $56.0	* All figures in millions

As the bids are awarded and PCS begins to unfold, we'll pass on the information in future issues of *MT.*

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Skip Arey, WB2GHA
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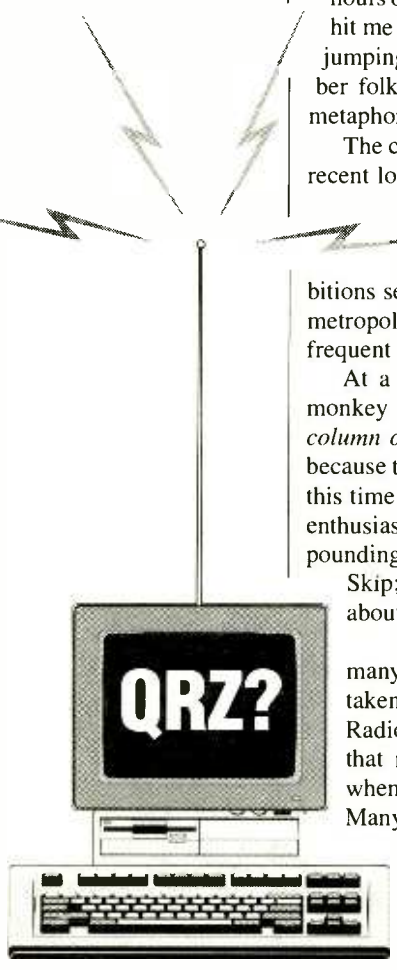
Doing the Computer Show Shuffle

It's funny how writing works. Sometimes a column idea comes out of my well of undeveloped notions. Other times, the words I put to page come as the result of a bench racing and lie swapping session from the wee hours of a radio hobbyist get-together. Still other ideas hit me like a bolt of lightning or like a crazed monkey jumping on my back and screaming in my ear. (Remember folks, I am a professional writer; don't try these metaphors at home!)

The concept for this column jumped on my back at a recent local computer show. Unless you live in a cave somewhere, you may have noticed that computer flea markets, swap meets, auctions and commercial exhibitions seem to occur on any given weekend near most metropolitan areas. Being your basic techno-junkie, I frequent as many local shows as my wallet will allow.

At a recent computer sales exposition, the crazed monkey of inspiration screamed in my ear . . . *"Do a column on computer shows!"* Normally I don't argue, because the monkey has a particularly nasty temper, but this time I said "But this column is for beginning radio enthusiasts." The monkey got really mad. He started pounding on my back saying, "Look around you, Uncle Skip; there are things here that folks need to know about."



The line between the computer and radio hobbies is blurring.

The monkey was right. Computer shows have many things to offer radio hobbyists. If you have taken a glance at John Catalano's "Computers & Radio" column here in the pages of *MT*, you know that modern monitoring is significantly enhanced when you stir in a modicum of computer literacy. Many new receivers and accessories are designed to have their use improved exponentially by running a cable between them and a PC.

At a computer show you will find hardware, software, books, parts and other things that are of particular use to a radio hobbyist if you keep your eyes open and remember why you showed up. I also discovered that beginners could use a hand at figuring out the lay of the land at these technology love fests. So allow me to pry this primate off my vertebrae and drop some notions your way.

■ Computer Shows vs. Hamfests

The lines between these two types of gatherings are blurring more and more. Computer vendors are known to frequent amateur radio swap meets because they know ham radio folks are prime targets for their wares. Ham gatherings usually have a great many local hams selling used gear. Computer shows tend to be made up of professional vendors selling new computer products.

But the main difference is that ham radio gatherings tend to be fairly friendly, laid back affairs (the Dayton Hamvention notwithstanding). On the other hand, pure computer shows put you deep in the realm of cutthroat capitalism and *caveat emptor*. At a computer show, everything moves fast, including your money. So do not go through the doors of a computer sale without a specific plan of action.

■ Preshow Planning

First, have a solid notion of how much money you are prepared to part with at one of these extravaganzas. It is really easy to get caught up in the veritable feeding frenzy of purchasing that goes on around you. If you blow the rent money on too many computer goodies you may find your significant other suggesting you move into the dog house with your toys for the foreseeable future.

Make yourself a two columned list. In the first column write down the things you "need." You know—the stuff that you specifically came to the show for and have the cash set aside to buy. In the second column, list those things that you "want" but could walk out of the show without the world coming to an end. In the world of computer shows you never have to be disappointed if something isn't available or if it costs too much that day. Like busses, there's always another computer show coming along, which may have just what you're looking for.

Even if you're really new to the computer show game and don't have a clear idea of your exact needs, jot down a few notions to guide the way. Maybe something like, "A piece of software that will help me manage my loggings," or "A book to help me understand how to use my modem." Computer shows can put you into sensory overload. There is so much to see and to buy that the only way to keep your head is to refer to your trusty list to guide you along.

Remember also that you are a radio person. Need a new jack for your headphones? Building up one of Doug Demaw's Workbench projects? Looking for coax connectors or "tweenies?" Add them to your list, Compadre. High quality, radio useful components frequent many of the hardware vendor's tables. Old Uncle Skip always has a project or two going on his workbench.

I remain amazed at how many useful parts turn up at computer shows at really great prices. Because the stuff tends to be "computer grade" the quality is often excellent, too. There are times I show up at one of

these shows and leave with nothing for my computers and pockets full of parts for fixing or building one radio related project or another.

Okay, you have your list of goodies; how do you figure out fair prices? A glance at the back pages of any of the major commercial computer magazines on your local newsstand will give you an idea of the going rate for most computer stuff.

■ Move Away from the Door

At most computer shows, you will find literally dozens of dealers often selling the same hardware and software. For this reason, never grab the first deal that comes your way. Price variations in excess of 25% for the same product are not uncommon. You can almost bet that you can beat the price of the first vendor you encounter as you move amongst the tables. For this reason, make your first pass through the place a "recon" run. Then you can pounce on the best prices without any difficulty the second time around.

■ Know Your Versions

Okay, suppose one of the things on your shopping list is a piece of software called "Write Up." Let's say it's the hot set-up in word processors and you want it real bad to write your QSL letters and for sending in your logging reports to club journals and to *MT*. You have checked in the computer magazines and see that the going rate for Write Up is $100 and you have all this down in your notes.

Now you turn the corner at the computer show and you see a vendor with stacks of "Write Up" software packages that he is selling for 25 bucks a pop. You think you've died and gone to computer heaven, right? Wrongo Bongo!! The latest and greatest (and $100) version of Write Up is Write Up Version 4.0. Careful examination of the vendor's boxes shows that he or she is unloading surplus earlier versions of Write Up Version 2.0.

Here is where things get a bit sticky and you have to make some judgment calls. Often, software upgrades are collections of additional program features. If the earlier version of the software meets your needs and you don't need the new bells and whistles of the latest version, you have found yourself a bargain. But if the latest version of the software corrects an enormous bug in the program that made all previous versions a living hell to use, you are not going to get your money's worth.

Also, do not be swayed by a silver tongued vendor's announcement of "There's a certificate for a free upgrade inside the box." Ask to see the certificate and be sure to take time to read it. You may find that the date for redeeming the certificate has long since expired.

■ We Know Where You Live

As you are reconnoitering the vendors, make note of where these folks come from. Some of the vendors will have come from several states away. Try to keep track of the ones that are obviously local. This is useful if you need to return or replace a defective product. It can be a real bear, tracking down someone from half a continent away when you go home and discover that new floppy drive you bought won't spin. Cheapskate that I am, I will even forgo a dollar or two difference in price if I am going to be dealing with somebody who is only a local phone call away.

Needless to say don't buy anything from a vendor who is unwilling to give you a receipt that includes his or her business name, address, and phone number. Never deal with anyone you can't track down. It is also useful to make significant purchases via credit card. Putting things on plastic gives you an extra avenue of recourse if your purchase is less than perfect. Your credit card company is often in a position to mediate problems should they arise.

Photo courtesy of George Ashleman, KB9ENX

***Ham radio gatherings, like this Mid-winter Hamfest near Chicago, tend to be fairly friendly, laid back affairs (the Dayton Hamvention notwithstanding). On the other hand, pure computer shows put you deep in the realm of cutthroat capitalism and* caveat emptor.**

■ CD ROMania

The hottest thing going in home computers has to be the CD ROM. I'm having a hard time remembering what scanner monitoring was like before I got my Grove FCC Database on CD. Computer shows are great places to get any of hundreds of CD-ROM titles for your PC. Here is a place that radio hobbyists can really get some neat stuff.

Two CD titles seem to pop up at every show I attend that are worth a look for the radio hobbyist. Walnut Creek's **QRZ! HAM Radio CD-ROM** edited by Fred Lloyd AA7BQ and Chestnut Software's **Ham Radio** disk are both full of tons of data useful to every radio person who has access to CD-ROM technology.

Don't let the "Ham" titles fool you. Much of the information and programs found on these disks can be used by any radio monitoring hobbyist. Both disks even have sections specifically devoted to SWLs. Keep an eye open items such as these as you cruise the tables.

Everyone who travels the world by way of radio monitoring needs a good atlas. Several companies put out CD-ROM atlas programs. Some of these programs are quite clever and can help you get a handle on the world you are listening to.

You are also likely to see many different collections of "shareware" committed to CD-ROM. CD technology lets a manufacturer put literally thousands of small programs on one disk. Check these over closely. I have always found a few programs on such disks devoted to the radio hobbyist.

■ Networking

No, I'm not talking about linking a bunch of computers together (although you could surely get the stuff to make that happen at a computer show). I'm talking about finding some like minded radio folks in amongst the common computer show rabble. Since I am a ham, I always wear my amateur radio "callsign" badge when I go to computer shows. It never fails to get noticed by a ham or two. These "eyeball" meetings are great fun and I get to widen my circle of radio friends.

■ Have Fun

Computer shows are a great way to shake off the winter doldrums until the first hamfests of spring appear with the robins. Give it a try, and keep an eye out for Old Uncle Skip.

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fax: (405) 233-2948 ATT: Hauser

Stamp it Out

The domestic postal rate increase to 32¢ is expected later to bump international rates up correspondingly, date unknown at presstime; before writing stations abroad, Americans should be sure to get the new rates from the Post Office. Remember that "G" stamps are not valid for international mail, since USPS will not inform foreign counterparts that they are worth 32¢! A glossy full-color QSL card still cannot be conveyed by E-mail or fax, but in light of recent horror stories, even before the rate increase, you may wish to try something other than snail-mail for writing to stations.

In *Play-DX*, G. Serra in Roma warns: better not send any money or stamps in envelopes to *PERÚ*; 90% of mail is checked and opened even if sent registered. Mail distributed via the airport postal service of Moscow, *RUSSIA*, is almost all checked by people who take everything out of the letters, registered or not. Better send mail by surface to St. Petersburg offices.

To *NIGERIA, LATVIA, LITHUANIA,* use registered airmail and don't hermetically seal envelopes, or better yet, use fax! For *UKRAINE,* use only registered letters. Peter Krochmaluk, Ontario, agrees: registered airmail is best; mail to Ukraine is lost in their postal system, not as censorship, but postal people looking for dollars.

Radio Tashkent, *UZBEKISTAN*, announces forwarding addresses abroad: 72, Wigmore St., London W1H 9DL, England, says Edwin Southwell in DSWCI *Shortwave News*. Wolfgang Büschel says these belong to Uzbek Airlines. Another is 848-850 Ramapur Rd., Bangkok 10050, Thailand; forwarding is due to mail theft problems, per Ed Rausch, HCJB *The Latest Catch*.

RAMADAN dates this year are approximately Jan. 31-Feb. 28, per Terry Krueger, *DXSF* via *Play-DX*; that's when stations under Islamic control habitually expand their broadcasts to all-night and shift times of newscasts; some normal Arabic schedules for *EGYPT, KUWAIT, SAUDI ARABIA* appear in *SWG* pages.

ISRAEL and Berlin-6005 got reprieves; new stations or services from *CZECH REPUBLIC, SOUTH AFRICA, ZAMBIA* and *ZIMBABWE* also highlight this month's news; read on...

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

ANDAMAN ISLANDS AIR Port Blair on 7115 ex-7170 due to Singapore, now scheduled 0315-0345 (Sat 0415, Sun 0505), 0700-0851 (Sun 0951); on 4760 until 0300 (Jose Jacob, *DX Post*)

ANGOLA R. Nacional, 9534.8, fair with English hour of news and Euro/African music at 2000, preceded by French, followed by Portuguese; also in Portuguese at 0120-0200+ on 3374.93, 4950.03, 7244.95, 11954.76. VORGAN program at *0453-0510+ on 9720.2 (Brian Alexander, PA) This is not the UNITA clandestine but a counter-program on RNA itself (Chris Greenway, BBCM) Until 0700 and on 11955 at 1100-1200, back in November after a break since June (BBCM) VORGAN no longer active on 4960, only on 9705 ex-9700 at *1130-1200*, best on USB (Vashek Korzinek, South Africa, *Play-DX*) 9705 presumably the real one

ARMENIA Araks Radio Agency with English news, local folk music at 2335-2349 on new 9685, as well as 2300-2315 on 9480 (Brian Alexander, PA) At 2330 also on 11970, 11920; 2300 also on 11960 (BBCM)

AUSTRALIA Australian Defence Forces Radio service to Africa changed some frequencies to DSB for easier reception: 0800-1000 on 18193-USB, 15607-DSB; 1400-1600 on 10623-DSB, 8743-USB (Hugh MacKenzie, ADFR, R, Netherlands *Media* Network) You mean also with carriers, i.e. AM? (gh) Heard several days at 1430, weak news about Australia, music on 7030-SSB, maybe for Forces (B. L. Manohar, Lucknow, India) See also SWGuide Highlights.

BELGIUM RVI in early Dec. on 13670 ex-13675, English to N. Am. at 1400 exc. Suns. 1330 (RVI *Radio World* via Steven Cline, Wolfgang Büschel) Finally took our advice after 2+ months of needless clash with UAE, tho still bothersome as neighbors, also uncovering Dubai's English at 1330. Also belatedly on 9925 at 0030 escaping Greece 9935 (gh)

BULGARIA R. Varna has its own SW program *Hello, Sea!* Fri. 2200-2300 on 7260, not the official frequency 7230 (Bulgarian listener on V. of Russia *DX Klub* via BBCM)

CANADA RCI at 2100-2159 on 9725 ex-15325. A new 50th-anniversary QSL is planned (RCI *Mailbag*)

CHETCHNYA Separatists are trying to establish a SW outlet to Europe and beyond, much like Pridnestrovye, but funding is the major problem; considering transmitters in Moldova, Ukraine, small chaance, but anything can happen (Groznyy listener to *World of Radio* via Kevin Hecht, PA)

CHINA CRI's 1200 to N. Am. has been dropped from winter schedule, but still on at that time to Pacific, Asia on 9715, 11660, 11795, 15440. For programs, see SWG Highlights.

(non) Hsin Hsing, New Star clandestine with numbers, heard at 1500 on 8300 but not former 9725, 11430, 15288 (Finn Krone, AWR-DX via BBCM) Was 15388, also 12750, believed from Taiwan (BBCM)

COSTA RICA RFPI's 15030 was off for some weeks as one of its original transmitters broke down; being rebuilt for somewhat higher power and may use 15050 or 15060 instead; and the bandswitch on 6200/12150/17905 unit broke so it stays on 17905-USB daytimes; has 5-year plan to raise $350,000 for a 100 kW transmitter which would also require new building and power lines. New direct E-mail address: rfpicr@sol.racsa.co.cr checked daily; on-line QSL available (RFPI *Mailbags*) First-quarter sked shows *WORLD OF RADIO* times unchanged; *Far Right Radio Review* moved to Sun 2200, Mon 0600, Tue 1800, Wed 0200, 10000 (RFPI *VISTA*)

Besides 1200, TIAWR's *Week in Review* airs earlier Sun. at 0600, on 5030, 6150, 7375, and/or 9725. Only other secular shows are *News* weekdays for 5 minutes at 0700, 2300; and perhaps in part, *Insight and Entertainment* hours weekdays 0600 and 1200 (via Bill Flynn, CA) Program hours repeat: 06 and 12; 07 and 23; 10 and 24; 11—no repeat (David Gregory, TIAWR via Flynn)

CUBA My DX program *Para los Diexistas* is on R. Rebelde, 5025, every Sat. at 0600-0620 since Nov. (Manolo de la Rosa, *Play-DX*) varies as low

as 5021.67 (BrianAlexander, PA) But SW not on when we checked in Dec., tho back at 1200 recheck; on MW 670 & 710, no DX show (gh) RHC SSB in English expanded to 0100-0700 on 9830 (*DXers Unlimited*) programs, see SWGuide Highlights.

CZECH REPUBLIC R. Metropolis, private external service on SW authorized last May, finally started testing in late Nov. with quadrilingual announcement loops (Dave Kenny via George Thurman, Edwin Southwell, J. D. Stephens, FIDONET via USENET via Thurman, Nick Terrence) A week later modified schedule to: 0700-0755 9455; 0800-0855 5905; 0900-1055 9470; 1100-1255 & 1300-1400 5905; 1600-1755 5940; 1800-1955 7250; 2000-2255 7305; 2300-0100 6200 (Jeff Richardson, DE, *DX Listening Digest*) Address is Yesiniova 38, 13000 Praha 3 (Southwell, Richardson, BBCM) Using 2 x 40 kW ex-jammers at historic Podebrady site east of Prague (ORF *KW-Panorama* via Büschel) At the old Tesla factory (Ludo Maes via Guido Schotmans via D. Dine via D. Mauer)

ECUADOR R. Francisco de Orellana, 2060 = 2 x 1030, almost daily in 2307-0158* period with dance music at 0030. R. Estéreo Carrizal, Calceta, 3260 at 0310-0349* to return at 1100 (Fernando Viloria, Venezuela) Is 400 W and only on SW, no relation to old Voz del Río Carrizal; addr. is Av. Estudiantil, 5a., Velásquez, Calceta, Manabí (Henrik Klemetz, HCJB *TLC*) R. Quito reactivated on 4919.9 at 0000, good signal, poor mod (Klemetz, HCJB *DX Partyline*) R. Progreso, Loja on 10120.9 = 2 x 5060.45 at 1923 (Rich McVicar, *ibid.*) HCJB carries TWR: German 2300-2400 on 15250; Portuguese 0930-1030 on 6125, 9765; 2200-2300 on 15355 (McVicar)

ETHIOPIA R. Ethiopia announced that EPRDF ruling coalition, which formerly had two clandestines with lengthy names, started new R. Fana (Torch), 10 kW on SW, later confirmed on 6210 at 0330-0800, 1530-1700 in Oromifa, Amharic, in line with R. Ethiopia content (BBCM) R. Amahoro, V. of Peace for Rwanda, at *0357 on 9560 gives address: P. O. Box 1631, Addis Ababa (Ed Rausch, NJ) Surprisingly strong; opens with xylophone, closes hour with drums (Brian Alexander, PA)

(non) Free Radio Voice of Ethiopian Unity (Amharic: *Yenetsa Radio Yeethiopia Andinet Dimts*) hostile to Ethiopian government, again heard after 9 months, 1600-1700 on 11945 Wed. & Sun., other days carrying Moscow in French; very similar to 1992's V. of Ethiopian Patriotism. Address is P. O. Box 91701, Washington, DC 20090 (BBCM)

GERMANY Contrary to lead item in Dec., DLR Berlin decided to keep 100 kW Britz on 6005 in 1995, as it's cheaper than leasing from Telekom (Wolfgang Büschel, Stuttgart, *W. O. R.*)

GOA AIR Panaji heard on 4775 1400-1600, including English news to 1445, clear ID mentioning "Pana-gahji" (Dan Robinson, VOA Bangkok, NASWA *Journal*) Goa IDs at 1400, 1430, 1445, but another AIR on 4775 mixes after 1500, maybe Gauhati (Jorma Mantyla, Finland, HCJB *DXPL*) No, the other one is Imphal, Manipur, 50 kW expanded to *0025-0300, 1130-1735*, very good with nice Northeastern music (Victor Goonetilleke, Sri Lanka, RN*MN*)

GREECE VOG at 0000-0350 shifted 7450 via Kavala to 7448 to avoid RTTY 7453; then blocked by Norway on new 7450 during the 0200 hour (John Babbis, MD, *DXLD*) VOG dominates here (gh, OK)

HAWAII *World of Radio* on KWHR Sat 1729 on 6120, Mon 0330 on 17510, but not Sat 2200 (gh)

HUNGARY Amazing that two 75m channels R. Budapest picked both conflict with BBC, such as 3955 both in English at 2200; 3975 both in German—BBC relaying Korea—at 2030; but Budapest also on new 4010 in Hungarian until 2200 (Alan Roberts, PQ, *DXLD*) Don't confuse with Kirgyzia

INDIA AIR found on weird 11288.5 AM at 1627; recheck at 1745 had drifted to 11286.5, GOS in English, and again at 2032 giving 7412, 9950, 11720, 9910, 11715, 15225; believe is bad crystal or punch-up error (Paul McDonough, MA, *W. O. R.*) see also GOA, ANDAMAN ISLANDS

INDONESIA RRI Sibolga now on 5030 ex-5256 (Jürgen Lohius, DSWCI *SW News*)

IRAQ Baghdad's Kurdish service confirmed again on 6560 at 0300-2130 (BBCM) RII, 13680, English news at 1012 (Brian Alexander, PA, *WOR*) Says English runs 0900-1200, but actually ends between 1230 and 1250; has 15-min features, some propagandistic. Mod quality varies from badly distorted to perfect (Ed Rausch, NJ, *WOR*)

ISRAEL As a "Hanukah present," Israel Radio announced funding had been found to continue SW through 1995 (Steven Cline, IN & gh) Only three months has been assured, while the Deputy Director General writes a report on policy and strategy, likely to take longer than that (Jeff Cohen, World Radio Network, USENET via Thurman)

KASHMIR AZAD (& non) Azad Kashmir Radio, voice of freedom fighters, has no entertainment programs; hours expanded to 0045-0500, 1000-1808 from Muzaffarabad, 110 kW. Trarkhel has 10 kW; and a 100 kW at Rawalpindi, Pakistan also runs daily one-hour programs on Kashmir (*The Nation*, Islamabad, via BBCM) Muz. on 7267.3, heard at 1128 ID, music; Trarkhel on 3665.1 (Al Quaglieri, NY, NASWA)

LEBANON V. of Lebanon, 6549.7, has news in English Mon.-Sat. 1800-1815, 2325-2336 (RVI *Radio World* via Cline) The later time gives us a chance.

MEXICO R. Universidad de SLP, 6045, heard 1300-2400 with classical music mix (Harry Haines via Don Moore, *Fine Tuning*) *1305, deep fades (Mike Nikolich, IL, *FT*) trace here (gh)

MOLDOVA (non) RMI via Romania, English to us at 0200-0224* on 7190 irregular, heard on only three dates one month despite many checks, and unID co-channel QRM (Brian Alexander, PA) USSR-era-type white noise jamming sporadically against RMI in various languages. At 1110 in Romanian shifted to 17812.4, 17737.4 to avoid jamming on 17815, 17735, but by 1120 obscured by expanded jammer bandwidth (BBCM)

MONACO TWR English at 0740 registered 7110, moved to 7120, settled on 7115 (AMID via Büschel)

MONGOLIA R. Ulaanbaatar fax is 976-1-323096 (via Mickey Delmage, CIDX *Messenger*)

NEPAL R. Nepal, 7165.25, quite good one morning, but very poor the next, from *1114, best on LSB to evade 7170; 1115 timesignal has 3 pips and a fourth higher and longer, ID as *Yo Radio Nepal Ho* (Rich McVicar, Quito, HCJB *DXPL*)

NEW ZEALAND Contrary to Nov. *MT*, p. 44, Kiwi Radio was *not* busted or closed down. The Dept. of Commerce arrived but did not enter, to advise us we were on air illegally. We will continue to broadcast irregularly into the distant future. Length varies on 5850, 30 to 800 watts at 0530-0830; 7445 at 0600-0850, 7455 at 0850-1000, both 100 to 1200 watts (Graham Barclay, Kiwi Radio) Apologies to you and Arthur Cushen who did not use the word "bust"—I assumed a "visit" was tantamount to a bust (gh)

NICARAGUA R. Miskut reactivated on 5770-USB until 2330* with *Ode to Joy* anthem (Henrik Klemetz, Colombia, HCJB *DXPL*)

NORWAY RN testing 7450 ex-9560 at 0200-0255 including English UT Mons; extended bands available to it include 7100-8100, 18900-19020 (Olav Mo Grimdalen, Teleforvaltning via Bob Thomas) see also GREECE

PAPUA NEW GUINEA R. West Sepik, 3205, closed down for good

at the end of August, per verie from Paia Ottawa (Lars Skoglund, *SWB* via DSWCI) Rabaul to install transmitter on 3325 for program to N. Solomons as Kieta transmitter is not being replaced due to uncertain situation. Rabaul 3385 is back at full strength following volcanic outage (Arthur Cushen, *NZ DX Times*)

PARAGUAY AWR plans new SW station probably here with two 50 or 100 kW, expanding maybe to four covering most of S. America; hope to be on by end of 1995 (AWR Germany via BBCM) All $1.6 million funded by Dr. Milton Alfonso, Brazil (Adrian Peterson, AWR)

PERU R. Jaen, 5005.5, reactivated after 10 years, heard at 1130; and 0330 with *Así canta Ecuador*, but not regular. Also playing Ecuadorian *pasillos* around 0100 is La Voz de Naranjos on exactly 4300; this area in Rioja was Ecuadorian territory until 1942 (Henrik Klemetz, Colombia, HCJB *DXPL*) see also lead story.

ROMANIA RRI at 1105 on 17855 plus spurs every 38 kHz between 17 and 20 MHz! (Andy Goodwin, UKOGBANI, BDXC *Communication*)

SAN ANDRÉS La Voz de la Isla at 0315-0411+ nonstop trop music, IDs at 0330, 0400 on 2200 = 2 x 1100, tho announced and listed as 1110 (Don Moore, IA, HCJB, *TLC*)

SA'UDI ARABIA Holy Koran Station at *0300, ID 0330 on 4942.5 = .05 x unheard 9885 (Hans Johnson, MD, HCJB, *DXPL*)

SLOVAKIA (& non) Larry Magne claims *Worldscan* for *PWBR*, so our new DX program renamed *Wavescan*; see Jan p. 44. Special QSLs for this thru March, with r.p. to Box 29235, Indianapolis, IN 46229. Time on HRJA will be Sat. 2100+ on 15675; WRMI UT Sun 0100+ on 9955 (Adrian Peterson, *Wavescan*) WRMI proud to be exclusive N. American outlet; probably repeated Sun. 1230 during *Viva Miami* (Jeff White, WRMI)

SOMALIA R. Mogadishu, V. of the Somali Rep., 6810.0 at 1715 (Harald Kuhl, Germany, *Play DX*) Not 6870 as before? (gh) 6-oh-zero-W on 14275 announced R. Free Somalia is back, testing 13710 at 1300 Sun from NE Somalia, weak signals heard across Africa (Victor Goonetilleke, Sri Lanka, RN*MN*) Don't confuse with VOA-Botswana!

SOUTH AFRICA Kathy Otto of Sentech writes me that DW relays may go back to Rwanda from Jan if electricity is available; and that TWR may start using Meyerton (Bill Westenhaver, PQ, *W. O. R.*) TWR started using 500 kW near Johannesburg Dec. 4, five hours per day in Fulani, Hausa, Yoruba, Twi, English, Swahili, adding coverage north of Equator (TWR HQ) No details.

TURKEY VOT is adding five new 500 kW this year; invites N. American and European listener suggestions on best frequencies, most convenient times, to Box 333, Yenesehir, Ankara 06443 (BDXC *Communication*) Install them in the Caribbean!

USA Tho missing from its own promos (gh), VOA *Communications World* is heard Sat 1030 to Pacific on 5985, 11720, 15425 (Arthur Cushen, RNZI *Mailbox*) At 1730 a good channel is 17895-Morocco (Kevin Hecht, PA) And we found on new site-unknown 9670; also both for *Talk to America* weekdays 1706 (gh)

New earliest broadcasts of *WORLD OF RADIO* are Fri 2130 on WWCR 12160 and WHRI 13760; repeats on WWCR Fri 2215 on 15685, Sun 1030 on 5065, Mon 0000 on 7435, Tue 1330 on 15685; on WHRI Sat 0600 on 7315, 9495, 1729 on 13760, 15105; see also HAWAII (gh)

WWCR has been looking for a channel in the 3-4 MHz range to replace 7435, at least late at night. Kurt Saxon planned to return on such a new frequency. For *Worldwide Country Radio* weekdays, 17525 replaced by 12160 1700-1900, 11970 1900-2100, but wants to use a single frequency; WINB reluctant to leave 12160 at 1900, so WWCR might go to 12030 (George McClintock, WWCR) More WWCR in SWG Highlights.

Brother Stair claims to soon be on his own 24-hour SW station; someone is considering donating a station in the SE USA, possibly Georgia (Diane Mauer, WI) The CP in McCaysville?

French music show weekdays 2300 on WRMI, 9955 is *Scream of the Chameleon* from Geraldine R. productions, Paris. No longer appearing on the Dec. 19 revision is Ernst Zundel, Nazi, but with the exception of Geraldine and *Viva Miami*, WRMI's airtime is filing up with more and more gospel hucksters, Castro-bashers; what a disappointment!

WRMI baseball caps are for sale at $10 ppd. worldwide (via George Thurman, gh comments)

KAIJ, Dallas, 15725 at 1730 Dr Scott preaching about 2-and 4-horn kingdoms!—and no ID at top of hour, against FCC regs (Dave Kenny, England, BDXC) KAIJ address is 411 Ryan Plaza Dr, Arlington, TX 76011; fax 817-277-9929 (Graham Powell, BDXC)

Is WEWN in financial trouble? Mother Angelica has been appealing for $175,000 per month to keep SW going (Kevin Hecht, PA) WEWN at 1300 was on 6000 for a few days, but because of strong Australia on 5995, moved back to 7425 (Martin Gallas, IL) Subsequently back on 6000 at 1200 in Spanish ruining out best Australia channel (gh)

New time for only show worth listening to on KTBN, 7510, *Joy of Music* is Mon 1330 (gh)

Unusual for an FCC-licensed station to be so far off-frequency, beyond tolerance, but KJES heard on 15383.8 at 1800; must be bad crystal for Costa Rican transmitter (gh)

Prophecy Countdown announced FCC approval of transfer of WCSN to WVHA in mid-Dec, may be completed by end of Jan (via Jim Moats, Robert Stessel)

VANUATU unID or 3330 at 1545-1610 with Australian C&W music (Guy Atkins, WA, HCJB *DXPL*) Is new frequency for R. Vanuatu, 0856-0925 //3945 (Martin/Foster/Valko, Victoria, *FT*) New SW xmtrs, 2 x 10 kW on 3945, 7260 at new site, Enton Lagoon (Arthur Cushen, *NZ DX Times*)

ZAMBIA Christian Voice is new 100-kW non-directional with 1500-km radius on 6065 at 1400-2030, later adding 4968, 7250. No low-angle radiation, so tough to DX. Clues: does not mention Lusaka or Zambia, has British accents, "The Voice", light "praise" music, not African, and has distinct jingle (Roger Stubbe, Zambia, HCJB *DXPL*) Backed by Pres. Chiluba, who dedicated it declaring Zambia a "Christian country"; programs health, ag, sports, news, music (Andrew Flynn, *Zambia Daily Mail* via HCJB *TLC*) Is in English only on 6065, 1200-1900, blocked by Sweden, to expand to 24h (RN*MN*) Address is Private Bag E-606, Lusaka; fax 260-1-274251 (Andy James, Christian Vision, RN*MN*) Andrew Flynn QSLed by fax 6065 at 2015; sked 1300-2030 (Ed Rausch, NJ)

ZIMBABWE As foretold in your Jan 94 *MT* column, ZBC is back on SW from late November, sounds like 100 kW, Radio 2 on 3306 *0300v, fades after 0400 news starts; also Radio 3 on 3396 (John Cobb, GA, *W.O.R.*) Or on 4828 when 3396 was missing; 3306 and 4828 also to 2200* (Brian Alexander, PA, *W.O.R.*) 3306 had African language and music after English ID at 0300 (Roger Chambers, NY) Had been off SW since 1989, presumably again from Gweru; also confirmed testing 5012, 5975, 6045, 7175 (BBCM) Radio 3 strong on 7175 at 1000-1200 (Vashek Korzinek, South Africa, *Play-DX*) 3306 also had Radio 4 at 1915-2000; addresses given as P. O. Box 2379, Bulawayo and P. O. Box 9048, Mbare (P. W. Müller, Germany, DSWCI *SWN*) Two Continental 100 kW and TCI 615 non-directional broadband antennas, same setup as in Zambia (Stubbe, *DXPL*) For a while swapped usage, *0300 on 4828, to 3996 at *0355 (John Cobb, GA)

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

Broadcast Loggings

Gayle Van Horn

SHORTWAVE BROADCASTING

Log of the Month

February's **LOG OF THE MONTH** was submitted by Giovanni Serra of Rome, Italy. Thanks Giovanni!

THAILAND: Radio Thailand. Lady announcer in Malay language with program notes and regional music. Gong interval signal to English ID as; "this is HSK9 Radio Thailand World Service broadcasting from Bangkok," including frequency and schedule quote. Music pause into Thai language newscast. Pop music tunes to English music comments. Interval signal repeat to 1400*.

0030 UTC on 9540
SPAIN: Exterior de Espana. Report on Spain's income tax laws. (Bob Fraser, Cohasset, MA)

0100 UTC on 7125
RUSSIA: Voice of Russia. Numerous IDs into national and world news to 0110. *News in Brief* segment monitored subsequent weekend evenings. (George F. Peek, Safford, AZ)

0126 UTC on 9455
UNITED STATES: Voice of America. *Report to the Americas* feature on immigrant smuggling, and politics. (Jim Moats, Ravenna, OH)

0152 UTC on 4980
VENEZUELA: Latin upbeat vocals. Program *Nuestro Insolito Universo* to ID, "esta es Ecos del Torbes." Local time check to regional ads. (Tom Banks, Dallas, TX)

0200 UTC on 3300
GUATEMALA: **Radio Cultural**. Announcer in Spanish to piano hymn and religious vocals. Marimbas music show heard on **Radio Tezulutlan** at 0240 on 4835. Weak signal for **Radio Chortis** on 3380 at 1125. (Tommy Patterson, Mobile, AL)

0235 UTC on 4930
HONDURAS: **Radio Internacional**. Weak signal but ID noted with frequency quote. **La Voz Evangelica** noted with religious programming at 0245 on 4820. (Patterson, AL)

0302 UTC on 7105
ASCENSION ISLANDS: **VOA** relay station. *Daybreak Africa* of world and regional features. Weather update, sports and newscast. **BBC** relay station heard on 9600 at 0427, with *Network Africa* show. and report on land reform in South Africa. (Moats, OH)

0318 UTC on 3270
NAMIBIA: Namibian BC Corp. German. US R&B tunes and German pops. Noted on //3290. (Don Taylor, Green Cove Springs, FL)

0325 UTC on 4755
BRAZIL: **RadioDifusora Maranhao**. Portuguese. Fair signal for talk and Braz pops. **Radio Integracao** heard on 4765 at 0345 with music and ID at 0358. (Walter Marksfield, Peoria, IL) **Radio Aparaceda** on 5034 at 0715, and tentative logging of **Radio Itatiaia** on 5970 at 0810. (Witham, HI)

0340 UTC on 17895
PAKISTAN: Radio Pakistan. Pakistani. Regional music from a rather poor recording, until Anderson's *Typewriter Song* and ID at 0345. Presumed newscast with a second ID at 0352, followed by national commentary. Asian music at 0357. (Witham, HI)

0355 UTC on 13675
UNITED ARAB EMIRATES: UAE Radio. International news until ID at 0340. Request for listener's letters sent to; Dubai Radio, Box 1695, Dubai, UAE. English service sign-off at 0356 with closing announcements and national anthem. (Witham, HI) Program monitored on 21604 at 1313 in Arabic on // 13674, 15319, 15394. (Serra,Italy)

0405 UTC on 5915
UKRAINE: Radio Ukraine International. Newscast in Ukrainian with topics on Ukraine and Russia closing at 0415. Announcer's discussion to ID at 0423. (Witham, HI)

0425 UTC on 4765
CONGO: RTV Congolaise. French. Very poor signal quality. African music to announcer's talk and possible ID included. News reporting format to music. (Patterson, AL)

0728 UTC on 5920
CROATIA: Hrvatski Radio. Croatian. Pop music to ID and chat from female duo. Romantic choral to folk tunes. Time pips signal at 0800 into ID and newscast. / /9830. (Serra, Italy)

0737 UTC on 17885
SEYCHELLES: BBC relay station. Sunday program, *The Jive Zone*. BBC African service ID on // 15400. (Serra, Italy)

0755 UTC on 15295
MALAYSIA: **Voice of Malaysia**. Soothing melodies to station ID and national news at 0800. Second ID at 0804, then into world news and headline wrapup. Business news update to return of easy-listening favorites. (Witham, HI) **Radio Malaysia** heard on 7295 at 1058 with IDs and newscast. (Sam Wright, Biloxi, MS)

1111 UTC on 11675
RUSSIA: Voice of Russia. *Commonwealth Update* featuring news and information on the Commonwealth of Independent States. // 11835, 12015. VOR noted on 7150 at 2230. (Moats, OH) Audible on 7115 at 1720 with fifth episode in Russian history series, and condensation of the story, *The Queen of Spades*. *Kaleidoscope* show on 9550 at 1831. (Fraser, MA)

1140 UTC on 9580
AUSTRALIA: Radio Australia. Report on the Aussie's national theatre. // 9860. (Fraser, MA) World news to IDs and *International Report* at 1831. // 7260. (Serra, Italy) *Science Show* monitored on 21725 at 0935. (GVH/NC)

1145 UTC on 9700
NEW ZEALAND: Radio New Zealand International. News service update to 50's oldies music show. (Marksfield, IL)

1235 UTC on 13730
AUSTRIA: Radio Austria International. Interesting report on the Freedom Party movement. (Fraser, MA)

1243 UTC on 17575
FRANCE: Radio France International. *Film Reel* show on special movie effects made by computers. Heard on // 15530. (Fraser, MA)

1353 UTC on 18870USB
RUSSIA: Radio Rossii. Russian. Political discussion on Britain and Lady Thatcher. English pop tunes to Britain's national anthem. Time pips signal to "Radio Rossi" ID, into international newscast. (Serra, Italy)

1405 UTC on 10621
AUSTRALIA: Australian Defense Forces Radio. DJ's pop tunes and national news. ID noted as, "Australian Armed Forces Radio," heard on // 8743. (Serra, Italy)

1606 UTC on 15240
SOUTH AFRICA: Channel Africa. News, regional music and ID. Frequency/schedule quote to featured programming and African music. VOA signal splatter on 15245. (Serra, Italy) French service audible on 9520 at 0420. (Witham, HI)

1635 UTC on 2625
NORTH KOREA: Voice of Our Young Soldiers. Korean. Talk and radio drama. (Witham, HI)

1700 UTC on 5985
TANZANIA: Radio Tanzania. Presumed Swahili. News with African headlines and national emphasis on Tanzania. Editorial comments on Tanzania, to firm ID at 1714 and 1715, into pop music program. (Witham, HI)

1710 UTC on 6205
SWITZERLAND: Swiss Radio International. News of African topics to sports roundup until ID at 1715. Report on efforts to keep Lake Lucern clean and consumable by 2020. Update on Berne's police enforcing mountain bikes for patrol. (Witham, HI)

1733 UTC on 7170
ALBANIA: Radio Tirana. Italian. International newscast to station ID. Folk music to program, *Una Domanda, Una Risposta*. Station address for letters. (Serra, Italy)

1745 UTC on 15410
MOROCCO: VOA relay station. *Music Time in Africa* show, featuring old folk music of the various tribes. // 17895. (Fraser, MA)

1745 UTC on 4990
ARMENIA: Arabic ID as, "huna Yerevan". Frequency/schedule quote. Folk music to newscast and IDs. //4810. (GVH/NC)

1804 UTC on 9500
SWAZILAND: Trans World Radio. Conversation on church matters to station address quote for letters. Religious music to brief interval signal and ID as, "Trans World Radio International". (Serra, Italy) *Voice of Prophet* religious messages to religious tune *Rock of Ages* to station ID at 0450. Additional IDs in English and French. (Witham, HI)

1930 UTC on 15315
NETHERLANDS ANTILLES: Radio Netherlands relay station. Time pips signal and upcoming program preview. *Newsline* show at 1939 featuring news on Angolan peace efforts and German Chancellor Helmut Kohl. (Moats, OH)

1930 UTC on 12095
UNITED KINGDOM: BBC. *Omnibus* on life in the Ottoman Empire. *Eyes on Africa* featuring news of the continent, noted on 15410 at 1930. (Fraser, MA)

1935 UTC on 9700
BULGARIA: Radio Bulgaria. *Cultural Review* featuring news on the theatre and the national arts. (Fraser, MA)

1956 UTC on 5060
UZBEKISTAN: Radio Tashkent. German. Regional folk tune to ID and station address. Sign-off 1959. (Serra, Italy)

2201 UTC on 17510
HAWAII: KWHR. Frequency quote into *World Harvest* magazine program of Christian music and news. (Moats, OH)

2215 UTC on 5975
CANADA: BBC relay station. *Seeing Stars* show all about the sun. Radio Canada noted on 5975 at 2305. News item noting that the popular *Mighty Morphin Power Rangers* TV show deemed too violent for kids. Radio Japan's relay station heard on 6120 at 1145 with photographer's report. (Fraser, MA)

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

Historical QSLing?

Ask *MT* contributor Edouard Provencher, and chances are he will proudly show off his "Historical QSLs"!

Edouard has added a new slant to his collection, by reporting program details to coincide with historical dates. So far, he has obtained QSL cards from Radio Moscow to commemorate the demise of the USSR, and QSLs commemorating the fall of the Berlin Wall and German Unification Day celebrations in Berlin from Deutsche Welle and Radio Berlin.

He goes on to explain, "another catch was from Radio France International, for the 50th anniversary of the D-Day celebrations from Omaha Beach on June 6th 1994."

To observe his 25th anniversary as a shortwave radio DXer, Edouard is compiling a souvenir QSL card album, collecting all the USA shortwave stations, including the Voice of America transmitter sites.

Great idea...historical QSLing!

BRAZIL

Radio Bras, 15445 kHz. Full data station QSL signed by Gary Hertha Eintoss. Station schedule enclosed, signed by Henrique Filho-Manager. Received in 86 days for an English report. Station address: c/o External Service, C.P. 08840,CEP 70912-790, Brasilia DF, Brazil. (Paul Jablonowski, Greenfield, WI)

COAST GUARD

NMF-USCG Station, 2670 kHz. Full data station card, friendly personal letter signed by C. Graer-WL7BXB, and antenna/ schedule sheet. Received in 18 days for an English utility report. Station address: USCG Commander Station NMF, P.O. Box 608, Marshfield, MA 02050-0005. (Steve McDonald, Port Coquitlam, B.C. Canada)

NOK-USCG Station, 2670 kHz. Full data prepared QSL card signed by S. Solen-RM3. Received in 13 days for an English utility report. Station address: Key West Group CG Station, USCG Base, Key West, FL 33040. (McDonald, CAN)

ECUADOR

Radiodifusora Nacional del Ecuador, 15350 kHz. Full data scenery card, unsigned. Received in 30 days for a Spanish report. Station address:c/o DX Party Line, HCJB, Casilla 691, Quito, Pichincha, Ecuador. (Edouard Provencher, Biddeford, ME)

FRANCE

Radio France International, 9790 kHz. Two full data scenery QSL cards, unsigned. Received in 4 months for English reception reports commemorating D-Day ceremonies at Omaha Beach. Station address: Boite Postal 9516, F-75016 Paris Cedex 16, France. (Provencher, ME)

ICELAND

Icelandic National Broadcasting Service, 13860 kHz. Full data scenery QSL card, unsigned. Received in 11 days for an English report and 1 IRC. Station address: Efstaleiti 1, 150 Reykjavik, Iceland. (David N. Klein, Danvers, MA)

JAPAN

NHK/Radio Japan, 6120 kHz. Full data QSL card for Sackville relay, signed by H. Kawamoto. Received in 30 days for an English report. Station address: c/o English Service, 2-2-1 Jinnan, Shibuya-ku, Tokyo 150-01 Japan. (Jablonowski, WI)

KUWAIT

Radio Kuwait, 9840 kHz. Full data scenery card, unsigned. Received in 60 days for an English report. Station address: P.O. Box 397, 13004 Safat, Kuwait. (Provencher, ME)

MEDIUM WAVE

WRVA-1140AM. Partial data station card, signed by Chief Engineer. Received in 12 days for an English AM report, mint stamps, and a prepared QSL (not returned). Station address: P.O. Box 1394, Richmond, VA 23211.(Gayle Van Horn, Brasstown, NC)

WSB-640AM. Full data QSL on station letterhead, signed by Greg Moceri-Program Director. Coverage map and frig magnet enclosed. Received in 8 days for an English AM report, mint stamp, and a prepared QSL (not returned). Station address: 1601 W. Peachtree St. N.E., Atlanta, GA 30309-2663. (GVH/NC)

WBAP-820AM. Full data QSL on station letterhead, signed by Clay Steely-Chief Engineer. Station bumper sticker enclosed. Received in 9 days for an English AM report and mint stamp. Station address: 2221 East Lamar Blvd., Suite 400, Arlington, TX 76006. (Sam Wright, Biloxi, MS)

WWWE-1100AM. Full data QSL on "3WE" station letterhead, signed by Gary Bruce-Program Director. Station bumper sticker enclosed. Received in 12 days for an English AM report and mint stamp. Station address; 1468 W. 9th St.,Eighth Floor, Cleveland, OH 44113. (Wright, MS)

NETHERLANDS

Radio Netherlands, 6165 kHz. Full data scenery QSL card, unsigned. Received in 34 days for an English report and souvenir postcard. Station address: Postbus 222, NL-1200 JG Hilversum, Holland (The Netherlands). (Tom Banks, Dallas, TX)

SHIP TRAFFIC

Chelsea-KNCX, 2182 kHz (Tanker). Full data verification letter, and photo of bridge/radio room. Received in 327 days for an English utility report and mint stamps. Ship QSL address: Keystone Shipping Co., 313 Chestnut St., Philadelphia, PA 19106. (Hank Holbrook, Dunkirk, MD)

William E. Crain-ELOR2, 156.65 MHz (Tanker). Full data prepared QSL card verified, a brief note. Received in 28 days for an English utility report and mint stamps. Ship QSL address: Chevron Shipping Co., 555 Market St., San Francisco, CA 94105-2870. (Holbrook, MD)

H.M. Krentz-WAN8912, 156.65 MHz (Commercial Fishing). Full data QSL prepared card verified, and brochure on vessel. Received in 18 days for an English utility report and mint stamps. Ship QSL address: Skipjack H.M. Krentz, Capt. Ed Farley, P.O. Box 582, St. Michaels, MD 21663. (Holbrook, MD)

SOUTH AFRICA

Channel Africa, 9585 kHz. Full data QSL verified, station schedule, sticker and souvenir postcards. Received for an English report and one U.S. dollar. Station address: P.O. Box 91313, Auckland Park, 2006, Rep. of South Africa. (Don Dacus, Russellville, AR 72801)

SOUTH KOREA

KBS/Radio Korea, 11715 kHz. Full data scenery card unsigned. Program schedule and souvenir pin enclosed. Received in 40 days for an English report. Station address: 18 Yoido-dong,Youngdungpro-gu, Seoul 150-790, Rep. of Korea. (Jablonowski, WI)

SPAIN

Radio Exterior de Espana, 12890 kHz. Full data scenery QSL card, unsigned. Station schedule and sticker enclosed. Received in 65 days for an English report. Station address: Apartado 156.202, E-28080 Madrid, Spain. (Frank Hillton, Charleston, SC)

SWEDEN

Radio Sweden, 11910 kHz. Full data station QSL, initialed by M.R. Received in 35 days for an English report. Station address: S-105 10 Stockholm, Sweden. (Jablonowski, WI)

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 5, 6, 7 or 8 hours for Eastern, Central, Mountain or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC; for example, the BBC's "John Dunn Show" (0030 UTC Sunday) will be heard on Saturday evening (7:30 pm Eastern, 4:30 PM Pacific) in North America, not on Sunday.

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

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings except for the "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	as:	Asia
na:	North America	au:	Australia
ca:	Central America	pa:	Pacific
sa:	South America	va:	various
eu:	Europe	do:	domestic broadcast
af:	Africa	om:	omnidirectional
me:	Middle East		

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Radio Programs

Four times a year *MT* publishes the following list of programs containing news and information relating to shortwave radio. For brevity, only peak listening times are included. Please direct corrections and additions to Jim Frimmel, c/o *MT*.

Sundays

0022 Radio Exterior de Espana: "Distance Unknown"
0030 Voice of America (am): "Communications World"
0038 Radio Vlaanderen Int'l: "Radio World"
0109 HCJB: "DX Partyline"
0115 WRMI: "Wavescan"
0122 Radio Exterior de Espana: "Distance Unknown"
0200 Radio For Peace Int'l: "World of Radio"
0245 Radio Romania Int'l: "DX Mailbag"
0259 Vatican Radio: "On-the-Air"
0300 WWCR #3: "Spectrum"
0330 Radio Havana Cuba: "DXers Unlimited"
0410 Radio Australia: "Feedback"
0418 Voice of Turkey: "DX Corner"
0500 WWCR #1: "World of Radio"
0509 HCJB: "DX Partyline"
0522 Radio Exterior de Espana: "Distance Unknown"
0525 Radio Japan: "Media Roundup"
0610 Radio Australia: "Feedback"
0630 Radio Havana Cuba: "DXers Unlimited"
0720 Radio Japan: "Media Roundup"
0810 Radio Australia: "Feedback"
0835 Radio Korea: "Shortwave Feedback"
0915 AWR-Europe (Slovakia): "Wavescan"
0940 FEBC (Philippines): "DX Report"
1000 Radio For Peace Int'l: "World of Radio"
1030 WWCR #3: "World of Radio"
1120 Radio Japan: "Media Roundup"
1137 Radio Korea: "Shortwave Feedback"
1235 Radio Korea: "Shortwave Feedback"
1245 WRMI: "Wavescan"
1308 Radio Korea: "Shortwave Feedback"
1353 Vatican Radio: "On-the-Air"
1419 Voice of Israel: "DX Corner"
1425 Radio Japan: "Media Roundup"
1436 Radio Korea: "Shortwave Feedback"
1635 Radio Korea: "Shortwave Feedback"
1725 Radio Japan: "Media Roundup"
1938 Radio Korea: "Shortwave Feedback"
2023 Voice of Israel: "DX Corner"
2038 Radio Korea: "Shortwave Feedback"
2115 AWR-Europe (Slovakia): "Wavescan"
2125 Radio Japan: "Media Roundup"
2235 Radio Korea: "Shortwave Feedback"
2245 Radio Bulgaria: "Radio Bulgaria Calling"
2253 Vatican Radio: "On-the-Air"
2300 KSDA (Guam): "Wavescan"
2300 Radio For Peace Int'l: "World of Radio"

Mondays

0000 WWCR #1: "World of Radio"
0125 Radio Japan: "Media Roundup"
0330 KWHR (Hawaii): "World of Radio"
0430 Radio New Zealand Int'l: "Mailbox"
0545 Radio Bulgaria: "Radio Bulgaria Calling"
0620 Voice of Med. (Malta): "VOM DX Corner"
0640 Radio Korea: "Shortwave Feedback"
0700 Radio For Peace Int'l: "World of Radio"
0720 Voice of Med. (Malta): "VOM DX Corner"
0739 Radio Vlaanderen Int'l: "Radio World"
1009 Radio Vlaanderen Int'l: "Radio World"
1040 All India Radio: "DX-ers Corner (2/4)"
1045 Radio Bulgaria: "Radio Bulgaria Calling"
1315 Radio Bulgaria: "Radio Bulgaria Calling"
1410 Radio Vlaanderen Int'l: "Radio World"
1420 Voice of Med. (Malta): "VOM DX Corner"
1435 All India Radio: "DX-ers Corner (2/4)"
1520 Voice of Med. (Malta): "VOM DX Corner"
1940 All India Radio: "DX-ers Corner (2/4)"
2130 All India Radio: "DX-ers Corner (2/4)"
2254 Voice of Israel: "DX Corner"
2340 All India Radio: "DX-ers Corner (2/4)"

Tuesdays

1247 Radio Sweden: "Media Scan"
1330 WWCR #1: "World of Radio"
1349 Radio Romania Int'l: "For Radio Amateurs"
1349 Radio Sweden: "Media Scan"
1449 Radio Sweden: "Media Scan"
1849 Radio Sweden: "Media Scan"
1900 Radio For Peace Int'l: "World of Radio"
2050 Polish Radio: "Polish Radio DX Club"
2136 Radio Havana Cuba: "DXers Unlimited"
2149 Radio Sweden: "Media Scan"
2235 Radio Havana Cuba: "DXers Unlimited"
2249 Radio Sweden: "Media Scan"
2349 Radio Sweden: "Media Scan"

Wednesdays

0049 Radio Sweden: "Media Scan"
0149 Radio Sweden: "Media Scan"
0220 RAE Argentina: "DX'ers Special"
0235 Radio Havana Cuba: "DXers Unlimited"
0249 Radio Sweden: "Media Scan"
0300 Radio For Peace Int'l: "World of Radio"
0349 Radio Sweden: "Media Scan"
0435 Radio Havana Cuba: "DXers Unlimited"
0535 Radio Havana Cuba: "DXers Unlimited"
0700 HCJB: "The Latest Catch"
0800 HCJB: "Ham Radio Today"
0930 HCJB: "The Latest Catch"
1030 HCJB: "Ham Radio Today"
1100 Radio For Peace Int'l: "World of Radio"
1144 Radio Prague: "Calling All Listeners"
1315 FEBC (Philippines): "DX Report"
1711 Radio Prague: "Calling All Listeners"
1730 HCJB: "Ham Radio Today"
1800 HCJB: "The Latest Catch"
1810 Radio Prague: "Calling All Listeners"
1820 Polish Radio: "Polish Radio DX Club"
1920 RAE Argentina: "DX'ers Special"
2110 Radio Prague: "Calling All Listeners"

Thursdays

0014 Radio Prague: "Calling All Listeners"
0114 Radio Prague: "Calling All Listeners"
0130 BBC: "Waveguide"
0130 HCJB: "Ham Radio Today"
0152 Radio Netherlands Int'l: "Media Network"
0200 HCJB: "The Latest Catch"
0235 RAE Argentina: "DX'ers Special"
0314 Radio Prague: "Calling All Listeners"
0344 Radio Prague: "Calling All Listeners"
0530 HCJB: "Ham Radio Today"
0600 HCJB: "The Latest Catch"
0752 Radio Netherlands Int'l: "Media Network"
0830 Radio New Zealand Int'l: "Mailbox"
0952 Radio Netherlands Int'l: "Media Network"
1124 Deutsche Welle: "DXers World Meeting"
1152 Radio Netherlands Int'l: "Media Network"
1320 Polish Radio: "Polish Radio DX Club"
1352 Radio Netherlands Int'l: "Media Network"
1552 Radio Netherlands Int'l: "Media Network"
1620 Polish Radio: "Polish Radio DX Club"
1752 Radio Netherlands Int'l: "Media Network"
1952 Radio Netherlands Int'l: "Media Network"
2210 Radio Prague: "Calling All Listeners"

Fridays

0052 Radio Netherlands Int'l: "Media Network"
0252 Radio Netherlands Int'l: "Media Network"
0352 Radio Netherlands Int'l: "Media Network"
1245 Radio Finland: "YLE Media Roundup"
1345 Radio Finland: "YLE Media Roundup"
1445 Radio Finland: "YLE Media Roundup"
1546 Radio Portugal Int'l: "Radio Portugal DX"
1916 Radio Portugal Int'l: "Radio Portugal DX"
1930 Radio New Zealand Int'l: "Mailbox"
1945 Radio Bulgaria: "Radio Bulgaria Calling"
2000 Radio For Peace Int'l: "World of Radio"
2016 Radio Portugal Int'l: "Radio Portugal DX"
2130 WWCR #3: "World of Radio"
2210 Radio Australia: "Feedback"
2215 WWCR #1: "World of Radio"
2220 Radio Budapest Int'l: "DX News"

Saturdays

0010 Radio Australia: "Feedback"
0045 Radio Bulgaria: "Radio Bulgaria Calling"
0210 Radio Australia: "Feedback"
0235 RAE Argentina: "DX'ers Special"
0246 Radio Portugal Int'l: "Radio Portugal DX"
0351 Radio Budapest Int'l: "DX World"
0400 Radio For Peace Int'l: "World of Radio"
0600 WHRI: "World of Radio"
0715 BBC: "Waveguide"
0739 HCJB: "DX Partyline"
0739 Radio Vlaanderen Int'l: "Radio World"
0940 FEBC (Philippines): "DX Dial"
1009 HCJB: "DX Partyline"
1030 BBC: "Waveguide"
1030 Voice of America (as): "Communications World"
1200 Radio For Peace Int'l: "World of Radio"
1230 Voice of America (as): "Communications World"
1315 Radio Bulgaria: "Radio Bulgaria Calling"
1344 Radio Romania Int'l: "DX Mailbag"
1345 Radio Tashkent: "DX Program"
1345 Voice of Turkey: "DX Corner"
1410 Radio Vlaanderen Int'l: "Radio World"
1440 FEBC (Philippines): "DX Dial"
1709 HCJB: "DX Partyline"
1729 WHRI: "World of Radio"
1729 KWHR (Hawaii): "World of Radio"
1730 Voice of America (af): "Communications World"
1730 Voice of America (me): "Communications World"
1800 Radio For Peace Int'l: "World of Radio"
1909 Radio Vlaanderen Int'l: "Radio World"
1945 Radio Romania Int'l: "DX Mailbag"
2015 HRJA Honduras: "Wavescan"
2130 WHRI: "World of Radio"
2130 Radio Havana Cuba: "DXers Unlimited"
2130 Voice of America (as): "Communications World"
2130 Voice of America (me): "Communications World"
2145 Voice of Turkey: "DX Corner"
2205 Radio Vlaanderen Int'l: "Radio World"
2237 Radio Havana Cuba: "DXers Unlimited"
2300 KSDA (Guam): "Wavescan"
2318 Voice of Turkey: "DX Corner"

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Dave Datko
California

Next Reporting Deadline
February 17, 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
(7:00 PM EST, 4:00 PM PST)
BBC
Canada (North-Quebec) [S]
China Radio Int'l
Monitor Radio Int'l [T-A]
Radio Australia
Radio Bulgaria
Radio Canada Int'l [S-M]
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [S]
Radio Prague
Radio Thailand
Radio Vilnius
Spanish National Radio
Voice of America (as/ca)
Voice of Russia
WYFR [T-F]
0003
Radio Pyongyang
0009
BBC*
China Radio Int'l*
0010
Voice of America (ca) [T-A]*
0015
Radio Cairo
0030
All India Radio
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int'l
Radio New Zealand Int'l [M-F]
Radio Sweden [T-A]
Radio Thailand [T-S]
Radio Vlaanderen Int'l
Voice of America (am) [T-S] (Special English)
Voice of America (as) (Special English)
Voice of America (ca) [S] (Special English)
Voice of Russia
0050
RAI Italy

0100 UTC
(8:00 PM EST, 5:00 PM PST)
BBC
Canada (North-Quebec)
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 Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio New Zealand Int'l [M-A]
Radio Prague
Radio Ukraine Int'l
Radio Yugoslavia
Spanish National Radio
Swiss Radio Int'l
Voice of America (am/as/ca)
Voice of Indonesia
Voice of Russia
WWCR #1 [T-A]
0110
Radio Australia [M-F]*
Radio Havana Cuba [S/T-F]*
Radio Japan [A]*
0130
BBC (as) [T-A]*
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Netherlands Int'l
Radio Sweden [T-A]
Radio Tirana
Voice of Greece
Voice of Russia
0145
BBC (ca) [T-A]*
0155
Vatican Radio [S-W-F]
Voice of Indonesia

0200 UTC
(9:00 PM EST, 6:00 PM PST)
BBC ("Newsdesk")
Canada (North-Quebec) [S]
Deutsche Welle
Monitor Radio Int'l [T-A]
Radio Australia
Radio Budapest
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [M]
Radio Romania Int'l
Radio Yugoslavia
RAE Argentina [T-A]
Voice of America (am) [T-A]
Voice of America (as)
Voice of Myanmar (Burma)
Voice of Russia
0203
Voice of Free China
0208
Radio Havana Cuba [T]*
0210
Radio Havana Cuba [W-S]*
0215
Radio Cairo
Radio Nepal
0230
Radio Havana Cuba [T-A]
Radio Netherlands Int'l
Radio Pakistan
Radio Portugal Int'l [T-A]
Radio Sweden [T-A]
Radio Tirana
Voice of Russia [T-A]

0300 UTC
(10:00 PM EST, 7:00 PM PST)
BBC
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
KVOH [T-F]
Monitor Radio Int'l [T-A]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Int'l [M-A]
Radio Prague
Radio Thailand
Voice of America (af) [A-S]
Voice of Russia
WHRI [T-S]
WINB [T-A]
WWCR #3 [T-A]
0301
Voice of America (af) [M-F]*
0303
Voice of Free China
0309
BBC*
China Radio Int'l*
0310
Radio Havana Cuba [S/T-F]*
0315
Radio Cairo
Voice of Greece [S/H]
0320
Radio Philipinas [M-A]
Vatican Radio
0330
BBC (af)*
Radio Austria Int'l
Radio Budapest
Radio Dubai
Radio Havana Cuba [T-A]
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int'l
Radio Prague
Radio Sweden [T-A]
Voice of America (af) [M-F] (Special English)
Voice of Russia
0340
Voice of Greece
0355
Radio Japan

0400 UTC
(11:00 PM EST, 8:00 PM PST)
BBC ("Newsdesk")
BBC (af)
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio New Zealand Int'l [A]
Radio New Zealand Int'l [M-F]*
Radio Romania Int'l
Radio Tanzania
Radio Ukraine Int'l
Swiss Radio Int'l
Voice of America (af/me)
Voice of Russia
Voice of Turkey
WHRI [T-A]
WINB [T-A]
WWCR #1 [T-S]
WWCR #3 [T-A]
0403
Radio Pyongyang
0408
Radio Havana Cuba [T]*
0409
China Radio Int'l*
0410
Radio Havana Cuba [W-S]*
0425
RAI Italy
0430
Radio Havana Cuba [T-A]
Voice of Russia
0431
Voice of America (af) [M-F]*
0440
BBC (af) [A-M]*
0445
BBC (af) [T-F]*

0500 UTC
(12:00 AM EST, 9:00 PM PST)
BBC ("Newshour")
Canada (North-Quebec)
Channel Africa
China Radio Int'l
Deutsche Welle
HCJB
Monitor Radio Int'l [T-F]
Radio Australia
Radio Bulgaria
Radio Cameroon
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Spanish National Radio
Vatican Radio [T/F]
Voice of America (af/me)
Voice of Israel
Voice of Russia
WHRI [A]
WWCR #1 [T-A]
0509
China Radio Int'l*
0510
Radio Australia [M-F]*
Radio Havana Cuba [T-S]*
0530
Channel Africa [S-F]
Radio Austria Int'l
Radio Dubai
Radio Finland
Radio Havana Cuba [T-A]
Radio Romania Int'l
Voice of Nigeria
Voice of Russia
0555
Radio Japan [A]

0600 UTC
(1:00 AM EST, 10:00 PM PST)
BBC
BBC (af) [A-S]*
BBC (af) [M-F]
Canada (North-Quebec)
Channel Africa
Deutsche Welle
Monitor Radio Int'l [T-F]
Radio Australia
Radio Canada Int'l [M-F]
Radio Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio New Zealand Int'l
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
0601
Voice of America (af) [M-F]*

0603
Radio Pyongyang
0609
BBC*
0610
Radio Havana Cuba [T-S]*
0627
BBC (af) [M-F]*
0630
Radio Austria Int'l [T-S]
Radio Havana Cuba [T-A]
Radio Yemen
Vatican Radio [H]
Voice of Nigeria [M-F]
Voice of Russia
0632
Radio Romania Int'l
0640
Vatican Radio [T]
0645
Radio Romania Int'l
Voice of Nigeria [M-F]*
0655
Voice of Med. (Malta) [M-F]

0700 UTC
(2:00 AM EST, 11:00 PM PST)
BBC
Monitor Radio Int'l [T-F]
Papua New Guinea
Radio Australia
Radio Japan
Radio New Zealand Int'l [A]
Radio New Zealand Int'l [M-F]*
Radio Prague
Swiss Radio Int'l (eu)
Voice of Myanmar (Burma)
Voice of Russia
WWCR #3 [S]
0703
Radio Pyongyang
Voice of Free China
0705
Radio New Zealand Int'l [M-F]*
0710
Radio Australia [M-F]*
0730
BBC (af) [A]*
HCJB
Radio Netherlands Int'l
Radio Pakistan
Radio Prague
Radio Vlaanderen Int'l
Vatican Radio [M-F]
Voice of Greece [S/H]
Voice of Russia
0745
Radio Finland
0750
[A]
Radio New Zealand Int'l [M-F]*
0755
Radio Japan
Voice of Med. (Malta) [M-F]

0800 UTC
(3:00 AM EST, 12:00 AM PST)
BBC
KNLS
Monitor Radio Int'l [M-A]
Radio Australia
Radio Korea
Radio New Zealand Int'l
Radio Pakistan
Voice of Indonesia [A-H]
Voice of Malaysia
Voice of Russia
0803
Radio Pyongyang
0810
Radio New Zealand Int'l [M-F]*
0830
R Slovakia Int'l
Radio Austria Int'l [T-S]
Radio Netherlands Int'l
Voice of Russia [M-A]
0855
Voice of Indonesia [A-H]

0900 UTC
(4:00 AM EST, 1:00 AM PST)
BBC
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Papua New Guinea [M]*
Radio Australia
Radio Finland
Radio Japan
Radio New Zealand Int'l [M-A]
Swiss Radio Int'l
Voice of Russia
0909
China Radio Int'l*
0910
Radio Australia [M-F]*
0920
Voice of Greece [S/H]
0930
[S]
FEBC (Philippines)
Radio Netherlands Int'l
Voice of Russia
0940
Voice of Greece
0945
Deutsche Welle [M-F]*
0955
Radio Japan

1000 UTC
(5:00 AM EST, 2:00 AM PST)
All India Radio
BBC
China Radio Int'l
FEBC (Philippines) [M-F]*
HCJB
Monitor Radio Int'l
Papua New Guinea
Radio Australia
Radio Bulgaria
Radio New Zealand Int'l [S-F]
Radio Tanzania
Radio Vlaanderen Int'l [M-A]
Voice of America (as/ca)
Voice of Kenya
Voice of Russia
WWCR #3 [A]
1009
China Radio Int'l*
1010
Radio New Zealand Int'l [M-F]*
1030
Radio Austria Int'l [M-A]
Radio Dubai
Radio Netherlands Int'l
Voice of Nigeria
Voice of Russia
1045
Radio New Zealand Int'l [M-F]*
Voice of Nigeria [A-S]*

1100 UTC
(6:00 AM EST, 3:00 AM PST)
BBC ("Newsdesk")
Channel Africa
Deutsche Welle
Monitor Radio Int'l [M-A]
Papua New Guinea
Radio Australia
Radio Ghana [A-S]
Radio Japan
Radio Jordan
Radio Mozambique
Radio New Zealand Int'l
Radio Pakistan
Radio Singapore Int'l
Swiss Radio Int'l
Swiss Radio Int'l (eu)
Voice of America (as/ca)
Voice of Israel
Voice of Russia
WHRI [A]
WYFR [M-A]
1103
Radio Pyongyang
1110
Radio Australia*
1120
Vatican Radio [M-A]
1130
Radio Korea
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Prague
Radio Singapore Int'l
Voice of Asia
Voice of Russia
WYFR [M-F]
1145
Deutsche Welle [M-F]*
1155
Radio Japan [M-F]

1200 UTC
(7:00 AM EST, 4:00 AM PST)
BBC
Canada (North-Quebec) [A-S]
China Radio Int'l
Monitor Radio Int'l [M-A]
Papua New Guinea
Radio Australia
Radio France Int'l
Radio New Zealand Int'l [H-T]
Radio Norway Int'l [S]
Radio Singapore Int'l
Radio Tashkent
Swiss Radio Int'l (eu)
Voice of America (as)
Voice of Russia
WHRI [A]
WWCR #1 [M-F]
WYFR [M-F]
1203
Radio Korea
Voice of Free China
1204
HCJB [M-F]
1209
BBC [W]*
China Radio Int'l*
1230
HCJB [M-F]*
Radio Austria Int'l
Radio Bangladesh [S-M]
Radio Bulgaria
Radio Cairo
Radio Canada Int'l
Radio Finland [M-A]
Radio Netherlands Int'l
Radio Singapore Int'l
Radio Sweden [M-F]
Voice of Russia
Voice of Vietnam
WYFR [M-F]
1231
Radio France Int'l [T]*
1240
Voice of Greece
1258
Africa No. 1 (Gabon)

1300 UTC
(8:00 AM EST, 5:00 AM PST)
BBC ("Newshour")
Canada (North-Quebec) [A-S]
China Radio Int'l
KNLS
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 Ghana
Radio Korea
Radio Norway Int'l [S]
Radio Romania Int'l [M-A]
Radio Singapore Int'l
Radio Tanzania [A-S]
Radio Tashkent [S]
Swiss Radio Int'l
Voice of America (as)
Voice of Kenya
Voice of Russia
WWCR #1 [S]
WYFR [M-F]
1301
Radio Romania Int'l [S]
1303
Radio Pyongyang
1309
China Radio Int'l*
1310
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 [M-A]
Radio Vlaanderen Int'l [S]
Radio Yugoslavia
Voice of America (as) (Special English)
Voice of Russia [M-A]
Voice of Turkey
Voice of Vietnam
1355
Radio Singapore Int'l

1400 UTC
(9:00 AM EST, 6:00 AM PST)
BBC
BBC (as) [M-F]*
Canada (North-Quebec) [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
Radio Vlaanderen Int'l [M-A]
Voice of America (as)
Voice of Israel [S-H]
Voice of Russia
WWCR #1 [M-F]
WYFR [M-F]
1409
China Radio Int'l*
1410
Radio Japan [M-F]*
1415
Radio Nepal
1424
HCJB [M-F]
1430
FEBC (Philippines)
Radio Canada Int'l
Radio Finland
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Romania Int'l [T-S]
Radio Sweden [M-F]
RTM Morocco [S]
Voice of Myanmar (Burma)
Voice of Russia
1431
Radio France Int'l [T]*
Radio Romania Int'l [M]
1435
Voice of Greece
1440
FEBC (Philippines) [S-F]*
1445
All India Radio
BBC (as) [M-F] (Special English)
Voice of Myanmar (Burma)
1455
Radio Japan [A]
Voice of Med. (Malta) [M-F]

1500 UTC
(10:00 AM EST, 7:00 AM PST)
BBC
BBC (af) [M-F]
Canada (North-Quebec) [A-S]
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Radio Australia
Radio Canada Int'l [S]
Radio Japan
Radio Jordan
Radio Omdurman
Swiss Radio Int'l
Voice of America (as/me)
Voice of Russia
WWCR #1 [M-A]
WWCR #3 [S]
WYFR [A]

1503
Radio Pyongyang
1509
China Radio Int'l*
1510
Radio Japan [M-F]*
1525
BBC (af) [S]*
Radio Veritas [T-F]
1530
All India Radio*
Deutsche Welle [M-F]*
FEBC (Philippines)
Radio Austria Int'l
Radio Netherlands Int'l
Radio Portugal Int'l [M-F]
Voice of Nigeria [M-H]
Voice of Russia
WYFR [M-F]
1540
Radio Veritas [A-M]
1550
Voice of Med. (Malta) [F]
1555
Radio Japan [A]
Radio Veritas [A-M]
Voice of Med. (Malta) [M-H]

1600 UTC
(11:00 AM EST, 8:00 AM PST)
BBC
Canada (North-Quebec) [A-S]
Channel Africa
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio Canada Int'l [S]
Radio France Int'l
Radio Jordan
Radio Korea
Radio Pakistan
Radio Tallinn [M-F]
Radio Tanzania
Voice of America (af) [A-S]
Voice of America (as/me)
Voice of Ethiopia
Voice of Kenya
Voice of Russia
WRNO [W]
WWCR #3 [S]
WYFR [A]
1604
HCJB [M-F]
1609
BBC*
China Radio Int'l*
1612
Vatican Radio
1630
HCJB [M-F]*
Radio Canada Int'l
Radio Dubai
Voice of America (af) [M-F]*
Voice of America (as/me) (Special English)
Voice of Ethiopia
Voice of Russia
1645
BBC (as)*

1700 UTC
(12:00 PM EST, 9:00 AM PST)
BBC
BBC (af)
Canada (North-Quebec) [A]
Channel Africa
China Radio Int'l
HCJB
Monitor Radio Int'l [M-A]
Radio Australia
Radio France Int'l
Radio Japan
Radio New Zealand Int'l [M-F]*
Radio Pakistan
Radio Prague
Radio Tirana
Swiss Radio Int'l
Voice of America (af)
Voice of America (as/me)
Voice of Russia
WRNO [M-F]
WWCR #3 [M-F]
1703
Radio Pyongyang
1709
China Radio Int'l*
1710
Radio Australia*
1715
Vatican Radio
1725
Radio New Zealand Int'l [F]*
1730
Radio Netherlands Int'l
Radio Romania Int'l
Vatican Radio [F]
Voice of America (af) [S]
Voice of Russia [S-F]
1740
BBC (af)*
1745
Radio Canada Int'l [M-F]
1755
Radio Japan [A]
Radio New Zealand Int'l [M-H]*

1800 UTC
(1:00 PM EST, 10:00 AM PST)
All India Radio
BBC ("Newsdesk")
Canada (North-Quebec) [A]
Monitor Radio Int'l [M-A]
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio Cameroon
Radio Mozambique
Radio New Zealand Int'l [M-F]*
Radio Norway Int'l [S]
Radio Omdurman
Radio Prague
Radio Tanzania
Radio Yemen
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Kenya
Voice of Russia
WWCR #3 [M-F]
1805
Radio New Zealand Int'l [M-F]*
1815
Radio Bangladesh
1830
Radio Kuwait
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int'l
Radio Sweden [M-F]
Radio Yemen
Voice of America (af) [A-S]
(Special English)
Voice of America (me) (Special English)
Voice of Russia
1835
Radio New Zealand Int'l [F]*
1840
Voice of Greece [M-A]
1855
Radio New Zealand Int'l [M-H]*
1857
BBC (af) [M-F]*

1900 UTC
(2:00 PM EST, 11:00 AM PST)
All India Radio
BBC
China Radio Int'l
Deutsche Welle
Monitor Radio Int'l [M-A]
Radio Australia
Radio Bulgaria
Radio Japan
Radio New Zealand Int'l
Radio Portugal Int'l [M-F]
Radio Romania Int'l [T-S]
Radio Tirana
Radio Vlaanderen Int'l
Spanish National Radio
Voice of America (af)
Voice of America (as/me)
Voice of Greece [M-A]
Voice of Russia
WHRI [M-F]
WINB [M-F]
WWCR #1 [M-F]
WWCR #3 [M-F]
1901
Radio Romania Int'l [M]
1909
China Radio Int'l*
1910
All India Radio [W]
Radio Australia [M-F]*
1930
BBC (af) [S]*
Deutsche Welle [T-F]*
R Slovakia Int'l
Radio Austria Int'l
Radio Finland
Radio Korea
Radio Netherlands Int'l
Radio Yugoslavia
Voice of Russia
1933
Deutsche Welle [M]*
1935
RAI Italy
1955
Radio Japan [T-W/S]

2000 UTC
(3:00 PM EST, 12:00 PM PST)
BBC
China Radio Int'l
Deutsche Welle
KVOH [A-S]
Monitor Radio Int'l [M-A]
Radio Australia
Radio Budapest
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Radio Portugal Int'l [M-F]
Radio Tallinn [M/H]
Swiss Radio Int'l
Swiss Radio Int'l (eu)
Vatican Radio [M-T]
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Indonesia
Voice of Israel
Voice of Nigeria [M-F]
Voice of Russia
WHRI [M-F]
WINB [M-F]
WWCR #3 [S-F]
2003
Radio Pyongyang
2007
Radio Damascus [M-F]
2009
China Radio Int'l*
2010
Radio New Zealand Int'l [S-H]*
2025
RAI Italy
2030
Polish Radio [A-S]
Polish Radio [M-F]*
Radio Korea
Radio Netherlands Int'l
Radio Thailand
Voice of Russia [A-S]
2055
Voice of Indonesia [M]
2057
Radio Kuwait

2100 UTC
(4:00 PM EST, 1:00 PM PST)
All India Radio
BBC ("Newshour")
China Radio Int'l
Deutsche Welle
KVOH [S]
Monitor Radio Int'l [M-A]
Radio Australia
Radio Cameroon
Radio Canada Int'l
Radio Damascus [F]
Radio Havana Cuba [M-A]
Radio Japan
Radio New Zealand Int'l [A-H]
Radio Prague
Radio Romania Int'l
Spanish National Radio
Voice of America (af/as/me)
Voice of Russia
Voice of Turkey
WHRI [M-F]
WINB [M-F]
WWCR #3 [S]
2109
China Radio Int'l*
2110
Radio Damascus [S-M]
Radio New Zealand Int'l [S-H]*
2112
Radio Damascus [F]
2115
BBC (ca) [M-F]*
Radio Damascus [T]
2120
Radio Cairo
2130
Radio Austria Int'l
Radio Cairo
Radio Canada Int'l [A-S]
Radio Havana Cuba [M-F]*
Radio Havana Cuba [W]
Radio Nacional de Venezuela [M-A]
Radio Riga Int'l [M-F]
Radio Sweden [M-F]
Voice of Russia
2145
Radio Damascus [W]
Radio Korea
2155
Radio Canada Int'l [M-F]
Radio Japan [A]

2200 UTC
(5:00 PM EST, 2:00 PM PST)
All India Radio
BBC
Canada (North-Quebec) [A-S]
China Radio Int'l
Monitor Radio Int'l [M-A]
Radio Australia
Radio Budapest
Radio Bulgaria
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Korea
Radio New Zealand Int'l
Radio Prague
Radio Ukraine Int'l
Radio Vlaanderen Int'l [M-F]
Radio Yugoslavia
RAI Italy
Voice of America (as)
Voice of Russia
2203
Voice of Free China
2209
China Radio Int'l*
2215
All India Radio [M/W/F]
Radio Cairo
2230
Radio Havana Cuba [M-A]*
Radio Sweden [M-F]
Voice of America (as) (Special English)
Voice of Israel
Voice of Russia [M-F]
2240
Radio Cairo
Voice of Greece [S-F]

2300 UTC
(6:00 PM EST, 3:00 PM PST)
AWR Latin America [H]*
BBC ("Newsdesk")
Monitor Radio Int'l [M-A]
Radio Australia
Radio Canada Int'l
Radio Japan
Radio New Zealand Int'l
Voice of America (as)
Voice of Russia
Voice of Turkey
WWCR #3 [S]
2303
Radio Pyongyang
2315
Radio Cairo
2330
Radio Canada Int'l [A]
Radio Finland
Radio Netherlands Int'l
Radio Sweden [M-F]
SLBC (Sri Lanka) [M]
Voice of Russia
2335
Voice of Greece [S-F]
2355
Radio Japan

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#RD-2750	27 & 50 MHZ Rubber Duck antenna	28.
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#RD-800	Cellular phone band RD antenna	29.
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#LP-22	Low Pass, Audio probe	25.
#DC-1C	Direct, 50 OHM probe	20.

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SIGNAL BAR GRAPH	NO	YES	YES	YES
LOW BATTERY IND.	NO	YES	YES	YES
ONE-SHOT & PRESET	NO	OPTIONAL	YES	YES
HI-Z LOW RANGE	NO	NO	NO	YES

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0000 UTC SHORTWAVE GUIDE 7:00 PM EST 4:00 PM PST

FREQUENCIES

0000-0100	Australia, ADF Radio	18735as			
0000-0030	Australia, Radio	9610as	13745as	17750as	
0000-0100 vl	Australia, VL8A Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0100	Bulgaria, Radio	7205na	9700na		
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100 vl	Canada, CBC N Quebec Sce	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	Canada, RCI Montreal	5960na	9755na	11920na	
0000-0100	China, China Radio Intl	9710na	11575af	11655na	11715na
		15110af	15130af		
0000-0100	Costa Rica, AWR Alajuela	5030ca	6150sa	9725na	
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			
0000-0100 vl	Italy, IRRS Milan	7125eu			
0000-0100	Lebanon, Wings of Hope	9960me			
0000-0030 sm	Lithuania, Radio Vilnius	7150na			
0000-0005 twtfa	Lithuania, Radio Vilnius	7150na			
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM Kuching	7160do			
0000-0100	Malaysia, RTM/Kota Kinaba	5980do			
0000-0030	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0030 m	Norway, Radio Norway Intl	6115sa	6120na		
0000-0100 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
0000-0100 vl	Papua New Guinea, NBC	4890do	9675do		
0000-0100	Philippines, FEBC/R Intl	15450as			
0000-0100	Russia, Voice of	7125af	9750na	11750na	15425na
		17570as	17890as		
0000-0100	Spain, R Exterior Espana	9540na			
0000-0030	Thailand, Radio	9680af			
0000-0100	United Kingdom,BBC London	5965as	5970sa	5975na	6175na
		7325na	9590na	9760as	9915sa
		11750na	11955as		
0000-0015	United Kingdom,BBC London	6195as	7110as	7180as	9580as
		11945as			
0000-0100	USA, KAIJ Dallas TX	5810am	13740am		
0000-0100	USA, KTBN Salt Lk City UT	7510am			
0000-0100	USA, KVOH Los Angeles CA	7415am			
0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	USA, Monitor Radio Intl	7535na	9430na		
0000-0100	USA, VOA Washington DC	5995am	6130am	7215as	7405am
		9455am	9770as	9775am	9890as
		11580am	11695am	11760as	15120am
		15185au	15205am	15290as	17735as
		17820as			
0000-0100	USA, WCSN Scotts Cor ME	9855eu			
0000-0100	USA, WEWN Birmingham AL	5825eu	7425na	9985sa	
0000-0100	USA, WHRI Noblesville IN	7315am	9495am		
0000-0100	USA, WINB Red Lion PA	11950na			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100 twtfas	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WWCR Nashville TN	5065am	7435am	13845am	
0000-0044	USA, WYFR Okeechobee FL	6085na			
0015-0030 sm	USA, VOA Washington DC	11835am	15155am		
0030-0100	Australia, Radio	13605as	13745as	13755as	15365pa
		15415as	17795pa	17860pa	
0030-0055	Belgium, R Vlaanderen Int	9930sa			
0030-0100	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0030-0100	Iran, VOIRI Tehran	7100na	9022na	9670na	
0030-0100	Netherlands, Radio	5905as	6020na	6165na	7305as
		9840na	11655na		
0030-0100	Russia, Voice of	7105na	7165na		
0030-0100	Sri Lanka, SLBC Colombo	15425as			
0030-0100	Sweden, Radio	6065sa	6200sa		
0030-0100	Thailand, Radio	9655as	11845af	11905as	
0030-0100 m	USA, WRMI/R Miami Intl	9955am			
0045-0100	USA, WYFR Okeechobee FL	6065na			
0050-0100	Italy, RAI Rome	9645na	11800na		

SELECTED PROGRAMS

Sundays

0000 WWCR #2: World University Network. Gene Scott evangelizes in his inimitable style. Get on the phone!
0015 BBC: Good Books. Recommendation of a book to read.
0015 WWCR #1: The Blessed Word of Life. Perry Johnson.
0030 BBC: The John Dunn Show. A melodic mix of songs old and new.
0030 Radio Sweden: People and Ideas. A magazine program about the Swedish people and the arts.
0030 WWCR #1: The People's Gospel Hour. Perry Rockwood interprets scripture for Christian life.

Mondays

0000 WWCR #1: World of Radio. See S 0500.
0000 WWCR #2: World University Network. See S 0000.
0015 BBC: Feature. See S 0230.
0030 BBC: In Praise of God. Weekly programme of worship and meditation.
0030 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
0030 Radio Sweden: Sounds Nordic (biweekly). See S 1230.
0030 WWCR #1: The Sower. Musical treat and spiritual tonic with Michael Guido.
0045 WWCR #1: Words of Hope. See S 1200.

Tuesdays

0000 WRMI: Scream of the Chameleon. See M 2300.
0000 WWCR #1: The Marty Nalitz Show (live). Talk Radio.
0000 WWCR #2: World University Network. See S 0000.
0000 WWCR #3: Voice of Liberty (live). Paul Parsons.
0015 BBC: A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way.
0030 Radio Sweden: Sixty Degrees North. See M 1230.
0048 Radio Sweden: Sports Scan. See M 1248.

Wednesdays

0000 WRMI: Scream of the Chameleon. See M 2300.
0000 WWCR #1: The Marty Nalitz Show (live). See T 0000.
0000 WWCR #2: World University Network. See S 0000.
0000 WWCR #3: Voice of Liberty (live). See T 0000.
0015 BBC: Concert Hall. See S 1515.
0030 Radio Sweden: Sixty Degrees North. See M 1230.
0049 Radio Sweden: Media Scan (1&3). See T 1247.

Thursdays

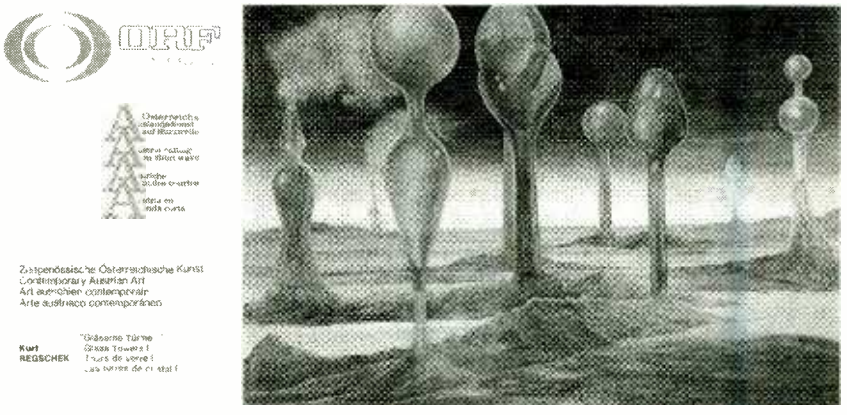
0000 WRMI: Scream of the Chameleon. See M 2300.
0000 WWCR #1: The Marty Nalitz Show (live). See T 0000.
0000 WWCR #2: World University Network. See S 0000.
0000 WWCR #3: Voice of Liberty (live). See T 0000.
0015 BBC: The Greenfield Collection. This classical music program replaces Ray on Record.
0030 Radio Sweden: Sixty Degrees North. See M 1230.
0047 Radio Sweden: Money Matters. See W 1249.

Fridays

0000 WRMI: Scream of the Chameleon.
0000 WWCR #1: The Marty Nalitz Show (live). See T 0000.
0000 WWCR #2: World University Network. See S 0000.
0000 WWCR #3: Voice of Liberty (live). See T 0000.
0015 BBC: Music Review. News and views from the world of music.
0030 Radio Sweden: Sixty Degrees North. See M 1230.
0046 Radio Sweden: Green Scan. See H 1246.
0046 Radio Sweden: Horizon (4). See H 1246.

Saturdays

0000 WRMI: Scream of the Chameleon.
0000 WWCR #1: The Marty Nalitz Show (live). See T 0000.
0000 WWCR #2: World University Network. See S 0000.
0000 WWCR #3: Voice of Liberty (live). See T 0000.
0015 BBC: Feature. See S 0230.
0030 BBC: From the Weeklies. Review of the British weekly press.
0030 Radio Sweden: Sixty Degrees North. See M 1230.
0035 Radio Sweden: A Review of the Newsweek. See F 1235.
0045 BBC: The Learning World. See M 0615.



An unusual QSL from Radio Austria was contributed by Donald Michael Choleva of Euclid, Ohio.

FREQUENCIES

0100-0200	Australia, Radio	9580pa	9610as	9660pa	11715as
		11855as	13605as	13755as	15240pa
		15365pa	15415as	15510as	17715as
		17750as	17795pa	17860pa	17880as
0100-0200 vl	Australia, VL8A Alice Spg	4835do			
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200 vl	Canada, CBC N Quebec Sce	9625do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130co			
0100-0200	Canada, CKZN St John's	6160co			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	China, China Radio Intl	7405af	11575af	15110af	15130af
0100-0130	Costa Rica, AWR Alajuela	5030ca	6150sa	9725ca	
0100-0200	Costa Rica, R Peace Intl	7385am	9400am	12150am	15030am
0100-0200	Cuba, Radio Havana Cuba	6000na	9830na		
0100-0127	Czech Rep, Radio Prague	7345na			
0100-0200	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0100-0150	Germany, Deutsche Welle	6040ra	6085na	6120na	6145na
		9565ra	9670na	9700na	
0100-0200 m	Guatemala, Radio Cultural	3300do			
0100-0200	Indonesia, Voice of	9675as	11752as		
0100-0130	Iran, VOIRI Tehran	7100na	9022na		
0100-0200 vl	Italy, IRRS Milan	7125eu			
0100-0110	Italy, RAI Rome	9645na	11800na		
0100-0200	Japan, NHK/Radio	9565na	11840as	11860as	11910as
		15195as	17810as	17845as	
0100-0130	Laos, Lao National Radio	7116as			
0100-0200 smtwh	Malaysia, Radio	7295do			
0100-0200	Netherlands, Radio	5905as	7305as		
0100-0125	Netherlands, Radio	6020na	6165na	9840na	11655na
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0200 vl	Papua New Guinea, NBC	4890do	9675do		
0100-0130	Philippines, FEBC/R Intl	15450as			
0100-0200	Russia, Voice of	5940na	6005as	6120na	7105na
		7125ra	7165na	7180na	7270na
		7315as	9400me	9920me	13640as
		17570as	17665as	17890as	
0100-0130 mtwhfa	Serbia, Radio Yugoslavia	6195na			
0100-0200 vl	Slovakia, AWR	7270as			
0100-0130	Slovakia, R Slovakia Intl	5930na	7300na	9440na	
0100-0200	South Korea, R Korea Intl	7550eu	15575na		
0100-0200	Spain, R Exterior Espana	9540na			
0100-0200	Sri Lanka, SLBC Colombo	15425as			
0100-0130	Switzerland, Swiss R Intl	5885na	6135na	9885na	9905na
0100-0200	Ukraine, R Ukraine Intl	6055na	7150na	7180na	7405na
		9620eu	9685na	9810na	11870na
0100-0200	United Kingdom,BBC Lordon	5965as	5970sa	5975na	6175na
		7325na	9590na	9760as	9915sa
		11705na	11955as	15360as	17790as
0100-0200	USA, KAIJ Dallas TX	5810am	13740am		
0100-0200	USA, KTBN Salt Lk City UT	7510am			
0100-0200	USA, KVOH Los Angeles CA	7415am			
0100-0200	USA, KWHR Naalehu HI	17510as			
0100-0200	USA, Monitor Radio Intl	7535na	9430na		
0100-0200	USA, VOA Washington DC	5995am	6130am	7405am	9455am
		9775am	11580am	15120am	15205am
		15340as	17740as		
0100-0200	USA, WCSN Scotts Cor ME	7465eu			
0100-0200	USA, WEWN Birmingham AL	5825eu	7425na	9985sa	
0100-0200	USA, WHRI Noblesville IN	7315am			
0100-0200	USA, WINB Red Lion PA	11950na			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0130	USA, WRMI/R Miami Intl	9955am			
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	USA, WWCR Nashville TN	5065am	5935am	7435am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na		
0100-0130	Uzbekistan, R Tashkent	7190eu	7250eu	9715eu	9740eu
0130-0145	Albania, R Tirana Intl	9580na	11840na		
0130-0200	Austria, R Austria Intl	9655na	9870sa	13730sa	
0130-0150	Greece, Voice of	7448na	9420na	9935na	
0130-0200	Netherlands, Radio	9860as	11655as		
0130-0200	Sweden, Radio	9895au	11695as		
0130-0200 m	USA, WRMI/R Miami Intl	9955am			
0140-0200	Vatican State, Vatican R	5980as	7335as		

SELECTED PROGRAMS

Sundays

0100 Slovakia (AWR): Music. A music break between program segments.
0100 WRMI: Viva Miami! A magazine program hosted by Jeff White from and about Miami and Florida, that includes DX and international travel features and seasonal tropical weather updates.
0100 WWCR #1: What Does the Bible Say?. M. H. Reynolds exposes other religions.
0100 WWCR #3: World of Prophecy. Texe Marrs.
0101 BBC: Play of the Week. A different radio drama program each week.
0115 Slovakia (AWR): Sermons of Great Britain. Advice from the pulpit.
0115 WRMI: Wavescan. WRMI is the only North American station to carry this new DX program from Adventist World Radio.
0130 Radio Sweden: People and Ideas. See S 0030.

Mondays

0100 Slovakia (AWR): Music. See S 0100.
0100 WWCR #1: Truth House. Evangelistic teachings by E. C. Fultcher and his global shortwave club.
0101 BBC: Feature. See S 0230.
0130 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
0130 Radio Sweden: Sounds Nordic (biweekly). See S 1230.
0140 Slovakia (AWR): Music. See S 0100.
0145 BBC: Music Feature. The BBC's music features may be either classical and popular music and usually presented in a series anthology.

Tuesdays

0100 WRMI: Viva Miami! See S 0100.
0100 WWCR #3: The Jack McLamb Show (live). Yet another far right radio show.
0105 BBC: Outlook. See M 1405.
0105 WWCR #1: The Golden Age of Radio Theater. Relive the golden moments of radio's yesteryear.
0130 BBC: Folk Routes. Ian Anderson extends the range of folk music to include country, cajun and blues.
0130 Radio Sweden: Sixty Degrees North. See M 1230.
0140 Slovakia (AWR): Music. See S 0100.
0145 BBC: Health Matters. Keeps track of new developments in the world of medical science, as well as ways of keeping fit.
0145 Slovakia (AWR): Voice of Prophecy. See M 1445.
0148 Radio Sweden: Sports Scan. See M 1248.

Wednesdays

0100 WRMI: Viva Miami! See S 0100.
0100 WWCR #3: The Jack McLamb Show (live). See T 0100.
0105 BBC: Outlook. See M 1405.
0105 WWCR #1: The Golden Age of Radio Theater. See T 0105.
0130 BBC: Feature. See S 0230.
0130 Radio Sweden: Sixty Degrees North. See M 1230.
0140 Slovakia (AWR): Music. See S 0100.
0145 BBC: Country Style. With David Allan.
0145 Slovakia (AWR): Voice of Prophecy. See M 1445.
0149 Radio Sweden: Media Scan (1&3). See T 1247.

Thursdays

0100 WRMI: Viva Miami! See S 0100.
0100 WWCR #3: The Jack McLamb Show (live). See T 0100.

0105 BBC: Outlook. See M 1405.
0105 WWCR #1: The Golden Age of Radio Theater. See T 0105.
0115 Slovakia (AWR): Power to Cope. See W 1415.
0130 BBC: Waveguide. Hear World Service better.
0130 Radio Sweden: Sixty Degrees North. See M 1230.
0140 BBC: Book Choice. Short book reviews every week.
0140 Slovakia (AWR): Music. See S 0100.
0145 BBC: The Farming World. Reports on new developments from around the world.
0145 Slovakia (AWR): Voice of Prophecy. See M 1445.
0147 Radio Sweden: Money Matters. See W 1249.

Fridays

0100 Slovakia (AWR): Travel Log. See H 1400.
0100 WRMI: Viva Miami! See S 0100.
0100 WWCR #3: The Jack McLamb Show (live). See T 0100.
0105 BBC: Outlook. See M 1405.
0105 WWCR #1: The Golden Age of Radio Theater. See T 0105.
0130 BBC: On the Move. A weekly program about travel and transport with Malcolm Billings.
0130 Radio Sweden: Sixty Degrees North. See M 1230.
0140 Slovakia (AWR): Music. See S 0100.
0145 BBC: Global Concerns. Update on environmental issues.
0145 Slovakia (AWR): Voice of Prophecy. See M 1445.
0146 Radio Sweden: Green Scan. See H 1246.
0146 Radio Sweden: Horizon (4). See H 1246.

Saturdays

0100 WRMI: Viva Miami!
0100 WWCR #3: The Jack McLamb Show (live). See T 0100.
0105 BBC: Outlook. See M 1405.
0105 WWCR #1: The Golden Age of Racio Theater. See T 0105.
0130 BBC: Worldbrief. Roundup of the week's news headlines, plus everything from sport and finance to best-sellers and weather.
0130 Radio Sweden: Sixty Degrees North. See M 1230.
0130 Slovakia (AWR): Quiet Moments. See F 1430.
0135 Radio Sweden: A Review of the Newsweek. See F 1235.
0140 Slovakia (AWR): Music. See S 0100.
0145 BBC: Jazz Now and Then. George Reid presents a mixture of jazz for all ages.
0145 Slovakia (AWR): Voice of Prophecy. See M 1445.

0200 UTC SHORTWAVE GUIDE 9:00 PM EST 6:00 PM PST

FREQUENCIES

0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415as	15510as	17750as
		17795pa	17860pa	17880as	
0200-0300 vl	Australia, VL8A Alice Spg	4835do			
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0300 vl	Canada, CBC N Quebec Sce	9625do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6120na	9535am	9755na	11845na
0200-0300	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0200-0300	Cuba, Radio Havana Cuba	6000na			
0200-0300	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	6035as	6130as	7265as	9515as
		9615as	9690as	9815as	12045as
0200-0230	Hungary, Radio Budapest	6025na	9835na	11910na	
0200-0300 vl	Italy, IRRS Milan	7125eu			
0200-0300	Kenya, Kenya Broadc Corp	4935do			
0200-0300 smtwh	Malaysia, Radio	7295do			
0200-0225	Moldova, R Moldova Intl	7190na			
0200-0230	Myanmar, Radio	5990do			
0200-0230	Netherlands, Radio	5905as	7305as	9860as	11655as
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0230 m	Norway, Radio Norway Intl	9560na			
0200-0300 vl	Papua New Guinea, NBC	4890do	9675do		
0200-0300	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na	11940na		
0200-0300	Russia, Voice of	5915na	5940na	5950na	6120as
		7105na	7165eu	7180eu	7205eu
		7225na	7225na	7270ns	7315eu
		13640as	15425na	17570as	17665as
		17890as			
0200-0230	Serbia, Radio Yugoslavia	6195na			
0200-0300 vl	Slovakia, AWR	7270as			
0200-0230	Sri Lanka, SLBC Colombo	15425as			
0200-0300	Taiwan, VO Free China	5950na	9680na	9765pa	11740ca
		11860as	15345as		
0200-0300	United Kingdom,BBC London	5970sa	5975na	6135af	6175na
		7235me	7325na	9590na	9760as
		9915sa	11955as	15360as	17790as
0200-0300	USA, KAIJ Dallas TX	5810am	13740am		
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0230	USA, KVOH Los Angeles CA	17775am			
0200-0300	USA, KWHR Naalehu HI	17510as			
0200-0300	USA, Monitor Radio Intl	5850na	9430na		
0200-0300	USA, VOA Washington DC	6130sa	7115as	7205as	7215as
		9455sa	9740as	11705as	15250as
		15370as	17740as	21550as	
0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am
		13740am	15120am	15205am	
0200-0300	USA, WCSN Scotts Cor ME	7465am			
0200-0300	USA, WEWN Birmingham AL	5825eu	7425na	9410me	
0200-0300	USA, WHRI Noblesville IN	7315am			
0200-0300	USA, WINB Red Lion PA	11950na			
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300 m	USA, WRMI/R Miami Intl	9955am			
0200-0300	USA, WRNO New Orleans LA	7355am			
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		
0230-0245	Pakistan, Radio	7290as	15190as	17705as	17725as
		21730as			
0230-0300 twhfa	Portugal, Radio	9570na	9705na	11840sa	
0230-0300	Russia, Voice of	5905na	9850as	12050na	15455ca
0230-0300	Sweden, Radio	6195na	6200na	7120na	
0250-0300	Vatican State, Vatican R	6095na	7305na		

SELECTED PROGRAMS

Sundays

0200 WWCR #2: World University Network. See S 0000.
0230 BBC: Feature. The BBC's special feature programs are varied in subject matter and a good listening choice. Many are presented in a continuing series format.
0230 Radio Sweden: People and Ideas. See S 0030.
0230 WWCR #1: The Lights of Spiritual Guidance. Gospel and song with J. Harold Lowman.

Mondays

0200 WWCR #2: World University Network. See S 0000.
0200 WWCR #3: Free at Last. Mike Seymour.
0230 BBC: Composer of the Month. In depth looks at classical composers and their music. A different composer is featured each month.
0230 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
0230 Radio Sweden: Sounds Nordic (biweekly). See S 1230.

Tuesdays

0200 WWCR #1: Protecting Your Wealth (live). Financial commentary, investments, and politics dealing with money issues.
0200 WWCR #2: World University Network. See S 0000.
0200 WWCR #3: Protecting Your Wealth (live). Financial commentary, investments, and politics dealing with money issues.
0230 BBC: Comedy/Quiz Feature. See M 1215.
0230 Radio Sweden: Sixty Degrees North. See M 1230.
0247 Radio Sweden: Sports Scan. See M 1248.
0248 Radio Portugal Int'l: Visitors' Notebook. See M 1546.

Wednesdays

0200 WWCR #1: Protecting Your Wealth (live). See T 0200.
0200 WWCR #2: World University Network. See S 0000.
0200 WWCR #3: Protecting Your Wealth (live). See T 0200.
0230 BBC: Andy Kershaw's World of Music. Recordings of diverse music from around the world.
0230 Radio Sweden: Sixty Degrees North. See M 1230.
0245 Radio Portugal Int'l: Musical Kaleidoscope. See T 1545.
0249 Radio Sweden: Media Scan (1&3). See T 1247.

Thursdays

0200 WWCR #1: Protecting Your Wealth (live). See T 0200.
0200 WWCR #2: World University Network. See S 0000.
0200 WWCR #3: Protecting Your Wealth (live). See T 0200.
0230 BBC: Sports International. Live commentaries and interviews, features and discussions.
0230 Radio Sweden: Sixty Degrees North. See M 1230.
0244 Radio Portugal Int'l: Challenge of the '90s. See W 1549.
0247 Radio Sweden: Money Matters. See W 1249.

Fridays

0200 WWCR #1: Protecting Your Wealth (live). See T 0200.
0200 WWCR #2: World University Network. See S 0000.
0200 WWCR #3: Protecting Your Wealth (live). See T 0200.
0230 BBC: Feature. See S 0230.
0230 Radio Sweden: Sixty Degrees North. See M 1230.
0246 Radio Portugal Int'l: Spotlight on Portugal. See H 1546.
0246 Radio Sweden: Green Scan. See H 1246.
0246 Radio Sweden: Horizon (4). See H 1246.

Saturdays

0200 WWCR #1: Protecting Your Wealth (live). See T 0200.
0200 WWCR #2: World University Network. See S 0000.
0200 WWCR #3: Protecting Your Wealth (live). See T 0200.
0230 BBC: People and Politics. Background to the British political scene.
0230 Radio Sweden: Sixty Degrees North. See M 1230.
0235 Radio Sweden: A Review of the Newsweek. See F 1235.
0246 Radio Portugal Int'l: Collector's Corner (triweekly). See F 1546.
0246 Radio Portugal Int'l: Listeners Mailbag (triweekly). See F 1546.
0246 Radio Portugal Int'l: Radio Portugal DX (triweekly). See F 1546.

THANK YOU ...

ADDITIONAL CONTRIBUTORS TO THIS MONTH'S SHORTWAVE GUIDE:

John Babbis, Silver Spring, MD; Gerald R. Brookman, Kenai, AK; Kenneth Dowst, Hartford, CT; Bob Fraser, Cohasset, MA; John L. Gomer, Sacramento, CA; George Peek, Safford, AZ; Kent Plourde, Bristol, CT; Aldon Wires, East Point, GA; *BBC Worldwide*; BBC *Summary of World Broadcasts*; Grove Enterprises BBS; Internet Shortwave Newsgroup via Larry Van Horn.

FREQUENCIES

0300-0400	Australia, Radio	9580pa	9660pa	13605pa	15240pa
		15365pa	15415as	15510as	17795pa
		17860pa			
0300-0400 vl	Australia, VL8A Alice Spg	4835do			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400	Bahrain, Radio	6010do			
0300-0400 vl	Canada, CBC N Quebec Sce	9625do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400 sm	Canada, RCI Montreal	6000ca	6120ca	9535ca	9725ca
		9755ca	11725ca	11845ca	
0300-0400	China, China Radio Intl	6955af	9440af	9690na	9710na
		11715na			
0300-0400	Costa Rica, R Peace Intl	7385am	9400am	15030am	
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	9745am	12005am	17490eu	21455eu
0300-0330	Egypt, Radio Cairo	9475na			
0300-0350	Germany, Deutsche Welle	6045na	6085na	6120na	9535na
		9640na	9650na		
0300-0400	Guatemala, Radio Cultural	3300co			
0300-0400 vl	Italy, IRRS Milan	7125eu			
0300-0400	Japan, NHK/Radio	5960na	9565na	11885na	11895na
		11920na	15210as	15230na	17810as
		17845as			
0300-0400	Kenya, Kenya Broadc Corp	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 vl	Papua New Guinea, NBC	4890do	9675do		
0300-0400	Russia, Voice of	4740eu	4940eu	5905na	5940na
		5950eu	6035eu	6085eu	7105na
		7165na	7180na	7225na	7270na
		7345na	9670as	9850as	9880as
		9895as	12050na	15425na	
0300-0400	S Africa, Channel Africa	5955af	9585af		
0300-0400 vl	Slovakia, AWR	6050af	7270as		
0300-0400	Taiwan, VO Free China	5950na	9680na	9765pa	11745as
		15345as			
0300-0400	Thailand, Radio	11890na			
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	13740am		
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785am			
0300-0400	USA, KWHR Naalehu HI	17510as			
0300-0400	USA, Monitor Radio Intl	5850na	9455af		
0300-0400	USA, VOA Washington DC	6035af	7105af	7280af	7340af
		7405af	9575af	9885af	
0300-0400	USA, WCSN Scotts Cor ME	7465am			
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	7315am	9495am		
0300-0400	USA, WINB Red Lion PA	11950eu			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA	7355am			
0300-0400	USA, WWCR Nashville TN	5065am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0315	Vatican State, Vatican R	6095na	7305na		
0315-0330 sh	Greece, Voice of	7448na	9420na	9935na	
0320-0350	Vatican State, Vatican R	5865af	7360af	9725af	
0330-0400	Austria, R Austria Intl	9870sa	13790sa		
0330-0357	Czech Rep, Radio Prague	5930as	7345af	9440me	
0330-0400	Hungary, Radio Budapest	5965na	9835na	11910na	
0330-0400 fas	Mongolia, R Ulan Bator	7290na	12000na		
0330-0400	Netherlands, Radio	6015na	6165na		
0330-0400	Sweden, Radio	6200na	7120na		
0330-0400	Tanzania, Radio	5050af			
0330-0357	UAE, Radio Dubai	11945na	13675na	15400eu	17890eu
		21485na			
0330-0400	United Kingdom,BBC London	9610af	11730af	15280as	15575af
		17790as			
0340-0350	Greece, Voice of	7448na	9420na	9935na	
0345-0400	Tajikistan, Radio	7245as			

SELECTED PROGRAMS

Sundays

0300 WWCR #2: World University Network. See S 0000.
0300 WWCR #3: Spectrum (live). SWLs and Hams call 1-800-774-7435 with technical questions and comments.
0315 BBC: Sports Roundup. The latest sports news.
0330 BBC (eu): Europe Today. News, features, profiles and trends for the new Europe.
0330 BBC: From Our Own Correspondent. BBC correspondents comment on the background to the news.
0330 Radio Sweden: People and Ideas. See S 0030.
0335 BBC (af): Postmark Africa. Expert answers to any question under the sun.
0350 BBC: Write On. Air your views about World Service: write to PO Box 76, Bush House, Strand, London WC2B 4PH.

Mondays

0300 WWCR #1: World of Prophecy. Texe Marrs.
0300 WWCR #2: World University Network. See S 0000.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC (eu): Europe Today. See S 0330.
0330 BBC: Anything Goes. See S 1430.
0330 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
0330 Radio Sweden: Sounds Nordic (biweekly). See S 1230.
0333 BBC (af): Network Africa. Breakfast show of news, sport, personalities, music, and listener's comments.

Tuesdays

0300 WWCR #1: Truth House. See M 0100.
0300 WWCR #2: World University Network. See S 0000.
0305 WWCR #3: Radio Free America (live). Tom Valentine hosts this talk/interview program.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC (eu): Europe Today. See S 0330.
0330 BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.
0330 Radio Sweden: Sixty Degrees North. See M 1230.
0333 BBC (af): Network Africa. See M 0333.
0348 Radio Sweden: Sports Scan. See M 1248.

Wednesdays

0300 WWCR #1: Truth House. See M 0100.
0300 WWCR #2: World University Network. See S 0000.
0305 WWCR #3: Radio Free America (live). See T 0305.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC (eu): Europe Today. See S 0330.
0330 BBC: Discovery. In-depth look at scientific research.
0330 Radio Sweden: Sixty Degrees North. See M 1230.
0333 BBC (af): Network Africa. See M 0333.
0349 Radio Sweden: Media Scan (1&3). See T 1247.

Thursdays

0300 WWCR #1: Truth House. See M 0100.
0300 WWCR #2: World University Network. See S 0000.
0305 WWCR #3: Radio Free America (live). See T 0305.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC (eu): Europe Today. See S 0330.
0330 BBC: Assignment. A weekly examination of a topical issue.
0330 Radio Sweden: Sixty Degrees North. See M 1230.
0333 BBC (af): Network Africa. See M 0333.
0347 Radio Sweden: Money Matters. See W 1249.

Fridays

0300 WWCR #1: Truth House. See M 0100.
0300 WWCR #2: World University Network. See S 0000.
0305 WWCR #3: Radio Free America (live). See T 0305.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC (eu): Europe Today. See S 0330.
0330 BBC: Focus on Faith. Comment and discussion on the major issues in the worlds of faith.
0330 Radio Sweden: Sixty Degrees North. See M 1230.
0333 BBC (af): Network Africa. See M 0333.
0346 Radio Sweden: Green Scan. See H 1246.
0346 Radio Sweden: Horizon (4). See H 1246.

Saturdays

0300 WWCR #1: Truth House. See M 0100.
0300 WWCR #2: World University Network. See S 0000.
0305 WWCR #3: Radio Free America (live). See T 0305.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC (eu): Europe Today. See S 0330.
0330 BBC: The Vintage Chart Show. Each week a classic Top 20 from the past with Paul Burnett.
0330 Radio Sweden: Sixty Degrees North. See M 1230.
0335 Radio Sweden: A Review of the Newsweek. See F 1235.

HAUSER'S HIGHLIGHTS:

CHINA: China Radio International

Daily	*News, Commentaries*
Tue-Fri	*Current Affairs*: major news and features
Sun	*Sports Beat, China Scrapbook, Music Album, Listeners' Letterbox*
Mon	*The Business Show,* alt w/ *China's Open Windows, Learn to Speak Chinese*
Tue	*Letterbox*, repeat
Wed	*Speak Chinese*, repeat
Thu	*Culture in China*
Fri	*In the Third World*
Sat	*Press Clippings, Travel Talk, Cooking Show, Music from China*

(via Rachel Baughn)

0400 UTC SHORTWAVE GUIDE 11:00 PM EST 8:00 PM PST

FREQUENCIES

0400-0500	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415pa	17750as	17795pa
		17860pa			
0400-0500 vl	Australia, VL8A Alice Spg	4835do			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500	Bahrain, Radio	6010do			
0400-0500 vl	Canada, CBC N Quebec Sce	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	6150me	9505me	9670me	
0400-0500	China, China Radio Intl	6950eu	9440af	9730na	9920eu
		11715af	15110af		
0400-0500	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0400-0500	Cuba, Radio Havana Cuba	6180na	9820na	9830na	
0400-0430	Ecuador, HCJB Quito	9745am	12005am	17490eu	21455eu
0400-0450	Germany, Deutsche Welle	6015af	6045na	6065af	7160af
		7225af	9565af	9765af	
0400-0500 twtfa	Guatemala, Radio Cultural	3300do			
0400-0500 vl	Italy, IRRS Milan	7125eu			
0400-0500	Kenya, Kenya Broadc Corp	4935do			
0400-0500 s	Lebanon, Wings of Hope	9960me			
0400-0500 smtwh	Malaysia, Radio	7295do			
0400-0425	Netherlands, Radio	6015na	6165na		
0400-0500	New Zealand, R NZ Intl	15115pa			
0400-0500 vl	Papua New Guinea, NBC	4890do	9675do		
0400-0430	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0400-0500	Russia, Voice of	5905eu	5920na	5925eu	5935na
		5940na	5950na	5965eu	6085eu
		7105na	7165eu	7180na	7270na
		7300na	7345na	9850as	9895as
		12050na	15425na		
0400-0500	S Africa, Channel Africa	5955af	9585af		
0400-0500 vl	Slovakia, AWR	6050as	9465af		
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0500	Swaziland, Swazi Radio	6155af	9500af		
0400-0430	Switzerland, Swiss R Intl	6135eu	9885na	9905na	
0400-0430	Tanzania, Radio	5050af			
0400-0500	Turkey, Voice of	9445na			
0400-0415	Uganda, Radio	4976do	5026do		
0400-0500	Ukraine, R Ukraine Intl	6055na	7150na	7180na	7405na
		9620na	9685na	9810na	11870na
0400-0500	United Kingdom,BBC London	3255af	5975na	6005af	6190af
		9410me	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	13740am		
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	7415am			
0400-0500	USA, KWHR Naalehu HI	9930as			
0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	USA, VOA Washington DC	5995eu	6040eu	6140af	6873af
		7170me	9885af		
0400-0500	USA, WEWN Birmingham AL	7425na			
0400-0500	USA, WHRI Noblesville IN	7315am	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, WWCR Nashville TN	5065am	5935am	7435am	
0400-0445	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0459	USA, WYFR Okeechobee FL	9770eu			
0415-0440	Italy, RAI Rome	5990me	7275eu		
0425-0500	Nigeria, FRCN/Radio	3326do	4990do		
0430-0500	Ecuador, HCJB Quito	12005am			
0430-0500	Russia, Voice of	4940as	4975as	6000as	9705as
		9775as	9785eu	9865eu	11675as
		11710as	11765as	12040eu	15160as
		15295as	15360as	17560as	17570au
		17580af	17610as	17620as	17675as
0430-0500	Swaziland, Trans World R	3200af	5055af	7140af	
0430-0500	Switzerland, Swiss R Intl	9905na			
0430-0500	USA, VOA Washington DC	6035af	7340af	7405af	9575af
0455-0500	Nigeria, FRCN/Voice of	7255af			

SELECTED PROGRAMS

Sundays

0400 Slovakia (AWR): Music. See S 0100.
0400 WWCR #2: World University Network. See S 0000.
0400 WWCR #3: Morning Watch Chapel. Terry Parker.
0405 WWCR #1: There's No Place Like Home. Paul Lindstrom.
0409 BBC (af): African Perspective. Feature or discussion analyzing a major issue.
0410 WWCR #1: View from Europe. Harvey Thomas.
0415 Slovakia (AWR): Sermons of Great Britain. See S 0115.
0430 BBC: Seeing Stars (1). A discussion of astronomical observations and special events for the near future.
0430 BBC: Short Story. Variable dramas.
0445 BBC: Feature. See S 0230.
0445 WWCR #1: A Study in God's Word. Hezikiah Smith reads Scripture.

Mondays

0400 Slovakia (AWR): Music. See S 0100.
0400 WWCR #1: America First Radio. Hosted by Don Wassall.
0400 WWCR #2: World University Network. See S 0000.
0409 BBC (af): Network Africa. See M 0333.
0430 BBC: Off the Shelf. Daily readings from the best of world literature.
0440 Slovakia (AWR): Music. See S 0100.
0445 BBC: Feature. See S 0230.

Tuesdays

0400 WWCR #2: World University Network. See S 0000.
0405 WWCR #1: Point of View. See M 1206.
0405 WWCR #3: Radio Free America. See T 0305.
0409 BBC (af): Network Africa. See M 0333.
0430 BBC: Off the Shelf. See M 0430.
0440 Slovakia (AWR): Music. See S 0100.
0445 BBC: On Screen. Film reviews and movie news from around the world.
0445 Slovakia (AWR): Voice of Prophecy. See M 1445.

Wednesdays

0400 WWCR #2: World University Network. See S 0000.
0405 WWCR #1: Point of View. See M 1206.
0405 WWCR #3: Radio Free America. See T 0305.
0409 BBC (af): Network Africa. See M 0333.
0430 BBC: Off the Shelf. See M 0430.
0440 Slovakia (AWR): Music. See S 0100.
0445 BBC: Country Style. See W 0145.
0445 Slovakia (AWR): Voice of Prophecy. See M 1445.

Thursdays

0400 WWCR #2: World University Network. See S 0000.
0405 WWCR #1: Point of View. See M 1206.
0405 WWCR #3: Radio Free America. See T 0305.
0408 Channel Africa: Historical Almanac. What happened on this date in the past.
0409 BBC (af): Network Africa. See M 0333.
0412 Channel Africa: Our Wild Heritage. See S 0519.
0415 Slovakia (AWR): Power to Cope. See W 1415.
0430 BBC: Off the Shelf. See M 0430.
0437 Channel Africa: Artist of the Week. Featuring the music of a particular recording artist.
0440 Slovakia (AWR): Music. See S 0100.
0445 BBC: From Our Own Correspondent. See S 0330.
0445 Slovakia (AWR): Voice of Prophecy. See M 1445.

Fridays

0400 Slovakia (AWR): Travel Log. See H 1400.
0400 WWCR #2: World University Network. See S 0000.
0405 WWCR #1: Point of View. See M 1206.
0405 WWCR #3: Radio Free America. See T 0305.
0409 BBC (af): Network Africa. See M 0333.
0413 Channel Africa: Historical Almanac. See H 0408.
0430 BBC: Off the Shelf. See M 0430.
0440 Slovakia (AWR): Music. See S 0100.
0445 BBC: Folk Routes. See T 0130.
0445 Slovakia (AWR): Voice of Prophecy. See M 1445.

Saturdays

0400 WWCR #2: World University Network. See S 0000.
0405 WWCR #1: Point of View. See M 1206.
0405 WWCR #3: Radio Free America. See T 0305.
0409 BBC (af): TalkAbout Africa. Telephone conversations with BBC correspondents on late-breaking African events.
0430 BBC: Jazz Now and Then. See A 0145.
0430 Slovakia (AWR): Quiet Moments. See F 1430.
0440 Slovakia (AWR): Music. See S 0100.
0445 BBC: Worldbrief. See A 0130.
0445 Slovakia (AWR): Voice of Prophecy. See M 1445.

HAUSER'S HIGHLIGHTS
KUWAIT: Radio Kuwait

Main Arabic Program

0200-1305	6055
0400-1305	15495
1315-1600	13620
1315-1745	9880
1605-1800	11990
1800-2400	9840
2100-0200	15495

English

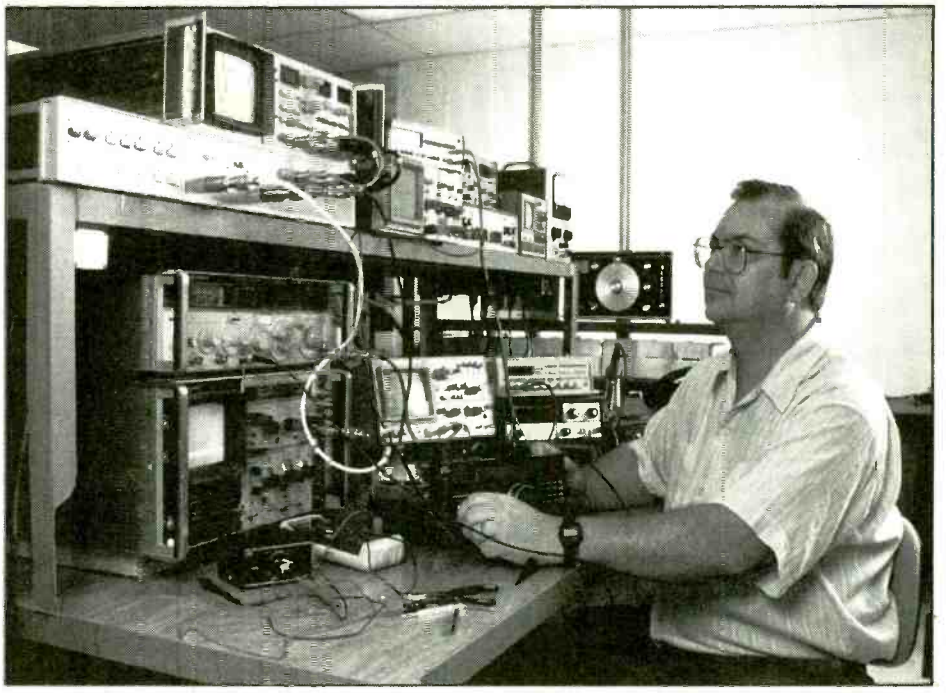
1800-2100	11990	
1830-1845	Daily	*News*
2000-2015	Daily	*Theatre in Kuwait*
2030-2045	Daily	*Saheeh Muslim*
1802-1815	Tue	*Science Report*
1802-1815	Sat	*Arqus Eye*

Also music, much of it Western (Radio Kuwait)

Grove Introduces Expanded Technical Support

Now Offering Repair Services!

You Can Expect Quality Service From Grove:

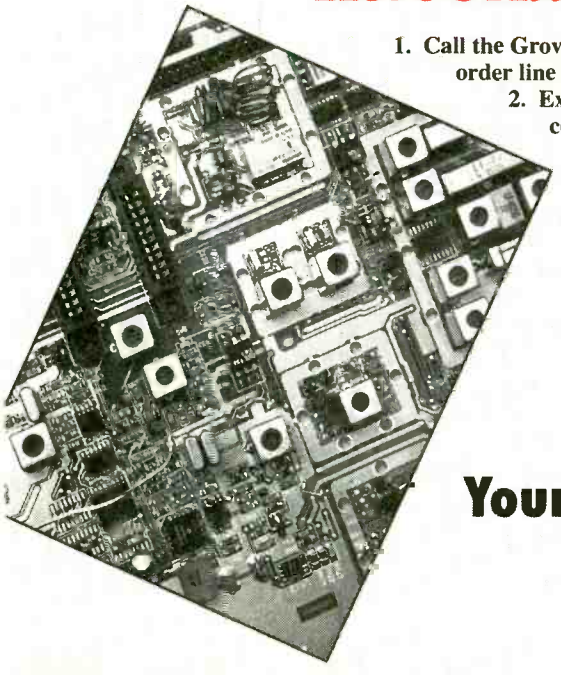


Friendly Grove technicians are only a phone call away.

For the past fifteen years Grove has provided unexcelled sales and service. We've built our reputation on you, our customer. We listen to your needs and continually meet them. You've asked for a repair station with a reputation that you can trust. We heard! We are proud to introduce: The Grove Technical and Repair Support Division. Grove's newest service offers you:

- **Repair for receivers, scanners and amateur radio equipment only.**
- **Certified, licensed technicians.**
- **Equipment will be reconditioned to meet or exceed the manufacturer's specifications.**
- **Modifications to restore deleted frequencies are available for some models.**
- **Fast return of your repaired or modified equipment.**
- **All equipment serviced by Grove Enterprises is warranted for a period of 90 days from the date shown on the customer receipt. The warranty is not transferable. Modifications to equipment may void original manufacturer's warranty.**
- **The Grove Assurance of Quality applies to all products that we sell and now service!**

Here's All You Need to Do:



1. **Call the Grove Technical and Repair Support Line at 704-837-7081. (Please Do not call the 800 number order line operators; they provide sales and product availability information only.)**
2. **Explain your problem to one of our trained technicians; it's possible the problem can be corrected on the phone at no charge!**
3. **If a repair is required, Grove technical staff will issue you a SO# (service order number). The $29.95 repair analysis fee is a non-refundable/minimum charge that pays the first $5.00 in return shipping* plus the first hour of diagnostic and repair. If additional labor is required, you will be charged at a rate of $35.00 per hour plus a parts cost.**
4. **Ship your equipment with the repair analysis fee. The SO# must be prominantly displayed on the shipping carton. *Packages without SO#'s will be refused.***
5. **Our Grove technicial staff will call you with the result of the repair analysis and charges before any work has begun.**
6. **Your equipment will be repaired or modified and shipped back to you.**

** Some equipment will require additional shipping charges.*

Your New Source for High Quality Repairs!

Call 704-837-7081

Grove Enterprises, P.O. Box 98, Brasstown, NC 28902

FREQUENCIES

0500-0600	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415as	17715pa	17750as
		17795as	17860pa	17880as	
0500-0600 vl	Australia, VL8A Alice Spg	4835do			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Bahrain, Radio	6010do			
0500-0600	Bulgaria, Radio	7335na	9700na		
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	China, China Radio Intl	6950eu	9595na	9920eu	
0500-0530	China, China Radio Intl	11715af	15110af		
0500-0600	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0500-0600	Cuba, Radio Havana Cuba	9820na			
0500-0600	Ecuador, HCJB Quito	9745na			
0500-0600 as	Eqt Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	6185na
0500-0515	Israel, Kol Israel	7465na	9435na	17545as	
0500-0600 vl	Italy, IRRS Milan	7125eu			
0500-0600	Japan, NHK/Radio	5975eu	6025na	7230eu	9565as
		11740as	11885na	15410as	17810as
0500-0600	Kenya, Kenya Broadc Corp	4935do			
0500-0600 s	Lebanon, Wings of Hope	9960me			
0500-0600	New Zealand, R NZ Intl	15115pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4990do		
0500-0600	Nigeria, FRCN/Voice of	7255af			
0500-0530 m	Norway, Radio Norway Intl	5905na			
0500-0600 vl	Papua New Guinea, NBC	4890do	9675do		
0500-0600	Russia, Voice of	5905eu	5920eu	5925eu	5940na
		5950as	6000eu	6065as	7105na
		7165eu	7175eu	7180eu	7270na
		7340na	7345na	9600na	9705as
		9850na	9865as	9895as	12050na
		13370as	15295na	17735as	17890as
0500-0600	S Africa, Channel Africa	7185af	11900af		
0500-0553 f	Seychelles, FEBA Radio	17725me			
0500-0600 vl	Slovakia, AWR	9465af			
0500-0600	Spain, R Exterior Espana	9540na			
0500-0600	Swaziland, Swazi Radio	6155af			
0500-0530	Swaziland, Trans World R	5055af	6070af	7140af	7200af
0500-0502	Uganda, Radio	4976do			
0500-0600	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410af
		9600af	9640na	11760as	11955as
		12095me	15280as	15310as	15360as
		15420af	15575me	17885af	
0500-0600	USA, KAIJ Dallas TX	5810am	13740am		
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	7415am			
0500-0600	USA, KWHR Naalehu HI	9930as			
0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600	USA, VOA Washington DC	5995eu	6035af	6040eu	6140af
		6873af	7170me	7405af	9530eu
		9665af	9700eu	11825me	12080af
		15205me	15600af		
0500-0600	USA, WEWN Birmingham AL	7425na			
0500-0600	USA, WHRI Noblesville IN	7315am	9495am		
0500-0600	USA, WINB Red Lion PA	11950na			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, 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
0510-0520	Botswana, Radio	3356af	4830af	7255af	
0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0530-0600	Australia, Radio	9660do	15510as	15565as	17715as
		17860pa	17880as		
0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0600	Finland, YLE/Radio	6120eu	9635af	11755me	
0530-0600	Romania, R Romania Intl	11940af	15250af	15340af	15380af
		17745af			
0530-0600	Russia, Voice of	5930as	11710as		
0530-0600	Swaziland, Trans World R	9500af	9650af		
0530-0600	UAE, Radio Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom,BBC London	11735eu			
0535-0600	Swaziland, Trans World R	6070af			
0542-0600 a	New Zealand, R NZ Intl	9700pa			
0550-0600 vl	Liberia, Radio ELBC	7275do			

SELECTED PROGRAMS

Sundays
0500 WWCR #1: World of Radio. Glenn Hauser's communications program for shortwave radio listeners.
0500 WWCR #2: World University Network. See S 0000.
0500 WWCR #3: Morning Watch Chapel. See S 0400.
0509 Channel Africa: Religions of the West. Religion in African cultures.
0519 Channel Africa: Our Wild Heritage. Conservation and Wildlife in Southern Africa.
0530 BBC (eu): Europe Today. See S 0330.
0530 WWCR #1: The Old Record Shop. Thirty minutes of selections of music from the days of the 78 rpm record. Recommended.
0532 Channel Africa: Gospel Music. Authentic regional music on a Sunday morning in Africa.
0547 Channel Africa: Talking of Books. Weekly book review.

Mondays
0500 WWCR #1: Sound Currents of the Spirit. James Bean.
0500 WWCR #2: World University Network. See S 0000.
0500 WWCR #3: Voice from the Throne (live). John McKenna.
0530 BBC (eu): Europe Today. See S 0330.
0530 WWCR #3: Wolfe Calling. Roland Wolfe.

Tuesdays
0500 WWCR #2: World University Network. See S 0000.
0500 WWCR #3: The Hour of the Time (live). William Cooper talk show.
0506 WWCR #1: Point of View. See M 1206.
0530 BBC (eu): Europe Today. See S 0330.

Wednesdays
0500 WWCR #2: World University Network. See S 0000.
0500 WWCR #3: The Hour of the Time (live). See T 0500.
0506 WWCR #1: Point of View. See M 1206.
0530 BBC (eu): Europe Today. See S 0330.

Thursdays
0500 WWCR #2: World University Network. See S 0000.
0500 WWCR #3: The Hour of the Time (live). See T 0500.
0506 WWCR #1: Point of View. See M 1206.
0530 BBC (eu): Europe Today. See S 0330.

Fridays
0500 WWCR #2: World University Network. See S 0000.
0500 WWCR #3: The Hour of the Time (live). See T 0500.
0506 WWCR #1: Point of View. See M 1206.
0530 BBC (eu): Europe Today. See S 0330.

Saturdays
0500 WWCR #2: World University Network. See S 0000.
0500 WWCR #3: The Hour of the Time (live). See T 0500.
0506 WWCR #1: Point of View. See M 1206.
0515 Channel Africa: Good Vibrations. Fifteen minutes of rock music and commentary.
0530 BBC (eu): Europe Today. See S 0330.

HAUSER'S HIGHLIGHTS:

ALGERIA R. Algiers no longer confirmed in Arabic or Spanish, nor with Chilean, Polisario and Palestinian clandestine programs; just its own French at 1700-1800, English at 1800-1900 on 11715 only (BBCM)

BRAZIL R. Nacional via Rio PTP on 22822.0 USB at 1544 (Harald Kuhl, Germany, *Play-DX*) R. Nova Visão, Santa Maria on 11704.4 closes weekdays at 2100*, Sat. 2200*, Sun. 2300* (Finn Krone, Denmark, *Play-DX*)

CANARY ISLANDS REE, Canarias has started testing new SW service to S. America; no details (REE *Distance Unknown* via Diane Mauer)

KOREA NORTH When microwave links act up, R. Pyongyang external services occasionally on SW feeders for a few days, 3560 and/or 4405; 3560 seems to be same transmitter used for V. of National Salvation on 4400 (Tooru Yamashita, R. Japan *Media Roundup*)

NIGERIA Answering a listener question, VON said prospects were hopeful that the present government would allow some of the malfunctioning SW transmitters at Ikorodu to be resuscitated by mid-1995 (BBCM)

0600 UTC SHORTWAVE GUIDE 1:00 AM EST 10:00 PM PST

FREQUENCIES

0600-0700	Australia, Radio	9660do	11910pa	13755pa	15510as
		17715as	17880as		
0600-0630	Australia, Radio	13605as	15240pa	15415pa	17795as
0600-0700 vl	Australia, VL8A Alice Spg	4835do			
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0700	Bahrain, Radio	6010do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0630 mtwhf	Canada, RCI Montreal	6050eu	6150eu	9760eu	11905me
0600-0700	China, China Radio Intl	7170eu	7405na		
0600-0630	China, China Radio Intl	3985eu			
0600-0700	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0600-0700	Cuba, Radio Havana Cuba	9820na			
0600-0700	Ecuador, HCJB Quito	9745na			
0600-0700 as	Eqt Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	6100af	9565af	11765af	13790af
		15185af	17820af	21705af	
0600-0615	Ghana, Ghana Broadc Corp	3316do	4915do		
0600-0700 vl	Italy, IRRS Milan	7125eu			
0600-0700	Japan, NHK/Radio	11860as	21610as		
0600-0700	Kenya, Kenya Broadc Corp	4935do			
0600-0700 vl	Kiribati, Radio	9825do			
0600-0630	Laos, Lao National Radio	7116as			
0600-0700 s	Lebanon, Wings of Hope	9960me			
0600-0700 vl	Liberia, Radio ELBC	7275do			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 asmtwh	Malaysia, Radio	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765me			
0600-0700	New Zealand, R NZ Intl	15115pa			
0600-0700 as	New Zealand, R NZ Intl	9700pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4990do		
0600-0700	Nigeria, FRCN/Voice of	7255af			
0600-0700 vl	Papua New Guinea, NBC	4890do	9675do		
0600-0700	Russia, Voice of	5905eu	5930eu	6065as	7175na
		7270na	7345na	9850as	9895as
		11710na	12050na	13370as	15230as
		17570na	17620as	17735af	17840as
		17890as	21790as		
0600-0700 vl	Slovakia, AWR	13715af			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, R Korea Intl	11945na			
0600-0700	Swaziland, Swazi Radio	6155af			
0600-0700	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0600-0615	Switzerland, Swiss R Intl	3985eu	6165eu		
0600-0630	Switzerland, Swiss R Intl	9885af	13635af	15340af	
0600-0615 s	Uganda, Radio	4976do	7110do		
0600-0700	United Kingdom,BBC London	3955eu	6005af	6190af	6195eu
		9410af	9600af	9640na	11760as
		11780eu	11940af	11955as	12095me
		15070af	15280as	15310as	15360me
		15400af	15420af	15575af	17790as
		17885af			
0600-0630	United Kingdom,BBC London	6180eu			
0600-0700	USA, KAIJ Dallas TX	5810am	13740am		
0600-0700	USA, KTBN Salt Lk City UT	7510am			
0600-0700	USA, KVOH Los Angeles CA	7415am			
0600-0700	USA, KWHR Naalehu HI	9930as			
0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	USA, VOA Washington DC	3980eu	5995eu	6040eu	6060eu
		6140af	6873eu	7170me	7325me
		7405af	9530af	9665af	11805af
		11825af	11950af	12035af	12080af
		15205me	15600af		
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, WWCR Nashville TN	5065am	5935am	7435am	
0600-0700	USA, WYFR Okeechobee FL	5985na	7355eu	9680eu	9850af
0600-0620	Vatican State, Vatican R	3945eu	6245eu		
0600-0700	Yemen, Yemeni Rep Radio	9780do			
0630-0700	Australia, Radio	9580pa	9860pa	11880pa	15415as
		21725as			
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Vatican State, Vatican R	5865af	7360af	9660af	11625af
0645-0700	Romania, R Romania Int	15250pa	15335pa	17805pa	

SELECTED PROGRAMS

Sundays
0600 Slovakia (AWR): Music. See S 0100.
0600 WWCR #1: Wolfe Calling. Roland Wolfe.
0605 BBC (af): Postmark Africa. See S 0335.
0610 Channel Africa: Checkpoint. An assessment of current political issues in South Africa.
0615 BBC: Letter from America. Alistair Cooke shares his inimitable view of contemporary American life.
0615 Slovakia (AWR): Sermons of Great Britain. See S 0115.
0630 BBC (af): African Perspective. See S 0409.
0630 BBC: Jazz for the Asking. Record requests with Malcolm Laylock.
0630 WWCR #1: Lutheran Reformation Hour. Richard Shekner.

Mondays
0600 Slovakia (AWR): Music. See S 0100.
0600 WWCR #3: The Sower. Musical treat and spiritual tonic with Michael Guido.
0602 BBC (af): Network Africa. See M 0333.
0615 BBC: The Learning World. News and views about worldwide education.
0615 WWCR #3: 70th Week Magazine. Ben McKnight.
0630 BBC (af): Network Africa. See M 0333.
0630 BBC: Feature. See S 0230.
0630 WWCR #3: The Big Backyard. Australian Embassy.
0640 Slovakia (AWR): Music. See S 0100.

Tuesdays
0602 BBC (af): Network Africa. See M 0333.
0615 BBC: The World Today. See M 1645.
0615 WWCR #3: 70th Week Magazine. See M 0615.
0630 BBC (af): Network Africa. See M 0333.
0630 BBC: Music Feature. See M 0145.
0630 WWCR #3: Afterglow. Don Johnson.
0640 Slovakia (AWR): Music. See S 0100.
0645 Slovakia (AWR): Voice of Prophecy. See M 1445.

Wednesdays
0602 BBC (af): Network Africa. See M 0333.
0615 BBC: The World Today. See M 1645.
0615 WWCR #3: 70th Week Magazine. See M 0615.
0630 BBC (af): Network Africa. See M 0333.
0630 BBC: Meridian Documentary. One of three topical programmes weekly about the world of the arts.
0630 WWCR #3: Unshackled. Pacific Garden Mission's radio drama.
0640 Slovakia (AWR): Music. See S 0100.
0645 Slovakia (AWR): Voice of Prophecy. See M 1445.

Thursdays
0602 BBC (af): Network Africa. See M 0333.
0615 BBC: The World Today. See M 1645.
0615 Slovakia (AWR): Power to Cope. See W 1415.
0615 WWCR #3: 70th Week Magazine. See M 0615.
0630 BBC (af): Network Africa. See M 0333.
0630 BBC: Sports International. See H 0230.
0630 WWCR #3: Afterglow. See T 0630.
0640 Slovakia (AWR): Music. See S 0100.
0645 Slovakia (AWR): Voice of Prophecy. See M 1445.

Fridays
0600 Slovakia (AWR): Travel Log. See H 1400.
0602 BBC (af): Network Africa. See M 0333.
0615 BBC: The World Today. See M 1645.
0615 WWCR #3: 70th Week Magazine. See M 0615.
0630 BBC (af): Network Africa. See M 0333.
0630 BBC: Meridian Books. See W 0630.
0630 WWCR #3: Unshackled. See W 0630.
0640 Slovakia (AWR): Music. See S 0100.
0645 Slovakia (AWR): Voice of Prophecy. See M 1445.

Saturdays
0615 BBC: The World Today. See M 1645.
0615 WWCR #3: Voice of Thunder. Terry Steenburg.
0630 BBC (af): Spice Taxi. A sideways look at African culture, from presidential style to cult films.
0630 BBC: Meridian Reports. See W 0630.
0630 Slovakia (AWR): Quiet Moments. See F 1430.
0630 WWCR #1: Financial Commentary. Curtis Calihan.
0630 WWCR #3: Watchman Reports. Charles Pemberton.
0640 Slovakia (AWR): Music. See S 0100.
0645 Slovakia (AWR): Voice of Prophecy. See M 1445.
0645 WWCR #1: Words of Hope. See S 1200.

HAUSER'S HIGHLIGHTS:
CUBA: Radio Havana Cuba

Top of the hour:
International News ..... Mon-Sat
Followed by:
Latin Am Newsline ..... Mon-Sat
The Jazz Place ..... Sun
The Mailbag Show ..... Sun
The World of Stamps... Sat
DXers Unlimited ..... Tue and Sat
(Benelux DX Club via Doug Dine via Diane Mauer)

FREQUENCIES

0700-0800	Australia, Radio	6080pa	9580pa	9860pa	11720pa
		11880pa	11910pa	13605pa	15240pa
		15565as	17695as	17750as	21595as
		21715as			
0700-0730	Australia, Radio	15415as	17795as		
0700-0800 vl	Australia, VL8A Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio	6010do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	China, China Radio Intl	7405na			
0700-0800	Costa Rica, AWR Alajuela	5030am	6150am	9725am	
0700-0800	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0700-0727	Czech Rep, Radio Prague	5930eu	7345eu	9505eu	
0700-0800	Ecuador, HCJB Quito	6135as	6205as	9420eu	9600eu
		9745pa	11835eu	11925pa	21455eu
0700-0800 as	Eqt Guinea, R East Africa	9585af			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0800 vl	Italy, IRRS Milan	7125eu			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11740as	15270as
		15335me	15410as	17810me	21610au
0700-0800	Kenya, Kenya Broadc Corp	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	
0700-0730	Myanmar, Radio	5990do	9730do		
0700-0715	New Zealand, R NZ Intl	15115pa			
0700-0800 as	New Zealand, R NZ Intl	9700pa			
0700-0800 vl	Papua New Guinea, NBC	4890do	9675do		
0700-0745	Romania, R Romania Intl	15250pa	15335pa	17720pa	17805pa
0700-0800	Russia, Voice of	5905eu	5930eu	7175na	7270na
		9480eu	9700as	9850as	9895as
		11675eu	12050na	13370as	15230me
		15385me	17560na	17795na	17840af
		17890af	21790af		
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
0700-0730	Switzerland, Swiss R Intl	3985eu	6165eu		
0700-0800	Taiwan, VO Free China	5950na			
0700-0715 mtwtfa	Uganda, Radio	4976do	7110do		
0700-0800	United Kingdom,BBC London	3955eu	6190af	6195eu	7325eu
		9410af	9600af	9640na	11760me
		11940af	11955as	12095af	15070af
		15280as	15310as	15360as	15400af
		17790as	17830af	17885af	
0700-0730	United Kingdom,BBC London	6005eu	11780eu	11860af	15575me
0700-0800	USA, KAIJ Dallas TX	5810am	13740am		
0700-0800	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KVOH Los Angeles CA	7415am			
0700-0800	USA, KWHR Naalehu HI	9930as			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	USA, WEWN Birmingham AL	7425na	13615na		
0700-0800 vl	USA, WHRI Noblesville IN	7315am	9495am		
0700-0800	USA, WINB Red Lion PA	11950na			
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5065am	5935am	7435am	
0700-0745	USA, WYFR Okeechobee FL	7355eu	9680eu	9850af	
0717-0800 mtwhf	New Zealand, R NZ Intl	9700pa			
0730-0800	Australia, Radio	9660pa	17880as		
0730-0800	Belgium, R Vlaanderen Int	5985eu	9925au		
0730-0757	Czech Rep, Radio Prague	17485as	21705au		
0730-0745 sh	Greece, Voice of	9935eu	11645eu		
0730-0745 mtwhf	Iceland, Natl BC Service	9265am			
0730-0800	Netherlands, Radio	9720pa	11895pa		
0730-0745 mtwhf	Vatican State, Vatican R	3945eu	6245eu	7250eu	9645eu
		11740eu	15210eu	15570eu	
0735-0800 smtwhf	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0740-0800 mtwhf	Monaco, Trans World Radio	7120eu			
0745-0800	Finland, YLE/Radio	6120eu	9560eu	11755eu	
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		

0800 UTC

0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	15565pa	17715as
		17880as			
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	China, China Radio Intl	9710na	11715na		
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		21455eu			
0800-0900 as	Eqt Guinea, R East Africa	9585af			
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, KTWR Agana	15200as			
0800-0900	Indonesia, Voice of	9675as	11752as		
0800-0900 vl	Italy, IRRS Milan	7125eu			
0800-0900	Kenya, Kenya Broadc Corp	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	
0800-0900 mtwtf	Monaco, Trans World Radio	7120eu			
0800-0825	Netherlands, Radio	9720pa	11895pa		
0800-0900 mtwhf	New Zealand, R NZ Intl	9700pa			
0800-0830 m	Norway, Radio Norway Intl	15175as			
0800-0850	Pakistan, Radio	15625eu	17900eu		
0800-0900 vl	Papua New Guinea, NBC	4890do	9675do		
0800-0900	Russia, Voice of	11675af	11710as	13370as	15230me
		17620na	17795as	17840as	17860as
		17890as			
0800-0815	Sierra Leone, SLBS	3316do			
0800-0900 vl	Slovakia, AWR	17630af			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	7550eu	13670eu		
0800-0805 smtwhf	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0800-0900	United Kingdom,BBC London	6190af	6195eu	7325eu	11940af
		11955as	12095af	15070af	15280as
		15360as	15400af	17640af	17830af
		17885af			
0800-0815	United Kingdom,BBC London	3955eu	9410eu	9600af	9640na
		11760me	15310as	15310eu	17790as
0800-0900	USA, KAIJ Dallas TX	5810am	13740am		
0800-0900	USA, KNLS Anchor Point AK	7365as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	7535eu			
0800-0900	USA, WEWN Birmingham AL	7425sa	9350na		
0800-0900 vl	USA, WHRI Noblesville IN	7315am	9495am		
0800-0900	USA, WINB Red Lion PA	11950na			
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	5065am	5935am		
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	Austria, R Austria Intl	6155eu	13730eu	15450as	17870au
0830-0900	Ecuador, HCJB Quito	6135pa	9745pa	17490pa	
0830-0900	Netherlands, Radio	9720pa	9895pa	13700pa	
0830-0900	Slovakia, R Slovakia Intl	11990au	17485au	21705au	
0855-0900	Guam, KTWR Agana	11830pa			

HAUSER'S HIGHLIGHTS

SA'UDI ARABIA: BSKSA external from Riyadh/Jeddah with Holy Koran

0300-0600	9730	9555
0900-1200	21495	17880
1200-1600	15280	15165
1600-1800	11920	11835 9730
1800-2100	11935	

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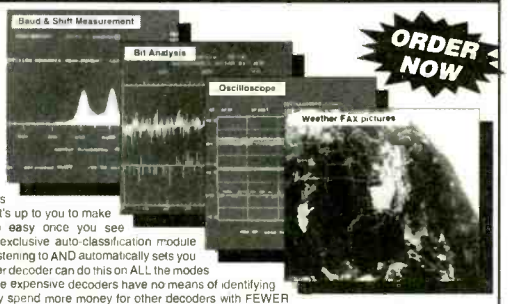

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- Twinplex
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- SWED-ARQ-ARQ-SWE
- ARQ-E/ARQ1000 Duplex
- ARQ-N-ARQ1000 Duplex Variant
- ARQ-E3-CCIR519 Variant
- POL-ARQ 100 Baud Duplex ARQ
- TDM242/ARQ-M2/4-242
- TDM342/ARQ M2/4
- FEC-A FEC100A/FEC101
- FEC-S • FEC1000 Simplex
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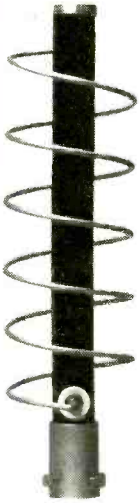

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FREQUENCIES

0900-1000	Australia, Radio	9510as	9580pa	9860pa	13605as
		15170as	21725as		
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Bahrain, Radio	6010do			
0900-1000	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			
0900-1000	Costa Rica, AWR Alajuela	5030am	6150am	9725am	
0900-1000	Costa Rica, R Peace Intl	7385am	9400am	15030am	
0900-1000	Ecuador, HCJB Quito	6135pa	9745pa	17490pa	21455pa
0900-1000 as	Eqt Guinea, R East Africa	9585af			
0900-1000	Finland, YLE/Radio	15330as	17800au		
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	12055as
		15410af	17780as	17800af	21600af
		21650as	21680as		
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-0915	Guam, KTWR Agana	15200as			
0900-1000	Guam, KTWR Agana	11830pa			
0900-1000 vl	Italy, IRRS Milan	7125eu			
0900-1000	Japan, NHK/Radio	9610as	9750as	11815as	15190as
		15270au			
0900-0948 vl	Kiribati, Radio	9825do			
0900-1000 vl	Liberia, Radio ELBC	7275do			
0900-1000	Malaysia, Radio	7295do			
0900-0920 mtwtf	Monaco, Trans World Radio	7120eu			
0900-0930	Netherlands, Radio	9720pa	13700pa		
0900-1000 mtwhf	New Zealand, R NZ Intl	9700pa			
0900-1000 mtwtf	Nigeria, FRCN/Radio	3326do	4990do		
0900-1000	Nigeria, FRCN/Voice of	7255af			
0900-1000 mtwtfa	Palau, KHBN/Voice of Hope	9830as			
0900-1000 vl	Papua New Guinea, NBC	4890do	9675do		
0900-1000	Russia, Voice of	9480eu	9550eu	9800pa	11675as
		11710me	11975as	12015as	13370as
		15385eu	15580as	17670as	17765eu
		17795eu	17840na	17860as	
0900-1000 vl	Slovakia, AWR	9450eu	17630af		
0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17515au	
0900-1000	United Kingdom,BBC London	6190af	6195as	9410eu	9740as
		11760me	11940af	12095af	15070af
		15190sa	15280as	15310as	15400eu
		15575me	17640af	17705af	17790as
		17830as	17885af		
0900-0915	United Kingdom,BBC London	6120as	6195eu	7345eu	9580as
		11955as	15360as		
0900-1000	USA, KAIJ Dallas TX	5810am	13740am		
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu		
0900-1000	USA, WEWN Birmingham AL	7465eu	9350na		
0900-1000 vl	USA, WHRI Noblesville IN	7315am	9495am		
0900-1000	USA, WINB Red Lion PA	11950na			
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5935am			
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0920-0935 sh	Greece, Voice of	15650au	17525au		
0920-0935 a	Monaco, Trans World Radio	7120eu			
0920-0945 s	Monaco, Trans World Radio	7120eu			
0930-0945 s	Armenia, Radio Yerevan	15275eu	15370eu		
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	7260pa	9720pa	9810pa	21505pa
0930-1000	Philippines, FEBC/R Intl	11690as			
0940-0950	Greece, Voice of	15650au	17525au		

1000 UTC

1000-1100	Australia, Radio	9580pa	9860pa	15170as	21725as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Bahrain, Radio	6010do			
1000-1030 mtwhfa	Belgium, R Vlaanderen Int	6035eu	15510af	17595af	
1000-1100	Bulgaria, Radio	12040au			
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			
1000-1100	Costa Rica, AWR Alajuela	5030am	5970am	9725am	
1000-1100	Costa Rica, R Peace Intl	7385am	9400am	15030am	
1000-1100	Ecuador, HCJB Quito	6135as	9745pa	11925pa	21455pa
1000-1100 as	Eqt Guinea, R East Africa	9585af			
1000-1040	Ghana, Ghana Broadc Corp	6130do	7295do		
1000-1100	India, All India Radio	15050as	15180as	17387au	17895as
1000-1100 vl	Italy, IRRS Milan	7125eu			
1000-1100	Malaysia, Radio	7295do			
1000-1100	Malaysia, RTM/Kota Kinaba	5980do			
1000-1030	Netherlands, Radio	7260pa	9720pa	9810pa	21505pa
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, FRCN/Radio	4990do	7285do		
1000-1100	Nigeria, FRCN/Voice of	7255af			
1000-1100 mtwhfa	Palau, KHBN/Voice of Hope	9830as			
1000-1100 vl	Papua New Guinea, NBC	4890do	9675do		
1000-1100	Philippines, FEBC/R Intl	11690as			
1000-1100	Russia, Voice of	9480eu	9550eu	9680na	9800eu
		11675na	11710as	12015eu	15385na
		17710af	17860as		
1000-1100	S Africa, Channel Africa	17810af			
1000-1100 vl	Slovakia, AWR	9450eu			
1000-1015	Uganda, Radio	4976do			
1000-1100	United Kingdom,BBC London	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	6095sa	7395sa		
1000-1100	USA, VOA Washington DC	5985pa	7405am	9590am	11720pa
		11915am	15120am	15425pa	
1000-1100	USA, WEWN Birmingham AL	7465eu			
1000-1100 vl	USA, WHRI Noblesville IN	6040am	9850am		
1000-1100	USA, WINB Red Lion PA	11950na			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5065am	15685am		
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	10059as	12025as	15010as	
1030-1100 mtwhfa	Austria, R Austria Intl	6155eu	13730eu	15450as	17870au
1030-1100 mtwhf	Ethiopia, Radio	5990af	7110af	9705af	
1030-1055	Iraq, Radio Iraq Intl	13680as			
1030-1100	Malaysia, RTM Kuching	7160do			
1030-1100	Netherlands, Radio	7260pa	9810pa		
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605eu

HAUSER'S HIGHLIGHTS:

RUSSIA VOR added good new 7125 at 2330-0200 in English (Kevin Hecht, PA) R. Alef, Moscow, from Jewish Children's Association *Banim Banot*, in Russian and occasional Hebrew: Fri 1600-1700, Sat/Tue/Thu 1700-1800 on 17890, 12075, 9815, 5935, 4055. R. Slavyanka, Russian Ministry of Defence for troops in border areas, Tue-Sun 0200-0400 on 7340, 7235, 7225, 6160, 5965, 5950, 4975, 4940, 4860, 4740; both one hour earlier in summer (BBCM)

FREQUENCIES

1100-1200	Australia, Radio	9510pa	9580pa	9710pa	9860pa
		13605as	15170as	15565as	
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Bahrain, Radio	6010do			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	China, China Radio Intl	9690na	9710na	11715na	
1100-1200	Costa Rica, AWR Alajuela	5030am	5970am	9725am	
1100-1200	Costa Rica, R Peace Intl	7385am	9400am	15030am	
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1200	Ecuador, HCJB Quito	12005am	15115am	21455pa	
1100-1130	Georgia, Radio	11815eu			
1100-1150	Germany, Deutsche Welle	15370af	15410af	17765af	17800af
		21600af			
1100-1110 as	Ghana, Ghana Broadc Corp	3366do	4915do		
1100-1200 vl	Guatemala, AWR	5980ca			
1100-1130	Israel, Kol Israel	15640na	15650eu	17575eu	
1100-1200 vl	Italy, IRRS Milan	7125eu			
1100-1200	Japan, NHK/Radio	6120na	9610as	15295as	
1100-1200	Malaysia, Radio	7295do			
1100-1200	Malaysia, RTM Kuching	7160do			
1100-1200	Malaysia, RTM/Kota Kinaba	5980do			
1100-1200 mtwhf	New Zealand, R NZ Intl	9700pa			
1100-1105	Nigeria, FRCN/Radio	4990do	7285do		
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1120	Pakistan, Radio	15625as	17900as		
1100-1200 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1100-1200 vl	Papua New Guinea, NBC	4890do	9675do		
1100-1200	Russia, Voice of	7205eu	9470eu	9550eu	9680eu
		9800eu	11675eu	11710as	11835as
		11980as	12015eu	13370as	15190as
		15265as	15495as	17755me	17765na
		17860me	21600af		
1100-1115	Rwanda, Radio	6055do			
1100-1200	S Africa, Channel Africa	9730af			
1100-1200	Singapore, SBC Radio One	6155do			
1100-1200	Singapore,R Singapore Int	9530as			
1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu	9885as	11640as
		13635as			
1100-1102	Uganda, Radio	7110do	7195do		
1100-1200	United Kingdom,BBC London	6190af	6195na	9410eu	9515na
		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		
1100-1200	USA, VOA Washington DC	5985as	6110as	7405am	9590am
		9615as	9760as	11720as	11915am
		15120am	15160as	15425as	
1100-1200	USA, WEWN Birmingham AL	9350na	9370as		
1100-1200 vl	USA, WHRI Noblesville IN	6040am	9850am		
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WWCR Nashville TN	5065am	5935am	15685am	
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1120-1130 mtwtfa	Vatican State, Vatican R	6245eu	11740af	15210af	17585me
1130-1157	Czech Rep, Radio Prague	7345eu	9505eu	11990eu	
1130-1200	Iran, VOIRI Tehran	11790as	11930me		
1130-1200	Netherlands, Radio	6045eu	7130eu		
1130-1200	South Korea, R Korea Intl	9650na			
1130-1200	Vietnam, Voice of	10059as	12025as	15010as	
1131-1152	Indonesia, RRI Sorong	4874do			
1145-1200	Rwanda, Radio	6055do			

SELECTED PROGRAMS

Sundays

1100 Israel Radio Int'l: Israel News Magazine. The latest world and Israel and regional news.
1100 WWCR #2: World University Network. See S 0000.
1115 Israel Radio Int'l: You're on the Air. Phone-in program.
1130 BBC: The John Dunn Show. See S 0030.
1136 Radio Prague: Live in Prague. Jazz from one of Prague's night spots.

Mondays

1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
1100 WWCR #2: World University Network. See S 0000.
1115 Israel Radio Int'l: Israel Mosaic. A weekly magazine of life in Israel.
1130 BBC: Composer of the Month. See M 0230.
1134 Radio Prague: Current Affairs. People and events in the Czech Republic and editorial commentary.
1139 Radio Prague: Press Review. News items and editorial comment from the Czech newspapers.
1142 Radio Prague: Magazine '94. Music and interviews about current Czech affairs.

Tuesdays

1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
1100 WWCR #2: World University Network. See S 0000.
1115 Israel Radio Int'l: Talking Point. A weekly discussion program.
1130 BBC: Megamix. Compendium of music, sport, fashion, health, travel, news and views for young people.
1135 Radio Prague: Current Affairs. See M 1134.
1142 Radio Prague: Press Review. See M 1139.

Wednesdays

1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
1100 WWCR #2: World University Network. See S 0000.
1115 Israel Radio Int'l: The Aliyah Page. For and about newcomers to Israel.
1130 BBC: Meridian Documentary. See W 0630.
1136 Radio Prague: Current Affairs. See M 1134.
1141 Radio Prague: Press Review. See M 1139.
1144 Radio Prague: Calling All Listeners. Commentary on listener letters with occasional DX news.

Thursdays

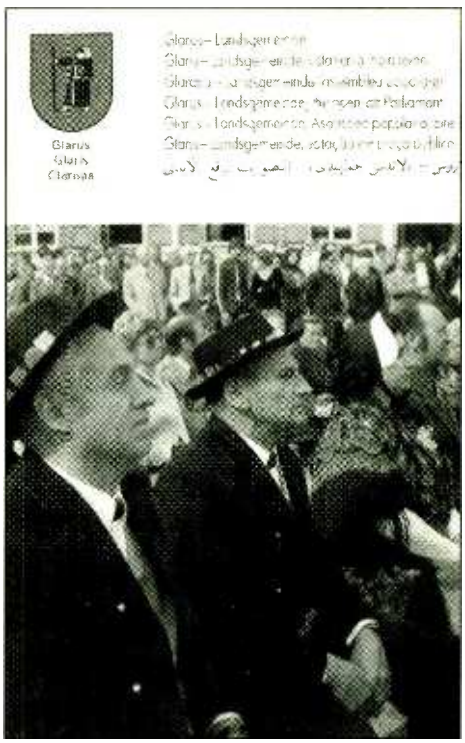
1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
1100 WWCR #2: World University Network. See S 0000.
1115 Israel Radio Int'l: Studio Three. Israeli arts magazine program.
1130 BBC: Feature. See S 0230.
1135 Radio Prague: Current Affairs. See M 1134.
1142 Radio Prague: Press Review. See M 1139.
1145 Radio Prague: Economic News. Czech financial reports.
1150 Radio Prague: From the Archives (biweekly). An historical look at the Czech people and their lifestyle.
1150 Radio Prague: Stamp Corner (biweekly). New issues and other philatelic events are reported.

Fridays

1100 Israel Radio Int'l: Israel News Magazine. See S 1100.
1100 WWCR #2: World University Network. See S 0000.
1110 Israel Radio Int'l: Letter from Jerusalem. Arie Haskell reviews the past week's current affairs.
1115 Israel Radio Int'l: Thank Goodness It's Friday. A program for the Sabbath eve.
1130 BBC: Meridian Books. See W 0630.
1136 Radio Prague: Current Affairs. See M 1134.

Saturdays

1100 WWCR #1: Focus on the Family (Russian). See M 1403.
1100 WWCR #2: World University Network. See S 0000.
1106 Israel Radio Int'l: Spotlight. People and issues in the news.
1115 WWCR #1: The Living Word (Ukrainian). John Harbarenko.
1130 BBC: Meridian Reports. See W 0630.
1130 WWCR #1: Unshackled. Pacific Garden Mission's radio drama.
1146 Radio Prague: The Arts. Focus on an a particular topic concerning Czech art.



Our thanks to Gerald Brookman of Kenai, Alaska for sharing this QSL from Swiss Radio International.

1200 UTC SHORTWAVE GUIDE 7:00 AM EST 4:00 AM PST

FREQUENCIES

1200-1230	Australia, Radio	5995pa	6060pa	6080pa	9580pa
		9610as	11800pa	15565as	
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Bahrain, Radio	6010do			
1200-1300	Brazil, Radiobras	15445na			
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300	China, China Radio Intl	9715as	9730na	11660as	11795pa
		15440pa			
1200-1300	Costa Rica, R Peace Intl	7385am	9400am	15030am	
1200-1300	Ecuador, HCJB Quito	12005am	15115am	21455pa	
1200-1300	France, Radio France Intl	9805eu	11615na	13625af	15155eu
		15195eu	15325af	15365na	15530ca
		17575ca			
1200-1300 vl	Guatemala, AWR	5980ca			
1200-1240	Iran, VOIRI Tehran	11790as	11930me		
1200-1300 vl	Italy, IRRS Milan	7125eu			
1200-1300	Jordan, Radio	9560eu			
1200-1300	Malaysia, Radio	7295do			
1200-1300	Malaysia, RTM/Kota Kinaba	5980do			
1200-1230 mw	Mongolia, R Ulan Bator	7290na	12015na		
1200-1300	Netherlands, Radio	6045eu	7130eu		
1200-1206 mtwhf	New Zealand, R NZ Intl	9700pa			
1200-1230	Nigeria, FRCN/Radio	4990do	7285do		
1200-1230 s	Norway, Radio Norway Intl	11850as	15165au		
1200-1300 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1200-1230 a	Palau, KHBN/Voice of Hope	9830as			
1200-1300 vl	Papua New Guinea, NBC	4890do	9675do		
1200-1300	Russia, Voice of	5960eu	7160na	7205na	9470eu
		9540eu	9550eu	9680eu	9800eu
		11655as	11675af	11710as	11760eu
		11980eu	12015af	12065me	13370eu
		15190af	15485eu	15495af	

1200-1300	Singapore, SBC Radio One	6155do			
1200-1300	Singapore,R Singapore Int	9530as			
1200-1300	South Korea, R Korea Intl	7180as			
1200-1230	Switzerland, Swiss R Intl	6165eu	9535eu		
1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300	United Kingdom,BBC London	6190af	6195na	9410eu	9515na
		9740na	11750as	11760as	11940af
		12095af	15070af	15220na	15310as
		15575me	17640af	17705eu	17830af
		17885af	21660af		
1200-1300	USA, KAIJ Dallas TX	9815am	13815am		
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	6095na	9455na		
1200-1300	USA, VOA Washington DC	6110as	9645as	9760as	11715as
		15160as	15425as		
1200-1300	USA, WEWN Birmingham AL	9350na	9985ca	15695na	
1200-1300 vl	USA, WHRI Noblesville IN	6040am	9850am		
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300 s	USA, WRMI/R Miami Intl	9955am			
1200-1300	USA, WWCR Nashville TN	5065am	13845am	15685am	
1200-1300	USA, WYFR Okeechobee FL	5950na	7355na	11790na	11830na
1200-1230	Uzbekistan, R Tashkent	6020eu	9715eu	13785eu	
1207-1300 occsnal	New Zealand, R NZ Intl	9700pa			
1215-1300	Egypt, Radio Cairo	17595as			
1220-1229 vl	Ghana, Ghana Broadc Corp	4915do			
1230-1300	Australia, Radio	5995pa	6060pa	7260as	11800pa
		15565as			
1230-1300	Austria, R Austria Intl	6155eu	11780as	13730na	
1230-1300	Bangladesh, Radio	9650as	13615as		
1230-1300	Bulgaria, Radio	9770as	11740as		
1230-1300	Canada, RCI Montreal	6150as	11730as		
1230-1300	Finland, YLE/Radio	11735na	11740na	15400na	
1230-1300	Ghana, Ghana Broadc Corp	6130do	7295do		
1230-1300	Russia, Voice of	6000eu	6060eu		
1230-1300	South Korea, R Korea Intl	9570as	11740as	13670eu	
1230-1300	Sweden, Radio	13775au	15120as	15240as	
1230-1300	Vietnam, Voice of	10059as	12025as	15010as	
1240-1250	Greece, Voice of	9935af	11645af	15630af	

SELECTED PROGRAMS

Sundays

1200 WWCR #1: Words of Hope. Paul Bryson or Eugene Brown.
1200 WWCR #2: World University Network. See S 0000.
1200 WWCR #3: The Overcomer Broadcast (live). Brother R. G. Stair preaches about the last days.
1201 BBC: Play of the Week. See S 0101.
1230 Radio Sweden: In Touch with Stockholm (biweekly). A mailbag program with on-the-air link-ups.
1230 Radio Sweden: Sounds Nordic (biweekly). The very latest in trends and music.
1230 WRMI: Viva Miami! See S 0100.
1230 WWCR #1: Staff of Life. Irene Armstrong.
1245 WRMI: Wavescan. See S 0100.

Mondays

1200 WWCR #2: World University Network. See S 0000.
1200 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1206 WWCR #1: Point of View. Marlin Maddoux interviewing on current events of interest to Christians.
1209 BBC: Words of Faith. People of all faiths share how their scripture gives authority and meaning to their lives.
1215 BBC: Comedy/Quiz Feature. These programs are panel quizes and other light entertainment in a format heard in America decades ago.
1230 Radio Sweden: Sixty Degrees North. Reports, interviews and analysis from Stockholm and other Nordic capitals.
1245 BBC: Sports Roundup. See S 0315.
1248 Radio Sweden: Sports Scan. A weekly review of all the news in sports.

Tuesdays

1200 WWCR #2: World University Network. See S 0000.
1200 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1206 WWCR #1: Point of View. See M 1206.
1209 BBC: Words of Faith. See M 1209.
1215 BBC: Multitrack: Hit List. See M 2330.
1230 Radio Sweden: Sixty Degrees North. See M 1230.
1245 BBC: Sports Roundup. See S 0315.
1247 Radio Sweden: Media Scan (1&3). Satellite news 85%; medium wave and shortwave news 15%.

Wednesdays

1200 WWCR #2: World University Network. See S 0000.
1200 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1206 WWCR #1: Point of View. See M 1206.
1209 BBC: Words of Faith. See M 1209.
1215 BBC: New Ideas. See M 1615.
1230 Radio Sweden: Sixty Degrees North. See M 1230.
1235 BBC: Feature. See S 0230.
1245 BBC: Sports Roundup. See S 0315.
1249 Radio Sweden: Money Matters. Economic and financial trends.

Thursdays

1200 WWCR #2: World University Network. See S 0000.
1200 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1206 WWCR #1: Point of View. See M 1206.
1209 BBC: Words of Faith. See M 1209.
1215 BBC: Multitrack: X-Press. See W 2330.
1230 Radio Sweden: Sixty Degrees North. See M 1230.
1245 BBC: Sports Roundup. See S 0315.
1246 Radio Sweden: Green Scan. Environmental concerns and solutions.
1246 Radio Sweden: Horizon (4). Science and technology in Sweden.

Fridays

1200 WWCR #2: World University Network. See S 0000.
1200 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1206 WWCR #1: Point of View. See M 1206.
1209 BBC: Words of Faith. See M 1209.
1215 BBC: Feature. See S 0230.
1230 Radio Sweden: Sixty Degrees North. See M 1230.
1235 Radio Sweden: A Review of the Newsweek. Looking back at the week's news events.
1245 BBC: Sports Roundup. See S 0315.

Saturdays

1200 WWCR #2: World University Network. See S 0000.
1200 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1209 BBC: Words of Faith. See M 1209.
1215 BBC: Multitrack: Alternative. See F 2330.
1215 WWCR #1: Focus on the Family (Weekend Edition). See M 1403.
1230 Radio Sweden: People and Ideas. See S 0030.
1245 BBC: Sports Roundup. See S 0315.

HAUSER'S HIGHLIGHTS
USA: WWCR program notes:

President's Saturday Radio Address and *Republican Attack*
2000-2015, 2345-2400 on 15685
United Slaves of America
Sat 1700 on 12160
The Specular Hour
Sat 2000 on 11970
Programs subject to change

FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240as	9610as	11800pa
1300-1330	Australia, Radio	6060pa	6080as		
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485do			
1300-1400 vl	Australia, VL8T Tent Crk	2325do			
1300-1400	Bahrain, Radio	6010do			
1300-1320	Brazil, Radiobras	15445na			
1300-1330	Bulgaria, Radio	9770as	11740as		
1300-1400 vl	Canada, CBC N Quebec Sce	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 mtwhf	Canada, RCI Montreal	11855na	17820na		
1300-1400	China, China Radio Intl	9595na	9715as	11660as	15440pa
1300-1400	Costa Rica, R Peace Intl	7385am	9400am	15030am	
1300-1400	Ecuador, HCJB Quito	15115am	17890am	21455eu	
1300-1330	Egypt, Radio Cairo	17595as			
1300-1330	Ghana, Ghana Broadc Corp	3366do	4915do		
1300-1400 vl	Guatemala, AWR	5980ca			
1300-1400 vl	Italy, IRRS Milan	7125eu			
1300-1400 mtwhfa	Lebanon, Wings of Hope	9960me			
1300-1400	Malaysia, Radio	7295do			
1300-1400	Malaysia, RTM/Kota Kinaba	5980do			
1300-1325	Moldova, R Moldova Intl	15390na			
1300-1325	Netherlands, Radio	6045eu	7130eu		
1300-1306 occsnal	New Zealand, R NZ Intl	9700pa			
1300-1330 s	Norway, Radio Norway Intl	9590eu	13800		
1300-1400 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1300-1400 vl	Papua New Guinea, NBC	4890do	9675do		
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1355	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	9525eu
		11815eu			
1300-1400	Romania, R Romania Intl	9690eu	11790eu	11830eu	11940eu
		15365eu	15390eu	17745eu	
1300-1400	Russia, Voice of	4740as	4795as	6000eu	6060eu
		7160as	7205eu	7210eu	7295eu
		7335eu	9540na	9550eu	9680eu
		9830eu	11710as	11765as	11865me
		12065na	13370as	15140eu	15150as
		15265eu	15320eu	15460eu	15470me
		15480as	15560me	17720eu	
1300-1400	Singapore, SBC Radio One	6155do			
1300-1400	Singapore,R Singapore Int	9530as			
1300-1330	Switzerland, Swiss R Intl	7250as	7480as	11640as	13635as
1300-1400	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	9815am	13815am		
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		
1300-1400	USA, VOA Washington DC	6110as	9645as	9760as	11805as
		15160as	15425as		
1300-1400	USA, WEWN Birmingham AL	9350na	15695na		
1300-1400	USA, WHRI Noblesville IN	6040am	9930am	15105am	
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400 s	USA, WRMI/R Miami Intl	9955am			
1300-1400	USA, WWCR Nashville TN	5065am	9475am	13845am	15685am
1300-1400	USA, WYFR Okeechobee FL	5950na	9705na	11550na	11830na
		11970na	13695af		
1307-1400 occsnal	New Zealand, R NZ Intl	9655pa			
1330-1400	Austria, R Austria Intl	15450as			
1330-1400 s	Belgium, R Vlaanderen Int	13675na			
1330-1400	Canada, RCI Montreal	6150as	9535as		
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	Netherlands, Radio	9895as	13700as	15150as	
1330-1400	Serbia, Radio Yugoslavia	11865au			
1330-1400	Sweden, Radio	11650na	15240na		
1330-1400	Switzerland, Swiss R Intl	6165eu	9535eu		
1330-1400	Turkey, Voice of	9675as			
1330-1355	UAE, Radio Dubai	13675eu	15320eu	15395as	21605as
1330-1400	Uzbekistan, R Tashkent	6020eu	9715eu	13785eu	
1330-1400	Vietnam, Voice of	10059as	12025as	15010as	
1345-1400	Vatican State, Vatican R	11625as	12050as	15585pa	
1355-1400 vl	Liberia, Radio ELBC	7275do			

SELECTED PROGRAMS

Sundays
1300 WWCR #2: World University Network. See S 0000.
1300 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1305 WWCR #1: New Testament Scriptures. Alexander Scourby.
1315 WRMI: Music. Musical selections for both English and Spanish listeners.
1330 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
1330 Radio Sweden: In Touch with Stockholm (biweekly). See S 1230.
1330 Radio Sweden: Sounds Nordic (biweekly). See S 1230.
1330 Radio Sweden: Sounds Nordic (biweekly). See S 1230.
1330 WWCR #1: Words of Hope. See S 1200.

Mondays
1300 WWCR #1: End Time Revival Network. Various speakers present an evangelical program.
1300 WWCR #2: World University Network. See S 0000.
1300 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1330 Radio Sweden: Sixty Degrees North. See M 1230.
1330 WWCR #1: Bread of Life (1). Jack Meeks.
1330 WWCR #1: The Sower. See M 0030.
1346 Radio Sweden: Sports Scan. See M 1248.

Tuesdays
1300 WWCR #1: End Time Revival Network. See M 1300.
1300 WWCR #2: World University Network. See S 0000.
1300 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1330 Radio Sweden: Sixty Degrees North. See M 1230.
1330 WWCR #1: World of Radio. See S 0500.
1349 Radio Sweden: Media Scan (1&3). See T 1247.

Wednesdays
1300 WWCR #1: End Time Revival Network. See M 1300.
1300 WWCR #2: World University Network. See S 0000.
1300 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1330 Radio Sweden: Sixty Degrees North. See M 1230.
1330 WWCR #1: What a Fellowship Hour. Clay Evans.
1347 Radio Sweden: Money Matters. See W 1249.

Thursdays
1300 WWCR #1: End Time Revival Network. See M 1300.
1300 WWCR #2: World University Network. See S 0000.
1300 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1330 Radio Sweden: Sixty Degrees North. See M 1230.
1330 WWCR #1: We Believe. Jim Walsh.
1346 Radio Sweden: Green Scan. See H 1246.
1346 Radio Sweden: Horizon (4). See H 1246.

Fridays
1300 WWCR #1: End Time Revival Network. See M 1300.
1300 WWCR #2: World University Network. See S 0000.
1300 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1330 Radio Sweden: Sixty Degrees North. See M 1230.
1330 WWCR #1: Battle Cry Sounding. Deborah Green.
1335 Radio Sweden: A Review of the Newsweek. See F 1235.

Saturdays
1300 WWCR #2: World University Network. See S 0000.
1300 WWCR #3: The Overcomer Broadcast (live). See S 1200.
1315 WWCR #1: Financial Commentary. See A 0630.
1330 Radio Sweden: People and Ideas. See S 0030.
1330 WWCR #1: Prophecy Flash. William F. Dankenbring.

HAUSER'S HIGHLIGHTS:

EGYPT: Voice of the Arabs (*Sawt al-Arab*)

External service in Arabic from Cairo:

0300-2430 ..... 15285 plus ...
0300-0600 9850
0600-1400 11980
1800-2430 9700
1900-2430 11665

Separate service in Arabic, **Arab Republic of Egypt Radio from Cairo** (*Idha'at Jumhuriyat Misr al-Arabiyah min al-Qahirah*) confirmed on SW:

0200-2400 ..... 12050 plus ...
0350-0700 9770
0350-2400 9800
0700-1100 ..... 15115 11665 9850
0700-1500 11785
1300-1500 11665
1300-1700 17670
1300-2400 9850
1700-1900 9670
(BBCM)

1400 UTC SHORTWAVE GUIDE 9:00 AM EST 6:00 AM PST

FREQUENCIES

1400-1500	Australia, ADF Radio	8743af	10621af		
1400-1430	Australia, Radio	5995pa	7240pa	9610pa	9710pa
		11800pa			
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			
1400-1500 vl	Australia, VL8T Tent Crk	2325do			
1400-1500	Bahrain, Radio	6010do			
1400-1430 mtwhfa	Belgium, R Vlaanderen Int	13675na			
1400-1500 vl	Canada, CBC N Quebec Sce	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	
1400-1430	Ecuador, HCJB Quito	15115am	21455eu		
1400-1500	France, Radio France Intl	7110eu	12030eu	17560me	
1400-1420	Ghana, Ghana Broadc Corp	3366do	4915do		
1400-1500	Guam, KSDA/AWR	9370as			
1400-1500 vl	Guatemala, AWR	5980ca			
1400-1500	India, All India Radio	13732as	15120as		
1400-1425 smtwh	Israel, Kol Israel	15640na	15650au		
1400-1500 vl	Italy, IRRS Milan	7125eu			
1400-1500	Japan, NHK/Radio	9535na	9750as	11705na	11840as
		11915as			
1400-1500 mtwhfa	Lebanon, Wings of Hope	9960me			
1400-1500 vl	Liberia, Radio ELBC	7275do			
1400-1500	Malaysia, Radio	7295do			
1400-1500	Malaysia, RTM Kuching	7160do			
1400-1500	Malaysia, RTM/Kota Kinaba	5980do			
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1500 s	Morocco, RTV Marocaine	17595af			
1400-1500	Netherlands, Radio	9895as	13700as	15150as	
1400-1500 occsnal	New Zealand, R NZ Intl	9655pa			
1400-1405	Nigeria, FRCN/Radio	4990do	7285do		
1400-1430 mtwhf	Palau, KHBN/Voice of Hope	9830as			
1400-1500	Philippines, FEBC/R Intl	11995as			
1400-1500	Russia, Voice of	5960as	6000eu	6060eu	6065as
		7115na	7160eu	7185eu	7210as
		7350as	9550na	9635as	9680eu
		9810eu	9830na	11760na	11925na
		12015as	12065eu	15140as	15205na
	15265na	15450na	15465eu	15480as	
	17780af	21515af			
1400-1500	Singapore, SBC Radio One	6155do			
1400-1500 vl	Slovakia, AWR	9455af			
1400-1500	South Korea, R Korea Intl	5975as	7275as	11740as	
1400-1420	Turkey, Voice of	9675as			
1400-1500	United Kingdom,BBC London	5990as	6190af	6195as	7110as
		7180na	9410eu	9515na	9660as
		9740na	11750as	11940af	12095af
		15070af	15575me	17640af	17705eu
		17830af	17840na	21470af	21660af
1400-1500	USA, KAIJ Dallas TX	13815am	15725am		
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510am			
1400-1500	USA, VOA Washington DC	6110as	7215as	9645as	9760as
		15160as	15205as	15395as	15425as
1400-1500	USA, WEWN Birmingham AL	7425na			
1400-1500 vl	USA, WHRI Noblesville IN	6040am	9930am	15105am	
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WRMI/R Miami Intl	9955am			
1400-1500	USA, WWCR Nashville TN	5065am	13845am	15685am	
1400-1500	USA, WYFR Okeechobee FL	9705na	11550na	11830na	17760na
1415-1500 mtwtfa	Bhutan, Bhutan BC Service	5025do			
1430-1500	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	11660as	11695pa
		11800pa			
1430-1500	Canada, RCI Montreal	9555me	11935me	15315af	15315eu
		15325me	17820af		
1430-1500	Ecuador, HCJB Quito	6080do	17890am	21455eu	
1430-1500	Finland, YLE/Radio	11735na	15400na	17740na	
1430-1500 s	Ghana, Ghana Broadc Corp	3366do			
1430-1455	Moldova, R Moldova Intl	11775eu			
1430-1500	Myanmar, Radio	5990do	7185do		
1430-1500	Romania, R Romania Intl	11740as	11810as	15335as	
1430-1500	Sweden, Radio	11650na	15240na		
1435-1445	Greece, Voice of	15650na	17520na		
1445-1500	Mongolia, R Ulan Bator	7290na	12000na		

SELECTED PROGRAMS

Sundays

1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
1400 Slovakia (AWR): Music. See S 0100.
1400 WWCR #1: Wings of Healing. Evelyn Wyatt.
1401 BBC: Feature. See S 0230.
1406 Israel Radio Int'l: Calling All Listeners. Israel Radio's weekly mailbag program.
1419 Israel Radio Int'l: Israel DX Corner. Program for shortwave listeners.
1430 BBC: Anything Goes. A variety of music and much more with Bob Holness.
1430 WWCR #1: Wayne Avenue Church of God. J. C. Wilber.
1440 Slovakia (AWR): Music. See S 0100.

Mondays

1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
1403 WWCR #1: Focus on the Family. James Dobson.
1405 BBC: Outlook. An up-to-the-minute mix of conversation, controversy and color from around the world.
1406 Israel Radio Int'l: The Israel Sound. The latest in Israeli popular music.
1418 Israel Radio Int'l: The Cutting Edge. Science, hi-tech and medicine.
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Sweden: Sixty Degrees North. See M 1230.
1430 WWCR #1: Pro Life Perspective. Anti-abortion message from the National Right-to-Life Committee.
1435 WWCR #1: The Brite Spot Hour. Harold Sightler.
1440 Slovakia (AWR): Music. See S 0100.
1445 BBC: Feature. See S 0230.
1445 Slovakia (AWR): Voice of Prophecy. An adult bible study program.
1446 Radio Sweden: Sports Scan. See M 1248.

Tuesdays

1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
1403 WWCR #1: Focus on the Family. See M 1403.
1405 BBC: Outlook. See M 1405.
1406 Israel Radio Int'l: Israel Mosaic. See M 1115.
1419 Israel Radio Int'l: Frequency Announcements. The current broadcast times and frequencies.
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Sweden: Sixty Degrees North. See M 1230.
1440 Slovakia (AWR): Music. See S 0100.
1445 BBC: Music Feature. See M 0145.
1445 Slovakia (AWR): Voice of Prophecy. See M 1445.
1449 Radio Sweden: Media Scan (1&3). See T 1247.

Wednesdays

1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
1405 BBC: Outlook. See M 1405.
1405 Israel Radio Int'l: Talking Point. See T 1115.
1415 Slovakia (AWR): Power to Cope. Advice for Christian living.
1418 Israel Radio Int'l: Eco Alert. Environmental issues in Israel.
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Sweden: Sixty Degrees North. See M 1230.
1440 Slovakia (AWR): Music. See S 0100.
1445 BBC: Good Books. See S 0015.
1445 Slovakia (AWR): Voice of Prophecy. See M 1445.
1447 Radio Sweden: Money Matters. See W 1249.

Thursdays

1400 Israel Radio Int'l: Israel News Magazine. See S 1100.
1400 Slovakia (AWR): Travel Log. A program for tourists.
1405 BBC: Outlook. See M 1405.
1406 Israel Radio Int'l: Jewish News Review. Events in the Jewish world.
1410 Israel Radio Int'l: Studio Three. See H 1115.
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Sweden: Sixty Degrees North. See M 1230.
1440 Slovakia (AWR): Music. See S 0100.
1445 BBC: The Learning World. See M 0615.
1445 Slovakia (AWR): Voice of Prophecy. See M 1445.
1446 Radio Sweden: Green Scan. See H 1246.
1446 Radio Sweden: Horizon (4). See H 1246.

Fridays

1405 BBC: Outlook. See M 1405.
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Sweden: Sixty Degrees North. See M 1230.
1430 Slovakia (AWR): Quiet Moments. A musical interlude.
1435 Radio Sweden: A Review of the Newsweek. See F 1235.
1440 Slovakia (AWR): Music. See S 0100.
1445 BBC: Global Concerns. See F 0145.
1445 Slovakia (AWR): Voice of Prophecy. See M 1445.

Saturdays

1400 Slovakia (AWR): Music. See S 0100.
1401 BBC: Sportsworld. The weekly sports magazine.
1415 Slovakia (AWR): Sermons of Great Britain. See S 0115.
1430 Radio Sweden: People and Ideas. See S 0030.
1430 WWCR #1: Hour of Reasoning. P. Mobley.

FREQUENCIES

1500-1600	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	11660as	11695pa
		11800pa			
1500-1600 vl	Australia, VL8A Alice Spg	2310do			
1500-1600 vl	Australia, VL8K Katherine	2485do			
1500-1600 vl	Australia, VL8T Tent Crk	2325do			
1500-1600	Bahrain, Radio	6010do			
1500-1600 vl	Canada, CBC N Quebec Sce	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	9535as	9785as	
1500-1600	Ecuador, HCJB Quito	6080do	15115am	17490eu	21455eu
1500-1550	Germany, Deutsche Welle	7195af	9735af	11965af	15145af
		17800af			
1500-1600	Guam, KSDA/AWR	9370as			
1500-1600 mt	Guam, KTWR Agana	11580as			
1500-1600	Iran, VOIRI Tehran	9575as	11790as		
1500-1600	Iraq, Radio Iraq Intl	15250as			
1500-1600	Italy, AWR Europe	7230eu			
1500-1600 vl	Italy, IRRS Milan	7125eu			
1500-1600	Japan, NHK/Radio	9535na	9750as	11955as	15355af
1500-1600	Jordan, Radio	9560eu			
1500-1600 mtwhfa	Lebanon, Wings of Hope	9960me			
1500-1600 vl	Liberia, Radio ELBC	7275do			
1500-1600	Malaysia, Radio	7295do			
1500-1600	Malaysia, RTM Kuching	7160do			
1500-1600	Malaysia, RTM/Kota Kinaba	5980do			
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1515	Mongolia, R Ulan Bator	7290as	12000na		
1500-1525	Netherlands, Radio	9895as	13700as	15150as	
1500-1600 occsnal	New Zealand, R NZ Intl	9655pa			
1500-1530	Nigeria, FRCN/Radio	4990do	7285do		
1500-1600	Nigeria, FRCN/Voice of	7255af			
1500-1600	Palau, KHBN/Voice of Hope	9965as			
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1530	Romania, R Romania Intl	11740as	11810as	15335as	
1500-1600	Russia, Voice of	4740as	4795as	4940as	5935eu
		6035eu	6065as	7115na	7165eu
		7180eu	7295eu	7330eu	7345na
		7360eu	9575eu	9635eu	9835na
		9885na	11765as	11825af	12015eu
	12065me	15205na	15265na	15320as	
	15465eu	15480as	21515af		
1500-1600	S Africa, Channel Africa	7225af			
1500-1550	Seychelles, FEBA Radio	9810as	11870as		
1500-1600	Seychelles, FEBA Radio	11870as			
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600 vl	Slovakia, AWR	9455af			
1500-1600	Sri Lanka, SLBC Colombo	9720as	15425as		
1500-1530	Switzerland, Swiss R Intl	9885as	12075as	13635as	
1500-1600	United Kingdom,BBC London	5990as	6190af	6195eu	9410eu
		9515na	9660as	9740na	11705eu
		11750as	11940af	12095me	15070af
		15260na	15400eu	17830af	17840na
		21470af	21660af		
1500-1530	United Kingdom,BBC London	15420af	17790af	21490af	
1500-1600	USA, KAIJ Dallas TX	13815am	15725am		
1500-1600	USA, KTBN Salt Lk City UT	7510am			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, VOA Washington DC	6110as	7125as	7215as	9645as
		9700as	9760as	15205me	15395as
1500-1600	USA, WCSN Scotts Cor ME	15665eu			
1500-1600	USA, WHRI Noblesville IN	13760am	15105am		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WWCR Nashville TN	12160am	13845am	15685am	
1500-1600	USA, WYFR Okeechobee FL	11830na	15215na	17760ca	
1525-1530 twhf	Philippines, Veritas Asia	15140as			
1530-1600	Austria, R Austria Intl	6155eu	9880me	11780as	13730eu
1530-1545	India, All India Radio	7140as	7412as	9910as	11670me
1530-1600	Netherlands, Radio	9895as	15150as		
1530-1600 mtwhf	Portugal, Radio	21515me			
1530-1600	Russia, Voice of	5920eu	6005af	6110af	7130na
		7150af	7205eu	9800eu	
1540-1555 asm	Philippines, Veritas Asia	15140as			
1545-1600	Vatican State, Vatican R	9500as	11640as		

SELECTED PROGRAMS

Sundays
1500 BBC (af): Postmark Africa. See S 0335.
1500 WWCR #1: Foursquare Gospel Tidings. J. E. Cartier.
1500 WWCR #2: World University Network. See S 0000.
1505 WWCR #3: America's Greatest Heroes. USA Radio Network.
1515 BBC: Concert Hall. Classical music concerts.
1530 WWCR #1: A Temple of Jesus Christ. Cleveland Waters.

Mondays
1500 WWCR #2: World University Network. See S 0000.
1515 BBC (af): Focus on Africa. Up-to-the-minute reports on the day's events from all over the continent.
1515 BBC: Feature. See S 0230.
1546 Radio Portugal Int'l: Visitors' Notebook. Tourist attractions and events in Portugal.

Tuesdays
1500 WWCR #2: World University Network. See S 0000.
1515 BBC (af): Focus on Africa. See M 1515.
1515 BBC: A Jolly Good Show. See T 0015.
1545 Radio Portugal Int'l: Musical Kaleidoscope. A variety of music for listening.

Wednesdays
1500 WWCR #2: World University Network. See S 0000.
1515 BBC (af): Focus on Africa. See M 1515.
1515 BBC: From Our Own Correspondent. See S 0330.
1530 BBC: Feature. See S 0230.
1549 Radio Portugal Int'l: Challenge of the '90s. The past, present, and future of Portugal.

Thursdays
1500 WWCR #2: World University Network. See S 0000.
1515 BBC (af): Focus on Africa. See M 1515.
1515 BBC: The Greenfield Collection. See H 0015.
1546 Radio Portugal Int'l: Spotlight on Portugal. Focus on the cities, towns, and regions of Portugal.

Fridays
1500 WWCR #2: World University Network. See S 0000.
1515 BBC (af): Focus on Africa. See M 1515.
1515 BBC: Music Review. See F 0015.
1542 Radio Portugal Int'l: Visitors' Notebook. See M 1546.
1546 Radio Portugal Int'l: Collector's Corner (triweekly). At look at stamps and other collectibles.
1546 Radio Portugal Int'l: Listeners Mailbag (triweekly). Listener letters are read and questions answered.
1546 Radio Portugal Int'l: Radio Portugal DX (triweekly). Shortwave radio listening tips.

Saturdays
1500 BBC (af): Spice Taxi. See A 0630.
1500 WWCR #2: World University Network. See S 0000.
1500 WWCR #3: The Home Education Network (live). Hosted by Terry and Vicki Brady.
1515 BBC: Sportsworld. See A 1401.

HAUSER'S HIGHLIGHTS:

SERBIA (non) R. Yugoslavia in English: 1330 on 11865; 1930 on 9720, 6100; 2200 on 6185, 6100; 0100 exc. Sun on 6195; 0200 on 6195 (BBCM) 0100 also on 9580; 0200 on 6190 (Eugene, *RVI Radio World*)

SRI LANKA SLBC N. Am. service Mon. 2330 on 15425 has been dropped since it never reached the target; still to Australasia at 1030-1130 on 11835, reactivated 17850, but not on announced 15120 (Victor Goonetilleke, *ibid.*, RN*MN*)

SPAIN REE excellent in English at 1900-2000 on new 9675 ex-11775 (Brian Alexander, PA) Ladino now scheduled: Thu 1945-2015 on 6130, UT Fri 0115-0135 on 11775, 0415-0435 on 9690 (BBCM)

THAILAND R. Thailand external closed down 4830, 97 MHz local FM; wants to add Russian, Spanish, Tagalog, Hindi, Cantonese; fax reports to +2776139 (Jürgen Lohius visiting Thailand via Büschel)

UKOGBANI BBC added new Central Asian/Caucasus service in Russian, Uzbek, Azeri at 1700 on 6095, 9750, 11925 (BBC *Waveguide*)

USA WJCR, Kentucky, often missing from 7490, still on 13595 (George Thurman, IL) Plans to move 13595 to 5920 for S. America (ASWLC)

1600 UTC SHORTWAVE GUIDE 11:00 AM EST 8:00 AM PST

FREQUENCIES

1600-1630	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	11660pa	11695pa
		11800pa			
1600-1700 vl	Australia, VL8A Alice Spg	2310do			
1600-1700 vl	Australia, VL8K Katherine	2485do			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			
1600-1700	Bahrain, Radio	6010do			
1600-1700 vl	Canada, CBC N Quebec Sce	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 s	Canada, RCI Montreal	11955na	17820na		
1600-1700	China, China Radio Intl	9710na	11575af	11715na	15110af
		15130af			
1600-1700	Ecuador, HCJB Quito	6080do	15350eu	21455eu	
1600-1700	Ethiopia, Radio	7165af	9560af		
1600-1700	France, Radio France Intl	6175eu	9485eu	11615me	11700af
		12015af	15530me		
1600-1650	Germany, Deutsche Welle	6170as	7225as	7305as	9525as
		9585as	11795as		
1600-1700	Guam, KSDA/AWR	9370as			
1600-1615 mt	Guam, KTWR Agana	11580as			
1600-1630	Iran, VOIRI Tehran	9575as	11790as		
1600-1700 vl	Italy, IRRS Milan	7125eu			
1600-1630	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	9655pa			
1600-1700	Nigeria, FRCN/Radio	4990do	7285do		
1600-1700	Nigeria, FRCN/Voice of	7255af			
1600-1630	Pakistan, Radio	9470me	11570af	13590af	15555as
		15675af	17660as		
1600-1700	Russia, Voice of	4740as	4975as	5905eu	5935na
		5950eu	5965eu	6000eu	6015eu
		6065as	7115na	7180as	7205na
		7335as	7345na	7350eu	7370eu
		7380as	9550na	9830af	9890eu
		12015eu	15105af	15205na	15265af
		15320as	17780eu		
1600-1700	S Africa, Channel Africa	7225af	15240af		
1600-1700	Singapore, SBC Radio One	6155do			
1600-1700 vl	Slovakia, AWR	9455af	11610af		
1600-1700	South Korea, R Korea Intl	5975as	9515af	9870af	
1600-1630	Sri Lanka, SLBC Colombo	9720as	15425as		
1600-1700	Swaziland, Trans World R	9500af			
1600-1645	UAE, Radio Dubai	11795af	13675eu	15435eu	21605eu
1600-1700	United Kingdom,BBC London	3915as	6190af	6195eu	9410af
		9515na	9740as	11750as	11940af
		12095af	15070af	15260na	15400eu
		17830af	21660af		
1600-1615	United Kingdom,BBC London	5990as	9660as	17705eu	17840na
		21470af			
1600-1700	USA, KAIJ Dallas TX	13815am	15725am		
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	6120as			
1600-1700	USA, Monitor Radio Intl	21640af			
1600-1700	USA, VOA Washington DC	3970af	6110as	7125as	9645as
		9700as	9760as	11920af	12040af
		13710af	15205as	15225af	15320af
		15395as	15410af	15445af	17785af
		17895af			
1600-1700	USA, WCSN Scotts Cor ME	15665eu			
1600-1700	USA, WEWN Birmingham AL	9455na	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, WWCR Nashville TN	12160am	13845am	15685eu	
1600-1700	USA, WYFR Okeechobee FL	11830na	15215na	15566eu	17760na
		21525af	21745eu		
1615-1700	United Kingdom,BBC London	5975as	9510as	9630af	15420af
1630-1700	Australia, Radio	6060pa	6080pa	7260as	9710pa
		9860pa	11660pa	11695pa	11800pa
1630-1700	Austria, R Austria Intl	11780as			
1630-1700	Canada, RCI Montreal	7150as	9550as		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	Liberia, Radio ELWA	4760do			
1630-1700	Russia, Voice of	7150na	7380as	9550eu	9890eu
1640-1650 s	Rwanda, Radio	6055do			
1645-1700	Tajikistan, Radio	7245as			
1650-1700 mtwhf	New Zealand, R NZ Intl	9655pa			

SELECTED PROGRAMS

Sundays

1600 KSDA (Guam): English Language Service. Sixty minutes of features and music from AWR's studios in London.
1600 WWCR #1: Afterglow. Don Johnson.
1600 WWCR #2: World University Network. See S 0000.
1615 BBC: Feature. See S 0230.
1645 BBC: Letter from America. See S 0615.

Mondays

1600 KSDA (Guam): English Language Service. See S 1600.
1600 WWCR #2: World University Network. See S 0000.
1600 WWCR #3: Spiritual Warfare. Mickey Bonner.
1605 WWCR #1&3: Joni and Friends. Joni Erickson-Tada presents help and advice especially for the disabled.
1610 WWCR #1&3: Life Issues. John Wilke on events affecting everyday living.
1615 BBC: New Ideas. Window on the world of technology, innovation and new products.
1615 WWCR #1&3: Living Waters. Father Robert Guste evangelizes from Louisiana.
1630 WWCR #1#3: Time of Deliverance. Benjamin Smith preaches.
1635 BBC: Feature. See S 0230.
1645 BBC: The World Today. Examines thoroughly a topical aspect of the international scene.
1645 WWCR #1&3: Wisdom from the Word. From the New Covenant Church in Philadelphia.

Tuesdays

1600 KSDA (Guam): English Language Service. See S 1600.
1600 WWCR #1&3: Spiritual Warfare. See M 1600.
1600 WWCR #2: World University Network. See S 0000.
1605 WWCR #1&3: Joni and Friends. See M 1605.
1610 WWCR #1&3: Life Issues. See M 1610.
1615 BBC: Megamix. See T 1130.
1615 WWCR #1&3: Living Waters. See M 1615.
1630 WWCR #1&3: Time of Deliverance. See M 1630.
1645 BBC: The World Today. See M 1645.
1645 WWCR #1&3: Wisdom from the Word. See M 1645.

Wednesdays

1600 KSDA (Guam): English Language Service. See S 1600.
1600 WWCR #1&3: Spiritual Warfare. See M 1600.
1600 WWCR #2: World University Network. See S 0000.
1605 WWCR #1&3: Joni and Friends. See M 1605.
1610 WWCR #1*3: Life Issues. See M 1610.
1615 BBC: Music Feature. See M 0145.
1615 WWCR #1&3: Living Waters. See M 1615.
1630 WWCR #1&3: Time of Deliverance. See M 1630.
1645 BBC: The World Today. See M 1645.
1645 WWCR #1&3: Wisdom from the Word. See M 1645.

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*. Enclose SASE and your QSLs will be returned.

Thursdays

1600 KSDA (Guam): English Language Service. See S 1600.
1600 WWCR #1&3: Spiritual Warfare. See M 1600.
1600 WWCR #2: World University Network. See S 0000.
1605 WWCR #1&3: Joni and Friends. See M 1605.
1610 WWCR #1&3: Life Issues. See M 1610.
1615 BBC: Network UK. Issues and events affecting the lives of people throughout the UK.
1615 WWCR #1&3: Living Waters. See M 1615.
1630 WWCR #1&3: Time of Deliverance. See M 1630.
1645 BBC: The World Today. See M 1645.
1645 WWCR #1&3: Wisdom from the Word. See M 1645.

Fridays

1600 KSDA (Guam): English Language Service. See S 1600.
1600 WWCR #1&3: Spiritual Warfare. See M 1600.
1600 WWCR #2: World University Network. See S 0000.
1605 WWCR #1&3: Joni and Friends. See M 1605.
1610 WWCR #1&3: Life Issues. See M 1610.
1615 BBC: Science in Action. The latest in science and technology.
1615 WWCR #1&3: Living Waters. See M 1615.
1630 WWCR #1&3: Time of Deliverance. See M 1630.
1645 BBC: The World Today. See M 1645.
1645 WWCR #1&3: Wisdom from the Word. See M 1645.

Saturdays

1600 KSDA (Guam): English Language Service. See S 1600.
1600 WWCR #1: Bill Rudge Ministries. Bill Rudge.
1600 WWCR #2: World University Network. See S 0000.
1600 WWCR #3: The Home Education Network (live). See A 1500.
1609 Channel Africa: Today's Dream. A musical magazine for Africa's youth.
1615 BBC: Sportsworld. See A 1401.
1615 WWCR #1: Eternal Good News. Germaine Lockwood.
1630 WWCR #1: Showers of Blessings. Jonathan Greer sermonizes before a live congregation.

FREQUENCIES

1700-1715	Albania, R Tirana Intl	7155eu	9760eu		
1700-1800	Australia, ADF Radio	10375af	10429af	10458af	10650af
1700-1800	Australia, Radio	6060pa	6080pa	7260as	9580pa
		9710pa	9860pa	11660pa	11695pa
		11880pa			
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800	Azerbaijan, Voice of	7160eu			
1700-1800	Bahrain, Radio	6010do			
1700-1800 vl	Canada, CBC N Quebec Sce	9625do			
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	11575af	11755pa	15110af
		15130af			
1700-1800	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
1700-1727	Czech Rep, Radio Prague	5930as	7345eu	9420me	
1700-1800	Ecuador, HCJB Quito	6080do	15490eu	17490pa	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 vl	Eqt Guinea, Radio Africa	7200af			
1700-1730	France, Radio France Intl	9485eu	11700af		
1700-1800	Iraq, Radio Iraq Intl	15250as			
1700-1800 vl	Italy, IRRS Milan	7125eu			
1700-1800	Japan, NHK/Radio	6150na	9535na	9580as	11930as
1700-1713 mtwhfa	Lebanon, Voice of	6550eu			
1700-1730 vl	Liberia, Radio ELBC	7275do			
1700-1800	Liberia, Radio ELWA	4760do			
1700-1800 mtwhf	New Zealand, R NZ Intl	9655pa			
1700-1800	Nigeria, FRCN/Radio	3326do	4990do		
1700-1750	Pakistan, Radio	7485eu	11570eu		
1700-1800	Russia, Voice of	5905me	5950eu	6065as	7115eu
		7170eu	7180eu	7205eu	7325na
		7330eu	7345eu	7370eu	9505eu
		9530na	9550na	9575eu	9725as
		9860na	9890eu	11825na	15385as
1700-1800	S Africa, Channel Africa	7225af	15240af		
1700-1800 vl	Slovakia, AWR	7270as	9450as		
1700-1715	Swaziland, Trans World R	7120af			
1700-1730	Switzerland, Swiss R Intl	6205af	9885af	13635me	
1700-1720	Uganda, Radio	4976do			
1700-1800	United Kingdom,BBC London	3955eu	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9510as
		9630af	9740as	11750as	11940af
		12095af	15070af	15400af	15420af
		17830af			
1700-1715	United Kingdom,BBC London	9515na	15260na		
1700-1745	United Kingdom,BBC London	3915as			
1700-1800	USA, KAIJ Dallas TX	13815am	15725am		
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	7425as			
1700-1800	USA, Monitor Radio Intl	21640af			
1700-1800	USA, VOA Washington DC	6045eu	6110as	7125as	7215as
		7235as	9645as	9670af	9700eu
		9760af	9770af	11920af	12040af
		13710af	15205as	15395as	15410af
		15445af	17895af		
1700-1800	USA, WCSN Scotts Cor ME	17612af			
1700-1800	USA, WEWN Birmingham AL	9455eu	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	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WWCR Nashville TN	13845am	15685eu		
1700-1800	USA, WYFR Okeechobee FL	15566eu	17760na		
1705-1800	Ghana, Ghana Broadc Corp	3366do			
1715-1730 mtwhf	Swaziland, Trans World R	7120af			
1715-1800	United Kingdom,BBC London	7160me			
1715-1730	Vatican State, Vatican R	6245eu	7250eu	9645eu	
1720-1730 mtwtf	Estonia, Estonian Radio	5925eu			
1730-1800	Netherlands, Radio	6020af	9605af	11655af	
1730-1800	Romania, R Romania Intl	9510af	9750af	11740af	11940af
1730-1800	Russia, Voice of	7105eu	7130me	7325as	7340eu
		9520na	9720eu	13670af	
1730-1745	Sweden, Radio	6065eu			
1730-1800	Vatican State, Vatican R	7305af	9695af	9725af	11625af
1745-1800 mtwhf	Canada, RCI Montreal	5995me	11935me	13610eu	15325eu
		17820eu			
1745-1800	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as	15075me	
1800-1900	Algiers, R Algiers Intl	11715eu	11745eu		
1800-1900	Australia, ADF Radio	10375af	10429af	10458af	10650af
1800-1900	Australia, Radio	6060pa	6080pa	9580pa	9860pa
		11660as	11695pa	11880pa	
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1800-1900	Bahrain, Radio	6010do			
1800-1900	Brazil, Radiobras	15268eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	China, China Radio Intl	11575af	11755pa	15110af	15130af
1800-1900	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
1800-1827	Czech Rep, Radio Prague	5930eu	7345eu	9420eu	
1800-1900	Ecuador, HCJB Quito	6080do	15490eu	21455eu	
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900 vl	Eqt Guinea, Radio Africa	7200af			
1800-1830	Ghana, Ghana Broadc Corp	3366do	4915do		
1800-1900	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as	15075me	
1800-1900 vl	Italy, IRRS Milan	7125eu			
1800-1900	Kenya, Kenya Broadc Corp	4935do			
1800-1900	Kuwait, Radio	11990na			
1800-1900	Liberia, Radio ELWA	4760do			
1800-1830	Netherlands, Radio	6020af	9605af	11655af	
1800-1849 mtwhf	New Zealand, R NZ Intl	9655pa			
1800-1830	Nigeria, FRCN/Radio	3326do	4990do		
1800-1830 s	Norway, Radio Norway Intl	7120eu	11930af		
1800-1855	Poland, Polish R Warsaw	5995eu	7270eu	7285eu	
1800-1900	Russia, Voice of	4740as	4940eu	5995eu	6055eu
		6110me	7105na	7170na	7180as
		7205eu	7345eu	7370eu	9505as
		9530eu	9550eu	9575eu	9860eu
		9880eu	9890eu	11825as	11945as
		13670af			
1800-1900 vl	Slovakia, AWR	9455af			
1800-1900 irreg	Sudan, Sudan Natl BC	9200af			
1800-1900	Swaziland, Trans World R	3200af			
1800-1845	Swaziland, Trans World R	9500af			
1800-1900	United Kingdom,BBC London	3955eu	6005af	6180eu	6190af
		6195eu	9410eu	9630af	9740as
		11955as	12095eu	15070af	15400af
		15420af	17830af		
1800-1830	United Kingdom,BBC London	5975as	7160me	9510as	11940af
1800-1900	USA, KAIJ Dallas TX	13815am	15725am		
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625as			
1800-1900	USA, Monitor Radio Intl	9370eu	21640af		
1800-1900	USA, VOA Washington DC	4985af	6040eu	9700eu	9760eu
		11920af	12040af	13680af	13710af
		15580af	17800af	17895af	
1800-1900	USA, WEWN Birmingham AL	9455eu	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	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WWCR Nashville TN	12160am	13845am	15685am	
1800-1845	USA, WYFR Okeechobee FL	15566eu			
1800-1900	USA, WYFR Okeechobee FL	17760na			
1800-1900	Yemen, Yemeni Rep Radio	9780do			
1815-1900	Bangladesh, Radio	7190eu	9647eu		
1815-1900	China, China Radio Intl	6955af	9440af		
1830-1900	China, China Radio Intl	9715as	11660as		
1830-1855	Moldova, R Moldova Intl	7235eu			
1830-1900	Netherlands, Radio	6015af	6020af	9605af	9860af
		9895af	15315af	17605af	
1830-1845	Rwanda, Radio	6055do			
1830-1900	Sweden, Radio	6065eu	9655af	13690me	
1830-1900	United Kingdom,BBC London	3255af			
1840-1850	Greece, Voice of	15650af	17525af		
1845-1900	Armenia, Radio Yerevan	4810eu	4990eu	5930eu	6065eu
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900	New Zealand, R NZ Intl	11735pa			

WHATWAZZAT?

The SP-200 Sound Enhancer from Grove Enterprises.

Do You Hear What I Hear?

If you, like most people in the world, have trouble understanding what broadcasters are saying, or find that the quality on your radio just isn't what you'd like it to be, then ***Grove*** has the product for you.

The ***Grove SP-200*** Sound Enhancer lets you hear signals the way they should be heard, not the way they sound through the inferior speakers on modern receivers and scanners. The ***SP-200*** allows you to control bass and treble as well as remove an annoying tone, reduce noise, sharpen the audio selectivity, control a tape recorder and improve any audio mode on your receiver or scanner.

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SP-200
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Housed in a stylish, solid oak cabinet hand crafted in the mountains of North Carolina, the **SP200** is sure to enhance any room and radio receiver. The control panel, constructed of sturdy, black aluminum, has been designed for optimum ease and convenience when tuning and refining signals.

The SP200 combines a powerful audio amplifier, top-of-the-line speaker, and an adjustable filter system in one to create the most versatile and precise listening environment ever available to radio enthusiasts. The keen peak/notch filter system and advanced noise limiter allow the listener to pull clear and distinct signals out of the haze of interference and background noise, while the adjustable bass and treble provide the flexibility to create just the sound you want. FSK, RTTY, packet, FAX, CW and all other data systems are enhanced while interference and electrical noise are reduced or even eliminated by the analog audio processor.

The **SP200** also comes equipped with a stereo/mono headphone jack, for private listening, and an automatic tape activator so that you never have to miss anything.

Try the new Grove **SP200** Sound Enhancer with your receiver, scanner, or transceiver and enjoy the latest in speaker sophistication; you'll agree this is truly a keynote speaker!

SPECIFICATIONS:
Power Required: 12 to 14 VDC @500 mA; 120 VAC adaptor incl.
Audio Power Output: 2.5 W @ 10% THD (8 ohms)
Audio Selectivity: Peak/notch 30 dB or greater, 0.3-6 kHz
Squelch Hold: 0-10 seconds
Noise Limiter: Adjustable-threshold pulse noise clamp
Tape Activator: Audio activated (VOX), 3 second hold
Tape Output: 500 mV P-P @ 600 ohms (nom.)
Headphone Jack: Universal mono-wired stereo jack
Dimensions: 10-7/8"W x 6-7/8"H x 7-1/4"D

* Plus $7.50 UPS Ground Shipping

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FREQUENCIES

1900-1930	Albania, R Tirana Intl	7230eu	9730eu		
1900-2000 mtwhf	Argentina, RAE	15345eu			
1900-2000	Australia, Radio	6060pa	6080pa	6150as	7240pa
		7260as	9560as	9580pa	9860pa
		11660pa	11695pa	11880pa	
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-2000	Bahrain, Radio	6010do			
1900-1945	Bangladesh, Radio	7190as	9647do		
1900-1930	Belgium, R Vlaanderen Int	5910eu	9925af		
1900-1918	Brazil, Radiobras	15268eu			
1900-2000	Bulgaria, Radio	7305eu	9700eu		
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955af	7405af	9440af	9710na
	9715as 11575af	11660as	11715na	11755pa	15110af
	15130af				
1900-2000	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
1900-2000	Ecuador, HCJB Quito	6080do	15490eu	17490eu	21455eu
1900-2000 vl	Eqt Guinea, Radio Africa	7200af			
1900-1950	Germany, Deutsche Welle	7110af	9665af	9765af	11785af
		11810af	11865af	13790af	15145af
		15425af			
1900-1910	Greece, Voice of	7450eu	9380eu		
1900-1945	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as	15075me	
1900-2000 vl	Italy, IRRS Milan	7125eu			
1900-2000	Japan, NHK/Radio	6150as	7140au	9535na	9580au
		11850au			
1900-2000	Kenya, Kenya Broadc Corp	4935do			
1900-2000	Kuwait, Radio	11990eu			
1900-2000	Liberia, Radio ELWA	4760do			
1900-1925	Netherlands, Radio	6015af	6020af	9605af	9860af
		9895af	15315af	17605af	
1900-2000	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, FRCN/Voice of	7255af			
1900-1930 s	Norway, Radio Norway Intl	5960eu	7215pa	9590af	
1900-2000 vl	Papua New Guinea, NBC	4890do	9675do		
1900-2000	Romania, R Romania Intl	5995eu	6105eu	6150eu	6190eu
		7195eu			
1900-2000	Russia, Voice of	4740as	5995eu	6005as	6055eu
	6110eu 7150eu	7170eu	7180na	7205eu	7210eu
	7275eu 7340as	7345eu	7400as	9505eu	9530af
	9550eu 9575eu	9800na	9860as	9890eu	11825as
	11945eu 13670eu	15205af			
1900-1915	Rwanda, Radio	6055af			
1900-2000 vl	Slovakia, AWR	9455as			
1900-2000	South Korea, R Korea Intl	5975as			
1900-2000	Spain, R Exterior Espana	9675af			
1900-2000	Swaziland, Trans World R	3200af	3240af		
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	9370eu	17510af		
1900-2000	USA, VOA Washington DC	3980eu	6040eu	7415af	9525pa
	9700af 9760af	11870as	11920af	12040af	13710af
	15180pa 15410af	15445af	15580af	17800af	
1900-2000	USA, WCSN Scotts Cor ME	17612af			
1900-2000	USA, WEWN Birmingham AL	9455eu	15375sa	15695eu	
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu		
1900-2000	USA, WINB Red Lion PA	12160eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000 a	USA, WRMI/R Miami Intl	9955am			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000	USA, WWCR Nashville TN	11970am	13845am	15685am	
1900-2000	USA, WYFR Okeechobee FL	17760af			
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1930-2000	Austria, R Austria Intl	5945eu	6155eu	9880me	13730af
1930-2000	China, China Radio Intl	9535as	9715as	9785as	11660as
1930-2000	Finland, YLE/Radio	6120eu	9730eu	11755eu	
1930-2000	Iran, VOIRI Tehran	9022eu			
1930-2000	Mongolia, R Ulan Bator	7290na	13650na		
1930-2000	Netherlands, Radio	6020af	9605af	9860af	9895af
		11655af	15315af	17605af	
1930-2000	Serbia, Radio Yugoslavia	6100eu	9720af		
1930-2000	Slovakia, R Slovakia Intl	5915eu	7345eu		
1930-2000	South Korea, R Korea Intl	7250eu			
1930-2000 a	Uganda, Radio	4976do	5026do		
1930-2000 s	USA, WRMI/R Miami Intl	9955am			
1935-1955	Italy, RAI Rome	7275eu	9575eu	11905eu	
1945-2000 t	Belarus, Belarussian R	5940eu	7105eu	7210eu	7405eu

2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7260as
		9580pa	9860pa	11660pa	11695pa
		11855as	11880pa		
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bahrain, Radio	6010do			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	6950eu	9440af	9715as	9730na
		9920eu	11660as	11715af	11755pa
		11795pa	15110af	15440pa	
2000-2100	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
2000-2100	Ecuador, HCJB Quito	6080do	17490eu		
2000-2100 vl	Eqt Guinea, Radio Africa	7200af			
2000-2050	Germany, Deutsche Welle	5960eu	7285eu		
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
2000-2030	Hungary, Radio Budapest	3975eu	6110eu	7220eu	
2000-2100	Indonesia, Voice of	9675as	11752as		
2000-2030	Iran, VOIRI Tehran	9022eu			
2000-2030	Israel, Kol Israel	7405na	7465na	9435eu	11603na
		17575af			
2000-2100 vl	Italy, IRRS Milan	7125eu			
2000-2100	Kenya, Kenya Broadc Corp	4935do			
2000-2100	Kuwait, Radio	11990eu			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2030	Lithuania, Radio Vilnius	9710eu			
2000-2010	Mongolia, R Ulan Bator	7295na	13650na		
2000-2025	Netherlands, Radio	6020af	9605af	9860af	9895af
		11655af	15315af	17605af	
2000-2050	New Zealand, R NZ Intl	11735pa			
2000-2005	Nigeria, FRCN/Radio	3326do	4990do		
2000-2100	Nigeria, FRCN/Voice of	7255af			
2000-2100 vl	Papua New Guinea, NBC	4890do	9675do		
2000-2030 mtwhf	Portugal, Radio	9780af	9815af	21515af	21655af
2000-2100	Russia, Voice of	4055eu	4860eu	5920eu	5995eu
	6055eu 6085eu	6110eu	7170eu	7205eu	7215eu
	7400eu 7420na	9490na	9515eu	9530eu	9550eu
	9800na 9860na	9875na	9890na	11675as	11750na
	12015na 13670as	15205eu	15385na		
2000-2100 vl	Slovakia, AWR	6055eu	9455af		
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do		
2000-2045 s	Swaziland, Trans World R	3240af			
2000-2030	Switzerland, Swiss R Intl	3985eu	6135af	6165eu	9770af
		9885af	11640af	13635af	
2000-2002	Uganda, Radio	4976do	5026do		
2000-2030	United Kingdom,BBC London	6190af	7160me	9630af	12095me
		15070af	17830af		
2000-2100	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6195eu	7325eu	9410eu	9740as
		11750sa	11955as	15400af	
2000-2100	USA, KAIJ Dallas TX	13815am	15725am		
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100 as	USA, KVOH Los Angeles CA	17775am			
2000-2100	USA, KWHR Naalehu HI	11980as			
2000-2100	USA, Monitor Radio Intl	7510eu	7535eu	9370eu	
2000-2100	USA, VOA Washington DC	3980eu	6040eu	7415af	9495eu
	9700eu 9760af	13710af	15160af	15205me	15410af
	15445af 15580af	17800af	21485af		
2000-2100	USA, WEWN Birmingham AL	9455na	15375na		
2000-2100	USA, WHRI Noblesville IN	9495am	13760eu		
2000-2100	USA, WINB Red Lion PA	12160eu			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100	USA, WWCR Nashville TN	11970eu	13845am	15685am	
2000-2045	USA, WYFR Okeechobee FL	21525af			
2000-2100	USA, WYFR Okeechobee FL	13695af			
2000-2030	Vatican State, Vatican R	7355af	9645af	11625af	
2005-2100	Syria, Radio Damascus	12085eu	15095na		
2015-2045 s	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Rome	7235me	9710me	11800me	
2030-2100	China, China Radio Intl	9535as	9785as		
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100	Netherlands, Radio	9860af	9895af		
2030-2100 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2030-2100	Poland, Polish R Warsaw	5995eu	6135eu	7285eu	
2030-2100	Russia, Voice of	6185as	7180eu	7260eu	9520eu
		9550eu			
2030-2045	Thailand, Radio	9655eu	9700eu	11905eu	
2030-2100	Vietnam, Voice of	10059as	12025as	15010as	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15225pa		
2050-2100	Vatican State, Vatican R	3945eu	5882eu		
2051-2100	New Zealand, R NZ Intl	15115pa			

FREQUENCIES

2100-2200	Australia, Radio	6060pa	6080pa	7240pa	7260as
		11855as	11880pa	11955pa	
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2115	Bahrain, Radio	6010do			
2100-2200 vl	Canada, CBC N Quebec Sce	9625do			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	Canada, RCI Montreal	5995eu	7260eu	9725eu	11945eu
	13650eu 13690eu	15140eu	15325eu	17820eu	
2100-2200	China, China Radio Intl	6950eu	9595na	9715as	9920eu
		11660as	15440pa		
2100-2130	China, China Radio Intl	9535as	9785as	11715af	15110af
2100-2200	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
2100-2200	Cuba, Radio Havana Cuba	11720eu			
2100-2127	Czech Rep, Radio Prague	5930eu	7345eu	9420eu	
2100-2200	Egypt, Radio Cairo	15375af			
2100-2130 mt	Estonia, Estonian Radio	5925eu			
2100-2150	Germany, Deutsche Welle	6185as	7225af	9615af	9670as
	9690af 9765as	11785as	11810af	15270af	
2100-2200	India, All India Radio	7412eu	9910eu	9950eu	11620au
		11715au	15225au		
2100-2200 vl	Italy, IRRS Milan	7125eu			
2100-2200	Japan, NHK/Radio	6035eu	9560as	9580af	11800eu
		11925eu			
2100-2115	Japan, NHK/Radio	9660as	11915as		
2100-2110	Kenya, Kenya Broadc Corp	4935do			
2100-2200	Lebanon, Wings of Hope	9960me			
2100-2200	Liberia, Radio ELWA	4760do			
2100-2125	Netherlands, Radio	9860af	9895af		
2100-2200	New Zealand, R NZ Intl	15115pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4990do		
2100-2200 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2100-2200 vl	Papua New Guinea, NBC	4890do	9675do		
2100-2125	Poland, Polish R Warsaw	5995eu	6135eu	7285eu	
2100-2200	Romania, R Romania Intl	5995eu	6105eu	6190eu	7105eu
		7195eu	9690eu		
2100-2200	Russia, Voice of	4055as	5905eu	5920eu	5965eu
	5975eu 5995eu	6055eu	7135as	7150na	7170eu
	7180na 7205na	7230eu	7300eu	7320eu	7330as
	7350as 7380eu	7400eu	9550eu	9620as	9750eu
	9795na 9865af	9890eu	13670na	15290na	15580na
2100-2150	S Africa, Channel Africa	5960eu	7285eu		
2100-2115	Sierra Leone, SLBS	3316do			
2100-2200 vl	Slovakia, AWR	6055eu	7270af		
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2200	Spain, R Exterior Espana	6125eu			
2100-2105	Syria, Radio Damascus	12085eu	15095na		
2100-2200	Turkey, Voice of	9400eu			
2100-2105	Uganda, Radio	4976do	5026do		
2100-2200	United Kingdom,BBC London	3255af	3915as	3955eu	5975na
	5990as 6005af	6160as	6180eu	6195eu	7325eu
	9410eu 9740as	11750sa	11955as	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, KWHR Naalehu HI	11980as			
2100-2200	USA, Monitor Radio Intl	7510eu	7535na	9355na	9370eu
2100-2200	USA, VOA Washington DC	6040eu	6125eu	7415af	9760eu
		11870pa	13710af	15185pa	15205me
		15410af	15445af	15580af	17735pa
		17800af	21485af		
2100-2200	USA, WEWN Birmingham AL	9455na	15375sa		
2100-2200	USA, WHRI Noblesville IN	9495am	13760am		
2100-2200	USA, WINB Red Lion PA	11915eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200	USA, WWCR Nashville TN	12160eu	13845am	15685am	
2100-2200	USA, WYFR Okeechobee FL	7355eu	11580af	13695af	
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130	United Kingdom,BBC London	6110am	15390am	17715am	
2130-2200	Australia, Radio	9580pa	9610as	9645as	9660pa
		11695pa	15365pa	17860pa	
2130-2200 vl	Australia, VL8A Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200	Iran, VOIRI Tehran	9670au			
2130-2200 as	Latvia, Radio	5935eu			
2130-2200 asmtwh	Moldova, R Dnestr Intl	9620eu			
2130-2200	Sweden, Radio	6065eu	9655eu		

2200-2300	Australia, Radio	9580pa	9610as	9645as	9660pa
		11695pa	11855as	11880pa	11955pa
		13755as	15365pa	17795pa	17860pa
2200-2300 vl	Australia, VL8A Alice Spg	4835do			
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2230	Belgium, R Vlaanderen Int	5910eu	6030eu		
2200-2300	Bulgaria, Radio	7105eu	9700eu		
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5995eu	7260eu	11705as	11945eu
		13650eu	13690eu	15140eu	15325eu
		17820eu			
2200-2230	China, China Radio Intl	3985eu			
2200-2300	China, China Radio Intl	6950eu	7170eu	7405na	9535as
		9690na	9710na	9785as	9920eu
		11715na	15440pa		
2200-2300	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
2200-2300	Cuba, Radio Havana Cuba	6180na			
2200-2227	Czech Rep, Radio Prague	5930eu	7345af	9420eu	
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300 vl	Eqt Guinea, Radio Africa	15190af			
2200-2230	Hungary, Radio Budapest	3955eu	6110eu	7220eu	
2200-2300	India, All India Radio	7412eu	9910eu	9950eu	11620au
		11715au	15225au		
2200-2230	Iran, VOIRI Tehran	9670au			
2200-2300 vl	Italy, IRRS Milan	7125eu			
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
2200-2300	Lebanon, Wings of Hope	9960me			
2200-2300	Malaysia, Radio	7295do			
2200-2300	Malaysia, RTM/Kota Kinaba	5980do			
2200-2300	New Zealand, R NZ Intl	15115pa			
2200-2205	Nigeria, FRCN/Radio	3326do	4990do		
2200-2300 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2200-2300 vl	Papua New Guinea, NBC	4890do	9675do		
2200-2300	Russia, Voice of	5920eu	5965eu	5975na	5995eu
		6055eu	7135as	7150na	7180eu
		7300eu	7320eu	7330eu	7350eu
		7380as	7400na	9550eu	9620na
		9750na	9865af	9890as	
2200-2230	Serbia, Radio Yugoslavia	6100na	6185eu		
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300 vl	Slovakia, AWR	7270af			
2200-2235 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2205	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	5810eu	9850eu		
2200-2300	UAE, Radio Abu Dhabi	9605na	9770na	11885na	
2200-2300	Ukraine, R Ukraine Intl	4820eu	5940eu	6020eu	7150na
		7180eu	7240eu	7405na	9620as
		9685na	9810eu	11870eu	
2200-2300	United Kingdom,BBC London	3955eu	5975na	6195eu	7110as
		9590na	9915sa	11695as	11750sa
		11955as	15400eu		
2200-2215	United Kingdom,BBC London	6180eu	9410me		
2200-2300	USA, KAIJ Dallas TX	13815am	15725am		
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	7510eu	13770na		
2200-2300	USA, VOA Washington DC	6035as	7215as	9705as	9770as
		9890as	11760as	13710af	15185au
		15290as	15305as	17735as	17820as
2200-2300	USA, WEWN Birmingham AL	7425na			
2200-2300	USA, WHRI Noblesville IN	7315am			
2200-2300	USA, WINB Red Lion PA	11915eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300 a	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300	USA, WWCR Nashville TN	12160am	13845am	15685am	
2200-2245	USA, WYFR Okeechobee FL	11580af	13695af		
2230-2300	Belgium, R Vlaanderen Int	9935sa			
2230-2300	Israel, Kol Israel	7405na	7465eu	9435sa	11603na
		15640sa	15650sa		
2230-2300	Lithuania, Radio Vilnius	9710eu			
2230-2300	Sweden, Radio	6065eu			
2240-2250	Greece, Voice of	9375au	9425au		
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
2245-2300 mtwhf	USA, Voice of the OAS	9670na	11835na	15155na	
2245-2300	Vatican State, Vatican R	6150as	7305as	9600au	11830pa

FREQUENCIES

2300-2315	Armenia, Radio Yerevan	9480eu	11960eu		
2300-0000	Australia, Radio	9580pa	9610as	9645as	9660pa
		9850as	11695as	11855as	13755as
		15365pa	17795pa	17860pa	
2300-0000 vl	Australia, VL8A Alice Spg	4835do			
2300-0000 vl	Australia, VL8K Katherine	5025do			
2300-0000 vl	Australia, VL8T Tent Crk	4910do			
2300-0000 vl	Canada, CBC N Quebec Sce	9625do			
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000 as	Canada, RCI Montreal	9535am	9755na	11845na	11920na
		11940na			
2300-2330 mtwhf	Canada, RCI Montreal	5960na	9755na	11845na	11940na
2300-0000	China, China Radio Intl	7405na	9535as	9730na	9785as
2300-0000	Costa Rica, R Peace Intl	7385am	9400am	15030am	17905am
2300-0000	Ecuador, HCJB Quito	6080do			
2300-0000	Egypt, Radio Cairo	9900na			
2300-0000	Guam, KSDA/AWR	11980as			
2300-0000 vl	Guatemala, AWR	5980ca			
2300-0000	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
2300-0000 vl	Italy, IRRS Milan	7125eu			
2300-0000	Japan, NHK/Radio	6055eu	6155eu	9560as	9580as
2300-0000	Lebanon, Wings of Hope	9960me			
2300-0000	Malaysia, Radio	7295do			
2300-0000	Malaysia, RTM/Kota Kinaba	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 mtwhfa	Palau, KHBN/Voice of Hope	11980as			
2300-0000 vl	Papua New Guinea, NBC	4890do	9675do		
2300-0000	Russia, Voice of	7125as	9620na	9685na	9750na
		12065na	13640as	15425na	17570as
		17890as			
2300-0000	Turkey, Voice of	7185me	9445na	11710eu	
2300-0000	UAE, Radio Abu Dhabi	9605na	9770na	13605na	
2300-0000	United Kingdom,BBC London	5975na	6175na	6195as	7110as
		7180as	7325na	9580as	9590na
		9915sa	11750sa	11945as	11955as
		15340as			
2300-2315	United Kingdom,BBC London	15400eu			
2300-0000	USA, KAIJ Dallas TX	13740am	13815am		
2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	USA, Monitor Radio Intl	7510eu	13625as	13770sa	
2300-0000	USA, VOA Washington DC	6035as	7215as	9705as	9770as
		9890as	11760as	15185au	15290as
		15305as	17735as	17820as	
2300-0000	USA, WCSN Scotts Cor ME	9855eu			
2300-0000	USA, WEWN Birmingham AL	7425na	11820sa		
2300-0000	USA, WHRI Noblesville IN	7315am			
2300-0000	USA, WINB Red Lion PA	11915eu			
2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000 mtwtfa	USA, WRMI/R Miami Intl	9955am			
2300-0000	USA, WWCR Nashville TN	5065am	13845am		
2330-2345	Armenia, Radio Yerevan	9685na	11920na	11970na	
2330-0000	Austria, R Austria Intl	9870sa	13730sa		
2330-0000 mtwhf	Canada, RCI Montreal	5960na	9755na		
2330-0000	Finland, YLE/Radio	5990na	6015na	9680as	
2330-0000	Netherlands, Radio	6020na	6165na		
2330-0000	Sweden, Radio	11910as			
2330-0000	Vietnam, Voice of	12025as	15010as		
2335-2345	Greece, Voice of	9425sa	11595sa	11645sa	

SELECTED PROGRAMS

Sundays

2300 WWCR #2: World University Network. See S 0000.
2315 KSDA (Guam): Pacific Island Journal. News and stories about the Pacific Islands.
2330 BBC: Feature. See S 0230.
2330 KSDA (Guam): AWR Magazine. News and interviews on Asian topics.
2345 KSDA (Guam): Digging Up the Past. A look at archeological discoveries and research.

Mondays

2300 KSDA (Guam): Sounds of Inspiration. An adult Christian music program.
2300 WRMI: Scream of the Chameleon.Top-of-the-charts French and European music are featured in this French-produced and multilingual program.
2300 WWCR #2: World University Network. See S 0000.
2300 WWCR #3: The Norm Resnick Show (live). Norm Resnich talk show.
2315 KSDA (Guam): Discovering the Bible. Recitation of scripture in story form.
2330 BBC: Multitrack: Hit List. The UK Top 20.
2330 KSDA (Guam): The Bible in Living Sound. A dramatic look at the bible.
2330 Radio Sweden: Sixty Degrees North. See M 1230.
2345 KSDA (Guam): Voice of Prophecy. An adult bible study program.
2346 Radio Sweden: Sports Scan. See M 1248.

Tuesdays

2300 KSDA (Guam): Sounds of Inspiration. See M 2300.
2300 WRMI: Scream of the Chameleon. See M 2300.
2300 WWCR #2: World University Network. See S 0000.
2300 WWCR #3: The Norm Resnick Show (live). See M 2300.
2315 KSDA (Guam): Discovering the Bible. See M 2315.
2330 BBC: Omnibus. Each week a half-hour programme on practically any topic under the sun.
2330 KSDA (Guam): The Bible in Living Sound. See M 2330.
2330 Radio Sweden: Sixty Degrees North. See M 1230.
2345 KSDA (Guam): Voice of Prophecy. See M 2345.
2349 Radio Sweden: Media Scan (1&3). See T 1247.

Wednesdays

2300 KSDA (Guam): Sounds of Inspiration. See M 2300.
2300 WRMI: Scream of the Chameleon. See M 2300.
2300 WWCR #2: World University Network. See S 0000.
2300 WWCR #3: The Norm Resnick Show (live). See M 2300.
2315 KSDA (Guam): Discovering the Bible. See M 2315.
2330 BBC: Multitrack: X-Press. New pop records, interviews, news and competitions.
2330 KSDA (Guam): The Bible in Living Sound. See M 2330.
2330 Radio Sweden: Sixty Degrees North. See M 1230.
2345 KSDA (Guam): Voice of Prophecy. See M 2345.
2347 Radio Sweden: Money Matters. See W 1249.

Thursdays

2300 KSDA (Guam): Sounds of Inspiration. See M 2300.
2300 WRMI: Scream of the Chameleon. See M 2300.
2300 WWCR #2: World University Network. See S 0000.
2315 KSDA (Guam): Discovering the Bible. See M 2315.
2330 BBC: Comedy/Quiz Feature. See M 1215.
2330 KSDA (Guam): The Bible in Living Sound. See M 2330.
2330 Radio Sweden: Sixty Degrees North. See M 1230.
2345 KSDA (Guam): Voice of Prophecy. See M 2345.
2346 Radio Sweden: Green Scan. See H 1246.
2346 Radio Sweden: Horizon (4). See H 1246.

Fridays

2300 KSDA (Guam): Sounds of Inspiration. See M 2300.
2300 WRMI: Scream of the Chameleon.
2300 WWCR #2: World University Network. See S 0000.
2300 WWCR #3: The Norm Resnick Show (live). See M 2300.
2315 KSDA (Guam): Discovering the Bible. See M 2315.
2330 BBC: Multitrack: Alternative. Latest developments on the British music scene.
2330 KSDA (Guam): The Bible in Living Sound. See M 2330.
2330 Radio Sweden: Sixty Degrees North. See M 1230.
2335 Radio Sweden: A Review of the Newsweek. See F 1235.
2345 KSDA (Guam): Voice of Prophecy. See M 2345.

Saturdays

2300 WRMI: Viva Miami!
2300 WWCR #2: World University Network. See S 0000.
2315 KSDA (Guam): Pacific Island Journal. See S 2315.
2330 BBC: Music Feature. See M 0145.
2330 KSDA (Guam): AWR Magazine. See S 2330.
2330 Radio Sweden: People and Ideas. See S 0030.
2330 WWCR #1: British Israel World Federation. Douglas Nesbitt preaches from the Old Testament.
2345 KSDA (Guam): Digging Up the Past. See S 2345.
2345 WWCR #1: Weekly Presidential Radio Address. Bill Clinton's weekly report to the nation.

HAUSER'S HIGHLIGHTS

PAKISTAN:

Local news, wx in English
1306 UTC ..... 7084.5 kHz
R. Pakistan, dictation-speed news in English
0230 UTC 15188.9 17705.1
17723.9 21730
(Ralph Famularo, Japan, SPEEDX)
Winter 94: Slow news in English
1600-1630 ..... 9435 9470 11570
13590 15555
17660
fax +811861 (via Gigi Lytle, TX)
Islamabad calling in English on 7088 at 1305; freq drifts, bad mod (B.L. Manohar, India)

AFGHANISTAN:

(non) R. Message of Freedom still heard but with difficulty due to jamming, 7090 ex-7000 at 0730-0830, also announcing 0230 (BBC Monitoring)

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	**$79.95**

SCRAMBLER/DESCRAMBLER

Descramble most scramble systems heard on your scanner radio or set up your own scrambled communication system over the phone or radio. Latest 3rd generation IC is used for fantastic audio quality-equivalent to over 30 op-amps and mixers! Crystal controlled for crystal clear sound with a built-in 2 watt audio amp for direct radio hook-up. For scramble systems, each user has a unit for full duplex operation. Communicate in privacy with the SS-70. Add our case set for a fine professional finish.

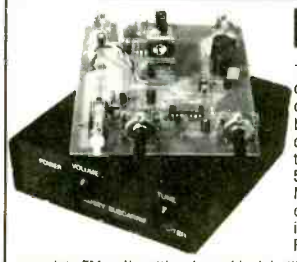
SS-70 Scrambler/Descrambler kit	**$39.95**
CSSD Matching case set	**$14.95**
SS-70WT Fully assembled SS-70 and case set	**$79.95**

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 50-100kHz 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 Kit	**$28.95**
CAA Matching case & knobset	**$14.95**

AIRCRAFT RECEIVER

Tune into the exciting world of aviation. Listen to the airlines, big business corporate jets, hot-shot military pilots, local private pilots, control towers, approach and departure radar control and other interesting and fascinating air-band communications. You'll hear planes up to a hundred miles away as well as all local traffic. The AR-1 features smooth varactor tuning of the entire air band from 118 to 136 MHz, effective AGC, superheterodyne circuitry, squelch, convenient 9 volt operations and plenty of speaker volume. Don't forget to add our matching case and knob set for a fine looking project you'll love to show. Our detailed instruction manual makes the AR-1 an ideal introduction to two life-long, fascinating hobbies at once-electronics and aviation! See *Kit Planes* magazine (January 1991) or *Popular Electronics* (January 1993) for excellent product reviews of the AR-1.

AR-1 Aircraft Receiver Kit	**$29.95**
C-AR Case and Knobset for AR-1	**$14.95**

INTERCEPTOR

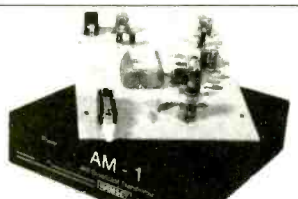
The Interceptor will lock on instantly to the nearest transmitter and allow you to listen with perfect audio quality. Since the Interceptor does not have to search through all frequencies, those quick transmissions that are hopelessly lost on scanners are captured easily. The Interceptor does not need tuning, making it ideal for hands-free surreptitious monitoring of nearby transmissions. The Interceptor is complete self-contained with internal speaker and earphone jack for private listening. Included are: Nicad battery pack, AC/adaptor charger, antenna and earphone. Increase your security and awareness-intercept the communications around you with the Interceptor. Fully wired with 1 year warranty. Covers 30-2000 MHz frequency range, FM deviations from 5 kHz to 200 kHz.

R10 Interceptor,
Fully Wired 1 year warranty **$349.95**

AM BROADCAST TRANSMITTER

High quality, true AM broadcast band transmitter is designed exactly like the big commercial rigs. Power of 100 mW, legal range of up to 1/4 mile. Accepts line level inputs from tape and CD players and mike mixers, tunable 550-1750 kHz. Complete manual explains circuitry, help with FCC regs and even antenna ideas. Be your own Rush Limbaugh or Rick Dees with the AM-1! Add our case set for a true station look.

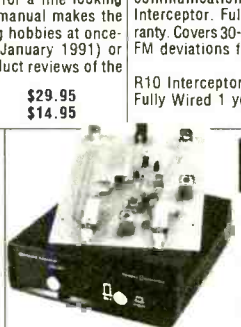
AM-1 Transmitter kit	**$29.95**
CAM Matching case set	**$14.95**



FOXHOUND DIRECTION FINDER

Locate hidden or unknown transmitters fast. The Foxhound direction finder connects to 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	**$29.95**
CSR Case and Knob Set	**$14.95**

ORDERS ONLY CALL 1-800-446-2295

(No tech info at this number)

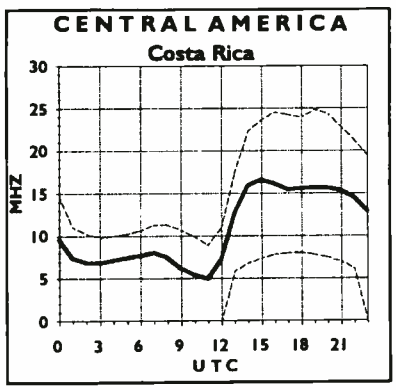
TECH/ORDER/INFO 716-924-4560 FAX 716-924-4555

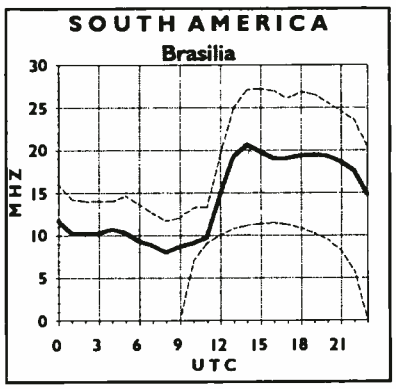
TERMS: Satisfaction guaranteed. Examine for 10 days. If not pleased return it in original form for refund. Add $4.95 for shipping, handling and insurance. For foreign orders add 20% for surface mail. COD (U.S. only) add $5.00. Orders under $20 add $3.00 NY residents add 7% sales tax. 90-day parts warranty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

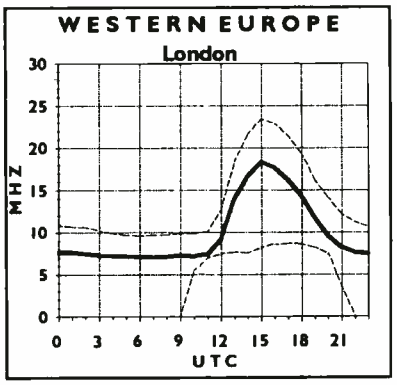
RAMSEY ELECTRONICS, INC.
793 CANNING PARKWAY, VICTOR NY 14564

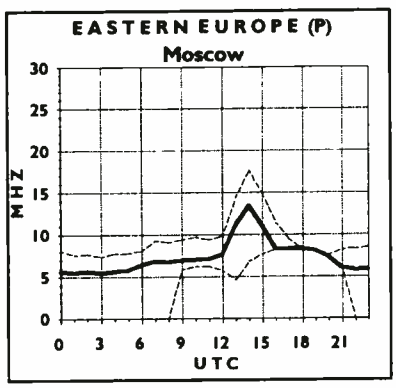
Propagation conditions: Eastern United States

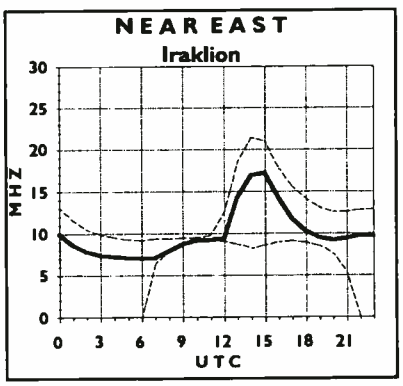
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear. The Sun Spot Number used this month for forecasting purposes is 15.

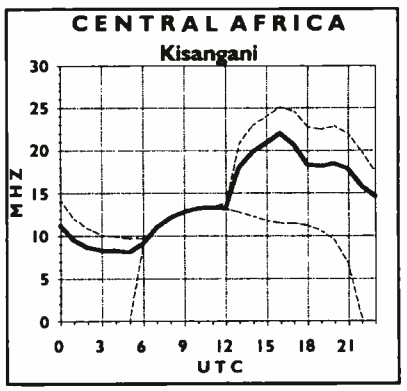


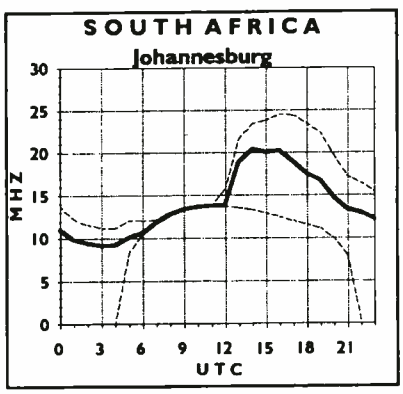


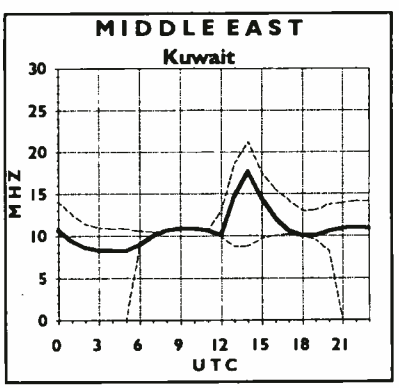


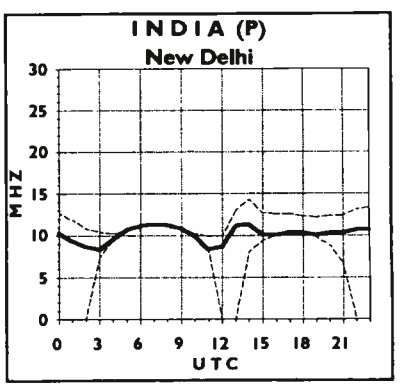


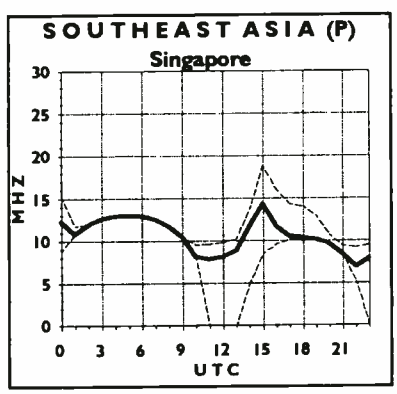


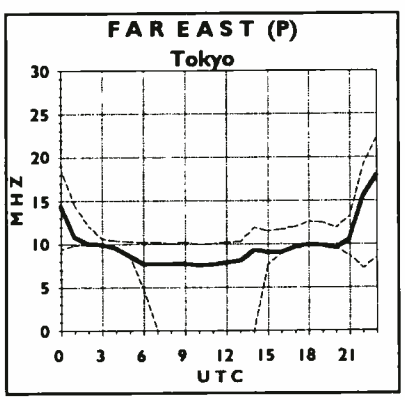


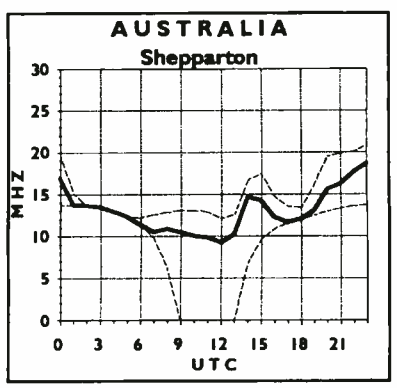






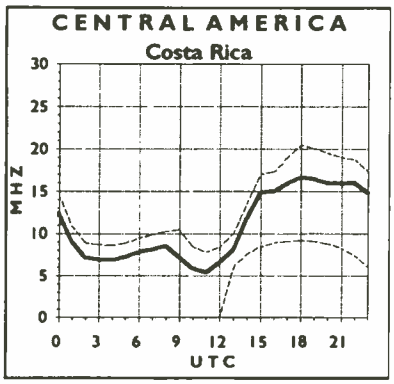


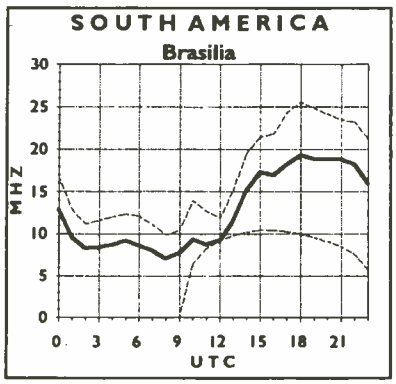


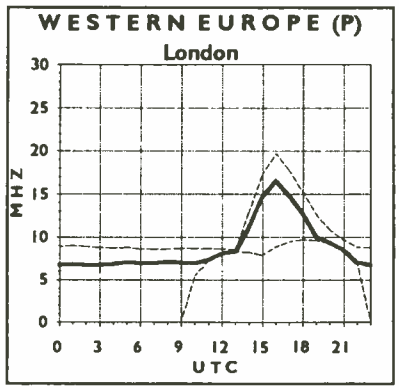


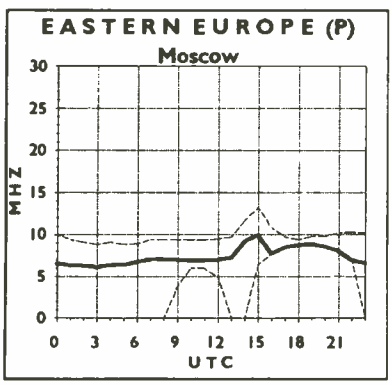
Propagation Conditions: Western United States

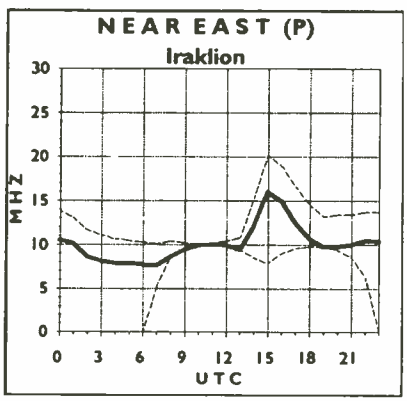
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom 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.

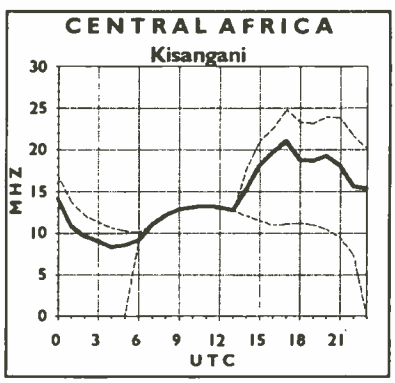


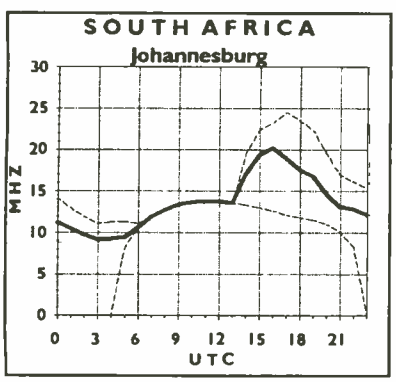


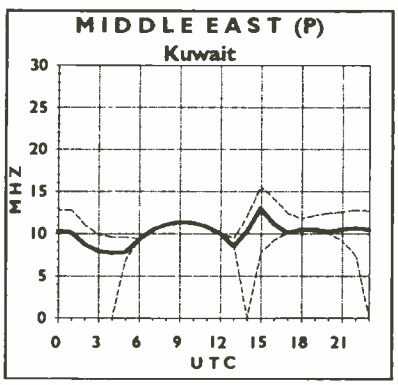


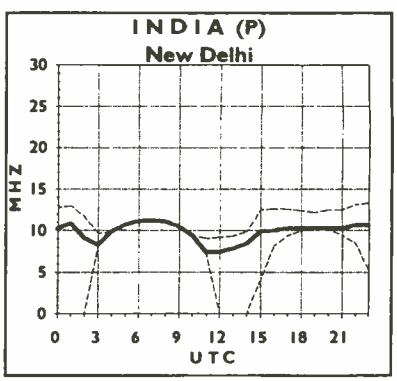


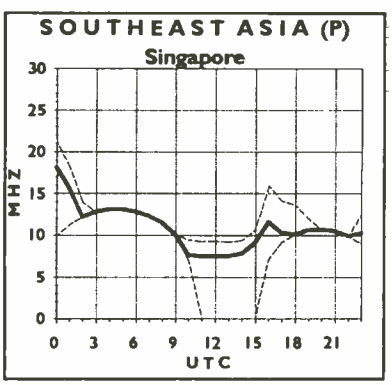


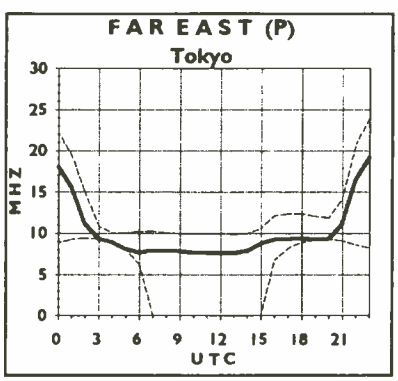


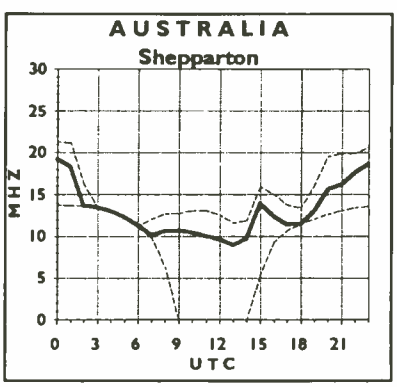












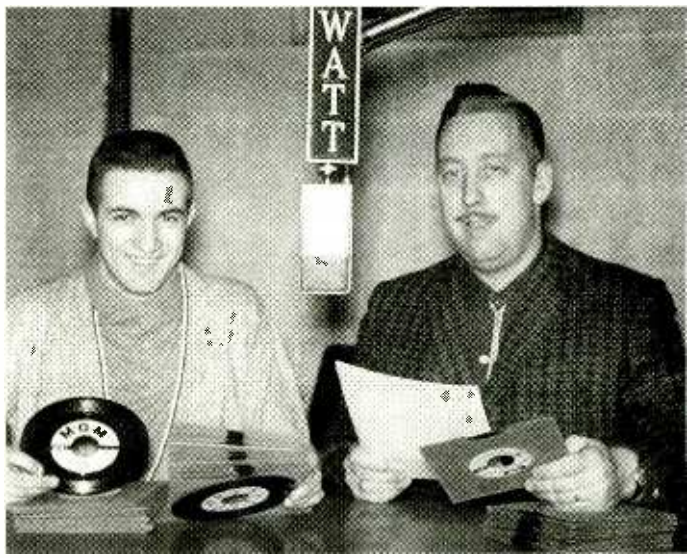
Working at WATT

By Doug DeMaw, W1FB

"Things ain't what they used to be." That is, indeed, an understatement! How many times do we hear that phrase today? It applies to many things, including the change from "personality radio" to the stereotyped formats in common use today across the standard AM broadcast band.

It is not unusual to tune in a dozen BC-band stations in a given area of the USA and hear the same musical selection being played at the same instant. Syndicated taped music via satellite has taken over and replaced live bodies that once painstakingly planned the program material and presented it fresh each day over the local airwaves.

Talk stations with endless rhetoric have become fashionable, and periodic local news and community-interest material is seldom featured. Much of the station automation and the inept announcers that are heard on many of the smaller stations today, are with us because these practices reduce the operating cost of broadcast stations.



Gail "Cool Cat" Hornung (left) and Doug "Big Daddy" DeMaw (right) doing their live" Night Beat" rock show at WATT in 1959. The author regrets to report that Gail Hornung died tragically in October of 1994 at age 55. Gail was hunting deer from a tree stand during archery season, when he fell to his untimely death.

Engineer Licensing Then

Strange as it may seem, I was once a DJ (disc jockey) in an AM BC station (WATT—1240 kHz) at Cadillac, Michigan. Actually, my position would be better described as "combo man," which means I was not only a DJ, but was chief engineer at the station. At that time (1958) the FCC required that the station engineer have a Radiotelephone First Class license. DJs and announcers needed only to have a restricted license, which could be obtained by mail, on request.

The FCC regulations are now so relaxed that little is required as proof of technical competence. The Radiotelephone First Class license has been eliminated and replaced by a life-time General Radiotelephone license. Previously, a license holder had to have active engineering time endorsed on the back of his license in order to renew his ticket at specified intervals.

Station Equipment in the 50s

WATT was but one station of a four-station group called the Paul Bunyon Network, a Mutual Broadcasting Co. affiliate. The call signs for the other three Michigan stations were WATZ, WATS and WPBN. Each of the stations was equipped with homemade transmitters, but used Collins Radio Co. exciters that were crystal controlled and had an 807 tube in the output stage. This drove an 805 triode, which drove push-pull 805s. The modulator consisted of a pair of 805s.

The control console was also homemade. At each side of the console was a Gates turntable that could accommodate 45-, 78- and 33.3-RPM recordings. All of the music and many of the commercials were on disk, thereby requiring two turntables so that a commercial could quickly follow a musical selection, or vice-versa. The DJ held his finger on the upcoming pre-qued disk, keeping it stationary at the que point while the turntable under it spun at the required speed. When the music ended he would rapidly kick in the commercial by removing his finger from the disk. Crude by today's standards, but effective!

At WATT we had two reel-to-reel tape decks that were made in Germany. They were constantly plagued with wow and flutter problems, and required almost daily maintenance in order ensure on-the-air quality from the taped commercials we made in our studio.

The antenna tower sat some 400 feet behind the station and was fed with 50-ohm, open four-wire transmission line. This homemade feed system was chosen over commercial air or gas filled 50-ohm line in an effort to minimize construction costs when WATT was built.

I designed and built the first remote pickup link the station had. It was not a transmitter-receiver link, but rather was designed to feed program material through the phone lines from the remote site to the station. Transistors were still somewhat in their infancy in 1959, so when I developed a solid-state amplifier and equalizer that could be clipped on the user's belt and operated from battery power, the station manager was ecstatic. The miniature audio transformers in the unit were hand wound.

Again, this was very archaic by today's standards, but it got the job done cheaply and effectively. We were left high and dry, of course, if there was no phone nearby to allow patching into the station.

Programming Then

WATT and most other AM stations of that era were called "full service stations," meaning that they carried news, sports, music, religion and live broadcasts of local interest. Very few full-service stations remain active in the USA today. Our directive, as DJs, was to provide something for everyone. We featured individual daily programs that, for example, featured mood, polka, country and

western, rock, and symphony music. Each DJ included in his program some commentaries about the history of the musical artist featured on the program and occasional humor was introduced by way of subscribed-to monthly quip books from which we read quickies.

Liberal broadcasting was forbidden at most Michigan stations in the 50s and early 60s, owing to a high population of religious listeners. Our station manager would destroy any recording that he felt was offensive or inappropriate for our listening audience, even though we DJs objected strongly to his philosophy. On his "hit" list were Little Richard recordings, Isley Brothers recordings, or any so-called yell-and-shout rock and roll. Even Bobby Darin's (real name Robin Walter Casada) "Mack the Knife" was outlawed at WATT "because it might give kids bad ideas." One of the jocks bought a copy at a local music store and played it during his shift. He was fired the next day!

■ The Big Payola Investigation

I had the dubious fortune of being in broadcasting during the Payola investigation of the early 60s. This revolved around big-time jocks who allegedly took money from record companies to push the recordings of certain artists (some were terrible performers) on their shows in order to get the record into the top 40 listings. Alan Freed, Dick Clark and others were caught up in that sweep.

Each of us at WATT had to sign sworn affidavits that listed everything we had received free while working for the station, including free passes to high-school football and basketball games. We were ordered by the FCC to never mention the names of the recording companies whose records we played, since that could lead to payola kickbacks for us. It was an interesting witch hunt while it lasted.

■ The Rock & Roll Era Begins

I was a broadcaster before the Beatles hit the scene. Elvis Presley was just coming into his own during my career. Part of our audience hated him and part worshipped him. I wasn't crazy about his style when he first popped up, but he grew on me with time. Dion, Freddy Canon, Bobby Vinton, Connie Francis and the whole Mo-Town organization were favorites of mine in those days. Gail Hornung and I did a nightly rock and roll stint entitled "The Night Beat Show." He was known on the live program as "Cool Cat" and I was "Big Daddy."

All of the jocks had special names in those days, such as Wolfman Jack and others. Buddy Morrow's "Night Train" served as the theme song for our rock show. The part I liked the least about my radio career was the fame and popularity that accompanied being a radio personality. No matter where you went you were recognized. Privacy was a rare commodity, and I have always been a rather private sort of person in my personal life.

■ In Conclusion

Perhaps radio is better today. It must be serving the needs and tastes of modern listeners. I must have been born 50 years too soon, as the saying goes, because I still seek out full-service stations and those that feature music other than contemporary rock and roll, rap, tabloid talk, and what is now called Country music. I like the Golden Oldies of the 50s and 60s and the Big Band sounds from the 40s and 50s, but then, I'm an older dude! No question about it: The face of AM broadcast radio has changed.

Landing That Wallpaper

QSLs—written verifications of reception—have always been an item of interest for the DXer. This is no less true for the domestic AM/FM Dxer. Many readers have sent reports to, and received QSLs from, shortwave stations. But what makes a good shortwave report may not do the trick for a domestic AM/FM/TV station.

There are several major differences between the typical international broadcast station and the typical domestic station. Maybe the most important is the target audience. By definition, an international station targets distant listeners, and it expects to hear from those distant listeners. On the other hand, a domestic station broadcasts only to the city in which it's located. It only expects to hear from people in town, and may go years without receiving a QSL request. Younger employees probably have no idea what a QSL is.

Also, many U.S. stations, especially AM stations, are not in the best of financial condition. Recent estimates have shown that as many as half of all U.S radio stations are losing money. To the DXer, this means your recently logged station doesn't have a staff sitting around waiting to answer your QSL request. Many smaller stations don't even have a staff; their programming arrives by satellite from Dallas or Chicago, and the transmitter is remote-controlled from a local convenience store, or a monitoring center in Colorado, or the owner's home.

Contrary to popular belief, distant reception reports do not make it easier for a station to sell commercials. If a station does verify your report, they're doing it out of courtesy. To be successful in collecting verifications, you need to make it easy for the station.

■ *Contents of a good report*

An effective reception report has several elements. First, it must explain why you're writing. Next, it must convince the reader that it's indeed their station you logged. Finally, it must explain what it is you want the station to do. All of this must be done in a short, concise letter—something that can be quickly and easily answered. Remember the One-Page Rule; a report that's longer than one page is likely to end up in the wastebasket.

My reports start by getting right to the point. "This is to report reception of your station KLMNO, 520AM, in Nashville, Tennessee, about 8:30pm Central Time on the night of February 30, 1994." This lets station personnel know more or less why I'm writing. It also assists in routing the report to the right employee. You should use the station's local time in your report; domestic stations generally don't understand UTC, and may not be able to convert properly from your local time to theirs.

Next, I provide information intended to convince them that it really was their station I was receiving. By far and away, the most important information you can provide to verify DX reception is local commercials. While the FCC no longer requires stations to keep records of commercials aired, these records are still necessary to convince the advertisers that they got the airtime they paid for. Station personnel can check these records and verify beyond a doubt that you did (or didn't!) hear their station. Mention the name of the advertiser and, if you heard it, their address and phone number.

Contrary to popular opinion, stations do not keep track of the music aired. Don't bother mentioning specific songs or musicians. A general mention of "country music, leading into local news" won't hurt, though.

National advertisements also don't help in verifying a station. Stations usually don't keep track of these, either, and even if they did, the McDonalds commercial could well have aired on any of the other stations on the same frequency. Again, a general mention of "after the news, three national commercials" won't hurt.

Similarly, mentioning that you heard a newscast from one of the national networks like CBS or CNN won't serve to confirm reception. It's worth mentioning, but you'll need more evidence to get that QSL. What will help to verify reception is a local newscast, especially when the station is in a small town. Mention some of the more localized news items, such as the county board approving a new roof for Podunk County High School.

Station identifications may convince you that you heard KLMNO, but they won't convince station employees. After all, it's common knowledge that stations are required to identify. I could tell you right now that KGU in Honolulu says "This is KGU, Honolulu," several times a day, even though I've never been to Hawaii to hear it. Station slogans, like "Hot 97" or "Q102," won't prove that you heard the station, either. But the chances of knowing what a station's slogan is without hearing the station are much less, so this information is well worth including in your report.

Here is an example of what I might write: "When I tuned in at 8:30pm, I heard the end of a country song. This was followed by the slogan "K-52," and then by ads for Acme Fire Extinguisher Repair at 3rd and Main Streets and for Joe's Restaurant, 555-1234. Next, I heard the KLMNO Milwaukee Weather. Finally, another country song was aired."

How much information do you need to log to get a QSL? This continues to be debated by

DXers. I've had receptions verified on the basis of only one local commercial, when personnel at the station felt confident I'd indeed heard their station. On another occasion, I verified a TV station by logging every commercial in their 10pm newscast. The quality of your information is much more important than the quantity.

Next, I write a brief summary of how well the station was heard and what kind of equipment I used to receive it. Domestic stations don't understand the SINPO code used on shortwave, nor do they understand the RST code used by hams. Explain the quality of reception in words: "KLMNO's signal was strong but with considerable fading and some interference from WABCD in Chicago."

Keep the description of your station short, and again remember that it will be read by non-technical personnel. Don't write a long review of all the features of your Drake R-8, or a blow-by-blow description of your antenna. One sentence should do it: "I use a GE Superadio II portable radio and a 75' wire antenna."

Finally, tell the station what you want. Write something like "if this report proves accurate, a letter of verification would be appreciated." Don't use the word QSL—most stations don't know what it means. (Those that do will recognize the subject of your letter and send a card anyway.) Also, don't forget to thank the station for taking the time to read and reply to your letter. Again, they're doing it as a courtesy to you.

What else to send/where to send it

Besides your report, there's one other thing you should send. Remember that many U.S. stations are losing money; enclose a self-addressed stamped envelope. Make it easy (and inexpensive) for the station, and your chances for a QSL improve greatly. Don't forget to make sure your address is on the SASE!

Figuring out where to send your report is the next step. Unfortunately, domestic stations rarely give their mailing address over the air. The *World Radio-TV Handbook* provides addresses for many domestic stations, but lower-power stations aren't listed. I'll go into more detail about reference materials for the domestic DXer next month, but for now I'll refer you to Gayle Van Horn (p.46, Dec *MT*) who recommends the *NRC AM Radio Log*, which is indeed a standard reference for the domestic AM DXer (NRC Publications, Box 164, Mannsville, NY 13661).

Once you've mailed your report, sit back and DX some more while you wait anxiously for that verification to return! Or, set aside some shelf space for the trinkets that stations often send with their QSLs. I've received postcards, bumper stickers (LOTS of bumper stickers!), key rings, bottle openers, and more.

SKIPPING IN

The following stations were among those heard or seen in the Nashville area in early December:

ZJB	885AM	Montserrat, West Indies
WGKA	1190AM	Atlanta, Georgia
KWCK	1300AM	Searcy, Arkansas
WKSJ	94.9FM	Mobile, Alabama
WKCN	99.3FM	Lumpkin, Georgia
WMCG	104.9FM	Milan, Georgia
KTXH	TV-20	Houston, Texas
WLTZ	TV-38	Columbus, Georgia
WSST	TV-55	Cordele, Georgia

Your QSL collection

Besides the trinkets mentioned above, I've also received station coverage maps and, from one station, plans for making your own AM loop antenna. Have you received anything interesting with a domestic QSL? Have you received a QSL that's interesting in itself? Write this column at the Brasstown address, or at the Internet address in the next paragraph.

Your new writer

As a new writer for *MT*, a brief introduction is in order. I live about 25 miles north of Nashville, Tennessee, and have been DXing informally for nearly 30 years, and formally for roughly seven years. I DX all domestic broadcast bands—AM, FM, TV—and occasionally shortwave and longwave. Contributions are more than welcome, through the Brasstown address at the front of the magazine, or through the Internet at 72777.3143@compuserve.com.

Bits and Pieces

- The season for tropo DX on FM and TV is ending in the North, but here in the South it runs all winter long. Winter E-skip is probably over by the time you read this, but E-skip didn't obey the seasons in 1994, and it may not in 1995! Of course, winter is the prime DX season for AM everywhere. Don't forget to check AM around sunrise and sunset; this is a good time to put those low-power daytime-only stations in your log. Also, don't forget to let us know what you log—and who you get verifications from.
- In an unusual move, the FCC has approved the application of station KWFT (620 AM) to move its towers. What's unusual about this? KWFT wants to move from Wichita Falls, Texas, to Plano, Texas, a move of 100 miles! Plano is a suburb of Dallas, and KWFT's move will allow it to cover Dallas and Fort Worth.
- Changes are being made in the familiar EBS emergency alerting system. Beginning in July, the length of the alert tone will be shortened to between 8 and 25 seconds, and by 1997, the tone will not exceed 8 seconds on any station. The new EAS (Emergency Alert System) will also add digital signals to the current alert tone and voice messaging system. Cable TV is being added to the system.

John Fulford, WA4VPY

Scanning at the Summit

The 1994 monitoring year went out with a bang with the Summit of the Americas held in Miami, Fla., during the first part of December. Representatives from all of the countries of the western hemisphere—with the exception of Cuba—were present. Needless to say, it was also the largest concentration of two-way radio systems in one geographical area that this monitor has ever seen!

Let's address the matter of protocol first. The head of state of a country—for example, the president of one of the South American countries—gets Secret Service protection. This also applies to his immediate family, such as his wife, children, etc. All others in the diplomatic party get protection from the Department of State's Office of Security. At least, this is how it works in theory.

At this conference there were so many different diplomatic delegations represented that the Department of State was drawn in to help provide executive protection. The Secret Service uses DES (Data Encryption Standard) digital scrambling. The Department of State does not use any form of speech encryption—at least none has ever been heard.

Do you see where this is going? One could monitor the Department of State channels and get a pretty good idea of what was happening. All of the Secret Service channels were busy with over thirty countries represented at the summit meeting.

UNITED STATES SECRET SERVICE
National Radio System

Designation	Frequency	Use
BAKER	165.7875	Field Offices
CHARLIE	165.3750	Field Offices
MIKE	165.2125	Dignitary/Ex President Protection
TANGO	164.6500	Field Offices/ Protection
GOLF	166.4000	Rptr input to any of above
JULIETT	170.0000	Paging
OSCAR	164.8875	Presidential Protection
PAPA	164.4000	Field Offices/ Protection
WHISKEY	167.0250	White House Staff Paging
NOVEMBER	166.7000	White House Staff
SIERRA	166.5125	White House Staff
ALPHA	32.23000	Transportation Division
LAVENDER	418.1250	Transportation Division
DELTA	169.9250	Marine Security Detachment
HOTEL	167.9000	Vice President Staff

The air to ground ECHO-FOXTROT was heard both prior to Air Force 1 landing and departing.

ECHO	407.8500	Uplink to AF-1/2
FOXTROT	415.7000	AF1/2 to Ground Sites

The Presidential limousine was also monitored on the YANKEE-ZULU channels.

YANKEE	162.6875	AF-1/2 to Limo
ZULU	171.2875	Limo to AF-1/2

Presidential Nighthawk Aircraft Fleet:

Presidential Transport	46.750
Presidential Transport	375.000
VIP Transport Net	34.350
Command Post	142.750
Squadron Command	265.800

The Presidential limousines and executive automobiles contain STU-III compatible Group-B cellular telephones. This means they use the wireline carrier (Bell System usually) and they are very heavily encrypted.

Coordination with the local, county, and state representatives was conducted on the new Motorola NIPSIC system. This is an 800 MHz trunked system that is being implemented in Florida. It is fully digital (no analog voice) and it uses the Motorola ASTRO™ line of radios.

DEPARTMENT OF STATE
Office of Security
National Radio System

Channel	Frequency	Use
01	407.2000	Control/Mobile (C/M)
	409.6250	Repeater Output
02	409.6250	Simplex
03	407.6000	Simplex
04	408.6000	Simplex

■ *Communication Chaos*

Next to the Department of State radio system, the most interesting and informative source of information was the Federal Communications Commission (FCC) radio system. The FCC uses 167.050 MHz as a repeater output and simplex channel. The input is 172.800 MHz. Every civilized country, including all of the participants to the Summit, use radio for their communications and security. A majority of the participants left their radio systems at home and used radios provided for them by our government. A few did not.

Of course, the frequencies used in their countries generally did not fit in the band plan of the United States. There was more interference than could be believed! There are only a finite number of frequencies, and the interference possibilities were being tested to the maximum. There was interference on the 144 and 440 MHz ham bands. The 450-460 MHz band was next, with the 162-174 MHz band bringing up the rear. The only band that did not seem to be affected was the 222-225 MHz ham band. Perhaps this was because this band is not widely used outside of the United States.

The FCC certainly earned their pay during the Summit. The few field agents that were there spent their time tracking down and stopping interference to United States systems.

As an example of the kind of thing that can happen, 167.5000 MHz is one of the main taxi cab frequencies used in Freeport, Bahamas. It is, or was, the main FBI frequency used in Miami. It got so bad with the island taxis that the FBI has just about vacated their old established frequency.

■ *The Secret Service in Washington*

For those of you visiting the Washington, D.C. area, the PAPA frequency (164.4000 MHz) is used by the White House Perimeter Patrols. The guards at the White House, and other executive buildings, such as Blair House and the Executive Office Building, are members of the United States Secret Service—Uniform Division. Their radio assignments are as follows:

Channel	Frequency	Use
GRAY	407.7500	C/M RPTR INPUT
	418.3500	RPTR OUT
ORANGE	414.9500	C/M RPTR INPUT
	418.7750	RPTR OUT

BROWN	418.8000	C/M RPTR INPUT
	414.8500	RPTR OUT
RED	419.7250	C/M RPTR INPUT
	415.9750	RPTR OUT
SILVER	419.1000	C/M RPTR INPUT
	415.6500	RPTR OUT
YELLOW	418.1500	C/M RPTR INPUT
	414.6750	RPTR OUT

With all of the excitement at the White House lately—an airplane crashing and several shooting incidents—these channels could bear watching.

While in Washington, be sure to visit Arlington National Cemetery. It is probably the best known of all of our national cemeteries and is unique in that it is the only military cemetery in the United States still operated by the United States Army. All of the others are operated by either the National Park service or the Department of Veterans Affairs. The callsign is "WAR330." The frequency is 165.1875 MHz.

■ *You Never Know*

To change the dial, one frequency worth putting in the scanner is 50.5 MHz. Yep, I know it is in the ham band. It is also the main frequency used by army airfields in the northeast. A convoy of HUMVEES was monitored using this as a convoy channel in the Great Lakes area.

■ *Boston Monitoring*

An anonymous reader sent in the following from the Boston, Mass., area.

Frequency	Agency	Use
140.0750	NAVY	Naval Intelligence Rptr
140.6500	NAVY	Naval Intelligence Secondary
162.2000	MARSHALL	Operations
163.6750	IMMIGRATION	Boston Repeater
163.7500	IMMIGRATION	Secondary
165.2375	CUSTOMS	Main Operations
165.2875	ATF	Main Operations
165.9500	IRS	Enforcement Rptr
166.0000	IRS	Internal Security
166.4625	TREASURY	Treasury Common
167.0500	FCC	Operational Rptr
172.8500	FAA	Boston Safety Operations
411.1500	STATE DEPT.	Boston Base
172.3000	COAST GUARD	Intelligence Division Rptr
162.1250	COAST GUARD	Special Operations
157.1000	COAST GUARD	Emergency/ Liaison CH. 22
157.0750	COAST GUARD	CH. 81 Boston Working
418.6250	DEA	CH.1 Rptr Out
416.0500	DEA	CH. 1 Rptr Input
418.6750	DEA	Surveillance Simplex
418.7500	DEA	Surveillance Simplex
418.9500	DEA	CH. 6 Rptr Out
416.2000	DEA	CH. 6 Rptr Input

■ *Strange Signals*

For those of you living in the Virginia area, a report has come in of strange transmissions coming from the area of Peters Mountain, between the cities of Gordonsville and Charlottesville. One side of the transmission is on 415.7000 MHz. This is the link from Air Force 1/2 to ground—the FOXTROT channel. The other side is on 415.4500 MHz. This is a Department of Agriculture frequency, but is also used by the Government Printing Office in the Washington area. Any ideas?

Moving outside of the normal scanner ranges, check out the 220-222 MHz band. We hams lost it to United Parcel Service several years ago. After much screaming and yelling, these two MHz were taken from amateur service and given to the UPS people for their national radio system that they were building and they could not get along without. Hams did not put up much of a fight, and UPS convinced the public that no packages would ever be delivered again and their company would dry up and vanish from the face of the earth if they did not get their two MHz of the spectrum. Well, they got it and did nothing with it. Their "nationwide" system never came to pass and is today comprised of 800 MHz channels.

What does this have to do with Federal Monitoring? Well, maybe nothing. But, there have been reports of strange signals around 220.0625 MHz. These signals have been reported in the Orlando, Fla., and the Stockton, Ca., area. The signals are data bursts. A "deep throat" source informs me that these are the control channels of the 220 MHz trunked systems that are being put in nationwide. There is already telephone book advertising of the 220 MHz trunked systems. Nobody has seen any systems yet, much less any radios. This would be a great place to hide, from which to run tactical communications.

While we are tuning outside of the normal channels, is anybody out there noticing the strange channels around 180.050 MHz around hospitals? It is not cardiac telemetry—those units are generally licensed in the 460 MHz band. It is not coming from the magnetic resonance image (MRI) unit. Those signals are usually in the 26 and 52 MHz bands. These signals seem to be in the amplitude modulation (AM) mode. Beats me.

Finally, I would like to thank the radio operator on Air Force 1 on the Miami/Washington, D.C. trip after the Summit of the Americas. The Democratic Party's strategy regarding how to handle the dismissal of the Surgeon General and how to rebut the Republican attack was right there in the clear. It makes one proud to be an American.

That's it for this month. Remember, Atlanta is only eight months away. 73's.....John WA4VPY

Jean Baker, KIN9DD

Oakland Oceanic Control

Welcome aboard! Today we will take a look at Oakland Center's Oceanic Control Area. Our host at Oakland Center is Dennis Addison, International Operations Air Traffic Specialist, who will explain procedures used to safely move aircraft over the Pacific Ocean.

DA: Starting with the basics: Oakland Center Oceanic Airspace covers over 18,000,000 square miles—not quite 10% of the earth's surface.

MT: How does the equipment used by the oceanic area differ from that utilized by the domestic sectors?

DA: The domestic areas of Oakland Center use the HOST Computer system to take the data from the different radar sites and generate targets on the controllers' radar scopes of Plan View Displays (PVD). The HOST computer system also provides all the flight data processing for all of the flights our facility is controlling.

The Oceanic Area uses a different computer system called ODAPS (Oceanic Display and Planning System). ODAPS performs all the flight data processing for the Oceanic Area. Each flight files a flight plan that includes all of the necessary information including its route. ODAPS processes each flight plan and generates the Flight Progress Strips (FPS). An FPS contains all of the information about a flight that the controller needs to do his job.

Dennis Addison, Int'l Operations ATC Specialist, and Carolyn Stone, ARINC Radio Operator who accompanied us on the Oakland Tour.

PVD (Plan View Display) and Flight Progress Strips

We post multiple FPSs for each flight over the ocean, depending on the route of flight. For instance, in Sector OC7—on a flight from the Orient to the United States—we post strips at the points the aircraft will cross 160, 150, 140, 134, and 130 degrees west longitude and the Oceanic Control Boundary along the west coast of North America. ODAPS calculates the time the aircraft is estimated to cross each of the points in the flight plan. The controller is able to use the strips on each of the aircraft to develop a mental picture of how the different flights fit together. Over the ocean, FPSs are currently the primary means of separating aircraft.

Standard oceanic separation is 100 nautical Miles (nm) laterally; 2000 feet vertically above flight level (FL) 290, and 1000 feet vertically below FL 290; 15 minutes longitudinally or 10 minutes between turbojet aircraft with Mach Number Technique. Standard domestic enroute radar separation is 5 nm laterally and longitudinally. The vertical minimas are the same.

The Oceanic Area traffic displays or PVDs look the same as the displays in a domestic radar sector. However, the PVDs in the Oceanic Area are **not** a radar presentation and **cannot** be used to separate traffic. ODAPS interpolates the aircraft's position on the PVD based on the aircraft flight plan and flight progress reports. The PVDs in the Oceanic Area are used primarily to assist controllers in maintaining the "traffic picture." Also, before controllers move aircraft, they look at the PVD. This provides a "double check" that a control decision made from the FPS information is correct.

New Traffic Solutions

Traffic levels in the Oceanic Area are growing rapidly. In order to help manage the increases in traffic, Oakland Center has initiated several different programs, such as the PACOTS (Pacific Organized Track System) and the Track Advisory Program. Keep in mind, the shortest route between two points is not always the fastest. Aircraft flying eastbound in the jet stream commonly pick up over 100 knots of tail wind. For the same reason westbound aircraft try to avoid flying the jet stream.

The PACOTS are a series of flexible routes that vary daily to take advantage of the changing upper winds. Our Traffic Management Unit (TMU) utilizes a computer called DOTS (Dynamic Ocean Track System) to generate the most efficient routes between Asia and North America. We typically generate one track from Asia to the Pacific Northwest and two tracks from Asia to California that fly in the morning. Then we generate another set of tracks from North America to Asia for the afternoon traffic. The PACOTS tracks can move over a thousand miles to the north or south depending on the position of the jet stream. The DOTS computer examines thousands of possible routes and determines which routes are most efficient.

PACOTS tracks, which are generated by our TMU, are also utilized between Hawaii and Asia. The PACOTS tracks from Asia to Hawaii, however, are generated by Japan Airlines and published by Tokyo ACC (Area Control Center). PACOTS tracks allow us to handle large volumes of traffic in an efficient manner.

We're now moving into the South Pacific area and generating a daily PACOTS track

(track W) from Los Angeles to Sydney, Australia. This was begun at the request of our customers. One of these customers estimated that the track would save them 2.5 million dollars annually. In the near future we will begin generating a second track from Sydney to Los Angeles and tracks between Los Angeles and Auckland.

We have a Composite Route System which runs from California to Hawaii. This series of six primary routes (three to Northern CA and three to Southern CA) utilize Composite Separation. Composite separation combines half of lateral and vertical separation to separated aircraft 50 nm laterally and 1000 feet vertically.

This Composite Route System allows us to efficiently handle a large volume of aircraft with minimum delays. These routes do not move with the winds like the PACOTS Tracks. Aircraft will plan flights via the most efficient route depending on the upper winds. At times aircraft from Southern California will fly all the way up to the Northern California tracks to get to Hawaii because of head winds on the Southern California tracks. Traffic levels on the Composite Route System remain fairly constant through out the year.

Communications over the Ocean

Communications in oceanic airspace are handled by Aeronautical Radio, Inc. (ARINC). As aircraft leave domestic airspace, radar service is terminated and the aircraft are instructed to contact ARINC, who transcribe the aircraft's communications and send it in digital format to the ODAPS computer system at Oakland Center. ODAPS displays the message on the monitor at the appropriate sector and updates the aircraft's flight plan database. Controllers take the information from the ODAPS monitor, transfer the data to the FPSs (flight progress strips) and take control actions as necessary. ODAPS uses the aircraft position and altitude reports to update the data on the PVD.

Although most of the communications in oceanic airspace are transmitted over HF radios, some of the latest generation aircraft have the capability to data-link their communications via satellites. In the future, satellites will be the primary means of communication and HF will be used as a backup.

Flight Planning

The Track Advisory Program is used to sequence aircraft into oceanic airspace with the required oceanic separation minimas. Prior to the Track Advisory Program, controllers manually calculated aircraft release times so that aircraft would enter oceanic airspace with initial oceanic separation. These manual releases worked all right; however, it was difficult for the airlines to plan their flights. Because of the length of oceanic flights, many aircraft are altitude and route critical. The airlines would not know what altitude or route to expect—or if there were any delays—until they were ready to depart.

In order to help alleviate these problems, we developed the Track Advisory Program. After the Westbound PACOTS Tracks from North America to Asia are published, airlines send their requests for release to Oakland Center several hours before the flights are planned to depart. Each request contains the altitude, PACOTS Track they would like to fly, and a time they would like to enter oceanic airspace. The request also contains up to three prioritized alternate requests which include acceptable delays, and different altitudes or routes.

The Track Advisory Program correlates all of the customers requests together, and the program first tries to use the airline's primary request. If that request is not available, alternates are reviewed. The computer then generates a Gateway Reservation List, which contains the releases for all of the requested flights. The Gateway Reservation List is transmitted to each airlines' flight dispatchers, who take this information and plan their flights accordingly.

As long as aircraft enter Oceanic Airspace within their allotted time window, they receive their requested route and altitude. If an aircraft *can't* make the release window, the flight dispatcher coordinates another release for the flight.

The Track Advisory Program has been very successful at reducing delays and allowing flight dispatchers more time to plan their flights.

MT: Do the Oceanic and Domestic Sectors use any equipment in common?

DA: Yes—the Traffic Management Unit (TMU), which is located on the control room floor. We have four areas that are comprised completely of domestic radar sectors. The Oceanic Area is made up of two domestic radar sectors and six oceanic sectors.

In addition to the PACOTS Tracks and Track Advisory Program we previously discussed, the TMU also monitors domestic sector operations to ensure that they run efficiently. Airport acceptance rates are watched to help ensure the demand does not exceed capacity. TMU computers monitor sector traffic levels and predict when a sector will become overloaded. If this happens, the supervisor is alerted and a plan is developed to maintain an acceptable workload by spacing departures and/or rerouting aircraft around the busy sector.

MT: And that describes the ultimate goal of all traffic controllers—whether it's over land or ocean. Thanks, Dennis. We really appreciate your kind assistance in giving us an overview of Oakland's Oceanic Control procedures.

That's it for now. Next time, we'll say so long and good luck to an old friend, feature lots of readers contributions, and have some software reviews, too. Until then, 73 & out.

Ken Reitz, KC4GQA

Going Automatic with World Radio Network

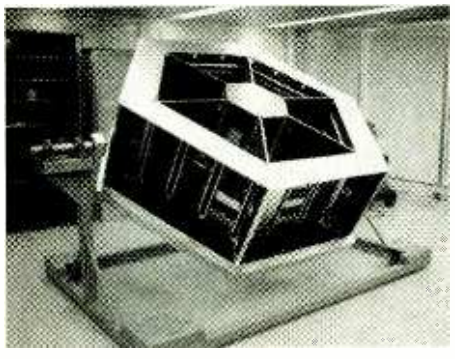
There are two faces to shortwave listening. The first is the thrill of pulling in distant signals from places we may never visit. Here's an excellent chance to tune into a slice of life in a foreign country—the language, the music, the culture—all live and as it happens. The second is the reality: the static crashes, the adjacent frequency interference and the inevitable fading (usually just as the station announces where it can be heard next in North America).

In my thirty years of more-or-less frequent shortwave listening, I have yet to hear more than snatches of Radio Telefis Eireann (RTE) from Ireland or any of the less powerful of the international radio broadcasters, whose small but no less interesting signals fall a thousand or so miles short of my antenna.

Haven't we reached the point at this end of the century, 100 years removed from Marconi's amazing adventure, that we can now listen to these wonderful stations without straining our ears? Call me spoiled from too many years of listening to local FM radio stations, but, there's got to be a better way!

WRN To The Rescue

World Radio Network (WRN) is helping to bring shortwave listening into the 21st century with its line-up of programming on Galaxy 5 channel 6, 6.80 MHz audio subcarrier. Originally on the low profile ASC 1 satellite, WRN moved to its current location last fall. With this move it has gained access to at least a million potential listeners whose satellite systems are unsteerable and locked onto Galaxy 5. Broadcasting 24 hours a day from its facilities in London, WRN retransmits a broad spectrum of shortwave programs familiar to all *MT* readers. From Radio Sweden at 0000 hrs UTC to the aforementioned RTE at 2300 UTC, WRN whisks listeners around the globe faster than the Concorde.



The Flight Model Phase 3-D Spaceframe inside the clean room facility in Orlando, Florida. The specially built handling structure allows easy access to all parts of the satellite during integration. (AMSAT-NA Photo by Keith Baker, KB1SF)

Here's a sample: At 0300 it's Radio Finland, at 0330 it's Vatican Radio, at 0400 it's Radio Canada International, at 0430 it's the BBC. The pace is dizzying but never tiring! The WRN schedule is mostly the same through the weekdays with different programs on the weekend. This gives the listener the chance to get used to the programming and fall into the habit of picking up on shows of particular interest.

Recently, I have become attached to the two hour broadcast of RTE from Ireland (which is on from 5:00 until 7:00 pm ET). This lively blend of music, chat, and news is all about Ireland and it doesn't take a listener long to feel at home. What's more, there are commercials which are just as entertaining as the programming!

The Future of World Radio

I had the opportunity, during the *MT* convention last October, to talk with Karl Miosga, Managing Director for WRN. Miosga represents a new position in the world of World Radio. He, like his counterpart at C-SPAN Audio Services, has the enviable task of bringing an age old technology to the ears of those who may have never heard a shortwave broadcast. He's making good use of it.

While WRN's service is the latest to take advantage of the qualities of satellite broadcasting, it's not the only one. The BBC, Deutsche Welle, Radio France International, The Voice of America and AFRTS have full-time audio services on satellite and, between WRN and C-SPAN, dozens more services have reception in North America they could never before have dreamed possible.

Are there more in store? Quite possibly. International broadcasters see their transmissions as vehicles for attracting lucrative future tourist dollars or encouraging business development. A favorable position on a popular satellite is money well spent.

Top Photo: ***Kopernicus 2 (33.5 degrees east) John Locker reports that this satellite sometimes carries six live transponders.*** **Bottom photo:** ***German satellite TV test pattern prior to feed from Iraq via Eutelsat at 13 degrees East. Photos by John Locker.***

Currently, C-band satellite TV is the only way to enjoy this audio feast. Very few cable companies can afford to make such programming available; and, the DBS entities, who have the capability, don't yet have the vision to realize it could be a good selling point. The real future for international broadcasting on satellite is quite a few years away. I expect it will take the form of, as yet, unbuilt satellites with high-powered, digital transponders capable of being received in vehicles as well as homes.

Those for whom the romance of over-the-air shortwave broadcasts beckons will not be disappointed. Million watt transmitters feeding enormous curtain antennas will be with us for many years to come and you'll still have the chance to QSL RTE the hard way! For the complete schedule of WRN programming get the latest issue of *Satellite Times* or write WRN at 408, The Strand, London WC2R 0NE.

■ AMSAT's Phase 3-D

The Radio Amateur Satellite Corporation (AMSAT) continues the long and tedious task of building amateur radio's most impressive satellite to date. Following the progress of Phase 3-D is an education in the time, money, dedication and skill which goes into building and launching any satellite.

Working with all-volunteer labor, Phase 3-D is slowly coming together at facilities in Orlando, Florida. While the launch date is quite a ways in the future, important tasks to insure a berth on the Ariane 5 launch vehicle is being done now. It's not just hardware on these projects, but a seemingly endless trail of paperwork as well. One realizes the importance of every step along the way. Unlike commercial satellite builders, there won't be a spare on a shelf on the ground should the launch not succeed.

In a recent press release, Keith Baker, KB1SF, of AMSAT says that the Phase 3-D's Frequency Coordinator has decided on all of the satellite's passbands. An announcement to that effect detailing the various bands and their frequencies will be released later.

■ MAILBAG

• The Locker Report: Longtime *MT* reader and European satellite enthusiast John Locker of Merseyside, England, sent an impressive group of photos of things he's recently seen on his side of the Atlantic. He also sent along a copy of an article he had in the November '94 edition of The European Satellite Users Group (TESUG) publication called *Footprint*. In the article he details how he was able to receive video from the MIR manned spacecraft via the Russian Cosmos 2054 satellite at 15 degrees west.

He wrote in *Footprint*, "...Early on the morning of September 15, I noticed what appeared to be carrier activity as I passed the 15 west position. Very weak, but it was registering at the lower extreme of my LNB's coverage (10820 MHz). Switching in the threshold extender on the receiver pulled in the signal, and by very fine tuning of the frequency and polarity, faint pictures fought their way through the noise. At times views of the earth were apparent and also shots of MIR's solar array..."

Good show, John! Have you seen or heard something unusual on your satellite system? If so, send a picture, write a note and let us all in on your good luck. By the way, John's equipment features a 3' dish with a .8 db LNB feeding an Echostar 8700. He reports that there is a slight rain fade in heavy storms mostly on the lower powered transponders on Intelsat 601 and PAS 1.

This 27-inch Zenith TV combines StarSight capability with a host of other Advanced Video Imaging features. StarSight offers instant programming information at the touch of a button; seven days of updated program schedule information; a simple guide for direct tuning by title, theme and channel number; and easy one-button VCR recording of selected programs. (Courtesy Zenith Electronics Corporation)

• Raymond Scott of Michigan writes regarding comments I made in this column about the DirecTV system. He says, "...I have now lived with the system for the past four weeks. The picture is always of laserdisc quality...and I have never seen the picture 'freeze'. The audio is comparable to CD's."

Well, Raymond, it turns out we're both right! Yes, there were a number of problems with the DirecTV system before you had yours installed. As reported in the Tech Report column in *DBS World* of 10-15-94: "...One of the major bugs in the system has been the freeze frames that have plagued the system since the beta test phase earlier this year..." In addition, the report goes on, "...Rain fade has been reported in several areas since DSS rolled out this past summer..."

My point was that the product was rushed a little too fast to market in quantities well below market demand, thus creating an artificial scarcity which played against consumers. Over-eager sales people pitching the system as the final word in technology overlooked the fact that the system is not for everyone. Just as cable or C-band are not for everyone either. Consumers should choose the system that is best for their environment, finances, and entertainment/hobby desires.

• Patrick Paventa of Hawthorne, NJ, writes, "...I've just received a local advertisement about a new Zenith TV product...It seems to be similar to existing satellite program guides. My question—Is this similar or compatible with the teletext I receive on my present Zenith TV?"

Patrick, the product is called StarSight, and Zenith was the first TV manufacturer to sign up with StarSight. Sony has recently agreed to become a licensee of the product which means that the next series of DirecTV DSS systems, which Sony is in line to begin making, may include the StarSight service on-board. StarSight is an interactive on-screen program guide service which offers instant programming information at the touch of a button.

And, Patrick, you may be right; it seems similar to existing satellite program guides. At least that's what Gemstar Development Corporation and SuperGuide Corporation have declared in a suit filed in Federal Court against StarSight Telecast, Inc. According to a report in *Satellite Retailer* of December 1994, the suit claims patent infringement and seeks a permanent injunction and damages. The short answer to your question, however, is that it is not compatible with your current teletext decoder.

Kevin Carey, WB2QMY

AWOS Awareness

Years ago, the longwaves were sprinkled with AM voice transmissions serving the weather needs of private and commercial pilots. These stations were part of the vast network of Transcribed Weather Broadcast or "TWEB" services.

Over the past 15 years or so, there has been a steady decline in the number of TWEB stations, to the point where today only a handful of stations remain, and most of these are confined to the middle and eastern United States. A few holdouts you can still hear are: **TUK** (194 kHz) Nantucket, MA; **GLS** (206 kHz) Galveston, TX; **GNI** (236 kHz) Grand Island, LA; and **ME** (350 kHz) Chicago, IL.

TABLE 1

Selected AWOS Stations

FREQ	ID	LOCATION
209	BNR	Findlay, OH
209	HCD	Hutchinson, MN
221	RBW	Walterboro, SC
227	DXX	Madison, MN
234	EQQ	Newnan, GA
238	DCH	Chandler, AZ
239	BBB	Benson, MN
259	PBY	Kayenta, AZ
260	EPM	Eastport, ME
269	CAD	Cadillac, MI
272	OLY	Olney, IL
293	UI	Quincy, IL
303	MRT	Marysville, OH
308	EVZ	Cartersville, GA
308	LPZ	Ruston, LA
321	FT	Denver, CO
326	ETH	Wheaton, MN
329	AAA	Lincoln, IL
329	BQP	Bastrop, LA
335	COQ	Cloquet, MN
338	PBT	Red Bluff, CA
340	JES	Jesup, GA
341	ORB	Orr, MN
359	LXL	Little Falls, MN
359	LYZ	Bainbridge, GA
359	SDY	Sidney, MT
362	MZH	Moose Lake, MN
364	HII	Lake Havasu City, AZ
371	FNA	Slidell, LA
371	PUR	Marshall, MO
372	UQN	Vidalia, GA
374	BOD	Bowman, NC
379	SF	San Francisco, CA
380	ML	Milledgeville, GA
382	IQK	Louisa, VA
394	RGK	Red Wing, MN
395	TAZ	Taylorville, IL
397	AIT	Aitkin, MN
400	PPI	South St. Paul, MN
404	OUC	Ocracoke Island, NC
407	EMM	Kemmerer, WY
410	DQU	De Quincy, LA
410	GDV	Glendive, MT
415	DJD	Canton, GA

The good news is that many new stations have been showing up on the airwaves to partially fill the void of TWEB service. These are the unmanned Automated Weather Observation Stations (AWOS). They make periodic checks of key weather parameters (wind speed and direction, temperature, humidity, barometric pressure, etc.) and report those measurements over the air in a computer-like synthesized voice. It's all part of the FAA's effort to streamline their operations and minimize the cost of providing essential services.

AWOS broadcasts aren't meant to be as detailed in scope as a TWEB broadcast, but they can be a viable alternative where TWEB service is no longer economical. The main difference between TWEB and AWOS is that AWOS does not give forecast information, conditions in other cities, or route information between cities—They just report the conditions occurring at the beacon site.

Table 1 shows some selected AWOS sites from a list compiled by Bill Hepburn, TWEB Editor for *The Lowdown* journal. You may wish to try for some of these stations when you're DXing the band. Bill points out that Minnesota has the greatest number of AWOS "Weather Robot" sites—about 30 stations in all.

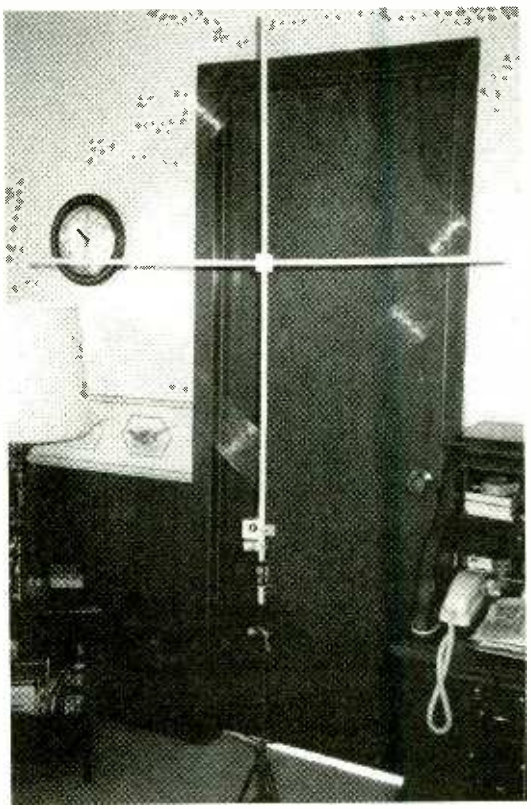


FIGURE 1: ***Paul Jablonowski's deluxe loop is supported by a music stand***

■ *Homespun Loop Revisited*

'Way back in the September '92 issue of *MT* I described a simple homespun loop antenna that you could build from junkbox parts. Then in November 1993 I described a companion preamp that could be added to the basic loop. Many readers reported excellent success with these projects and we are still getting occasional requests for reprints of these articles. (Reprints are available for $2 each from *Monitoring Times*—See the address at the front of the magazine.)

Paul Jablonowski sent me a picture of his Homespun Loop complete with the optional preamp and a power on/off switch. (See Figure 1.) Paul has a great idea for supporting the loop that I think is worth passing along. He uses an old music stand which allows for sturdy support of the loop, and yet provides for easy rotation. From his condo shack, Paul is getting great results on the low band—much better than when he used a wire antenna for reception.

Ken Cornell, author of the *Low and Medium Frequency Scrapbook,* sent along a helpful description of how the impedance changes depending on whether you couple to the one-turn pickup loop (as in the unamplified version) or the main loop as in the preamplified version. (See Figure 2.)

As Ken explains, with the passive loop

you'll be connecting the one-turn pickup winding directly to the receiver via coaxial cable, which roughly matches the low impedance (Z) of most modern communications receivers (50 ohms). When the preamp circuit is added, the one-turn winding is not used, and the main loop winding is connected to the input of the MPF102 preamp circuit (high-Z).

■ Information Please

What is it that attracts people to the longwaves? For many, the answer has to do with previous military service where they either operated longwave gear or depended on longwave signals for safe and accurate navigation.

Warner Chapman (VE8MA) is one such devotee. Back in the 50's he flew C-54 cargo planes in Greenland where longwave beacons were essential for getting to the next snowy airfield. He has fond memories of that early equipment and asks if any of this old gear is still available on the surplus market.

You're in luck, Warner! There are firms that carry many of the old champions and make them available for public sale. Some large cities have surplus shops where you're likely to find radio and electronic gear sitting right on the shelves. The granddaddy of all surplus radio stores is Fair Radio Sales. You can write them for a catalog at 1016 E. Eureka St., Lima, OH 45802.

■ How low will it go?

Gordon Bell (NY) read the November column with interest which listed the longwave tuning range for several popular receivers. He supplied some additional information on the capabilities of the Kenwood R-5000 receiver. According to Gordon, the R-5000 will tune well below the published limit of 100 kHz, but the manufacturer does not guarantee the performance specifications below this limit. His own R-5000 drops all the way down to 30 kHz.

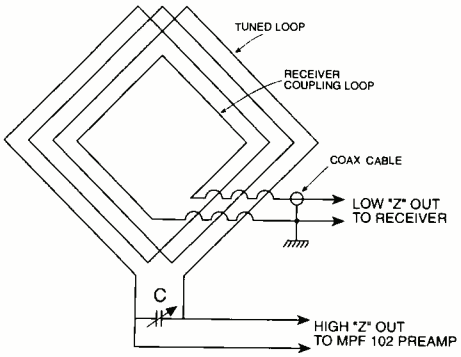


FIGURE 2: ***This drawing shows two operating arrangements for a loop. One low-Z for direct connection to a receiver, and one high-Z configuration for connection to a preamp.***

■ End Notes

Are you planning a winter get-away this season? If your plans take you near the Daytona Beach area, you may want to visit the Lighthouse Museum in Ponce de Leon Inlet, FL. This is an interesting stop for anyone interested in navigation aids—including longwave. Besides the lighthouse itself (which you can climb) there are numerous historical exhibits relating to maritime navigation.

The generator building used to house a Coast Guard beacon during the 1940's that operated on 290 kHz and identified with the numeral "1". Pictures and write-ups about the beacon (and its shaky start) are on display inside the building.

According to the write-up, the beacon transmitted its ID on the second, third, and sixth minute in clear weather, and every three minutes during bad weather. Accurate time was kept by a Seth Thomas clock referenced to the National Bureau of Standards. I wonder if any old timers remember hearing this, or similar "timed" beacons on the air?

That's it for this month. I'll see you in March!

Ike Kerschner, N3IK

The SKN Game

SKN means Straight Key Night. SKN is a non-contest event held twice a year by the ARRL. Its purpose is to have fun with CW. The only rule is that you must use a straight key. SKN is held twice a year on New Years Eve and again on the 4th of July. No awards or certificates are to be earned in this one; however, you are encouraged to vote for the best sounding fist of the night.

SKN is a very laid back event with most contacts being a half hour or more duration. In fact many QSO's last more than an hour, and often we find new friends. All you need to participate is a rig capable of sending CW and a straight key. Get on your favorite CW band (most activity is found on 80 and 40) and send CQ SKN.

To me the SKN is a very important event for several reasons, the first being *Fun.* The second reason is this: it gives us a chance to find out what good code sounds like.

The J-37 is one of the better military surplus straight keys available. They can be found at hamfests ranging from $5 to $35, often with a metal housing (explosion proof) encasing the entire key except for the knob.

The Effects of Neglect

No longer is it a requirement that a candidate for an amateur license pass a code sending test. This may partially account for the terrible sounding code that is proliferating on the various bands. Since the sending test has been discarded, the folks who teach ham classes are neglecting to teach how to send good code.

Generally it is assumed that, since the new novice will be using an electronic keyer, good code will come automatically. A few hours operating on any of the CW bands will produce hard evidence that this is not the case.

An example of what I am saying is a contact that I had with one new ham that took over twenty minutes just to get the name and QTH (forget the rig description). I might add that signals were solid s-7. This poor guy did not have a clue how to set up his keyer, or what good sounding code was like. Unfortunately this is not an isolated incident. There are too many misadjusted keyers and paddles out there and no one is doing anything about it.

The answer is not a liberal application of the WOFF HOUNG or RETTY SNITCH (ancient instruments of torture for poor operators). It is training. There are too few instructors who are willing to spend the time teaching the new ham how to adjust his key and send good code.

A Second Fallacy

This is the belief that faster is better. ***Not true!*** A contact at 10 WPM with an operator that sends good code is far to be preferred over the 30+wpm QSO that requires repeat after repeat. In the long run the slower speed often accomplishes more in a shorter time.

There is an old saying among commercial CW operators that really applies here: "twenty is plenty." A lot of old timers try to impress newcomers with their ability to copy high speed code, but remember, most of these speedsters have been doing it for years. In time most of us can develop more speed if we feel that is really important.

As a rule, 20 wpm is a point at which most of us are capable of sending good code. It is easy to copy and one can accomplish a lot at that speed. At speeds above 25 wpm we begin to run into hand/ear coordination problems. It is not impossible to send good code at this speed—it just takes more time to develop the skill. And we must have properly adjusted equipment. So if you really want to join the high speed CW types, just practice—but practice off the air!

In order to learn how to send good code we must first of all forget the notion that an electronic keyer will automatically take care of all of our problems. The first step to learning properly is to obtain a decent straight key, and adjust it properly.

There are only two critical adjustments to be made to your key. The first is contact spacing, and the second is spring tension. Contact spacing is fairly easy: set them so you can see light between the contacts. A 1/32-inch spacing is good to begin with.

Tension is a bit more difficult to set. First of all, place your forearm on the table and let your hand rest lightly on the key. Adjust the spring tension so that the weight of your hand (without force) will close the contacts. Setting the tension too tightly results in operator fatigue in a very short period of time, and discourages use of this reliable sending instrument. What you are looking for is a light motion. In other words, simply let the hand relax. Only a very slight effort should be required to lift it in order to make and break contact. Do not grip the key in a death grip—just let your fingers lay on top of it in a relaxed way.

OK, now that the key is set we are ready to learn how to send. It is important that you have good code to listen to. I suggest tuning W1AW's code practice and if possible making a tape of a session or two. If you have a computer and software that will create Morse, it will do just fine, or use a regular code practice tape.

While listening to the code, send in step with it. After a few practice sessions, tape your sending and listen to it. Does it sound as good as what you were copying? Of course, your sending sessions should be done off the air with a code practice oscillator. Take your time and send at a pace you are comfortable with. Learning to send 15+ wpm should not take too long.

Now that you have an ear for good sounding code, go ahead, use the electronic keyer, but follow the manufacturer's instructions on how to adjust the paddle and keyers (that's easier now that you know what good code is). See you in SKN!

Low Band Activity

This is the season for great hamming on 160, 80 and 40 meters. Noise levels are very low, and DX is rolling in. Most evenings DX from Europe and South America can be heard just after nightfall. As the night progresses, stations to the west begin to come through; by daybreak Oceania and Asia are workable most days on 40 and very frequently on 80 and 160.

The MFJ code practice oscillator has a built-in key which, though not the best, is a very good training aide.

Remember, if you want to chase DX on these bands you are going to lose some sleep. Forget the tales about needing high power and big antennas: your 100 watts and dipole will let you work plenty of DX.

Six Meters

Since my review of the Ramsey FX-50 six meter FM rig several new six meter FM transceivers have hit the market. This is truly good news. I will report on some of these units as soon as I have a chance to obtain more information.

Activity on six meter FM has been fairly decent, considering the lack of solar activity. Some openings of several hundred miles have been observed here on a weekly basis. If you are active on six meters please drop me a note about what you are using and working.

HAPPY NEW YEAR es 73. Ike, N3IK

Rob Kenoul's

Ham DX Tips

Though this is the shortest month of the year, you can still log many "new ones." Here are some DX tips that we hope will help you do so.

ANTARCTICA VI0ANT will be active from the Australian Antarctic research base until mid-March on the following frequencies. CW 3502, 7005, 14005, 21005 kHz; SSB 3798, 7070 (listening up for US hams), 14190, and 21295 kHz; RTTY 14085, 21085 kHz. The operator is VK4EET (Eddie De Young, 131 Plantain Road, Shailer Park, Queensland 4128, Australia), who will answer all QSL requests when he returns home in late March. DL1SBF reports that DL7VTS will be part of a scientific team to an Antarctic island located at 63 degrees 13 minutes S, 58 degrees 55 minutes W, until 26 February. While there he will be using the special call sign DP1KGI on SSB, CW, and RTTY as his work schedule permits. The route for QSL requests should be arranged before the time of the operation and will be given by DP1KGI on the air. **BOLIVIA** CP8XA has been operating on 10110 to 10115 kHz CW starting at 0030 UTC after his CW operations on 14005 to 14010 kHz daily at 2230 UTC. QSL to: Peter Kapraun, Box 240, Guayaramerin, Beni, Bolivia. **CONTESTS** The weekend of February 18th and 19th will see quite a bit of contest activity from various parts of the world. First, this is the second time period of the ARRL CW DX contest—also the YL-ISSB QSO Party, and the Colorado QRP QSO Party. The following weekend of the 24th to 26th is the CQ World Wide 160 meter SSB contest—a time to add some top band to your log book. **FERNANDO DE NORONHA** PY0FF can be found by CW DXers needing this rare country on either 14025 kHz starting at 2100 to 2200 UTC or 7001 to 7005 kHz starting at 2200 to 0000 UTC most days. His QSL manager is: W9VA, William Smith, 1345 Linden Ave., Deerfield, IL 60015. **JAPAN** Operating from Amini Island (for you Islands on the Air, IOTA, award hunters, reference number AS-023) is JO6HYO who likes 18125 to 18130 kHz SSB starting at 0900 UTC most days. QSLs should be sent via the Japanese QSL bureau: JARL, 1-14-2 Sugamo, Torshima, Tokyo, 170 Japan **KIRGHIZ REPUBLIC** If you need this exotic country and you are looking for a new 75 country on 75 meters, look on or near 3795 kHz SSB at or just before 1200 UTC for EX0V. His QSL manager is: DF8WS, Wilhelm Schommer, Merscheiderweg 37, D-54662, Speicher, Germany. **RWANDA** Yes, even with all of the recent tragedies this country has undergone, there are still active amateurs from here. 9X5EE is on 10101 kHz CW at 2200 UTC or 7001 to 7005 kHz CW at 2200 UTC most days. Requests for QSLs should be sent to his QSL manager: PA3DLM, Tiny J. M. Mahoney Bockstael, Josef Haydnstr 17, NL-4536, BT Terneuzen, Netherlands **UNITED ARAB EMIRATES** Al Mur Al Mohiri, A6AH is a recently licensed amateur and is already becoming quite an accomplished DXer. You can find A6AH on or near 3792 kHz SSB starting at 0030 UTC most days. QSL to: Al Mur Al Mohiri, P. O. Box 4800, Dubai, United Arab Emirates. **VATICAN STATE** HV4ANC is the only active amateur from yet another rare DX country, and now RTTY DX enthusiasts can log him on 14088 kHz at 1425 UTC most days. Those desiring a QSL should write: IK0FVC Francesco Valsechi, Via Bitossi 21, I-00136, Roma, Italy. **VIETNAM** UA0FM will be in this country starting in February and until the end of April and hopes to obtain permission to operate amateur radio. Permission to operate from here has been granted on a case by case basis.

Well, that does it for another month. Remember your DX tips and comments are very much appreciated and desired. 73 de Rob

Geyer Says Caiman Was Costa Rican CIA Operation

In a column that ran in many newspapers, including the November 9 edition of the *Washington Times,* well known international reporter Georgie Anne Geyer said that longtime anti-Castro clandestine **Radio Caiman** was a CIA operation from a transmitter site in Costa Rica. Geyer confirms the observations of many DXers by noting that the long-running clandestine is now off the air. Its 9965 kHz frequency has been silent since October.

Geyer's contention that Caiman operated from Costa Rica is somewhat at odds with conventional wisdom in the DX hobby. As is noted in the 1995 edition of *Passport to World Band Radio,* a Guatemalan location has always been assumed. However, Geyer's column adds credence to considerable DX speculation that the CIA had been behind this obviously well-financed but secretive operation. Geyer is an experienced nationally syndicated columnist who often makes television appearances on programs such as PBS' "Washington Week in Review."

USA intelligence agencies have a recent history of Costa Rican operations, most notably the quasi-clandestine **Radio Impacto.** Although Impacto was licensed, and was therefore listed in the annual *World Radio and Television Handbook,* its obvious focus on anti-Nicaraguan (and later anti-Panama) programming pointed a finger at the USA as its sponsor. After the end of the Panamanian invasion, Impacto permanently left the airwaves.

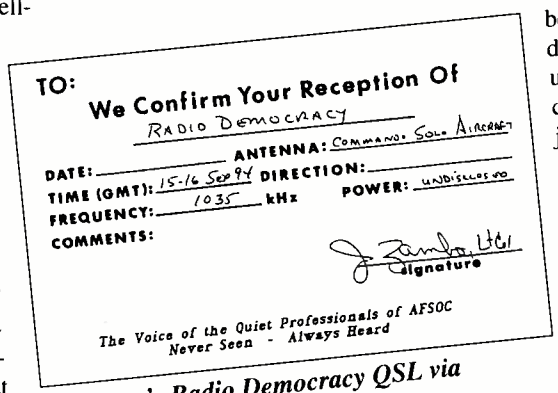
Even though Caiman has gone QRT, many of us still have outstanding station logs that have not been verified. Unfortunately, the CIA failed to provide a correspondence address for reception reports. Perhaps an *MT* reader in Langley, VA, might be able to assist us?

It is clear that the Cuban government is keenly interested in all of the United States anti-Castro clandestines. As we reported last month, a Cuban government complaint led to the bust of **Frente Nacional Cubano** in Puerto Rico. According to BBCMS, lengthy analyses of the Cuban clandestines recently aired in Havana on both **Tele-Rebelde Television** and **Radio Progresso.** The Progresso report claimed that the first anti-Castro clandestine was Radio Dominicana, which broadcast from the Dominican Republic in 1959.

Colombian Negotiations

A November 18 Associated Press story reported that the Colombian government has opened informal contacts with two remaining leftist rebel military groups, the Revolutionary Armed Forces of Colombia and the National Liberation Army (ELN). The ELN is the longtime clandestine operator of **Radio Patria Libre.** Colombian President Ernesto Samper said that he was willing to open formal talks with the guerrillas "at an undetermined site abroad."

Ulis Fleming reports a late fall logging of Patria Libre on 6260 kHz at 1130 UTC. Their weekend broadcast on 15050 kHz around 2130 UTC has not been heard much lately. It would be a good idea to pay attention to this station during the political maneuvers within Colombia. DXers are still searching for an ELN correspondence address. Does anybody have any idea where the rebels can be contacted?


TO:
We Confirm Your Reception Of
RADIO DEMOCRACY
DATE: ANTENNA: COMMAND SOL AIRCRAFT
TIME (GMT): 15-16 SEP 94 DIRECTION:
FREQUENCY: 1035 kHz POWER: UNDISCLOSED
COMMENTS:
J. Zambo, Lt Col
Signature
The Voice of the Quiet Professionals of AFSOC
Never Seen - Always Heard

Provance's Radio Democracy QSL via Pennsylvania

Radio Democracy QSL's

We've had several reports of QSLs received for Radio Democracy airborne clandestine broadcasts from Haiti. Most are coming from a logical source: the base of the aircraft at a Pennsylvania Air National Guard base. One example is printed here this month. *MT* reader Terry Provance of Zanesville, OH, bagged it for a report to verie signer Lt. Col. James L. Zambo, the Mission Control Chief. The working address is Pennsylvania Air National Guard, headquarters, 193D Special Operations Group/DOOW, 76 Constellation Court, Middletown, PA 17057.

I've heard multiple reports from DXers who have visited this base. The National Guard personnel report that they have flown missions during **all** recent USA military operations, including the Gulf War and the invasions of Panama and Grenada.

Books You'll Like

I've been using two books that cover topics of interest to DXers of unusual shortwave signals. Although *MT* has mentioned them in the "What's New" column, they should be of special interest to chasers of unlicensed broadcasters.

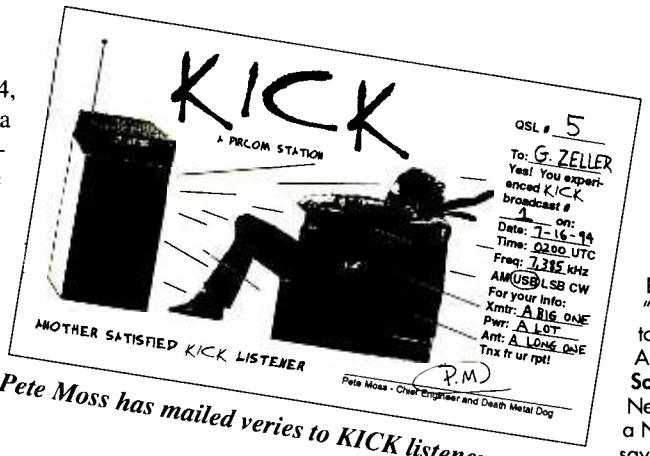
Don Schimmel's name will be very familiar to all utility DXers. His brand new book, *The Underground Frequency Guide,* is described on the cover as "a directory of unusual, illegal, and covert radio communications." Don has done a really outstanding job of covering topics such as numbers stations, covert communications networks, and strange digital signals that we all have heard on shortwave. It concludes with a 60 page list of frequencies where odd signals have been found lately. You'll want to have this one. It's available from many *Monitoring Times* advertisers, or direct from High Text Publications at 125 North Acacia Ave., Suite 110, Solana Beach, CA 92075 for $14.95 plus $3.00 shipping.

I often get asked about good resources on clandestine stations. Mathias Kropf's *The Clandestine Broadcasting Directory* contains a database of recently active clandestines that is sorted by frequency, time, and station. Especially since the *World Radio and Television Handbook* still ignores clandestines in most issues, Kropf's book is handy to have. Most radio suppliers carry it, or it can be ordered direct for $12.95 plus $2.00 shipping from Tiare Publications, PO Box 493, Lake Geneva, WI 53147.

What We Are Hearing

Your loggings of North American pirate stations are always welcome c/o PO Box 98, Brasstown, ND 28902. Maildrop addresses used by pirates reported this month include: PO Box 452, Wellsville, NY 14895; PO Box

146, Stoneham, MA 02180; PO Box 2024, Faribault, MN 55021; PO Box 3511, La Mesa, CA 91944; PO Box 605, Huntsville, AL 35804; PO Box 109, Blue Ridge Summit, PA 17214; and PO Box 220342, 42373 Wuppertal, Germany. Times are in UTC, with frequencies listed in kHz.



Pete Moss has mailed veries to KICK listeners

Anarchy One- 7415 at 2330. This one is only sporadically active, so Harold had a good catch. This time they featured a story about a Vietnam veteran. Addr: La Mesa. (Harold Frodge, Midland, MI)

Black Rider Radio- 7470 at 2300. This new one airs productions of diverse music including opera, jazz, obscure rock, and narrative poems. A professional male announcer details all the song titles and artists around sign-off. Addr: Wellsville, requires a picture postcard of your home town with reports. (George Zeller, Cleveland, OH)

Caribbean Sound System- 6955 at 2200. Count Whip's broadcasts always originate from a cruise ship in tropical waters. A recent trip featured the entire Executive Council of the North American Shortwave Association as passengers. Addr: Stoneham. (Randy Ruger, Brandon, FL, Frodge)

CUMM- 6955 at 2330. This new one promotes behavior that got Joycelyn Elders fired as Attorney General. Addr: None. (Ulis Fleming, Glen Burnie, MD)

FAQ- 7415 at 2315. This new one is still somewhat mysterious. It mixes rock music with commentary collages, claiming to not be affiliated with any other pirate. Addr: None. (Barry Williams, Enterprise, AL)

KDED- 7470 at 0030. "The Voice of the Grateful Dead" has broadcast somewhat regularly in recent months. Deadheads and Jerry Garcia fans will like this one. Addr: Wellsville; $1 US extra helpful for their psychedelic QSL. Richard got one, which was his first pirate verie. Congratulations! (Richard Peterson, Silver City, NM; Paul Roales, Tulsa, OK; McCarthy, Frodge)

KICK- Station maven Pete Moss talked us into printing his QSL this month. Then, nobody logged his station. Addr: Huntsville. (Direct from the station)

KTVI- 6955 at 2330. Emmanuel Goldstein combines rock music with pirate commentary on this station. Hopefully, his transmitter does not take his call letters literally. Addr: Faribault. (Skip Arey, Waterford Works, NJ)

North American Pirate Relay Service- 6955 at 0200. Richard T. Pistek continues a very active scheduled relays of other pirate stations' programs, including many Europirates that are otherwise very tough DX catches on our side of the Atlantic. Harold got six pirate QSL's this month, including this one in 18 days. Addr: Wellsville. (Frodge, Rose)

Primitive Radio- 7415 at 1500. Holden Caulfield features a classic rock format with a laid back style appropriate to his primitive theme. Addr: Wellsville. (Rose, Frodge)

Quantum State Laboratory- 7470 at 2330. A report to this one for their rock and/or rap music shows produces the elaborate QSL that we pictured in the October issue. Addr: Stoneham (Frodge, McCarthy)

Radio Airplane- 6954 at 0100. Pirate Captain Eddy still broadcasts from his Piper Cub aircraft. During a recent holiday extravaganza he was joined by Nemesis of Radio Doomsday and Pigpen Marley from 6YVOS. Addr: Wellsville. (Rick Doehner, Houston, TX; Rose, Frodge)

Radio 43- 6960 at 0100. This relatively new one blends weird music with old dramas about professors who search for extraterrestrial life. Addr: None, but accepts computer BBS reports via (417) 624-1809. (Frodge)

Radio Albatross- Future plans: 15675 at 2000. A new production by Radio Animal of **WKND,** Pirate Mike of **Radio Audibon,** and Capt'n Sly has announced that they bought time on Radio Copan in Honduras on all Tuesdays in February. Addr: Pittsburgh. (Direct from the station)

Radio Azteca- 6955 at 0200. Bram Stoker's DX parodies are among the funniest material that can be heard on the shortwave broadcasting bands. Many of his jokes and jabs are contributed by listeners at Bram's invitation. Addr: Wellsville. (Rose, Ruger, Frodge)

Radio DC- 7475 at 0015. Jose heard this one in CW Morse code with their slogan, "Don't vote Republican." If you watched the recent election returns, you found that the station's advocacy has recently been ineffective. Addr: None, but verifies logs in *The ACE*. (Jose Rivera, Arlington, VA)

Radio Doomsday- 6954 at 2300. Nemesis came back from the dead after his recent suicide on Halloween, and has resumed broadcasting since then with rock music and pirate commentary shows. Note to Larry Van Horn: they use a numbers station lady to give their address as "452-14895." Addr: Wellsville. (William Hassig, Mt. Prospect, IL; Ruger, Doehner)

Radio Garbanzo- 6955 at 0015. Fearless Fred has returned with his original comedy bits, the "Nuts hell, we're beans" slogan, and ads for Jeffrey Dahmer barbecue sauce. Norman picked up their 108th QSL. Addr: Wellsville. (Norman Driskell, Providence, RI)

Radio Halloween- 7415 at 1450. We probably won't hear this one again until October, but it reminds us to look for enhanced pirate broadcasting activity around major holidays. Addr: Wellsville. (Richard McCarthy, Madison, AL; Rose)

Radio Mirage- 7415 at 1515. This Europirate rocker is among those with a NAPRS relay arrangement. They recently broadcast their 10th anniversary program. Addr: Wuppertal. (Rose, Frodge)

Radio Titanic International- 7413 at 1515. Jesse heard this Europirate's special 19th anniversary broadcast via a North American relay. The 1400-1500 UTC range is a good time to check for pirates on Sunday mornings. Addr: Wuppertal (Frodge, Rose)

RFM- 7470 at 0215. H. V. (V as in Victor) Short inserts his low key wit into calm productions of rock music. Richard's QSL arrived only 17 days after he mailed a report. Addr: Wellsville. (McCarthy)

Solid Rock Radio- 7415 at 1600. Dr. Love has developed a following among DXers that is summarized by his slogan, "We're not just another station; we're totally involved in the (pirate) community." Addr: Wellsville. (Rose)

Southern Music Radio- 6958 at 0145. This New Zealand pirate is sometimes heard via a North American relay. Our information says that they were the first pirate to buy airtime on licensed station **Radio Copan** in Honduras. Addr: Wellsville. (Frodge)

Spam Radio- 6965 at 0215. King Spam has announced that he will now respond to reception reports with either his traditional obscene QSL sheet or a generic plain verie. Listeners should indicate their preference when they write in. Addr: Fairbault. (Frodge)

Starshine Radio- 7490 at 2330. This Swedish pirate programs different musical styles during broadcasts, with classic rock and disco being recent examples. They claim to be the most active Scandinavian pirate. For QSL's of their North American relays, they ask for $2 US return postage. Addr: Wuppertal. (Gigi Lytle, Lubbock, TX; Doehner, Frodge)

(unidentified)- 9011 at 0200. Robert asks for our help on this one. He heard nearly an hour of rock music by The Who on this very unusual frequency. Ideas, anyone? (Robert Thomas, Bridgeport, CT)

Up Against the Wall Radio- 6954 at 2330. Owsley's distinctive "oogah" horn interval signal kicks off an excursion to music of the late 60's and early 70's. Nick liked their ad for a portable hole. Addr: Wellsville. (Nick Terrence, Huntington, NY; Doehner, Ruger, Frodge)

Voice of the Dead- 7470 at 0030. Here's an unusual one that features rock, reggae, and classical music, all composed by dead artists. They feature a dead comic, with a slogan of "All dead people all the time." Addr: try Wellsville c/o WREC. (Williams, Hassig)

WKND- 7415 at 1745. Radio Animal has sometimes featured A. J. Michaels of **Action Radio** lately as an in-studio guest. Addr: Blue Ridge Summit. (Frodge)

WHAT'S NEW?

BOOK REVIEWS AND NEW PRODUCTS

by Larry Miller

Guest reviewers: Bob Grove, Haskell Moore

Uniden's New Scanners

Every time you turn around, Uniden comes up with more scanners to make even the most jaded of listeners drool. New on the market is the BearTracker BCT-7, an "800 MHz pre-programmed highway information system." With Highway Patrol Alert, Highway Patrol Scan, Local/County Police Scan, Dot/News/Fire Scan, and Weather Scan, this unit definitely belongs in your dashboard. The BCT-7 also features Citizens Band Monitor, and covers 800 MHz and aircraft. One hundred user programmable channels are just a finger-press away and there's even a one-touch band search to make things easy on the road. Everything from Citizens Band up to 956 MHz is covered (except military air) in this nifty unit.

Also hot off the benches is the Bearcat 9000XLT scanner, sporting 500 channels in twenty banks, and frequency coverage from 25 MHz to 1.3 GHz (less UHF TV and cellular freqs). This one has a VFO control, selectable attenuator, selectable modes (AM, WFM, NFM), selectable delay, TurboScan and Search, Frequency Transfer, Automatic Store, Aux Line Output, Data Skip Feature, and Programmable Search. Not enough for you? Take a look at the great LCD Dot Matrix display which looks easy to read and gives you all the info you need. I especially like the quick 100 channels per second scan rate, the rotary tuner and the Audio Frequency Sound Control to eliminate unwanted static noise. By the way, a CTCSS Tone Board is available as an option.

Are you impressed yet?

Next in the stable of new releases from Uniden is the BC3000XLT handheld scanner with 400 channels and continuous band coverage from 25 MHz to 1.3 GHz. Not only will you find Frequency Transfer, Automatic Store and Sorting, Twin Turbo Scan and Search, Weather Search, and Data Skip, but you'll also find a Selectable Attenuator, Selectable Modes (AM, WFM, NFM), and a Count Key. The 3000XLT scans at up to 100 channels per second and searches at up to 300 steps per second. It does all this on the strength of a rechargeable nickel-cadmium battery pack supplying five hours of dependable use.

Last, but not least, is the BC80XLT handheld, which covers a good slice of spectrum from 29 to 956 MHz. Fifty channels in five banks handle the load nicely and there are eleven bands, plus 800 MHz to keep you happy. The 80XLT features band search, five priority channels, manual channel access, memory backup, built-in scan delay, full frequency LCD, one-touch weather, low battery indicator, AC adapter/charger and a Bearcat frequency guide. For more information and pricing, ring up your local radio dealer.

Scanners: QuickTone CTCSS Kit

CTCSS encoders and decoders have been off limits to the hobbyist for some time. A couple of scanners have optional tone boards, but for the rest of us — go fish.

PL is a Motorola trademark for subaudible tone squelch, also known as CTCSS. The new QuickTone Subaudible Tone Encoder/Decoder Kit decodes any of the 39 standard CTCSS tones with quartz crystal accuracy and no tuning or drift. Jumpers allow easy frequency programming, and built-in digital audio filtering eliminates falsing and interference from normal speech.

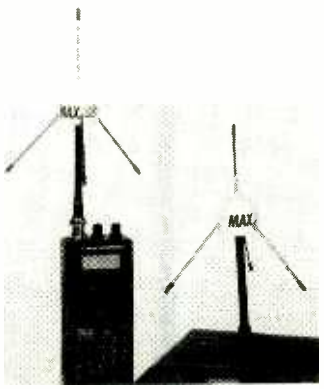
All parts are included and hook-up is through the audio path. The QT-1 uses the latest single-chip CMOS technology, runs on 5-15 volts at very low current and fits in a 2"x1"x1/2" package. It's easy to build and comes with full instructions.

To get yours call DX Radio Supply at 610-273-7823 or write to Box 360, Wagontown, PA 19376. The price is $39.95 plus $4.00 shipping. The optional case is $14.95.

Max Redesign

The folks at Cellular Security Group know how hot the 800 MHz band is and they have taken steps to make your listening enjoyment on the high end of the dial even better. The new improved MAX 800 Ground Plane Antenna has just been released. This new version of an old favorite, the classic MAX 800, has been "re-engineered for optimum performance on the new generation of hot scanners."

We saw Cellular Security Group President Tom Bernie at a ham show in Boxboro, Massachusetts, a few months back and he was pretty excited about the new antenna. He said users will



Cellular Security's improved Max 800 Ground Plane Antenna

be "pleased by the lighter weight and elimination of adapters this new model features...it's a spin-off of our successful commercial remote data antenna."

Two versions are currently available, both with standard BNC fittings. Handheld $31.95 and Base $35.95. Check with your favorite dealer for availability.

Record It!

Audio equipment specialists Viking International recently announced their new line of professional long play audio recorders. These aren't your dime store recorders by a long shot—these are heavy duty commercial machines with excellent audio fidelity.

The standard Viking recorder provides ten hours of recording time on a C120 audio cassette. Available are models with 10, 14 and 16 hours of recording time. All models have an optional built-in automatic voice activator with adjustable sensitivity.

Recording what goes on over the airwaves is vital for many listeners. Viking's products are professional quality at competitive prices. For more information, give the good folks at Viking International a call at 415-468-2066 or write 150 Executive Park Blvd., Suite 4600, San Francisco, CA 94134. Tell 'em *MT* sent you!

Spread Spectrum: A New Wave

The whisper in communications circles is growing and if you listen closely you can hear the words *spread spectrum*. This new technology is already in use by the military for their tactical radios and by some of the 900 MHz cordless telephones. Cellular networks and wireless Personal Communications Networks will all be using spread spectrum.

In fact, the technology is growing so quickly that new applications for it appear faster than we can keep track of them.

McGraw-Hill, Incorporated, recently announced a new book to help us understand this new form of communications. *The Spread Spectrum Communications Handbook* by Marvin K. Simon, Jim K. Omura, Robert A. Scholtz and Barry K. Levitt, is billed as the most authoritative reference. At twelve hundred pages, the tome covers theory, practical issues and even an in-depth look at multiple access communications and positioning systems applications.

The Spread Spectrum Communications Handbook is $99.50 from McGraw-Hill, Inc., 11 W 19 Street, New York, New York, 10114-0036.

Keeping Time

Every shack needs a clock—preferably a 12/24 hour clock. MFJ has the clock for you: the MFJ-114, featuring giant 2.3 inch red LED digits. The clock's display format is 12 hour local or 12 hour UTC and is user selectable. A nice touch is the adjustable base, which allows you to rotate it for best viewing. It can also be mounted on a wall or ceiling.

The clock measures 12-1/2 x 6-1/2 x 1-1/4 inches and uses 110 VAC power. There's even a battery backup in case of power failure at your listening station. The MFJ-114, with unconditional full one year guarantee, is $39.95 from MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762, or call them at 1-800-647-1800.

Electronics Pocket Reference

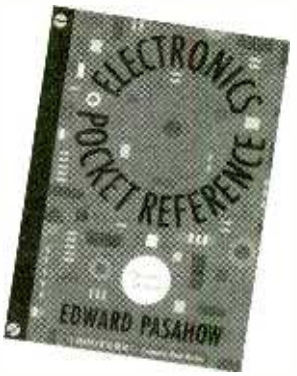
It's hard to believe that you can cram—legibly—over 500 pages of useful information into a 4 x 5-1/2 inch book, but that's exactly what McGraw-Hill has done in this new 1994 edition of the *Electronics Pocket Reference* by Edward Pasahow.

The reference manual is divided into 16 chapters, covering definitions and equations, circuit components, linear and digital circuits, power supplies, tests and measurements, schematics and symbols, mathematical tables and formulas, materials and even first aid.

The chapter on communications includes an excellent tutorial on time and frequency standard stations, both terrestrial and satellite; calculating Doppler effects; frequency allocations and TV channel assignments; lists of binary codes and data communications standards.

Information goes from the simplest tables to the most advanced Laplace transform equations. An extensive table of unit conversions is included, even a periodic chart of the elements.

For experimenters, teachers, technicians and engineers, as well as the home craftesman, this is an encyclopedic collection of valuable reference information.



$24.95 from McGraw-Hill, Inc., Blue Ridge Summit, PA 17294-0701.

—bg

Underground Signals

Don Schimmel has a long and prestigious career in radio monitoring. A former member of the intelligence community, Schimmel, who writes the utilities column for *Popular Communications*, has injected new life into the third edition of *The Underground Frequency Guide*.

The shortwave spectrum radiates mysterious signals of all manner, many of them covert and often illegal. Spy numbers stations, smugglers, pirate broadcasters, VIP diplomatic transmissions, federal government links and more are discussed in detail.

Schimmel includes loggings and message formats, explanations of some of the familiar—but odd—sounds encountered on the shortwave spectrum, and insights into interpreting many number and letter groups.

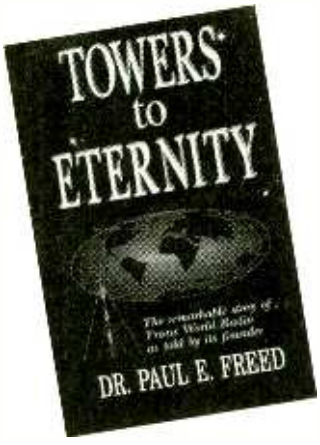
Well-written and thorough, Larry Miller says, "It's an excellent addition for any spook specialist." The 244-page, third edition of *Underground* is $14.95 plus shipping, and is available from Harry Helms' HighText Publications, PO Box 1489, Solana Beach, CA 92075, or from Grove Enterprises and other *MT* advertisers.

—bg & lm

Grove Repair Service

Can't find a service technician for your scanner or amateur radio? Try Grove's Technical and Repair Support Division. This new service offers repair for receivers, scanners, and amateur radio equipment by certified and licensed technicians. Equipment will be reconditioned to meet or exceed the manufacturer's specifications. They'll even perform modifications to restore deleted frequencies on some models.

All equipment serviced is warranted for ninety days and you can bank on a fast return. Got a problem with your radio? Ring up Grove at 704-837-7081 and explain it. It's even possible that the problem can be solved over the phone at no charge! A quality company—Grove does it all.



Radio Freebie

If you're an old-timer, you may remember Paul Freed's excellent history of TransWorld Radio called *Towers to Eternity*. *Towers* has just been updated and revised.

If you've ever thought of putting your own station on the air, you'll get some real inspiration here. Freed started out with a cheap 2,500 watt army surplus transmitter and located it in Tangier, Morocco. Today, TransWorld Radio is 6 million worldwide watts plus satellite. The story of how he got from army surplus to top of the heap is great reading. And it's not often we recommend a book — and then tell you it's free.

All you have to do to get your copy is ask for one. It's postpaid and free of charge — if you mention *Monitoring Times*. Send a card or letter to Rose Marie Jaszka, Trans World Radio, P.O. Box 8700, Carey, NC 27511. You may also reach Ms. Jaszka by phone at 919-460-7000.

Radio Design By Computer

Seems everyone is using their computers to design things, from needlepoint patterns to linear circuits. **The ARRL Radio Designer** allows you to "build, test and evaluate audio and radio circuits without warming up your soldering iron, running out of parts, or investing in a benchful of expensive test equipment."

You want examples? With this program you can model passive and small-signal linear circuits from audio to RF, predict and analyze performance of linear, small-signal active and passive DC, audio and RF circuitry from amplifiers, filters, matching networks, power splitter and combiners.

There's more, but we'd need a whole page to describe it all. The ARRL Radio Designer 1.0 runs on a 286, 486, or Pentium IBM PC or 100% compatible, 8 mb of RAM, Microsoft Windows 3.1 or higher, 3.5 inch floppy drive, hard disk with at least 5 megs free and mouse. The program retails for $150 (add $5 UPS) from ARRL, 25 Main Street, Newington, CT 06111, telephone 203-666-1541.

Getting Started in VHF

CQ's "Getting Started in VHF" is a bona-fide award winner. This video introduction to amateur radio repeaters and other aspects of VHF operating has been named a finalist in the New York Festival's video competition for 1994. Just recently, the video was awarded a Silver Hugo Award from the International Communication Film and Video Festival. You have to get your hands on this one!

"Getting Started in VHF" is for both new hams and old hands who are trying VHF for the first time. It takes the viewer from choosing and using VHF radios to repeater operating practices and packet radio basics, right through to satellite communications, moon bounce and amateur television. Truly a winner, "Getting Started in VHF" is available for $19.95 from *CQ* at 1-800-853-9797 or write CQ, 76 N. Broadway, Hicksville, NY 11801.

Project Kits From Probe

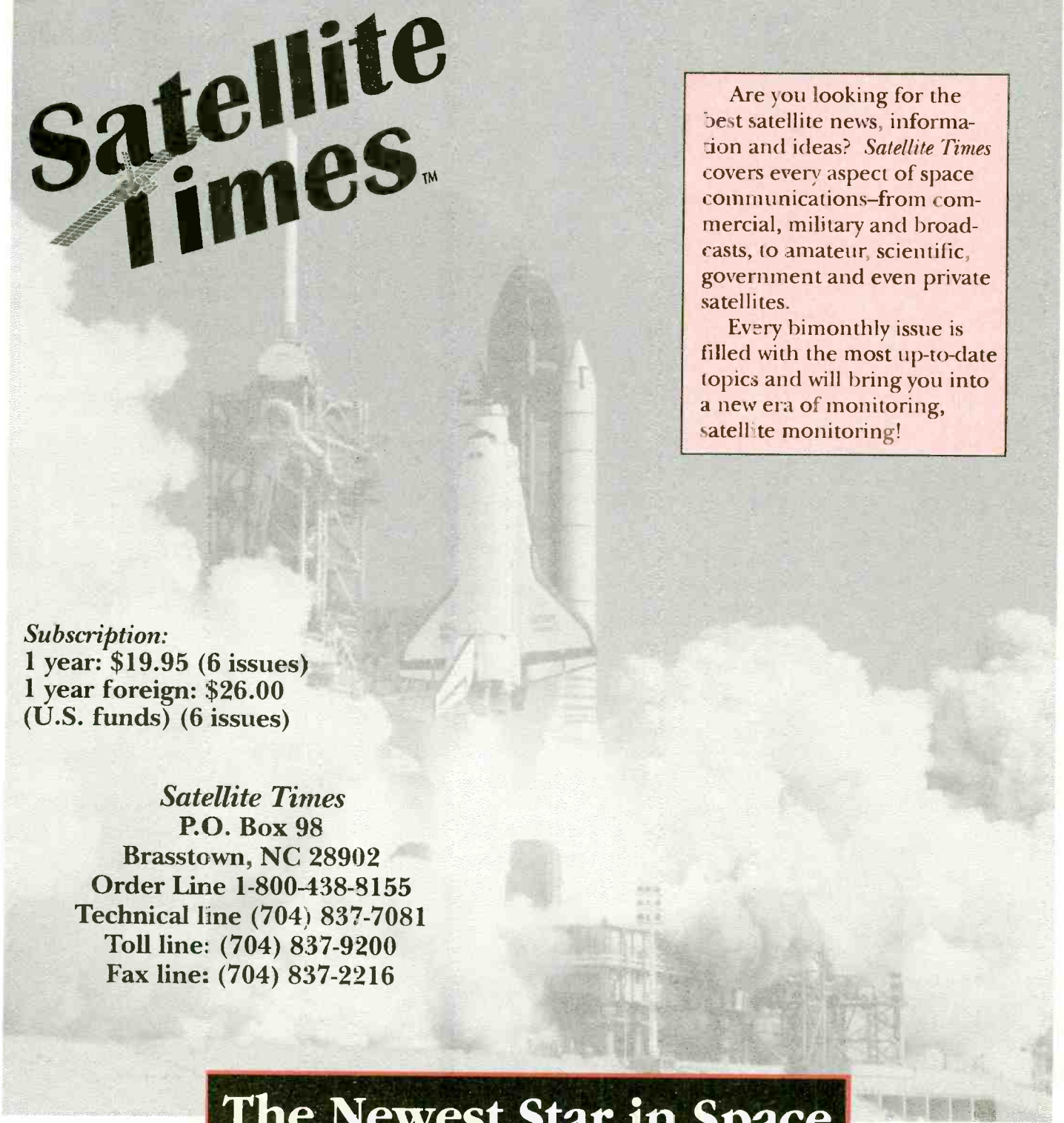
If you're a tinkerer, you'll love Probe Electronics' new brochure. The Cincinnati, Ohio, company has everything from SPDT microswitches to potentiometers to transformers, to fans to speakers, to signal strength meters to integrated circuits and linear IC's.

If you're into kits, Probe has a list that may interest you. How about their Electronic Timer kit for $6.95 or their Audio Oscillator for $6.95? Talk about a deal! $9.95 gets you their Audio Amplifier kit and for $12.95 you can build a Stereo Amplifier.

By the way, if you're looking for a low-pass, high-pass or hum notch filter, this is the place. They go for $6.95 each. For more information or to order, call 513-769-4070 or write Probe Electronics, 1300 Bonnell Avenue, Cincinnati, OH 45215.

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 300 S. Hwy 64 West, Brasstown, NC 289202.

A New Leader in Space Has Been Launched...



Are you looking for the best satellite news, information and ideas? *Satellite Times* covers every aspect of space communications–from commercial, military and broadcasts, to amateur, scientific, government and even private satellites.

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The Newest Star in Space

Evaluating the Optoelectronics Scout/400

About a year ago, when Optoelectronics Engineering Manager Bill Owen paid a visit to an aircraft carrier in harbor, he observed the ship's crew operating a myriad of radios. Like any ardent scanner buff, he began to imagine the opportunities. However, the major challenge was finding the frequencies being used without drawing attention to himself in the process. He felt it would be a bit unwise to pull out a frequency counter and start writing down frequencies on a Navy vessel. That sort of behavior has been known to get folks escorted away by men with guns. It was then and there that the idea for the Scout® was born.

In a nutshell, the Scout is a small, innocent-looking frequency counter (pictured next to a pager above) which has been specially designed to collect frequencies inconspicuously. Measuring just 3.7" high X 2.75" wide X 1.2" deep, the Scout isn't much larger than a pack of cigarettes and could easily pass for a high tech pager. And if you use the optional DB32 dual band antenna (which is just 1.75" tall), very few people will even notice it clipped onto your belt.

However, don't be deceived by its size; this is one very powerful tool! The Scout functions like a conventional frequency counter in that it measures the frequency of any transmission from 10 MHz to 2.8 GHz that is ten to fifteen dB greater than the ambient RF level. Measurement time is a fast 75 milliseconds with 1 kHz resolution. But in addition to its diminutive size and innocent appearance, its unique memory features are what really set it apart from a conventional counter.

When the Scout is armed to begin collecting frequencies, it can store up to four hundred in the built-in non-volatile memory. The Scout will also keep track of up to 250 hits per frequency.

Operation of the Scout is very straightforward. The three slide switches and one push button on the front each serve two or more functions. Nevertheless, the primary and secondary functions of each switch are clearly labeled and very easily understood.

The Scout features a large, clear display which can be seen easily in the sun, and a bright electroluminescent display light for night operation. It also has an aural beep to inform you when it has logged a hit, or will function in the "silent" mode with a pager style vibrator.

If by now you think you've heard it all, the Scout still has one more extraordinary trick up its sleeve. When connected via the ICOM CI-V interface to the ICOM R7000, R7100, or R9000 receiver, or a Realistic® PRO2005/6 scanner modified to allow computer control (such as with OptoScan456), it will automatically tune the scanner to the frequency the Scout most recently captured. Or, you may scroll back through previously captured frequencies to tune the scanner to those. Just think of the potential—instant lock-on to any strong transmitter in the vicinity!

The Scout® on Patrol

Well, it all looks pretty good on paper. But how will it perform under actual conditions? The following chart shows the results of my tests using several different transmitters. In each case, the receiving antenna specified was the one that provided the maximum range for the Scout. Performance will vary according to local RF conditions.

Transmitter Type	Output Power	Receiving Antenna	Range
Cellular Telephone	3 Watt	Seeker 800	198 Feet
Cellular Telephone	600 mW	Seeker 800	130 Feet
UHF Amateur Handheld	4 Watt	DB32	201 Feet
VHF Amateur Mobile	45 Watt	DB32	276 Feet
UHF Amateur Mobile	35 Watt	DB32	285 Feet
Citizen's Band Handheld	4 Watt	20" Collapsible Whip	103 Feet
Baby Monitor/ Cordless Phone	100 mW	20" Collapsible Whip	2 Inches

To test the Scout in a truly random environment, I attached it to the dashboard of my car with a strip of Velcro. Over the course of several days, it provided some very interesting data. Even though the built-in digital filter minimizes the number of false readings, under circumstances of high RF saturation (such as near high-powered paging transmitters and repeaters), quite a few may slip by. On the positive side, the Scout revealed numerous frequencies that I had not yet logged.

After using the Scout for just a short time, it became readily apparent that the logic of operation had been well thought out. For instance, when the backlight was activated, it would go off after ten seconds in order to conserve the battery. However, when a new frequency was captured or any switch setting was changed, the light would reactivate for another ten seconds. This feature was quite useful when using the Scout in the car at night.

The life of the built-in NiCad battery was more than sufficient for an average day's use, typically exceeding six hours. The battery can be recharged in two hours with the provided charger, or quick charged in less than an hour from a one amp, twelve volt source.

The Scout is manufactured by Opoelectronics, Inc., 305-771-2050 (5821 NE 14th Ave., Ft. Lauderdale, FL 33334). It is also available from Grove Enterprises (800-438-8155). The introductory price of $399.95 is expected to jump to a new list price of $449 in February. The Seeker 800 antenna, mentioned in the chart above, is available from Radioware (800-950-9273) for $37.99.

—Haskell Moore

MT Editor's Note: This review is based upon the most recent version of the Scout®, which we were later informed has been renamed model 400 (named for the number of frequencies it can record). The previous version, model 25, stored half as many frequencies. Besides the vastly increased memory capability, several other features, such as retention of non-volatile memory, power up beep, and display appear to be improved. An upgrade to the 400 from your model 25, however, will cost around $80 through the manufacturer.

—rb

Bob Parnass, AJ9S

• The Radio Shack PRO-62 Portable Scanner
• RadioMap™ Transmitter Locating Service

The new Radio Shack PRO-62 is a small portable scanner made by General Research Electronics (GRE) which lists for about $300. It is very similar to the PRO-43, introduced in 1992, but the PRO-62 lacks coverage of the 220 - 400 MHz ham radio and military air bands. While the PRO-43 has an upper frequency limit of 999.9875 MHz, the PRO-62 stops at 960 MHz and has slightly different band edges. The PRO-62 tunes:

30 - 54 MHz ..... (5 kHz steps)
118 - 136.9875 MHz ..... (25 kHz steps)
137 - 174 MHz ..... (5 kHz steps)
380 - 512 MHz ..... (12.5 kHz steps)
806 - 823.9875 MHz ..... (12.5 kHz steps)
849.0125 - 868.9875 MHz ..... (12.5 kHz steps)
894.0125 - 960.0 MHz ..... (12.5 kHz steps)

The PRO-62 has 200 channels divided into 10 banks. Individual lockout and 2 second rescan delay may be selected for each of the memory channels. Users may choose between AM and narrow band FM modes on any frequency. The PRO-62 has one pair of search limits and the step sizes are factory set. Frequencies cannot be locked out during a search as they can in the Uniden/Bearcat 220XLT.

As with most of the other Radio Shack models, the PRO-62 has 10 "monitor" memories which can be written manually during a search. The Hyperscan™ feature means the PRO-62 is specified to scan at 25 channels per second and search at 50 steps per second. When enabled, the priority channel is checked every 2 seconds. Any channel may be designated as the priority channel.

A user can reset the microprocessor or perform a full scale initialization, which clears all memories, by actuating a pushbutton accessible through a tiny hole in the side of the case.

■ *Physical*

The PRO-62 is just the right size for a portable scanner. It is slightly smaller than the Uniden/Bearcat 220XLT but larger than the tiny ICOM R1. The top panel contains volume and squelch knobs, a 1/8" earphone jack, and a BNC antenna connector.

The new sculptured plastic case recesses the keypad to avoid unintentional key depressions while wearing the scanner under a coat or in a pocket. Further keypad protection is afforded by the KEYLOCK slide switch, which disables all keys except MANUAL, SCAN, and LIGHT.

The road to a well-built scanner seems paved with broken belt clips. The PRO-62 and PRO-43 use the same plastic belt clip of dubious strength, fastened to the rear with two screws. I replaced my clip with a redrilled steel belt clip from a ham walkie talkie.

A semi-rigid rubberized antenna is furnished with the PRO-62 and is the same as the antenna on the PRO-43.

The liquid crystal display (LCD) looks to be the same as that used on the PRO-43. It is smaller than the 220XLT display but has sharper contrast. Pushing the LIGHT button illuminates a single, anemic lamp behind the display. It stays dimly lit for only as long as you keep the button pressed and is not latched or timed as in the brighter 220XLT.

Inside, the PRO-62's three printed circuit boards are populated mostly with surface mount components and construction closely resembles the PRO-43.

■ *Good RF Performance ...*

A PRO-62 with a serial number near 000460 was used for this review. The PRO-62 and older PRO-43 were programmed to the same frequencies and run side by side both using their stock rubberized antennas. They were equally sensitive to weak signals.

Just for fun, a new Uniden/Bearcat 220XLT portable was joined to the tests and proved to be a bit more sensitive in the 460 MHz range than the Radio Shack models.

Some railfans were disappointed with the PRO-43 performance in the 160 - 162 MHz range due to intermod. Is the PRO-62 any better? Yes.

In general, portable scanners are overloaded by strong signals when connected to an outdoor antenna. Connecting the PRO-43 to an outdoor Antenna Specialists AV-801 rendered most of the VHF railroad channels unusable due to interference from 158 - 159 MHz paging signals. The PRO-62 proved to be more resistant to the pagers.

The PRO-62's dynamic range, or ability to hear weak signals when there are strong signals present on other frequencies, is better than the 1,000 channel PRO-2035, discussed in January 1995 *Monitoring Times*.

Who wants to hear 135 MHz aircraft images in the 156 MHz police allocations, or 441 MHz ham repeater images in the 462 MHz business band? Owing to the use of up conversion, images aren't as big a problem in the PRO-62 as on other portable scanners like the Radio Shack PRO-37 and Uniden/Bearcat 220XLT.

■ *...but Mushy Audio*

If the PRO-62 has an Achilles Heel, it is mediocre audio output. Transmissions could not be understood using the PRO-62 in a busy restaurant. Like the PRO-43, the newer PRO-62 uses an LM-386 audio amplifier IC and although the radio is loud enough in a quiet room, it distorts when the volume control is advanced too far. This is partly due to the internal speaker.

Both the PRO-43 and PRO-63 audio lack high frequency response, producing sounds people describe as "muffled." Some PRO-43 owners improved high frequency audio response by removing or replacing C341, a tiny .015 microfarad capacitor in the audio circuitry. A similar change could prossibly help the PRO-62.

■ *Batteries—Your Choice*

Whether it's grabbing a handful of NiCd cells or stockpiling alkalines in preparation for tornado season, many scanner hobbyists like to pick and choose their own batteries. Those folks will appreciate the PRO-62's flexibility.

RadioMap™ Transmitter Locating Service:

A New Way to Find, Identify, and Visualize Licensed Transmitter Sites

If you are reading this column, you are probably someone who wonders when passing an antenna or radio tower: "What signals are transmitted from that antenna and on what frequencies? Can I receive them using my scanner or shortwave receiver?"

And so it was with me in 1985 when I moved to my current home. A small hut and guyed tower, sporting two parabolic dish antennas, sat atop a ridge about one mile from my back yard. There were no signs, and a barbed wire fence surrounding the 5 acre parcel prevented a closer look.

I have been collecting license information in my own electronic databases since 1983. Each year, I'd hope to identify the mystery tower. An FCC license database is useful, but transmitter site information is often vague or incorrect. Also, over 15% of the licenses in the FCC database specify a transmitter latitude and longitude but no city!

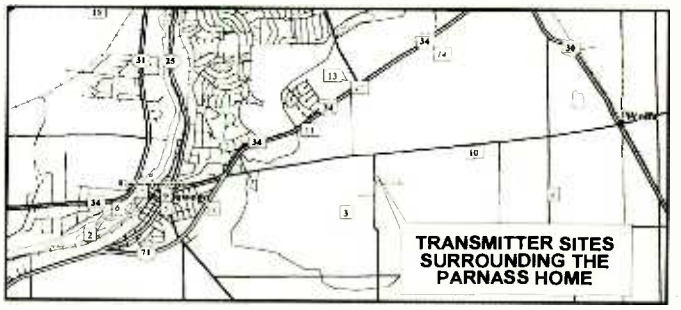
In July 1994, I was finally able to solve the tower enigma using a computer-based process I invented for the purpose of identifying transmitter sites in my neighborhood. My process used transmitter site databases and displayed the sites on a color map. I named the transmitter location process and the resulting report RadioMap™.

It turns out my mystery tower is part of a microwave relay system licensed to ANR Pipeline Company. The transmitter latitude and longitude information filed with the FCC was correct, but the transmitter was mistakenly listed in the wrong city, in an adjacent county!

While researching transmitter sites for friends in other areas, I designed an algorithm to help portray dense sites with scores of transmitters—such as in Chicago or Manhattan—neatly, without clutter. These transmitter sites are marked on high quality street maps. Although the sample RadioMap accompanying this article is printed in black and white, actual RadioMap reports are printed in color.

I've found RadioMap to be a great tool for tracking down sources of intermodulation interference which wreak havoc with local repeaters and home scanners.

There are no ham radio stations shown on a RadioMap report. Instead, there are police, fire, cellular phone cell sites, paging transmitters, state and local governments, businesses, factories, AM/FM and television stations, selected FAA transmitters, etc.—from VLF through microwave frequencies. Fixed station locations are marked on the map, and callsign, frequency, and licensee name are listed on separate key pages.



RadioMap Detail

I am making these custom RadioMap reports available to other radio enthusiasts. You choose the center location—anywhere in the United States. You can find and identify the FCC licensed transmitter sites and selected FAA transmitter sites in your neighborhood, near your office, around airports, sports stadiums, or anywhere else.

I will adjust the map coverage area for best readability. An area of four square miles or less works best in cities with a lot of transmitters. In rural areas, RadioMaps with a 25 square mile area or greater are often possible.

To get an 8-1/2" by 11" custom, color RadioMap transmitter location report, including key sheets, send:

1. Check for $19.95 payable to me, Bob Parnass, 2350 Douglas Road, Oswego, Illinois 60543-9794. Personal checks are subject to delay until your check clears.
2. The center location for your RadioMap transmitter location report, preferably latitude and longitude, down to the nearest one second, e.g., *41 41 15 North latitude, 88 18 33 West longitude*. If you don't know the latitude and longitude, please specify the city, and nearest street intersection, e.g., *intersection of Ogden Avenue and Mill Street in Naperville, Illinois*.
3. Your evening telephone number so I can call you if I have questions while researching the transmitters in your area.

RadioMap is a trademark of Bob Parnass.

The PRO-62 requires six AA batteries. A battery clip slides up into the bottom of the radio case and a separate trap door slides over it. Like most other Radio Shack portables, there are two jacks on the side—the same tiny size as in the PRO-43. An optional, AC operated "wall wart" power supply/charger can power the radio or recharge NiCd batteries.

PRO-62 current drain was measured at 88 milliamps while scanning and 90 - 140 milliamps at various settings of the volume control with the squelch open, about the same as measured for the PRO-43. Both models have a battery saving mode which takes effect only when the scanner is in Manual mode. Most parts of the scanner circuitry shut down but "awake" every second or so. The power savings are significant, and the only tradeoff is that the first small part of a transmission may be missed while the scanner is asleep.

Although it's not mentioned in the user manual, the PRO-43 battery saver feature can be temporarily disabled by pressing the DIRECT key. It takes more work on the PRO-62. First, open the squelch, then press either the up or down arrow key, then press MONITOR and close the squelch.

■ *Summary*

People who want a quality portable of conservative design and who don't need military aircraft frequency coverage should consider the PRO-62. It is a good, predictable performer and is somewhat more resistant to intermod problems than the PRO-43.

MAGNE TESTS

SHORTWAVE EQUIPMENT REVIEW

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

• Today's Best Receivers: The Bottom Line
• Forthcoming Receivers for 1995
• Improved Watkins-Johnson HF-1000 Due Out

The virtue of having monthly reviews of new equipment is that there's enough room for in-depth analysis. The downside is putting all this into perspective to answer that bottom-line question, "Which receiver to buy?" So let's stand back and see just which models of shortwave receivers are best to buy and why, and what the future holds.

To begin with, *MT* readers aren't your standard shortwave listeners. We indulge ourselves with first-class equipment for first-class results. Too, we tend to have a number of receivers, rather than the usual solitary portable.

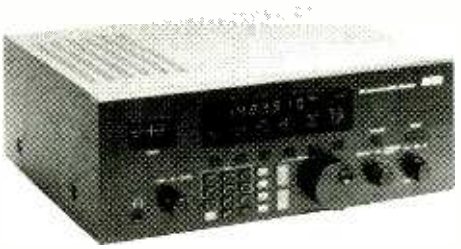
This means that our main receiver is almost always a tabletop or portatop model. As compared with portables, these allow for improved listening to world band stations—especially if you live in the central or western parts of the continent, or listen during the daytime. It also applies to residents of Alaska and Hawaii.

Tabletop and Portatop Models for Listening to Programs

For serious listening to world band programs, the best tabletop model is the Drake R8, which gets fully five stars in the 1995 *Passport to World Band Radio*. It is outstanding on nearly every front: bringing in difficult signals, producing pleasant-quality sound, and having both flexibility of operation and first-class service. It stands out not only for reception of world band, but also utility and AM (BCB) signals, as well. Of course, for proper reception of AM signals, virtually any tabletop model needs a Kiwa or other first-rate amplified loop antenna.

Where the R8 falls short is in user-friendliness, but most regular users get used to its *modus operandi* quickly enough. Too, it needs a good external speaker, such as one of the smaller Radio Shack offerings, and it doesn't receive FM broadcasts. Figure a round kilobuck, extra speaker included.

The Japan Radio NRD-535, when coupled to a fidelity-enhancing Sherwood phase-locked product detector, can also be a superb receiver for listening to programs. This is a tough combination to beat, but costs about twice as much as the R8, which needs no add-ons to produce first-class audio.



Magne's choice for both program listening and DXing is the Drake R8.

The best portatop for enjoying shortwave programs is the $800 (with keypad) Lowe HF-150. Like the R8, it has outstanding sound quality when it's connected to a suitable outboard speaker. Unlike the R8, it's reasonably intuitive to operate, although it could also be better in this regard.

While the HF-150 is just about as good as the R8 for listening to programs, because of its marginal front end it tends to pick up spurious signals if you use it where local AM stations come in strong. You can buy Lowe's excellent preselector to cure this, but it complicates operation and makes the radio as costly as the R8. Indeed, the HF-150 is now available in an optional rack-mounted configuration, complete with the radio, a preselector and an external antenna stacked atop each other.

Tabletop and Portatop Models for DXing

For DXing, the Drake R8 is once again our choice as best. Yet, various configurations of the more-costly Japan Radio NRD-535 are also outstanding, and the '535's ergonomics are better, especially for the sort of channel-hopping done by bandscanners. However, absent the Sherwood device, the '535's audio quality is inferior—not necessarily a significant drawback for DXing—and its passband tuning is not equal to that of the Drake.

There are no inexpensive tabletop or portatop models. Still, the AOR AR3030 tabletop model, which goes for about $800, is a nice radio, especially for single-sideband reception. So is Drake's SW8 portatop, at about $600. Both models have synchronous selectable sideband, but neither works as effectively as it could. The Yaesu FRG-100, which lacks synchronous selectable sideband, sells for that same price, and is almost as good.

Top Portables

The dedicated radio aficionado also needs a portable while away from the "shack." For pleasant listening to news and entertainment, the Grundig Yacht Boy 400—usually under $200—is an outstanding buy. So is Sony's similar ICF-SW7600G, which has the added benefit of synchronous selectable sideband, lacking on the Grundig. This makes the '7600G somewhat better than the Grundig for rejection of adjacent-channel interference, but the Grundig has the edge when it comes to audio quality. Both have digital frequency readout.

However, if you really want to go for top-notch performance in a portable, there's Sony's ICF-2010, usually under $400. It's a larger and more sophisticated version of the '7600G, and is the best portable on the market for DXing, and among the best for listening to programs. Its rural FM performance is good, too, but beware of overloading where FM signals are strong.

Traveling? If you go light, the '2010 can be a bit bulky, although I've traveled worldwide with mine with no problem. But the smaller Grundig Yacht Boy 400 and Sony ICF-SW7600G are plenty small enough for stuffing into carry-ons.

If you travel often and want something even more tiny and ultra-light—and lots of fun to use, too—a good choice is the Sony ICF-SW100S. It has a clamshell case, like a Lilliputian laptop computer, and is packed with all sorts of computer-like high-tech features, along with synchronous selectable sideband and other goodies. But its Tom Thumb speaker sounds tinny, and its sensitivity to weak signals with the built-in antenna is not all it could be.

At around $400, it's not exactly cheap, either.

If you don't want to risk a $200-400 radio while traveling, try either Sony's ICF-SW30, which performs pretty well, but lacks decent tuning facilities; or the Radio Shack DX-375, which is easier to tune, but doesn't perform quite so well as the Sony and doesn't appear to be as well constructed. Both sell for around $100, give or take.

■ Personal Picks

My personal picks? The Drake R8 for a tabletop, because it handles world band listening and DXing, as well as utility and AM reception, so brilliantly. Even radios costing far more don't cut the mustard like the R8.

For a portable, the Sony ICF-2010 is still the DX champ, and is pretty much equal to any other model for enjoying international programs. If you must have something smaller, the Grundig Yacht Boy 400 is, overall, the '2010's equal for program listening, but not for DXing. For that, the Sony ICF-SW7600G qualifies as runner-up.

As to the two portatops currently available—the Lowe HF-150 and Drake SW8—both are excellent for tabletop use, but are lacking as field portables. The HF-150 is too unhandy to carry about, and the SW8 lacks sensitivity to weak signals with its built-in antenna.

Speaking of antennas, there is no such thing as a tabletop model that isn't designed to work best off a good external antenna, preferably a passive-wire type designed for shortwave listening. On the other hand, be careful when connecting powerful antennas to portables, or your beloved receiver may be awash in overloading.

■ Coming Up for 1995

What's coming up? With luck, Sangean's long-awaited ATS-909 should be appearing around midyear. Looking ahead to the last half of 1995, you can expect to see such things as a new Grundig Satellit portable—the "900"—as well as an unusually sophisticated new tabletop model from Lowe.

The Grundig and the Lowe both promise to make use of advanced digital technology, with the Grundig using it mainly for advanced tuning. The Lowe, on the other hand, may make much use of digital technology for its radio operation, as well—somewhat as the Watkins-Johnson HF-1000 already does. However, it remains to be seen whether either will perform better than today's top models. And even when they finally do appear, there'll almost certainly be other new models waiting around the corner to tempt us.

■ Improved Watkins-Johnson HF-1000 Due Out

Watkins-Johnson tells us that they hope to have an improved version of the HF-1000 receiver on the market by around February. It will include a revised EPROM and newly designed circuit board, which the manufacturer hopes will address the various criticisms raised by owners and reviewers.

Those with existing receivers can expect to get the new EPROM for free. Too, a hardware fix for low-level RFI unearthed by listener George Zeller also will be made available, albeit possibly at nominal cost. A second source of low-level RFI that we found during our tests is scheduled to be ameliorated in the newly produced receivers, according to the manufacturer.

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.

PASSPORT® TO WORLD BAND RADIO'S Radio Database International White Paper® equipment reports contain virtually everything found during IBS' exhaustive tests of premium receivers and outdoor antennas. These are available in the U.S. from Grove Enterprises, Universal Radio, EEB and DX Radio Supply; in Canada from Sheldon Harvey (Radio Books), 79 rue Kipps Street, Greenfield Park PQ, J4V 3B1; in the United Kingdom from Lowe Electronics Limited, Chesterfield Road, Matlock, Derbyshire DE4 5LE, England; and in Japan from IBS Japan, 5-31-6 Tamanawa, Kamakura 247. For a complete list of available reports, please send a self-addressed stamped envelope to RDI White Papers, Box 300M, Penn's Park PA 18943 USA.

John Catalano, PhD

A New Dimension

Grove's FCC Database and Mapping Software, ver. 4.0

Software is a constantly changing and developing industry. The super high tech product of today quickly becomes tomorrow's dated product with trivial features. Just look at what a few years has done to game and simulation programs, for example. The latest version of Microsoft's flight simulator has almost no connection to its earlier versions. Well, so it is with radio related software, as we'll see in this latest product from Grove.

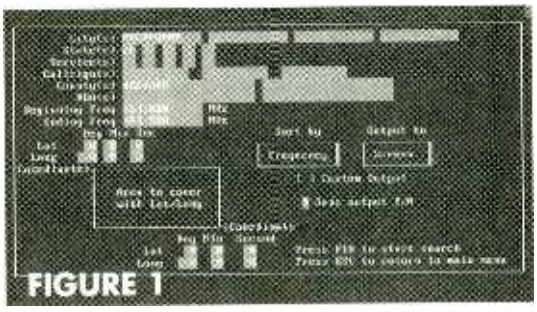


FIGURE 1

■ Mapping? What mapping? What for?

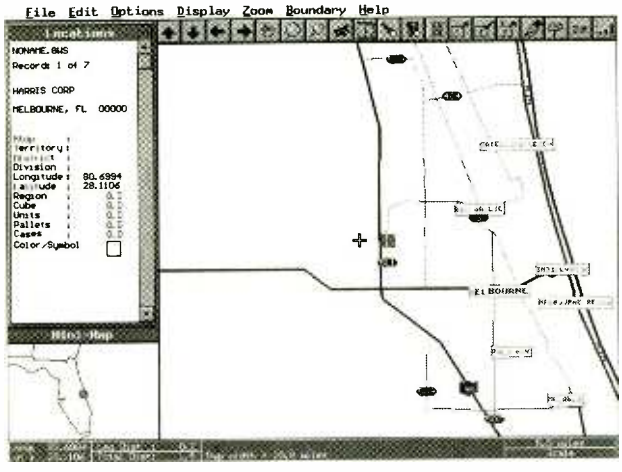
When I first spoke to Bill Grove about the concept of his "mapping" database, I must confess, I didn't see the point. Frequency databases are extremely useful manually, punching their frequencies into the scanner, or identifying unknown signals we hear. Many listeners "import" the frequencies from the database into their favorite radio control program, such as SCORPIO, ScanCat, or the like. This importing allows the control program to read the frequency file directly, without the user having to manually key them in. In either case, it is very clear that a list of FCC licensees, is a very useful accessory to any listening post. (Remember, government and military users are not FCC licensees.)

But what about this mapping thing?

In past columns we have looked at commercially available databases. In fact, one of them was Grove's last version of this product. So what makes this one so different? In a word—a lot, by giving you "eyes." Identifying a signal source by matching frequencies is just part of the story. We might hear a signal on our scanner at a given frequency—say 153.08 MHz—which we would like to identify. By running the Grove database version 4, a menu of seven choices are displayed on the main screen. The choice you will probably use most often is "Start New Search."

Selecting this brings up the screen in Figure One. Assuming we are monitoring in Melbourne, Florida, the pertinent information has been entered. Pressing the F10 key and waiting about 20 seconds brings up a screen which shows all licensees in Melbourne authorized to transmit on 153 to 153.5 MHz. Other information such as callsign, service type, owner's name, latitude, longitude, antenna height, power, and emission type are displayed. Each of these can be used as search parameters alone or in combination. Just about everything you'd want to know about the party you keep hearing on 153.08 MHz—which happens to be Harris Corp, according to the first record—is here.

FIGURE 2



■ Oh, THAT mapping!

Although more comprehensive than most databases, and very easy to use (neither of which is a small achievement), if the Grove database stopped here it would be at the head of the pack of such radio database products in my opinion. But Bill Grove has gone further, using some of the data we have retrieved to present a graphical analysis of the station antenna's exact location. *Oh yes!* I heard myself say, the first time I used it. *Now everything about this mapping falls into place.*

The concept is so basic: adding the dimension of exact physical map location to the identification of a signal. No longer do we have to be happy with only knowing to whom we are listening. We can now physically locate the signal source. This could be useful in aiming directional antennas or just realizing why you can hear certain signals due to natural or man-made obstructions. But it really goes further than that.

Using a mapping program Geo Whiz v2.03, which comes with the Grove Database and is accessed from the main menu, Figure Two results. From the screen area at the lower left labelled "Mini-Map," we can see the familiar shape of the Florida peninsula. The small box on the East Coast is the region which is magnified on the right side of the screen.

The shaded box (actually colored on the monitor), which sits above and to the left of the Melbourne label, below and to the left of the Eau Gallie label and just right of Interstate Route 95, is the location of the Harris Corp station antenna broadcasting on 153.03 MHz. By clicking on the large magnifying glass icon at the top of the screen we can get a pretty high resolution map of the area. In Figure Three we can now see that the antenna site is on route 511 between routes 95 and 509.

As we saw in Figure Two, city and town labels can be included on the map and are under the control of the user. There are many, many other features in this mapping program, such as distance measurements down to 0.1 of a mile! For example, this site is 0.3 miles east of route 95. By clicking on the box in the upper left of the screen, the location of the next record in the search you performed is displayed as the box jumps to its antenna location. If you remember, we searched for all

stations between 153 and 153.5 in Melbourne. This actually resulted in a list of seven stations, one of which was on 153.08 MHz.

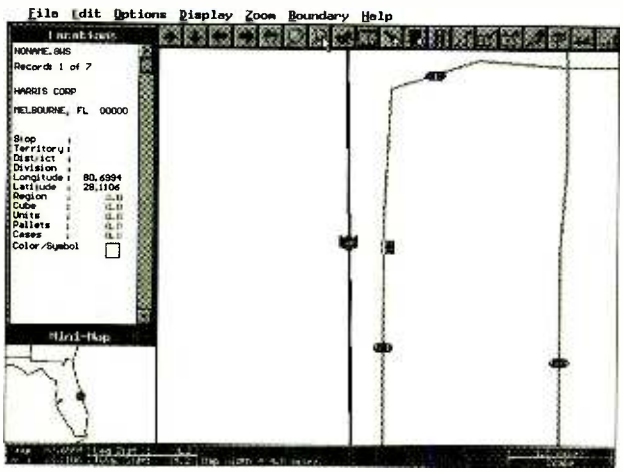
The map program is capable of showing interstate highways, rivers, state roads, city streets and secondary roads—a very high level of geographical detail for a program which is primarily a frequency database program!

■ *Putting it to the test*

I decided to "station surf" in a different way. Instead of searching the database just on local towns, in order to find unknown and/or unheard stations in my location, I searched on the entire county and any surrounding counties. For the search frequency range I selected everything from 30 MHz to 900 MHz, hit F10 to start the search and waited. If there was a station anywhere near me, I would know about it! *What power!* I thought as I waited nine minutes (on a single speed CD ROM drive) for the search. This was a pretty big search. As it turned out, the number of SELECTED records was over three thousand! Most searches I conducted were completed in well under 30 seconds, making the retrieval time quick, compared to other large database programs.

I then viewed the location of the 3404 stations which fit these search parameters on the map! As I clicked down the records I measured the distance from them to my location. Any within a distance of seven miles or less should be easily heard. Stations which were from seven to fifteen miles from my location, might still be possible catches due to the flat terrain. After that—good luck, you're in the twilight zone. I could just as easily have used another feature of the Grove database and searched on an area defined by longitudes and latitudes—a unique feature. If you want to be sure you're not missing anything this is the way to do it. It's time-consuming, but very thorough.

FIGURE 3



■ *Three thousand, four hundred and three ....*

Overall I liked the program and think it is a big improvement over the previous versions which I found very useful but a bit difficult to use. The version 4.0 database was very easy to use, and is based on a FoxPro engine. Installation from disk was menu driven and relatively quick. The menu screens are simple, yet very well presented. Search time is one of the shortest I've measured. The mapping program really gave me "eyes."

The only problem I encountered was with the mapping program going to the Gulf of Mexico every once in a while! This happens when a record does not have a longitude or latitude in the file. It especially catches you by surprise when it's the first record of a search and you are transported to a watery map location.

When searching for a specific city in a specific state, the program originally gave you all cities of that name in all states. Thus, what should have been a few-second search would blow up into minutes. This has now been fixed, along with a number of other minor irritations, via a patch program which is available on the Grove BBS at no charge.

A modification that I would really like to see is the inclusion of a user selectable field—for example, frequency—on the map record selection box in the upper left of the map screen. If this info were provided on the map screen, there would be less need for jumping back and forth between the database retrieval screen and the map.

Federal government allocations are done by IRAC, not the FCC, and have not been available to the public since the days of President Reagan. The lack of federal government stations leaves big holes of coverage in the 108 to 136 MHz range and the UHF military aircraft range. Also, amateur radio frequencies such as repeaters and propagation beacons, are not included. In the next version I believe that at least FAA aircraft/airport frequencies should be included, if a source can be found.

And of course, being very price conscience, $170 is quite of sum of money for any software product.

But as it stands, the Grove CD ROM FCC database represents a very unique and useful product in the hobby monitoring market. Add the mapping feature to all else and it positions it not just in the lead of its competitors, but in a league of its own. Although we have talked about the use of this program primarily in the VHF-UHF range, it should be noted that frequencies from the hundreds of kilohertz into the gigahertz range are resident in the database. This makes it useful for the medium wave, shortwave and VHF-UHF listeners as well. Both the database and the mapping sections have additional features and functions that we have not covered.

The Grove FCC Database Version 4.0 comes on CD-ROM, includes an easy-to-read, twenty-page instruction booklet on the database, and a fifty-page book on the mapping program, and is priced at $169.95 for the mapping version and $99.95 for the non-mapping version. Shipping is extra. It is available from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902; Tel (800) 438-8155. Check *MT* for their latest ad.

■ *In Closing*

If you saw that picture of yours truly in the December *MT*, help me get the guy with the wide angle lens who was on his knees in front of me when he shot my picture. Although I eat very well, the picture had my body as big as my swelled head. You nice people can stop sending me the Slimfast now. You know that old saying: Believe none of what you hear and only half of what you see.

Ed. Note: Database manager Bill Grove reports that while the new CD-ROM is being well received, some locales have reported missing listings. Grove is presently correcting the problem and will send out replacement disks at no charge when the supplement becomes available. If your new Grove FCC Database has missing licensees, call Grove Enterprises at 800-438-8155 for a free future supplement.

Doug Demaw, W1FB

How to Use DC Voltage Regulators

Solid state voltage regulators are inexpensive. They are available in many sizes and shapes for a wide variety of applications. Experimenters and radio amateurs are often confused about how to use voltage regulators safely and correctly. This is because little has been published about the hands-on use of these popular ICs. Furthermore, there is frequent indecision about which terminal is which among the various voltage regulator package styles (TO-92, TO-204, TO-3 and TO-220). This article provides the basic knowledge required for putting regulators to work in your electronics projects.

■ *Why Use Regulators?*

Most solid-state equipment is designed for a fairly narrow range of dc operating voltage. Excessive supply voltage can destroy transistors and ICs quickly. Too low a supply voltage can render the circuit inoperative or cause faulty performance. Therefore, it is desirable to use a power supply that delivers a fixed value of voltage that conforms to the manufacturer's specifications.

Voltage regulators are important in ac-operated power supplies as well as in dc power supplies. For example, some radio equipment is designed for +6- or +9-volt operation. Mobile operation with this type of gear requires reducing the car's ignition voltage from 13.6 to 6 or 9 volts. A simple voltage regulator makes this possible at low cost. Furthermore, voltage regulators function as electronic filters to ensure a nearly pure dc output that would otherwise require many thousands of microfarads of capacitance to achieve. Regulators are available for positive or negative voltage control, depending upon the builder's needs.

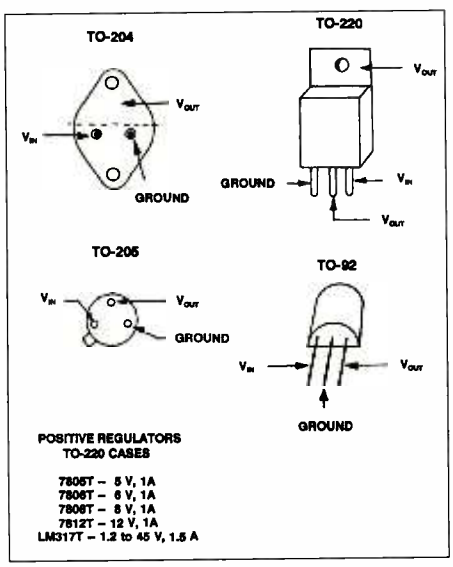


FIGURE 1: *Terminal connections and case styles for voltage common regulators.*

■ *Fixed-Voltage Regulators*

Voltage regulators are available for fixed-value or variable dc output. The smaller ones (in TO-92 plastic cases) can handle up to 100 mA of current, whereas the larger ones (in TO-220 or TO-204 cases) may be rated at 1.5 amperes. Figure 1 shows the pinout (lead identification) for the various case styles. Please note that the metal cases or metal tabs are common to certain inner elements of these ICs. Keep this in mind when you mount your regulator on a metal chassis or heat sink: Prevent causing destructive short circuits! Some regulators must be separated from ground by means of mica insulators and nylon shoulder washers.

Figure 2A shows a basic fixed-voltage regulator that will deliver +5, +6, +8 or +12 volts, depending upon the regulator IC used at U1. These are standard output voltages for non-adjustable regulators. The dc input voltage to U1 must always exceed the output voltage in order to obtain the desired regulation. As a rule of thumb, the input voltage should be at least 1.33 the output voltage. Thus, you should use at least 16 dc input volts for a 12-volt regulator, and so on.

Beware of excessive input voltage because it can ruin the IC or cause destructive power dissipation and heating. The greater the input voltage the larger the heat-sink area required to keep the IC from overheating and shutting itself down. Voltage regulators have built-in shut-down circuits that protect them from excessive heat and current.

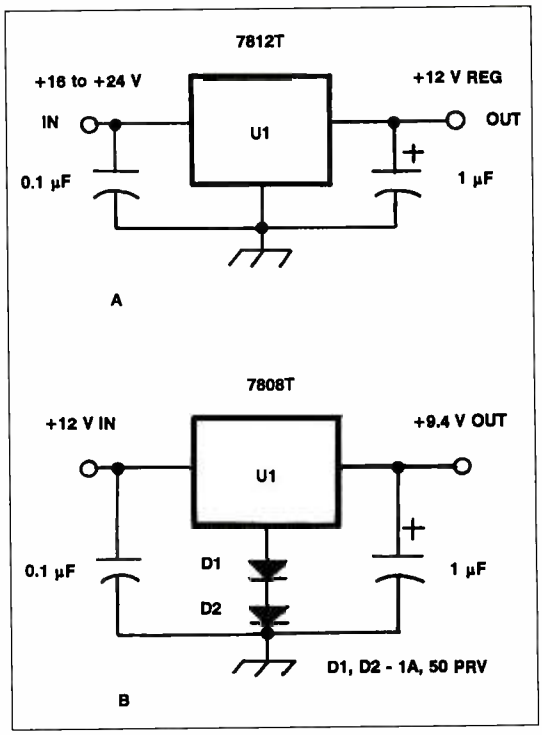


FIGURE 2: *Shown at A is the circuit for a basic fixed-voltage regulator. U1 is selected for the desired output voltage and current. Drawing B shows how to use diodes to increase the IC output voltage.*

Figure 2B illustrates a method for increasing the output voltage from a fixed-voltage regulator. One or more silicon rectifier diodes are inserted between the IC ground lead and circuit ground. The barrier voltage for a silicon diode is 0.7, so one diode would raise the output voltage by that amount. Two diodes would increase the output by 1.4 volts. In this manner we can, for example, cause an 8-volt regulator to provide 9.4 volts at its output port.

■ *Variable-Voltage Regulator*

Various regulator ICs are available for use in variable-voltage dc power supplies. This type of supply is especially handy in the experimenter's workshop. A practical power supply might have an adjustment range of 1.2 to 45 volts at 1.5 ampere. However, most experimenters prefer a voltage range of 1.2 to 24 or 28. An LM317T regulator makes this

possible. A practical circuit is presented in Figure 3.

It is important to understand that the lower the power supply output voltage the lower the available current from the IC. This is because the regulator must dissipate greater power within itself, owing to the higher input-output voltage ratio. Therefore, a 1.5-ampere regulator will not deliver its maximum current as the output voltage is lowered. For example, the available current is roughly 600 mA at 3 volts output, 1 A at 9 volts output and 1.2 A at 12 volts output when using an LM317T.

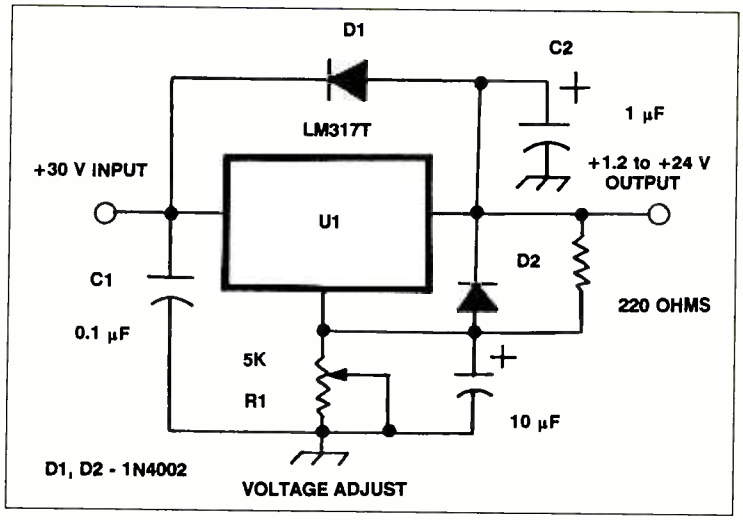


FIGURE 3: *Circuit for a standard variable-voltage regulator that provides +1.2 to +24 volts at up to 1.5 A. The unregulated dc input voltage is +30. Lower values of input voltage may be used if less than 24 volts of output is desired. Fixed-value resistors and a multiposition switch can be used in place of R1 to obtain preset output voltages (see text). Optional diodes D1 and D2, along with the 10-µF capacitor, are optional. The diodes protect U1 against voltage spikes (see text).*

R1 in Figure 3 should be rated at no less than 1/4 watt, and preferably at 1/2 watt or greater in order to ensure R1 longevity. This potentiometer may be replaced by a single-pole multiposition wafer switch and fixed-value resistors of the appropriate ohmage for obtaining specific output voltages, such as 1.5, 5, 6, 9 and 12. A potentiometer would be used first to determine how much resistance is required for each voltage level, as indicated by an ohmmeter.

■ Regulator Protection

Two rectifier diodes and a 10-µF capacitor may be added to a typical three-terminal voltage regulator to protect it from potentially damaging voltage spikes that can occur when high values of capacitance are used before and/or after the regulator. D1 and D2 in Figure 3 (optional) will prevent damage to the IC when installed as shown. Since the diodes are inexpensive and readily available it is wise to include them when you build your regulator circuit.

Capacitors C1 and C2 in Figure 3 prevent the regulator IC from self-oscillating at low frequencies. Oscillation prevents proper operation of the IC and can transmit unwanted spurious energy into the equipment that is powered by the regulator.

■ Heat Sinks

Although a heat sink (large metal surface that draws heat away from the IC) may not be necessary at low values of current flow, it is prudent to include one. The greater the current taken from the regulator, the more intense the internal heating and the larger the required heat-sink area or mass. Silicone heat-sink grease (thin layer) should be used between the IC body or metal tab and the heat sink in order to ensure maximum heat transfer. The surface of the heat sink should be smooth where it contacts the IC.

■ Closing Remarks

Voltage regulators, diodes and the other components for voltage regulator circuits are widely available at modest cost from the vendors of surplus electronics parts. Most surplus fixed-voltage, 1-A regulators sell for $1 or less. The voltage-variable, 1.5-A regulators are in the $3.50 price class.

Any regulated or unregulated dc power supply can be used to supply voltage to the regulators discussed here. The requirement is only that the power supply have higher output voltage than will be delivered by the regulator. A regulator is recommended when you use a dc-output wall transformer.

EXPERIMENTER'S WORKSHOP

TWEAK, TUNE, AND MODIFY!

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Extended Memory for the PRO-2035

Last month, I said **Extended Memory** might be feasible for the PRO-2035, thanks to the continued use of static RAM. The stock SRAM was an unfamiliar chip, which I said appeared to be a 32k x 8 SRAM. Surprise! IC-502 is a conventional static RAM, 8k x 8 (64-k). Consider then, if 8k x 8 yields 1,000 channels, a drop-in 32k x 8 replacement will yield 4,000 channels.

Now don't get me wrong, the PRO-2035's factory-stock 1,000 channels are ample for many needs. The thing that's *not ample* is the organization of 1,000 channels into ten banks of 100-channels each. Banks are not subdivided, so we're limited to ten easily memorized configurations of related frequency groups. While most channel configurations that are arranged logically by subject matter will not exceed 100-channels, some will. This reduces the available logical banks to nine or fewer, depending on how you like to organize. If you consider the following a typical organization, 1,000 channels in ten banks may not be quite so luxurious:

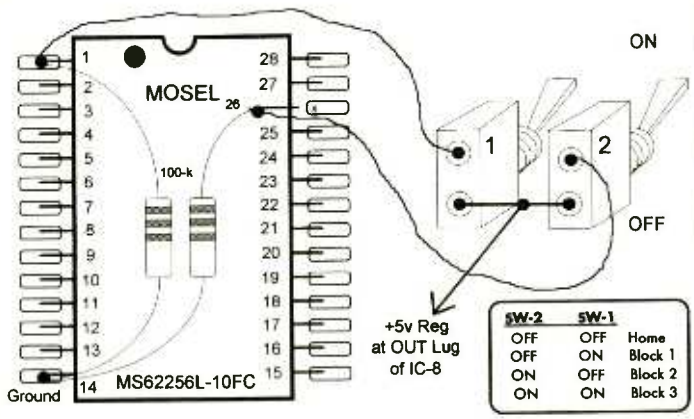
Emergencies/Disasters
City Police/Law Enforcement
County Police/Law Enforcement
State Police/Law Enforcement
Medical/Health
Civilian aeronautical
Military aeronautical
News Media
Public Works & Utilities
County government agencies
State government agencies
Federal government agencies

We've already exceeded the ten bank allocation without considering that military aero and federal government frequencies can easily exceed 100-channels. Now what about logical arrangements for railroads, private detectives, satellites, ground military, additional government services, marine, forest, petroleum, business and other interesting radio services? There's no way to program the PRO-2035 with a wide diversity of interests and still have a logical, effective organization of the programming.

Due to the bank limitations of the scanner, you are forced to allocate two or more specific services to each bank, or allow services to overflow from one bank to the next, or both. You'll have to accept a serious compromise in your organization. We scannists seek to eliminate compromises: We want it all! Sure, 4,000 channels may go beyond our immediate needs, but acquiring 40 scan banks as a byproduct of extended memory will not be such an exhorbitant luxury!

The PRO-2035 is the latest of a class of scanners that use static RAM for programmable storage. Others that have already been covered here in the back issues of *Monitoring Times* (June 1993), *World Scanner Report*, and/or in my *Scanner Modification Handbooks* include: PRO-2004/5/6, PRO-2032/2022/2021, PRO-32/34/37/39, BC-760XLT, BC-560XLT (and there may be more)—all of which can benefit from Extended Memory modifications. This article focuses on the PRO-2035, but the method is similar for all receivers that use static RAM. Refer to the aforementioned publications for your particular scanner or absorb the principles given this month for the PRO-2035 and apply them to your machine.

4,000 Channel Extended Memory for the PRO-2035



QUICK START

1. Remove IC-502; clean pads; install 32k x 8 SRAM as shown, pin for pin except that Pin 26 must not be soldered to pad.
2. Install two 100-k resistors as shown.
3. Install two SPST toggle switches where desired.
4. Wire switches as shown
5. Consult text when in doubt

■ *Extended Memory for the PRO-2035*

Preliminary Notes: These instructions are expressly for the 4,000-channel, 40-bank, 4-Block Extended Memory using a 32k x 8 SRAM because of the incredible ease and low cost of this modification. A procedure for 16,000-channels; 160-banks, and 16 Blocks using a 128k x 8 SRAM is similar, but differs enough in both complexity and cost that I'll reserve it for a future column if there is interest.

For those not familiar with Extended Memory mods, the June'93 issue of *MT* offers some background. The instructions below are more than adequate for all but those hobbyists who don't know a soldering iron from a welding torch—in which case, discretion could be the better part of valor.

Costs of this modification will include about $15 for the SRAM chip; $5 for the switches and 25-cents for the resistors: call it $25 for the whole enchilada.

1. Procure a low-power 32k x 8 SRAM. Speed is not important, 150-ns or faster will do. Low power (LP) rating is important. The replacement SRAM should be the surface mount (SMT) style. The **Mosel MS62256L-10FC** is ideal for this project, but any pin-for-pin equivalent from 'most any manufacturer will do. The Mosel part number can be cross-referenced by your supplier if they don't stock that brand. Try **Future-Active Electronics**, (800) 343-0874, if you don't have a favored supplier. If all your resources fail, contact me by e-mail, network, or US mail, and I may be able to direct you to a source.

You'll also need two SPST toggle switches (Radio Shack 275-624) and two small 100-k resistors, (Radio Shack 271-1347).

2. Refer to the instructions given last month for disassembly of the Logic/CPU Board. Disassemble the Logic/CPU Board so that you can fully access IC-502, the resident SRAM.
3. Locate and remove IC-502. If you're handy with desoldering techniques, you can try to remove this chip without destroying it. Otherwise, the best bet is to first snip each pin close to the body of the chip and remove it before ever heating the pads. Then carefully desolder the cut pins from the pads. Clean the pads so they are smooth and shiny, using your soldering pencil and desoldering wick.

   NOTE: *The hardest part of this job is removing the stock SRAM chip, and that wouldn't be so troublesome except that it's vital to preserve the integrity of the solder pads. This is not difficult; just slow down and take your time. Liberal use of desoldering wick before exerting force on the pads will go a long way to simplifying the job. Clip the pins away from the body of the chip before applying heat to the pads to reduce chances of damage to the pads. This destroys the stock SRAM chip, but so what? You're not going to have a use for it anyway. Pick your poison and then relax; the job's a piece of cake hereafter.*

4. Identify Pin 26 of the new SRAM chip and carefully bend or work it up so that it is above the plane of the remaining 27 pins. Pin 26 ***will not be soldered*** to the Logic/CPU board, and must not touch the corresponding pad beneath it. Let it "float" even with or slightly above the body of the chip, but no higher. You don't want to break that pin!
5. Place the new chip on the pads in exactly the same orientation as the old one. Position it so that all 27 pins are matched square on their pads, and lightly tack-solder Pin 1 to its pad.
   NOTE: there is no board trace going to Pin 1; just an empty pad. That's great!
6. Adjust the chip, if necessary, so that the remaining 26 pins are matched square on their pads and lightly tack-solder Pin 15 to its pad. Now the chip should be immovable on the board. If the remaining 25 pins are still perfectly matched to their pads, then solder them one at a time, making sure each is clean and perfect before doing the next one. When you're done, Pin 26 should be well above its pad, not touching anything.
7. Carefully solder a 100-kΩ (1/8 or 1/4 watt) resistor to Pin 1. Solder another 100-kΩ (1/8 or 1/4 watt) resistor to the free floating Pin 26. Solder the free ends of the two resistors to ground at Pin 14 of IC-502. (See the drawing)
8. Solder two flexible, insulated hookup wires, about 12" long, one each to Pin 1 and Pin 26 of IC-502. Position them flat against the PC board and secure with a dab of hot glue, melted wax, or perhaps a bit of tape.
9. Reassemble the Logic/CPU Board into the front panel in reverse order by which it was removed. Reinstall the front panel to the scanner. Route the two hookup wires installed in Step 8 to wherever you'd like to mount the two Block Switch switches—probably the rear panel if you're using conventional switches; maybe inside the front panel, if you found a way to install micro-mini toggles there.
10. Install the two switches at a location of choice. Solder a jumper wire between matching ends of one end of the two switches. Leave the other matching ends free.
11. Solder a hookup wire from the jumpered ends of the two switches to the OUT lug of IC-8, located in the front-left corner of the main receiver board (regulated +5v).
12. Solder the wire from IC-502, Pin 1 to the free lug on one of the switches. Solder the wire from IC-502, Pin 26 to the free lug on the remaining switch.
13. This completes the work; it's incredibly easy, especially considering the value received by quadrupling the programmable memory! Clean up any mess to where you can safely test the scanner. Check all your work under a magnifying glass and strong light. Watch for solder-blobs and bad-looking solder joints. The work should ***look good***!

■ *Testing & Operation*

Both Block Switches should be in the OFF position (+5v **not** applied to either Pin 1 or Pin 26 of the SRAM.) This will be the Home Block, (Block 0) or the first 1,000 channels. Test the scanner for all functions and programmability. Program 1000.000 into Ch-1. Troubleshoot, diagnose, and fix any discrepancies before moving on. Problems, if any, will typically be solder blobs or bad solder joints on the pins of the SRAM.

When all is well, turn ON Block Switch #1; turn the scanner OFF and then back ON. Whatever was in Ch-1 should disappear and be replaced by 0's. Program 1001.000 into Ch-1. Turn OFF Block Switch #1 and Block Switch #2 ON. Turn the scanner OFF and then back ON. Whatever was in Ch-1 should disappear and be replaced by 0's. Program 1002.000 into Ch-1. Turn both Block Switches ON. Turn the scanner OFF and then back ON. Whatever was in Ch-1 should disappear and be replaced by 0's. Program 1003.000 into Ch-1.

Now turn both Block Switches OFF; press MANUAL : 1 : MANUAL, and 1000.000 should return to the display. You can now test each of the switch positions, one at a time, to ensure that whatever was programmed into Ch-1 is retained. If so, all is well. You can now prepare a much better organization for your Monitoring Plan.

Operation is simple: the two Block Switches offer four combinations (count 'em), of 1,000 channels/10 banks each, which is like having four PRO-2035's, except that only one at a time can be in use. Still, that gives you 4,000 channels and 40-banks for under $25. Beat that if you can!

OK, now let me have your suggestions and needs for future projects. If you have any neat circuits or modifications for the more popular radios, by all means shoot 'em to me and I'll get your name recorded into history. You can be anonymous, if you want. We aim to please. Now you aim, too, please.

W. Clem Small, KR6A, CET

How to Evaluate Antenna Feedlines

As a rule we all want to maximize our antenna system's ability to support weak-signal reception. After all, even a poor antenna system will usually let you hear strong signals well. Those really-rare DX signals from "far-away places with strange-sounding names" generally yield themselves up only to a radio monitor with a good antenna system. However, any antenna system with a poor-quality feedline is a poor quality system, so this month let's take a look at factors that determine what makes a good feedline.

■ Types of Feedlines

Open-wire feedline (fig. 1A) introduces the lowest signal-loss of any commonly available feedline. This type of line is not too popular, however, due to the fact that it is affected by weather and weathering, and the relative difficulty of installing it. It should not be run near metal objects and can never be coiled or run underground as can coax.

Open-wire feedline is also subject to much more signal pickup on the feedline than is coaxial cable. Therefore, if the feedline passes through an area of high electrical-noise on the way from antenna to receiver, this noise may be picked up and superimposed on any signal passing down the line, causing interference to reception. Coaxial lines are relatively immune to electrical-noise pickup.

Twinlead feedline (fig. 1B) is the next lowest in signal loss of the commonly available feedlines. It has the same problems as open-wire line, in that it can pick-up noise, is affected by weather, should not be run near metal, and should not be coiled or routed underground. Twinlead can be purchased in the 300-ohm TV size, or as "ladder line" in 450-ohm size for transmitting use.

Coaxial cable feedline (fig. 1C) is the most versatile of feedlines; it can be coiled, routed through metal or underground, weathers well, and is not affected by ambient weather conditions. Different types of coax differ, however, both in terms of impedance value (50 ohm and 75 ohm being the most common) and the level of loss which they introduce into a signal. Standard-grade coax with solid-polyethylene dielectric (inner insulation) has considerably more signal loss than the foamed-polyethylene dielectric type.

Hardline is very similar in general appearance to ordinary coaxial cable but is relatively rigid. It has a much lower level of signal loss than ordinary coax and is therefore much more useful into UHF and microwave frequencies. Common impedance values for hardline are 50 ohm and 75 ohm.

■ Feedline Loss

Feedline loss varies not only with type of feedline but also with the frequency of the signals you are trying to receive. Typical feedline loss-per-100-ft values for ordinary, polyethylene-dielectric coax would be .33 dB at 1 MHz, 1.2 dB at 10 MHz, and 4 dB at 100 MHz. Foam-dielectric cable typically has about half that loss level, while hardline has perhaps a tenth that of the ordinary coax. Twinlead is lower in loss than hardline below 90 MHz with open-wire line significantly lower than both at all frequencies.

At HF and lower, using moderate quality coax, we can use lengths of up to 100 ft or so and not introduce unreasonable losses; at MF and lower the losses are even less. Using the same length and the same type coax at VHF and higher frequencies we will find that the losses become quite noticeable and probably unacceptably high. At VHF and UHF for lengths over perhaps 25 feet we start thinking about foam cable, and at the higher UHF frequencies we may want to use hardline even for such a short run. With open-wire line we can often utilize runs of a few hundred feet at HF without introducing unacceptable levels of signal loss.

Keep in mind that tolerable levels of line-caused loss are determined not only by our receiver's signal level requirements but also by the desired signal's initial received strength as it leaves the antenna and enters the feedline.

■ What About Feedline Impedance?

For short feedline-length, receive-only applications at HF or lower frequencies we usually have no need to be concerned with the impedance value of the coaxial cable which we use. Where long spans are involved, it is more reasonable to be concerned about matching the antenna to the feedline and the feedline to the receiver in order to obtain maximum signal transfer and compensate somewhat for the feedline loss.

When there is a gross mismatch, such as when we connect 300-ohm circuit to a circuit with 50-ohms of impedance, signal loss due to mismatch may be significant enough to justify the use of matching transformers, baluns, or a transmatch. When we go to the VHF frequencies or higher, where received noise is usually not the limiting factor in weak-signal detection, matching the antenna, feedline, and receiver becomes much more important.

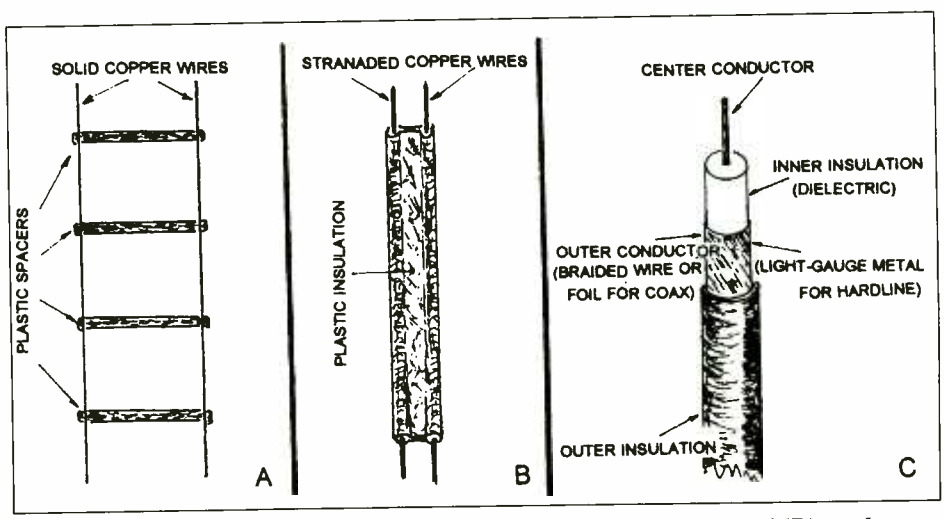


FIGURE 1: *Common types of feedlines: open-wire line (A), twinlead (B), and coaxial cable (C).*

RADIO RIDDLES

Last Month:

When discussing small vs. large antennas, the concepts of antenna "aperture" or "capture area" often come up. What do these terms mean and what, if anything, is captured by a capture area?

Well, there are various kinds of antenna apertures which we can consider; the one we refer to here is a basic measure of an antenna's ability to "capture" or extract energy from a passing radio wave. An antenna with greater gain functions as if it had a larger area extracting energy from the wavefront, and an antenna with less gain functions as if it had a smaller area extracting that energy. This is true even if the low-gain and high-gain antennas are identical in size and shape.

Aperture or capture "area," then, is not something which you can outline by drawing a geometrical shape, so much as it is the antenna's tendency to respond *as if it had* sufficient area to capture the amount of incoming wave energy that it does indeed capture.

This Month:

In the Radio Society of Great Britain's *Radio Communication Handbook*, 4th edition, one may find the statement: "There are two basic types of aerials ... the Hertzian ...and the Marconi... ." Now I ask you: "Are most antennas really just variations on these two types?" and "What are Hertz and Marconi antennas anyhow?"

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.

Choosing a Feedline

When you are choosing a feedline be sure to consider whether the feedline that you are planning to use is likely to have excessive loss *at the frequency of operation and length of feedline that you will utilize*. As a rule of thumb a loss of 1 dB is essentially unnoticeable in reception; 3-dB is half an S-unit and noticeable; 6 dB is a full S-unit and very noticeable.

And lastly, although feedline loss can be a serious problem for some installations, it is important to realize that it isn't necessary or even advisable to use the best cable available when your application is a non-demanding installation (i.e., short feedline runs and lower frequencies utilized). It is good to also keep in mind that, for really demanding installations (i.e., long runs, higher frequencies), there are sometimes acceptable alternatives to the lowest-loss coaxial lines or hardline (i.e., open-wire line or twinlead).

December Omission

Oops! In December, the figure caption for Fig. 1 accidentally covered the values of the resistors and capacitors used in the antenna routing system. They were : R = 4.7K 1/2 watt; C = .01 uF at 500 VDC; and all switches were SPST.

ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ

Q. *My Sony ICF-2010 AM broadcast band is encountering sharp static in the early evening, preventing the reception of weak stations, and I can't add an outdoor antenna. Is there any filter I can add to reduce the interference? (Ken Perrin, Arroyo Grande, CA)*

A. No. The 2010 does not have a noise blanker. Have you tried rotating the radio on the table in an attempt to null out the direction of the offending interference? Another possibility would be to try the Select-A-Tenna loop, an 11" tabletop directional antenna available from several *MT* advertisers. The Grove SP-200 Sound Enhancer has a variety of audio-processing features that should offer some relief.

Finally, you may have to consider a more expensive radio with a good noise blanker.

Q. *Why are tabletop receivers so small, including teensy knobs and switches? (Jack Belck, Glen Carbon, IL)*

A. There seems to be a perception by the Japanese manufacturers that tiny is better. Perhaps some of this is an illusion stemming from the fact that the Japanese domination of the electronic marketplace began shortly after bulky tubes were being replaced by tiny transistors.

Most consumer electronics are Japanese in origin, and compactness is a common theme. While Japanese average physical stature is slightly smaller than the average American, that alone can't account for the considerable reduction in product size.

Japan historically has had limited natural resources and their population density necessitates space optimization. These might be predisposing factors, but that is a matter of conjecture.

Q. *Years ago, when my local AM broadcasters went off the air at night, I could hear certain distant stations which I no longer can. Why not? (Bob Brock, Phoenix, AZ)*

A. Possibly for several reasons: The stations may no longer be on the air; they may have changed frequencies; a new station might now be blocking them; they may have changed their antenna directivity; or they may now switch to low power at nighttime.

Q. *I recently saw a World War II military transmitter with the frequency designation "420 Mc." What does "Mc" mean? (Walter Szczepaniak, Philadelphia, PA)*

A. Mc (megacycles) and Mc/s (megacycles per second) are the obsolete equivalent of the modern MHz (megahertz). Also formerly common were kc (kilocycles) and kc/s (kilocycles per second), now replaced by kHz (kilohertz). Since "hertz" means "cycles per second," the shorter name is less cumbersome and has been permanently adopted as the unit of frequency.

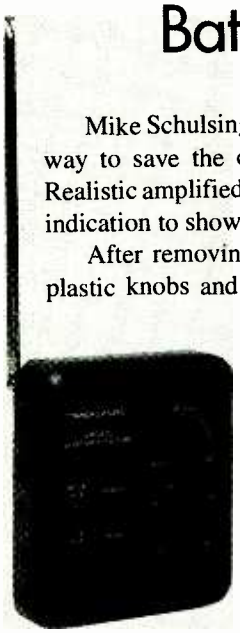
Q. *What are my licensing privileges when I possess a Restricted Radiotelephone Operators Permit? (Rob Martens, Cinnaminson, NJ)*

Bob's Tip of the Month

Battery Saver and Another Cellular Mod

Mike Schulsinger of Springfield, Ohio, offers a nifty way to save the current which runs the LED on the Realistic amplified shortwave antenna, but still allows an indication to show that the device is switched on.

After removing the four cover screws and the two plastic knobs and two plastic switch covers, open the cover to locate the wires for the LED. Carefully snip either of these wires close to the small circuit board, bending it out of the way; it can always be bent back and resoldered if restoration is desired.



Realistic® Amplified Shortwave Antenna

Now reassemble the case, knobs and switch covers. Slide the power switch to "ON." Place a dab of white correction fluid or similar paint to the left of the cover so that it will be covered when the switch is off.

Very clever. Thanks, Mike.

■ *Cellular Restoration on the Uniden MR8100*

Several years ago, Uniden developed a scanner intended for noisy mobile environments. The MR8100 never did receive wide acclaim, but a number of them were sold. It required software to get up and running on all cylinders, but it still skipped cellular frequencies. Kevin O'Rourke of Wheaton, Illinois, provides this "fix."

With the MR8100 connected to an appropriate computer, insert the software into the drive so that the screen appears as in Figure 1 of your programming guide.

With NUM LOCK and CAPS LOCK both turned off, press CTRL+ALT+P; the display will now read, "ENTER CODE:".

Press CAPS LOCK, then enter "ECPA1986"; the display will now read, "ENTER CODE:ENABLED," which then disappears, thus restoring full cellular frequency coverage.

Questions or tips sent to "Ask Bob," c/o *MT*, are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of *MT*.

A. None. Those permits were issued many years ago by the FCC in an effort to have some record of the users of licensed two-way radio systems, but they were discontinued.

Q. *Why are scanner and shortwave receiver audio specifications typically made at 10% audio distortion when, with little effort or expense, it could be as low as 1%? (Jack Belck, Glen Carbon, IL)*

A. Those specifications arose decades ago when hi-fi became a buzzword, and it was determined that as much as 10% audio distortion could be tolerated with little loss in sound integrity.

Remember, however, that the 10% maximum is only reached at full, rated output power; it is much lower at normal listening volume. And while we would like distortionless sound while playing Tchaikowsky on our home entertainment centers, most DXers would not benefit from perfect audio while listening to shortwave or scanner fare.

Q. *My shortwave portable has a whip antenna and an external antenna jack, but I live in an apartment and can't erect an outside antenna. How can I get better range? (Ken Perrin, Arroyo Grande, CA)*

A. Several possibilities exist. Try a length of wire, ten feet or so, connected to the whip; try 20-30 feet of wire attached to the external antenna jack and running out a window (inconspicuously) to a tree, porch, or other end support, or even through the apartment; try the new Grove TUN-5 MiniTuner Plus connected to the external antenna jack.

LETTERS

(Continued from page 4)

always felt that this was the Rolls Royce of receivers ever since I first saw it described in advertisements in the 1941 issue of *QST*."

"I have to congratulate Linton on completely restoring his SX-28. I bought one at a flea market a few years ago, and started to work on it, but was brought to a halt by the difficulty of replacing some of the bypass capacitors, as Linton describes. Maybe his example will inspire me to complete my restoration this winter.

"The problem with poor audio that some owners have experienced with the SX-28 arises from the fact that its audio output transformer is designed to match the output tubes into either a 500 or a 5000 ohm load. The SX-42 (which I did restore a couple of years ago) also has the same type of output transformer. Since the matching Hallicrafters speakers have internal transformers to match 500 ohms to the driver voice coils, they give excellent audio when connected directly to the receivers. However, if even a 16 ohm speaker is connected directly to the SX-28, miserable audio will result. Other receivers intended for professional, military, or amateur use have similar output impedances to the DX-28 and SX-42.

"If a matching speaker is not available, the easiest solution is to run down to your local Radio Shack store and purchase a P/A line transformer, cat. #32-1031 for $5.99. This is designed to match a 70 volt audio line to a 4, 8, or 16 ohm speaker. The primary taps are marked in watts and the 10 watt tap corresponds to 500 ohms when a speaker is connected to the appropriate secondary tap (70 volts across 500 ohms gives about 10 watts).

"I used such a line transformer to match my SX-42 to a small speaker when I had it apart on my workbench. These transformers can also be used to match a modern low impedance headphone set to a tube receiver which has only a high impedance headphone output."

Short Subjects

■ "I was pleasantly surprised to see the ELF protection item in the December *MT* (p.97). I had not expected to see this announcement prior to the April 1st issue. Is it too late to include ads for my foil lined underwear and colander hats? Thanks for the laugh; don't drink too many electrolytes and you will recover shortly."
John Douglas, N0ISL, Elk River, MN

"In my opinion it is a bad idea to separate the index from the traditional December issue. My main objection is that a separate index is clumsy to use and easily lost or misplaced. Perhaps reason will prevail and you'll go back to the tried and true practice of including the index in the December issue next year."
Ed Michelman, AH6LO

Here are your choices: (1) Three pages of Index in the Dec issue, which generally includes three or four pages of MT *Convention report as well, thus knocking out two feature articles, (2) move the Index to the January issue, or (3) continue to send it for an SASE to those who want the Index. What's the consensus?*

Corrections to Jan's article on FEMA's Multiple Radio Vehicle by Bob Morehouse (not Haskell Moore as listed in Contents): Table 1 should read "MRV Radios & Spectrum of Coverage." Also, fires near Wenatchee were in Washington, not Oregon. **Correction** to Table 1—Easy Mods for the PRO-2035 in Jan's "Experimenter's Workshop": First diagram was labelled correctly; the second should have read "Automatic Tape Recorder Switch."

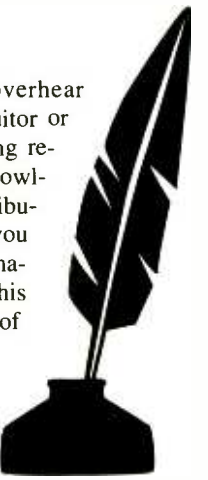
New Columnist

■ *MT* is glad to welcome Doug Smith to its stable of editors. Doug edits the "TV News" column for the Worldwide TV-FM DX Association's publication, *Vhf-Uhf Digest*, and did an excellent job preparing a column in time for this February issue. Send him clippings of AM\FM broadcast news from your area. He'd also like to continue the tradition begun by Joe Eisenberg of listing unusual DX catches in "Skipping In." While you're sending in your contributions, I'm sure he'd appreciate a word or two about what you'd like to see in the column, or any questions you may have about mediumwave DXing.

Affordable Overseas Delivery

• Good news for our international readers! We have contracted with an international mail carrier for overseas delivery of *Monitoring Times* and *Satellite Times*, which should greatly reduce the cost of air mail delivery. As a gift to you, this February issue is being mailed to all overseas subscribers using the service. If you were pleased with the delivery time, we hope you will consider sending in the extra postage required to continue receiving the service. If you did not receive a letter outlining the rates, contact our office for the cost of delivery to your region.

From the Editor



■ Occasionally, we overhear complaints about the editor or *MT* editorial staff lacking responsiveness to or acknowledgment of reader contributions. I want to assure you that every piece of information that comes through this office is looked at in light of its potential importance or usefulness to the hobby and is forwarded to the appropriate columnist. The input of *MT* readers is of immense value to us—without it, we'd either be talking to ourselves or preaching, and that's certainly not why our staff writes about radio each month!

You will very rarely see a contribution published in *MT* that does not carry an attribution. However, whether the editorial staff is able to respond individually varies with each person's situation and work load. Though our authors are paid for what they do, that doesn't buy time—or postage, for that matter! They obviously write for the love of it, in addition to other fulltime responsibilities.

Also bear in mind that our readers now number over 35,000! Staff who do not have other fulltime jobs, but who are employed by *MT* to produce the magazine, add up to *three*: the editor, the art director, and assistant to the art director, with help by our advertising agent. I ask you to compare that figure with the staff box of any other magazine! Any apparent lack of responsiveness is not by choice; we do greatly enjoy and appreciate your letters and clippings.

I believe I speak for the entire staff when I say that, although we have grown in numbers, we still feel the sense of "family" that comes from a common love of radio, and it comes as a rude surprise and a sense of failure when occasionally others see us in the light of a merely commercial enterprise, or compare our responsiveness to the informality of a radio club newsletter. We are neither. Grove Enterprises and *Monitoring Times* were born out of Bob Grove's conviction that non-amateur radio hobbyists deserved the same access to equipment and information that would enhance their hobby as was available to hams. The rest is history, as for fourteen years now we have been sharing back and forth those sometimes frustrating, sometimes glorious, monitoring times.
Rachel Baughn, Editor

Who Says 800 MHz Coverage Is A THING OF THE PAST?

We Say It's Here NOW Through Our Incredible Limited Time Offer!

Grove Has Combined the ICOM R7100 with a **FREE** GRE Super Converter to Give You Full 25-2000 MHz Coverage—***Legally.*** And You Will Save Almost **$600** in the Bargain!

Although cellular-capable scanners and converters can no longer be imported into or manufactured in the United States, Grove Enterprises is offering this special package while existing supplies last. The powerful **ICOM R7100** has still has the same great quality as before, but now it lacks the 800-900 MHz range (actual range now is 25-800 and 900-2000 MHz).But by adding the **GRE Super Converter**, the missing cellular range is restored for continuous 25-2000 MHz coverage!

The ICOM R7100's retail price of $1850, with the addition of the $94 Super Converter, would make most people's wallet smoke! But for a limited time, we have combined these fine receivers and converters—**a value of $1944 per package**—and we are offering them to you for only ***$1349.95 plus $20 2nd Day Air shipping!***

Order SCN15-C

Only **$1349.95**

Plus $20 2nd Day Air Shipping

*(the **SAME** price as **GROUND** from other companies!)*

Call Now—Stock is Limited and Moving Rapidly!

GROVE ENTERPRISES, INC.
300 South Highway 64 West
Brasstown, NC 28902

(800) 438-8155

Memphis Area Shortwave Hobbyists (MASH): P.O. Box 3888, Memphis, TN 38173, Jim Pogue (901)873-4291 or Brandon Jordan 373-8046. Memphis area; SW, MW, FM, TV, utilities, pirates, etc.

Metro Radio System: Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. *M.R.S. Newsletter.*

Michigan Area Radio Enthusiasts: Bob Walker, P.O. Box 81621, Rochester, MI 48308. E-mail via Internet MARE/Ken Zichi ab415@leo.nmc.edu. Great Lakes Region. All bands. *Great Lakes Monitor.* $9.50 annual US & Canada. $1 sample.

Minnesota DX Club: Greg Renner, P.O. Box 10703, White Bear Lake, MN 55110, 612-822-1186 for meeting info. Minnesota. All bands. *MDXC Newsletter.* $10 annual.

Monitoring the Long Island Sounds: Ed, 2134 Decker Ave, North Merrick, NY 11566. Primarily scanner, some SWL. 50 mi. radius of LI. Net Tues 8pm 146.805. *Monitoring the Long Island Sounds.*

MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 Third St., West Chester, OH 45069-2212, (513)777-2909. SW Ohio, SE Ind., N Ken; All bands. Meets 2nd Sats 7pm at VOA Bethany station. Net Thurs 9:30 146.835/6.235. No dues.

Mountain NewsNet: James Richardson, P.O. Box 621124, Littleton, CO 80162-1124, (303) 933-2195. Colorado statewide. Public Safety notification group. *Mile High Pages.*

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711, (913)266-5707. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp. Annual Labor Day convention.

National Radio Club - DX Audio Service: Ken Chatterton, P.O. Box 164, Mannsville, NY 13661-0164, (315) 387-3583. Worldwide. North American Broadcasters. *DX-Audio Service* (90-min.tape). Sample $3.

North American SW Assoc.: Bob Brown, 45 Wildflower Lane, Levittown, PA 19057, (215) 945-0543. Worldwide; Shortwave broadcast only. *The NASWA Journal.* Regional meetings.

North Central Texas SWL Club: Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. North Central TX area; All bands.

Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities. Meet 3rd Tuesdays.

Northeast Scanner Club: Les Mattson, P.O. Box 458, Rio Grande, NJ 08242, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN).* $29 annual.

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice & fax, (416) 444-3526 DX-Change information svce; (905) 841-6490 BBS. Predominantly Province of Ontario; All bands. *DX Ontario.* Meet 3rd Wednesdays, Toronto; bi-monthly, Ottawa.

Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. Pacific NW and BC Canada. DXing all bands. *PNBCDXC Newsletter.* Irregular meetings.

Pitt Co SW/Scanner Listeners Club: L. Neal Sumrell, P.O. Box 1818, Winterville, NC 28590-1818. Eastern NC; All bands. *The DX Listener.* Irregular meetings.

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749, (808) 982-9444; Puna, HI; SW and MW. Meet 1st Tuesdays. No dues.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland, (410) 239-7366; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD.* Meet irregularly.

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *RCMA Journal.*

Regional Communications Network (RCN): Jay Delgado or Public Information Unit, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.#10 SASE for info.

Rocky Mountain Radio Listeners: Mike Curta, P.O. Box 470776, Aurora, CO 80047-0776. Metro Denver, Colorado. All bands. Meets monthly 2nd or 3rd Sundays 1-4pm, Aurora Central Library.

Scanning Wisconsin: Ken Bitter, Dept. MT, S. 67 W. 17912 Pearl Dr., Muskego, WI 53150-9608, (414) 679-9442. Wisconsin. VHF/UHF. *Scanning Wisconsin* ($2 for sample)

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.

SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing): Bob Thunberg, Business Mgr., P.O. Box 196, DuBois, PA 15801-0196. Worldwide; SWBC, utilities. *Shortwave Radio Today.* $23 annual in US. Sample $2 or 6 IRCs. $2 for award program info open to non-members.

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.

Monitoring Clubs Outside North America

Associazione Italiana Radioascioto (A1R): C.P. 873, 34100 Trieste, Italy. Broadcasting all bands, utilities, pirates. *Radiorama* (Italian) 70,000 lira. April 25 annual mtg.

Australian Radio DX Club Inc: P.O. Box 227, Box Hill, Victoria 3128, Australia. SW, MW, Utilities. *Australian DX News.* Sample 2 IRCs or $2US cash.

British DX Club: Colin Wright, 126 Bargery Road, Catford, London, SE6 2LR, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine. *Communication.* L10 UK, L12 Eur, L16 ww. Sample 3 IRCs or $2 US cash. Meets monthly in Twickenham (London).

DX Australia: P.O. Box 422, Moonee Ponds, Victoria 3039, Australia. MW, SW. *DXers Calling.*

DX Club of India: Navin Patel, 1-Dutt Niwas, 809 - M.G. Road, Mulund, Bombay-400 080, India. India; MW/SW/Ham. DX World (quarterly) Rs 50/-, 30 IRCs outside India. 3 IRCs sample.

DX Club Paulista: Marcelo Toniolo Dos Anjos, C. Postal 592, Sao Carlos - SP (Brasil), 13560-970. South America. Shortwave, including utilities. *Actividade DX* (in Portuguese).

Finnish DX Association: Mr. Arto Mujunen, Suomen DX-Liitto, P.O. Box 454, FIN-00101 Helsinki, Finland; +358-0-842146 fax. Finland and worldwide. SW and BCB. *Radiomaailma.*

Friendship DXers Club: Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. Venezuela and Caribbean. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 kHz. Venezuelan membership free.

International Listeners Organization: Mohsin Abbas, St. Nisar Ali Shah Ahamed Pura, Sheikhupura, Pakistan, 1-(50359) 2-(50561). South Asia. Broadcasting. *Listener Times.*

International Radio Youth Club: G.M. Mostafa Kamal, Amla Wapda Colony-1, Kushtia-7032, Bangladesh

National Society of Pakistani DXers: Mr. Liaqat Ali, E-161/1, Iqbal Park, Opposite Adil Hospital Defence Housing Society Road, Lahore Cantt., Pakistan. Worldwide. All wave. Has library, meets fortnightly 1400-1800 UTC at library. 4 IRCs for more info.

New Zealand Radio DX League: P.O. Box 3011, Auckland, New Zealand. MW, SW, FM, TV. *New Zealand DX Times.*

New Zealand DX Radio Association: Mr. R. Dickson, 88 Cockerell St., Brookville, Dunedin, New Zealand. MW, SW, amateur and utilities. *Tune-In.*

North Ontago Radio Listener's Club: P.O. Box 179, Oamaru, New Zealand.

Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhupura, 39350 Pakistan; Pakistan; SWBC.

QSL Club de France: Patrick Frigerio, 40 Rue de Haguenau, 67700 Saverne, France. SWBC, pirates, CB-DX, hams, etc. Courrier (in French). 6 bulletins, 72 FF, EEC=16 IRCs, elsewhere 20 IRCs.

Shortwave Radio Communications Club: Atiqur Rehman, Dawood Street, Khalid Road, Sheikhupura, P.C. 39350 Pakistan. South Asia; MW/SW. *The Amateur* (Urdu language). Meets 1st Fri on SW Complex, S.K.P.

South African DX Club (SADXC): P.O. Box 18008, Hillbrow 2038, South Africa; MW, SW, utilities. $46 annual airmail to US; *The South African Shortwave Listener.*

Southern Cross DX Club Inc.: Stephen Newlyn, G.P.O. Box 1487, Adelaide, SA 5001, Australia. Worldwide and Pacific. All bands. *DX Post.* $25 annual in Australia. Meets last Fridays, 8pm, Thebarton.

Stichting ScanSearch Military Aircraft Communications (SC-MAC): Gerbrand Diebels, Roer 29, 5751 TJ Deurne, Netherlands. Military aviation NW Eur (VHF/UHF) and worldwide (HF). *Airlift* (Dutch) bi-monthly. FL 35, up to FL 45 outside Netherlands.

Universal DX League: Mr. Kanwarjit Sandhu, 408, Krishna nagar, Ludhiana 141 001. India. India and Int'l; SW/MW/AM/FM/TV DXing/Pirate and Clandestine. *DX Post* bi-monthly, sample 4 IRCs. Annual 24 IRCs or US$10. SWL net: Sun 0300 UTC on 7080/1600 on 14150 SSB, VU3SIO net control.

Viamão DX-Club: Alencar Aldo Fossá, P.O. Box 101, Cunhas Road 1286, Jaguaribe Residential Park, 94400-970 Viamão, Rio Grande Do Sul, Brazil, South America. SWBC. Meets occasionally; multi-lingual.

Umbrella Organizations

Association of North American Radio Clubs (ANARC): Richard d'Angelo, 2216, Burkey Drive, Wyomissing, PA 19610. 18 member clubs across North America.

European DX Council (EDXC): Michael Murray, P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE, England. 16 member clubs across Europe.

South Pacific Association of Radio Clubs (SPARC): Arthur Cushen, 212 Earn Street, Invercargill, New Zealand.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Feb 4-5	Miami, FL	So Fla Section Conv / Evelyn Gauzens W4WYR, 2780 NW 3rd St., Miami, FL 33125, (305) 642-4139
Feb 11	Pensacola, FL	Pensacola Area Hams Assn / Bill Behrends WA4YRN, 1050 W. Carlton Rd., Pensacola, FL 32534, (904) 476-8537
Feb 11	Charleston, SC	Charleston ARS / Jenny Myers WA4NGV, 2630 Dellwood Ave, N. Charleston, SC 29405-6814, (803) 747-2324
Feb 11	Blaine, MN	Robbinsdale ARC / Susan Baker N0JND, 5300 Three Points Blvd, Mound, MN 55364-1124
Feb 11	Goshen, NY	Orange Co ARC / Bruce Sparrow N2KTV, PO Box 496, Harriman, NY 10926, (914) 496-9091
Feb 11-12	Gtr Palm Bch Co Fl	1st Annual WPBARC Fox Hunt Contest: Open to all parties licensed and unlicensed. Non-members $1 donation. Registration by mail to Fox Hunt, P.O. Box 6834, W Palm Bch, FL 33405-6834 For info call Sam Falco KD4VBI, (407) 844-7522. Deadline Midnight Fri Feb 10.
Feb 12	Freeport, NY	Long Is Mobile ARC, Neil Hantman WE2V, 2 Majestic Ct., Dix Hills, NY 11746, (516) 462-5549
Feb 17-19	Orlando, FL	N Fla Section Conv / John Lenkerd W4DNU, 1046 Turner Rd, Winter Park, FL 32789, (407) 645-2026
Feb 18	Elkin, NC	Briarpatch, Foothills ARC / Glenn Diamond N4VL, Rt 6 Box 453, Galax, VA 24333, (703) 236-6514
Feb 25	LaPorte, IN	LaPorte Cabin Fever Hamfest, LaPorte ARA / Bud Thilly W9IGJ, PO Box 30, LaPorte, IN 46351 (219) 362-1121. Talk-in 146.610 (- 131.8 PL) or 146.520 simp. $4 general admission.
Feb 25	Brooksville, FL	Hernando Co ARA / Clem Rountree N4PIE, PO Box 1721, Brooksville, FL 34605, (904) 799-3202
Feb 25-26	Cincinnati, OH	Gt Lakes Div Conv / Stanley Cohen WD8QDQ, 2301 Royal Oak Ct, Cincinnati, OH 45237 (513) 531-1011. Location: Cincinnati Gardens Exhibition Center, 2250 Seymour Ave at Langdon Farm Rd, 8am-5pm. General admission $8
Feb 26	Dearborn, MI	Livonia ARC / Neil Coffin WA8GWL, 35681 Hees St., Livonia, MI 48150 (313) 427-3905
Feb 26	Cuyahoga Falls, OH	Cuyahoga Falls ARC / Carl Hervol N8JLQ, 11192 Cottingham Circle Circle, Uniontown, OH 44685 (216) 497-7047
Mar 16-18	Kulpsville, PA	8th Annual Winter SWLFest / P.O. Box 591, Colmar, PA 18915. Location, Holiday Inn, Sumneytown Pike, Kulpsville. $35 registration and meals.
June 2-5	Rebild, Denmark	EDXC Conference - Deadline for registration **Feb 1**. MT can fax you last-minute info, or send 950 DKK (room not included) to EDXC '95, P.O. Box 48, DK-5200 Odense V, Denmark; 24H Fax +45 65 96 74 27.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Events Calendar
P.O. Box 98, Brasstown, NC 28902-0098

DX Radio Tests

These special test broadcasts provide a unique opportunity to hear and identify the following stations. If you hear their broadcasts, please let the engineer know at the address provided. More information on DXing the broadcast band can be found in *DX Monitor*, the publication of the International Radio Club of America (IRCA, P.O. Box 1831, Perris, CA 92572-1831, USA) and *DX News*, the publication of the National Radio Club (NRC, P.O. Box 5711, Topeka, KS 66605-0711). Both clubs are devoted to the hobby of hearing distant stations on the standard AM and FM broadcast bands.For a sample of either publication, send one 29 cent stamp ($1 US or 1 IRC overseas) to the addresses above. The following tests were arranged by J.D. Stephens for IRCA unless otherwise noted.

Monday, Feb 6 - K1YU-910, P.O. Box 165, Galena, AK 99741 will conduct a DX test 5-5:30 am EST. The test will include voice IDs, Morse code IDs, and easily identifiable music. Reception reports may be sent to Mr. Robert C. Sommer, General Manager.

Saturday, Feb 11 - WWOL-780, 1263 West Main, Forest City, NC 28043, will conduct a DX test 2-4 amEST. The test will include voice IDs, Morse code IDs, and march music. Power will be 10 kW using a nondirectional antenna pattern. Reception reports may be sent to Mr. Julius Blanton Engineer.

Sunday, Feb 12 - KNZZ-1100, 1360 E. Sherwood Drive, Grand Junction, CO 81501, will conduct a DX test 3-3:30 am EST. The test will include Morse code ID's. Power will be 10 kW using a daytime antenna pattern. Reception reports may be sent to Mr. Dwight Morgan-Chief Engineer.

Monday, Feb 13 - KGYN-1210, P.O. Box 130, Guymon, OK 73942, will conduct a DX test 2-2:30 am EST. The test will include voice ID's and Morse code ID's. Power will be 10 kW. Reception reports may be sent to Mr. Bill Weldon-Program Director..

Tuesday, Feb 14 - WREN-1250, 201 NW Highway 24, Topeka, KS 66608, wil l conduct a DX test 1-2 am EST. The test will include voice ID's, Morse code ID's, & Gospel music. Reception reports may be sent to Mr. Bob Plummer (AA0OU), Studio Engineer.

Monday, Feb 20 - KERR - 750, Polson, MT, will conduct a DX test 2-2:30 am EST. The test will include Morse code ID's. Power will be 50 kW using a nondirectional antenna pattern. Reception reports may be sent to Mr. Andy Anderson, c/o KBMR-AM Radio, 3500 East Rosser Avenue, Bismarck, ND 58501.

INDEX OF ADVERTISERS

STOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

Ads for **Stock Exchange** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.
Ad copy must be typed for legibility.

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word — *Subscribers only!*
All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue. Send camera-ready copy or copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads, contact Beth Leinbach, 704-389-4007.

"TINY-TENNA!" See display ad page 81 this issue.

R-390-A SALES—SERVICE—PARTS. Information SASE Miltronix, P.O. Box 3541, Toledo, OH 43608.

GE SUPERADIO III, custom designed with up to four noise-free SCA channels. Performance guaranteed. Credit Card orders accepted. (800) 944-0630.

ACOUSTIC GUITAR PICKUPS: quick-mount, low price, high quality, wholesale/retail, money-back guarantee--can also be used as a contact mic.. Sample $20 S&H included. VISA/MC accepted. CLE, Box 1913, Sarasota, FL 34230-1913. Phone/FAX (813) 922-2633

Highest price paid for used scanners! (614) 544-5842 (03-95)

THE ANARCHIST'S BBS is a resource for anarchists, investigators, researchers, computer hackers and phone phreaks. Categories include: Computer hacking, Investigation techniques, Telecommunications Technology and Surveillance. Call 214-289-8328 for free trial access

New YUPITERU MVT-7100 full coverage .5 to 1300 MHz hand held scanner plus extras. $675 or best offer. Call (601) 924-3017.

Goes-Tap 2 channel Receiver, new. $50 plus shipping. Paid $175. Call (203) 288-4477.

YUPITERU 7100, Cellular, mint. $475. WB9YCJ/6 (714) 564-9010.

ICOM R-9000 Receiver. Unblocked. 1 year old, mint condition with all manuals, documentation. $4000 firm. (716) 381-1702.

"GARAGE SALE - Make an offer on any or all of the following radios: SBE Optiscan scanner; Bearcat 20/20 scanner; Wilson WH2510 mobile transceiver; Wilson H5410 portable transceiver; Omnicron talking time clock; Omnicron auto message recorder; Motorola Convertacom for MT1000; Communications Specialist headset/mic.; Shure 890TT DTMF mic.; Motorola HMH105A desk mic.; Federal Interceptor siren/PA. Call Vic White, (801) 575-2425 or (801) 299-1336."

Grundig Satellit 500, one year old. Used couple times. With manual and original box. $225 shipped. (209) 544-9057-George.

American Electrola Chuck Harder's For the People Project. Only 1000 made. Includes tunable indoor/outdoor active antenna, recorder activator, electronics for PC. $275 OBO. Wanted: Drake R8. Tim (406) 787-5829.

FOR SALE: NXL-250 Indoor Active Antenna. $70 or offer. (206) 778-3668.

YAESU FRG-8800 Communications Receiver in excellent condition. Original box, manual. $290. (206) 453-5129.

ICOM H-16, program from front panel, transmit 140-260 MHz, receive 100-600 MHz, two batteries, $400. Uniden BC200XLT, cellular restored, two batteries, $200. Relm, 144-174, 100 watt amp., $175. Don Peyton (903)753-8335.

WANTED: Stereo Processor: for satellite audio subcarriers: Drake, Maspro, etc.. Ku-Feed horn and LNB. Newer Scanners-base and handheld. Bill (203) 288-4477.

CLOSING COMMENTS

Bob Grove
Publisher

One More Anti-Monitoring Law Sneaks Through

It is no longer lawful to monitor cordless telephones. Public Law No. 103-414 (108 Stat. 4279) amends the Electronic Communications Privacy Act of 1986 (ECPA '86) to include cordless telephones, previously exempted, from unauthorized eavesdropping.

Not that it shouldn't have been. When the ECPA first emerged nearly a decade ago, I was besieged by the press to find out how I stood on the issue which banned monitoring of mobile telephones (including cellular).

The toughest question I faced was, "Why do you think that people should be allowed to listen in on other people's private conversations?"

I made it very clear that privacy protection was the responsibility of the sender, not the scanner listener. After all, you wouldn't stand in a crowd announcing your credit card numbers and expect no one to notice.

If the ECPA prohibited the interception of cellular (and other mobile) radiotelephone conversations, why were cordless phones excluded from protection? Because the bill was lobbied to Congress by the cellular telephone industry; they didn't give a hoot about cordless phones.

Since then, virtually every court decision has upheld the precedent decision that cordless telephones, since they look like walkie-talkies and have no cords, must be obviously a radio transmitter. Users should have no reasonable expectation of privacy.

But have you looked at cellular portables lately? They look just like cordless phone handsets. How can the average consumer tell the difference? He can't. We might not approve of this additional monitoring restriction, but it shouldn't have been unexpected. It was just a matter of time.

So what are the practical consequences? None. Consumers will go on using their cordless phones with reckless abandon, and scanner listeners who are so inclined will keep on intercepting their calls, just as they have for some twenty years.

Compliance is by conscience; there are no "cordless police" just as there are no "cellular police," and there are no prohibitions against manufacturing or importing cordless-capable scanners...yet.

Interceptors®

The Interceptor® series offers quality design in a portable package. The R10 and R20 Interceptors® are near field receivers used for communications monitoring and counter surveillance applications. With use of the signal strength bargraphs they are ideal for locating stuck transmitters. Unlike scanners and receivers that must be tuned to a specific frequency or scanned through a fixed frequency range, The Interceptors® will instantly tune to strong signals.

R10 ..... $359.

- *New* squelch delay feature
- *New* high intensity LEDs & low battery indicator
- Continuous 30MHz - 2GHz coverage in less than 1 second
- Check deviation & signal strength
- Skip button lets R10 scan to next signal
- Completely automatic, no tuning necessary
- Built in speaker or headphones

R20 ..... $119

- Pager sized, with built in telescoping whip antenna
- 9 volt battery operation
- Monitor Aircraft, CB, AM broadcast transmissions when close
- Check Microwave oven leakage
- Wide .5MHz - 3GHz frequency range

Decoders

To measure Tones and Codes off the air, the TC200 & DC440 Decoders are the units of choice. The Optoelectronics Decoder line can be used with any scanner, service monitor, or communications receiver to monitor PL and DPL tones.

DC440 ..... $259.

- 50 CTCSS tones, 106 DCS codes and 16 DTMF characters
- Convenient front panel controls for Power, Mode and Recall
- New CI-V compatible interface for PC
- Compact Size ideal for mobile or portable operation with optional NiCad battery pack ($39.)
- 2 line by 16 character back-lit display

TC200 ..... $179.

- Measures CTCSS tones only
- Fast - .1Hz resolution with .2 second display update
- Large 4 digit, .5" LCD display
- Low power design, 5+ hours operation

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OptoScan OS456 ..... $299.

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