Volume 14, Number 10 • October 1995

U.S. $3.95
Can. $6.25
Printed in the United States

Monitoring Times

The Full-Spectrum Radio Magazine
A Publication of Grove Enterprises, Inc.

Man vs. Power Lines: Going to War With STATIC

Also in This Issue:

- Joe Adamov: "The Voice of Russia"
- How Scanner Listeners Keep Up with Trunking
- Equatorial Guinea's Intriguing SW History

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Monitoring Times™

Vol. 14, No.10 October 1995

Cover Story

Man vs. Static

By B.W. Battin

When an incessant buzz or a pulsating noise obliterates the signal you're trying to hear, don't immediately suspect Mother Nature. It's probably man-made, and there's probably something you can do about it.

Your best ally when going to war with static is the power company. They can help you track down the potential sources, and steer you toward a solution. That's what B.W. did, and the fix has held—so far.

Static is a problem not limited to the city: it's universal, even in the pastoral setting of John Bailey's cover photo. See page 8 for the story.

CONTENTS

Reviews:

This month's rave review is from John Catalano talking about the Collins PropMan propagation software (page 104). You'll find more on propagation topics in our feature article on page 22, and in the Experimenter's Workshop on page 108.

October's receiver reviews include the Chinese-made Aroma shortwave portable receiver (p.102), and the AR-2700 handheld scanner (p.100), shown at left. Both are less than they could be—one a little, and one by a lot.

Also reviewed are the Alinco DR-MO6 six-meter transceiver (p.90), and an inexpensive Wefax converter from Logic Limited (p.95) that will show you weather maps and more in a jiffy.

DEPARTMENTS

MONITORING TIMES (ISSN: 0889-5341) is published monthly by Grove Enterprises, Inc., Brasstown, North Carolina, USA.

Address: P.O. Box 98, 300 S. Highway 64 West, Brasstown, NC 28902-0098
Telephone: (704) 837-9200
Fax:(704) 837-2216 (24 hours)
BBS: (704) 837-9200, -7081, -5957, -5183 (M-F 5:30 pm-8 am; 24 hours on weekends)
Internet Address: www.grove.net or mt@grove.net; Editorial: mteditor@grove.net

Subscription Rates: $23.95 in US; $48.50 Canada air; and $82.95 foreign air elsewhere, US funds. Label indicates last issue of subscription

Postmaster:
Send address changes to *Monitoring Times*, P.O. Box 98, Brasstown, NC 28902-0098.

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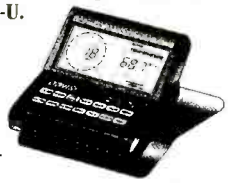

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LETTERS

Thanks, MT!

"[Several months ago] I purchased a Yacht Boy shortwave radio and started to enjoy it very much. I went searching for more information, and to my chagrin I had problems even finding magazines. Then last week via mail came your magazine and my prayers were answered. Start a subscription; your magazine has already given me hours of reading enjoyment." Jim Velon, Scottsdale, AZ

We get letters like this all the time, with folks saying "why haven't I heard about you before?" Help us get the word out! If you know someone who would appreciate *Monitoring Times*, call 1-800-438-8155 (in the US and Canada) and give us their name and address, and if they haven't already seen one, we'll send them a sample!

Correction

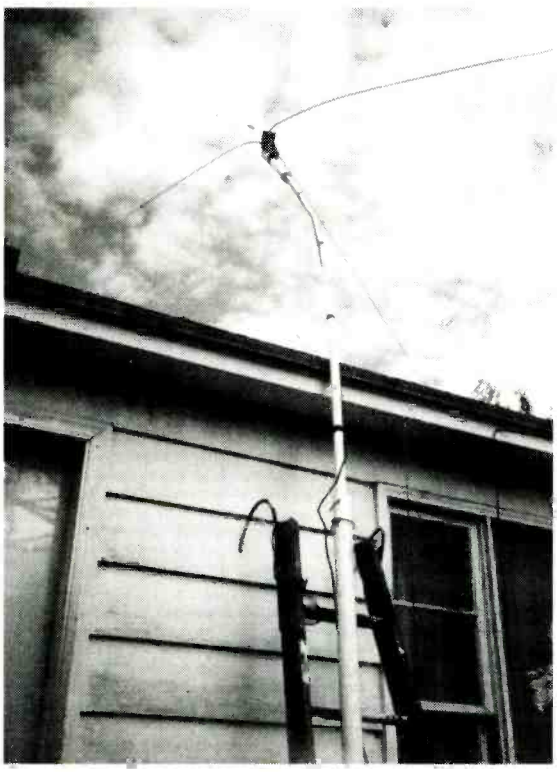
Joe O'Connell, Director of the Office of External Affairs for the Int'l Broadcasting Bureau (which oversees the various U.S. broadcasting outlets), writes, "*Monitoring Times* picked up an earlier *Miami Herald* item [in the August 'Shortwave Broadcasting Global Forum'] which stated that the head of the U.S. Interests Section in Havana 'had protested to the State Department that Radio Marti had placed an employee at risk by broadcasting allegations he was a security agent for the Cuban government."

The *Herald* later published a retraction, plus a statement from Joseph Bruns, Acting Director of the IBB, who said, "Radio Marti never broadcast such an allegation." Since *MT* picked up the story at face value, we are also glad to set the record straight by passing along the subsequent correction.

Man vs. Static

Our lead story on static will have special meaning for Larry Fowler of Falmouth, MA. Larry also struggled with an interference problem he thought was coming from the primary power lines and step-down transformer in front of the house. He wrote about his problem to publisher Bob Grove, whose reply arrived, just as Larry had his saw all sharpened up ready to cut down the light pole.

"I did take your advice and contacted my local power company, and because I had the benefit of your knowledge, really impressed the hell out of the radio repairman. 'Corona discharge problem?' he asked. 'Yes, that's what I believe is the problem; you DO know what corona discharge is, don't you?' I asked matter-of-factly, only having read the term for the first time in your letter. I described how I had tracked the problem down using my DX-390 on batteries.



"On the theory that some may benefit from the mistakes of a few, I am enclosing a picture illustrating the dubious virtues of PVC pipe masts. Yours Truly, "...and I wouldn't sign this for a million dollars!"

—Gooding, Idaho

"I came home from work that very night, and the wife says, 'I'll bet you'll never guess what two line trucks and a supervisor found! The woman across the street has a lamp that comes on when you touch it, and IT was causing all your interference!'

"She said they shut the power off to the whole street and disconnected the transformer to test it. Well ... the hum was still there. She said they all pulled up in front of the house across the street with yellow lights flashing like a SWAT team on a drug bust and started walking around her yard with meters, and finally went up and rang the bell!

"Within a few minutes inside the house, they tracked the source to the hand touch light fixture. 'Do you know what kind of electrical interference problems you're creating using that lamp, Mrs.?' the repairman told me later he asked her. 'Well, it's enough to get two line trucks and my supervisor out here to shut the power down to the whole street just to find that lamp! Now we can't tell you to turn it off, but technically you are breaking the law by using it in its condition.'

"'I did think it was awfully funny that a touch lamp would be on when I come in and there's been nobody in the house all day. I guess I should throw it away?' she asked. 'That would make everybody VERY happy, Ma'am, including your neighbor across the street who called us about it,' he replied.

And so ends my saga of interference. I've put up with it since September 1994; filters, tuners, grounding systems, digital signal processors—NOTHING would make it go away. Thanks, Bob, for taking the time. You made a difference."

Trunking—Not all bad news

Ron Bruckman, editor of the Radio Monitors of Maryland newsletter, sent a news clipping heralding how disappointing the new Carroll County communications system was going to be for scanner monitors. "They try to make it like it's the end of the world for those who monitor the local police/fire/sheriff, etc. In a way it is, for those who do not own a scanner capable of receiving 800 MHz signals. So many agencies are heading in this direction; Baltimore Co. switched their low-band channels about eight years ago.

"However, if the system works like Baltimore County's does, it will be a good move for scanner listeners. As that system works, if either party doesn't pause for at least three seconds, they remain on the same channel and do not switch to another open one. Believe me, they don't pause. Who is going to think about pausing for three seconds, especially during an emergency?

"I can monitor Baltimore Co's police/fire better than ever since their move five years ago. Before they left their low-band channels (39 MHz) I could only hear dispatchers from various locations, and occasionally cars returning calls. Now I can monitor a portable unit in the basement of an apartment complex 30 miles from my location. I would say 90% of the calls remain on the same channel, too."

That's good news, Ron. Readers should file away that piece of information with the other tips on scanning trunked systems provided by this month's "Scanning Report" and in our feature article by Alan Henney.

(Continued on Page 114)

Fugitive Radio

■ Randall Waggoner, a trusty at the Boone County Jail in Harrison, Arkansas, learned what every *Monitoring Times* readers already knows—radio is fun. In Waggoner's case, however, his inability to resist the draw of the hobby cost him more time in the slammer.

Waggoner had just escaped from jail when he stole a patrol vehicle and headed for the wide open spaces. Once in the vehicle, however, listening to the police radio installed in the dash was more than the con could bear. He picked up the microphone and began a lengthy conversation with the deputies who were hunting him.

Freedom was elusive because Wagonner apparently was not. He was arrested three hours later. Waggoner had been serving time for theft and would have been released in six months. After his cruise in the patrol truck, he now faces felony escape and vehicle theft charges, more time behind bars and, worst of all, no radio.

Radio Modifier Convicted

■ In what may be considered a ground-breaking case, a federal jury in Tulsa, Oklahoma, convicted Larry Nathan Gass of illegally modifying two-way radios to monitor Tulsa Police Department Communications. The radios were used by Gass, his security company, and the media to monitor police communications.

After the verdict came down of guilty on 17 counts, Gass said, "Whatever it takes and as long as it takes, this definitely will be appealed, because we think the people have a right to know what their police are doing."

Tulsa Police Internal Affairs Sgt. Rod Hummel, who handled the investigation along with the FBI, said "this case is not about us wanting to keep things from people. We want to maintain the security of our radio system." Police Chief Ron Palmer says that the privacy of the radio system is essential to protect officers and the public. Under the chief's current policy, the public and news media may monitor three of the system's twenty channels. Gass' attorneys argued in court that the radio frequencies are public, but the court didn't agree. Gass faces up to 85 years in prison and $4.25 million in fines.

Say, is someone trying to send a message to radio hobbyists who cross the line?

England Works on the Spectrum

■ The 28-470 MHz band is one of the most crowded in the UK, and British users are howling about how best to allocate it. The government's Radio Spectrum Review Committee made 28 recommendations, 24 of which were accepted, covering defense and civil use of the spectrum.

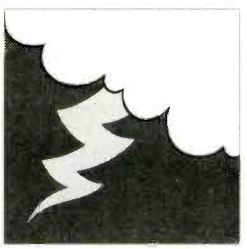
The Ministry of Defense has already released the 225-230 MHz band for terrestrial digital broadcasting and is considering a recommendation to seek the release of the 380-399.9 MHz band for civil systems. NATO has already agreed to give access to two 5 MHz band sections in the 380-400 MHz band by 1997 for emergency services. Spectrum efficiency and harmonization with the rest of Europe is the goal, according to government spokesmen.

Cutting Edge Police Technology

■ The National Law Enforcement Technology Center (NLETC) is committed to developing new technology to assist police. On the drawing boards is a Fleeing Vehicle Tagging System (FVTS), a way in which to mark a vehicle for later locating. The system consists of a projectile launcher, which allows police officers to fire a tagging projectile at an escaping vehicle. The projectile is equipped with a tiny radio transmitter which allows police to follow the car from a distance.

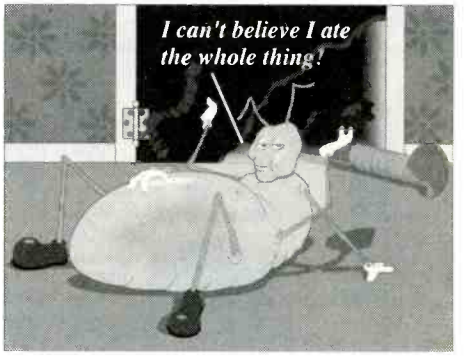
Also undergoing testing is a personnel monitoring system. Originally developed for the Army, the system includes a miniature video camera to transmit video of the scene, wireless networks to carry communication and data transmissions, GPS for location information, and a personal status monitor to track the officer's vital signs.

Tracking Lightning



■ A Florida company is marketing a device to detect lightning. SkyScan is unique in that it uses tiny antennas to detect bursts of electromagnetic radiation in the form of low frequency radio signals. The bursts of white noise occur below 1 MHz and can alert users to the presence of lightning before it becomes a threat. The device is being marketed to boaters, golfers, and others involved in outdoor activities.

The Terminators



■ In Nigeria, a radio studio belonging to central Nigeria's state radio station has been totally destroyed by termites. The pesky creatures ate the entire station, according to witnesses, who said "it was an amazing sight."

Taxi!

■ Radio saved the day—and Mike Houde's life. The 37-year old Canadian was caught in an avalanche on 9,500 foot Wedge Mountain. Houde and his hiking group had a VHF radio and called for help.

Miles away, taxi driver Kelly Harrison heard the call on the ham radio band and immediately phoned the RCMP's Whistler Detachment. A rescue was launched and Houde and his four companions were found. Houde suffered a broken arm, leg, and internal injuries. Whistler Search and Rescue official Brad Sill said that "if it had been delayed by five hours, I think the injuries were serious enough that he would have expired."

Who says you can never hail a taxi when you need one?

See No Evil, Hear No Evil

■ Six Southampton Englishmen who held up a security van thought that they had committed the perfect crime. The robbers radioed the driver, saying they had planted a bomb in the vehicle that would be set off if they didn't cooperate. They cooperated.

In a backwoods clearing, the robbers erected lead sheeting around the truck to prevent radio signals from escaping and went

to work on the armored doors with acetylene torches. Unfortunately, the heat from the process ignited the £11.4 million in bank notes inside the van.

Not only that, but the lead sheeting didn't work. The police arrived just in time to watch the van erupt in flames. All but £1.5 million was saved. Police decided to charge the men with conspiracy to commit a robbery, since they ended up making such a farce of the escapade.

How to Speak Australian

■ The Australian Broadcasting Authority has released new standards calling for an increase in Australian content on Aussie TV. Beginning in 1998, television featuring Australian content will rise from 50 to 55 percent of total transmission time. Proposals for 100% of children's programming to be Australian and 10 hours annually of Australian documentaries was also proposed.

Honoring the Language

■ The South African Broadcasting Corporation (SABC) has promised the public that as long as "at least two Africans speak it" they will continue to broadcast in Afrikaans. Dr. Pallo Jordan, minister of posts, telecommunications and broadcasting assured parliament that the people needn't worry about the future of the language.

Beacon Hunt

■ Paul F. Masching likes mysteries. The 54-year-old unemployed electronics technician took it upon himself to hunt down an airplane door that flew off in-flight. The 400-pound door departed an American Eagle ATR-72, leading teams of aviation investigators on a search through Chicago.

Masching used his ham radio to pick up the glideslope beacons that identify a five-mile path to each of the runways at Chicago's O'Hare Airport. He said the signals led him right to the airplane's door. "I surveyed the area from the edge to about five miles off the runway. I was walking in the woods and I saw it."

American Eagle Flight 4127 lost the door about three minutes into its flight, and a flight attendant narrowly escaped begin sucked out the opening.

ARRL's Wilson Resigns

■ Citing the effects of a stroke, the American Radio Relay League President George S. Wilson III, W4OYI, submitted his resignation. Wilson had held the office since 1992, but felt that his medical condition prevented him from travelling and devoting the energy required to perform his duties. Rodney J. Stafford, KB6ZV, has been appointed to succeed Wilson. Stafford will be the ARRL's 12th president, having served as First Vice President since 1992. Rod and his wife Patricia, N6KLI, are life members of the League.

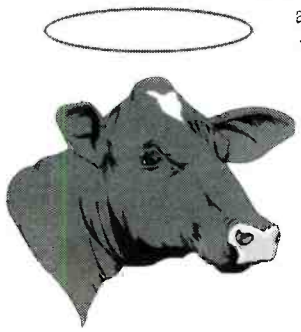
Young Ham of the Year

■ Adam Weyhaupt, N9MEZ, has been named 1995's Young Ham of the Year. Weyhaupt, 15, was selected for the annual honor from a pool of three finalists. The competition honors America's outstanding young amateur radio operator.

Weyhaupt, who lives in Alton, Illinois, was honored for his role in organizing and providing amateur radio communications during the Midwest floods of 1993 and the 1994 US Olympic Festival in St. Louis, Missouri. The runners-up for the award were 18-year-old Bryce Duncan, N0YDI, of Red Wing, Minnesota, and 14-year-old Toby Metz, KB7UIM, of Meridian, Idaho.

Leave Our Cows Alone

■ Cable News Network and India's national TV network Doordarshan recently signed an agreement to telecast CNN's round-the-clock news program on one of Doordarshan's channels. India has been somewhat touchy about opening the door to the western media so negotiations were delicate. Many in India felt that the agreement as "a blatant invitation to the Western media to project their stereotype image of India."



Finally, the day for the CNN sign-on arrived. Everyone was watching. The first story was about India's economic reform, which began by showing cows roaming on a busy Bombay street. CNN, knowing that cows are considered holy in India, wanted to begin their programming by showing the bovines. Suddenly things got hot in New Delhi. CNN, they said, was making fun of India, showing the cows to make the country look bad.

Inventor Honored

■ Al Gross, W8PAL, self-confessed addict to *MT*, was honored by Dr. Pekka J. Tarjanne, Secretary General of the International Telecommunications Union, with an honorary, permanent membership to ITU and a special medallion in recognition of his pioneering contributions to mobile, personal, wireless telecommunications now in use worldwide.

"Communications" is written by Larry Miller with help from Laura Quarantiello, Rachel Baughn, and the following readers who are hereby inducted into the Communications Media Monitoring Team: Dave Alpert, New York, NY; Ogal Preston Crews, Alexandria, VA; Harold Eads, Fincastle, VA; Simon Nellington III, Louisville, KY; R. Rogers, Vancouver, BC; Peter Smith, Los Angeles, CA and Terry Zimms, Lancaster, PA. We also consulted the following publications and organizations and we list their names in appreciation: American Radio Relay League; BBC *World Broadcast Information*, *National Scanning*, *Radio World*, and the *W5YI Report*.

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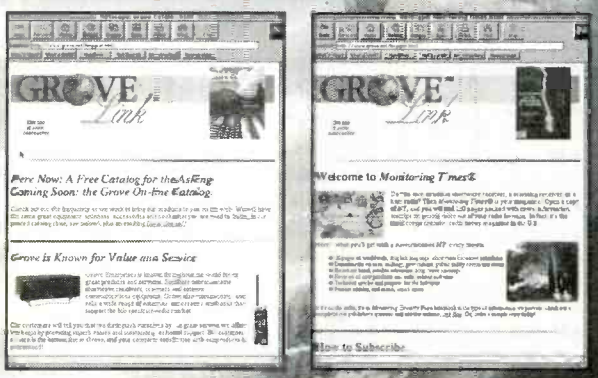

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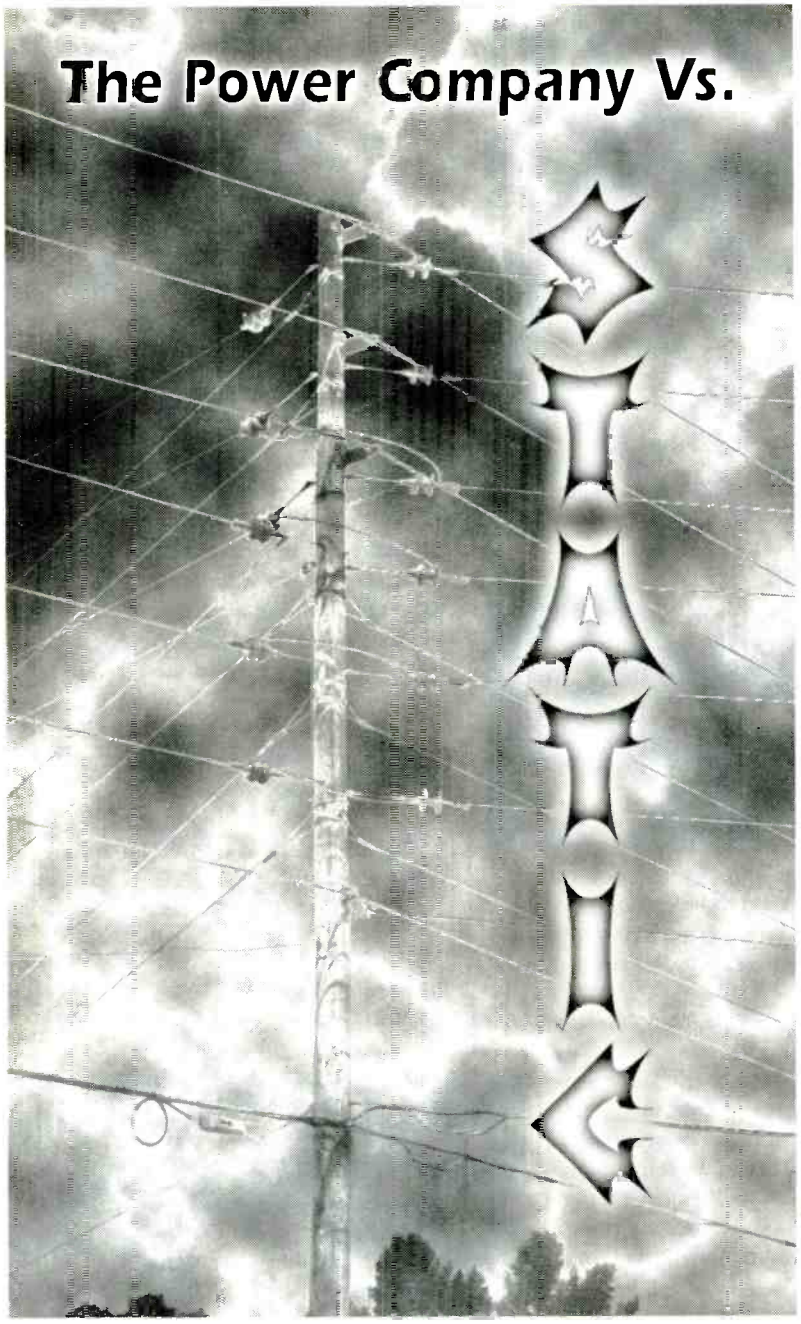


Photo by John Bailey

Zzzzzzzzzk! Hiss! Buzz!

Static.

Don't you just hate it!

It can wipe out just about any AM signal—from the bottom of the frequency barrel all the way through the short wave bands. It can be a distant hiss or lightning's powerful bursts. At its most intense it can cover the strongest local stations with an ear-splitting roar.

Story by B.W. Battin
Photos by B.W. Battin except as indicated

Even higher frequencies like the television channels, though less susceptible to static, are not immune to it. Those aggravating bands of lines or squiggles that occasionally shoot across the TV screen are visual forms of static. The problem is usually confined to the video portion of the program because it's broadcast in AM. TV audio is transmitted in FM, which is less likely to be affected by static.

It's a lot like political attack ads, right? Annoying, but you've got to live with it. Well, not always.

Static is caused by electrical disturbances, which can be produced by all sorts of things, even the water droplets in clouds, which carry small electric charges. Like lightning, that's the sort of natural electrical activity you can't do anything about. The other kind, the kind you may *not* have to live with, is man-made.

Looking for Help

My first experience with eliminating this sort of static came in September 1991. One morning I tried to tune in an AM radio station from Albuquerque, 30 miles away. What I got was *zzzzzzzzkssssss!* The station's signal was gone, obliterated. I tried other stations, getting the same result.

I presumed the problem was temporary. After all the static hadn't been there the day before, so it was probably safe to assume it would go away as mysteriously as it appeared. No such luck.

The next day it was the same. *Zzzzzzzzkssssss*, and no radio stations. At the time, I was monitoring shortwave broadcasts for *Monitoring Times*, and the constant static would have made the task all but impossible. So I called the FCC, held the phone next to the radio,

and let the man on the other end of the line listen to my problem.

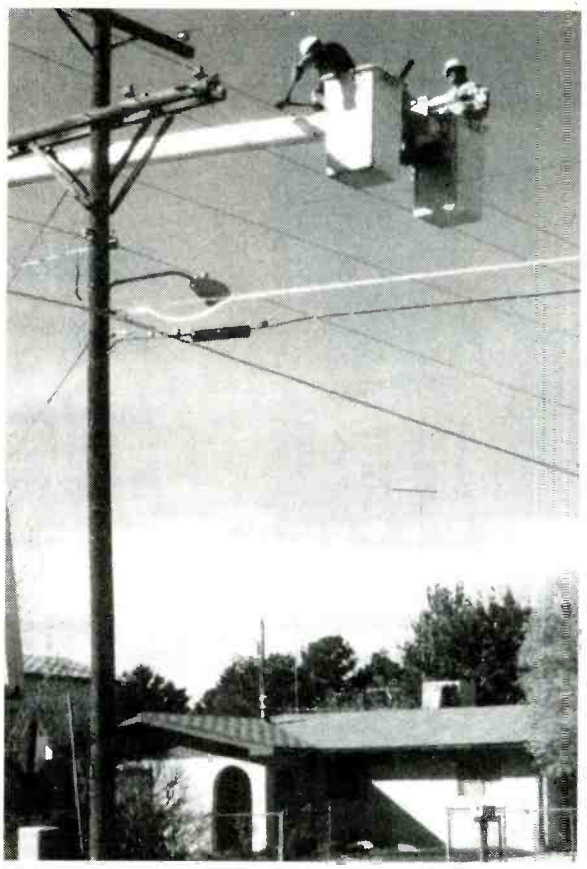
"It's the power lines," he said.

The power lines? I'd imagined one of my neighbors operating a giant electric planet-smashing machine or something. I'd never even considered the electric lines.

I asked the man at the FCC what I could do to get the problem fixed.

"Call the power company," he replied.

I phoned the Public Service Company of New Mexico (PNM) and was referred to a friendly employee named Clara Steiner. She said the first thing I needed to do was determine whether the source of the problem was something right there in my house. All sorts of things commonly found in the home are potential static makers—switches, automatic controls, heating elements—just about anything electric. Faulty doorbell transformers are always near the top of the suspect list.



Across the street from the author's home (background) workers from the Public Service Company of New Mexico search for the source static interfering with the reception of amplitude-modulated radio signals.

Steiner asked me to turn on a battery-operated AM radio and then begin switching off the circuit breakers in my service panel one at a time. If the static went away, I'd know not only that the problem originated within the house, but I'd learn which circuit the culprit was on, narrowing the search considerably.

I followed her instructions. The problem was not in the house.

Steiner had also suggested that the static could originate at a neighbor's house, but a quick trip outside with a portable radio convinced me this wasn't the case. The closer I got to the power lines, the more intense the static.

And because I live on a corner, I have power lines running along two sides of my property. They're connected. And they were both emitting static.

I realized that all those metal cables were, in effect, an enormous antenna — for the static.

Help Arrives

When I reported my findings to Clara Steiner, she dispatched a PNM crew headed by Gene Jameson, the division engineer for this area. "Loose hardware" is usually the problem, he explained. And that can mean any nut or bolt on any pole in the vicinity of my home.

The crew moved from pole to pole, tightening everything that could be tightened, while Jameson listened to the radio in his car, waiting for the static to stop. It took most of the morning. But they found the problem. A loose bolt on an anchor bracket.

Ahhhhhh. Relief.

I could again hear AM radio stations.

I could again monitor shortwave broadcasts for *Monitoring Times*.

... Time Passes

And then one day not too long ago—three years and a couple of months after the power company made the static go away—I turned on my radio in the morning, and...

Zzzzzzzzzksssssss!

It was worse than before. Not even the station with a tower a mere two miles away could get through the noise. I called Gene Jameson, who said he would dispatch a crew, but before it got here, the static vanished. I called him back, told him not to come.

The next day: *zzzzzzzzksssssss!*

I called Jameson again. And once more the static went away before anyone from the power company could get here. It did not augur well for getting rid of my problem. Intermittent troubles can be tricky.

That night I turned on the Grundig portable beside my bed, planning to listen to BBC World Service as I drifted off to sleep. *Buzz! Buzz! Buzz!* The noise was so annoying that I had to turn the radio off. In the morning, the buzzing was gone. For days the static came and went, moving from one time of day to another, roaring on one occasion, whispering on the next.

Jameson came out with a PNM crew to see what he could accomplish. Although the static that morning wasn't strong enough to wipe out the local AM broadcasters, its ceaseless growl was easily discernible between stations.

As before, only thing the PNM crew could do was start systematically tightening things and see what happened.

Why a Loose Bolt Can Be Such a Bad Thing

The problem, Jameson explained, is electrical arcing—but not the big buzzing arcs of the mad scientist's laboratory as depicted in old horror films. Despite the havoc they cause

Gene Jameson, division engineer for the Public Service Company of New Mexico, watches as workers in a cherry picker look for loose hardware that could be arcing and causing radio interference.

Workers from the Public Service Company of New Mexico try to eliminate the power-line caused static that's been interfering with the author's radio reception.

for radio listeners, these discharges are usually too small to be seen, and they normally occur in the parts of the system that don't actually deliver electric power.

"All it takes is a very small arc to make a lot of noise (on a radio)," Jameson said. "An actual short (in the system) would burn (it) out."

Simply put, the problem occurs because power lines create their own electromagnetic fields. "A bolt or a washer may not be energized," Jameson said, "but if it's in that field, it can pick up a charge and it can spark."

For there to be a spark, there has to be a gap for it to travel across, which is why loose hardware is so often the root of the problem.

RADIO INTERFERENCE CASE FORM

Case #: _____ Date: _____

Rcvd. by: _____

CUSTOMER INFORMATION

Name: _____ Home Phone: _____

Address: _____ Bus. Phone: _____

City: _____ Zip: _____

Convenient times to call on customer on site: _____

COMPLAINT INFORMATION

Equipment experiencing interference:

	Yes	No	
A.M. Radio	___	___	
F.M. Radio	___	___	
T.V. VHF	___	___	Channels affected: _____
T.V. UHF	___	___	Channels affected: _____
Amateur Radio	___	___	Channels affected: _____
CB Radio	___	___	Channels affected: _____
Stereo	___	___	Channels affected: _____
Telephone	___	___	Wired ___ Cordless ___ Cellular ___

Type of Interference:

Date interference first noticed: _____

Date interference last noticed: _____

Intermittent? ___ Constant? ___ Day? ___ Night? ___

If intermittent:

How long is each period? _____ How frequent? _____

Time(s) of interference: _____

Day(s) interference occurs: _____

Describe visual or audial interference:

_____

_____

_____

Neighbors affected? Yes ___ No ___ Unknown ___

If possible, list names and addresses:

_____

_____

Interference clear up after rainstorm? Yes ___ No ___ Unknown ___

Additional Information: _____

_____

Public Service Company of New Mexico employees fill out this form when they receive a complaint of radio interference.

It's unavoidable, Jameson said. As the system ages, it's exposed to heat and cold and weather. Things shrink and expand. Things loosen.

He said static complaints are rare; he handles about five a year. And, as Clara Steiner indicated, the fault doesn't always lie with the power lines. He's seen doorbell transformers cause the problem, and once it turned out to be the photoelectric cell on a security light. "The most interesting one turned out to be the heater on a guy's fish aquarium," he said.

Imponderables

Jameson and his crew spent about an hour and a half tightening everything they could find to tighten, but the static persisted. This time they'd failed to find the problem.

The next day it went away all by itself.

If it comes back, Jameson said he'll have to call in someone from Albuquerque, where they have radio direction finding equipment that can help locate the source of the interference. But for now the static is gone.

The first cold blast of winter has just hit.

Outside, the 7200-volt power lines serving my neighborhood spend the night in below freezing temperatures. In the morning, they're warmed by the sun. As the days pass, the poles and cross arms and guy cables and even the lines themselves shrink and expand.

And things loosen.

By Joe Adamov
Commentator
Voice of Russia World Service

I was born in Batumi, Georgia, on the shore of the Black Sea, in a bank over which flew the Union Jack (the British flag). The building was guarded by Indian soldiers in turbans. My dad was manager and had an apartment on the second floor. The area was under British occupation. I'm one hundred percent Armenian, a nation which adopted Christianity in the year 303.

Father worked in the Ministry for Foreign Trade and was sent to London for several years, where I picked up my English in a boarding school.

On returning to Moscow in 1931, I entered an American school for children of United States specialists working in Moscow. Both teachers and children were American, and my accent changed overnight.

They say life is a great thing if you don't weaken. I guess I did not weaken when both my parents suffered under Stalin's repressions. When entering the North American Service of Radio Moscow the boss told me that to work at the mike I had to be born in the United States. I "meekly" answered, "Why don't you record me and let someone listen?" They did, and an American member of the Comintern was chosen for the audition. When he heard the tape, all he said was, "What state does he come from?"

That began my career at the mike.

53 Years Later ...

The editor of *Monitoring Times* has asked me what the changes of the past years in Russia have meant to our staff on a personal level. One thing we all feel is that the buying power of our pay has dropped drastically. If before I could buy twelve pairs of good shoes on one month's pay, today I can buy only one. On the money I had in the bank after working for half a century, I could buy 22 Soviet cars. Today that money buys three silk neckties.

If you still don't understand what inflation is, perhaps this will explain it: I bought my first car in 1950 for 900 rubles. Today, according to the rate of exchange, 900 rubles is 20 cents. Did you ever see a brand new car for 20 cents? I drove it for three years without a hitch.

Perhaps the biggest rise is in the cost of real estate. My apartment—three rooms and a kitchen—went up in price 54 thousand times! That's 45 years' pay.

No, we are not hungry. We have enough to eat. But to buy something besides food is tough for most of us. Nevertheless, there are more casinos in Moscow than in all of Western Europe. And, more expensive models of Mercedes cars were sold in one year than in all of Western Europe. The gap between the rich and the average is enormous.

The Price of Liberty

Perhaps the biggest gain in recent years is freedom of speech. You'll never understand this, because you've always enjoyed it. Yes,

LIBERTY is the sweetest thing in life. In the past four years I haven't had a single word deleted from my program. That makes you forget all the hardships of life. Yes, we are free to say what we think.

Under the old system, we had to go through censorship. I've answered approximately 23 thousand questions in the 38 years I've been doing *Moscow Mailbag*. There was hardly a program where something would not be deleted, either by the editor or the censor. (Often they had to prove they were doing something.)

I once got a simple question from a student: "Who is richer—the US or the Soviet Union?" At that time, Khrushchev had promised a land of "milk-and-honey" in 20 years—that is, by 1980. Realizing that we had to "toe the line," I answered that, yes, you are richer today, but the day will come when we will surpass Uncle Sam. The censor deleted both the question and the answer. I got mad and went for an explanation.

"Where did you get the idea that they're richer?" the censor wanted to know. "It's common knowledge," I answered. "I've never heard it," he countered. "But Mr. Khrushchev said it on several occasions during his trip to the States." "But he said it there, not here." "But our papers printed every word he uttered in the States."

I had him pressed to the ropes. The only thing he could blurt out was: "Well, then my Party consciousness does not allow me to pass this." "Tomorrow I'll show you something that will make you forget your Party consciousness."

"I'd love to see you do it," he retorted.

Next day I showed him Khrushchev's "Let's Live in Peace and Friendship"—a collection of his speeches and press conferences. I pointed to the quotation "only a fool can fail to see that America is rich and powerful."

I asked, "Whom could Khrushchev have had in mind when he said that?" The censor turned green. "All right, let it go," was his verdict.

Side Benefit—A Worldwide Reputation

What makes me continue the show and not seek other, more lucrative pastures, is the fantastic response. It acts like a spur. Lawrence Magne, Editor-in-Chief of the *Passport to World Band Radio* called Joe Adamov "somewhat of a legend." Vlad Listyev, the top Russian TV anchorman, on whose program I was a guest a couple of months before he was shot, also introduced me as the "legendary" Joe Adamov.

In the past few months I've been called "Radio Moscow's priceless treasure"—even "nature's miracle"—but these are only a few out of a collection of 300 such superlatives. I keep them for self-defense, and believe you me, they've been needed.

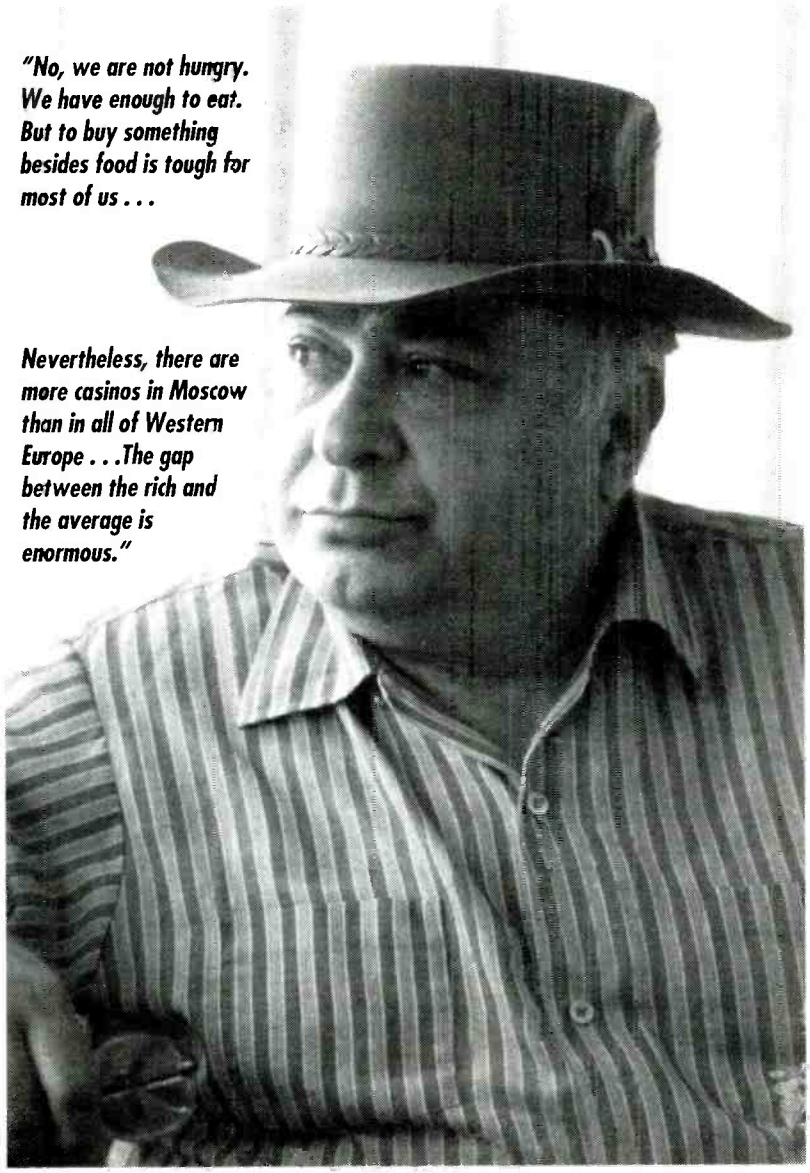
According to a Radio Moscow's letters' department poll, "*Mailbag* beat all the features of Radio Moscow English Service by 350 per cent." Dr. Kim Andrew Elliot of the Voice of America, when he was still Assistant Professor at his University, wrote to me that, according to a poll he took, not counting the DX programs, *Moscow Mailbag* was the top-rated shortwave program from the non-English-speaking world. With the English-speaking countries included it took fifth place!

In 1986 I was guest anchorman on the Mike Willesee TV show in Australia. In ten days "down under" I appeared 12 times on TV and 14 times on radio. The next year I visited them they made an hour-long documentary called "The Man from Moscow." In the past years, I've been doing an average of 100 live interviews a year from my home to stations around the world. The peak came at the showdown at the Russian White House in 1993, during which I did 31 live interviews in one day.

The Lighter Side of Broadcasting

Before I started doing *Mailbag*, I used to interview some of the celebrities that came to Moscow, among them General Eisenhower when he came to Moscow with Marshal Zhukov. General Eisenhower asked one of his aides, "Do I have to make a speech?" "No, Sir, you just take the salute." "That's good," said the General, "I hate making speeches."

At the airport I tried interviewing Adlai Stevenson, twice Democratic presidential candidate and U.S. Ambassador to the U.N.



Meet Joe Adamov in person this month in Atlanta, Georgia, at the Grove Expo. Joe is pictured here wearing his Aussie hat while visiting the land down under.

The planes warming up their engines made such a noise that we could not find a quiet spot anywhere. Finally I interviewed him in the men's washroom. Is this one for the Guinness *Book of World Records*?

In Eleanor Roosevelt's autobiography there is a picture of a young and thin Joe Adamov interviewing the First Lady. Our tape recorders were primitive at that time. I discovered the tape had gotten all torn and twisted. I caught up with her in the VIP room and told her there was too much background noise, and would she be so kind as to do the interview once again? "Certainly," she replied, "I'm ready." About twenty American and Soviet officials stood by as I did the whole thing over again.

The second time I interviewed Mrs. Roosevelt was at the National Hotel where she was staying. I showed her about 12 questions I had prepared and asked her to please delete any she did not want to answer. She said, "That's very democratic of you." And struck out two questions. After reading her autobiography I realized that she did not like us. I don't blame her. I felt she was proud when I told her that her husband had gone down in our history books as the Great American President.

I met Walter Cronkite when he was a wire correspondent in Moscow after the war, before he became *the* Walter Cronkite. After he retired I interviewed him in Moscow and remarked that America without Walter Cronkite would be like America without the Empire State Building or the Niagara Falls. He naturally protested, but I insisted it was a fact.

Vice-President Hubert Humphrey had something in common with Mikhail Gorbachev. You just couldn't stop him from talking. I asked Humphrey for a five-minute interview, and he spoke for 40 minutes!

When interviewing Ed Sullivan in Montreal at Expo-67 for our TV I had to call the police to hold the crowd back. He asked to see our national dancers in the concert hall. The moment we walked in, the audience spotted him and kept clapping and shouting. I got tired of this and said, "Just follow me." We climbed onto the stage (which caused a burst of applause), but we disappointed the audience by walking behind the scenes where he could not be seen. I brought out two chairs, and he stayed to the end of the show.

I told Bob Hope there must be many jokes connected with his name. "Oh, yes," he replied, "quite a few." "What do you think of this one? Where there's laughter there's Hope."

Pyatniskaya 25, headquarters of Voice of Russia as well as a couple of independent radio stations.

"Hey," said Bob, "Give me some more like that, and I'll take you on."

J. B. Priestly, the eminent British playwright and terrific public speaker, asked me before our interview, "Is this room bugged?" "Sure," I said and pointed at the mike on the table!

I felt I was walking side by side with History, when at Expo-70 in Japan I acted as host to Charles Lindberg, who flew across the Atlantic in 1927 on the "Spirit of St. Louis."

Years may go by, but the memories linger on.

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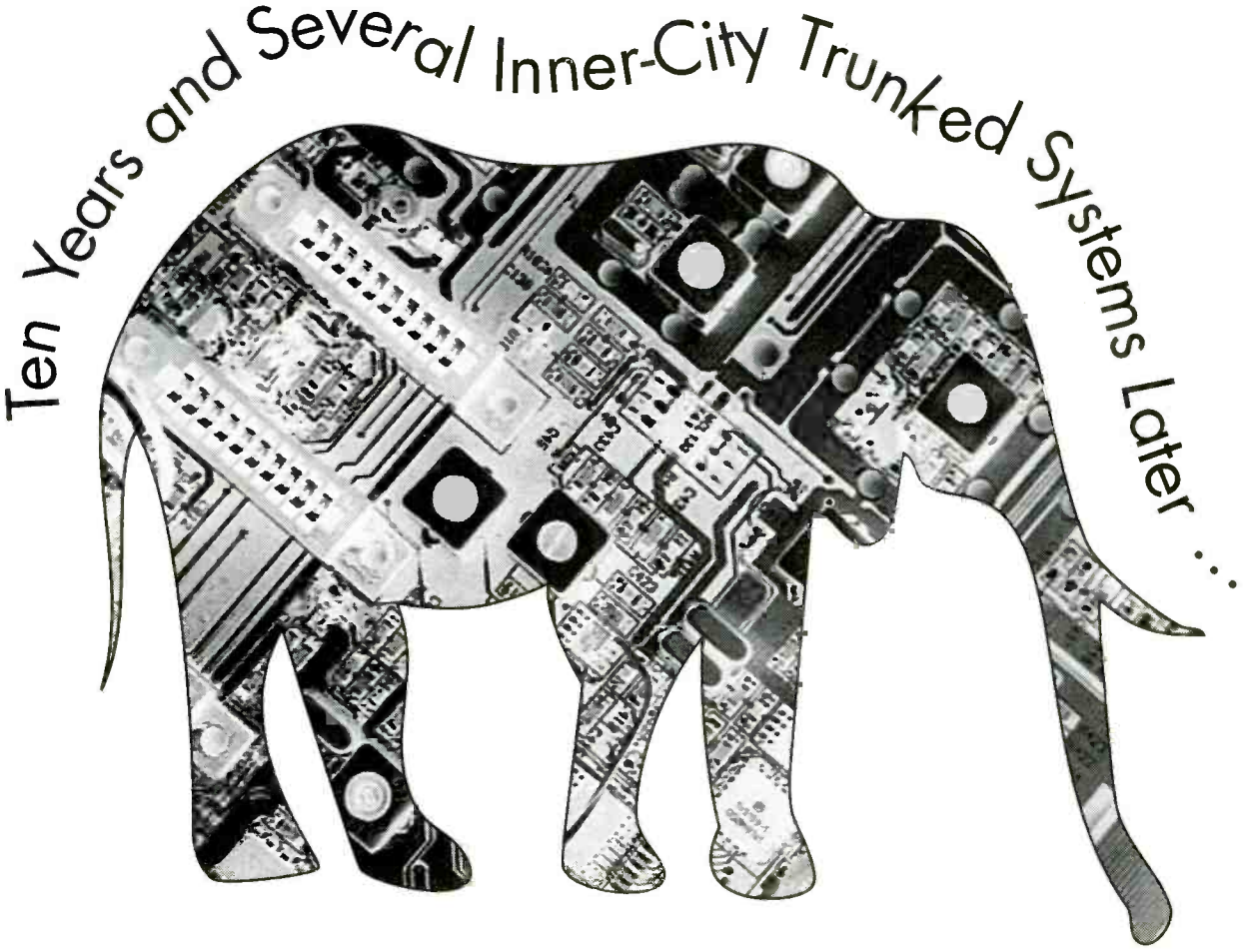

Scanner Listeners Keep Pace with Technology

By Alan Henney

Often considered a trend-setter in the field of public safety, the City of Miami was one of the first to develop an amphibious fire engine and to transmit electrocardiograms using two-way radios. But in October 1985, the City of Miami stunned scanner enthusiasts when the city's agencies started communicating on an 800 MHz trunked radio system—a revolutionary communications system, which sounded ideal in theory, but had never been built on the large scale required to meet the demands of a municipal government.

Business radio users had leased trunked systems for years, but it wasn't until Miami installed its trunked system that scanner enthusiasts began to look toward the future with increasing pessimism.

Since Miami's trunked system went online, hundreds of municipalities across the country have installed similar systems. In a few cases, members of the press who are willing to spend the money are the only "outsiders" to officially receive permission to own a radio on a municipal trunked system. Taxpaying scanner enthusiasts, unfortunately, are rarely provided an opportunity to officially purchase a radio which will track conversations on the same system.

Efficiently monitoring the radio traffic on Miami's trunked radio system with a mere scanner is difficult, and during peak periods, almost impossible. Some skilled scanner enthusiasts, who got fed up with trying to monitor trunked systems like Miami's on a scanner, (which included the chore of locking out the daily data channel), pioneered their own crusade to keep pace with the new technology. [*Ed. Note: See this month's Scanning Report for some tips on how to monitor trunking systems using one or two scanners.*]

As cable TV hackers learned, the best way to beat a system is to use the same equipment the system itself uses and modify it as necessary. The process starts with the purchase of an appropriate Motorola radio, programming software, and cables—the same (or similar) equipment as used by the City of Miami. All of this can be purchased openly and legally.

One necessary ingredient which hackers cannot purchase from Motorola is the coveted information required to program the radio. Persistent hackers have, however, been able to obtain this information from various sources.

Some five years ago, after spending about $3,000 for equipment, a few die-hard scanner listeners became the first outsiders to monitor the fledgling public safety trunked systems just as a firefighter or police officer would do—except with more capability. Using Motorola radios such as the STX, Syntor, MaxTrac, Saber SI, MTS 2000, and MTX

Continued on Page 18

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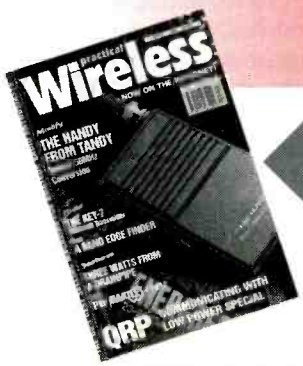

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8000, these scanner buffs can monitor both police and fire talkgroups (or subfleets) on the same radio, select scan lists, and customize radio options as they desire. Scanner buffs with such radios monitor talkgroups on public safety trunked systems as if they were conventional (non-trunked) radio frequencies.

After losing numerous jurisdictions to trunked radio systems across the nation, many loyal scanner listeners are, like their colleagues in South Florida, keeping pace with the technology. Since the late 1980s (when reports of hackers programming phantom STX radios first surfaced), equipment, software, and the technology have become more affordable and more available to hackers and other outsiders. Now, if they have the money and access to the technology, die-hard police and fire listeners across the nation can possess Motorola trunked radios solely for monitoring purposes. (We'll discuss the legal issues later.)

How do they do it?

The process starts with procuring the right 800 MHz radio. Hamfests offer good opportunities to purchase used Motorola equipment at reasonable prices. Until recently Motorola's STX was the radio of choice, because it was the most common portable radio used by Motorola public safety, trunked systems.

The price for a used working STX usually ranges from $400 to $900, although some have been purchased for as low as $150. The biggest drawback of the STX is that it only scans five talkgroups, all of which must be within the same system.

Not just any Motorola STX radio will work, however. Motorola produced numerous models of the popular STX portable—each designed for a specific trunking protocol and version (Privacy Plus or Smartnet). Some STX radios are designed for conventional operation only. For the purpose of monitoring public safety systems, the ideal STX radio to obtain is the 821 enhanced, which supports Smartnet I, II, and IIi (in addition to conventional operation).

Motorola trunked systems fall into two broad categories: Privacy Plus for the private sector, and Smartnet for public safety users. While similar to Privacy Plus, Smartnet offers several features which are geared toward public safety, such as faster access, dynamic regrouping, emergency call, multiple priority access levels, and others.

The original Smartnet system, known as SmartNet I, was popular in the late 1980s and early 1990s. SmartNet II is the current system. SmartNet IIi is a hybrid between the two. System IIi allows radios in the trunk to use talkgroups (or subfleets) from either system I or II.

Now that STX radios are out of production and used STX radios are in short supply, finding an appropriate radio with usable software may be a difficult task. Especially with numerous digital radio systems in the planning stages, a used digital Saber Astro might make a good candidate for monitoring both digital and analog systems in the future, assuming the software is available. Unlike the STX, the newer radios scan multiple talkgroups across numerous systems, although the programming is more involved. The Astro Saber may be one of a few viable alternatives for scanning until a digital scanner hits the market, if it ever does.

The MTX 8000, which is only available in Privacy Plus, is a popular radio used by hackers to monitor public safety trunked systems. Smartnet is similar enough to Privacy Plus to yield adequate results using the MTX 8000. Prices for models B5 and B7 of the MTX 8000 start at $700 (new).

How they make the software work

Motorola sells the STX software for $350. Virtually anyone can purchase the software from Motorola. Programming the radio, however, is a different story. The STX software can read conventional and trunking data from an STX. But as the program comes, it can only program the radio for conventional channels or modify any existing trunking data currently in the STX (i.e., only for the trunked system for which it was previously programmed). Data for other trunked systems cannot be entered, nor can the software (by itself) be used to copy the existing trunking data into a different radio.

Using the STX software, new trunking data can officially be programmed into the radio in only one of two ways. (The programming process for the STX radio is fairly typical of Motorola's other 800 MHz radios.) In the first method the person doing the trunked system programming downloads what is known as the "TCMS" (trunking control management system) file directly from Motorola. The TCMS file contains the trunking data for one specific system and only allows programming of that one system through the STX software. Conventional channels can be programmed at any time.

The second method makes use of a "system key." The system key attaches to a PC's serial port and permits the programmer to program trunking (and of course conventional) data into a radio for any system for which the key allows. System keys are available exclusively through "inside sales" of Motorola and are usually only sold to owners of Motorola trunked systems. Hackers reportedly modify the software or hardware to bypass the system key and thus gain full programming privileges.

Especially coveted by hackers are copies of the in-house "lab" software Motorola itself uses to create TCMS files and program trunked radios. Using the lab software, no system key or TCMS file is required to program trunked data into a radio.

How the radio is programmed

Once a hacker has the radio, cable, interface box and usable programming software,

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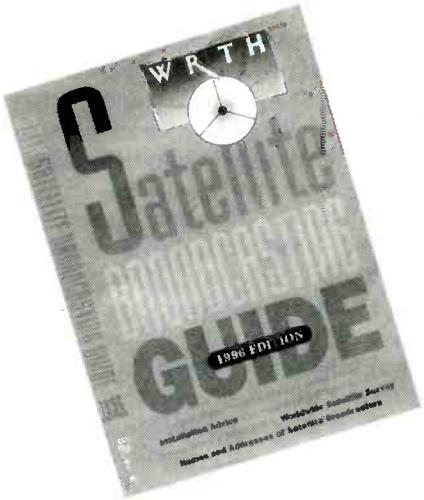

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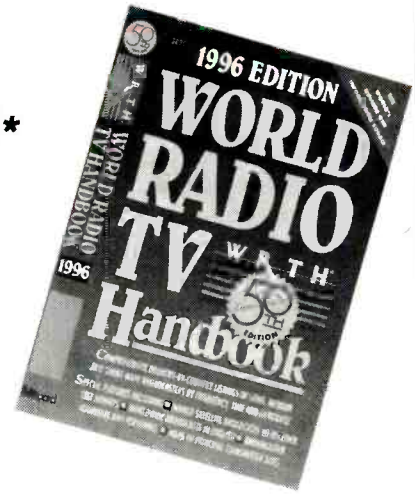

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getting the trunking data remains the final obstacle. Often the quickest and easiest way is to read the data from an active radio. However, to monitor both police and fire departments this process requires obtaining a radio compatible with the available cables and software from each department.

Moreover, the talkgroup configuration of trunked radios often varies greatly, even within an agency. A fire chief, for example, likely has access to several talkgroups which most firefighters do not have in their radios. So getting the complete data directly from a source within the municipal government or another person who has access to the master TCMS file is most desirable.

When programming, the radio hackers normally change the radio's identification number, also known as an individual ID (since each portable or mobile radio is often assigned a specific number). If the data was downloaded from a borrowed radio, this helps protect the source of the information.

Intruder Alert

Using the same radios as the trunked system itself uses does have its drawbacks. Disabling the transmitter is important. Should

MaxTrac 100

the radio's push-to-talk (PTT) switch accidentally get keyed, the radio will identify itself to the system which it is monitoring. An unknown or duplicate radio ID would easily tip-off an alert dispatcher that a phantom radio is monitoring the trunked system.

To prevent an accidental keying of the radio some hackers tape popsicle sticks around the radio's PTT switch. But this may not be enough to avoid detection by the system. Depending upon how the system is configured, a dispatcher can query a particular talkgroup and attempt to force all radios to identify. Again, a duplicate or unknown radio ID would stick out—especially if the ID belonged to a public works vehicle which was monitoring a police channel!

Through a procedure intended for emergencies, some Smartnet systems can remotely turn on the transmitter of an individual radio so that the agency can monitor what's happening in its vicinity. So hackers may find that disabling the transmitter is essential to maintaining anonymity.

Once the system operator learns of a duplicate or fake radio designation, the phantom radio can be "put to sleep" by the system operator. "Waking up" the radio is a difficult task for hackers and generally requires the replacement of a $300 controller board. The system operator, however, can easily wake up the radio by sending a command through the system controller.

In Miami, where unauthorized cloning of the city's trunked radios is a common occurrence, the system operator routinely queries the system for security breaches. Technicians reportedly discover several fake or duplicate radio designations each month. In some cases the radio shop accidentally programmed a radio with the wrong designation—but not always.

Even disabling the radio's transmitter may not be enough to protect a phantom radio. Broward County, Florida, one source warns, is in the process of implementing a complex system to deactivate phantom radios. Over a period of several days Broward County plans to "put to sleep" all invalid (unused) radio IDs. This procedure will supposedly be repeated on a regular basis in an attempt to discourage hackers from monitoring the county's trunked system.

Trunked System Personalities

Programming a trunked radio is much different from programming a conventional synthesized two-way radio. Trunked radios have personalities: the STX allows for as many as 96. Each personality can contain a single conventional channel (repeater or simplex), or a trunked system fleet with up to 16 subfleets. The personality number often corresponds to the designation referenced on the radio. In Arlington County, Virginia, for example, talkgroup "1-Adam" is the fire dispatch channel (also simulcast on 154.13). The "1" is the personality/fleet number and the "Adam" is the subfleet (talkgroup).

In lieu of a frequency, each subfleet is assigned a unique three-digit hexadecimal (base 16) number. A failsoft frequency, however, may be assigned to each subfleet (or the entire fleet) for emergency use, should a central site controller malfunction. While in failsoft mode, frequencies of the trunked system revert to conventional repeater channels.

Here is an example of a generic fire personality (fleet #1 with 12 subfleets). Each agency on the trunked system, like the fire department, would likely have at least one personality/fleet configured for its own needs. Additional personalities could contain a conventional repeater or simplex channel or additional fleets for the same department.

Hypothetical Fire Personality #1

Tlk Grp	Failsoft	Sub Name
A ... 300	859.9875	DISP (AKA "1-A")
B ... 303	859.9875	OPS1
C ... 306	859.9875	OPS2
D ... 309	858.5875	OPS3
E .. 30C	858.5875	CMD1
F ... 30F	858.5875	CMD2
G .. 312	857.9875	CMD3
H ... 315	857.9875	ADMN
I 318	857.9875	FPRV
J 31B	856.5875	FINV
K ... 31E	856.5875	EMS1
L 321	856.5875	EMS2
M X	[unused]	
N X	[unused]	
O X	[unused]	
P X	[unused]	

The first column is the subfleet (talkgroup) letter designation, which is followed by the subfleet's unique hexadecimal code. The hexadecimal codes used in the above example appear in increments of three, starting with 300—although nearly any hexadecimal number from 0 (zero) to FFF could have been chosen in any order as long as each was

unique. In the third column is the failsoft frequency, followed by the subfleet's name which appears on the radio's LCD.

Individual voice frequencies used by the trunked system are not programmed into the radios—only the four data channels are. In theory, the central controller can dynamically assign virtually any of several hundred 800 MHz frequencies to a talkgroup as required. In this manner new trunked voice channels may be added or removed without recalling the radios for reprogramming.

Legal Ramifications

Motorola's Master Radio Service Software license agreement states that its software and archive (data) files contain "valuable proprietary information" as well as Motorola trade secrets. The license prohibits unauthorized dissemination, distribution, modification, reverse engineering, and disassembly of Motorola software or archive files. Federal copyright statutes provide Motorola with additional protection against unauthorized distribution or modification to its software and archive files.

The legal action Motorola has pursued against Francis J. Harris (see *MT*, Nov 1994) demonstrates how seriously Motorola views abuse of its software and equipment. Harris told the court he programmed the trunked radios to research his book of radio frequencies and communications techniques used by various law enforcement agencies. The data, codes, and equipment he used to program the trunked radios are available on the open market, Harris said. "The trade secrets," he stated, "are not as secret as Motorola claims they are."

As one of the most popular portable trunking radios ever made, the STX (left) has also been the popular choice of hackers since trunked systems started. Shown at right is the Saber synthesized handie-talkie.

Motorola charged that Harris distributed reprogrammed trunked radios and that he threatened to publish proprietary trunking information which would allow other radio hackers to tune in to law enforcement radio communications which Motorola indicated are otherwise secure. Motorola attorneys also told the judge that Harris could use his reprogrammed radios to cut into emergency communications networks, endangering public safety.

Motorola assures local governments that its safeguards make the company's trunked radio systems secure and resistant from hackers such as Harris. Motorola also offers rewards of up to $10,000 for the successful prosecution of anyone caught copying, modifying or otherwise illegally using its software or hardware.

So far, Motorola's tight safeguards and various federal laws have been unable to stop determined hackers from obtaining the data and technology necessary to program their own trunked radios. As secure as the process appears, it is vulnerable to clever hackers, especially those who are proficient in assembly language programming, and individuals with good connections.

What's the Future for Scanning?

What has become the inexpensive and versatile scanning receiver may soon be a treasured antique. As we approach the turn of the century with both trunking and digital communications systems threatening the future of scanner listening, die-hard hobbyists continue to aggressively pursue their hobby—which is becoming both more expensive and ever more challenging. Changes have occurred so rapidly that many scanner buffs wonder what the future could possibly have in store. While no one knows for sure, one thing is for certain: only time will tell.

[Ed. Note: We'll have more on these issues in a feature coming next month.]

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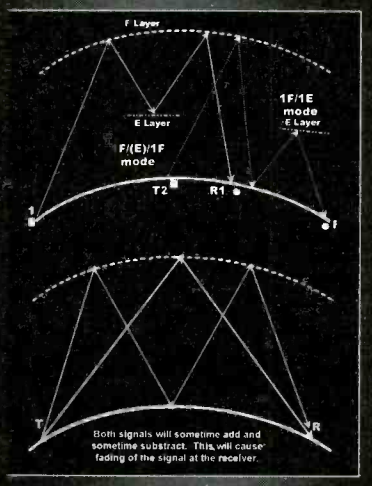
Alan Henney is the general editor of the Capitol Hill Monitors newsletter. His e-mail address is henney@gwis2.circ.gwu.edu

Propagation Modes from ELF to SHF



By Jacques d'Avignon

You can hear it just about anytime, anywhere in the world: "This is London calling. You are tuned to the Pacific Service of Radio Australia." So, given the distances involved and the earth's curvature, how do they do that?

Any time you tune your shortwave receiver across the various shortwave bands, "London calling" is the type of announcement that you will hear on the hour and the half hour. Occasionally you will also hear some more exotic announcement in unusual languages. Since radio waves travel in a straight line and the Earth is round, how do these transmissions reach you halfway around the Earth?

Radio waves travel through the air (propagate) in several different ways. Typically, a propagation mode that works very well in one part of the radio frequency spectrum will not necessarily work well, if at all, for other frequencies. Let's make a list of the main modes and then we will discuss their uses and limitations. The following are the most common modes of propagation.

Ground Wave Propagation: mostly encountered in the low frequency (LF) beacon and in the medium frequency (MF) broadcast band area of the spectrum.

Line Of Sight (LOS) propagation: the preferred mode of propagation for very high frequency (VHF), ultra-high frequency (UHF), super-high frequency (SHF), and extra-high frequency (EHF) bands.

Ionospheric refraction (reflection): the "normal" propagation mode for the high frequency (HF) part of the spectrum. In certain very specific circumstances, this mode can function as high as 50 MHz.

Near Vertical Incidence Skywave (NVIS): special ionospheric propagation mode used in the lower HF band, 2 to 6 MHz (called the Tropical Bands), utilizing the ionosphere to reflect an HF signal for communication purposes inside the "skip zone."

Ground Wave Propagation

The mode that the AM broadcast stations use to reach their audience, the ground wave will hug the ground and reach out from the

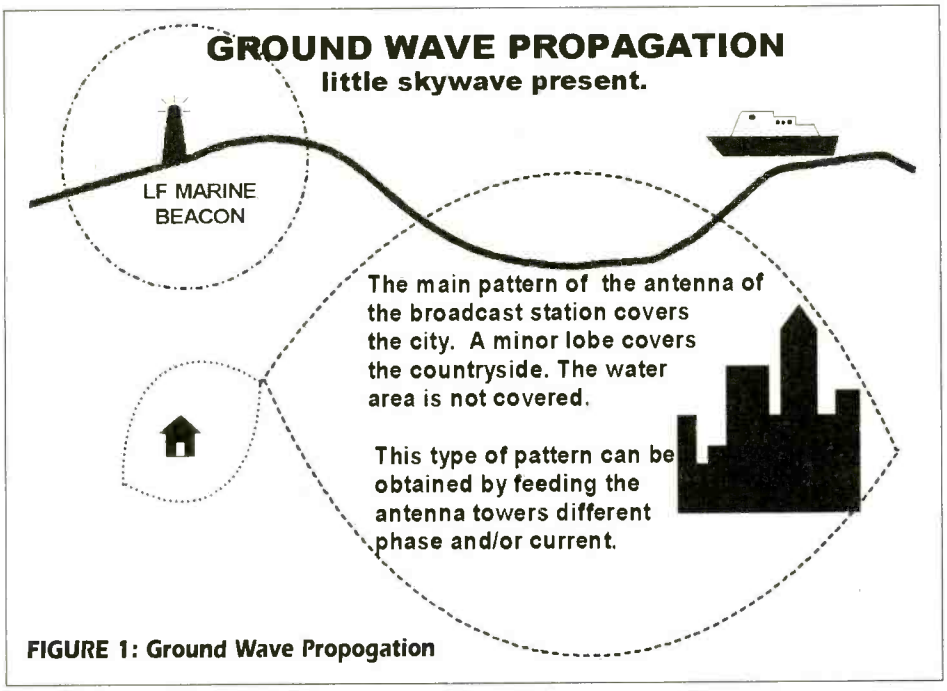


FIGURE 1: Ground Wave Propogation

transmitter site, especially in the daytime. The radiation pattern can be modified by using more than one tower so that the waves will travel further in certain directions and be heard only faintly in others. Often, the day and night patterns are different in order to protect other stations on the same frequency but geographically far removed. Broadcast stations try to have the least amount of skywave component in their signals: their market is close by and most of the power should be directed in the ground wave component. (Figure 1)

The marine and/or aero beacon stations also use this type of propagation. Their signals are designed to be used close to the station. But even with the special antenna system used by these stations, it is practically impossible to remove all the sky-wave components of these signals. Thus, LF beacon signals are occasionally heard very far from their intended target.

Another major user of ground waves is the GWEN system (Ground Wave Emergency Network), installed and operated by the USA armed forces in the event the ionosphere should be disrupted by a force such as a nuclear bomb. This system operates in the vicinity of 160 kHz area of the spectrum.

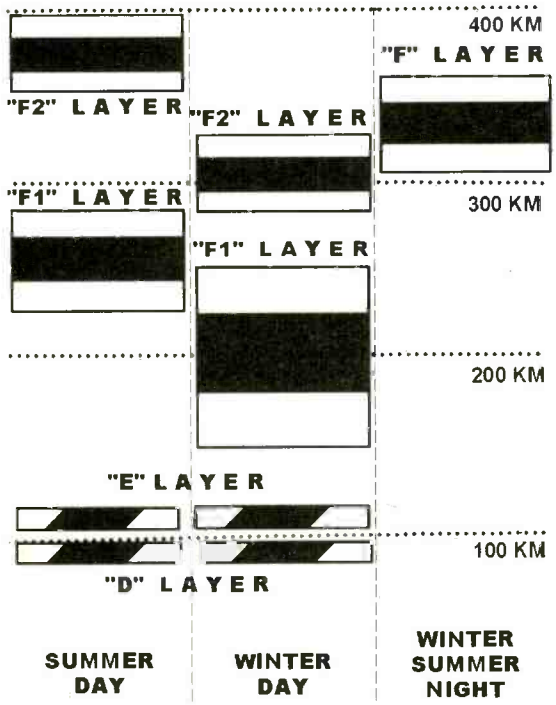
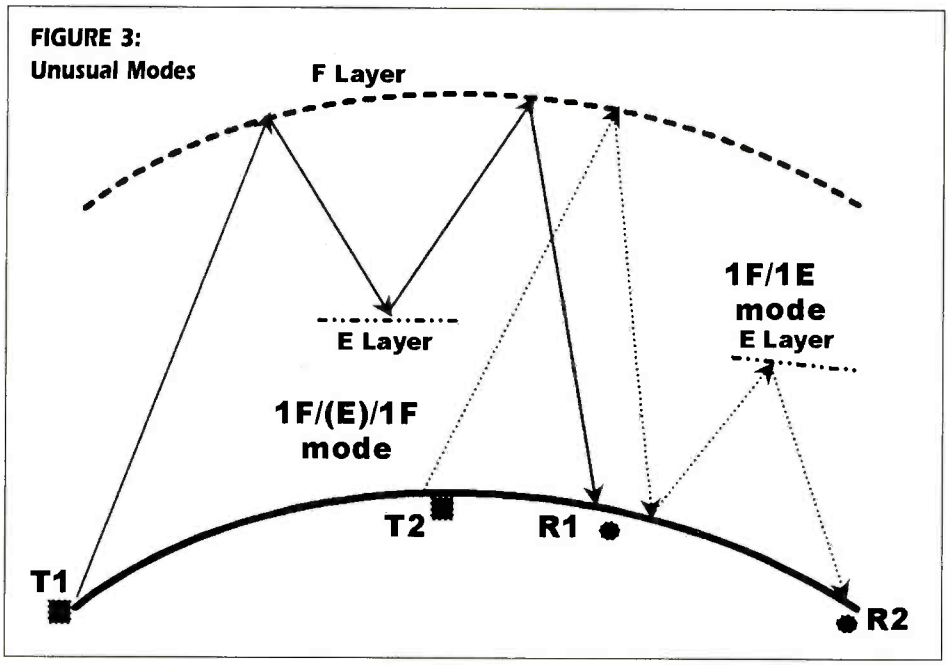


FIGURE 2: Ionospheric layers, simplified

Line Of Sight

This is the normal mode for FM/TV broadcasts, microwave networks, satellite up and down links, and most of all, the transmissions above 50 MHz, including radar. In this type of propagation, both transmitter and receiver have to "see" each other directly or indirectly. This is why your scanner antenna should be installed as high as possible.

Indirect contact between the antennae can be accomplished, in the case of a microwave network, by bouncing the signal off large metal plates, or a mountain side, so that the signal will turn corners and be picked up by another relay site. The most interesting example of this type of installation that I have seen is located along the Alaska Railroad south of Anchorage. They found it



easier to use this mirror system to turn corners than to build additional sites in very rugged terrain!

This type of propagation is normally immune from the weather problems at the low end of the range, but as you move up in frequency, you will encounter absorption by rain, fog, and snow. As you reach the upper limit of the microwave spectrum, most of your power will be absorbed by the water vapor in the atmosphere in the same manner as your broadcast ground wave signal will be absorbed by jungle vegetation.

■ HF ionospheric refraction.

This is the normal propagation mode that will carry shortwave transmissions to far places. Around the globe we have a few ionized layers that can refract the HF frequencies. The nature of these layers and how well we can use them to refract the HF waves are influenced by (1) the daily state of the sun, (2) where we are located in the sun's 11 year cycle, and (3) the time of day, plus a few other variables. The number of layers and their respective altitude vary according to the time of day and season of the year. Incidentally, the time of day referred to is the time of day halfway between the transmitter and the receiver, as it is here that the signals will normally be refracted on the way between the transmitter and you!

During the daylight hours, the ionosphere is comprised of four layers: D and E located below 100 kilometers, F1 and F2 between 150 and approximately 300 kilometers. There will be a difference in altitude for each layer between winter and summer. At night, no matter what the season, the D layer disappears, the E layer becomes very weak, and the F1 and F2 layers combine into one single F layer located between 300 and 400 kilometers. (Figure 2)

Refraction by the nighttime F layer is responsible for most of the signals that we hear from around the world, and that includes the signals received from the AM broadcasting stations and from aero/marine beacons that have very little skywave components in their signals. Obviously, this layer is the mirror that lets us hear the international broadcasters' message on shortwave. However, because of the geometry of the signal path in this type of propagation, a "skip zone" extends between transmitter site and the first bounce back to earth. There is a mode (NVIS) that will fill this void, which we will examine later.

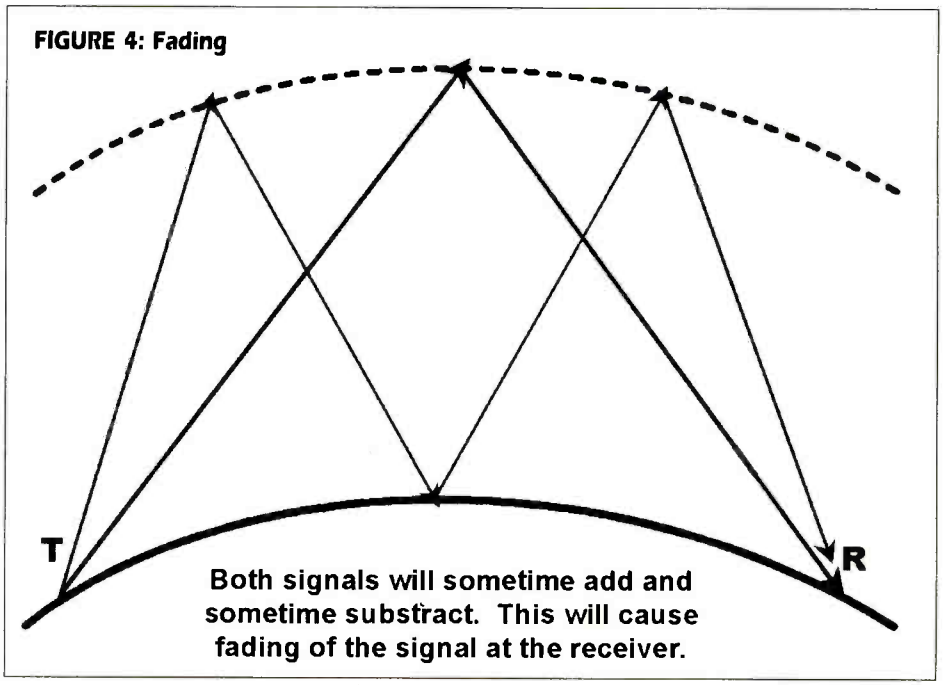
During the day, the D, E, and F1/F2 layers are responsible for the refraction, but it is difficult to differentiate exactly which layer does the actual refracting on a specific path. It is possible that the signal is reaching you by refraction by more than one layer; this will cause some unusual audio effects, for which there is no easy fix.

Simple refraction schemes such as 2F, 2E, 1F, etc. are common. Some most "interesting" schemes such as 1F/1E/1F, 1F/(E)/1F can also be present. (Figure 3) The amount of refraction and how the wave is refracted does have a great influence on the quality of the signal that will reach you. A good example of the effect of such composite refraction schemes is fading.

■ Fixes for Fading

Among many possible causes, fading can be the result of the same signal arriving by two different routes: an F and an E layer refraction, for example. Or, the signal may be refracted by one layer, but take two different paths, such as 1F and 2F, thereby phasing itself in and out. This can be caused by the transmitting antenna's wide beamwidth where

Continued on Page 26



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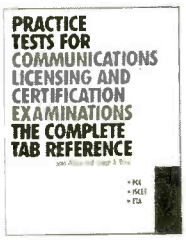

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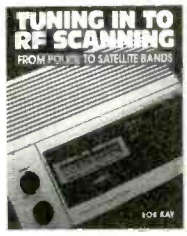

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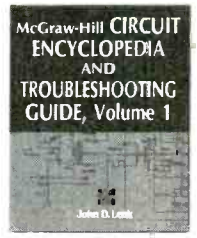

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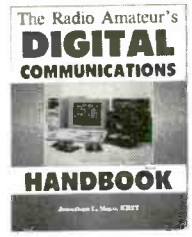

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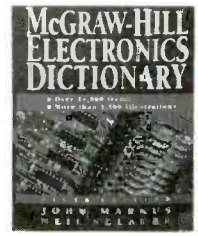

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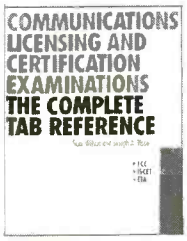

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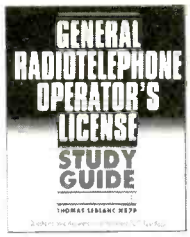

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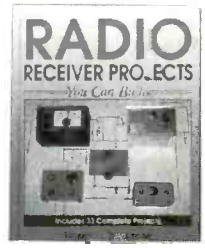

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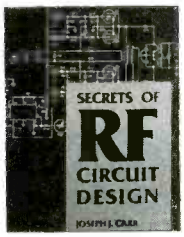

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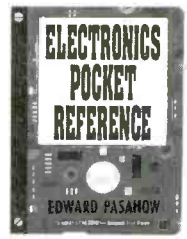

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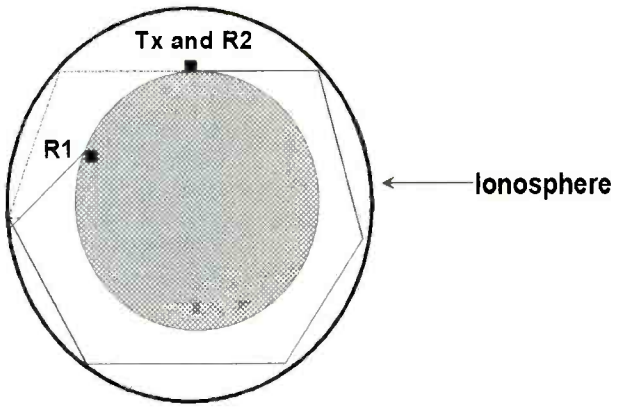
some of the energy is broadcast at a low angle, giving a 1F path, while some energy is radiated at a high angle for a 2F route. (Figure 4)

The first type of fading is very difficult to avoid at either the receiving or transmitting site. The second situation could be helped at the transmitter site by using an antenna with a very narrow beamwidth, thus concentrating the maximum energy at a specified radiation angle. But one of the most effective cures to fading is diversity reception.

FIGURE 5: Chordal Propagation



The signal transmitted from "T" can be received at "R1" without a single bounce off the earth. The same signal can also be received at "R2" after a trip around the world. At "R2", the reception delay was measured at 138 milliseconds. If there had been 35 hops, the delay would have been measured at 160 milliseconds.

Diversity reception is an old technique used to reduce the problems of fading on shortwave. This technique was used on a large scale when many of the overseas telephone calls were made on HF circuit. (Now, don't say: "That was way before my time!" because this technique is still being used today!) Two of the most interesting diversity techniques are frequency diversity and space diversity reception.

In both types of diversity reception, it is necessary to feed the output of two receivers into a polling device that will feed the speaker/line the best signal. The frequency diversity technique relies on the fact that fading does not occur simultaneously on two frequencies separated by just a few MHz. While the signal level is dropping on one frequency, it is rising on the other frequency. Space diversity uses two antennae separated by 10 to 20 wavelengths, and operates on the principle that the same frequency will not fade at the same instant in both antennae.

There are limitations to the frequency diversity system when it is used for high speed RTTY or facsimile. There may be enough time difference between the two signals (if one is a 1F and the other is a 2F signal, for instance), to cause major distortion problems in the signal being fed to the decoding device.

In space diversity one limitation is the space requirement for the installation. You need a lot of real estate to install all your antennae. This could be very expensive, especially if you are using rhombic antennae that could already measure 5 to 10 wavelengths!

Divergent Paths

As a subset of the ionospheric propagation mode, three types of "unusual" propagation geometry are worth our attention. These three modes are: chordal propagation, ducted ionospheric propagation, and near vertical incidence skywave (NVIS).

In my listing at the beginning of this article, I have specifically separated NVIS because it is a mode that is much used and well understood. The two other subset modes—chordal and ducted—are not as well understood and do not appear to have any special use.

The chordal mode is graphically described in Figure 5. We know that there are no ground reflections along the path, as the delay is only 138 milliseconds between transmission and reception after the signal has made a full trip around the world. If there were multiple hops along the way, as expected in a normal ionospheric propagation mode, the delay would be at least 160 milliseconds.

This type of propagation is very similar to sound propagation along the vaulted ceiling of certain cathedrals. You speak facing the wall, and across the church a person can hear what you are whispering by listening to the wall! Your voice is carried along the vaulted ceiling, because no one under that ceiling can hear what you are saying.

The ducted mode, Figure 6, apparently occurs most often at frequencies between 13 and 18 MHz, and the conditions for insertion and extraction of the signal to utilize the mode are fairly stringent. Some research was done on this mode in the 1970s, but it does not appear as if there is any viable use for this mode nor even a good explanation of how it occurs.

Figure 7 describes graphically how the Near Vertical Incidence Skywave (NVIS) works in practice. This mode carries other names also: showerhead mode, district mode, and the tropical mode. The origin of the name "showerhead" is obvious: the signal is sent

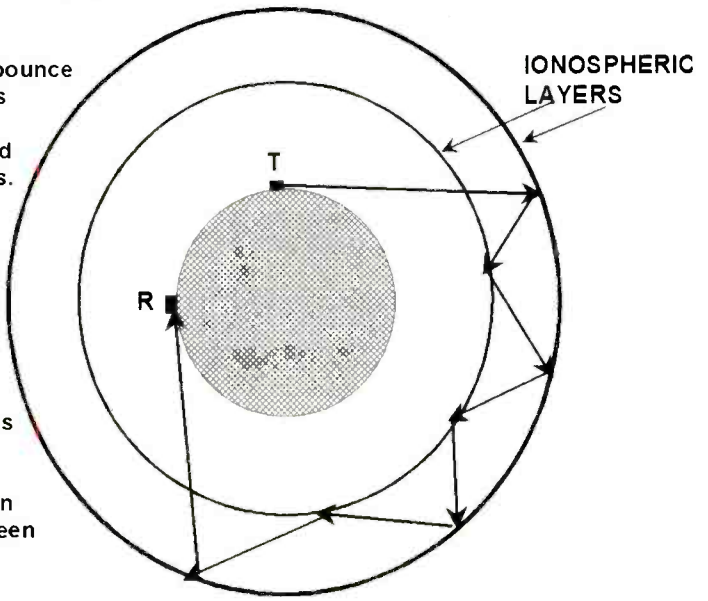
FIGURE 6: Ducted Propagation

The signal will bounce between various layers of the ionosophere and within the layers.

No known commercial use for this type of propagation.

Difficult to achieve and to predict, but does occur regularly.

Little attenuation measured between "T" and "R".



straight up and comes back down to earth like the water from a showerhead, scattering in a tight circle around the transmission source.

The name "district" is used to describe the mode in Australia, and comes from the fact that it can be used to communicate on HF within an administrative district, which is smaller than a province but bigger than a state in the US (excluding Texas and Alaska!). The Australians outside the larger populated centers depend greatly on HF communications in their daily life and much of the research on this mode was done "down under."

NVIS is also called the tropical mode, as it used for broadcasting in the "Tropical Bands" of the HF spectrum. It is virtually impossible to use ground wave propagation broadcasting in a tropical environment. The vegetation would absorb most of the radiated power within a few miles of the transmitter, so the only recourse is to use HF in the NVIS mode to reach the audience, which is usually scattered over a fairly large geographical area.

However, the NVIS signal is not necessarily confined to the immediate vicinity of the transmitter. The signal will, at times, be heard halfway around the world. For example, just think of the African, South American, and Australian stations in the tropical bands that can be heard in Eastern North America, especially during the northern hemisphere winter!

NVIS has many uses besides being utilized for tropical broadcasting, but it also has some limitations. The main limitation is that the frequency has to be fairly low; normally the frequencies used are in the 2 to 6 MHz area of the spectrum. Any frequency higher than this will result in the signal being lost in space, as the ionosphere would be transparent at such high angle of incidence.

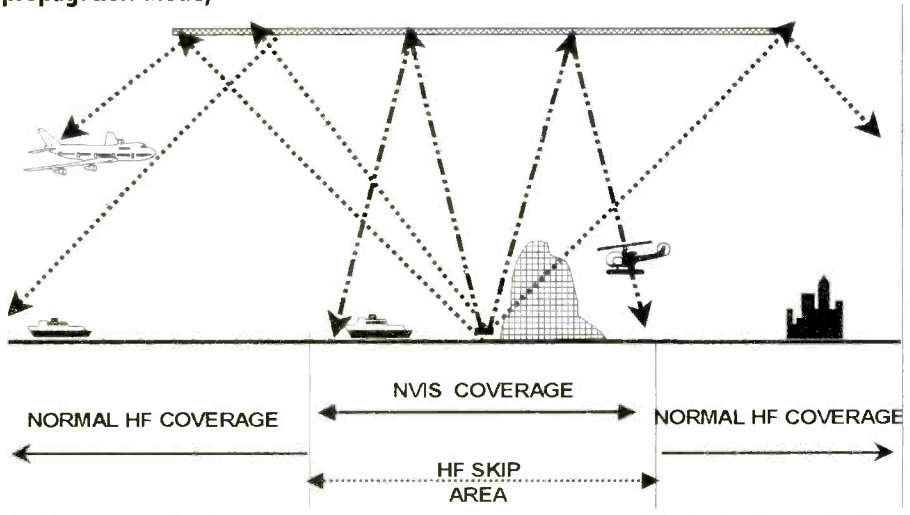
The very high angle of radiation required of the antenna is another limitation. Without it, the signal will be directed too far away from the vertical and will behave as a normal HF transmission. An antenna designed for DX—for example, a vertical quarter wavelength—will not produce the proper pattern for NVIS operation. The simplest antenna for this propagation mode is a horizontal dipole erected about 1/4 wavelength above the ground.

One of the principal uses of NVIS is for communication with ships, helicopters, or aircraft working within the "skip zone" of HF but outside the VHF/UHF line-of-sight path of the coastal or base station. Providing reliable communication with temporary survey camps in remote areas is another use.

There are other exotic propagation modes that have not been discussed here, such as meteor scatter, auroral backscatter, sporadic E, VHF ducting caused by meteorological conditions, and a few more bizarre modes. It should also be remembered that there are no strict barriers between the various propagation modes and at times there will be some overlap between them. The best example of this is when you hear 50 MHz transmissions on your scanner coming from South America, and sometimes from Africa. This should not happen if we look at the theory—50 MHz is at the low end of the VHF range in the spectrum where propagation should be line-of-sight only. Yet, we still hear those transmissions!

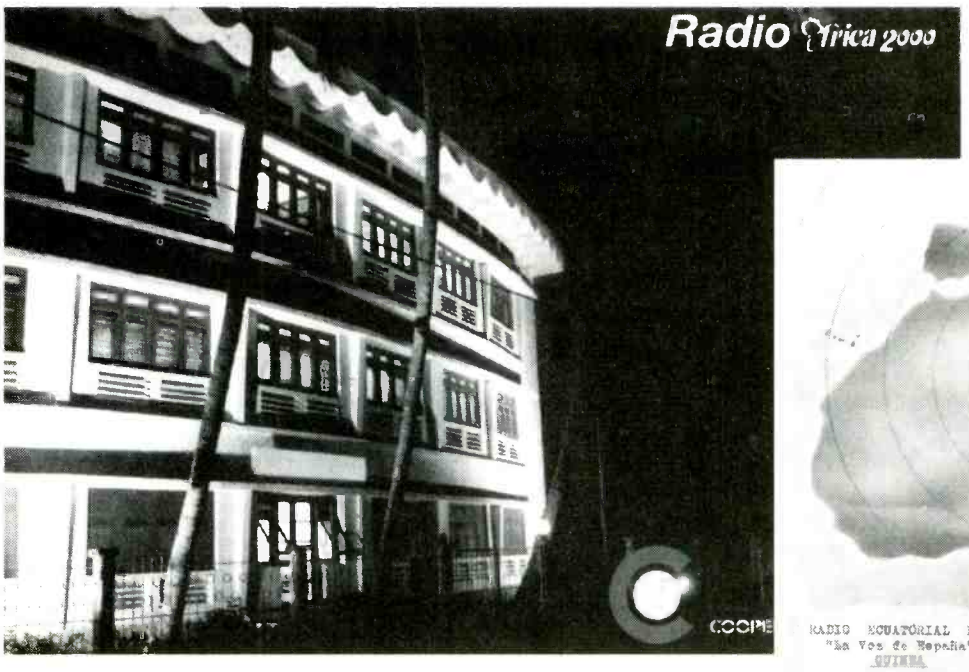
So, enjoy your hobby, and do not question too closely exactly how the signal reaches you. Studying propagation modes brings us closer to both the theory *and* the magic that brings us: "This is London calling."

FIGURE 7: Near Vertical Incidence Skywave (also called "district or shower" propagation mode)



Last Minute News Flash:

Jacques d'Avignon reports that the birth of a new sun cycle has been detected by the Caltech observatory on August 12. It appears to be a premature birth! A press release has been sent out by Caltech; watch for more details to come.



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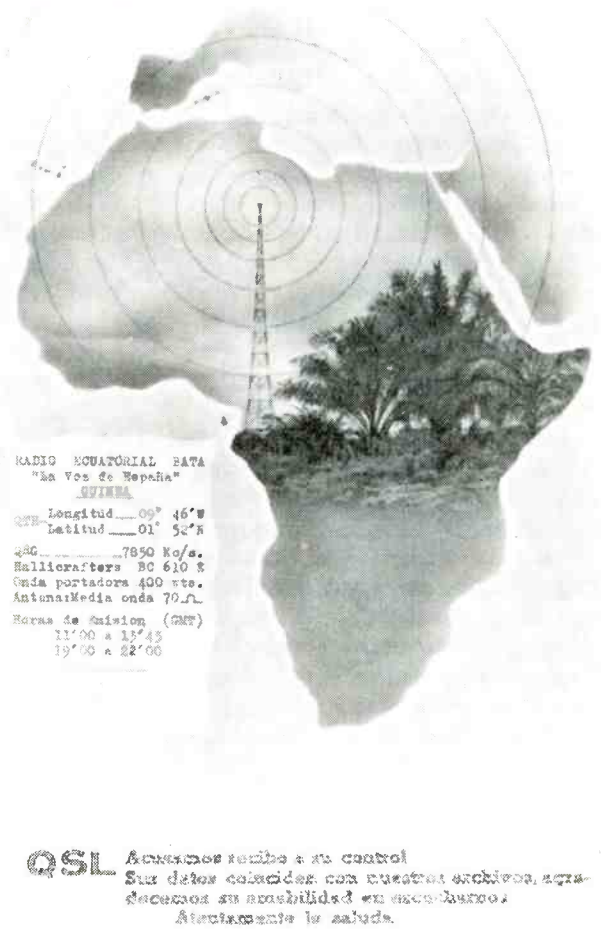


History and Mystery of Shortwave Broadcasting in Equatorial Guinea

By Jerry Berg

"Skulls lie in the ocean here, old bones remembered by sons and daughters. Men and women were taken to the island's edge during the reign of Francisco Macias, and pushed over. Their shadows licked the waves, then vanished. With weights tied to their ankles, the plunge was swift."

So began a 1993 newspaper report on a largely forgotten African outpost of the Spanish colonial empire known as Equatorial Guinea. For the first 11 years of independence—1968 to 1979—the country was ruled by Macias, who was said to have murdered an estimated 40,000 people, including 21 of his own cabinet ministers. Eventually overthrown in a coup, Macias went into the jungle with $150 million which he burned when pursuers started closing in. When they caught him, they had to bring in Moroccan soldiers for the firing squad because Macias vowed he would return from the dead to haunt all those connected with his demise, and no one doubted him.

Ruling Equatorial Guinea since 1979 has been Teodoro Obiang, who has family connections to Macias. Although the human rights situation has improved somewhat as a result of the collapse of two of Spanish Guinea's benefactors, Cuba and the Soviet Union, plus the collapse of world cocoa prices, Obiang has himself been charged with widespread human rights violations. These have not been on the scale of Macias, but thousands have disappeared or been jailed and the regime is suspected of a threat on the life of the U.S. ambassador. The country survives on foreign aid.

Spain came to this African backwater in 1778 and remains the major influence in its life. The country consists of three parts: the jungle-covered mainland enclave of Rio Muni, whose main city is Bata; the relatively fertile island of Bioko (formerly called Fernando Poo), some 20 miles south of the Cameroon coast and 100 miles northwest of the Rio Muni mainland; and the smaller island of Annobon, a distant 400 miles to the southwest (on the far side of Sao Tome). The country's capital, Malabo, formerly called Santa Isabel, is on the island of Bioko. The population of the country is about 375,000.

Radio Atlantica.

Spanish Guinea, as it was known before 1968, does have the redeeming value of having long been the source of good shortwave broadcast DX. And as befits a place where voodoo and witchcraft play a big part, it has also been home to some interesting shortwave mysteries. The biggest one was a project known as Radio Atlantica.

The story started authoritatively enough, with a news item in *The New York Times* of June 13, 1947. "The world's most powerful commercial radio station" had been under construction since February 1947 on the island of Fernando Poo, said the article. The 200 kW station would be used largely for advertising, and one beam would be to the United States. The programs would be directed from Madrid, and time would be sold to any commercial user. Programming was expected to consist largely of recordings, and the station would commence operation with a library of 55,000 records. "The economic struggle between nations is beginning, and a directional station of 200 kW puts at the disposition of Spain and her commercial firms the greatest instrument of propaganda," it was proclaimed.

The news was published again, along with some new information, in Ken Boord's "International Short-Wave" column in the October 1947 edition of *Radio News*, wherein it was confirmed that work had begun on the station early in the year. It would be operated by the Sociedad de Radiodifusion Intercontinental, a company which operated mainly low-powered mediumwave stations in Spain, and it would be known as Radio Atlantica. Transmissions would be in Spanish, English, German, Portuguese, Italian and French, with beams toward Europe, Africa, the U.S.A. and South America, plus Spain.

"The Voice of Spain will be heard in all parts of the world," continued the article. "This will be, in the first place, a demonstration of our progress technically, and of our high ambitions, and, in the second place, no less important, Spain will be able to speak in a strong voice to people in every spot in the world, directly and definitely, without necessity of intermediaries."

More detailed information appeared in Ken Boord's column two months later in the form of an interview by Eddy Copper-Royer, "Comptoir International de Publicite, New York and Paris," with Sr. Don Valentin Ruiz Senen, President of the Compania Intercontinental in Madrid. Sr. Ruiz Senen noted that a high-elevation, equatorial location would be best for worldwide transmission. It was estimated that the directional antennas would increase signal levels so that "when . . . Radio Atlantica is on the air, radio listeners in San Sebastian, Madrid, Pamplona, London, Milan, Stuttgart will hear it as well as a local station." It was reported that the frequency would be "as short as possible, probably in between the 13 and 17 meter bands in daytime, and 25 to 30 meters at night."

Sr. Ruiz Senen reported that the Spanish government's role in the venture "could not be more enthusiastic. Understanding the international interest in such an enterprise and the prestige of the Spanish nation which will bring under such form, at the disposal of all the nations, a powerful instrument of exchange, the government granted a concession to build and operate the station. The Governor General of Guinea, Sr. Bonelli, took a very important part in establishing the conditions under which the station is going to be built and will have to be operated, up to the point that he authorized the construction in a large area of 60 acres located at Musola."

Two unusual QSL's from Radio Santa Isabel.

"The Compania de Radiodifusion Intercontinetal, to which the concession has been granted . . . will create offices everywhere in the principal economic centers such as New York, Buenos Aires, Brussels, Lausanne, Milan, Lisbon, Paris, and so on," he continued. "There will be a delay of 18 to 19 months before the first broadcast can be on the air. Programs will be recorded every day in the principal centers of the United States, in London, and so forth; then they will be shipped by air to Fernando Poo. This will give to the programs the immediate reaction of all international artistic activities and the station will in such a way broadcast the best radio production in all lines."

The equipment would be American. It was reported that an order for two 5 kW transmitters had been placed with a well-known U.S. manufacturer, one for delivery to Madrid, the other to Fernando Poo, for establishment of a direct circuit between the station and the home office. The 200 kW transmitter would also be ordered from the U.S., which was at that time the only source for senders of such power.

Atlantica on the air?

The 1948 and 1949 editions of the *World Radio Handbook* gave possible frequencies and a possible future schedule of Radio Atlantica, and it wasn't long before loggings of the station began appearing in the DX press. Newark News Radio Club Shortwave Section Editor James J. Hart of Irvington, New Jersey, reported in the February 1949 NNRC Bulletin that the new Radio Atlantica was testing irregularly on 14402 kHz, and had been heard with good signals until 2300 GMT. The next month he reported having heard the station himself, IDing as "Radio Atlantica."

Seven months later, however, Ken Dobeson, the British representative of Radio Nacional de Espana, reported that the station was still under construction and that the studios were completed but that start-up would have to await the arrival of high-power tubes, probably from the U.S. Two months later he

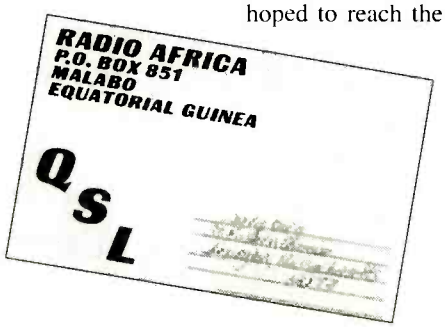
reported that the main station would be operational in 1950 and that a small transmitter, which would ultimately be used for point-to-point service between the station and the home office in Madrid, would soon be operational.

In May 1951, Ken Boord reported that he had been reliably informed that a low-powered transmitter had been operating from Santa Isabel (as Malabo was then known), on the island of Fernando Poo, for four years. In November, well-known Michigan DXer John DeMyer reported that Emisora de Radiodifusion de Santa Isabel had been heard in African countries, and that it was operating with low power on 7200 kHz at 0630-0730, 1200-1400 and 1700-1900 GMT. A higher-powered transmitter was expected to come into service around December 5, 1951, when an international meeting of West African colonies was to be held in Spanish Guinea.

In 1952, the *World Radio Handbook* listed Emisora de Radiodiffusion de Santa Isabel on 7200 kHz with 500 watts of power. DXer John J. Oskay of New Jersey, who thought he had heard the station with mentions of "Atlantica," received a non-verification letter in which station official Angel Margallo said that the station was in fact on the air on 7200 kHz at 0630-0730, 1200-1400 and 1800-2030 GMT. Their most distant report had been from Germany, and they planned to increase their power to 750 watts, with a new antenna, by January 15, 1952.

In a letter to the NNRC Amateur Section in February 1952, Margallo provided some interesting observations on a Spanish Guinea that was very different from the land of the future. "It is very hot here, but health conditions are much better than in some of the nearby colonies. Many married people of European stock and their children live here. Also, many foreign people from the French and English colonies come here by plane for the weekend. This week, 15 French people arrived and the plane leaving for Douala [Cameroun] carried five Englishmen who had spent their vacation here."

Margallo, who was EA0AB, noted that his DXCC was stuck at 93, but that he hoped to reach the 100 mark before returning to Spain on extended leave. "Much of my time is spent on official work connected with the operation of the government radio station on the 40 meter band," he said.



The Radio and Television Statios of Santa Isabel.

The exact sequence and relationship of the foregoing events has never been established with precision. In my opinion, either Margallo had a separate amateur transmitter, or the early, low-powered Radio Atlantica transmitter to which Messr. Dobeson had made reference in 1949 had in fact arrived, and whatever transmitter was at hand had been put to work by Margallo for combined amateur and broadcasting purposes—a not uncommon practice in the early days of shortwave broadcasting.

The 14400 kHz signal may have been an harmonic of this transmitter, perhaps even emitted intentionally. Early mentions of "Atlantica" may have been the product of overenthusiasm, either in DXers' imaginations or in the broadcasting practices of Sr. Margallo, who may have made some informal "Radio Atlantica" announcements in order to accelerate the station's place in history. This is all speculation, however.

In January 1952, Ken Boord reported that construction of super-power Radio Atlantica had been delayed indefinitely, but that an improved transmitter for 7200 kHz was imminent. Oskay noted in the February 1952 NNRC Bulletin (without citing any particular source) that "at the present time [Radio Atlantica] seems years away as the transmitter for that one is being built in the U.S.A. and due to our defense program it has been sidetracked indefinitely."

Whatever the reason, Radio Atlantica never made it on the air. As most DXers know, however, Spanish Guinea has over the years been home to several sought-after shortwave stations. The origins of these shortwave broadcasting efforts may well have been the long-forgotten Radio Atlantica project.

■ Equatorial Guinea on shortwave today.

The stations that have been on the air from Spanish Guinea have been exotic enough to be interesting, and powerful enough to be decently heard, especially in eastern North America. Emisora de Radiodifusion de Santa Isabel, on 7200 kHz, was the first. It was heard often in the United States from 1952 onward.

It became known as Radio Malabo in 1975, and it is now the Malabo branch of Radio Nacional de Guinea Equatorial. It is fairly well heard on 6250 kHz at 0530 UTC sign on and until 2200 UTC sign off. "Radio Africa" English-language religious programs are also heard intermittently over the Malabo sender on varying frequencies around 7190 or 15190 kHz, closing at 2300 UTC. A separate 10 kW station, Radio Africa 2000, was also on the air from Malabo on 6910 kHz from 1989 until a dispute over Spanish aid forced its closedown in 1993.

Radio Ecuatorial in Bata went on the air in 1956 with 400 watts. It was heard on 7850 kHz. It is now the Bata sender of Radio Nacional on 5005 kHz (and occasionally 4926), and is also heard often at 0500 UTC sign on and until 2200 UTC sign off.

■ Radio Calatrava.

A final shortwave mystery connected with Spanish Guinea was a station called Radio Calatrava, which was heard from time to time in 1958-59 in the 6668-82 kHz range. It closed down at 2100 UTC, usually after a classical music program and the playing of "Ave Maria."

Although the station was commonly thought to be in Spanish Guinea, the location was never established with certainty. There was a Calatrava in Rio Muni, but Radio Bata told one DXer that Calatrava was in South America (although the *National Geographic* was unable to come up with a South American town by that name). Many towns in Spain, which were located in what was once a Spanish political subdivision known as Campo de Calatrava, added "de Calatrava" to their names, but there was no suggestion that the station was in Spain.

Radio Calatrava was heard by respected DXers both on the East Coast and in Europe, and although it merited a brief entry in the 1960 and 1961 editions of the *World Radio TV Handbook*, it was last heard in late 1959, disappearing thereafter into the mists of DX history that have enveloped this faraway place from the beginning.

To Positively ID or to Tentatively ID — That Was the Station! (Methinks)

By Frank F. Orcutt

The author pulls the tricky IDs out of the ether with a Hallicrafters SX-100, which is the same age he is.

We've all wrestled with this dilemma before: after months (sometimes years) of dragging yourself out of bed in the middle of the night, night after night, fueled by untold gallons of coffee and risking the wrath of one's abruptly awakened spouse, you, the intrepid DXer, trip over the cat and down the stairs groping your way to the shack to once again continue your quest for whatever DX target has been Number One With a Bullet on top of your hit list for longer than you'd care to admit.

Still half asleep you slip on the head phones and fire up the rig. Suddenly, you feel a protuberance in your throat. Sweaty hands carefully tweak the controls of the radio. Then, as if possessed, you shout "PAY DAY!"

You detect a moderately strong, open carrier on the frequency where you've spent more time lately than you've spent with your kids (ask your wife!). Five minutes until sign-on, your pulse races as audio rises from the background noise. Like a trophy marlin fisherman who just set the hook, you've still gotta land that sucker! So riding that signal like a wave, you stay right on top of it until it fades out.

You expeditiously cross check all the pertinent data. Fade-out time is in complete agreement with your DX Edge grayline predictions, language, program format, and everything else checks out against the reams of reference material at your finger-tips. The only thing left to do is review your tape and transcribe the ID that you're sure you heard at the top of the hour.

Hours later, you find yourself slumped over your tape deck. Befuddled, you slip off the sweaty headphones. The right side of your brain hears a definite ID; the port side isn't so sure. Everything else fits. Listen to the tape one more time. . . did the announcer say "Nibi-Nibi" or not? Faced with this quandary, let's consider the following:

Jay Ingram, former host and producer of the CBC's science program *Quirks & Quarks,* has written a book titled, *Talk, Talk, Talk,* published by Viking. The book deals with all conceivable aspects of human speech, how we learn it and use it, as well as how we assimilate it.

As part of the research for his book, Ingram conducted a most interesting experiment. He enlisted the help of CBC colleague Vicki Gabereau, host of the weekday afternoon show, *GABEREAU,* (which airs on CBC's domestic MW service). On 25 May 1992 during an interview of Ingram by Gabereau, the latter mispronounced her name a couple of times. This was done deliberately and at Jay's request. Hopefully, this experiment would illustrate if what someone *wanted to,* or *expected* to hear had any correlation with what was actually heard.

At the end of the first hour of her show, right before going into network news *and* in her opening remarks for the show's second hour, Vicki Gabereau, speaking with her normal intonation, clearly mispronounced her name as **"Figgy"** Gabereau. Each time she watched for any hint of a reaction to the erratum from the production staff and technicians in the control room. Both times, nothing—not so much as a hint of a double-take, no "What the Hell did you say!?" was heard from her PL head set. Not one of the crew had caught it and they were astonished upon reviewing the tape of the show.

GABEREAU is heard by tens of thousands of faithful listeners five days a week; surely the CBC would be flooded with mail concerning the incident.....**NOT!** Not even a post card from Vicki's mother inquiring as to why her daughter had changed her name.

The DX adventure we've just been through begs the question: "How should one report the logging in this case?" Positive? [If you can sleep and face yourself in the morning, go for it.] Tentative? [You run the chance of having to "correct" yourself in the hobby publications where the log ran, lest someone else does it for you.] Embarrassing? Somewhat. [But it shouldn't be fatal to your reputation unless you make a habit out of it.] UNID? [You can always play it safe, but you'll never hear Glenn Hauser announcing to the world that you were the first to log an unidentified station!]

The experiment poses another question, "If someone *wants* to hear something badly enough, or if a person is so *accustomed* to hearing the same words, said the same way, at about the same time most days, could a person (in this case a DXer), given the right circumstances, hear something that wasn't said?"

Well, like those movies with ambiguous endings that my wife hates so much, I'm not here to offer any answers. Just some food for thought.

As for myself, I've no time to ponder these imponderable questions. I'm off to transcribe a tape of a DX catch, bagged this morning by yours truly.

Hmmm...now what was that the announcer mentioned? **"...Tezulutlan..."**? Or **"...Tristan..."**? Guess I'll have to report this as tentative. But I could swear I heard him say....

Larry Van Horn, N5FPW
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USSTRATCOM Frequencies

As promised in last month's Ute World, I have included a comprehensive U.S. Strategic Command (USSTRATCOM) frequency list (Table One) in this month's column. As most longtime readers of this column know, *MT*'s *Utility World* column has been tracking these designators and their associated frequencies since they were first reported in this magazine in May 1989.

One of the major questions regarding these frequency designators that has gone unanswered up until this point was the significance of the Sierra, Papa, X-ray, and Whiskey characters in the designators. After six years of intensive monitoring and the analysis of thousands of logs sent to this column, an educated guess can now be rendered.

The **Papa** designator appears to be associated with the Post Attack Command and Control System (PACCS). Normally we associate the PACCS with the wideband signals we hear in the 225-400 MHz military aircraft band. Based on intercepts, it would appear that these frequencies are used as a back-up, voice coordination net for the PACCS aircraft. If you check the July 1988 issue of *MT*, for example, you can see this connection by cross-checking the Papa frequencies in Table One with their associated listings in the Strategic Air Command (SAC) frequency list we ran in that month's Utility World column.

For a number of years utility listeners monitored aircraft associated with the former Strategic Air Command on the frequencies we now know as **Sierra** designators. The old SAC communications system was known as Giant Talk. The old Global Command and Control System (GCCS) and Giant Talk frequencies were combined in 1992. In a sense, Giant Talk went away—but not its frequencies.

Since 1992, several ute monitors have reported on-the-air conversations with military personnel referring to these old Giant Talk channels as SCACS (Strategic Command and Control System—pronounced "SACKS") frequencies. Aircraft missions heard on these frequencies have ranged from bombers performing ordnance training missions to aircraft conducting in-flight refueling.

Sound a little familiar? I now believe that these Sierra or SCACS frequencies are used when Air Combat Command (ACC) aircraft are performing a USSTRATCOM mission.

The **X-ray** channels were a little more difficult to analyze. It wasn't until we compared the known X-ray frequencies with an old list of Mystic Star frequencies, that the relationship became apparent. Each one of these frequencies is also used by Andrews Air Force Base, Maryland, for Mystic Star support. Since Airborne National Command Post (ABNCP) aircraft can also be considered "Executive" aircraft like those of the 89th Air Wing, I now believe the primary purpose of these frequencies is to serve as a voice coordination link when certain VIP aircraft are airborne and need command post support. Again, like the Papa frequencies, the X-ray channels are voice coordination frequencies.

The last of these designators was the most stubborn nut to crack. Based on your logs and an almost daily watch of all the USSTRATCOM frequencies, it has been noted that traffic on the **Whiskey** channels was significantly less than the other SCACS frequencies previously mentioned. Based on the July 1988 SAC list and a detailed analysis of recent intercepts, it would appear these frequencies have been set aside as a warning network. I now believe these frequencies are used to warn the USAF National Airborne Operations Center (NAOC—formerly NEACP—see August 1995 column) aircraft of important military activity which will involve them. These frequencies only seem to be active during major exercises that are conducted about once a month. These exercises all involve the NAOC aircraft.

In conclusion, the basic functions connected with these frequencies as noted in our 1988 frequency list has not changed. The only change from seven years ago appears to be the designators.

If you have any information that updates our frequency table or the information presented above, I would like to hear from you. You can write this column care of our Brasstown address or the above e-mail address via the Internet.

Ute World Pot Luck

• A U.S. Air Force communications system that hasn't gotten a lot of coverage in the hobby press is the Inter-American Air Forces Telecommunications System, or SITFA. This voice net ties stations in Latin America with U.S. Air Force stations stateside. Transmissions are USB (some packet has been noted) and the following frequencies have been reported:

4503.5 4764 5743.5 7317 7320 7729 7932 7935 8059 8061
8064 8067 9043.5 11547 13217 13897 13918 13921 14640
14643 14646 14649 15675 18367.5 18370.5 18373.5 18376.5
19497 19500 20597 20600 20860 23066.5 24860

• Finally, the U.S. Army also appears to be running an inter-American, military, communications network. This one uses USB, CW, and SITOR-A/B modes of transmission. You can catch activity on the following frequencies:

7525.5 9080 10322.5 11614.5 14434.5 15484.5 16233.5
18708.5 19253.5 19568.5 20144.5 23384.5 24216.5

Stations in this net include:

ACA5	Corozal, Panama	HK3EJC	Bogota, Colombia
AAC65	Ft. Dietrick, MD, USA	HK3EMC	Bogota, Colombia
ACL	San Jose, Costa Rica	HPGN	Panama City, Panama
CAWZJ	Santiago, Chile	HR2	Tegucigalpa, Honduras
CPEM	La Paz, Bolivia	HTGN1	Managua, Nicaragua
CVL5D	Montevideo, Uruguay	LTR46	Buenos Aires, Argentina
DECA2	Guatemala City, Guatemala	PRU65	Lima, Peru
DECA3	Guatemala City, Guatemala	PTO2	Brasilia, Brazil
HCE24	Quito, Ecuador	SAL1	San Salvador, El Salvador
HIR4	Santo Domingo, D. R.	YWH3	Caracus, Venezuela
HK3BIM	Bogota, Colombia	ZPQ5	Asuncion, Paraguay

Reports on this U.S. Army/Latin America communications net and SITFA are requested.

TABLE 1: USSTRATCOM Network Frequencies

This list is the most complete list of USSTRATCOM frequencies and designators available at presstime. For a number of reasons, this list is dynamic and changing. The complete switch-over to 3 kHz spacing in the OR segment of the bandplan has not been completed as of this time. Also, we are at sunspot minimum, and higher frequencies are not being used or heard. #—indicates that this designator/frequency has not been confirmed through monitoring.

Papa (PACCS/ABNCP) Nets

Note: Another possible frequency that might be associated with this net is 15035 kHz (designator unknown).

P-380	5684
P-381	5700
P-382	11408
P-383	15044

Sierra (SCACS) Nets

Note: Other possible frequencies that might be associated with this net include: 3369 5026 6828 15964 18046 20890 27870

S-302	3113	S-311	11494	S-391	6761
S-303	3295	S-312	13211	S-392	9027
S-304	4495	S-313	14955	S-393	11244
S-307	7330	S-314	15041	S-394	13241
S-308	8101	S-315	15962	S-395	17975
S-309	9057	— —	— —	S-396	20631#
S-310	11220	S-390	4725	S-397	23337#

X-ray (Executive) Nets		X-212	15048
X-201	3078#	X-213	18023
X-202	3074#	— —	— —
X-203	3064	X-901	3144#
X-204	3060#	X-902	5710#
X-205	3057#	X-903	6730
X-206	3046	X-904	9017
X-207	Unknown	X-905	11226
X-208	3134	X-906	13217
X-209	4742	X-907	15094#
X-210	11229	X-908	17992
X-211	15038	X-909	23265

Whiskey (Warning) Nets		W-111	17972
W-100	3032	W-112	18387
W-101	5800	W-113	18623#
W-102	6683?/5875?	W-114	19665
W-103	6757	W-115	19755#
W-104	7475	W-116	20167
W-105	7831	W-117	20407
W-106	Unknown	W-118	23872#
W-107	10204	W-119	24828#
W-108	12070	W-120	24978#
W-109	13247	W-121	26532#
W-110	15499	W-122	26859#

Other possible USSTRATCOM frequencies to monitor include:
2334 6828 11405 11408 11445 11607 13907

UW in Cyberspace

No more dialup modems calls. No more downloading mail at 14.4K baud. No more sorting through hundreds of messages and pulling duty as the Grove Enterprises' electronic postmaster! Cyberspace has come to Brasstown and we now have a full-time e-mail address for the *Utility World* column—mt@grove.net.

For the last two years, I have had to call out to a dial-up service in Raleigh in order to access the information superhighway and your e-mail messages, but those days are now gone. We finally have our 'T1' computer line direct into the Internet and an automated system to act as postmaster instead of your UW editor.

I hope that you take advantage of our new technology and the Internet to communicate with the staff of *Monitoring Times* and *Satellite Times*. We should be able to respond with more speed and ease to our readers. You can also send your logs via the Internet at the address noted in the masthead. Please do not uuencode your logs. Send the logs as an e-mail message or an attached file using MIME. For those of you who sent mail to the old mercury.interpath.net address, please note that old mailbox has been closed.

That does it for this month; now it is time to see what you have been hearing this month in the world of utility communications.

Utility Loggings

Larry Van Horn

UTILITY WORLD

Abbreviations used in this column

AFB	Air Force Base	MFA	Ministry of Foreign Affairs
AM	Amplitude Modulation	MHz	Megahertz
ARQ	Synchronous transmission and automatic repetition teleprinter system	MOD	Ministry of Defense
		M/V	Motor Vessel
		NORAD	North American Aerospace Defense Command
ARQ-E	Single-channel ARQ teleprinter system	NW	Nightwatch
		Packet	Teleprinter system commonly used by amateur radio operators
ARQ-E3	Single-channel ARQ teleprinter system		
ARQ-M2	Multiplex ARQ teleprinter system with two data channels	POL-ARQ	Polish diplomatic ARQ teleprinter system
		ROU-FEC	Romanian diplomatic version of the FEC teleprinter system
ARW	Air Refueling Wing		
Canforce	Canadian Forces	RTTY	Radioteletype
Comms	Communications	SAM	Special Air Mission
CW	Continuous Wave	SCACS	Strategic Command and Control System
EAM	Emergency Action Message	Selscan	Selective scan
FAA	Federal Aviation Administration	SITOR-A	Simplex teleprinting over radio system, mode A
FAF	French Air Force	SITOR-B	Simplex teleprinting over radio system, mode B
Fax	Facsimile		
FEC	Forward Error Correction	SOCC	Sector Operations Control Center
FEC-A	One-way traffic FEC teleprinter system	SWBC	Shortwave Broadcast
		Tanjug	Telegrafska Agencija Nove Jugoslavija
FF	French Forces		
GHFS	Global HF System	Unid	Unidentified
HF	High Frequency	U.S.	United States
LDOC	Long Distance Operational Control	USAF	U.S. Air Force
		USB	Upper Sideband
MARS	Military Affiliate Radio System	USN	U.S. Navy
		WFM	Wideband Frequency Modulation
Meteo/Meteo	Meteorology		

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

2357.7 OUA32-Danish Naval Radio, Stevns, with V CW marker at 2343. (Ary Boender-Netherlands)

2474.0 PBC-Dutch Navy Goeree Island, Netherlands, with 75 baud RTTY channel checks at 1740. (Dman-UK)

2893.0 MTO-Royal Navy Rosyth, Scotland, with 75 baud RTTY channel checks at 1659. (Dman-UK)

3064.0 Unid station KDPO with 5-letter groups in CW at 2215. (Boender-Neth)

3067.0 Unid station NT7R working GR1D with coded CW messages at 2130. E68W working 5USW with CW traffic at 2135. (Boender-Neth)

3282.0 Unid station LHMO working 5OEM with 5-letter CW groups at 2200. (Boender-Neth)

3390.0 MGJ-Royal Navy Glasgow, Scotland, with 75 baud RTTY transmissions at 1707. (Dman-UK)

3693.2 RFLI-FF Fort de France, Martinique, (IGE) to St. Jean Du Maroni using ARQ-E at 0100, recently upgraded to 192 baud. (Fred Hetherington-Ormond Beach, FL)

3824.0 German female 5-digit number station (Swedish Rapsody) in AM at 2300 (Wednesday). (Boender-Neth)

3831.0 Unid station V58J working HJ9U with CW traffic at 2245. (Boender-Neth)

3832.0 FDC-FAF Metz, France, with V CW marker at 2245. (Boender-Neth)

4050.0 Mice 51 at 0241 calling Mice 96, no joy. (Rick Baker-Austintown, OH)

4540.0 SZVY-M/V *Ionian Wind* working Boulogne Radio in CW at 2155. (Robin Hood-UK)

4601.0 Unid station RGC7 working Z4C5 on 4602.5 with CW at 2315. (Boender-Neth)

4602.5 Unid station ESUP sending "VVV XXXXXX ESUP ESUP 06365 Barwinok 570" repeated 3 times in CW at 2210. 5E9S working many stations with 5-letter groups at 2232. (Boender-Neth)

4739.0 RAF Volmet broadcast heard several times. New frequency replaces 4722. (Hood-UK)

4742.0 Nightwatch at 1121 working WAR46 with communications checks. (Baker-OH)

4780.0 KFA2-Israeli Mossad number station from 0200-0220. (Ed Rausch-Cedar Grove, NJ)

5097.4 CFH-Canforce Halifax, NS, Canada, with 75 baud RTTY traffic at 1100. (Hetherington-FL)

5255.0 Unid station UBVV calling Q550 with 50 baud RTTY RYs then encrypted traffic at 1640. (Dman-UK)

5267.0 RFFA-MOD Paris, France, with ARQ-E transmission at 1715. (Dman-UK)

5303.5 D06 working T06, "wait for 2406 to feed ARCOM for party line." F45 working I45...percent complete at Fairhaven." Very strong, Army Corps of Engineers at Fairhaven, NY? (Harry Riddell-Rochester, NY) *I believe this is a army reserve channel rather than ACOE-Larry.*

5359.5 W73 working W45, Ratrig/Ratvan/NCS mentioned at 1410. Also heard administrative messages passed from Sgt to Sgt. (Riddell-NY) *Another U.S. Army frequency pops up on the air-Larry.*

5371.0 CIA-Unid station with msg for 568 in AM at 2100. (Boender-Neth) *Ary is this a Mossad station?-Larry.*

5419.0 Spanish female 5-digit number station in AM at 0700 (Sunday/Monday UTC). (Tom Mazanec-Maple Heights, OH)

5456.7 RFHJ-FF Papeete, Tahiti, with ARQ-E3 traffic ro RFLI-Fort de France at 1000. (Hetherington-FL)

5687.0 Wise 81 working Plantation (Hurlburt), both very strong here discussing cancelled fueling of Cowbow 22 at 0140. (Jeff Haverlah-Houston, TX)

5710.0 SAM 29000 working Andrews (Mystic Star) at 0050. (Baker-OH)

5711.0 DoD Cape at 1909 working King 1 for shuttle launch. (Baker-OH)

6287.5 ORJH-Belgian Naval vessel *Godetia* working OSN-Ostend Naval Radio in CW at 0745. (Hood-UK)

6382.2 EAD2-Madrid Radio, Spain, with CW marker at 0224. (Sue Wilden-Columbus, IN)

6442.4 FUM-French Navy, Papeete, Tahiti, with 72 baud RTTY test tape at 1610. (Robert Hall-Capetown, RSA)

6462.1 FUM-French Navy Papeete, Tahiti, with 75 baud RTTY RYs at 0950. (Hetherington-FL)

6502.0 TBB6-Turkish Naval Radio, Anakara, Turkey, with extensive CW marker at 0050. (Roger Parmenter-Cape Cod, MA)

6730.0 NW01 working Admirable here and on 5700 (S-381) passing 'traffic' — a 26 character EAM at 0448. (Haverlah-TX)

6734.0 Portishead LDOC working Speedbird 2740 at 1828, moved to 5610 due to bad conditions. (Boender-Neth)

6735.0 Mike calling India on the USN Foxtrot Tango net at 0429. Mike had what sounded like a Dutch accent. (Haverlah-TX)

6739.0 Offutt GHFS with a 339 character EAM — Preamble SLVQCK at 0056. MacDill and others with a 197 character EAM — Preamble SLVCKA at 0322. Sentry 34 working Lajes GHFS looking for working frequencies for Croughton GHFS at 0512. The frequencies given out by Lajes were 6739, 11175, and 8992. (Haverlah-TX)

6750.0 Foxtrot Tango working Golf at 0308. (Haverlah-TX)

6751.0 Sidecar working V9A at 2109, having problems with data link setup. (Baker-OH)

6754.0 VXA-Edmonton military, Alberta, Canada, at 0525 with weather broadcast. (Baker-OH)

6761.0 Whiteman AFB radio maintenance at 0216 for a radio check, no response. Mash 84 (KC-135 tanker) working Mash Control (305th ARW, Grissom AFB, IN) at 0217. Heard Mash 84 just prior to HF comms on 252.1 MHz in refueling ops. (J.L. Metcalfe-KY)

6762.5 Aeronautical weather at 0230. British or Canadian? (Metcalfe-KY) *Not really sure, I haven't heard this one before and and my last listing for this one in my database was 11/93. 66/75 ID'ed this frequency as Papa Kilo-Larry.*

6786.0 Spanish female 5-digit number station in AM at 0700 (Wednesday), 0500 (Thursday) and 0800 (Friday). (Mazanec-OH)

6814.0 English female 5-digit number station in AM at 1917 (Monday). (Wilden-IN)

6829.0 Spanish female 5-digit number station in AM at 0400 (Monday). (Don Storck-Hemlock, MI)

6830.0 Andrews (Mystic Star) working SAM 300 and SAM 200 with phone patch traffic at 1320 and 1500 respectively. (Storck-MI)

6835.0 Repairman 67 working unid station. Results of various test performed on presumed new USN ship at 1308. (Riddell-NY)

6993.0 Andrews (Mystic Star) working Air Force Two at 0110. (Haverlah-TX)

7635.0 Shark 19 working Barracuda 04 with position/speed contact information then into Spanish with switch to possible "Canal Seis" at 1215. Heard again next day with call signs 17/19. (Riddell-NY) *Doesn't sound like the CAP to me, Harry-Larry.*

7643.3 RFLIRT-Cayenne, French Guiana, with ARQ-E3 (RTI) to RFLI at 0130. Used to be ARQ-E. (Hetherington-FL)

7646.0 DDH7-Hamburg, Germany, with 50 baud RTTY weather broadcast at 1702. (Dman-UK)

7765.0 Clearance 1 at 1824 working DoD Cape working shuttle launch. (Baker-OH)

7801.0 Nightstar 1 and 2 changed to Delta 4/5 after 1200. Other weak stations heard, RTTY test. (Riddell-NY) *I believe this is an Air Force channel, unknown use-Larry.* 9BC22-IRNA Teheran, Iran, with 50 baud RTTY English news bulletins at 1655. (Dman-UK)

7827.0 FAA-type selscan heard here in USB or 7830 in LSB at 0244. (Metcalfe-KY) *The only thing I show is SCACS W-105 on 7831-Larry.*

7862.0 Spanish female 5-digit number station in AM at 0300 (Saturday). (Mazanec-OH)

8050.2 RFQP-FF Jibouti apparently having difficulty in conversion from ARQ-M2 to ARQ-E3. Unable to snyc either mode. (Hetherington-FL)

8127.0 Israeli Forces Radio 'Galei Zahal' with USB broadcast for Israeli military forces at 2315. (Boender-Neth)

8136.0 Spanish female 5-digit number station in AM at 0500 (Sunday). (Mazanec-OH)

8178.0 P7X with 5-letter groups (120 groups) in CW at 1430. Group heading was "QRA DE P7X IIPII 101430Z GR120 BT." P7X operates here quite often. (Metcalfe-KY)

8356.5 IBJE-M/V *Tuscania* working UUI-Odessa Radio in CW at 0747 in English. (Hood-UK)

8367.0 FBQA-French aircraft carrier Foch calling St. Lys Radio several times in CW, but didn't seem to get a reply at 0750. (Hood-UK)

8473.5 WLO-Mobile Radio, AL, with CW marker at 0632. (Wilden-IN)

8570.0 WNU43-Slidell radio, LA, with CW marker at 1931. (Wilden-IN)

8968.0 Sidecar working various units at 0551. (Haverlah-TX) *Callsign confirmed as Canadian NORAD Region, Eastern SOCC by Canadian NORAD officials during our recent trip to Cheyenne Mountain-Larry.*

9013.0 Chalice Alpha working Trenton military with a phone patch to Raymond 24 (Tinker AFB) Radar Maintenance at 2246. (Haverlah-TX) Sidecar working 7MS with Link 11 voice coordination net at 0501. (Baker-OH)

9016.0 McClellan GHFS working MacDill GHFS at 0452. (Haverlah-TX) Sailsmith with a test call, "when your command is called, answer with audibity of the conference." Then called Pacific, Satcom, Ucom, Nightwatch, Atlantic, and Special Operations. Replies not heard. Then MacDill worked McClellan; again a mention of the conference at 1950. (Riddell-NY)

9017.0 NW01 working WAR46 and Washtub working Protrude at 1503. Question was asked between the tactical calls which crypto they were using, USN or USAF; answer was USAF. Lifebouy working NW01 for data check, but NW01 begs off because he is working on higher precedence traffic at 0527. (Haverlah-TX) NW01 calling Mandatory at 2120 about a wide band transmission. NW01 up at the same time on 230.650 MHz WFM with a very strong signal. Identified on WFM as 01. WFM signal dropped at 2150. (Metcalfe-KY)

9043.0 Ft. Bragg Metro working Dragon Metro, Victory Metro, then electronic comms followed at 1250. Mention of mode 1/3. (Riddell-NY)

9057.0 Ballpark working Errand Boy, and Rasputin working NW01 here and on 6730. They also tried frequency W-102, but were unsuccessful at 1708. (Haverlah-TX) Joint Star 02 working NW01 at 1930 for comm check. (Riddell-NY)

9320.0 SAM 677 working Andrews (Mystic Star) at 0304. Who is 677? (Haverlah-TX) German female 5-digit number station at 2100. (Rausch-NJ)

10001.3 MacDill GHFS with an EAM message at 2118. Could a frequency this accurate be a punch up error? (Rausch-NJ) *Most USAF aircraft have WWV 10 MHz as a preset in their HF radios so I guess anything is possible, but bizarre-Larry.*

10045.9 4XZ-Israeli Navy, Haifa, with V CW marker at 1734. (Hall-RSA)

10393.7 RFFVA-FF Paris, France, with ARQ-E3 traffic to RFFVAT at 2100. Recently changed from ARQ-M2. (Hetherington-FL)

10470.2 RFFA-FF Paris using ARQ-E3 (FDX) to RFFVAE at 2148. Used to be ARQ-M2. (Hetherington-FL)

10780.0 King 64 at 1834 working Cape Radio for radio check. (Baker-OH)

10815.7 AAA6USA-U.S. Army MARS station, Ft. Sam Houston, TX, and AAA3USA-Ft. Meade, MD, using packet mode. May be a BBS operation. (Metcalfe-KY)

11034.8 Egyptian Embassy, Amman, Jordan, with SITOR-A Arabic traffic at 1620. (Hall-RSA)

11059.0 Andrews working SAM 26000 here and on 6730 with various phone patches at 0112. (Haverlah-TX)

11125.3 Jeddah Meteo, Saudi Arabia, with 100 baud RTTY weather codes at 1550. (Hall-RSA)

11175.0 Offutt GHFS with "Enlist, Enlist, Request you echo the following" — Foxtrot message "GLO time 49 authentication JV." Like the Fairley broadcast, no echo of the message noted at 2149. Look 80 working NW01 through a MacDill phone patch, trying to work Seymour Johnson by "burning" RF17. He told the ground party he could burn RF1 through RF10 and 17. He was asked if he could burn RF24 and the reply was no, at 1833. (Haverlah-TX) Paccom 01 working McClellan/Hickam GHFS. Moved to 11181 discrete. During flight was advised that Sierra Pete is no longer in service, that Big Foot had assumed control. (Roop-CA) *This is true. NORAD has combined both western SOCCs into one with McChord staying open-Larry.*

11178.0 Architect-RAF weather VOLMET now on this frequency (ex-11200). Noted at 0533 and this should be a good propagation indicator for Europe when listening to 11175. (Haverlah-TX) Noted same at 1436. (Hood-UK) NN363-possible Dutch Navy at 0152 calling P2E, no joy. (Baker-OH)

11181.0 Hickam GHFS working McClellan GHFS in voice and data at 0446. (Haverlah-TX)

11214.0 SAM 203 working Andrews (Mystic Star) at 2236. (Baker-OH)

11217.0 NASA-2 talking with NASA-832 (NASA SR-71 aircraft) at 1636. 832 said he was going subsonic south of Boise. (Rick Roop-Sacramento, CA) *In the future also check 6712 and 9023 for NASA SR-71 activity, according to Rick Baker at WUN-Larry.*

11226.5 Link 11 data transmission noted here at 0517. (Haverlah-TX)

11229.0 NW01 working Parsonage with EAMs, etc at 0116. (Haverlah-TX)

11244.0 Washtub working Offutt GHFS with phone patch to common 339-3944 (Station ID'ed as Neon Gas) looking for TACAMO Ops at 1914. Offutt GHFS calling and working NW03 at 1657. NW03 wants a phone patch to NW01 (DSN 939-1857). Offutt GHFS also called Generic. Pinon 99 (muffled and heavy whine in background) working MacDill GHFS with various phone patches. Three hours out of Beale AFB. (Haverlah-TX) Mice 51 at 0238 working McClellan GHFS with phone patch to Victor Ops requesting status of tanker Mice 96. Requested frequency, advised 4050.0, said 96 was up on that frequency. (Baker-OH)

11450.3 RDD77-Moscow Meteo, Russia, with 50 baud RTTY weather codes. (Hall-RSA)

11466.0 Very active Mystic Star net with SAM 26000, AF1/SAM 29000, AF2, SAM 677, SAM 970 and SAM 403 on frequencies such as 11466, 11460, 11220, 8026, 6993, 6830, and 6717 at various times. (Haverlah-TX)

12067.0 Wolfman and Venom 21 concerning primary air control frequencies for a weekend exercise. Also heard Cougar 24 and Venom 01-04/11/22/30 in net over several days. May have passed 10133.0 as an alternate, but nothing heard there. (Metcalfe-KY) *Interesting, I show nothing for 10133 and the Army on 12068.5-Larry.*

12136.0 Unid station with 5-number groups in CW at 1400. (Metcalfe-KY)

12212.7 YZI234-Tanjug, Belgrade, Serbia, with 50 baud RTTY French news bulletin at 1707. (Hall-RSA)

12469.8 690SB with quick brown fox, counting and RY SG test tape using 100 baud RTTY at 0047. (Metcalfe-KY)

12569.0 KYJI-Fishing vessel *Okainiai* working LYL-Klaipeda Harbour Radio using 50 baud RTTY at 1012. (Hood-UK)

12664.5 FUM-French Navy Papeete, Tahiti, with 75 baud RTTY RYs at 1250. (Hetherington-FL)

12806.0 NKW-USN Diego Garcia, with fax chart at 1452. (Hall-RSA)

13242.0 Hickam GHFS with an all frequency request for Paccom 01 at 0326. Note the frequency. (Haverlah-TX) *Yes sir, one of the new OR bandplan frequencies-Larry.*

13341.8 MFA Cairo, Egypt, with SITOR-A Arabic traffic at 1515. (Hall-RSA)

13339.0 Jeddah LDOC, Saudi Arabia, working Saudi 532 at 1459. (Hood-UK)

13372.0 5YD-Nairobi, Kenya, with 50 baud RTTY test tape at 1625. (Dman-UK)

13375.0 English female 5-digit number station (Lincolnshire Poacher) at 1630 and 1700. (Rausch-NJ)

13480.0 RPTI-Portuguese Naval Radio with foxes/RY test tape using 50 baud RTTY at 1506. (Hood-UK)

13500.3 V5G-MFA Bucharest, Bulgaria, with ROU-FEC transmissions at 1655. (Hetherington-FL)

13521.0 MFA Warsaw, Poland, requesting unid station to move to 11125. That station sent a 5-digit group message on that frequency. All in 100 baud POL-ARQ at 1628. (Hood-UK)

14476.0 DDH8-Hamburg, Germany, with 50 baud RTTY weather transmission at 1720. (Dman-UK)

14502.0 MFA Cairo, Egypt, with SITOR-A message in Arabic at 1727. (Dman-UK)

14665.0 SPW-Warsaw, Poland, with SITOR-B traffic list at 1300. (Dman-UK)

14846.7 Zaire Banking Circuit with 48 baud RTTY transmission at 1150. (Hall-RSA)

14926.9 RFTJ-FF Dakar, Senegal, with idling ARQ-E3 signal at 1158. (Hall-RSA)

14975.5 P6Z-MFA Paris, France, with idling FEC-A transmission at 1617. (Hall-RSA)

15016.0 McClellan GHFS working Fairchild Mobile at 2040. (Gordon Levine-Anaheim, CA)

15043.0 MacDill working Geranium in voice and data on this frequency and 13242.0 at 1607. (Haverlah-TX)

15043.6 MFA Cairo, Egypt, with SITOR-A Arabic traffic at 1636. (Hall-RSA)

15673.1 UMS-Moscow, Russia, with 50 baud RTTY traffic at 1515. (Hetherington-FL)

15858.0 German Embassy in Madrid, Spain, with ARQ-E message to Bonn at 1705. (Dman-UK)

16300.0 Radio Moscow SWBC feeder in Russian at 1800. (Hall-RSA)

16692.6 UTHZ-MT *Antares* with SITOR-A traffic at 1156. (Hall-RSA)

16799.5 UUIV-Russian ship RKTS *General Petrov* with 50 baud RTTY traffic at 1207. (Hall-RSA)

16802.1 UUUB-Russian ship RKTMS *Marshall Sudets* with 50 baud RTTY traffic at 1205. (Hall-RSA)

16912.0 GYA-Royal Navy London, with fax chart at 1218. (Hall-RSA)

16915.4 FUX-French Navy, Le Port, Reunion, with 75 baud RTTY test tape at 1212. (Hall-RSA)

16928.0 UJY-Kaliningrad Radio, Russia with 50 baud RTTY traffic list at 1003. (Dman-UK)

17024.0 SAB83-Gothenburg Radio, Sweden, with SITOR-B shipping messages at 1712. (Dman-UK)

17590.3 HZN49-Jeddah Meteo, Saudi Arabia, with 96 baud RTTY weather codes at 1326. (Hall-RSA)

17976.0 King 88 with phone patch thru Thule GHFS to Rescue Ops at 1925. (Riddell-NY)

18046.1 SNN299-MFA Warsaw, Poland, with POL-ARQ transmission at 1255. (Hall-RSA)

18303.0 English female number station in AM at 1200. (Hall-RSA)

18441.2 JMJ5-Tokyo Meteo, Japan, with fax chart at 1147. (Hall-RSA)

18504.0 RFFA-MOD Paris, France, with ARQ-E3 traffic at 0945. (Dman-UK)

18506.5 MFA-Jakarta, Indonesia, with SITOR-A and RTTY diplo traffic at 1128. (Hsll-RSA)

18561.3 9BC31-IRNA Teheran, Iran, with 50 baud RTTY news bulletins in Arabic at 1135. (Hall-RSA)

18751.7 Egyptian Embassy-Rabat, Morocco, with 4-letter groups and Arabic SITOR-A traffic at 1300. (Hall-RSA)

18760.2 P6Z-MFA Paris, France, with FEC-A idling transmission at 1550. (Hall-RSA)

19049.0 RFFA-MOD Paris, France, with ARQ-E3 traffic at 0940. (Dman-UK)

19978.0 CLP67-Cuban Embassy Baghdad, Iraq, with 100 baud RTTY Iraqi news in Spanish at 1510 then Spanish messages to Habana. (Hetherington-FL)

20148.2 U.S. Army Inter-Americas military communications net with various stations from South America using FEC transmissions. (Hetherington-FL)

20157.2 Another U.S. Army sponsored Inter-Americas military communications net using FEC at 1315 and 1731. (Hetherington-FL)

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

Trunking

Mention the word "Trunking" to a group of scanning hobbyists and you'll hear a lot of moaning and complaining. As we all know, the new trunked radio systems are computer-controlled and utilize dozens of frequencies. Frequencies are selected by random and the frequency can change several times within a single conversation. To make matters worse, there can be several different agencies on a single trunked system. It isn't uncommon for a trunked radio system to include the highway department, the police, and the dog catcher!

Monitoring a trunked system becomes especially problematic because the frequencies and frequency assignments change at random. You may overhear a police officer calling for assistance and in the next instant, you're listening to the street cleaning department.

At first glance, following a trunked system does seem impossible. Heck, we've all seen the newspaper articles that predict the demise of scanning. Sure, a trunked system does present a special challenge, but I've yet to see a single scanner radio sitting on the curb on trash day! The important point to remember is that trunked systems can be monitored. There are thousands of scanner buffs out there who do it, and so can you.

Trunked radio systems can be monitored without breaking any laws—though not for peanuts.

The ideal way to tackle a trunked radio system is to use two scanner radios with lightning-fast scan rates—the faster the better. In the first scanner radio, program all the trunked frequencies in ascending order. In the second scanner radio, program the same frequencies in descending order. Turn on both scanner radios and deactivate the delay feature. If you're trying to follow a specific conversation, it may be necessary to manually "step" one of the radios to the next frequency. It's a little tricky, but it works.

Another way to beat the system is to schedule your monitoring sessions during specific time periods. If the dog catcher and highway department for example, go home at 5pm, schedule your public service monitoring for the evening hours. Another ideal time period is late night when the only active transmissions are from the local police.

Although each trunked system varies, look for at least one "control" data channel that will need to be locked out. The control channel can change hourly or daily, so you'll need to review them regularly.

As you monitor a trunked system, note the frequencies that are never used for control purposes or for voice communications. These frequencies may be reserved for a special purpose. They may be tactical frequencies, telephone patch frequencies, or an emergency paging frequency. To solve the mystery, store the unused frequencies in your scanner radio and be sure to note the type of transmission that finally breaks the silence.

In the above scenario, I've described a basic trunked system. There are large trunked systems that are far more complicated. There could be more than 40 frequencies, divided into several groups and the same frequency could be used at several locations. The frequency groups may be assigned to different areas and each group may have its own control channel. Discovering the group frequency assignments and the communities that they serve is not impossible. It may take several weeks of monitoring and some skillful note taking, but it can be done.

Scanning trunked systems in this fashion won't guarantee that you'll hear every word, but you will be able to follow and understand individual conversations. Again, the method isn't foolproof, but until the first "trunked scanner radio" hits the market, it's the best method for keeping yourself tuned in to all the action. [*Ed. Note: See this month's feature on trunking for more on how sophisticated trunking systems work, and how some hackers have taken on the technical—and juristic—challenge.*]

Treasure Hunt

The weakest link between you and the world of radio communications is your coax cable. If you improperly install a connector, your ability to hear all of the action will be compromised. The use of adapters is another problem area that can frustrate both neophytes and experienced hobbyists.

To help solve the problems, I'm offering a custom length of RG6-U with your choice of connectors and/or adaptors already installed. Here are the clues:

1. If you monitored 35.02 MHz, what would you probably hear?
2. Images on your scanner are offset by 21.40, 21.60, or 21.70. True or false?
3. I ordered at "CTR-8" from Grove Enterprises. What did I get?
4. If I'm listening to 121.90 MHz, what is the correct mode?
5. The Radio Shack PRO-60 has a dimmer switch. Yes or No?

The cable length that you choose cannot exceed 100 feet. Specify on your entry card the type of connectors and adaptors that are needed. If you are our lucky winner, you will receive a custom length of coaxial cable that will instantly connect between your scanner

radio and antenna. Send your answers to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902. Post cards are recommended.

Frequency Exchange

If you don't like the summer crowds, the month of October may be the ideal time to visit the beach. An anonymous reader has sent in the following frequencies for **Ocean City, New Jersey.**

46.36	Primary fire
460.60	Bethany Beach fire

Police--trunked	856.7375	859.7375	860.9875
853.9625	857.7375	859.9875	
855.2375	858.7375	860.7375	

Since **Philadelphia, Pennsylvania,** is only an hour drive from Ocean City, let's stop and visit with another anonymous contributor. Here are the drug enforcement frequencies for the city of Philadelphia.

418.625	418.90	460.475
418.675	418.95	154.95
418.75	453.375	155.445
418.825	460.25	155.490

Readers should take note that DEA activity on 418 MHz is primarily encrypted. However, some clear voice is occasionally monitored.

Our final anonymous contributor has invited us to **Mobile County, Alabama.** If we promise not to reveal his identity, he will share the following:

Site A frequencies	857.7625	859.7625
856.2375	858.2375	860.2375
856.7625	858.7625	860.7625
857.2375	859.2375	

Site B	***Site C***	***Site D***
856.2625	856.4625	856.9875
857/2625	857.4625	857.9875
858.2625	858.4625	858.9875
859.2625	859.4625	859.9875
860.2625		

Site E	***Site F***	857.9625
866.4125	854.9625	858.9625
866.9125	855.4625	859.9625
867.4125	855.7125	860.4625
868.4125	855.9625	860.9625
	856.9625	

Site A--Springhill
Site B--Bayou La Batre
Site C--Citronelle
Site D--Wilmer
Site E--Gopher Hill
Site F--Spanish Port

The trunked radio frequencies for **Dade County, Florida,** have been provided by Jim Essler.

821.1125	821.8625	822.5625	823.3625
821.1375	821.8875	822.6625	823.4125
821.362	822.1375	822.8125	823.5125
821.3875	822.2875	822.9125	823.6125
821.6125	822.3875	823.1625	823.8625
821.6375	822.5375	823.2625	

Jim's complete one page list provides the receive/transmit frequencies as well as the assigned frequency groups for the two systems that are utilized. The list is free for an SASE. Send your requests to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Traveling west, our next fall stop is **Tooele, Utah.** Michael Evans lives nearby and here are his favorite frequencies.

154.16	Weber fire	155.79	Weber Co. Sheriff
154.25	Ogden fire	460.25	Ogden PD car to car
154.28	Statewide fire	460.50	Ogden PD
155.265	Paramedics		

According to Michael Burgess, **Hendricks County, Indiana,** is very scenic during October. Mike lives on the western side of Marion Co., Indianapolis. As Indianapolis expands, Mike will keep us updated with new frequencies.

153.845	Hendricks Sheriff	155.31	Plainfield PD
154.13	Fire	155.475	Sheriff
154.19	Fire	155.61	Police, base
154.28	Fire	155.79	Plainfield PD
154.815	Hendricks Sheriff	155.85	Police, mobile
154.785	Sheriff	158.97	Plainfield PD
154.89	Police, mobile	460.3125	Hendricks PD
155.13	Police, base	465.3125	Hendricks PD
155.16	Lifeline helicopter medevac		

For our last stop, we've been invited to "Gary's" house in **Oakland, California.** Gary doesn't want us to use his last name so pay no attention to the name on the mail box.

153.845	Fresno Police	460.325	Fresno Police
154.37	Fresno Police	460.40	Fresno Police
154.92	Selma Police	460.45	State Police
155.130	Selma Police	460.425	Fresno Police
155.79	Reedley Police	460.475	Fresno Police
460.05	Fresno Police	858.7125	Sanger Police
460.175	Clevis Police	859.7125	Sanger Police
460.225	Fresno Police	860.7125	Sanger Police
460.275	Fresno Police		

If you want to see your name and favorite frequencies in print, send them to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Briefcase Satellite

In my June 1995 column I asked if anyone could identify a briefcase device that utilized satellite communications. Bill Jackson sent me a fax that described the unit as a "Saturn Miniphone." The unit is a lightweight, portable M station, with the handset contained inside the briefcase. The antenna is built into the briefcase lid and is detachable. A coax cable umbilical cord is supplied.

The Saturn Miniphone is manufactured by Mackay Communications in Raleigh, North Carolina. The transmit frequency range is between 1626.50 and 1660.50 MHz. Channel spacing is 10 kHz. The Saturn Miniphone is in use by the military, law enforcement, and private communities. The state of Florida, for example, is spending $3 million dollars to purchase 67 miniphones for use during natural disasters.

Scanning and Radar Guns

This column tracked the development of radar guns and radar jammers for many years. Even though these devices have moved from radio waves to light waves, the interest still seems to be there, so here is some background on laser guns used to clock speeders, and the defensive measures being taken by motorists.

Laser gun radar units fire a pulse of infrared light at the target and wait for the reflection of the pulse to return. The laser beam (infrared light), is approximately 1.5 feet wide at 500 feet. The pulses are very short and are fired at nearly four hundred times a second. The speed of the car is determined by the gun's ability to time each return pulse. It takes less than one second for a police officer to clock a car that is approximately a half-mile away.

The obvious way to beat laser radar guns is to prevent or distort the returning pulse of light. And that's exactly what many of you are doing. My mail bag contains numerous letters from readers who have mounted off-road driving lights on the front of their vehicles. Driving lights emit infrared light, which will distort the laser gun infrared light and prevent the gun from obtaining a reading.

Rear lights and side lights are also recommended. Now, I know what you're thinking...your car will look like a Christmas tree and it will blind other motorists. To solve that problem, entrepreneurs have been installing infrared-pass filters on the lights. With the filters installed, the lights appear to be off, but their ability to scatter return laser pulses is not affected.

Scanner Tips

A scanner buff in Brown Deer, Wisconsin, spotted two bank robbery suspects and began to follow them in his vehicle. The two men and their car matched an earlier police bulletin that the citizen had heard on his scanner radio.

The citizen followed the two robbers in his car and used his cellular phone to alert the police. The police arrested the robbers and also recovered the stolen money. The Brown Deer Police Captain credited the citizen with the apprehension and said that "It was like having an extra police officer on the road." (News clipping from David Zantow).

Antenna Repair

If you're beginning to question the performance of your roof top scanning antenna, it may be time to rebuild it. Antennas that have been exposed to the weather for more than three years should be checked for rust and corrosion. The obvious places to look are the connection points on the individual elements. Rusty rivets should be drilled out and replaced with stainless or brass hardware. Before reinstalling the elements, clean the metal around the contact point and after assembly, seal with a light coat of outdoor urethane.

Your antenna repairs should not be limited to the hobby of scanning. Television antennas can also be repaired and restored in the same manner. All you need is a drill, new hardware, a sheet of fine sand paper and sealer. When an old antenna is restored, you'll be amazed by the improvement in reception.

Instant Scanning

With today's technology, you can actually take the "scan" out of scanning. The new "Scout" by Optoelectronics will automatically tune your AR-8000 or AR2700 to any frequency captured by the Scout. There are no additional gadgets or computer interfaces to buy. You simply use the supplied cord, and plug the two units together. It's as simple as plugging in an ear phone.

The Scout will announce new frequencies with a double beep and a frequency already recorded with a single beep. Take the Scout and your scanner radio to the mall or to a hotel room and you won't need to search for the active frequencies. As soon as a nearby transmitter is keyed, you'll not only have the frequency, your scanner radio will be tuned to it and you will hear the action!

For more information, check out Grove's Catalog or contact Optoelectronics, (305) 771-2050.

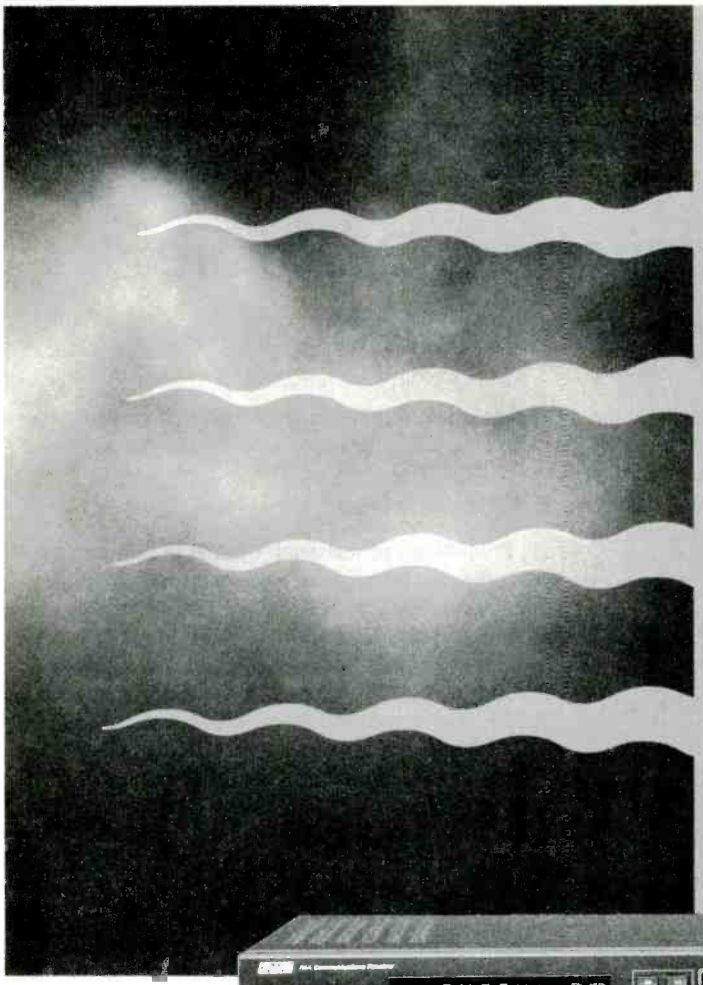
Build Your Own

Looking for an inside project during the fall and winter season? Why not try your hand at converting a television antenna into a VHF/UHF beam antenna? All that's needed are a few basic hand tools and an assortment of nuts and bolts.

To walk you through the conversion process, I'm offering a ten page instruction manual that everyone can read and use. The drawings are non-technical and include everything that you will need including a parts and hardware list.

You can use an old, discarded television antenna or you can convert a new antenna to receive the scanning bands. It's easy, it will save you money and you will feel a sense of accomplishment. Best of all, the conversion really works. With a beam antenna you'll hear more of the action and weak signals will come in loud and strong.

To receive the conversion package, via first class mail to your door step, send $5.00 dollars to Bob Kay, P.O. Box 131, Gunpowder Branch, APG, MD 21010-0131. Please allow three to four weeks for delivery.



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Rumors of Monitoring's Death are Greatly Exaggerated

I must admit I found Kirk Kleinschmidt's article in the July 1995 *MT* entitled "PROJECT 25: Will Scanners Be Locked Out of the Action?" to be intriguing from the perspective of writing for the beginners in our hobby. Since it is my role to get folks excited about the radio monitoring hobby, you'd think I would be upset at the prospect of Project 25 or any other regulation or technology that would pose a challenge to monitoring opportunities. Maybe it's because I'm wired a bit differently, but I am more excited than disappointed.

Here are some commonly-held "facts" for you:

1) Mediumwave monitoring will be destroyed and become impossible due to overcrowding on the AM broadcast band.

2) Shortwave monitoring will become an exercise in futility because so many broadcast stations are moving to satellites and other modes.

3) Amateur radio is an archaic hobby which hasn't kept pace with the advances in communications technology.

4) VHF/UHF monitoring will become impractical due to such practices as encryption and the movement to higher and higher frequencies.

Sounds really bad, huh? It makes you wonder if you should find some other way to occupy your time. Do you get the feeling that you should let your *MT* subscription lapse in favor of something more "permanent"?

Well, before you give up and break out the needlepoint hoop instead of the medium wave loop, let me tell you another fact: I first heard all the dire predictions listed above over twenty-five years ago! Had I taken any of them to heart and found a more "stable" hobby, I would have missed an awful lot of fun. Under the shadow of these dire predictions I have logged thousands of signals, heard history being made several dozen times over, and have amassed enough radio lore and legend to fill a book or two.

Every so often I hear these same four predictions mumbled in some new form and a feel the collective sigh of many monitors. I just turn back to my radios and keep having fun. I do have to admit one thing to all those doomsayers. In most cases I am not monitoring the same things I did so many years ago when they first tried to convince me that the hobby was dying. Change is one of the constants of this hobby. But change always brings about new challenges and the opportunity to log new and different signals. If you want to listen to the same half dozen stations every day for the next twenty-five years, you can stick to your car radio. But if you want to hear the exciting signals that the future of radio has to offer, stick with me and, of course, *MT*.

Let's pick these notions apart one by one and you will see that there is still plenty of reason to stick with the radio monitoring hobby.

AM Radio is Dead

Predictions of the death of AM radio have been around ever since Edwin Armstrong developed Frequency Modulation (FM) in 1933. Well, here we are over sixty years later and AM radio is going strong. Mediumwave monitoring still remains the most inexpensive way to get started in the radio monitoring hobby. Any standard AM broadcast band radio will yield hundreds of signals to the tenacious monitor. If you look at the bulletins of the National Radio Club and the International Radio Club of America (the two major mediumwave groups), you will see that folks are still happily logging stations and adding to their totals.

Tracking the changes in AM broadcast band programming over the years makes a great study of the shifts in American society. And guess what? The popularity of putting stations on this "dying" band of frequencies is so great that the Federal Communications Commission has taken steps to expand the band up through 1700 kHz. So I think you will find that there will still be plenty of stations to add to your mediumwave log books for the foreseeable future.

Shortwave Broadcasting is Dead

As for the demise of shortwave broadcasting. I really wish I had a nickel for every time I've heard *that* fear raised. I could easily afford a Watkins-Johnson HF1000 receiver by now. The notion that satellite transmission would sound the death knell for shortwave broadcasting has been around since the first TELSTAR bird went up in the early sixties. It's thirty years later and it's still cheaper to set up a shortwave station than it is to put up a satellite. Shortwave radio is still a very efficient means of getting your message across to a wide audience.

As I tune around the bands I do not hear any shortage of shortwave broadcast signals. If anything, I wish the high-powered superstations *would* shift their signals to space so I could hear their lower-powered cousins without so much interference.

The same thinking can be applied to those point-to-point, utility, and military signals. A culling of the more commonly-heard stuff would open up a whole new world to most monitors. I'm not planning on turning my shortwave receivers into doorstops just yet.

Ham Radio is Dead

When I was first licensed as WN2GHA, most of what

you heard on the air was CW, SSB, and maybe a little RTTY. Folks were just beginning to jump into VHF/FM with both feet. If you really hunted around you could find a handful of folks playing with SSTV and ATV. Even back then people were worried about ham radio disappearing, losing bandwidth, and becoming irrelevant.

Since that time amateur radio gained three HF bands and new modes such as packet radio. The recent development of the "No-Code" Technician's Class license has brought thousands of new folks into the world of amateur radio. Many of these folks are already tweaking the technology and getting us moving in new and exciting directions—All of this, and you can *still* have a good old-fashioned rag chew on 75 meters if you want to.

Taking the "if you can't beat 'em, join 'em" perspective, we now have hams in space thanks to the MIR and SAREX programs. New doors open daily in the world of amateur radio. Anybody who thinks amateur radio is dead needs to have his or her own pulse checked.

Scanner Listening is Dead

Folks who do their business in the VHF/UHF spectrum have been feeling the need for privacy in their radio activities. Regardless of whether the motives behind this are profit or paranoia, some folks are spending a lot of money, brain power, and legal effort to make it hard for hobbyists like you and me to listen in on what's going on.

Actually, this is nothing new; the technology to provide privacy has been around in various forms since before the inception of high band monitoring. Encryption devices and techniques have always introduced one more opportunity for Murphy's Law to wreak havoc, as today's users are discovering. Similar things can be said for "moving up the band" to higher frequency equipment. More than one public safety organization has moved up above 800 MHz, only to discover coverage problems that they did not experience with more traditional lower frequencies. All of this new technology buys new headaches.

As the case against sophisticated encryption accumulates, and the good citizens of every hamlet keep a vigilant eye on the town father's spending practices, you are likely to see the movement away from "scannable" frequencies take place very slowly, if at all.

Do you ever wonder what they do with their old licenses and radios? Since many of my local constabularies have moved their day-to-day practices up the band, I find all kinds of exciting things going on on the "old" frequencies. Things such as drug enforcement and interdiction, stake-outs, and undocumented mutual aid activities. All of this communication is occurring "in the clear."

Don't forget that scanning receiver technology and practices are also moving along quite nicely, thank you. Folks have already figured out ways to scan "trunked" radio systems. [*See trunking feature and this month's Scanning Report-Ed.*] One of the selling points of trunked communications was that it was unscannable. Nothing is unscannable, because scanning technology itself will always advance, especially coupled with the personal computer.

When folks worry about losing scanning opportunities, they often forget that there are thousand of signals to log that have nothing to do with the potentially-protected public safety frequencies. Radio is everywhere. My local hardware store uses itinerant frequency communications to communicate within the store, and believe it or not, you can hear some interesting things.

As you have probably figured out by now, I'm not sold on all this doom and gloom. I've even come up with a few answers of my own to those who would drive folks away from the radio monitoring hobby with tales of disappearing signals.

Uncle Skip's Radio Monitoring Axioms

1) There will always be signals to monitor.
2) No usable frequency ever goes unused.
3) For every lock there is a key.
4) Any law can be changed.

Radio — Alive and Kicking!

Radio is in wider use today than at any point in history. If you hit the lottery and could quit your job and devote your whole life to the radio monitoring art, you still couldn't log everything that there is to hear. And every day more signals are popping up for your monitoring pleasure.

Oh, it would no doubt be a safe bet that what you will be monitoring in ten or twenty years will be quite different from what you tune in to today. I'd even place a side bet that the equipment and technology you will use at that future time will also be unlike anything you could imagine today. After all, in the span of a single lifetime, we have already passed through the ages of the vacuum tube, the transistor, and the integrated circuit.

As I said above, as old frequencies are vacated for one purpose, another will rise in its place. There are few receivers—maybe none—that became obsolete because there were no longer any *signals* they could receive. Someone will always covet any unused portion of the radio spectrum. My old Bearcat IV, 8-channel, scanning receiver doesn't cover 1.2 GHz, but there are plenty of signals around worth plugging in crystals to hear.

Practical encryption may limit our access to some signals. But even the military does not encrypt every signal. As a matter of fact, anyone who tunes around the military frequencies will be surprised at how much stuff remains "in the clear." Some encryption systems will likely be defeated—radio hobbyists being the tenacious bunch they are. Likewise, transmitting techniques that make signals "unscannable" just throw down a gauntlet that more than a few hobbyists will pick up.

Laws like the ECPA rule the land today. Prohibition and the 55 mile an hour speed limit once did, too. The State of New Jersey had a strangle hold on mobile-operated scanners for decades. But a group of dedicated hobbyists kept after their legislators and, after many defeats and failed attempts, a hobbyist-friendly law was passed. It is no longer a crime in New Jersey for me to carry my Pro-43 in my briefcase. Sure, things can change for the worse—if you aren't willing to make them change for the better.

So, do not fear, my friends. I look forward to enjoying monitoring right along with you for many years to come.

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

America's Newest SW Station

WGTG, McCaysville, GA, was first heard testing July 29 on 7355 until 2200* with a one-minute tape loop asking for reports to Box 1131, Copperhill, TN 37517; phone 706-492-5944. The signal is 50 kW with 900-foot-long rhombic aimed toward Mexico, authorized to test Fri/Sat/Sun 1300-2200. Regular programming is expected to start in 2-3 months (J. D. Stephens, AL, *W.O.R.)* First day transmissions were also caught by Rob Keeney, KS, and Chris Lobdell, MA (Ed Rausch and Hans Johnson) Not heard here until one week later, following Saturday at *1800-2200* with same continuous loop ID, fair to good signal (gh, OK) Was on 7354.95, so I called and helped him tune it up to 7355.00 (Dave Valko, PA, HCJB *DXPL*)

We interviewed David Frants of WGTG ("With Glory To God"), for *World of Radio*. WGTG is on the Georgia side of the border, close to Tennessee and *MT*'s North Carolina HQ. Their test authorization has been expanded to 7 days a week at above times; later they will try 15.1-15.4 MHz, but ultimately expect to operate on 9 or 11 MHz. Frants has built the station, including the transmitter, himself. It is capable of compatible SSB but is testing AM only at first. Rhombic has 10 dB gain, is 90 feet high, aimed NE/SW. He is also installing a yagi.

The station is a "mom-and-pop" first broadcasting venture, with no previous involvement in AM, FM or SW, and no consulting engineer (gh) Programming will be Christian, non-denominational, but fundamentalist. Will originate some programming from KJV Bible, also satellite downlink, phones, and tapes. (HCJB *TLC*) May include some radio hobby, and ham programs; they plan two more transmitters (RN*MN*) *(Watch for an upcoming feature on WGTG by J.D. Stephens- ed.)*

ANDAMAN ISLANDS Do not send a greenback for return postage to AIR Port Blair; apparently violates foreign currency regs as mine was returned (Roland Höller, Germany, DSWCI *SW News*) 4760 heard at *2323-2336 with IS, ID, vocal anthem, 2335 news in English ('SSF', *ibid.*)

AUSTRALIA Clarifying item in June *MT*, p. 42, R. Australia's one and only E-mail address is raust3@ozemail.com.au. We will also have a Web page very soon but meantime try: http://www.aussiemusic.com.au (Arie Schellears, RA Transmission Manager)

BOLIVIA ID of 6142.0 station last month revised to R. Bando Negro, 0930-1115+, at Villa Serrano (Emilio Pedro Povrzenic, Argentina, *Latinoamérica DX* via *Radio Nuevo Mundo*) 6142 QSLed as R. Mauro Núñez, Cedec, Casilla 196, Sucre, signed by Dir. Gen. Dr. Vladimir Gutiérrez; owned by Centro de Estudio para el Desarrollo del Chuquisaca (L. E. Svensson, *SW Bulletin* via *Play-DX*)

On 4702.27 is new R. Eco Amor, San Borja, Beni, nom. 4700 heard at 0211 (Hermod Pedersen via Rippel, *Jihad DX*) Station name is just R. Eco (Pedersen, Internet via HCJB *Latest Catch*)

CANADA CFCX Montréal, 6005 seems off, as usually audible in daytime but missing in August (Kevin Hecht, PA)

CHINA [non] CRI on new 11655 at least for 0000 English, 0100 Chinese, // Mali 11715 & 9710, but 11655 with awful rumble reminding me of Albania (Kevin Hecht, PA *World of Radio*)

COSTA RICA R. For Peace International now has WWW site at this URL: http://www.clark.net/pub/cwilkins/rfpi (Brad Heavner, RFPI) My *Sound Currents of the Spirit* has been replaced by *Spiritual Awakenings*, Sun. 2030, Mon. 0430, 1230; also on WWCR Mon.-Fri. 1510-1515 on 15685 (James Bean, ME)

AWR-Pan America has new series of QSL cards, six featuring repros in full color of water color paintings of volcanoes in CR; report with return postage to Box 1177, Alajuela 4050 (David Gregory, TIAWR via Adrian Peterson) 5030, 6150, 7375, 9725, 13750, 15460

CUBA Arnie Coro, CO2KK, of RHC's *DXers Unlimited*, visited USA again this summer, for VHF conference in Colorado, and to appear on Jay Marvin's WLS talk show, weeknights 10 pm-2 am CT on 890, 94.7, after Marvin had visited him in Cuba. Arnie described how he had almost been "disappeared" when caught buying parts for rebel radio transmitters as a teenager during the Revolution (gh) RHC is harmonic-rich, at various times on 12000, 18540, 18500, 19010, 28515 (John H. Cobb, Jr., GA) [non] R. Martí, see Hot Spots, page 47.

CZECH REPUBLIC RFE/Radio Liberty, now headquartered here, has this address: Vinohradsk-El, 120 00 Prague 2; tel: +42-2-2422-7520 (BBC Monitoring) Radio Ropa mars BBC Antigua 2100-2300, but Ropa audible in clear as early as 2015 (Alan Roberts, PQ, *W.O.R.*)

ECUADOR Due to budget restrictions, HCJB cutting daytime English service on 6080, and both SSB frequencies, 21455 and 15540 as of Sept. 1 (HCJB *DX Partyline*) Euro service at 0700-0830 planned to replace 11615 from Sept. 1, either 5930, 6050, 6055 or 6110 (*DXPL* via Büschel via *Jihad DX*) The Oct. *Radio Stamps* program on HCJB *DXPL* will be my 50th and last (Neil Carleton via Tom Kuca) Bill Rapley, 64, EDXC reporter on *DXPL* and host of popular *Blues, Rags and All That Jazz*, died July 14 of apparent heart attack (*DXPL* via John Norfolk)

FINLAND YLE tentative W-95 schedule—24 Sept to 30 Mar—includes 13645 to N. America at 1500-1600 (via Rumen Pankov, via Büschel) This and many other services to and from Europe appear one UT hour later from Sept. 24, so English should be at 1230, 1330, 1430, 1630? (gh)

FRANCE In retaliation for Australian opposition to French nuclear testing in the Pacific, David Page vowed to boycott Aussie music for a few weeks on *Club 9516*, RFI Sundays (gh)

GABON Africa Number One, in French at 0500-2300 on 9580; also 17630 at 0759-1559, 15475 at 1559-1900; fax +241-742133 (BBCM) No mention of English news capsules here; overlooked?

GOA AIR, Panaji, testing daily on 15290 at 0228 with *Vividh Bharati* program, QRM de Jordan from 0259 (David Foster, Australia, *NU* via HCJB *TLC*) Test span is 0055-0430 (*Wavescan*, WRMI) // 10330 India (Rich McVicar, HCJB *DXPL*)

GREECE VOG QSLed my report in just 16 days contrary to typical 150 days; have four designs this year corresponding to D, M, J and S frequency seasons showing classical architecture; address used was: ERT S.A., Direction of Engineering and Development, P.O. Box 60019, 153 10 Aghia Paraskevi Attikis, Athens (Kevin Hecht, PA, *World of Radio*)

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

HONDURAS Ernst Zündel is on HRJA, 15674.6, at 2000, Saturday in German, Sunday in English, barely audible, perhaps using old 100-watt standby (Ernie Behr, Ont., *W.O.R.*) His Nazi message may be back next on WRMI (gh)

HUNGARY 6025 Kossuth Radio relay was to cease August 1 due to costs (Kai Ludwig via ORF via Honzik, *DX Revue*; Büschel via *Jihad DX*) R. Budapest revamped DX segments in July, replacing three 3-minute weekly items as given last month with weekly *DX Show*, UT Mon 0230, Thu 0100 (Tom Kuca, NY) Confirmed Mon 0236 on 9835 with heavy USB QRM from Cuba 9830 (gh) Replaced with two shows now called *DX Quiz* and *DX Catches* (Lájos Horvath, RB DX editor via *DX Ontario*)

ICELAND RUV on 7870 at *1854 //11402 (Frank Baldwin, Ipswich, BDXC, WDXC, DSWCI)

INDIA AIR has dropped these frequencies: 3295 Jaipur, 3355 Kurseong, 5990 Bhopal, 6010 Calcutta, 6120 Hyderabad. Shillong new sked: 0030-0400 4970, 0700-0930 7130, 1100-1600 4970 (Alok Das Gupta, India, AWR *Wavescan*) see also Kashmir, Hot Spots, p.47; ANDAMAN ISLANDS, and GOA here

INDONESIA RRI Fak2, Irian Jaya, stays on 7231 eves, such as 1200 Jakarta news, stronger lately (Craig Seager, NSW, *Jihad DX* via HCJB *DXPL*)

INTERNATIONAL VACUUM *World of Radio* experimented with non-delayed airing on Tech Talk Network, Fridays 2330 UT, 7:30 pm ET, in August, thanks to cooperation of George Thurman, Gary Burgois, Skyvision; check to hear if it continues now on Telstar 302, 85.1 W, transponder 21, 5.8 MHz audio (gh)

IRELAND A group promoting SWBC from here says a service could be established for less than 6 megapounds (BBC *Waveguide*)

ISRAEL 8127 relay of Galey Tzahal—note spelling—is not first time; previously in Dec. 1980 was on 3901, 5893, 6420, 18128 (BBCM) Israeli sources say it's the diplomatic transmitter VLB inadvertently energized by nearby MW 1287 transmitter (Daniel Rosenzweig, Internet via HCJB *TLC* via BBCM) Don't you believe this "spur story" for outside consumption; it's really on SW for non-technical reasons (Larry Magne, PA, HCJB *TLC*) 8127 heard in early July but gone in late July (Beppe Gornati and Finn Krone, DSWCI *SW News*)

JAPAN R. Japan's *Crosscurrents*, Thursdays in Oct., will broadcast listener essays on "The Book That Sticks in Your Memory" (Kevin Hecht, PA, *W.O.R*)

JORDAN R. Jordan in English at 1100-1200 and 1400-1630 moved to 11970 (Carl ---, England, R. Netherlands *Media Network*) 15 MHz channels were good in summer; should not have changed in August, but maybe will be good on 11 MHz for winter (Kevin Hecht, PA)

KUWAIT R. Kuwait, English at 1800-2100 on 11990, instead of its own selection of programs as on other days, relays "FM Super Station 99.7" on Thursdays (June sked via Kevin Hecht)

LITHUANIA Closure of 9710 transmitter mentioned here last month only lasted a week or so, as the Prime Minister ordered it back on (BBCM) English at 2300 moved Aug. 1 from 9530 to 7360 (Kevin Hecht, PA) Should be at 0000 now, perhaps same frequency (gh)

MONGOLIA RUB, English at 0300-0330, usual muddy modulation on 12000 (Mike Ryan, NASWA *Journal*) At least you can hear it, in Bangkok (gh)

MOZAMBIQUE Em. Interprov. Maputo on 5135.7v, 1650 local language, music, news, very good //fair 6323.5 (Vashek Korzinek, RSA, *NU* via HCJB *TLC*)

NEW ZEALAND You might enjoy *Cadenza*, classical music with news on the hour, UT Tue-Sat 0130-0230 on RNZI 15115; comes in nightly while I'm still sipping my after-dinner wine (Don Rasmussen, Reno, NV, *W.O.R.*) May or may not shift a UT hour earlier for DST from Oct (gh)

PALAU By splitting two 100 kW, KHBN plans to have four 50 kW (*Wavescan* via TIAWR) W-95 registrations account for up to three at once, effective 24 Sept to 31 Mar (gh) 9730 at 0800-1300, 9965 at 0900-1800 & 2200-2400, 9985 at 1100-1800 & 2200-2400, 11775 at 2100-2300, 15140 at 0000-0200 & 0800-1100 (George Jacobs & Associates)

PARAGUAY R. Nacional, news and typical music 1130-1155, flutter on 9737.03 (Chuck Bolland, FL) That's *Cuerdas maravillosas*, weekdays (sked via Nabeshima, *Radio Nuevo Mundo*)

PERU Juan Carlos Codina, Argentine expert on LA DX, latest living in Holland, has passed away. We will miss you! (Finn Krone, DSWCI *SW News*) We too. JCC originated the "immersion" technique, discovering many new SW stations while living in Perú in the 80s (gh) I don't believe Codina is really dead (Dario Monferini, Italy)

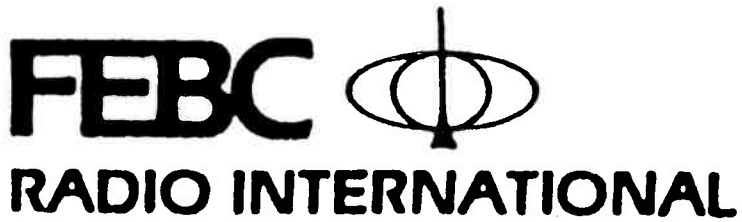
R. Atlántida, Iquitos, for many years has had a Spanish/English program for tourists, weekdays 2300-2330, *Trocha turística* "in this enigmatic and majestic and beautiful jungle;" outside production at Jr. Arica 441, Iquitos; on 4790. **R. Oriente**, Yurimaguas, 6188.2, has been putting spurs on 6201.2 or .3, as well as 6227.2; the 6201.2 is particularly strong from *1000. Not to be confused with **R. La Voz de Huamanga**, which was on 6200.5 in mid-93, but last heard here in Aug. 94 on 6070.3 (Henrik Klemetz, Colombia)

The station on 5770 last month has been identified as **Estación Soritor**, a town near Rioja, with job notices, IDs, on 5766.5. New on 7559.44 is **R. Altura**, Huamarca, good Sunday from 2011, excellent at 0044 (Rich McVicar, HCJB *TLC*) Also here at 0115-0145 on 7559.45 (Ed Rausch, NJ, *ibid.*) **R. San Ignacio** on new 8364.77v, different programming from station of same name also heard on 6571; heard Sat 2128-2225*, back on until 0052* on 8364.58; very strong but CW QRM, and too much reverb on ID (Rich McVicar, HCJB *TLC*) **R. La Voz de Santa Cruz**, Cajamarca province, heard at 2330 on 7050.3 giving sked as 2315-0430 on "49 metros," S9 at first but faded by 0030 as hams objected (Jim Headland, Macuma, Ecuador, *ibid.*) Still at 0153 with IDs over pop music on 7050.33 (McVicar, *ibid.*) **Rdif. Juancabamba** [*sic*], 6535.78 ex-3370 at 1141 and very good to excellent all day, testing with 1000 watts, "cruzando fronteras" (McVicar, HCJB *DXPL*) Two weeks later on 6545.78 at 0055 (Dave Valko, PA, *DXPL*) unID on 4750.12 until 0200* (Björn --- via Finn Krone via Herkimer, *DXPL*) It's new **R. San Francisco de** (2 syllables, very fast and unintelligible), mentions FM and SW only, places in northern Perú such as Huamarca, San Ignacio, Cajamarca, Jaen, Huancabamba; 0159 piano IS, 0210* without formal sign-off; next night mentioned Parroquia de San Miguel (de Tumbes?), Rio San Francisco, not on my map. **R. Victoria**, Lima, on new 9720 at 1920, announcing this and 6020 (McVicar, *DXPL*)

PHILIPPINES **R. Pilipinas** at 0230 on 17760, 21580 both good but overmodulated; 17840 no longer in use; V. Of Democracy program Mon-Fri (David Norcross, Barricada, GU) **R. Veritas Asia** on

new 11715 in Pilipino 1500-1525 Mon-Fri, to 1555 on Sat, Sun, Wed (Bob Padula, *DX Press*) Service to Mideast, including Sunday mass with much English (Victor Goonetilleke, Sri Lanka, RN*MN* via WDXC *Contact*) Blocked at times in N. America by two other Catholic stations, KJES and WEWN! (gh)

FEBC's DX Secretary, Tom Brooks, and his wife had to leave in May due to serious illness, and I inherited his enormous work-load, including an eight-month backlog of reception reports which it will be impossible for me to answer; from now on, please send in no more than one frequency-report per month. E-mail: english@febc.jmf.org.ph; DXers use this: dx@febc.jmf.org.ph (via Robert J. Foyle, FEBC June-Sept)



RUSSIA [See Aug. p. 44] 15470 Islamic program in Bengali at 1330-1400 is called *Mukto Probaho* which we translate as "Free Flow" (BBCM) On a *Moscow Mailbag* Joe Adamov said R. Moscow peaked at 70 transmitters, now V. of Russia uses 30 (Tom Sundstrom, NJ, *Jihad DX*, via Büschel, WDXC *Contact*) Squawks Stewart mentioned last month are not unusual on VOR—Grigoriopol', Moldova on 11750 and 9620 always has a rumble; 9665 sometimes groans and dies for 5-10 min before they can get it back on. 15400 for English 1500-2000, 11730 at 2030-0000, Spanish -0100 from Grigoriopol' often fails for several minutes to hours at a time (Kevin Hecht, PA)

SIERRA LEONE Full name of Islamic station on 9630, see Aug p 43, is Radio Al-Koran Al-Karim, and it has not been confirmed by BBCM (BBCM) Remarkable that a 250 kW station in use for a sesquidecade has never been reliably monitored in the DXing community! Gabon used 9630 for some years in evening including AWR religion; no trace of any ITU registration for a Muslim station (Bob Padula, *DX Press*)

SOUTH AFRICA Channel Africa is one of best sources for African news, 0500 on 9695. Unlike the late R. RSA, Channel Africa is serious in covering Af news, with freelancers from around the continent, mostly sounding every bit as good as BBC or VOA counterparts, and have an insight into some stories lacking elsewhere (Larry Shewchuk, Manitoba, CIDX *Messenger*)

SRI LANKA Protesters led by Buddhist monks and Catholic priests burnt the US flag on July 4 in front of the US Embassy in a peaceful demonstration against setting up the VOA station at Iranawila. Placards read "Get Out, VOA" and "Down With America" (Iranian news agency quoting United News of India, via BBCM)

TAIWAN V. of Asia's previous address at Kaohsiung is invalid; now PO Box 24-777, Taipei; fax +886-2-7519277; 0500-0700 on 7285, 0700-1100 on 9280, 0900-1000 on 7285, 1100-1700 on 7445 starting with an hour of English (BBCM)

THAILAND R. Thailand to N. Am. At 0030 in English on 15390, but 0300 still 15370 (Roland Schulze, Philippines, via Wolfgang Büschel)

USA Family Radio has been running a deficit of $3 million per year, so has sold KECR-FM near San Diego for $9 million, to keep WYFR and other stations going three more years. (*W.O.R.*) KECR FM-93.3 sold for $12.5 million, but Family keeps AM 910 (*FMedia*)

On a Sabbath broadcast, Pastor John Osborne reported that WVHA had been granted the tax exemption they wanted in Maine, but substantial budget cuts were necessary, delaying installation of log-periodic antenna toward Tijuana, and reducing schedule to: Mon-Fri 1700-2100 on 15745, Wed also 2200-2400 on 9852, Sat 1300-1445 on 11695, 1445-1700 on 15665, 1700-2100 on 15745; Sun 1100-1200 on 13770, 1300-1400 on 15745, 1700-2100 on 15745, 2100-2130. On 13720. Not in English: Sat 1700-1900, Sun 1100-1130, 1300-1400, 1700-1800 (Jim Moats, OH, *W.O.R.*) *DXTRA* is no longer broadcast, but may start up again later (Gordon Simkin, WVHA via Diane Mauer)

Pastor Pete Peters' *Scriptures for America*, bumped from WHRI and then from WJCR, next showed up on WRNO, UT Mon 0300-0400 on 7395 (Tim Hendel, FL, *W.O.R.*) WWCR hopes to have a fourth transmitter on by yearend, and authorization to use a frequency around 3.3 MHz.

World of Radio on WWCR: Friday 2115 on 9475, Sat 1300 on 15685, UT Sun 0230 and 0600 on 7435, 0930 on 5065, Tue 1230 on 15685. Subject to change, one hour later from November. WHRI and KWHR were canceled in late July after the stations started editing items out of the tapes and inserting their own commercials (gh) see also INTERNATIONAL VACUUM.

WHRI new alternate frequencies available for W-95; 6055 at 0500-0700, 6185 at 1000-1300, 7315 at 0000-1000 (Geo Jacobs & Assoc)

WINB, if and when it returns, W-95 registrations: 1600-1900 on 15715, 1900-2200 on 11740, 2200-0600 on 11950 (GJ&A)

KJES, NM, authorized by FCC to operate at only 20 kW; a precedent? (*Wavescan* via TIAWR)

WRMI wants reports on times increased Cuban jamming is noted on 9955; new, simpler e-mail addr is: **RadioMiami@aol.com** (Jeff White, WRMI, *Jihad DX*)

La Voz de la Esperanza, location unknown, on 17628 at 1400-1600, versus Gabon on 17630 (David Crawford via Terry Krueger, HCJB *DXPL*) Sounds like a Latin, but at 1400 broke for a quick English ID as KVOH, 17775, so this a spur matched by a clearer one on 17922 (gh, OK) KVOH now has three transmitters, and will soon add second frequency such as 5 MHz for California coverage (*Wavescan* via TIAWR)

Calvary Satellite Network, Twin Falls, ID, bought the KGEI transmitter, but getting that back on SW is lower priority than expanding their KAWZ satellite/translator network. CSN is not oriented to the far right and I am affiliating my Maine FM station with them (Jim Bean, *W.O.R.*)

[non] I shall soon be on SW covering all of Southern Africa twice a week on a powerful station on the East African coast. We are at present covering all the UK and Eastern Europe from a SW station in Ireland, Sunday night (Bro. Stair, *Overcomer* via Mauer) No details but Ireland would be R. Fax, not reported lately; also, we asked WGTG and they were noncommittal on whether B.S. would be a client (gh)

VOA-Europe heard on SW for first time in two years, strong at 1415-1700+ on 6165, must be Greenville testing (Kevin Hecht, PA) With consolidation of VOA and RFE/RL there is no longer any barrier to any of them using any relay site (gh) Woofferton, England, has been carrying RFE/RL since July, and Biblis, Germany, is being mothballed; RL also via Morocco (Chris Evans, WDXC *Contact*) VOA via Holzkirchen and Lampertheim, Germany, now and RL via Tinang, Philippines (Bob Padula, *DX Press*) Details were for summer season, probably outdated now (gh)

VIRGIN ISLANDS, BRITISH Heard in Holland on 7850, the Pan Caribbean Disaster Preparedness Program, which is occasionally active from Road Town. I'm on the way to visit there, hoping to pick up a QSL for my 249th country (Maarten van Delft, visiting HCJB, *DXPL*) This is SWBC?.

ZAÏRE **La Voix du Zaïre**, heard again after 25 years, on 15244.08, at 1600, 1850 and 0500, always weak, and blocked by VOA 1630-1700, also VOA splash from 15255 1700-1800 (Vladimir Titarev, Ukraine, DSWCI *SW News*) French unID at 1900 on same freq (Finn Krone, Denmark, *ibid.*) 15244.1 reactivated at 1730, poor-fair with Afro music, French news 1800-1824, then Afro language till 2000, heard until 2018 (Eugene Gebreurs, RVI *Radio World* via Steven Cline, Diane Mauer) unID on 7295 could be **Mbuji-Mayi** reactivated, possible only in 1-minute R. Liberty break at 1759 (Titarev, *op. cit.*) **R. Bukavu** on 3278.0 ex-3276 at 1844-1900 (Godfrey Clewiston, RSA, DSWCI *SW News*)

ZAMBIA Christian Voice on slightly new 4968.0 at 1510, religion in English (Gerhard Werdin, Zimbabwe, DSWCI *SW News*) Ex-4965

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

Broadcast Loggings

SHORTWAVE BROADCASTING

Gayle Van Horn

0000 UTC on 9540
SPAIN: Radio Exterior Espana. Station ID and program preview. *Visitor's Logbook* feature to national news and weather updates. (Tom Banks, Dallas, TX)

0012 UTC on 9580
YUGOSLAVIA: Radio Yugoslavia. Story of Yugo basketball team winning European Nationals. Frequency quote to 0025*. (Sue Wilden, Columbus, IN)

0100 UTC on 6040
GERMANY: Deutsche Welle. World news and mailbag show. (Wilden, IN) *Jazz Corner* heard on 17800 at 1648. (John Hanz, Old Bridge, NJ) German audio for DW heard via satellite (Satcom C4 transponder 5) at 1547 with European pop vocals to national market report. Station ID at 1600 into world news. DW in English also noted on the Anik E1 satellite transponder 10 at 1600. (GVH, NC)

0102 UTC on 9835
HUNGARY: Radio Budapest. Frequency/time schedule quote, to national news topics. (Wilden, IN)

0130 UTC on 6175
PORTUGAL: Radio Portugal International. // 9570 to North America fair with sign-on ID and frequency schedule. National and world news to sports roundup. National weather update to *Visitor's Notebook* program, a travelogue to southern Portugal. Time tones to Portuguese ID, national anthem and 0202*. (Frank Hillton, Charleston, SC)

0144 UTC on 9655
AUSTRIA: Radio Austria International. News feature story on the female head of United Nations forces in Angola. Sign-off 0155 into Spanish service. (Wilden, IN)

0213 UTC on 11740
USA: Voice of Free China relay (via Okeechobee, FL). Newscast and national current affairs focus. (Wilden, IN) Economic news heard for same relay on 9680 at 0305. (William McGuire, Cheverly, MD; Edward Griffin, San Francisco, CA)

0230 UTC on 6145
ALBANIA: Radio Tirana International. // 7160 to North America with audio hum. Melody interval signal to sign-on ID. National news to easy listening folk vocals. Update on Albania's educational system, and text on the struggle of the people since 1600's. Sign-off at 0300. (Hillton, SC)

0230 UTC on 9850
SWEDEN: Radio Sweden. *60 Degrees North* program. *Media Scan* program at 0247 featuring news of World Radio Network's expansion plans. Good signal. (Jim Moats, Ravenna, OH)

0320 UTC on 9690
SPAIN: China Radio International via Noblejas relay. Moderately strong signal with some fading noted. Program on a charity event in Beijing to assist the handicapped in China. Sign-off 0355. (Wilden, IN)

0344 UTC on 3306
ZIMBABWE: ZBC. Vernacular. Pop music show by male DJ host. Children chattering to mentions of city Harare. Afropop music from Sade. (Giovanni Serra, Anzio, Italy)

0354 UTC on 3220
SOUTH AFRICA: Channel Africa. ID break during regional newscast. Pop song, time tips at 0400, into African news. Program preview for educational forum. (Serra, Italy)

0429 UTC on 4930.6
HONDURAS: Radio Internacional. Spanish. Romantic Latin American music. ID as, "internacional su radio Honduras," to local time check.(Serra, Italy)

0451 UTC on 4904.5
CHAD: Radiodiffusion Nationale Tchadienna. French. Afropops to ID and tat tam sound with announcement. Brief children's choral chant into program. (Serra, Italy)

0615 UTC on 12080
BOTSWANA: VOA relay. Daybreak program to weather update for Africa. Report on refugees conference in Washington, DC, to 0630*. (Hanz, NJ)

0710 UTC on 7110
MONACO: Trans World Radio. Religious text at tune-in. U.S. and European address quote to IDs. Religious music and frequency quotes. (Hillton, SC)

0950 UTC on 6100
NEW ZEALAND: Radio New Zealand International. Pop music program to 1000 ID. Regional news from male/female team. Distorted audio as Monitor Radio Int'l signed on at 1000 on 6095. (Bob Fraser, Cohasset, MA)

1005 UTC on 9735
PARAGUAY: Radio Nacional del Paraguay. Spanish. Station ID to sunrise prayer service. Good signal. (Hanz, NJ)

1012 UTC on 15400
ASCENSION ISLANDS: BBC relay. Newsdesk segment on Haiti and Israel. (Hanz, NJ)

1029 UTC on 9505
CZECH REPUBLIC: Radio Prague. Interval signal to station ID. National news to cultural segment on Czech composers. (Hanz, NJ)

1300 UTC on 13760
NORTH KOREA: Radio Pyongyang. Interval signal to station ID and program preview. Usual text on the *Great Leader*, fair to good signal quality. (Moats, OH; Claude Turner, Chicago, IL)

1335 UTC on 15008.5
VIETNAM: Voice of Vietnam. Female's newscast to ID and local music pause. Featured program on Ho Chi Minh. News updates on the economy and U.S./Vietnam relations, followed by patriotic hymns and current affairs. (Serra, Italy)

1350 UTC on 15400
FINLAND: Radio Finland. *Compass North* program reports on movie stars advertising, and the return of 1950's fads. (Fraser, MA; Hanz, NJ; Wilden, IN)

1530 UTC on 15345
MOROCCO: RTV Marocaine. Arabic. Very weak signal (S2) for Arabic music program of vocals and instrumental tunes. Signal peaked to S5 at 1552. ID at 1600 to newscast. Signal audible to 1715. Morocco's **Medi I** heard in French on 9575 at 1835. Very weak news update at 1850. (GVH, NC)

1645 UTC on 4335
ETHIOPIA: (Clandestine) Radio Torch. Amharic. Male/female announcers with presumed news report, very weak. (Jerry Witham, Keaau, HI) Radio Torch is operated by the Ethiopian People's Revolutionary Democratic Front, the ruling coalition, and was inaugurated on Nov. 7, 1994. The broadcasts of Radio Torch echo the line taken by Radio Ethiopia, the government station in Addis Ababa. (GVH, NC)

1735 UTC on 6420.8
IRAN: (Clandestine) Voice of the Communist Party of Iran. Persian. Lady announcer's text and regional music. (Witham, HI) Broadcasts from this station, were first monitored on Aug. 26, 1984. The station broadcast in Persian and in the past has also carried programs in Azeri. It is believed to be associated with the Voice of the Iranian Revolution. (GVH, NC)

1735 UTC on 15475
GABON: Afrique Numero Un. French. Reggae rap to U.S. hip hop tunes. Parallel signal on 9580 very weak. Music from Michael Jackson and Mariah Carey. Time tips at 1800 to ID and national news. (Hillton, SC; Serra, Italy)

1805 UTC on 9950
INDIA: All India Radio (via Aligarh). English national news to 1810. Station ID to editorial on Pakistan, // heard on 11620 (via Bangalore) very weak, no other // audible. (Sam Wright, Biloxi, MS)

1820 UTC on 11990
KUWAIT: Radio Kuwait. Easy-listening instrumentals to world newscast at 1830 on U.S., Greece and Bangladesh.. ID break at 1840. Headline news review to 1843, fanfare and U.S. pop music program. (Wright, MS; Serra, Italy)

1830 UTC on 12095
UNITED KINGDOM: BBC World Service. *Omnibus* on the history of photography. *Seeing Stars* noted on 9915 at 2330, featuring double stars, and the planets of Uranus and Neptune. (Fraser, MA)

1855 UTC on 11402 USB
ICELAND: Icelandic National Broadcasting Service-Rikisutvarpid. Icelandic. Sign-on with melody interval signal and station ID (repeated twice) to kilohertz quote. Male announcer's newscast at 1900. Bell chimes to "National" ID. Lady announcer's interview segments. Good signal quality. (GVH, NC)

1956 UTC on 7430
GREECE: E.R.A. Thessaloniki (HS). Greek. Local pop songs to male/female announcer. Musical bridge into female's newscast on the war in former Yugoslavia. (Serra, Italy)

2004 UTC on 9445
TURKEY: Voice of Turkey. Newscast to musical bridge. Press review to economic news update. (Serra, Italy)

2035 UTC on 11920
ARMENIA: Voice of Armenia. Interval signal to station ID. Newscast into folk music program. Fair signal. (Darren White, Hattisburg, MS; Brian Bagwell, St. Louis, MO)

2100 UTC on 11950
UKRAINE: Radio Ukraine International. Interval signal to ID and news bulletin. *Ukraine Today* at 2108, with report on upcoming presidential visit to Germany. (Moats, OH)

2110 UTC on 11750
RUSSIA: Voice of Russia. *Mailbag* program on crime, lighthouses, cartoons, Zhukov, and superstitions. VOR noted on 11675 at 2015 with *This is Russia*. (Fraser, MA)

2120 UTC on 13840
MARIANA ISLANDS: Monitor Radio International. *Daily Edition* in progress at tune-in. Reports on Bosnia and Serbia's president Slobodan Milosevich. Fair to poor signal. (Moats, OH)

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

All Fired Up !

That's right... the AM bands are all fired up! Mediumwave DX is back and burning up the dials!

Mediumwave DX clubs play an integral part in the hobby by enabling AM enthusiasts to exchange information. IRCA and NRC clubs publish weekly bulletins (bi-weekly/monthly in the off season) chock full of station operating schedules, DX Test information, QSL data, musings, receiving equipment, antennas, and other topics of interest. Radio stations often contribute feature articles as well.

For more information send $1.00 or 3 IRCs to; The International Radio Club of America, P.O. Box 70223, Riverside, CA 92513-0223. Send a 32 cent mint stamp for a sample issue to; National Radio Club, c/o Paul Swearingen-Publisher, P.O. Box 5711, Topeka, KS 66605-0711. Don't miss out on this year's AM season! It's going to be a sizzler!

BELGIUM

Radio Vlaanderen International, 9925 kHz. Full data color map/scenery QSL card unsigned. Received in 30 days for an English taped cassette report, and one U.S. dollar. Station address: P.O. Box 26, B-1000 Brussels, Belgium. (Walter Szczepaniak, Philadelphia, PA)

CANADA

Radio Canada International. Full data 50th Anniversary card signed. Pennant, stickers, and schedules enclosed. Received in 13 days for an English report. Station address: P.O. Box 6000, Montreal PQ, H3C 3AB Canada. (Jennifer Hull, New York, NY)

CUBA

Radio Havana Cuba. No data verification letter signed by Lourdes Lopez. Souvenir key chain and station logo card enclosed. Received in 145 days for an English report and souvenirs. Station address: P.O. Box 6140, Havana, Cuba. (Mark Redfox, Seattle, WA)

MEDIUM WAVE

CJSB/CKQB, 540 AM kHz. Full data station sheet signed by Jeff Ruck-Chief Engineer. Received in 15 days for an English AM report from their "Farewell" DX Test. Station address: 1504 Merivale Rd., Ottawa ONT K2E 6ZE Canada. (Mark Spat, West Swanzey, NH)

WBZY, 1200 AM kHz. Full data QSL card signed by Bill King. Received in 39 days for an English AM report for a DX Test, mint stamps enclosed. Station address: 1906 Wilmington Rd., New Castle, PA 16105. (Hank Holbrook, Dunkirk, MD)

WSUI, 910 AM kHz. Full data QSL card signed by Dennis Reese-Program Director. Personal letter, program schedule and coverage map. Received in 25 days for an English AM report and mint stamps. Station address: 3300 Engineering Bldg., University of Iowa, Iowa City, IA 52242-1597. (Holbrook, MD)

WGVL, 1440 AM kHz. Full data prepared QSL signed by Ricky Childress-Program Director. (station formerly simulcast with WSSL FM) Received in 14 days for an English AM report and mint stamps. Station address: P.O. Box 100, Greenville, SC 29602. (Loyd Van Horn, Brasstown, NC)

WECO, 940 AM kHz. Full data prepared QSL signed by Carl E. Stump-President/Engineer. Received in 12 days for an English AM report and mint stamps. Station address: P.O. Box 100, Wartburg, TN 37887. (Van Horn, NC)

NEW ZEALAND

Radio New Zealand International, 6100 kHz. Full data QSL card unsigned. Map of New Zealand, frequency booklet, mail order product list, and NZ tourist brochure. Received in 13 days for an English report and 3 IRCs. Station address: P.O. Box 123, Wellington, New Zealand. (Paul Jablonowski, Greenfield, WI)

ROMANIA

Radio Romania International, 11940 kHz. Full data "studio building" card, unsigned. Received in 107 days for an English report. Station address: General Berthelot 62-64, sectorul 1, P.O. Box 111, 70756 Bucharest, Romania. (Charlie Washburn, North Perry, ME; Hugh Waters, Singapore)

RUSSIA

Voice of Russia, 15105/11675 kHz. Full data scenery card signed by Elena Frolovskaya. Received in 44 days for an English report and one IRC. Station address: c/o TV & Radio Agency "Astra", ul. 3326 Moscow, Russia. (Claude Turner, Chicago, IL; Waters, Singapore)

SHIP TRAFFIC

Lake Charles V7AB4, 156.500 MHz USB (Bulk Carrier). Full data prepared QSL card stamped with ship's seal and personal letter enclosed from Leszek Haberko SP1NQW-Radio Officer. Received in 27 days for an English utility report, one IRC, one U.S. dollar, mints stamps, and a self-addressed-envelope. Ship address: c/o Bay Ocean Management, Suite 100, 270 Sylvan Ave., Englewood Cliffs, Englewood, NJ 07632. (Russ Hill, Oak Park, MI)

Marjorie Lykes KAXP, 8207 kHz USB (Container/Cargo). Full data prepared QSL card stamped with ship's seal, unsigned. Received in 19 days for an English utility report, one U.S. dollar, and a stamped self-addressed-envelope. Ship address: c/o Lykes Bros. Steamship Co., 300 Poydras St., P.O. Box 50998, New Orleans, LA 70130. (Hill, MI)

SICILY

RAI-Caltanissetta, 6060 kHz. Full data "Giovanni Omiccioli" card unsigned. Received in 80 days for an English report, and cassette tape. Station address: c/o Radiotelevisione Italiana, Casella Postale 320, Centro Correspondenza, 00100 Rome, Italy. (Washburn, ME)

SWEDEN

Radio Sweden, 15240 kHz. Full data card, unsigned. Program schedule enclosed. Received in 13/9 days for an English report and one IRC. Station address: S-105-10 Stockholm, Sweden. (Turner, IL; Hull, NY)

How to Use the Shortwave Guide

1: Convert your time to UTC.

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

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

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

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

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

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

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

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

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

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

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

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

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

Hot News and Hot Spots

More SW News Compiled by Glenn Hauser

Radio Martí extended its relay via WHRI, 9495 to fiscal yearend at least, Sept. 30, and added a night so it's UT Tue-Sun 0100-0400. Although jammed in Havana, USIA believes 9495 is well received elsewhere in Cuba, says Mark Seifert via Ulis Fleming, *Jihad DX*, Büschel. Joseph D. O'Connell of the International Broadcasting Bureau corrects the item here in August, that R. Martí had placed an employee at risk (see "Letters to the Editor").

As a result of a USIA Inspector General report that he interfered in objectivity of news and tried to dismiss his critics at Radio Martí, Jorge Mas Canosa, chairman of the Martí advisory board, may be replaced by the Clinton Administration, perhaps with former Rep. Dante Fascell of Florida, says Mark Matthews, Baltimore *Sun* via Mike Agner. Before this, in late July, Kevin Hecht happened upon C-SPAN coverage of a House vote to eliminate R. Martí, saying its board was corrupt, but it was resoundingly defeated by a voice vote allying Republicans and Democrats.

Southern Sudan may be getting a clandestine: the National Democratic Alliance of opposition groups planned to start broadcasting by the end of July, Reuter reported via Kropf, *Contact* via *Jihad DX*. BBCM also heard R. Monte Carlo report such plans without details. **V. of Sudan**, opposition station, was then heard by BBCM at 1300-1500 on 9024.2, as **Omdurman** moved its 9200 transmitter down to 9024 to jam it during these two hours only, says HCJB's *Latest. Catch.*

KBC, Kenya, reported that another **R. Mogadishu** had been set up on the south side of the city by Uthman Ali Ato, former ally of Aydid, subtitled **V. of the Somali Pacification**, on the same frequency as Aydid's, in Somali with English and Arabic to be added later. BBCM confirmed it on 6722 at 1710-1800* to return at *0300. **R. Hargeisa** is gone, the equipment having been sold to Ethiopia, but the director of **R. Free Somalia** at Galkayo used to work at Hargeisa and might QSL an old Hargeisa report with the assistance of Sam Voron, says Ed Kusalik, Alta., *NU* via Chuck Rippel, *Jihad DX*.

R. of the Saudi Opposition from Najd and Hijaz (Arabic: *Idha'at al-Mu'aradah al-Sa'udiyah fi Najd wa al-Hijaz*) was heard on 11785 at 1300 in early July but not since, assumed to originate from Iraq, says BBCM. But be careful: 11785 also carries **Qatar** from *0243 to 0707 and 1700-2130 with 15345v in between, per BBCM via Finn Krone, *Wavescan*. Subsequently BBCM found 11785 carrying another anti-Saudi station at 1035, **Holy Medina Radio**. In early August, INA news agency from Iraq via BBCM said **Mother of Battles Radio** would broadcast 2000-2300 on 7150, 13650, 15340 in Arabic as *Umm al-Ma'arik*. An exclusive report by the Jordanian newspaper *Sawt-al-Mar-ah* says following Gulf War and opposition attacks on Iraqi transmitter sites, a large number of emergency mobile transmitting units have been put in use, constantly on the move with locations known only to Saddam and a few technicians; via BBCM.

V. of the Islamic Rep. of Iran appeared on new 7070 at many hours, including end of English at abrupt sign-on 0121 past 0130 in Spanish, as heard by Brian Alexander, PA. It appears this is to cover an opposition station on 7070, with a similar clash on 6175/6177, says Finn Krone, AWR *Wavescan*. That is believed to be **V. of Mojahed** with a second program at *1500 on 6020 and 6175, while at 1600-1700 three stations were on 6175: **VOM-2, IRIB** in Persian, and Iranian jammer, say Goonetilleke, Pankov, via Büschel, *Jihad DX*. **V. of Human Rights and Freedom for Iran** is in Persian at 0230-0425, 0600-0635, 1545-1625, 1630-1825 on variable 15150, 11470, 9255, 9270, per BBCM.

Croatian Radio, Zagreb, had news in English twice an hour after 2200 on 13830, 11635, 7370, 5895, not only at the top of the hour, but also at :50 past, except 11635 is off after 2259, reports Marie Lamb, NY, on HCJB *Latest Catch*.

SHORTWAVE GUIDE

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

Next Reporting Deadline
October 20, 1995

Jim Frimmel, Program Manager
Texas

Dave Datko
California

Jeff Demers
New Hampshire

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

newsline

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

0000 UTC
(8:00 PM EDT, 5:00 PM PDT)
Australia, Radio
Bulgaria, Radio
Canada, N Quebec Svc
China, China Radio Intl
Croatia, Croatian Radio
Czech Rep, Radio Prague
Lithuania, Radio Vilnius
New Zealand, Radio NZ Intl
Russia, Voice of
Spain, R Exterior de Espana
Thailand, Radio
United Kingdom, BBC London (am) (Newsdesk)
United Kingdom, BBC London (as pac) (Newsdesk)
United Kingdom, BBC London (south as)
USA, Monitor Radio Intl [T-A]
USA, VOA Washington DC (am)
USA, VOA Washington DC (as pac)
USA, VOA Washington DC (ca)
0003
North Korea, R Pyongyang
0010
China, China Radio Intl*
USA, VOA Washington DC (ca) [T-A]*
0015
Egypt, Radio Cairo
0030
Belgium, R Vlaanderen Intl
India, All India Radio
Netherlands, Radio
Netherlands, Radio (am)
New Zealand, Radio NZ Intl [M-F]
Russia, Voice of
Sweden, Radio [T-A]
Thailand, Radio [T-S]
USA, VOA Washington DC (am) [T-S] (Special English)
USA, VOA Washington DC (as pac) (Special English)
0045
United Kingdom, BBC London (am)*
United Kingdom, BBC London (as pac)*
United Kingdom, BBC London (south as)*
0050
Italy, RAI

0100 UTC
(9:00 PM EDT, 6:00 PM PDT)
Australia, Radio
Canada, N Quebec Svc [S]
Canada, RCI Montreal
Croatia, Croatian Radio
Cuba, Radio Havana Cuba [T-S]
Czech Rep, Radio Prague
Ecuador, HCJB Quito (am)
Germany, Deutsche Welle
Indonesia, Voice of
Japan, Radio
New Zealand, Radio NZ Intl
Norway, Radio Norway Intl [M]
Russia, Voice of
Slovakia, R Slovakia Intl [A]*
Slovakia, R Slovakia Intl [S/T-F]
South Korea, Radio Korea Intl
Spain, R Exterior de Espana
Switzerland, Swiss Radio Intl
Ukraine, R Ukraine Intl
United Kingdom, BBC London (am) (Newsdesk)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (south as) (Newsdesk)
USA, Monitor Radio Intl [T-A]
USA, VOA Washington DC (am)
USA, VOA Washington DC (as)
USA, VOA Washington DC (ca)
Vietnam, Voice of Vietnam
Yugoslavia, Radio [M-A]
0110
Australia, Radio [M-F]*
0113
Cuba, Radio Havana Cuba [T-S]*
0130
Austria, R Austria Intl
Cuba, Radio Havana Cuba [T-S]
Greece, Voice of
Netherlands, Radio
Russia, Voice of
Sweden, Radio [T-A]
Vietnam, Voice of Vietnam
0145
Albania, Radio Tirana
0151
Vatican State, Vatican Radio [A]
0155
Canada, RCI Montreal [T-A]
Indonesia, Voice of
Vatican State, Vatican Radio [W/F]

0200 UTC
(10:00 PM EDT, 7:00 PM PDT)
Argentina, RAE [T-A]
Australia, Radio
Canada, N Quebec Svc
Canada, RCI Montreal
Croatia, Croatian Radio
Cuba, Radio Havana Cuba [T-S]
Germany, Deutsche Welle
Hungary, Radio Budapest
Myanmar, Radio
New Zealand, Radio NZ Intl [M-A]
Romania, Radio Romania Intl
Russia, Voice of
United Kingdom, BBC London (af) (Newsday)
United Kingdom, BBC London (am) (Newsday)
United Kingdom, BBC London (as pac) (Newsday)
United Kingdom, BBC London (eu) (Newsday)
United Kingdom, BBC London (south as) (Newsday)
USA, Monitor Radio Intl [T-A]
USA, VOA Washington DC (as)
USA, WHRI Noblesville IN [T-A]
USA, WWCR #3 Nashville TN [T-A]
Vietnam, Voice of Vietnam
0203
Taiwan, Voice of Free China
0212
Cuba, Radio Havana Cuba [T-S]*
0215
Egypt, Radio Cairo
Nepal, Radio
0228
Cuba, Radio Havana Cuba [S]
0230
Albania, Radio Tirana
Cuba, Radio Havana Cuba [T-A]
Netherlands, Radio
Pakistan, Radio
Portugal, Radio Portugal Intl [T-A]
Russia, Voice of [T-A]
Sweden, Radio [T-A]
Vietnam, Voice of Vietnam

0300 UTC
(11:00 PM EDT, 8:00 PM PDT)
Australia, Radio
Canada, N Quebec Svc
China, China Radio Intl
Croatia, Croatian Radio
Cuba, Radio Havana Cuba [T-S]
Czech Rep, Radio Prague
Germany, Deutsche Welle
Japan, Radio
New Zealand, Radio NZ Intl [M-A]
Russia, Voice of
South Africa, Channel Africa
Thailand, Radio
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu) [S-F]
United Kingdom, BBC London (south as)
USA, Monitor Radio Intl [T-A]
USA, VOA Washington DC (af) [A-S]
USA, WHRI Noblesville IN [T-A]
USA, WWCR #3 Nashville TN [T-A]
0301
USA, VOA Washington DC (af) [M-F]*
0303
Taiwan, Voice of Free China
0310
China, China Radio Intl*
0313
Cuba, Radio Havana Cuba [T-S]*
0315
Egypt, Radio Cairo
0320
Philippines, Radio Philipinas [M-A]
Vatican State, Vatican Radio
0330
Austria, R Austria Intl
Cuba, Radio Havana Cuba [T-S]
Czech Rep, Radio Prague
Hungary, Radio Budapest
Russia, Voice of
Sweden, Radio [T-A]
UAE, Radio Dubai
United Kingdom, BBC London (eu) [A]
USA, VOA Washington DC (af) [M-F] (Special English)
0340
Greece, Voice of
United Kingdom, BBC London (af)*
0355
Japan, Radio [W-M]

0400 UTC
(12:00 AM EDT, 9:00 PM PDT)
Australia, Radio
Canada, N Quebec Svc
Canada, RCI Montreal
China, China Radio Intl
Croatia, Croatian Radio
Cuba, Radio Havana Cuba [T-S]
Germany, Deutsche Welle
New Zealand, Radio NZ Intl [A]
New Zealand, Radio NZ Intl [M-F]*
Norway, Radio Norway Intl [M]
Romania, Radio Romania Intl
Russia, Voice of
South Africa, Channel Africa
Switzerland, Swiss Radio Intl
Tanzania, Radio
Turkey, Voice of
Ukraine, R Ukraine Intl
United Kingdom, BBC London (af) (Newsdesk)
United Kingdom, BBC London (am) (Newsdesk)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu) [S-F] (Newsdesk)
United Kingdom, BBC London (south as) (Newsdesk)
USA, Monitor Radio Intl [T-F]
USA, VOA Washington DC (af)
USA, VOA Washington DC (me)
USA, WYFR Satellite Network [A]
Zimbabwe, ZBC
0403
North Korea, R Pyongyang
0410
China, China Radio Intl*
0412
Cuba, Radio Havana Cuba [T-S]*
0425
Italy, RAI
0430
Cuba, Radio Havana Cuba [T-A]
Finland, Radio
Netherlands, Radio (am)
Russia, Voice of
United Kingdom, BBC London (af)*
United Kingdom, BBC London (eu) [A]
0431
USA, VOA Washington DC (af) [M-F]*

0500 UTC
(1:00 AM EDT, 10:00 PM PDT)
Australia, Radio
Bulgaria, Radio
Cameroon, Radio
Canada, N Quebec Svc
Canada, RCI Montreal [M-F]
China, China Radio Intl
Cuba, Radio Havana Cuba [T-S]
Ecuador, HCJB Quito (am)
Germany, Deutsche Welle
Israel, Kol Israel
Japan, Radio
New Zealand, Radio NZ Intl [S-F]
Russia, Voice of
South Africa, Channel Africa
Spain, R Exterior de Espana
United Kingdom, BBC London (af) (Newsday)
United Kingdom, BBC London (am) (Newsday)
United Kingdom, BBC London (as pac) (Newsday)
United Kingdom, BBC London (eu) (Newsday)
United Kingdom, BBC London (south as)
USA, Monitor Radio Intl [T-F]
USA, VOA Washington DC (af)
USA, VOA Washington DC (me)
USA, WWCR #1 Nashville TN [T-A]
Vatican State, Vatican Radio [T/F]
0510
Australia, Radio [M-F]*
China, China Radio Intl*
0513
Cuba, Radio Havana Cuba [T-S]*
0530
Austria, R Austria Intl
Cuba, Radio Havana Cuba [T-A]
Nigeria, Voice of
Romania, Radio Romania Intl
Russia, Voice of
United Kingdom, BBC London (af)*
Yugoslavia, Radio
0555
Japan, Radio [A]

0600 UTC
(2:00 AM EDT, 11:00 PM PDT)
Australia, Radio
Croatia, Croatian Radio
Cuba, Radio Havana Cuba [T-S]
Czech Rep, Radio Prague
Germany, Deutsche Welle
Japan, Radio
Kenya, Voice of
Malaysia, Voice of
New Zealand, Radio NZ Intl [M-A]
Norway, Radio Norway Intl [S]
Russia, Voice of
South Korea, Radio Korea Intl
Switzerland, Swiss R Intl (eu)
Switzerland, Swiss Radio Intl
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu)
United Kingdom, BBC London

(south as)
USA, Monitor Radio Intl [T-F]
USA, VOA Washington DC (af) [A-S]
USA, VOA Washington DC (me)
0601
USA, VOA Washington DC (af) [M-F]*
0603
North Korea, R Pyongyang
0612
Cuba, Radio Havana Cuba [T-S]*
0628
Cuba, Radio Havana Cuba [S]
0630
Austria, R Austria Intl [T-S]
Cuba, Radio Havana Cuba [T-A]
Nigeria, Voice of [M-F]
Russia, Voice of
United Kingdom, BBC London (af)*
Vatican State, Vatican Radio [H]
0632
Romania, Radio Romania Intl
0645
Nigeria, Voice of [M-F]*
Romania, Radio Romania Intl
0655
Japan, Radio [W-M]
Malta, V of Mediterranean [M-F]

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)
Australia, Radio
Japan, Radio
Myanmar, Radio
New Zealand, Radio NZ Intl [A]
New Zealand, Radio NZ Intl [M-F]*
Papua New Guinea, NBC
Russia, Voice of
Switzerland, Swiss R Intl (eu)
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu)
United Kingdom, BBC London (south as)
USA, KWHR Naalehu HI [M-F]
USA, Monitor Radio Intl [T-F]
USA, WWCR #1 Nashville TN [M]
USA, WWCR #3 Nashville TN [S]
0703
North Korea, R Pyongyang
Taiwan, Voice of Free China
0710
Australia, Radio [M-F]*
0730
Austria, R Austria Intl [T-S]
Belgium, R Vlaanderen Intl
Czech Rep, Radio Prague
Ecuador, HCJB Quito (eu)
Greece, Voice of
Netherlands, Radio
Russia, Voice of
0745
Finland, Radio
0750
New Zealand, Radio NZ Intl [M-F]*
0755
Japan, Radio
Malta, V of Mediterranean [M-F]

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)
Australia, Radio
Indonesia, Voice of [A-H]
Malaysia, Voice of
New Zealand, Radio NZ Intl
Pakistan, Radio
Russia, Voice of
South Korea, Radio Korea Intl
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu)
United Kingdom, BBC London (south as)
USA, KNLS Anchor Point AK
USA, Monitor Radio Intl [M-A]
USA, WWCR #1 Nashville TN [M-F]
0803
North Korea, R Pyongyang
0810
New Zealand, Radio NZ Intl [M-F]*
0830
Netherlands, Radio
Russia, Voice of [M-A]
Slovakia, R Slovakia Intl
0855
Indonesia, Voice of [A-H]

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
Australia, Radio
China, China Radio Intl
Ecuador, HCJB Quito (pac)
Finland, Radio
Germany, Deutsche Welle
Japan, Radio
New Zealand, Radio NZ Intl [M-A]
Papua New Guinea, NBC [M]*
Russia, Voice of
Switzerland, Swiss Radio Intl
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu)
United Kingdom, BBC London (south as)
USA, Monitor Radio Intl [M-A]
USA, WWCR #1 Nashville TN [H-F]
USA, WWCR #3 Nashville TN [A]
0910
Australia, Radio [M-F]*
China, China Radio Intl*
0930
Armenia, Voice of [S]
Austria, R Austria Intl [M-A]
Netherlands, Radio
Philippines, FEBC [M-A]
Russia, Voice of
0945
Germany, Deutsche Welle [M-F]*
0950
Russia, Radio Pacific Ocean [A]
0955
Japan, Radio

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
Australia, Radio
Belgium, R Vlaanderen Intl [M-A]
China, China Radio Intl
India, All India Radio
Kenya, Voice of
New Zealand, Radio NZ Intl [S-F]
Papua New Guinea, NBC
Russia, Voice of
Tanzania, Radio
United Kingdom, BBC London (af) (Newsdesk)
United Kingdom, BBC London (am) (Newsdesk)
United Kingdom, BBC London (as pac) (Newsdesk)
United Kingdom, BBC London (eu) (Newsdesk)
USA, Monitor Radio Intl
USA, VOA Washington DC (as pac)
USA, VOA Washington DC (ca)
USA, WYFR Satellite Network [M-A]
Vietnam, Voice of Vietnam
1010
China, China Radio Intl*
New Zealand, Radio NZ Intl [M-F]*
1020
New Zealand, Radio NZ Intl [H]*
1030
Netherlands, Radio
Nigeria, Voice of
Philippines, FEBC [M-F]*
Russia, Voice of
UAE, Radio Dubai
USA, WYFR Satellite Network [M-F]
1045
Nigeria, Voice of [A-S]*

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
Australia, Radio
Canada, N Quebec Svc [A-S]
Germany, Deutsche Welle
Ghana, Radio [A-S]
Japan, Radio
Jordan, Radio
Mozambique, Radio
New Zealand, Radio NZ Intl (Newsdesk)
Pakistan, Radio
Papua New Guinea, NBC
Russia, Voice of
Singapore, R Singapore Intl
Switzerland, Swiss R Intl (eu)
Switzerland, Swiss Radio Intl
United Kingdom, BBC London (af) (Newsdesk)
United Kingdom, BBC London (am) (Newsdesk)
United Kingdom, BBC London (as pac) (Newsdesk)
United Kingdom, BBC London (eu) (Newsdesk)
United Kingdom, BBC London (south as) [H-T] (Newsdesk)
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (as pac)
USA, VOA Washington DC (ca)
USA, WHRI Noblesville IN [A]
USA, WWCR #1 Nashville TN [M-A]
USA, WYFR Satellite Network [M-F]
1103
North Korea, R Pyongyang
1110
Australia, Radio*
1120
Vatican State, Vatican Radio [M-A]
1130
Austria, R Austria Intl
Czech Rep, Radio Prague
Russia, Voice of
Singapore, R Singapore Intl
South Korea, Radio Korea Intl
Taiwan, Voice of Asia
USA, WYFR Satellite Network [M-F]
1145
Germany, Deutsche Welle [M-F]*
1155
Japan, Radio [S-F]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
Australia, Radio
Canada, N Quebec Svc [A-S]
Canada, RCI Montreal [M-F]
China, China Radio Intl
France, Radio France Intl
New Zealand, Radio NZ Intl [H-T]
Norway, Radio Norway Intl [S]
Papua New Guinea, NBC
Russia, Voice of
Singapore, R Singapore Intl
Switzerland, Swiss R Intl (eu)
United Kingdom, BBC London (af) [M-A]
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac) [M-A]
United Kingdom, BBC London (eu)
United Kingdom, BBC London (south as)
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (as pac)
USA, WYFR Satellite Network [M-F]
Uzbekistan, Radio Tashkent
1203
South Korea, Radio Korea Intl
Taiwan, Voice of Free China
1204
Ecuador, HCJB Quito (am) [M-F]
1210
China, China Radio Intl*
1215
United Kingdom, BBC London (af) [M-A]*
United Kingdom, BBC London (eu)*
United Kingdom, BBC London (south as) [M-A]*
1230
Austria, R Austria Intl
Bangladesh, Radio [S-M]
Bulgaria, Radio
Canada, RCI Montreal (as)
Ecuador, HCJB Quito (am) [M-F]*
Egypt, Radio Cairo
Finland, Radio [M-F]
Netherlands, Radio
Russia, Voice of
Singapore, R Singapore Intl
Sweden, Radio [M-F]
USA, WYFR Satellite Network [M-F]
Vietnam, Voice of Vietnam
1231
France, Radio France Intl [T]*
1240
Greece, Voice of

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
Australia, Radio
Canada, N Quebec Svc [S]
Canada, RCI Montreal [S]
China, China Radio Intl
Ghana, Radio
Kenya, Voice of
Norway, Radio Norway Intl [S]
Papua New Guinea, NBC
Poland, Polish Radio Warsaw [A]
Poland, Polish Radio Warsaw [M-F]*
Romania, Radio Romania Intl [M-A]
Russia, Voice of
Singapore, R Singapore Intl
Switzerland, Swiss Radio Intl
Tanzania, Radio [A-S]
United Kingdom, BBC London (af) (Newshour)
United Kingdom, BBC London (am) (Newshour)
United Kingdom, BBC London (as pac) (Newshour)
United Kingdom, BBC London (eu) (Newshour)
United Kingdom, BBC London (south as) (Newshour)
USA, KNLS Anchor Point AK
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (as pac)
USA, WYFR Satellite Network [M-F]
1301
Romania, Radio Romania Intl [S]
1303
North Korea, R Pyongyang
1310
Brazil, Radiobras [M-F]*
China, China Radio Intl*
1324
Ecuador, HCJB Quito (am) [M-F]
1328
Egypt, Radio Cairo
1330
Austria, R Austria Intl
Belgium, R Vlaanderen Intl [S]
Canada, RCI Montreal (as)
Finland, Radio [M-A]
India, All India Radio
Netherlands, Radio
Philippines, FEBC [M-A]
Russia, Voice of [M-A]
Singapore, R Singapore Intl
Sweden, Radio [M-F]
Turkey, Voice of
UAE, Radio Dubai
USA, VOA Washington DC (as pac) (Special English)
Uzbekistan, Radio Tashkent
Vietnam, Voice of Vietnam
1355
Singapore, R Singapore Intl

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
Australia, Radio
Belgium, R Vlaanderen Intl [M-A]
Cameroon, Radio
Canada, N Quebec Svc [A-S]
Canada, RCI Montreal [S]
China, China Radio Intl
France, Radio France Intl
Ghana, Radio
Japan, Radio
Russia, Voice of
South Korea, Radio Korea Intl [M-A]
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu)
United Kingdom, BBC London (south as)
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (as pac)
USA, VOA Washington DC (as)
USA, WWCR #1 Nashville TN [M-A]
1410
China, China Radio Intl*
1415
Nepal, Radio
1424
Ecuador, HCJB Quito (am) [M-F]
1430
Canada, RCI Montreal
Finland, Radio
Morocco, RTV Marocaine [S]
Myanmar, Radio
Netherlands, Radio
Philippines, FEBC [M-A]
Romania, Radio Romania Intl [T-S]
Russia, Voice of
Sweden, Radio [M-F]
USA, WYFR Satellite Network [M-F]
1431
France, Radio France Intl [T]*
Romania, Radio Romania Intl [M]
1435
Greece, Voice of
1440
Philippines, FEBC [M-F]*
1445
India, All India Radio
Myanmar, Radio
1455
Japan, Radio [A]
Malta, V of Mediterranean [M-F]

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
Australia, Radio
Canada, N Quebec Svc [A-S]
Canada, RCI Montreal [S]
China, China Radio Intl
Japan, Radio
Jordan, Radio
Russia, Voice of
South Africa, Channel Africa
Sudan, Radio Omdurman
Switzerland, Swiss Radio Intl
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac) [A-S]
United Kingdom, BBC London (eu)
United Kingdom, BBC London (south as)
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (as pac)
USA, VOA Washington DC (as)
USA, VOA Washington DC (me)
USA, WWCR #1 Nashville TN [M-F]
USA, WYFR Satellite Network [A]
1503

North Korea, R Pyongyang
1510
China, China Radio Intl*
1525
Philippines, Radio Veritas [T-F]
1528
United Kingdom, BBC London (af) [M]*
1530
Austria, R Austria Intl
India, All India Radio*
Netherlands, Radio
Nigeria, Voice of [M-H]
Philippines, FEBC [M-A]
Portugal, Radio Portugal Intl [M-F]
Russia, Voice of
Seychelles, FEBA Radio
1540
Philippines, Radio Veritas [A-M]
1550
Malta, V of Mediterranean [F]
1555
Japan, Radio [A]
Malta, V of Mediterranean [M-H]
Philippines, Radio Veritas [A-M]

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
Australia, Radio
Canada, N Quebec Svc [A]
China, China Radio Intl
Czech Rep, Radio Prague
Estonia, Estonian Radio [M-F]
Ethiopia, V of Ethiopia
France, Radio France Intl
Germany, Deutsche Welle
Jordan, Radio
Kenya, Voice of
Norway, Radio Norway Intl [S]
Pakistan, Radio
Russia, Voice of
South Africa, Channel Africa
South Korea, Radio Korea Intl
Switzerland, Swiss R Intl (eu)
Tanzania, Radio
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu)
United Kingdom, BBC London (south as)
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (af) [A-S]
USA, VOA Washington DC (as)
USA, VOA Washington DC (me)
USA, WWCR #3 Nashville TN [A]
USA, WYFR Satellite Network [M-A]
Vietnam, Voice of Vietnam
1604
Ecuador, HCJB Quito (do) [M-F]
1610
China, China Radio Intl*
1612
Vatican State, Vatican Radio [M-F]
1630
Canada, RCI Montreal (as)
Ecuador, HCJB Quito (do) [M-F]*
Ethiopia, V of Ethiopia
Finland, Radio
Russia, Voice of
South Africa, Channel Africa [F]*
UAE, Radio Dubai
USA, VOA Washington DC (af) [M-F]*
USA, VOA Washington DC (as) (Special English)
USA, VOA Washington DC (me) (Special English)
1638
Germany, Deutsche Welle [M-F]*
1645
United Kingdom, BBC London (am) [M-F]*
United Kingdom, BBC London (as pac) [M-F]*

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
Albania, Radio Tirana
Australia, Radio
Canada, N Quebec Svc [A]
China, China Radio Intl
Czech Rep, Radio Prague
Ecuador, HCJB Quito (eu)
France, Radio France Intl
Japan, Radio
New Zealand, Radio NZ Intl [M-F]*
Pakistan, Radio
Russia, Voice of
Switzerland, Swiss Radio Intl
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu)
United Kingdom, BBC London (south as)
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (af)
USA, VOA Washington DC (as pac)
USA, VOA Washington DC (as)
USA, VOA Washington DC (me)
USA, WRNO New Orleans LA [M-F]
1703
North Korea, R Pyongyang
1710
Australia, Radio*
China, China Radio Intl*
1715
Sweden, Radio
Vatican State, Vatican Radio
1725
New Zealand, Radio NZ Intl [F]*
1730
Austria, R Austria Intl
Netherlands, Radio
Romania, Radio Romania Intl
Russia, Voice of [S-F]
Vatican State, Vatican Radio [F]
1740
United Kingdom, BBC London (af) [W-M]*
1745
Canada, RCI Montreal [M-F]
1755
New Zealand, Radio NZ Intl [M-W]*

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
Australia, Radio
Cameroon, Radio
India, All India Radio
Kenya, Voice of
Mozambique, Radio
New Zealand, Radio NZ Intl [M-F]*
Norway, Radio Norway Intl [S]
Poland, Polish Radio Warsaw [A]
Poland, Polish Radio Warsaw [M-F]*
Russia, Voice of
Sudan, Radio Omdurman
Tanzania, Radio
United Kingdom, BBC London (af) (Newsdesk)
United Kingdom, BBC London (as pac) (Newsdesk)
United Kingdom, BBC London (eu) (Newsdesk)
United Kingdom, BBC London (south as) (Newsdesk)
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (af) [A-S]
USA, VOA Washington DC (af) [M-F]*
USA, VOA Washington DC (me)
USA, WHRI Noblesville IN [M-F]
USA, WWCR #1 Nashville TN [S-F]
USA, WWCR #3 Nashville TN [M-F]
Vietnam, Voice of Vietnam
Yemen, Yemeni Rep Radio
1830
Bangladesh, Radio
Kuwait, Radio
Netherlands, Radio
Russia, Voice of
Sweden, Radio [M-F]
United Kingdom, BBC London (af) [A-S]*
USA, VOA Washington DC (af) [A-S] (Special English)
USA, VOA Washington DC (me) (Special English)
Yemen, Yemeni Rep Radio
1840
Greece, Voice of [M-A]
1845
Armenia, Voice of [M-F]
1855
New Zealand, Radio NZ Intl [M-H]*
1858
United Kingdom, BBC London (af) [M-F]*

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
Australia, Radio
Belgium, R Vlaanderen Intl
China, China Radio Intl
Germany, Deutsche Welle
India, All India Radio
Japan, Radio
New Zealand, Radio NZ Intl
Portugal, Radio Portugal Intl [M-F]
Romania, Radio Romania Intl [T-S]
Russia, Voice of
South Korea, Radio Korea Intl
United Kingdom, BBC London (af)
United Kingdom, BBC London (as pac) (Newshour)
United Kingdom, BBC London (eu) (Newshour)
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (af)
USA, VOA Washington DC (as pac)
USA, VOA Washington DC (me)
USA, WHRI Noblesville IN [M-F]
USA, WWCR #3 Nashville TN [M-F]
Vietnam, Voice of Vietnam
1901
Romania, Radio Romania Intl [M]
1910
Australia, Radio [M-F]*
Brazil, Radiobras [M-F]*
China, China Radio Intl*
1925
Germany, Deutsche Welle [M]*
1930
Albania, Radio Tirana
Austria, R Austria Intl
Finland, Radio
Germany, Deutsche Welle [T-F]*
Netherlands, Radio
Russia, Voice of
Slovakia, R Slovakia Intl
Yugoslavia, Radio
1935
Italy, RAI

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
Australia, Radio
Bulgaria, Radio
China, China Radio Intl
Czech Rep, Radio Prague
Estonia, Estonian Radio [M/H]
Germany, Deutsche Welle
Hungary, Radio Budapest
Indonesia, Voice of
Israel, Kol Israel
New Zealand, Radio NZ Intl
Nigeria, Voice of [M-F]
Russia, Voice of
Switzerland, Swiss R Intl (eu)
Switzerland, Swiss Radio Intl
United Kingdom, BBC London (af) (Newshour)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac) [A]
United Kingdom, BBC London (eu)
United Kingdom, BBC London (eu) [S-F]*
USA, KVOH Los Angeles CA [A-S]
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (af) [A-S]
USA, VOA Washington DC (af) [M-F]*
USA, VOA Washington DC (me)
USA, WHRI Noblesville IN [M-F]
2003
North Korea, R Pyongyang
2007
Syria, Radio Damascus [M-F]
2010
China, China Radio Intl*
New Zealand, Radio NZ Intl [S-H]*
2025
Italy, RAI
2030
Netherlands, Radio
Poland, Polish Radio Warsaw [A-S]
Poland, Polish Radio Warsaw [M-F]*
Thailand, Radio
Vietnam, Voice of Vietnam
2055
Indonesia, Voice of [M]
2057
Kuwait, Radio

2100 UTC
(5:00 PM EDT, 5:00 PM PDT)
Australia, Radio
Cameroon, Radio
Canada, N Quebec Svc [A-S]
Canada, RCI Montreal
China, China Radio Intl
Cuba, Radio Havana Cuba [M-A]
Germany, Deutsche Welle
Greece, Voice of [M-A]
India, All India Radio
Japan, Radio
New Zealand, Radio NZ Intl [A-H]
Romania, Radio Romania Intl
Russia, Voice of
Spain, R Exterior de Espana
Syria, Radio Damascus [F]
Turkey, Voice of
United Kingdom, BBC London (af)
United Kingdom, BBC London (am)
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu)
USA, KVOH Los Angeles CA [S]
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (af)
USA, VOA Washington DC (as pac)
USA, VOA Washington DC (me)
USA, WWCR #1 Nashville TN [M-F]
2110
China, China Radio Intl*
New Zealand, Radio NZ Intl [M-H]*
Syria, Radio Damascus [S-M]
2112
Syria, Radio Damascus [F]
2115
Syria, Radio Damascus [T]
United Kingdom, BBC London (af)*
United Kingdom, BBC London (eu)*
2120
Egypt, Radio Cairo
2130
Cuba, Radio Havana Cuba [M-A]*
Egypt, Radio Cairo
Finland, Radio
Latvia, Latvian Radio [M-F]
Russia, Voice of
Sweden, Radio [M-F]
Sweden, Radio [M-F]
2145
South Korea, Radio Korea Intl
Syria, Radio Damascus [W]
2155
Canada, RCI Montreal [M-F]

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
Australia, Radio
Belgium, R Vlaanderen Intl [S-F]
Bulgaria, Radio
Canada, N Quebec Svc [S]
Canada, RCI Montreal
Canada, RCI Montreal
Canada, RCI Montreal (as)
China, China Radio Intl
Croatia, Croatian Radio
Cuba, Radio Havana Cuba [M-A]
Hungary, Radio Budapest
India, All India Radio
Italy, RAI
New Zealand, Radio NZ Intl [A-H]
Russia, Voice of
South Korea, Radio Korea Intl
Spain, R Exterior de Espana
Ukraine, R Ukraine Intl
United Kingdom, BBC London (af) (Newsdesk)
United Kingdom, BBC London (am) (Newsdesk)
United Kingdom, BBC London (as pac) (Newsdesk)
United Kingdom, BBC London (eu) (Newsdesk)
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (as pac)
USA, WHRI Noblesville IN [M-F]
Yugoslavia, Radio
2203
Taiwan, Voice of Free China
2210
China, China Radio Intl*
2215
Egypt, Radio Cairo
2230
Canada, RCI Montreal [A]
Finland, Radio
Russia, Voice of [M-F]
USA, VOA Washington DC (as pac) (Special English)
2240
Egypt, Radio Cairo
Greece, Voice of [S-F]
2245
USA, Voice of the OAS [M-F]*

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
Armenia, Voice of [Daily]
Australia, Radio
Canada, N Quebec Svc [S]
Canada, RCI Montreal [A-S]
Croatia, Croatian Radio
Germany, Deutsche Welle
India, All India Radio
Japan, Radio
New Zealand, Radio NZ Intl [A-H]
Russia, Voice of
Turkey, Voice of
United Kingdom, BBC London (af)
United Kingdom, BBC London (am) [S-F]
United Kingdom, BBC London (as pac)
United Kingdom, BBC London (eu)
USA, KWHR Naalehu HI [M-F]
USA, Monitor Radio Intl [M-A]
USA, VOA Washington DC (as pac)
USA, WHRI Noblesville IN [M-F]
2303
North Korea, R Pyongyang
2315
Egypt, Radio Cairo
2330
Netherlands, Radio (am)
Russia, Voice of
Vietnam, Voice of Vietnam
2335
Greece, Voice of [S-F]

RAMSEY America's #1 Source For Hobby Kits

TONE GRABBER

Grab Touch-Tone numbers right off the air, phone or tape. A simple hook-up to any radio speaker or phone line is all that is required to instantly decipher touch-tone phone numbers or codes. A 256 digit memory stores decoded numbers and keeps its memory even in the event of power loss. An 8 digit LED display allows you to scroll through the memory bank to examine numbers. To make it easy to pick out number groups or codes, a "dash" is inserted between sets of digits that were decoded more than 2 seconds apart. A "central-office" quality crystal controlled decoder is used allowing rapid and reliable detection of numbers at up to 20 digits per second! For a professionally finished look, add our matching case set. Start cracking those secret codes tomorrow with the Tone Grabber!

TG-1 Tone Grabber kit	**$99.95**
CTG Matching case set	**$14.95**
TG-1WT Fully assembled TG-1 and case	**$149.95**

FM RECEIVER/TRANSMITTER

Keep an ear on the local repeater, police, weather or just tune around. These sensitive superhet receivers are fun to build and use. Tunes any 5 MHz portion of the band and have smooth varactor tuning with AFC, dual conversion, ceramic filtering, squelch and plenty of speaker volume. Complete manual details how the rigs work and applications. 2M FM transmitter has 5W RF out, crystal control (146.52 included), pro-specs and data/mike inputs. Add our case sets for a nice finish.

FM Receiver kit	**$34.95**
Specify band: FR-146 (2M), FR-6 (6M), FR-10 (10M), FR-220 (220MHz)	
CFR Matching case set	**$14.95**
FT-146 Two Meter FM trans kit	**$99.95**

SCRAMBLER/DESCRAMBLER

Descramble most scramble systems heard on your scanner radio or set up your own scrambled communication system over the phone or radio. Latest 3rd generation IC is used for fantastic audio quality-equivalent to over 30 op-amps and mixers! Crystal controlled for crystal clear sound with a built-in 2 watt audio amp for direct radio hook-up. For scramble systems, each user has a unit for full duplex operation. Communicate in privacy with the SS-70. Add our case set for a fine professional finish.

SS-70 Scrambler/Descrambler kit	**$39.95**
CSSD Matching case set	**$14.95**
SS-70WT Fully assembled SS-70 and case set	**$79.95**

SCA DECODER

Tap into the world of commercial-free music and data that is carried over many standard FM broadcast radio stations. Decoder hooks to the demodulator of FM radio and tunes the 50-100 kHz SCA subcarrier band. Many radios have a demod output, but if your radio doesn't, it's easy to locate, or use our FR-1 FM receiver kit which is a complete FM radio with a demod jack built-in. These "hidden" subcarriers carry lots of neat programming-from stock quotes to news to music, from rock to easy listening-all commercial free. Hear what you have been missing with the SCA-1.

SCA-1 Decoder kit	**$27.95**
CSCA Matching case set	**$14.95**
FR-1 FM receiver kit	**$24.95**
CRR Matching case for FR-1	**$14.95**

SCANNER CONVERTER

Tune in on the 800-950 MHz action using your existing scanner. Frequencies are converted with crystal referenced stability to the 400-550 MHz range. Instructions are even included on building high performance 900 MHz antennas. Well designed circuit features extensive filtering and convenient on-off/bypass switch. Easy one hour assembly or available fully assembled. Add our matching case set for a professional look.

SCN-1 Scanner converter kit	**$49.95**
CSCN Matching case set	**$14.95**
SCN-1WT Assembled SCN-1 and case	**$89.95**

FULLY WIRED & TESTED

DSP FILTER

What is DSP? DSP allows the "construction" of various filters of great complexity by using computer code. This allows us to have easy access to a variety of filters, each perfectly optimized for whatever mode we are operating. The DSP II has been designed to operate in 10 different modes. Four filters are optimized for reducing interference to SSB phone signals from CW, heterodynes and random noise interference. Four more filters operate as "brick-wall" CW bandpass filters. the remaining two filters are designed for reliable recovery of RTTY and HF packet radio information signals. A single front panel switch selects any of these filters. Easy hookup to rigs speaker jack.

W9GR DSP Filter	**$299.95**
12V DC Power Supply	**$11.95**

BROADBAND PREAMP

Ever wish you could "perk up" your counter to read really weak signals? Or, how about boosting that cable TV signal to drive sets throughout the house, or maybe preamping the TV antenna to pull in that blacked out football game. And, if you're into small broadcasting, boost your transmitter power up to 100 mW! The PR-2 broadband preamp is the answer to all those needs as well as many others. You can use the PR-2 anywhere a high gain, low noise, high power amp is called for: digging out those weak shortwave signals or putting new life into that scanner radio-especially at 800 MHz. The PR-2 has a high power compression point, meaning that it does not overload easily-in fact many folks use it for boosting the power on their FM-10A stereo transmitters. Newly designed microwave MMIC chips from NEC in Japan enable the PR-2 to have gain all the way up to 2 GHz, although we only spec it to 1 GHz-believe it or not, the connector lead length is the limiting factor! Customers tell us the PR-2 outperforms professional lab units by the "big boys" that go for hundreds more. The PR-2 is the ideal general purpose amp you'll wonder how you got along without.

PR-2 Specifications: Gain: 25dB, Noise Figure: 2.5 dB, Input/Output Impedance: 50-75 ohms, Compression point: +18 dBm

PR-2 Broadband Preamp, Fully Wired and Tested **$59.95**

STEREO TRANSMITTER

Run your own Stereo FM radio station! Transmits a stable signal in the 88-108 MHz FM broadcast band up to 1 mile. Detailed manual provides helpful info on FCC regs, antenna ideas and range to expect. Latest design features adjustable line level inputs, pre-emphasis and crystal controlled subcarrier. Connects to any CD or tape player, mike mixer or radio. Includes free tuning tool too! For a pro look add our matching case set with on-board whip antenna.

FM-10A Stereo transmitter kit	**$34.95**
CFM Case, whip ant set	**$14.95**

ACTIVE ANTENNA

Cramped for space? Get longwire performance with this desktop antenna. Properly designed unit has dual HF and VHF circuitry and built-in whip antenna, as well as external jack. RF gain control and 9V operation makes unit ideal for SWLs, traveling hams or scanner buffs who need hotter reception. The matching case and knob set gives the unit a hundred dollar look!

AA-7 Kit	**$28.95**
CAA Matching case & knobset	**$14.95**

AIRCRAFT RECEIVER

Tune into the exciting world of aviation. Listen to the airlines, big business corporate jets, hot-shot military pilots, local private pilots, control towers, approach and departure radar control and other interesting and fascinating air-band communications. You'll hear planes up to a hundred miles away as well as all local traffic. The AR-1 features smooth varactor tuning of the entire air band from 118 to 136 MHz, effective AGC, superheterodyne circuitry, squelch, convenient 9 volt operations and plenty of speaker volume. Don't forget to add our matching case and knob set for a fine looking project you'll love to show. Our detailed instruction manual makes the AR-1 an ideal introduction to two life-long, fascinating hobbies at once-electronics and aviation! See *Kit Planes* magazine (January 1991) or *Popular Electronics* (January 1993) for excellent product reviews of the AR-1.

AR-1 Aircraft Receiver Kit	**$29.95**
C-AR Case and Knobset for AR-1	**$14.95**

INTERCEPTOR

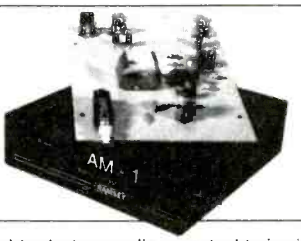
The Interceptor will lock on instantly to the nearest transmitter and allow you to listen with perfect audio quality. Since the Interceptor does not have to search through all frequencies, those quick transmissions that are hopelessly lost on scanners are captured easily. The Interceptor does not need tuning, making it ideal for hands-free surreptitious monitoring of nearby transmissions. The Interceptor is complete self-contained with internal speaker and earphone jack for private listening. Included are: Nicad battery pack, AC/adaptor charger, antenna and earphone. Increase your security and awareness-intercept the communications around you with the Interceptor. Fully wired with 1 year warranty. Covers 30-2000 MHz frequency range, FM deviations from 5 kHz to 200 kHz.

R10 Interceptor,
Fully Wired 1 year warranty **$349.95**

AM BROADCAST TRANSMITTER

High quality, true AM broadcast band transmitter is designed exactly like the big commercial rigs. Power of 100 mW, legal range of up to 1/4 mile. Accepts line level inputs from tape and CD players and mike mixers, tunable 550-1750 kHz. Complete manual explains circuitry, help with FCC regs and even antenna ideas. Be your own Rush Limbaugh or Rick Dees with the AM-1! Add our case set for a true station look.

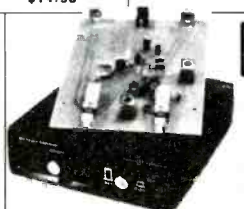
AM-1 Transmitter kit	**$29.95**
CAM Matching case set	**$14.95**



FOXHOUND DIRECTION FINDER

Locate hidden or unknown transmitters fast. The Foxhound direction finder connects to the antenna and speaker jack on any radio receiver, AM or FM from 1 MHz to 1 GHz. The antenna (a pair of dipole telescopic whips) is rotated until the Null meter shows a minimum. A pair of LEDs indicate to turn Left or Right. The Foxhound is ideal to use with a walkie-talkie, if you wish to transmit, go ahead, a build-in T/R switch senses any transmitted RF and switches itself out of circuit while you talk. It doesn't get any easier than this! We provide all parts except for a few feet of 1/2 inch PVC pipe available at any hardware store for a dollar or two. Add our matching case set for a complete finished unit. Be the one with the answers, win those transmitter hunts and track down those jammers, you'll do it all with your Foxhound.

DF-1 Foxhound direction finder kit	**$59.95**
CDF Matching case set for DF-1	**$14.95**
FHT-1 SlyFox Foxhunt transmitter kit	**$129.95**
FHID-1 Voice ID option	**$29.95**
CFHT Heavy duty metal case set for FHT-1	**$29.95**



SHORTWAVE CONVERTER

The SC-1 converter brings the sounds of the world right into your car radio or home stereo (set to AM broadcast band). Front panel push switches let you choose easily between regular AM radio and the shortwave bands. An additional switch allows the selection of any two bands of interest, each 1 MHz wide. Set one range for daytime frequencies and one for nighttime when propagation is different, choose any two frequencies between 3 and 22 MHz. Frequencies are tuned on your AM radio, making it easy to log stations or set presets. A built-in antenna switch automatically switches the existing AM antenna to either the radio or converter, making hook-up easy and fast. As with many of our kits, a handsome matching case and knob set is available to put the finishing touches on your kit.

SC-1 Shortwave Converter Kit	**$27.95**
CSC Matching Case and Knob Set	**$14.95**

SHORTWAVE RECEIVER

Here's a complete shortwave radio guaranteed to inspire awe in any listener. Imagine tuning in the BBC, Radio Moscow, Radio Baghdad and other services with just a couple of feet of antenna. This very sensitive (about a microvolt!) receiver is a true superhet design with AGC, RF gain control and plenty of speaker volume. Smooth varactor diode tuning allows you to tune any 2 MHz portion of the 4 to 11 MHz frequency range, and the kit conveniently runs on a 9 volt battery. Add our matching custom case and knob set to give your radio a finished, polished, look. Amaze yourself-and others-see how you can listen to the world on a receiver you built in an evening.

SR-1 Shortwave Radio Kit	**$34.95**
CSR Case and Knob Set	**$14.95**

ORDERS ONLY CALL 1-800-446-2295

(No tech info at this number)

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

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

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

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

FREQUENCIES

0000-0030	Australia, Radio	9610as	13605pa	13745as	17750as
0000-0100 vl	Australia, VL8A Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0100	Bulgaria, Radio	9700na	11720na		
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100 vl	Canada, CBC N Quebec Svc	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, China Radio Intl	9710na	11655na	11715na	
0000-0100	Costa Rica, AWR Alajuela	5030am	6150am	7375am	9725am
		13750am			
0000-0010	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0000-0027	Czech Rep, Radio Prague	5930na	7345na		
0000-0030	Egypt, Radio Cairo	9900na			
0000-0015	Ghana, Ghana Broadc Corp	3366do	4915do		
0000-0045	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
0000-0100 f/vl	Italy, IRRS Milan	7125va			
0000-0100	Lebanon, Voice of Hope	6280me			
0000-0100	Lebanon, Wings of Hope	9960va			
0000-0030 as	Lithuania, Radio Vilnius	7360na			
0000-0005 mtwhf	Lithuania, Radio Vilnius	7360na			
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM Kuching	7160do			
0000-0100	Netherlands, Radio	6020na	6165na	9845na	
0000-0100	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0100	Palau, KHBN/Voice of Hope	9965as			
0000-0100	Philippines, FEBC/R Intl	15450as			
0000-0100	Russia, Voice of	7125na	7260na	9620na	9720na
		9750na	11730na	11730na	11750na
0000-0030	Thailand, Radio	9655as	9690af	11905af	
0000-0100	Spain, R Exterior Espana	9540na			
0000-0100	United Kingdom,BBC London	5965as	5970sa	5975va	6175na
		6195as	7325va	9410as	9590va
		9915sa	11750sa	11955as	15280as
		15360as			
0000-0030	United Kingdom,BBC London	7110as	7180as	9580as	11945as
0000-0100	USA, KAIJ Dallas TX	5810am			
0000-0100	USA, KTBN Salt Lk City UT	15590am			
0000-0100	USA, KWHR Naalehu HI	17510au			
0000-0100	USA, Monitor Radio Intl	7535am	9430ca		
0000-0100	USA, VOA Washington DC	5995na	6130am	7215va	7405na
		9455am	9770va	9775na	
		11695am	11760va	13740am	15185va
		15205am	15290va	17735va	17820va
0000-0100	USA, WEWN Birmingham AL	7425na			
0000-0100	USA, WHRI Noblesville IN	5745am			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WWCR Nashville TN	5065am	7435am	13845am	
0000-0045	USA, WYFR Okeechobee FL	6085na			
0030-0100	Australia, Radio	9580pa	9660pa	11795as	13605pa
		13755as	15240pa	15365pa	15415as
		15510as	17795pa	17860pa	
0030-0055	Belgium, R Vlaanderen Int	6030na	13800na		
0030-0100	Ecuador, HCJB Quito	9745am			
0030-0100	Iran, VOIRI Tehran	6175na	7180na	7260na	9022na
0030-0100	Netherlands, Radio	5905as	7305as	9860as	11655as
0030-0100	Sri Lanka, SLBC Colombo	15425as			
0030-0100	Sweden, Radio	6065sa	9810sa		
0030-0100	Thailand, Radio	9655as	11905as	15370as	
0045-0100	USA, WYFR Okeechobee FL	6065na			
0050-0100	Italy, RAI Rome	9645na	11800na		

SELECTED PROGRAMS

Sundays

0010 Australia, Radio: Charting Australia. A program intended to strengthen Australia's links with the Indian subcontinent.
0011 Russia, Voice of: News and Views. Russian views on news developments.
0011 Spain, R Exterior de Espana: Spanish Hall of Fame. Recordings of great Spanish opera singers and descriptions of their careers.
0024 Spain, R Exterior de Espana: Distance Unknown. A program for shortwave listeners and DXers.
0030 Australia, Radio: Correspondents' Report. A round-up of global stories with Hamish Robertson.
0032 Russia, Voice of: Folk Box. One of the top ten entertainment programs (Passport to World Band Radio).
0033 Spain, R Exterior de Espana: What's Cooking Today?. Discover the food specialties of a particular region of Spain.
0056 Spain, R Exterior de Espana: Program Announcements. Descriptions of Spanish National Radio's programs and schedule information.

Mondays

0011 Australia, Radio: Network Asia. See S 2320.
0011 Russia, Voice of: News and Views. See S 0011.
0012 Spain, R Exterior de Espana: Visitors Book. Who's visiting Spain this week.
0022 Spain, R Exterior de Espana: Spain Step-by-Step. A journey to all corners of Spain, both present and future.
0032 Russia, Voice of: Yours for the Asking. A 30-minute musical request program.
0045 Spain, R Exterior de Espana: Radio Club. Listener letters are answered and music requests played.
0056 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Tuesdays

0011 Australia, Radio: Network Asia. See S 2320.
0011 Russia, Voice of: News and Views. See S 0011.
0015 Spain, R Exterior de Espana: Panorama. A magazine program focusing on everything that's happening in Spain.
0020 Spain, R Exterior de Espana: Press Review. Review of the Spanish press.
0026 Spain, R Exterior de Espana: Sports Spotlight. Summary of the weekend's sports results.
0032 Russia, Voice of: The Jazz Show. See M 0532.
0036 Spain, R Exterior de Espana: Cultural Encounters. Highlighting cultural interaction between Spain and North America.
0049 Spain, R Exterior de Espana: Spanish Course by Radio. A course in Spanish with English commentary.
0057 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Wednesdays

0011 Australia, Radio: Network Asia. See S 2320.
0011 Russia, Voice of: News and Views. See S 0011.
0016 Spain, R Exterior de Espana: Panorama. See T 0015.
0022 Spain, R Exterior de Espana: Press Review. See T 0020.
0029 Spain, R Exterior de Espana: Review of the Spanish Economy. Spain's status in financial matters.
0032 Russia, Voice of: Music at Your Request. See M 1232.
0036 Spain, R Exterior de Espana: Entertainment in Spain. Current favorites from the world of stage and screen.
0049 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.
0056 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Thursdays

0011 Australia, Radio: Network Asia. See S 2320.
0011 Russia, Voice of: News and Views. See S 0011.
0016 Spain, R Exterior de Espana: Panorama. See T 0015.
0022 Spain, R Exterior de Espana: Press Review. See T 0020.
0029 Spain, R Exterior de Espana: As Others See Us. Review of the foreign press.
0032 Russia, Voice of: The Jazz Show. See M 0532.
0039 Spain, R Exterior de Espana: The Natural World (biweekly). Ecological and environmental news and developments.
0041 Spain, R Exterior de Espana: Science Desk (biweekly). Developments in science and technology.
0049 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.
0055 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Fridays

0011 Australia, Radio: Network Asia. See S 2320.
0011 Russia, Voice of: News and Views. See S 0011.
0016 Spain, R Exterior de Espana: Panorama. See T 0015.
0022 Spain, R Exterior de Espana: Press Review. See T 0020.
0029 Spain, R Exterior de Espana: People of Today. Focus on a Spaniard of note.
0032 Russia, Voice of: Folk Box. See S 0032.
0038 Spain, R Exterior de Espana: Cultural Clippings. What's going on in Spain.
0049 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.
0057 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Saturdays

0010 Australia, Radio: Feedback. See S 0410.
0011 Russia, Voice of: News and Views. See S 0011.
0016 Spain, R Exterior de Espana: Panorama. See T 0015.
0022 Spain, R Exterior de Espana: Press Review. See T 0020.
0029 Spain, R Exterior de Espana: Window on Spain. A different region of Spain is described each week.
0030 Australia, Radio: Indian Pacific. Peter Mares with news and analysis from across the Pacific and Asia.
0032 Russia, Voice of: Kaleidoscope. See S 0532.
0039 Spain, R Exterior de Espana: Arts in Spain. A review of cultural activities.
0049 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.
0056 Spain, R Exterior de Espana: Program Announcements. See S 0056.

HAUSER'S HIGHLIGHTS

PHILIPPINES: FEBC

English is now daily:

0000-0200 15450 to India
0930-1100 11635 (new) to China, SE Asia
1300-1600 11995 to India, SE Asia

Programs:

DX Dial: Sun 1330, Wed 1315 approx., Sat 0940
Life in the Cities, Sun 0930
Far East Forum, Fri 0945, Sat 1415
Mailbag, Sat 0945 and 1540, Sun 1340
Asian News Update, Mon-Fri 1030
News from the Philippines, Mon-Fri 1440
Computer Corner, Mon-Fri 0940, 1345, Sun 1335

FREQUENCIES

0100-0200 twhfa	Argentina, RAE	11710am			
0100-0200	Australia, AF Radio	13535as			
0100-0200	Australia, Radio	9580pa	9660pa	13605pa	13745as
		13755as	15240pa	15245as	15365pa
		15415as	15510as	17715as	17750as
		17795pa	17860pa	17880as	
0100-0200 vl	Australia, VL8A Alice Spg	4835do			
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200 vl	Canada, CBC N Quebec Svc	9625do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Canada, RCI Montreal	6120am	9535am	9755am	11940am
		13670am			
0100-0130 vl	Costa Rica, AWR Alajuela	5030ca	6150sa	7375am	13750am
0100-0200	Costa Rica, R Peace Intl	7385am	9400am		
0100-0110	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0100-0200	Cuba, Radio Havana Cuba	6000na	9830na		
0100-0127	Czech Rep, Radio Prague	7345na	9405na		
0100-0200	Ecuador, HCJB Quito	9745am			
0100-0150	Germany, Deutsche Welle	6040na	6085na	6110na	6145na
		9555na	9640na	11740na	11865na
0100-0115	Ghana, Ghana Broadc Corp	3366do	4915do		
0100-0200	Guatemala, Radio Cultural	3300do			
0100-0130	Iran, VOIRI Tehran	6175na	7180na	7260na	9022na
0100-0115 f/vl	Italy, IRRS Milan	7125va			
0100-0110	Italy, RAI Rome	9645na	11800na		
0100-0200	Japan, NHK/Radio	5960na	9680as	11840as	11860as
		11900as	11910as	17810as	17845as
0100-0200	Lebanon, Voice of Hope	6280me			
0100-0200	Lebanon, Wings of Hope	9960va			
0100-0200 smtwh	Malaysia, Radio	7295do			
0100-0200	Netherlands, Radio	5905as	7305as		
0100-0125	Netherlands, Radio	6020na	6165na	9845na	
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0200	Philippines, FEBC/R Intl	15450as			
0100-0200	Russia, Voice of	9620na	11750na	12050na	13645na
		13665na	15180na	15425na	15580as
0100-0127	Slovakia, R Slovakia Intl	5930na	7300na	9440sa	
0100-0200	South Korea, R Korea Intl	7550eu	11810na	15575sa	
0100-0200	Spain, R Exterior Espana	9540na			
0100-0200	Sri Lanka, SLBC Colombo	15425as			
0100-0130	Switzerland, Swiss R Intl	5890na	6135na	9885na	9905na
0100-0200	Ukraine, R Ukraine Intl	9750na	9835na	11720na	11780na
		11875na	11950na		
0100-0200	United Kingdom,BBC London	5970sa	5975va	6175na	6195as
		7325va	9410as	9590va	9605as
		9915sa	11750sa	11955as	15360as
0100-0200	USA, KAIJ Dallas TX	5810am			
0100-0200	USA, KTBN Salt Lk City UT	7510am			
0100-0200	USA, KWHR Naalehu HI	17510au			
0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	USA, VOA Washington DC	5995na	6130na	7405na	9455na
		9775na	13740na	15170na	15205na
		15250na	17740na	17820na	
0100-0200	USA, WEWN Birmingham AL	7425na			
0100-0200	USA, WHRI Noblesville IN	5745am			
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	Vietnam, Voice of	7250na	9840na	15010na	
0100-0130 mtwhfa	Yugoslavia, Radio	9580na	9720af	11870na	
0130-0200	Austria, R Austria Intl	9655na			
0130-0150	Greece, Voice of	7450na	9420na	9935na	
0130-0200	Netherlands, Radio	9860as			
0130-0200	Sweden, Radio	9695au			
0140-0200	Vatican State, Vatican R	9650as	11935as		
0145-0200	Albania, R Tirana Intl	6145na	7160na		

SELECTED PROGRAMS

Sundays

0108 Germany, Deutsche Welle: Inside Europe. A radio magazine offering a European perspective on events of the week.
0110 Australia, Radio: Book Reading. Serialized readings of the best Australian novels.
0111 Russia, Voice of: Moscow Mailbag. Joe Adamov answers listener questions.
0111 Spain, R Exterior de Espana: Spanish Hall of Fame. See S 0011.
0124 Spain, R Exterior de Espana: Distance Unknown. See S 0024.
0130 Australia, Radio: The Europeans. Maria Zijlstra presents reports and features on aspects of European politics, culture and society.
0132 Russia, Voice of: Audio Book Club. The best of Russian classic and contemporary literature.
0133 Spain, R Exterior de Espana: What's Cooking Today?. See S 0033.
0137 Germany, Deutsche Welle: Religion and Society. News and developments concerning the world's major religions.
0144 Spain, R Exterior de Espana: Getting to Know Spanish Wine. Learn about the wines of Spain.
0156 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Mondays

0108 Germany, Deutsche Welle: Mailbag. Listener mail from the Americas is answered.
0110 Australia, Radio: Sports Headlines. A one-minute sports update.
0111 Russia, Voice of: World War II (1939-1945). Russia's participation in the second world war - a 50th anniversary program.
0112 Spain, R Exterior de Espana: Visitors Book. See M 0012.
0118 Australia, Radio: Sports Summary. A two-minute wrap-up of Australian sport.
0118 Germany, Deutsche Welle: Living in Germany. A weekly look at the social and political issues in the 1990s.
0120 Australia, Radio: Network Asia. See S 2320.
0122 Spain, R Exterior de Espana: Spain Step-by-Step. See M 0022.
0132 Russia, Voice of: Russian by Radio. See S 1532.
0133 Germany, Deutsche Welle: German by Radio. See S 1134.
0145 Spain, R Exterior de Espana: Radio Club. See M 0045.
0156 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Tuesdays

0109 Germany, Deutsche Welle: European Journal. See S 2324.
0110 Australia, Radio: Sports Headlines. See M 0110.
0111 Russia, Voice of: Focus on Asia and the Pacific. News and comments on events in the region.
0115 Spain, R Exterior de Espana: Panorama. See T 0015.
0118 Australia, Radio: Sports Summary. See M 0118.
0120 Australia, Radio: Network Asia. See S 2320.
0120 Spain, R Exterior de Espana: Press Review. See T 0020.
0126 Spain, R Exterior de Espana: Sports Spotlight. See T 0026.
0132 Germany, Deutsche Welle: German Tribune. News and views from the Federal Republic.
0132 Russia, Voice of: Music. See S 0432.
0138 Spain, R Exterior de Espana: Cultural Encounters. See T 0036.
0149 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.
0157 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Wednesdays

0109 Germany, Deutsche Welle: European Journal. See S 2324.
0110 Australia, Radio: Sports Headlines. See M 0110.
0111 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
0116 Spain, R Exterior de Espana: Panorama. See T 0015.
0118 Australia, Radio: Sports Summary. See M 0118.
0120 Australia, Radio: Network Asia. See S 2320.
0122 Spain, R Exterior de Espana: Press Review. See T 0020.
0129 Spain, R Exterior de Espana: Review of the Spanish Economy. See W 0029.
0132 Russia, Voice of: Music. See S 0432.
0133 Germany, Deutsche Welle: Backdrop. A program of culture and the arts in Germany.
0136 Spain, R Exterior de Espana: Entertainment in Spain. See W 0036.
0149 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.
0156 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Thursdays

0109 Germany, Deutsche Welle: European Journal. See S 2324.
0110 Australia, Radio: Sports Headlines. See M 0110.
0111 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
0116 Spain, R Exterior de Espana: Panorama. See T 0015.
0118 Australia, Radio: Sports Summary. See M 0118.
0120 Australia, Radio: Network Asia. See S 2320.
0122 Spain, R Exterior de Espana: Press Review. See T 0020.
0129 Spain, R Exterior de Espana: As Others See Us. See H 0029.
0132 Russia, Voice of: Music. See S 0432.
0133 Germany, Deutsche Welle: German Tribune. See T 0132.
0139 Spain, R Exterior de Espana: The Natural World (biweekly). See H 0039.
0141 Spain, R Exterior de Espana: Science Desk (biweekly). See H 0041.
0149 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.

Fridays

0109 Germany, Deutsche Welle: European Journal. See S 2324.
0110 Australia, Radio: Sports Headlines. See M 0110.
0111 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
0116 Spain, R Exterior de Espana: Panorama. See T 0015.
0118 Australia, Radio: Sports Summary. See M 0118.
0120 Australia, Radio: Network Asia. See S 2320.
0122 Spain, R Exterior de Espana: Press Review. See T 0020.
0129 Spain, R Exterior de Espana: People of Today. See F 0029.
0132 Russia, Voice of: This is Russia. See S 1111.
0133 Germany, Deutsche Welle: Come to Germany. Focus on a seasonal event, festival, or attraction.
0138 Spain, R Exterior de Espana: Cultural Clippings. See F 0038.
0139 Russia, Voice of: Music. See S 0432.
0149 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.
0157 Spain, R Exterior de Espana: Program Announcements. See S 0056.

Saturdays

0108 Germany, Deutsche Welle: European Journal. See S 2324.
0110 Australia, Radio: Oz Sounds. See S 1310.
0111 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
0116 Spain, R Exterior de Espana: Panorama. See T 0015.
0122 Spain, R Exterior de Espana: Press Review. See T 0020.
0129 Spain, R Exterior de Espana: Window on Spain. See A 0029.
0130 Australia, Radio: The Australian Scene. A state by state look at life in Australia presented by Denis Gibbons.
0131 Germany, Deutsche Welle: Through German Eyes. See S 1629.
0132 Russia, Voice of: Interview. See S 0347.
0132 Russia, Voice of: Music. See S 0432.
0139 Spain, R Exterior de Espana: Arts in Spain. See A 0039.
0149 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.
0156 Spain, R Exterior de Espana: Program Announcements. See S 0056.

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

FREQUENCIES

0200-0300	Australia, Radio	9580pa	9660pa	13605pa	15240pa
		15365pa	15415as	15510as	17715as
		17750as	17795pa	17860pa	
0200-0300 vl	Canada, CBC N Quebec Svc	9625do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6120na	9535am	9755am	11940am
		13670am			
0200-0300	Costa Rica, R Peace Intl	7385am	9400am		
0200-0210	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0200-0300	Cuba, Radio Havana Cuba	6000na	9820na	9830na	
0200-0300	Ecuador, HCJB Quito	9745am			
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	7285as	9615as	9640as	9690as
		11945as	11965as	12045as	
0200-0230	Hungary, Radio Budapest	6000na	9835na	11910na	
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0200-0300	Lebanon, Wings of Hope	9960va			
0200-0300 smtwh	Malaysia, Radio	7295do			
0200-0225	Moldova, R Moldova Intl	9540na			
0200-0230	Netherlands, Radio	5905as	7305as	9860as	11655as
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0230 m	Norway, Radio Norway Intl	7480na	9560na		
0200-0300	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0200-0300	Russia, Voice of	9620na	11730na	11750na	11805na
		12050na	13645as	13665na	13790na
		15180na	15425na	15580as	
0200-0300	Slovakia, AWR	9465as			
0200-0230	Sri Lanka, SLBC Colombo	15425as			
0200-0300	Taiwan, VO Free China	5950na	7130as	9680na	11740ca
		11825as	15345as		
0200-0300	United Kingdom,BBC London	5970sa	5975va	6135af	6175na
		6195eu	7325va	9410va	9590am
		9605as	9760as	9915sa	11955as
		15360as			
0200-0300	USA, KAIJ Dallas TX	5810am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0230	USA, KVOH Los Angeles CA	17775am			
0200-0300	USA, KWHR Naalehu HI	17510au			
0200-0300	USA, Monitor Radio Intl	5850na	9430am		
0200-0300	USA, VOA Washington DC	7115as	7205as	9635as	11705as
		11725as	15170as	15205as	17740as
		17820as			
0200-0300	USA, WEWN Birmingham AL	7425na			
0200-0300	USA, WHRI Noblesville IN	5745am			
0200-0300	USA, WJCR Upton KY	7490na	13595na		
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		
0200-0230	Vietnam, Voice of	7250na	9840na	15010na	
0230-0300	Albania, R Tirana Intl	6145na	7160na		
0230-0300	Austria, R Austria Intl	9655na	9870ca	13730sa	
0230-0245	Pakistan, Radio	7290as	15190as	17705as	17725as
		21730as			
0230-0300	Philippines, R Pilipinas	17760me	17865me	21580me	
0230-0300 mtwhf	Portugal, R Portugal Intl	6175sa	9570na		
0230-0300	Sweden, Radio	7120na	9850na		
0250-0300	Vatican State, Vatican R	7305na	9605na		

SELECTED PROGRAMS

Sundays

0200 USA, Monitor Radio Intl: Bible Lesson. Lesson-sermons from the King James Version of the Bible and Mary Baker Eddy's textbook.
0208 Germany, Deutsche Welle: Commentary. Guest commentary about a current event.
0210 Australia, Radio: Charting Australia. See S 0010.
0211 Russia, Voice of: Music and Musicians. World-famous performers and composers play for you.
0212 Germany, Deutsche Welle: Sports Report. The latest news from the world of sports.
0216 Germany, Deutsche Welle: Mailbag Asia. Listener mail from Asia is answered.
0230 Australia, Radio: Correspondents' Report. See S 0030.

Mondays

0200 USA, Monitor Radio Intl: Sunday from the Mother Church. From the First Church of Christ, Scientist, in Boston, MA, USA.
0208 Germany, Deutsche Welle: Asia-Pacific Report. See S 2309.
0210 Australia, Radio: Sports Headlines. See M 0110.
0211 Australia, Radio: Network Asia. See S 2320.
0211 Russia, Voice of: Music and Musicians. See S 0211.
0224 Germany, Deutsche Welle: European Journal. See S 2324.

Tuesdays

0200 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0206 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0208 Germany, Deutsche Welle: Asia-Pacific Report. See S 2309.
0210 Australia, Radio: Sports Headlines. See M 0110.
0211 Australia, Radio: Network Asia. See S 2320.
0211 Russia, Voice of: Commonwealth Update. See M 2311.
0224 Germany, Deutsche Welle: European Journal. See S 2324.
0232 Russia, Voice of: Folk Box. See S 0032.
0249 USA, Monitor Radio Intl: Letterbox. See M 1149.
0252 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Wednesdays

0200 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0206 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0208 Germany, Deutsche Welle: Asia-Pacific Report. See S 2309.
0210 Australia, Radio: Sports Headlines. See M 0110.
0211 Australia, Radio: Network Asia. See S 2320.
0211 Russia, Voice of: Commonwealth Update. See M 2311.
0224 Germany, Deutsche Welle: European Journal. See S 2324.
0232 Russia, Voice of: Yours for the Asking. See M 0032.
0249 USA, Monitor Radio Intl: Letterbox. See M 1149.
0252 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Thursdays

0200 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0206 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0208 Germany, Deutsche Welle: Asia-Pacific Report. See S 2309.
0210 Australia, Radio: Sports Headlines. See M 0110.
0211 Australia, Radio: Network Asia. See S 2320.
0211 Russia, Voice of: Commonwealth Update. See M 2311.
0224 Germany, Deutsche Welle: European Journal. See S 2324.
0232 Russia, Voice of: The Jazz Show. See M 0532.
0249 USA, Monitor Radio Intl: Letterbox. See M 1149.
0252 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Fridays

0200 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0206 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0208 Germany, Deutsche Welle: Asia-Pacific Report. See S 2309.
0210 Australia, Radio: Sports Headlines. See M 0110.
0211 Australia, Radio: Network Asia. See S 2320.
0211 Russia, Voice of: Commonwealth Update. See M 2311.
0224 Germany, Deutsche Welle: European Journal. See S 2324.
0232 Russia, Voice of: Music at Your Request. See M 1232.
0249 USA, Monitor Radio Intl: Letterbox. See M 1149.
0252 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Saturdays

0200 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0206 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1129.
0208 Germany, Deutsche Welle: Commentary. See S 0208.
0210 Australia, Radio: Feedback. See S 0410.
0211 Russia, Voice of: Commonwealth Update. See M 2311.
0212 Germany, Deutsche Welle: The Week in Germany. See S 1609.
0222 Germany, Deutsche Welle: Economic Notebook. See T 0332.
0230 Australia, Radio: Indian Pacific. See A 0030.
0232 Russia, Voice of: The Jazz Show. See M 0532.
0237 Germany, Deutsche Welle: The Jazz Corner. See F 2333.

HAUSER'S HIGHLIGHTS
TAIWAN: CENTRAL BROADCASTING SYSTEM

CBS is operated by Ministry of Defense, broadcasts to mainland (and usually heavily jammed), has five networks targeted at different interest groups, most also on MW.

CBS Network 1 in Standard Chinese, news on the hour:

0000-0100	11905
0355-0700	15320, 11905, 7250
0700-0955	15320, 11905
0955-1630	15320, 7250, 3335
1630-1900	15320, 11905, 7250, 3335
1900-2050	3335
2050-2200	11905, 3335
2200-2400	11905

CBS Network 2, Std. Chinese, news on hour:

0000-0955	11970, 7105
0955-2155	11775, 6180
2155-2400	11970, 11775, 7105, 6180

CBS Network 3, Std. Chinese:

0955-2400	9630, 6087

CBS Network 4, Cantonese:

0955-2400	9690, 6040

CBS Network 5, all on 11905:

1000-1140	Mongolian
1140-1310	Tibetan
1310-1330	Std. Chinese special messages
1330-1500	Uighur

(BBC Monitoring)

FREQUENCIES

0300-0400	Australia, Radio	9580pa	9660pa	13605pa	15240pa
		15245as	15365pa	15510as	17750pa
		17795pa	17860pa		
0300-0400 vl	Canada, CBC N Quebec Svc	9625do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9710na	11715na	
0300-0400	Costa Rica, R Peace Intl	7385am	9400am		
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0310	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0300-0400	Cuba, Radio Havana Cuba	6000na	9820na	9830na	
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB Quito	9745am			
0300-0330	Egypt, Radio Cairo	9475na			
0300-0350	Germany, Deutsche Welle	6085na	6185na	9535na	9615na
		9640na	11750na		
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Japan, NHK/Radio	11790as	11840as	17810as	
0300-0330	Japan, NHK/Radio	11885na	11895ca	15230na	
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0300-0330	Mongolia, R Ulan Bator	9960na	12000na		
0300-0325	Netherlands, Radio	9860as	11655as		
0300-0400	New Zealand, R NZ Intl	15115pa			
0300-0330	Philippines, R Pilipinas	17760me	17865me	21580me	
0300-0400	Russia, Voice of	9620na	9665na	11730na	12050na
		13605na	13645na	13665na	15180na
		15425na	15580na		
0300-0400	S Africa, Channel Africa	3220af			
0300-0400	Taiwan, VO Free China	5950na	9680na	11745as	11825as
0300-0330	Thailand, Radio	15345as 9655na	11905na		
0300-0330	United Kingdom,BBC London	5970sa	6135af	7325va	9760as
		9915sa	15360as	15380as	
0300-0400	United Kingdom,BBC London	3255af	5975va	6005af	6175na
		6180eu	6190af	6195eu	9410va
		9600af	9605as	11760me	12095af
		15310as			
0300-0400	USA, KAIJ Dallas TX	5810am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	USA, KWHR Naalehu HI	17510au			
0300-0400	USA, Monitor Radio Intl	5850na	7535af		
0300-0400	USA, VOA Washington DC	5980af	6115af	7105af	7280af
		7340af	7405af	9575af	15300af
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	5745am			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400	USA, WWCR Nashville TN	5065am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0315	Vatican State, Vatican R	7305na	9605na		
0300-0400	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
0315-0330 s	Greece, Voice of	7450na	9420na	9935na	
0320-0350	Vatican State, Vatican R	7360af	9660af		
0330-0357	Czech Rep, Radio Prague	9480as			
0330-0400	Hungary, Radio Budapest	6000na	9835na	11910na	
0330-0400	Sweden, Radio	7120na	9850na		
0330-0400 vl	Tanzania, Radio	5050af			
0330-0400	UAE, Radio Dubai	11945na	13675na	15400na	21485na
0330-0400	United Kingdom,BBC London	9610af	11730af	11955as	15280as
0340-0350	Greece, Voice of	7450na	9420na	9935na	
0345-0400 irreg	Burundi, Radio Nationale	6140do			

SELECTED PROGRAMS

Sundays

0300 USA, Monitor Radio Intl: Bible Lesson. See S 0200.
0308 Germany, Deutsche Welle: Inside Europe. See S 0108.
0310 Australia, Radio: Book Reading. See S 0110.
0311 Russia, Voice of: Moscow Mailbag. See S 0111.
0330 Australia, Radio: At Your Request. Dick Paterson plays favorite music.
0332 Russia, Voice of: Your Top Tune. Win a prize by guessing which song of the three is the most popular.
0337 Germany, Deutsche Welle: Religion and Society. See S 0137.
0347 Russia, Voice of: Interview. Talks with individuals about various subjects of current interest.

Mondays

0300 USA, Monitor Radio Intl: Sunday from the Mother Church. See M 0200.
0308 Germany, Deutsche Welle: Mailbag. See M 0108.
0310 Australia, Radio: Sports Bulletin. See S 1120.
0311 Russia, Voice of: Moscow Mailbag. See S 0111.
0318 Germany, Deutsche Welle: Living in Germany. See M 0118.
0320 Australia, Radio: Network Asia. See S 2320.
0332 Russia, Voice of: Timelines. A variety program with an upbeat flair and an insight into Moscow life.
0333 Germany, Deutsche Welle: German by Radio. See S 1134.

Tuesdays

0300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0309 Germany, Deutsche Welle: European Journal. See S 2324.
0310 Australia, Radio: Sports Bulletin. See S 1120.
0311 Russia, Voice of: Moscow Mailbag. See S 0111.
0320 Australia, Radio: Network Asia. See S 2320.
0330 Russia, Voice of: Audio Book Club. See S 0132.
0332 Germany, Deutsche Welle: Economic Notebook. The economic scene in Germany and around the world.
0349 USA, Monitor Radio Intl: Letterbox. See M 1149.
0352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Wednesdays

0300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0309 Germany, Deutsche Welle: European Journal. See S 2324.
0310 Australia, Radio: Sports Bulletin. See S 1120.
0311 Russia, Voice of: Science and Engineering in the CIS. See S 0611.
0320 Australia, Radio: Network Asia. See S 2320.
0332 Russia, Voice of: Russian by Radio. See S 1532.
0333 Germany, Deutsche Welle: Insight. A weekly analysis of major developments on the international scene.
0349 USA, Monitor Radio Intl: Letterbox. See M 1149.
0352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Thursdays

0300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0309 Germany, Deutsche Welle: European Journal. See S 2324.
0310 Australia, Radio: Sports Bulletin. See S 1120.
0311 Russia, Voice of: Moscow Mailbag. See S 0111.
0320 Australia, Radio: Network Asia. See S 2320.
0332 Russia, Voice of: Audio Book Club. See S 0132.
0333 Germany, Deutsche Welle: German by Radio. See S 1134.
0349 USA, Monitor Radio Intl: Letterbox. See M 1149.
0352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Fridays

0300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
0309 Germany, Deutsche Welle: European Journal. See S 2324.
0310 Australia, Radio: Sports Bulletin. See S 1120.
0311 Russia, Voice of: World War II (1939-1945). See M 0111.
0320 Australia, Radio: Network Asia. See S 2320.
0332 Russia, Voice of: Russian by Radio. See S 1532.
0333 Germany, Deutsche Welle: Science and Technology. See M 1634.
0349 USA, Monitor Radio Intl: Letterbox. See M 1149.
0352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Saturdays

0300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
0306 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1129.
0308 Germany, Deutsche Welle: European Journal. See S 2324.
0310 Australia, Radio: Soundabout. Kim Taylor and friends bring top new releases, a weekly chart countdownm, and rock news from around the world.
0311 Russia, Voice of: Moscow Mailbag. See S 0111.
0332 Germany, Deutsche Welle: Through German Eyes. See S 1629.
0332 Russia, Voice of: Audio Book Club. See S 0132.

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

FREQUENCIES

0400-0500	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15365pa	15415pa	15510pa	17715pa
		17750as	17795pa	17860pa	
0400-0500 vl	Canada, CBC N Quebec Svc	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	9650me	11835me	11905me	15275me
0400-0500	China, China Radio Intl	9560na	9730na	11680na	
0400-0500	Costa Rica, R Peace Intl	7385am	9400am		
0400-0410	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0400-0500	Cuba, Radio Havana Cuba	6000na	6180na	9820na	9830na
0400-0430	Ecuador, HCJB Quito	9745am			
0400-0450	Germany, Deutsche Welle	6015af	6120af	6185af	7150af
		7225af	9565af	9765af	11765af
0400-0500 twtfa	Guatemala, Radio Cultural	3300do			
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0400-0458	New Zealand, R NZ Intl	15115pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0430 m	Norway, Radio Norway Intl	7480na			
0400-0430	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0400-0500	Russia, Voice of	9620eu	9665na	12010na	12050na
		13665na	15180na	15425na	15580as
0400-0500	S Africa, Channel Africa	3220af			
0400-0427	S Africa, Trans World R	7165af			
0400-0430	Switzerland, Swiss R Intl	6135na	9885na	9905na	
0400-0430	Tanzania, Radio	5050af			
0400-0500	Turkey, Voice of	9445na			
0400-0415	Uganda, Radio	4976do			
0400-0500	Ukraine, R Ukraine Intl	9685na	9835na	9860na	11875na
0400-0500	United Kingdom,BBC London	3255af	5975va	6005af	6180eu
		6190af	6195va	7160af	9410va
		9600af	9610af	11730af	11760me
		11955as	12095va	15280as	15310as
		15575me	17640af		
0400-0500	USA, KAIJ Dallas TX	5810am			
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	USA, KWHR Naalehu HI	17780as			
0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	USA, VOA Washington DC	3985va	5995va	6010va	6040va
		6873va	7170va	7200va	7280af
		7405af	9575af	11965va	15205va
		15300af			
0400-0500 vl	USA, WEWN Birmingham AL	7425na			
0400-0500	USA, WHRI Noblesville IN	5745am	9495am		
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	9370eu			
0400-0500	Zimbabwe, ZBC/Radio 3	3306do	3396do		
0425-0500	Nigeria, FRCN/Radio	3326do	4990do		
0430-0500	Australia, AF Radio	13535as			
0430-0500	Finland, YLE/Radio	15440af			
0430-0500	Netherlands, Radio	6165na	9590na		
0430-0500	Swaziland, Trans World R	3200af	5055af	6070af	
0430-0500	Switzerland, Swiss R Intl	9905na			
0445-0500	Tajikistan, Tajik Radio	7245as			
0455-0500	Nigeria, FRCN/Voice of	7255af			
0459-0500 mtwhf	New Zealand, R NZ Intl	11900pa			

SELECTED PROGRAMS

Sundays
0408 Germany, Deutsche Welle: Commentary. See S 0208.
0410 Australia, Radio: Feedback. Dennis Gibbons answers letters and discusses new programs, reception problems, and questions about Australia.
0411 Russia, Voice of: News and Views. See S 0011.
0412 Germany, Deutsche Welle: Sports Report. See S 0212.
0416 Germany, Deutsche Welle: Feature of the Month (1). A special feature on important developmental issues of our time.
0416 Germany, Deutsche Welle: International Talking Point. Journalists discuss major trends and events.
0430 Australia, Radio: Correspondents' Report. See S 0030.
0432 Russia, Voice of: Music. Music as selected by Radio Moscow staff.
0436 Germany, Deutsche Welle: People and Places. Interviews, stories and music for Africa listeners.

Mondays
0408 Germany, Deutsche Welle: Africa Highlight. A weekly feature on an important topic concerning Africa.
0410 Australia, Radio: Sports Headlines. See M 0110.
0411 Australia, Radio: Pacific Beat. A magazine which provides a focus on the people and issues of the region.
0411 Russia, Voice of: News and Views. See S 0011.
0424 Germany, Deutsche Welle: European Journal. See S 2324.
0430 Australia, Radio: International Report. Overseas and local correspondents analyze regional and global issues and events.
0432 Russia, Voice of: Music. See S 0432.

Tuesdays
0408 Germany, Deutsche Welle: Africa Report. Reports and background to the news from Africa by Deutsche Welle correspondents.
0410 Australia, Radio: Sports Headlines. See M 0110.
0411 Australia, Radio: Pacific Beat. See M 0411.
0411 Russia, Voice of: News and Views. See S 0011.
0424 Germany, Deutsche Welle: European Journal. See S 2324.
0430 Australia, Radio: International Report. See M 0430.
0432 Russia, Voice of: Music. See S 0432.

Wednesdays
0408 Germany, Deutsche Welle: Africa Report. See T 0408.
0410 Australia, Radio: Sports Headlines. See M 0110.
0411 Australia, Radio: Pacific Beat. See M 0411.
0411 Russia, Voice of: News and Views. See S 0011.
0424 Germany, Deutsche Welle: European Journal. See S 2324.
0430 Australia, Radio: International Report. See M 0430.
0432 Russia, Voice of: Music. See S 0432.

Thursdays
0408 Germany, Deutsche Welle: Africa Report. See T 0408.
0410 Australia, Radio: Sports Headlines. See M 0110.
0411 Australia, Radio: Pacific Beat. See M 0411.
0411 Russia, Voice of: News and Views. See S 0011.
0424 Germany, Deutsche Welle: European Journal. See S 2324.
0430 Australia, Radio: International Report. See M 0430.
0432 Russia, Voice of: Music. See S 0432.

Fridays
0408 Germany, Deutsche Welle: Africa Report. See T 0408.
0410 Australia, Radio: Sports Headlines. See M 0110.
0411 Australia, Radio: Pacific Beat. See M 0411.
0411 Russia, Voice of: News and Views. See S 0011.
0424 Germany, Deutsche Welle: European Journal. See S 2324.
0430 Australia, Radio: International Report. See M 0430.
0432 Russia, Voice of: Music. See S 0432.

Saturdays
0408 Germany, Deutsche Welle: Commentary. See S 0208.
0410 Australia, Radio: Book Reading. See S 0110.
0411 Russia, Voice of: News and Views. See S 0011.
0412 Germany, Deutsche Welle: Africa This Week. A weekly review of trends and events on the African continent.
0430 Australia, Radio: Indian Pacific. See A 0030.
0432 Germany, Deutsche Welle: Man and Environment. See T 1634.
0432 Russia, Voice of: Music. See S 0432.

HAUSER'S HIGHLIGHTS

MALTA: V. OF THE MEDITERRANEAN

English at 1400-1500 on 11925, repeated next day at 0600-0700 on 9765, has some new programs:

Mon/Tue	"The Lie"—readings from a Maltese novel
Wed/Thu	*Journey Around the Mediterranean*—started with Tripoli, Libya
Fri/Sat	*Maltese Parliamentary Procedures* (Via Edwin Southwell, WDXC *Contact*)
Wed/Thu	*DX Corner* follows *Journey*
Mon/Tue	*Mailbag* near end of hour (Wolfgang Büschel, WDXC *Contact*)

Reported on 11905, not 11925
(Frank Baldwin, BDXC *Communication*)

Many thanks to Scott H. Sikes, of Athens, GA, for this colorful card from Radio New Zealand.

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*

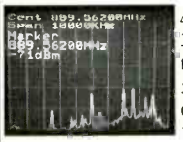
The Latest From AOR Products

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

AOR

Electronic Distributors Co.
325 Mill Street, N.E.
Vienna, VA. 22180
Phone: 703 938 8105 FAX: 703 938 4525

EDCO

EDCO

Exclusive North and South American Distributors.

0500 UTC SHORTWAVE GUIDE

1:00 AM EDT
10:00 PM PDT

FREQUENCIES

0500-0530	Australia, AF Radio	13535as			
0500-0600	Australia, Radio	9580pa	9660pa	13605as	15240pa
		15245as	15365pa	15415as	17715pa
		17795pa	17860pa		
0500-0600	Bulgaria, Radio	9700na	11720na		
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0530 mtwhf	Canada, RCI Montreal	6050eu	7295eu	15430af	17840af
0500-0600	Costa Rica, R Peace Intl	7385am	9400am		
0500-0510	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0500-0600	Cuba, Radio Havana Cuba	9820na	9830na		
0500-0600	Ecuador, HCJB Quito	9745am			
0500-0600 as	Eqt Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	6175na	6185na	9515na
		11705na			
0500-0515	Israel, Kol Israel	5900na	7465na	9435na	
0500-0600	Japan, NHK/Radio	5975eu	6110na	7230eu	9680na
		11725as	11740as	11790na	11885na
		11955as	17810as		
0500-0600 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0500-0600	Lebanon, Wings of Hope	9960va			
0500-0525	Netherlands, Radio	6165na	9590na		
0500-0600 mtwhf	New Zealand, R NZ Intl	11900pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4990do		
0500-0600	Nigeria, FRCN/Voice of	7255af			
0500-0600	Russia, AWR	9895me			
0500-0600	Russia, Voice of	12010na	12030na	12040na	12050na
		13370as	13645na	13665na	15425na
		15580na			
0500-0600	S Africa, Channel Africa	5955af	9695af		
0500-0600	Slovakia, AWR	9455af	13715me		
0500-0600	Spain, R Exterior Espana	9540na			
0500-0600	United Kingdom,BBC London	3255af	5975va	6005af	6180eu
		6190af	6195va	7160af	9410va
		9600af	9640va	9740as	11760af
		11955as	12095va	15070me	15280as
		15310va	15360as	15420af	15575me
		17640af	17885af		
0500-0600	USA, KAIJ Dallas TX	5810am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9975am			
0500-0600	USA, KWHR Naalehu HI	17780as			
0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600	USA, VOA Washington DC	3985va	5995va	6035af	6040va
		6140va	6873va	7170va	7200va
		7405af	9630af	11965va	12080af
		15205va			
0500-0600	USA, WHRI Noblesville IN	5745am	9495am		
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	9985eu	11580eu	
0500-0530	Vatican State, Vatican R	9660af	11625af	13765af	
0500-0600	Zimbabwe, ZBC/Radio 3	3306do	3396do		
0505-0600	Swaziland, Trans World R	3200af	5055af	6070af	9500af
0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0530-0600	Australia, Radio	15510as	15565as	17880as	
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Romania, R Romania Intl	11810af	15250af	15340af	17745af
		17790af			
0530-0557	Yugoslavia, Radio	9580na	11870na		

SELECTED PROGRAMS

Sundays

0508 Germany, Deutsche Welle: Inside Europe. See S 0108.
0510 Australia, Radio: Beat of the Pacific. Conversations with and music by indigenous Pacific music-makers.
0511 Russia, Voice of: Top Priority. A weekly panel discussion of key events.
0511 Spain, R Exterior de Espana: Spanish Hall of Fame. See S 0011.
0524 Spain, R Exterior de Espana: Distance Unknown. See S 0024.
0530 Australia, Radio: The Australian Music Show. Kim Taylor presents the music, people, and issues of the Australian contemporary music industry.
0532 Russia, Voice of: Kaleidoscope. A variety of topics ranging from science and ecology to cultural matters.
0533 Spain, R Exterior de Espana: What's Cooking Today?. See S 0033.
0537 Germany, Deutsche Welle: Religion and Society. See S 0137.
0544 Spain, R Exterior de Espana: Getting to Know Spanish Wine. See S 0144.

Mondays

0508 Germany, Deutsche Welle: Mailbag. See M 0108.
0511 Russia, Voice of: World War II (1939-1945). See M 0111.
0512 Spain, R Exterior de Espana: Visitors Book. See M 0012.
0518 Australia, Radio: Sports Summary. See M 0118.
0518 Germany, Deutsche Welle: Living in Germany. See M 0118.
0520 Australia, Radio: Pacific Beat. See M 0411.
0522 Spain, R Exterior de Espana: Spain Step-by-Step. See M 0022.
0532 Russia, Voice of: The Jazz Show. The world of Russian jazz.
0533 Germany, Deutsche Welle: German by Radio. See S 1134.
0545 Spain, R Exterior de Espana: Radio Club. See M 0045.

Tuesdays

0509 Germany, Deutsche Welle: European Journal. See S 2324.
0511 Russia, Voice of: Commonwealth Update. See M 2311.
0515 Spain, R Exterior de Espana: Panorama. See T 0015.
0518 Australia, Radio: Sports Summary. See M 0118.
0520 Australia, Radio: Pacific Beat. See M 0411.
0523 Spain, R Exterior de Espana: Press Review. See T 0020.
0526 Spain, R Exterior de Espana: Sports Spotlight. See T 0026.
0530 Australia, Radio: Indigenous News. News for and about the aboriginal people of Australia.
0532 Germany, Deutsche Welle: German Tribune. See T 0132.
0532 Russia, Voice of: Yours for the Asking. See M 0032.
0538 Spain, R Exterior de Espana: Cultural Encounters. See T 0036.
0549 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.

Wednesdays

0509 Germany, Deutsche Welle: European Journal. See S 2324.
0511 Russia, Voice of: Commonwealth Update. See M 2311.
0516 Spain, R Exterior de Espana: Panorama. See T 0015.
0518 Australia, Radio: Sports Summary. See M 0118.
0520 Australia, Radio: Pacific Beat. See M 0411.
0522 Spain, R Exterior de Espana: Press Review. See T 0020.
0529 Spain, R Exterior de Espana: Review of the Spanish Economy. See W 0029.
0530 Australia, Radio: Pacific Women. Patti Orofino looks at issues of concern to women of the Pacific.
0532 Russia, Voice of: Music at Your Request. See M 1232.
0533 Germany, Deutsche Welle: Backdrop. See W 0133.
0536 Spain, R Exterior de Espana: Entertainment in Spain. See W 0036.
0549 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.

Thursdays

0509 Germany, Deutsche Welle: European Journal. See S 2324.
0511 Russia, Voice of: Commonwealth Update. See M 2311.
0516 Spain, R Exterior de Espana: Panorama. See T 0015.
0518 Australia, Radio: Sports Summary. See M 0118.
0520 Australia, Radio: Pacific Beat. See M 0411.
0522 Spain, R Exterior de Espana: Press Review. See T 0020.
0529 Spain, R Exterior de Espana: As Others See Us. See H 0029.
0530 Australia, Radio: Pacific Religion. Coverage of religious issues of relevance to people of the Pacific region.
0532 Russia, Voice of: Folk Box. See S 0032.
0533 Germany, Deutsche Welle: German Tribune. See T 0132.
0539 Spain, R Exterior de Espana: The Natural World (biweekly). See H 0039.
0541 Spain, R Exterior de Espana: Science Desk (biweekly). See H 0041.
0549 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.

Fridays

0509 Germany, Deutsche Welle: European Journal. See S 2324.
0511 Russia, Voice of: Commonwealth Update. See M 2311.
0516 Spain, R Exterior de Espana: Panorama. See T 0015.
0518 Australia, Radio: Sports Summary. See M 0118.
0520 Australia, Radio: Pacific Beat. See M 0411.
0522 Spain, R Exterior de Espana: Press Review. See T 0020.
0528 Spain, R Exterior de Espana: People of Today. See F 0029.
0530 Australia, Radio: Beat of the Pacific. See S 0510.
0532 Russia, Voice of: Music. See S 0432.
0533 Germany, Deutsche Welle: Come to Germany. See F 0133.
0538 Spain, R Exterior de Espana: Cultural Clippings. See F 0038.
0549 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.

Saturdays

0509 Germany, Deutsche Welle: European Journal. See S 2324.
0510 Australia, Radio: Oz Sounds. See S 1310.
0511 Russia, Voice of: Commonwealth Update. See M 2311.
0516 Spain, R Exterior de Espana: Panorama. See T 0015.
0522 Spain, R Exterior de Espana: Press Review. See T 0020.
0529 Spain, R Exterior de Espana: Window on Spain. See A 0029.
0530 Australia, Radio: One World. Carolyn Court reports on environmental issues important to the Pacific.
0532 Russia, Voice of: Timelines. See M 0332.
0533 Germany, Deutsche Welle: Through German Eyes. See S 1629.
0535 Radio Havana Cuba: Feature Report. See S0119.
0541 China Radio Int'l: China in Action (biweekly). See F 1241.
0541 China Radio Int'l: World in Action (biweekly). See F 1241.
0546 WYFR: The Radio Reading Circle. See M 1246.
0547 China Radio Int'l: In the Third World. See F 1247.
0539 Spain, R Exterior de Espana: Arts in Spain. See A 0039.
0549 Spain, R Exterior de Espana: Spanish Course by Radio. See T 0049.

FREQUENCIES

0600-0700	Australia, Radio	11910pa	13605as	13755pa	15240pa
		15365pa	15510as	17715as	17795pa
0600-0630	Australia, Radio	9580pa	9660pa	15415pa	
0600-0700 vl	Canada, CBC N Quebec Svc	9625do			
0600-0700 vl	Canada, CBC N Quebec Svc	9625do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Costa Rica, R Peace Intl	7385am	9400am		
0600-0610	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0600-0700	Cuba, Radio Havana Cuba	9820na	9830na		
0600-0700	Ecuador, HCJB Quito	9745am			
0600-0700 as	Eqt Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	11915af	11960af	13790af	15185af
		15225af	17820af	17875af	21680af
0600-0615	Ghana, Ghana Broadc Corp	3316do	4915do		
0600-0700 mtwh/vl	Italy, IRRS Milan	7125va			
0600-0700	Japan, NHK/Radio	11955as	17810as		
0600-0700 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0600-0700 vl	Kiribati, Radio	9825do			
0600-0700	Lebanon, Wings of Hope	9960va			
0600-0700 vl	Liberia, Radio ELBC	7275do			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 mtwhfa	Malta, V of Mediterranean	9765me			
0600-0635 s	Malta, V of Mediterranean	9765me			
0600-0700 mtwhf	New Zealand, R NZ Intl	11900pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4990do		
0600-0700	Nigeria, FRCN/Voice of	7255af			
0600-0700	North Korea, R Pyongyang	15180as	15230as		
0600-0630 m	Norway, Radio Norway Intl	7295pa			
0600-0700	Russia, Voice of	12010na	12030na	12040na	12050na
		13370as	13645na	13665na	15425na
		15560as	15580as	17570as	
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		

0600-0700	South Korea, R Korea Intl	7205na	11945na		
0600-0615	Switzerland, Swiss R Intl	6165eu	9535eu		
0600-0700	United Kingdom,BBC London	6005af	6180eu	6190af	6195va
		7160af	9410va	9600af	9640va
		9740as	11760me	11940af	11955as
		12095va	15070va	15280as	15310as
		15360va	15400af	15420af	15575va
	17640af	17790as	17885af		
0600-0700	USA, KAIJ Dallas TX	5810am	9815am		
0600-0700	USA, KTBN Salt Lk City UT	7510am			
0600-0700	USA, KVOH Los Angeles CA	9975am			
0600-0700	USA, KWHR Naalehu HI	17780as			
0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	USA, VOA Washington DC	3985va	5995va	6035af	6040va
		6060va	6140va	6873va	7170va
		7325va	7405af	9630af	11805va
		11950af	11965va	12035af	12080af
		15205va			
0600-0700	USA, WEWN Birmingham AL	7425na			
0600-0700	USA, WHRI Noblesville IN	5745am	9495am		
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	9985eu	
0600-0620	Vatican State, Vatican R	4005eu	5860eu		
0600-0700 irreg	Yemen, Yemeni Rep Radio	9780as			
0600-0700	Zimbabwe, ZBC/Radio 3	5975do	6045do		
0605-0700	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0630-0700	Australia, Radio	5995as	6020pa	6080pa	9860pa
		15245as			
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Georgia, Georgian Radio	11805eu			
0630-0700	Vatican State, Vatican R	11625af	13765af	15570af	
0631-0640	Romania, R Romania Intl	7225eu	9550eu	9665eu	11810eu
0645-0700	Finland, YLE/Radio	6120eu	9560eu	11755af	
0645-0700	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			

SELECTED PROGRAMS

Sundays

0608 Germany, Deutsche Welle: Commentary. See S 0208.
0610 Australia, Radio: Feedback. See S 0410.
0611 Russia, Voice of: Science and Engineering in the CIS. The latest developments in science and technology.
0612 Germany, Deutsche Welle: Sports Report. See S 0212.
0616 Germany, Deutsche Welle: Feature of the Month (1). See S 0416.
0616 Germany, Deutsche Welle: International Talking Point. See S 0416.
0630 Australia, Radio: Correspondents' Report. See S 0030.
0632 Russia, Voice of: Music. See S 0432.
0636 Germany, Deutsche Welle: People and Places. See S 0436.

Mondays

0608 Germany, Deutsche Welle: Africa Highlight. See M 0408.
0610 Australia, Radio: Sports Headlines. See M 0110.
0611 Australia, Radio: Pacific Beat. See M 0411.
0611 Russia, Voice of: Mailbag. Answering listener questions.
0624 Germany, Deutsche Welle: European Journal. See S 2324.
0628 Australia, Radio: Pacific Weather. The latest weather on the continent and in the region.
0630 Australia, Radio: International Report. See M 0430.
0632 Russia, Voice of: Moscow Yesterday and Today. See S 1632.

Tuesdays

0608 Germany, Deutsche Welle: Africa Report. See T 0408.
0610 Australia, Radio: Sports Headlines. See M 0110.
0611 Australia, Radio: Pacific Beat. See M 0411.
0611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
0624 Germany, Deutsche Welle: European Journal. See S 2324.
0628 Australia, Radio: Pacific Weather. See M 0628.
0630 Australia, Radio: International Report. See M 0430.
0632 Russia, Voice of: Interview. See S 0347.
0639 Russia, Voice of: Music. See S 0432.

Wednesdays

0608 Germany, Deutsche Welle: Africa Report. See T 0408.
0610 Australia, Radio: Sports Headlines. See M 0110.
0611 Australia, Radio: Pacific Beat. See M 0411.
0611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
0624 Germany, Deutsche Welle: European Journal. See S 2324.
0628 Australia, Radio: Pacific Weather. See M 0628.
0630 Australia, Radio: International Report. See M 0430.
0632 Russia, Voice of: Interview. See S 0347.
0639 Russia, Voice of: Music. See S 0432.

Thursdays

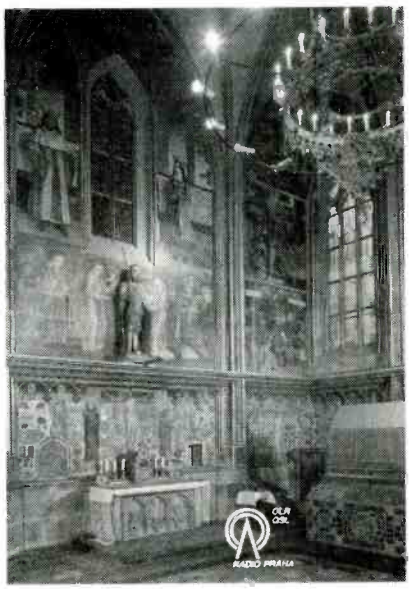
0608 Germany, Deutsche Welle: Africa Report. See T 0408.
0610 Australia, Radio: Sports Headlines. See M 0110.
0611 Australia, Radio: Pacific Beat. See M 0411.
0611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
0624 Germany, Deutsche Welle: European Journal. See S 2324.
0628 Australia, Radio: Pacific Weather. See M 0628.
0630 Australia, Radio: International Report. See M 0430.
0632 Russia, Voice of: Interview. See S 0347.
0639 Russia, Voice of: Music. See S 0432.

Fridays

0608 Germany, Deutsche Welle: Africa Report. See T 0408.
0610 Australia, Radio: Sports Headlines. See M 0110.
0611 Australia, Radio: Pacific Beat. See M 0411.
0611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
0624 Germany, Deutsche Welle: European Journal. See S 2324.
0628 Australia, Radio: Pacific Weather. See M 0628.
0630 Australia, Radio: International Report. See M 0430.
0632 Russia, Voice of: Interview. See S 0347.
0639 Russia, Voice of: Music. See S 0432.

Saturdays

0608 Germany, Deutsche Welle: Commentary. See S 0208.
0610 Australia, Radio: Book Reading. See S 0110.
0611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
0612 Germany, Deutsche Welle: Africa This Week. See A 0412.
0630 Australia, Radio: Indian Pacific. See A 0030.
0630 Germany, Deutsche Welle: Man and Environment. See T 1634.
0632 Russia, Voice of: Interview. See S 0347.
0639 Russia, Voice of: Music. See S 0432.



This QSL from Radio Praha was sent to MT by John C. Wells, of New York, and features beautiful church architecture and decor.

FREQUENCIES

0700-0800	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	15240pa	15565as
		17695as			
0700-0730	Australia, Radio	13605as	15415as	17795as	
0700-0800 vl	Australia, VL8A Alice Spg	4835do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R Peace Intl	7385am	9400am		
0700-0727	Czech Rep, Radio Prague	7345eu	15640eu		
0700-0800	Ecuador, HCJB Quito	5900pa	11615as		
0700-0800 as	Eqt Guinea, R East Africa	9585af			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0800 mtwh/vl	Italy, IRRS Milan	7125va			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11725as	11740as
		11850as	11955as	15335me	17810me
		17815eu	21610au		
0700-0800 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800	Lebanon, Wings of Hope	9960va			
0700-0800 vl	Liberia, Radio ELBC	7275do			
0700-0800	Liberia, Radio ELWA	4760do			
0700-0800 asmtwh	Malaysia, Radio	7295do			
0700-0716 mtwhf	New Zealand, R NZ Intl	11900pa			
0700-0757 as	New Zealand, R NZ Intl	11900pa			
0700-0750	North Korea, R Pyongyang	15340af	17765me		
0700-0800	Russia, Voice of	13370as	15560as	17570as	17590as
		17695as	17870as		
0700-0800	Slovakia, AWR	7215eu	13715af		
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0730	Switzerland, Swiss R Intl	6165eu	9535af	9885af	13635af
		15340af			
0700-0800	Taiwan, VO Free China	5950na			
0700-0800	United Kingdom,BBC London	6190af	9410va	9600af	9640va
		9740as	11760me	11940af	11955as
		12095va	15070va	15280as	15360va
		15400va	15575me	17640af	17790as
		17830af	17885af		
0700-0730	United Kingdom,BBC London	6005af	6180eu	6195eu	
0700-0715	United Kingdom,BBC London	7160af	11860af		
0700-0800	USA, KAIJ Dallas TX	5810am			
0700-0800	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KVOH Los Angeles CA	9785am			
0700-0800	USA, KWHR Naalehu HI	17780as			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	USA, WEWN Birmingham AL	7425na			
0700-0800	USA, WHRI Noblesville IN	5745am	9495am		
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	5985na	7355eu	9985eu	
0700-0759	USA, WYFR Okeechobee FL	13695af			
0700-0745 mtwhf	Vatican State, Vatican R	4005va	5860va		
0700-0800	Zimbabwe, ZBC/Radio 3	5975do	6045do		
0705-0800	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0717-0800	New Zealand, R NZ Intl	9700pa			
0730-0800	Australia, Radio	9660pa	17880as		
0730-0800	Austria, R Austria Intl	6155eu	13730eu		
0730-0800 mtwhfa	Austria, R Austria Intl	15410me	17870me		
0730-0755	Belgium, R Vlaanderen Int	6015eu	9925au		
0730-0745 s	Greece, Voice of	9425eu	11645eu	15650eu	
0730-0800	Netherlands, Radio	9700pa	9720au		
0740-0800	Monaco, Trans World Radio	7115eu			
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		
0745-0755	Greece, Voice of	9425eu	11645eu	15650eu	
0745-0800	USA, WRMI/R Miami Intl	9955am			
0755-0800	Guam, AWR/KTWR	15200as			

0800 UTC

0800-0900	Australia, AF Radio	15605af	18191af		
0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	17715as	21725as
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900 vl	Canada, CBC N Quebec Svc	9625do			
0800-0900 vl	Canada, CBC N Quebec Svc	9625do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R Peace Intl	9400am			
0800-0830	Ecuador, HCJB Quito	5900pa	11615eu		
0800-0900 as	Eqt Guinea, R East Africa	9585af			
0800-0830	Finland, YLE/Radio	15115au	17820as		
0800-0830	Georgia, Georgian Radio	11910eu			
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, TWR/KTWR	15200as			
0800-0900 mtwh/vl	Italy, IRRS Milan	7125va			
0800-0900 vl	Kiribati, Radio	9825do			
0800-0900	Lebanon, Wings of Hope	9960va			
0800-0830	Liberia, Radio ELWA	4760do			
0800-0900	Malaysia, Radio	7295do			
0800-0825	Malaysia, Voice of	15295as			
0800-0900	Monaco, Trans World Radio	7115eu			
0800-0825	Netherlands, Radio	9700pa	9720au		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0830 m	Norway, Radio Norway Intl	15220me			
0800-0850	Pakistan, Radio	15625eu	17900eu		
0800-0900 vl	Papua New Guinea, NBC	4890do	9675do		
0800-0900	Russia, Voice of	9835as	11800as	11900as	13370as
		15560as	17590as	17695as	17765as
		17870as			
0800-0815	Sierra Leone, SLBS	3316do			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	7550eu	13670me		
0800-0900	United Kingdom,BBC London	6190af	9410va	9740as	11760me
		11940af	11955as	12095va	15070va
		15280as	15310as	15400va	15575me
		17640va	17830af	17885af	
0800-0815	United Kingdom,BBC London	9640va			
0800-0900	USA, KAIJ Dallas TX	5810am			
0800-0900	USA, KNLS Anchor Point AK	6150as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	7535eu	9425pa	15665eu	
0800-0900	USA, WEWN Birmingham AL	7425na			
0800-0900	USA, WHRI Noblesville IN	5745am	9495am		
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WRMI/R Miami Intl	9955am			
0800-0900	USA, WWCR Nashville TN	5065am	5935am	7435am	
0800-0900	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do	
0805-0835	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0815-0900 mtwtf	Nigeria, FRCN/Radio	3326do	4990do		
0830-0900 s	Armenia, Voice of	15170eu	15270eu		
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Netherlands, Radio	9720pa	12065pa	13700pa	
0830-0857	Slovakia, R Slovakia Intl	11990au	15640au	17485au	
0855-0900	Guam, TWR/KTWR	11830pa			

HAUSER'S HIGHLIGHTS

USA: WWCR

- is carrying Lyndon Larouche's show, *Executive Intelligence Review*, Sun 2100 on 12160 (Fred Waterer, *DX Ontario*)
- August programming changes at WWCR, perhaps some still in effect:

The Curb Records Int'l Country
Mon-Fri 1800-2000 on 12160, repeated at 0700-0900 on 5065

Rock the Universe
Mon 0500-0600 on 7435

Ken Berryhill's Country Classics
Sun 0630 on 5065, Mon 0600 on 7435, 2030 on 15685

The Old Record Shop
Tue 2030 on 15685, Sat 1030 on 5065

Forever Health, Fernando Fogundez
Mon-Fri 2100-2200 on 12160

Weekday strip at 1000 on 15685 moved up to 0800 on 7435 including
Spectrum repeat Mon
Tempered Steel Tue
Ham Radio & More Mon 0905 on 7435, Sat 1605 on 12160

(Adam Lock, WWCR)

FREQUENCIES

0900-1000	Australia, AF Radio	15605af	18191af		
0900-1000	Australia, Radio	5995as	7240as	9510as	9580pa
		9860pa	13605as	15170as	21725as
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa		
0900-1000	Costa Rica, R Peace Intl	9400am			
0900-1000	Ecuador, HCJB Quito	5900pa			
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	12055as
		15410af	17715as	17780as	21600af
		21680as			
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-1000	Guam, AWR/KSDA	9530as			
0900-0915	Guam, TWR/KTWR	15200as			
0900-1000	Guam, TWR/KTWR	11830pa			
0900-1000	Japan, NHK/Radio	9610as	11850au	15190as	
0900-0948 vl	Kiribati, Radio	9825do			
0900-1000	Lebanon, Voice of Hope	6280me			
0900-1000	Lebanon, Wings of Hope	9960va			
0900-1000	Malaysia, Radio	7295do			
0900-0905	Monaco, Trans World Radio	7115eu			
0900-0930	Netherlands, Radio	9720pa	13700pa		
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-1000 vl	Papua New Guinea, NBC	4890do	9675do		
0900-1000	Russia, Voice of	9835as	11800as	11900as	17590as
		17695as	17765as	17870as	
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17515au	
0900-1000	United Kingdom,BBC London	6190af	6195as	9740as	11750as
		11940af	12095va	15070va	15190sa
		15280va	15400va	15575me	17640va
		17705va	17830va	17885af	
0900-0915	United Kingdom,BBC London	9575as	11765as	11955as	15310as
		15360as			
0900-0930	United Kingdom,BBC London	9410me	11760me		
0900-1000	USA, KAIJ Dallas TX	5810am	9815am		
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu	9430as	13615au
0900-1000	USA, WEWN Birmingham AL	7425na			
0900-1000	USA, WHRI Noblesville IN	5745am	9495am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WRMI/R Miami Intl	9955am			
0900-1000	USA, WWCR Nashville TN	5065am	5935am	7435am	
0900-1000	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do	
0905-0920 smtwhf	Monaco, Trans World Radio	7115eu			
0910-0940	Mongolia, R Ulan Bator	9960au	12000na		
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0930-1000 mtwhfa	Austria, R Austria Intl	6155eu	13730pa	17870pa	
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	7260pa	9720pa	9810pa	12065pa
		13705as	21505pa		
0930-1000	Philippines, FEBC/R Intl	11635as			

1000 UTC

1000-1100	Australia, Radio	5995as	7240as	9580pa	9860pa
		13605as	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			
1000-1025 mtwhfa	Belgium, R Vlaanderen Int	6035eu	15545af	17595af	
1000-1100 vl	Canada, CBC N Quebec Svc	9625do			
1000-1100 vl	Canada, CBC N Quebec Svc	9625do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa		
1000-1100	Costa Rica, R Peace Intl	9400am			
1000-1100	Ecuador, HCJB Quito	5900pa			
1000-1100	India, All India Radio	15050as	15180as	17387au	17895as
1000-1100	Iraq, Radio Iraq Intl	13680eu			
1000-1100	Lebanon, Voice of Hope	6280me			
1000-1100	Lebanon, Wings of Hope	9960va			
1000-1100	Malaysia, Radio	7295do			
1000-1100 vl	Malaysia, RTM Kuching	7160do			
1000-1100 vl	Malaysia,RTM KotaKinabalu	5980do			
1000-1100	Netherlands, Radio	7260pa	9720pa	9810pa	12065pa
		13705as	21505pa		
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100 vl	Papua New Guinea, NBC	4890do	9675do		
1000-1100	Philippines, FEBC/R Intl	11635as			
1000-1100	Russia, Voice of	9835as	11800eu	11900as	13370as
		15110as	15405as	15510eu	17560as
		17590as	17765as	17870as	
1000-1100	Singapore, SBC Radio One	6155do			
1000-1100	Slovakia, AWR	15620am			
1000-1030	Sweden, Radio	6160eu			
1000-1100	United Kingdom,BBC London	6190af	6195as	9410va	9740as
		11750as	11760me	11940af	12095va
		15070va	15190sa	15310as	15400eu
		15575me	17640va	17705va	17790as
		17885af			
1000-1030	United Kingdom,BBC London	15280as	17830as		
1000-1100	USA, KAIJ Dallas TX	9815am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, Monitor Radio Intl	6095sa	7395sa	9430as	13625as
1000-1100	USA, VOA Washington DC	5985va	6165am	7405am	9590am
		11720va	15425va		
1000-1100	USA, WHRI Noblesville IN	6040am	9495am		
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5065am	5935am	7435am	
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	7250na	9840as	12020as	15010as
1030-1100	Austria, R Austria Intl	17870pa			
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605me

This classic QSL from Belgium Radio & Television (now called Radio Vlaanderen International) was sent to MT by Donald Michael Choleva, of Euclid, OH.

FREQUENCIES

1100-1200	Australia, Radio	5995as	7240as	9510pa	9580pa
		9710pa	9860pa	13605as	15170as
		15530as	15565as		
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, AWR Alajuela	5030am	7375am	9725am	13750am
1100-1200	Costa Rica, R Peace Intl	9400am			
1100-1130	Ecuador, HCJB Quito	5900pa			
1100-1200	Ecuador, HCJB Quito	12005am	15115am		
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af
		17800af	17860af		
1100-1200	Iraq, Radio Iraq Intl	13680eu			
1100-1200	Japan, NHK/Radio	6120na	9610as	15350as	
1100-1200	Lebanon, Voice of Hope	6280me			
1100-1200	Lebanon, Wings of Hope	9960va			
1100-1200	Malaysia, Radio	7295do			
1100-1200 vl	Malaysia, RTM Kuching	7160do			
1100-1200 vl	Malaysia,RTM KotaKinabalu	5980do			
1100-1200	Nepal, Radio	5005do	7165do		
1100-1200	New Zealand, R NZ Intl	9700pa			
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1120	Pakistan, Radio	15625as	17900as		
1100-1200 vl	Papua New Guinea, NBC	4890do	9675do		
1100-1200	Russia, Voice of	4740as	9835as	11900as	11940as
		13370as	15110as	15405as	15510eu
		17560as	17590as	17675as	17685as
		17755as	17765as	17775as	17795as
		17835as	17870as		
1100-1200	Singapore, SBC Radio One	6155do			
1100-1200	Singapore,R Singapore Int	9530as			
1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850au	
1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu	13635as	15545as
		17515as			
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200	United Kingdom,BBC London	5965na	6190af	6195va	9410va
		9515na	9575as	9740va	11750as
		11760me	11765as	11940af	11955as
		12095va	15070va	15310as	15360as
		15575me	17640va	17705af	17830af
1100-1130	United Kingdom,BBC London	6100au	15190sa	15400eu	17790va
1100-1200	USA, KAIJ Dallas TX	5810am	9815am		
1100-1200	USA, KTBN Salt Lk City UT	7510am			
1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	USA, Monitor Radio Intl	6095na	7395ca	9355eu	9425au
1100-1200	USA, VOA Washington DC	5985va	6110va	6165am	7405am
		9590am	9645va	9760va	11720va
		15160va	15425va		
1100-1200	USA, WEWN Birmingham AL	7425na			
1100-1200	USA, WHRI Noblesville IN	6040am	9495am		
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200 s	USA, WVHA Green Bush ME	13770af			
1100-1200	USA, WWCR Nashville TN	5935am	7435am	15685am	
1100-1200	USA, WYFR Okeechobee FL	5950na	11830na		
1100-1130	Vietnam, Voice of	7250as	9840as	15010as	
1130-1200 vl	China, China Radio Intl	6995as	11445as	15135as	
1130-1157	Czech Rep, Radio Prague	7345eu	9505eu		
1130-1200	Iran, VOIRI Tehran	11745as	11790as	11875me	11930me
		15260af	17750me		
1130-1200	Myanmar, Voice of	5990do			
1130-1200	Netherlands, Radio	6045eu	7130eu	7160eu	
1130-1200	South Korea, R Korea Intl	11715na			
1145-1200	USA, WRMI/R Miami Intl	9955am			

SELECTED PROGRAMS

Sundays

1100 USA, Monitor Radio Intl: Bible Lesson. See S 0200.
1109 Germany, Deutsche Welle: Arts on the Air. Reports and interviews on major cultural events and developments.
1111 Russia, Voice of: This is Russia. NEW! A program which helps you to get to know Russia and the Russians better.
1120 Australia, Radio: Sports Bulletin. Ten-minute reports on Australian, regional and international sport.
1129 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. Discussions on how the Bible addresses the trends of thought of today.
1130 Australia, Radio: Fine Music Australia. The best Australian fine music performances and compositions are presented by Ivan Lloyd.
1132 Russia, Voice of: Audio Book Club. See S 0132.
1134 Germany, Deutsche Welle: German by Radio. An advanced German language course for English speakers.

Mondays

1100 USA, Monitor Radio Intl: Monitor Radio News. Five minutes of the latest world news at the beginning of the hour.
1106 USA, Monitor Radio Intl: Monitor Radio International. News, analysis, commentary, interviews and features in a magazine format.
1109 Germany, Deutsche Welle: Newsline Cologne. Worldwide current affairs program with a review of the German or European press.
1111 Russia, Voice of: Science and Engineering in the CIS. See S 0611.
1120 Australia, Radio: Sports Bulletin. See S 1120.
1130 Australia, Radio: Innovations. Desley Blanch reports on Australian inventions and innovative practices.
1132 Russia, Voice of: Music. See S 0432.
1133 Germany, Deutsche Welle: Hallo Africa. A program with musical requests and greetings to friends.
1149 USA, Monitor Radio Intl: Letterbox. Listeners make their views known by telephone or letter to host Lisa Dale.
1152 USA, Monitor Radio Intl: Religious Article from the CSM. As published in the christian Science Monitor.

Tuesdays

1100 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1106 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1109 Germany, Deutsche Welle: Newsline Cologne. See M 1109.
1111 Russia, Voice of: Commonwealth Update. See M 2311.
1120 Australia, Radio: Sports Bulletin. See S 1120.
1130 Australia, Radio: Arts Australia. Amanda Smith presents reviews and comment on current events within the Australian arts scene.
1132 Russia, Voice of: Russian by Radio. See S 1532.
1133 Germany, Deutsche Welle: Hallo Africa. See M 1133.
1149 USA, Monitor Radio Intl: Letterbox. See M 1149.
1152 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Wednesdays

1100 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1106 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1109 Germany, Deutsche Welle: Newsline Cologne. See M 1109.
1111 Russia, Voice of: Commonwealth Update. See M 2311.
1120 Australia, Radio: Sports Bulletin. See S 1120.
1130 Australia, Radio: Science File. Ian Wood examines the world of science, medicine and technology.
1132 Russia, Voice of: Audio Book Club. See S 0132.
1133 Germany, Deutsche Welle: Hallo Africa. See M 1133.
1149 USA, Monitor Radio Intl: Letterbox. See M 1149.
1152 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Thursdays

1100 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1106 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1109 Germany, Deutsche Welle: Newsline Cologne. See M 1109.
1111 Russia, Voice of: Commonwealth Update. See M 2311.
1120 Australia, Radio: Sports Bulletin. See S 1120.
1124 Germany, Deutsche Welle: DXers World Meeting (4/5). A program for listeners in Africa.
1130 Australia, Radio: Couchman. Peter Couchman in conversation with people from all walks of life.
1132 Russia, Voice of: Russian by Radio. See S 1532.
1133 Germany, Deutsche Welle: Hallo Africa. See M 1133.
1149 USA, Monitor Radio Intl: Letterbox. See M 1149.
1152 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Fridays

1100 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1106 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1109 Germany, Deutsche Welle: Newsline Cologne. See M 1109.
1111 Russia, Voice of: Commonwealth Update. See M 2311.
1120 Australia, Radio: Sports Bulletin. See S 1120.
1130 Australia, Radio: The Parliament Program. A roundup of events in the Australian Parliament.
1132 Russia, Voice of: Audio Book Club. See S 0132.
1133 Germany, Deutsche Welle: Hallo Africa. See M 1133.
1149 USA, Monitor Radio Intl: Letterbox. See M 1149.
1152 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Saturdays

1100 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1106 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1129.
1109 Germany, Deutsche Welle: The Week in Germany. See S 1609.
1111 Russia, Voice of: Commonwealth Update. See M 2311.
1120 Australia, Radio: Sports Bulletin. See S 1120.
1120 Germany, Deutsche Welle: Mailbag Africa. Listener mail from Africa is answered.
1130 Australia, Radio: Business Weekly. See S 1610.
1132 Russia, Voice of: Timelines. See M 0332.
1134 Germany, Deutsche Welle: Saturday Special. Information unavailable.

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

FREQUENCIES

1200-1300	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9610as	11800pa	15565as	
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Brazil, Radiobras	15445na			
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300 vl	Canada, CBC N Quebec Svc	9625do			
1200-1300 vl	Canada, CBC N Quebec Svc	9625do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300 mtwhf	Canada, RCI Montreal	9635am	11855am	13650am	
1200-1300	China, China Radio Intl	8425na	9655as	9715as	11660as
		11795pa	15440pa		
1200-1230 vl	China, China Radio Intl	8660as	11445as	12110as	15135as
1200-1300	Costa Rica, AWR Alajuela	5030am	7375am	9725am	13750am
1200-1300	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1200-1300	Ecuador, HCJB Quito	12005am	15115am		
1200-1300	France, Radio France Intl	9805eu	11615au	13625na	15155eu
		15195eu	15325af	15530na	
1200-1230	Iran, VOIRI Tehran	11745as	11790as	11875me	11930me
		15260af	17750me		
1200-1300	Iraq, Radio Iraq Intl	13680eu			
1200-1300	Jordan, Radio	11970na			
1200-1300	Malaysia, Radio	7295do			
1200-1300 vl	Malaysia,RTM KotaKinabalu	5980do			
1200-1250	Myanmar, Voice of	5990do			
1200-1300	Netherlands, Radio	6045eu	7130eu	7160eu	
1200-1206	New Zealand, R NZ Intl	9700pa			
1200-1230 s	Norway, Radio Norway Intl	13800as	15170as		
1200-1300 vl	Palau, KHBN/Voice of Hope	9965as			
1200-1300 vl	Papua New Guinea, NBC	4890do	9675do		
1200-1300	Russia, Voice of	4740as	4975as	5960as	7150as
		9540na	9800pa	9895as	11820as
		11880as	13370as	15105as	15110as
		15405as	15435as	15510eu	15560as
		15570as	17590as	17600as	17645as
		17755as	17765as	17775as	17780as
		17795as	17835as	17890as	
1200-1300	Singapore, SBC Radio One	6155do			
1200-1300	Singapore,R Singapore Int	9530as			
1200-1300	South Korea, R Korea Intl	7285as			
1200-1230	Switzerland, Swiss R Intl	6165eu	9535eu		
1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300	United Kingdom,BBC London	6190af	6195va	9410va	9515na
		9575as	9740va	11365am	11750as
		11760me	11765as	11865va	11940af
		11955as	12095va	15070va	15310as
		15360as	15575me	17640va	17705va
		17830af	17885af	21660af	
1200-1300	USA, KAIJ Dallas TX	5810am	9815am		
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	6095na	9355as	9425au	9455na
1200-1300	USA, VOA Washington DC	6110va	9645va	9760va	11715va
		15160va	15425va		
1200-1300	USA, WEWN Birmingham AL	7425na			
1200-1300	USA, WHRI Noblesville IN	6040am	9495am		
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WRMI/R Miami Intl	9955am			
1200-1300 a	USA, WVHA Green Bush ME	11695af			
1200-1300	USA, WWCR Nashville TN	7435am	13845am	15685am	
1200-1300	USA, WYFR Okeechobee FL	5950na	6015na	11830na	17750na
1215-1300	Egypt, Radio Cairo	17595as			
1230-1300	Austria, R Austria Intl	13730na	15450as		
1230-1300	Bangladesh, Radio	9548as	13615as		
1230-1300	Bulgaria, Radio	15635as	17625as		
1230-1300	Canada, RCI Montreal	9660as	11855na	15195as	
1230-1300	Finland, YLE/Radio	11900na	15400na		
1230-1300 w	Indonesia, RRI Sorong	4875do			
1230-1255 s	Monaco, Trans World Radio	7115eu			
1230-1300	South Korea, R Korea Intl	9570as	9640as	13670eu	
1230-1300	Sweden, Radio	11650na	15240na		
1230-1300	Vietnam, Voice of	7250as	9840as	15010as	
1240-1250	Greece, Voice of	11645af	15630af	15650af	
1255-1300 a	Monaco, Trans World Radio	7115eu			

SELECTED PROGRAMS

Sundays

1210 Australia, Radio: Charting Australia. See S 0010.
1211 Russia, Voice of: News and Views. See S 0011.
1216 France, R France Intl: African Analysis (biweekly). An in-depth analysis of African current affairs.
1216 France, R France Intl: Asian Analysis (biweekly). An in-depth analysis of Asian current affairs.
1223 France, R France Intl: Paris Promenade. Spotlight on a city bistro or restaurant.
1228 France, R France Intl: Counterpoint (biweekly). A specific human rights issue is examined.
1228 France, R France Intl: Everywoman (biweekly). A program for and about women.
1230 Australia, Radio: Report from Asia. A weekly roundup of Asian events.
1232 Russia, Voice of: Kaleidoscope. See S 0532.
1234 France, R France Intl: Club 9516. Listener letters are read in this mailbag program.

Mondays

1210 Australia, Radio: Australiana. A variety of Australian topics are discussed in these 20-minute segments.
1211 Russia, Voice of: News and Views. See S 0011.
1230 Australia, Radio: International Report. See M 0430.
1231 France, R France Intl: RFI Europe. European press review focuses on current affairs in other countries of the region.
1232 Russia, Voice of: Music at Your Request. Music as requested by listeners.
1241 France, R France Intl: Sports. A summary of the seasonal matches from around the continent.
1247 France, R France Intl: Arts in France. Profile on the work of a French artist or a cultural activity such as music.

Tuesdays

1210 Australia, Radio: Australiana. See M 1210.
1211 Russia, Voice of: News and Views. See S 0011.
1230 Australia, Radio: International Report. See M 0430.
1231 France, R France Intl: France Today. Current happenings in France.
1232 Russia, Voice of: Folk Box. See S 0032.
1233 France, R France Intl: RFI Europe. See M 1231.
1242 France, R France Intl: Books. New books, publishing trends, and authors.
1249 France, R France Intl: Science Probe. Developments in the world of science, technology, and health.

Wednesdays

1210 Australia, Radio: Charting Australia. See S 0010.
1211 Russia, Voice of: News and Views. See S 0011.
1230 Australia, Radio: International Report. See M 0430.
1231 France, R France Intl: RFI Europe. See M 1231.
1232 Russia, Voice of: Music. See S 0432.
1242 France, R France Intl: The Bottom Line. Focus on financial matters.
1247 France, R France Intl: Land of France. A feature on life and times in France.

Thursdays

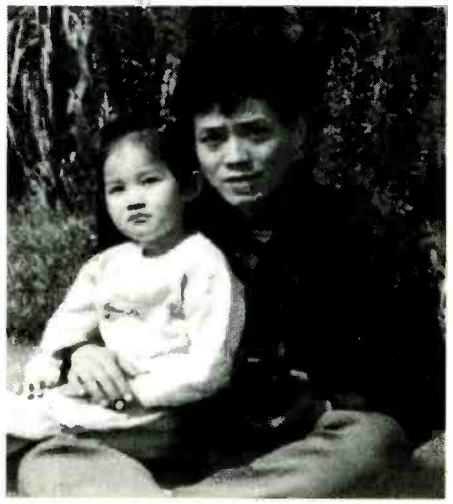
1210 Australia, Radio: Australiana. See M 1210.
1211 Russia, Voice of: News and Views. See S 0011.
1230 Australia, Radio: International Report. See M 0430.
1231 France, R France Intl: Sports. See M 1241.
1232 Russia, Voice of: The Jazz Show. See M 0532.
1234 France, R France Intl: RFI Europe. See M 1231.
1244 France, R France Intl: The Americas Magazine. Focus on a subject relating to a country of the western hemisphere.
1249 France, R France Intl: North/South (biweekly). Focus on a public activity in France.
1249 France, R France Intl: Planet Earth (biweekly). An interview with an expert on ecological matters.

Fridays

1210 Australia, Radio: Australiana. See M 1210.
1211 Russia, Voice of: News and Views. See S 0011.
1230 Australia, Radio: International Report. See M 0430.
1231 France, R France Intl: RFI Europe. See M 1231.
1232 Russia, Voice of: Yours for the Asking. See M 0032.
1241 France, R France Intl: Film Reel. Interview with an performer or film maker.
1248 France, R France Intl: Made in France. See H 1448.

Saturdays

1210 Australia, Radio: Ockham's Razor. Robyn Williams with straight, sharp talk about science.
1211 Russia, Voice of: News and Views. See S 0011.
1228 France, R France Intl: Spotlight on Africa. Correspondent reports and interviews on African affairs.
1230 Australia, Radio: Background Report. In-depth reports examining a broad range of influences that shape our world.
1232 Russia, Voice of: Music at Your Request. See M 1232.
1247 France, R France Intl: French Lesson. Learn French by radio.



Xie Qiao at home after two years as CRI correspondent in Washington. (The Messenger)

FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240as	9560pa	9610as
		11800pa			
1300-1330	Australia, Radio	6060pa	6080as	9510pa	
1300-1320	Brazil, Radiobras	15445na			
1300-1330	Bulgaria, Radio	15635as	17625as		
1300-1400 vl	Canada, CBC N Quebec Svc	9625do			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955na	17820na		
1300-1400	China, China Radio Intl	7405na	9715as	11660pa	15440pa
1300-1400	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1300-1400	Ecuador, HCJB Quito	12005am	15115am		
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400	Iraq, Radio Iraq Intl	13680as			
1300-1400	Malaysia, Radio	7295do			
1300-1400 vl	Malaysia, RTM Kuching	7160do			
1300-1400 vl	Malaysia,RTM KotaKinabalu	5980do			
1300-1325	Netherlands, Radio	6045eu	7130eu	7160eu	
1300-1350	North Korea, R Pyongyang	9345as	9640eu	11740as	15230as
		15430as			
1300-1330 s	Norway, Radio Norway Intl	9590eu	15340as		
1300-1400 vl	Palau, KHBN/Voice of Hope	9965as			
1300-1400 vl	Papua New Guinea, NBC	4890do	9675do		
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1400	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	9525eu
		11815eu			
1300-1400	Romania, R Romania Intl	11945eu	15365eu	17720eu	
1300-1400	Russia, Voice of	9540na	9800pa	9895as	11940as
		13370as	17675as	17685as	17725as
		17755as	17780as	17795as	17835as
1300-1400	Singapore, SBC Radio One	6155do			
1300-1400	Singapore,R Singapore Int	9530as			
1300-1330	Switzerland, Swiss R Intl	7230as	7480as	13635as	15545as
1300-1400	United Kingdom,BBC London	6190af	6195va	7180as	9410va
		9515na	9740va	11365am	11750as
		11760me	11860af	11865va	11940af
		12095va	15070va	15310as	15575me
		17640va	17705va	17830af	17885af
	21470af	21660af			
1300-1400	USA, KAIJ Dallas TX	5810am			
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	9355as	9455na	13625as
1300-1400	USA, VOA Washington DC	6110va	9645va	9760va	11715va
		15160va	15425va		
1300-1400	USA, WEWN Birmingham AL	7425na	11875na		
1300-1400 irreg	USA, WGTG McCaysville GA	7355am	11760am		
1300-1400	USA, WHRI Noblesville IN	6040am	15105am		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WRMI/R Miami Intl	9955am			
1300-1400 a	USA, WVHA Green Bush ME	11695af			
1300-1400	USA, WWCR Nashville TN	7435am	13845am	15685am	
1300-1400	USA, WYFR Okeechobee FL	5950na	6015na	11830na	13695na
		17750na			
1300-1330	Uzbekistan, R Tashkent	7285eu	9715eu	15295eu	17815eu
1307-1400 occsnal	New Zealand, R NZ Intl	9655pa			
1330-1400	Austria, R Austria Intl	6155eu	13730eu	15450as	
1330-1355 s	Belgium, R Vlaanderen Int	13670na			
1330-1357	Canada, RCI Montreal	9535as	11795as		
1330-1400	Canada, RCI Montreal	15315eu	15325eu	17820eu	17895eu
		21455eu			
1330-1400	Finland, YLE/Radio	11900na	15400na		
1330-1400	India, All India Radio	13732as	15120as		
1330-1355	Moldova, R Moldova Intl	15315na			
1330-1400	Netherlands, Radio	9890as	13700as	15150as	
1330-1400	Sweden, Radio	11650na	15240na		
1330-1400	Switzerland, Swiss R Intl	6165eu	9535eu		
1330-1400	Turkey, Voice of	9675as			
1330-1400	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605me
1330-1400	Vietnam, Voice of	7250as	9840as	15010as	
1345-1400	Vatican State, Vatican R	11625as	13765as	15585as	

SELECTED PROGRAMS

Sundays

1300 USA, Monitor Radio Intl: Bible Lesson. See S 0200.
1310 Australia, Radio: Oz Sounds. Twenty minutes of music selections by Radio Australia announcers.
1311 Russia, Voice of: Music and Musicians. See S 0211.
1329 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1129.
1330 Australia, Radio: The Europeans. See S 0130.

Mondays

1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1310 Australia, Radio: Asia Focus. Reporting on the commercial interrelationships of the Asia/Pacific Region.
1311 Russia, Voice of: World War II (1939-1945). See M 0111.
1330 Australia, Radio: The Australian Music Show. See S 0530.
1332 Russia, Voice of: Russian by Radio. See S 1532.
1349 USA, Monitor Radio Intl: Letterbox. See M 1149.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Tuesdays

1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1310 Australia, Radio: Asia Focus. See M 1310.
1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1330 Australia, Radio: Jazz Notes. The best of Australian jazz introduced by Ivan Lloyd.
1332 Russia, Voice of: Music. See S 0432.
1349 USA, Monitor Radio Intl: Letterbox. See M 1149.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Wednesdays

1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1310 Australia, Radio: Asia Focus. See M 1310.
1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1330 Australia, Radio: Blacktracker. Mal Honess with traditional and contemporary aboriginal music.
1332 Russia, Voice of: Interview. See S 0347.
1339 Russia, Voice of: Music. See S 0432.
1349 USA, Monitor Radio Intl: Letterbox. See M 1149.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Thursdays

1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1310 Australia, Radio: Asia Focus. See M 1310.
1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1330 Australia, Radio: Australian Country Style. Graham Bell goes up country.
1332 Russia, Voice of: Music. See S 0432.
1349 USA, Monitor Radio Intl: Letterbox. See M 1149.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Fridays

1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1306 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1310 Australia, Radio: Asia Focus. See M 1310.
1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1330 Australia, Radio: Music Deli. Paul Petran present music from a variety of cultures.
1332 Russia, Voice of: Music. See S 0432.
1349 USA, Monitor Radio Intl: Letterbox. See M 1149.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Saturdays

1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1306 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1129.
1310 Australia, Radio: Business Weekly. See S 1610.
1311 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1330 Australia, Radio: The Australian Scene. See A 0130.
1332 Russia, Voice of: Your Top Tune. See S 0332.

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

FREQUENCIES

1400-1500	Australia, AF Radio	8743af	10621af		
1400-1430	Australia, Radio	7240pa	9560as	9610pa	11695pa
1400-1500	Australia, Radio	5995pa	11800pa		
1400-1435 mtwhfa	Belgium, R Vlaanderen Int	13670na			
1400-1500 vl	Canada, CBC N Quebec Svc	9625do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955na	17820na		
1400-1500	China, China Radio Intl	7405na	11815as		
1400-1500	Costa Rica, R Peace Intl	6200am	9400am	15050am	1400-
1400-1500	France, Radio France Intl	7110as	15405as	17560as	17695as
1400-1500	Ecuador, HCJB Quito	12005am	15115am		
1400-1500	India, All India Radio	13732as	15120as		
1400-1500	Japan, NHK/Radio 11915as	9535na	9610as	11705na	11895as
1400-1500	Lebanon, Wings of Hope	9960va			
1400-1500	Malaysia, Radio	7295do			
1400-1500 vl	Malaysia, RTM Kuching	7160do			
1400-1500 vl	Malaysia,RTM KotaKinabalu	5980do			
1400-1500 mtwhfa	Malta, V of Mediterranean	11925me			
1400-1435 s	Malta, V of Mediterranean	11925me			
1400-1500 s	Morocco, RTV Marocaine	17575af			
1400-1500	Netherlands, Radio	9890as	13700as	15150as	
1400-1500 occsnal	New Zealand, R NZ Intl	6100pa			
1400-1500 vl	Palau, KHBN/Voice of Hope	9965as			
1400-1500	Philippines, FEBC/R Intl	11995as			
1400-1500	Russia, Voice of	9595as	11835as	11910as	11935as
		11945sa	11985me	12025as	13770as
		15320me	15425me	15540me	17570af
		17710me	17780as		
1400-1500	Singapore, SBC Radio One	6155do			
1400-1500	United Kingdom,BBC London	6190af	6195as	7180as	9410va
		9515na	9740va	11365am	11750as
		11865va	11940af	12095va	15070va
		15310as	15575me	17640va	17705va
		17830af	21470af	21660af	
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510am			
1400-1500	USA, Monitor Radio Intl	9355as			
1400-1500	USA, VOA Washington DC	6110va	7125va	7215va	9645va
		9760va	15160va	15255va	15395va
		15425va			
1400-1500	USA, WEWN Birmingham AL	7425na	11875na		
1400-1500 irreg	USA, WGTG McCaysville GA	7355am	11760am		
1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WRNO New Orleans LA	15420am			
1400-1445 a	USA, WVHA Green Bush ME	11695af			
1400-1500	USA, WWCR Nashville TN	12160am	13845am	15685am	
1400-1500	USA, WYFR Okeechobee FL	6015na	11550as	11830na	17750na
1400-1415	Vatican State, Vatican R	11625as	13765as	15585au	
1415-1500 mtwtfa	Bhutan, Bhutan BC Service	5025do			
1430-1500	Australia, Radio	6060pa	6080pa	7260as	9710pa
		11660as	11695pa		
1430-1500 vl	China, China Radio Intl	8660as	11445as	15135as	
1430-1500	Finland, YLE/Radio	11900na	15400na		
1430-1440 mtwhf	Indonesia, RRI Uj Pandang	4753do			
1430-1500 mtwhf	Portugal, R Portugal Intl	21515me			
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1430-1500	Sweden, Radio	13740au	15120as	15240as	
1430-1458	Uzbekistan, R Tashkent	7285eu	9715eu	15295eu	17815eu
1435-1445	Greece, Voice of	15630na	17525na		
1440-1500	Myanmar, Voice of	5990do	7185do		
1445-1500	Mongolia, R Ulan Bator	7290as	9950as		
1458-1500 mtwhfa	Seychelles, FEBA Radio	9810as			
1458-1500 s	Seychelles, FEBA Radio	11870as			

SELECTED PROGRAMS

Sundays

1410 Australia, Radio: Sports Bulletin. See S 1120.
1411 Russia, Voice of: Science and Engineering in the CIS. See S 0611.
1416 France, R France Intl: African Analysis (biweekly). See S 1216.
1416 France, R France Intl: Asian Analysis (biweekly). See S 1216.
1422 France, R France Intl: Paris Promenade. See S 1223.
1427 France, R France Intl: Everywoman. See S 1228.
1430 Australia, Radio: Report from Asia. See S 1230.
1432 Russia, Voice of: Music. See S 0432.
1433 France, R France Intl: Club 9516. See S 1234.

Mondays

1410 Australia, Radio: Sports Bulletin. See S 1120.
1411 Russia, Voice of: Science and Engineering in the CIS. See S 0611.
1430 Australia, Radio: International Report. See M 0430.
1431 France, R France Intl: RFI Europe. See M 1231.
1432 Russia, Voice of: Audio Book Club. See S 0132.
1440 France, R France Intl: Sports. See M 1241.
1447 France, R France Intl: Arts in France. See M 1247.
1450 Australia, Radio: Stock Exchange Report. Financial news from Sydney and other exchanges.

Tuesdays

1410 Australia, Radio: Sports Bulletin. See S 1120.
1411 Russia, Voice of: Newmarket. This program tells where and how to invest in Russia, how to sell your product, or start a business.
1430 Australia, Radio: International Report. See M 0430.
1431 France, R France Intl: France Today. See T 1231.
1432 Russia, Voice of: Music. See S 0432.
1433 France, R France Intl: RFI Europe. See M 1231.
1442 France, R France Intl: Books. See T 1242.
1449 France, R France Intl: Science Probe. See T 1249.
1450 Australia, Radio: Stock Exchange Report. See M 1450.

Wednesdays

1410 Australia, Radio: Sports Bulletin. See S 1120.
1411 Russia, Voice of: Moscow Mailbag. See S 0111.
1430 Australia, Radio: International Report. See M 0430.
1431 France, R France Intl: RFI Europe. See M 1231.
1432 Russia, Voice of: Russian by Radio. See S 1532.
1443 France, R France Intl: The Bottom Line. See W 1242.
1446 France, R France Intl: Land of France. See W 1247.
1450 Australia, Radio: Stock Exchange Report. See M 1450.

Thursdays

1410 Australia, Radio: Sports Bulletin. See S 1120.
1411 Russia, Voice of: This is Russia. See S 1111.
1430 Australia, Radio: International Report. See M 0430.
1431 France, R France Intl: Sports. See M 1241.
1432 Russia, Voice of: Audio Book Club. See S 0132.
1435 France, R France Intl: RFI Europe. See M 1231.
1443 France, R France Intl: North/South (biweekly). See H 1249.
1443 France, R France Intl: Planet Earth (biweekly). See H 1249.
1443 France, R France Intl: The Americas Magazine (5). See H 1244.
1448 France, R France Intl: Made in France. A review of something very French.
1450 Australia, Radio: Stock Exchange Report. See M 1450.

Fridays

1410 Australia, Radio: Sports Bulletin. See S 1120.
1411 Russia, Voice of: World War II (1939-1945). See M 0111.
1430 Australia, Radio: International Report. See M 0430.
1431 France, R France Intl: RFI Europe. See M 1231.
1432 Russia, Voice of: Russian by Radio. See S 1532.
1441 France, R France Intl: Film Reel. See F 1241.
1446 France, R France Intl: Counterpoint (biweekly). See S 1228.
1446 France, R France Intl: Silk Roads (biweekly). Focus on South Asia.
1450 Australia, Radio: Stock Exchange Report. See M 1450.

Saturdays

1410 Australia, Radio: Sports Bulletin. See S 1120.
1411 Russia, Voice of: Newmarket. See T 1411.
1425 France, R France Intl: Focus on France. Zooming in on a French news item.
1430 Australia, Radio: Background Report. See A 1230.
1432 France, R France Intl: Asia File. Correspondent reports and interviews on Asian affairs.
1432 Russia, Voice of: Audio Book Club. See S 0132.
1440 France, R France Intl: French Lesson. See A 1247.

HAUSER'S HIGHLIGHTS
SEYCHELLES: FEBA

Final S-95 until 4 Nov, and provisional for D95 until 2 Mar:
No longer shows Fri-only English around 0500, just *Network* Mon-Sat 1458-1600 on 9810, and the other English to S Asia on 11870 at 1458-1530 (Sat, Sun, Mon - 1545).
Odd Language dept.:
Badaga on 7270 at 1445-1500 Sun/Mon;
Tulu same Thu/Fri;
Siraiki on 9810 0230-0245 Wed/Thu;
Tsangla on 15445 at 1142-1200 Sat;
Kui on 15445 1300-1315 Sun/Tue;
Bhili same on Fri/Sat
(FEBA via Wm. Westenhaver)

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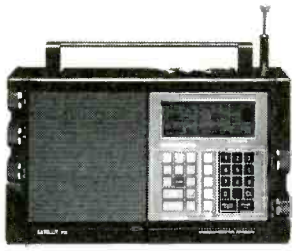

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Grundig's flagship SW receiver, with advanced microprocessor functions, synchronous AM detection, USB/LSB, alphanumeric memory channels, 512 presets (expandable to 2048!), AC power supply. *List $699.95*
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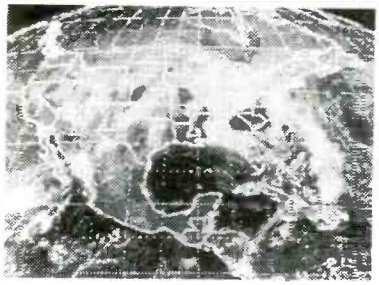
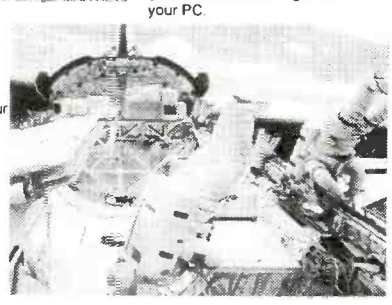


PC HF Fax Plus $129

PC HF Fax Plus is a simple, yet comprehensive HF system that receives Fax, RTTY, CW, and AMTOR on an IBM PC or compatible. It includes an FSK demodulator, advanced signal processing software, tutorial audio cassette, and complete reference manual. Just plug the demodulator into a serial port, install the software and get text and vivic images on your PC.

PC SSTV $149.95

PC Slow Scan Television is a complete system for sending and receiving full color amateur SSTV. The package includes an SSTV FSK modem, SSTV software, image capture utilities and reference manual. All popular formats are supported including Robot, Scottie, Martin and AVT. The system requires a 286, 386 or faster PC with VGA or super VGA display.



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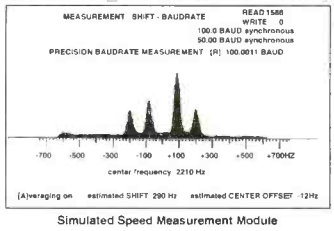
FINALLY - NOW AVAILABLE IN THE USA
The Decoder that is the STANDARD of the European Continent.

HOKA CODE-3 USA Version

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

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



Simulated Speed Measurement Module

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

26 Modes included in standard package include:

- Morse
- RTTY/Baudot/Murray
- Sitor CCIR 625/476-4 ARQ - Navtex
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- Autospec - Mk's I and II
- DUP-ARQ Artrac
- Twinplex
- ASCII
- ARQ6-90/98
- SI-ARQ/ARQ-S
- SWED-ARQ-ARQ-SWE
- ARQ-E/ARQ1000 Duplex
- ARQ-N-ARQ1000 Duplex Variant
- ARQ-E3-CCIR519 Variant
- POL-ARQ 100 Baud Duplex ARQ
- TDM242/ARQ-M2/4-242
- TDM342/ARQ-M2/4
- FEC-A FEC100A/FEC101
- FEC-S • FEC1000 Simplex
- Sports info 300 baud ASCII
- Hellschreiber-Synch/Asynch
- Sitor • RAW (Normal Sitor but without Synch.
- ARQ6-70
- Baudot F788N
- Pactor
- WEFAX

Available as extra options

Option 3 Piccolo $85.00
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Option 5 4 special ARQ & FEC systems TORG-10/11, ROU-FEC/ RUM-FEC, HC-ARQ (ICRC) and HNG-FEC $115.00
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- All modes in typical baud rates with possibility of changing to any desired value of speed and shift.
- All options are available from the main menu, saving or loading to and from hard/floppy drive in bit form, means no loss of unknown signals!
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1500 UTC SHORTWAVE GUIDE

11:00 AM EDT
8:00 AM PDT

FREQUENCIES

1500-1600	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9615as	9710pa	11660as	11695pa
		11800pa			
1500-1600 vl	Canada, CBC N Quebec Svc	9625do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955na	17820na		
1500-1600	China, China Radio Intl	11815as	15165as		
1500-1600	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1500-1600	Ecuador, HCJB Quito	12005am	15115am		
1500-1600	Guam, TWR/KTWR	11580as			
1500-1600	Japan, NHK/Radio	9535na	11915as	11955as	15355af
1500-1600	Jordan, Radio	11970na			
1500-1600	Lebanon, Wings of Hope	9960va			
1500-1600	Malaysia, Radio	7295do			
1500-1600 vl	Malaysia, RTM Kuching	7160do			
1500-1600 vl	Malaysia,RTM KotaKinabalu	5980do			
1500-1525 mtwhfa	Moldova, R Moldova Intl	11580eu			
1500-1515	Mongolia, R Ulan Bator	7290as	9950as		
1500-1525	Netherlands, Radio	9890as	13700as	15150as	
1500-1600 occsnal	New Zealand, R NZ Intl	6100pa			
1500-1550	North Korea, R Pyongyang	9325eu	9640eu	9977na	13785me
1500-1600 vl	Palau, KHBN/Voice of Hope	9965as			
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as	
1500-1600	Russia, Voice of	4940as	4975as	7305me	9595as
		11775as	11890as	11910as	11945sa
		12025as	12035me	15320me	15400af
		15480as	15540me	17570af	17750me
		21740af			
1500-1600 mtwhfa	Seychelles, FEBA Radio	9810as			
1500-1530 s	Seychelles, FEBA Radio	11870as			
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600	Slovakia, AWR	13595am			
1500-1600	Sri Lanka, SLBC Colombo	9720as	15425as		
1500-1530	Switzerland, Swiss R Intl	12075as	13635as	15545as	
1500-1600	United Kingdom,BBC London	5965as	5975as	6190af	6195as
		7180as	9410va	9515na	9740va
		11365am	11750as	11775va	11865va
		11940af	12095va	15070va	17705va
		17830af	21470af	21660af	
1500-1530	United Kingdom,BBC London	11860af	15400eu	17880af	21490af
1500-1600	USA, KTBN Salt Lk City UT	15590am			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, VOA Washington DC	6040me	6110as	7125as	7215as
		9645as	9700as	9760va	15205as
		15255as	15395as		
1500-1600	USA, WEWN Birmingham AL	7425na	11875na		
1500-1600 irreg	USA, WGTG McCaysville GA	7355am	11760am		
1500-1600	USA, WHRI Noblesville IN	9930am	13760am	15105am	
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WRNO New Orleans LA	15420am			
1500-1600 a	USA, WVHA Green Bush ME	15665af			
1500-1600	USA, WWCR Nashville TN	12160am	13845am	15685am	
1500-1600	USA, WYFR Okeechobee FL	11705na	11830na	17750na	
1530-1600	Iran, VOIRI Tehran	11875as	15260as	17750as	
1530-1600	Netherlands, Radio	9890as	15150as		
1530-1600	United Kingdom,BBC London	11765as			
1545-1600	Vatican State, Vatican R	11640as	15585as		

SELECTED PROGRAMS

Sundays

1500 USA, Monitor Radio Intl: Bible Lesson. See S 0200.
1510 Australia, Radio: Oz Sounds. See S 1310.
1511 Russia, Voice of: News and Views. See S 0011.
1529 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1129.
1530 Australia, Radio: Fine Music Australia. See S 1130.
1532 Russia, Voice of: Russian by Radio. A course in the Russian language.

Mondays

1500 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1506 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1510 Australia, Radio: Asia Focus. See M 1310.
1511 Russia, Voice of: News and Views. See S 0011.
1530 Australia, Radio: Innovations. See M 1130.
1532 Russia, Voice of: Folk Box. See S 0032.
1549 USA, Monitor Radio Intl: Letterbox. See M 1149.
1552 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Tuesdays

1500 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1506 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1510 Australia, Radio: Asia Focus. See M 1310.
1511 Russia, Voice of: News and Views. See S 0011.
1530 Australia, Radio: Arts Australia. See T 1130.
1532 Russia, Voice of: Music. See S 0432.
1549 USA, Monitor Radio Intl: Letterbox. See M 1149.
1552 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Wednesdays

1500 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1506 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1510 Australia, Radio: Asia Focus. See M 1310.
1511 Russia, Voice of: News and Views. See S 0011.
1530 Australia, Radio: Science File. See W 1130.
1532 Russia, Voice of: The Jazz Show. See M 0532.
1549 USA, Monitor Radio Intl: Letterbox. See M 1149.
1552 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Thursdays

1500 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1506 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1510 Australia, Radio: Asia Focus. See M 1310.
1511 Russia, Voice of: News and Views. See S 0011.
1530 Australia, Radio: Couchman. See H 1130.
1532 Russia, Voice of: Yours for the Asking. See M 0032.
1549 USA, Monitor Radio Intl: Letterbox. See M 1149.
1552 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Fridays

1500 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1506 USA, Monitor Radio Intl: Monitor Radio International. See M 1106.
1510 Australia, Radio: Asia Focus. See M 1310.
1511 Russia, Voice of: News and Views. See S 0011.
1530 Australia, Radio: The Parliament Program. See F 1130.
1532 Russia, Voice of: Music at Your Request. See M 1232.
1549 USA, Monitor Radio Intl: Letterbox. See M 1149.
1552 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1152.

Saturdays

1500 USA, Monitor Radio Intl: Monitor Radio News. See M 1100.
1506 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1129.
1510 Australia, Radio: Oz Sounds. See S 1310.
1511 Russia, Voice of: News and Views. See S 0011.
1530 Australia, Radio: Business Weekly. See S 1610.
1532 Russia, Voice of: Timelines. See M 0332.

THANK YOU ...

Additional contributors to this month's Shortwave Guide:
John Babbis, Silver Spring, MD; Bob Fraser, Cohasset, MA; Ken Loh, Portland, OR; Jim Moats, Ravenna, OH; Adrian Sainsbury *Radio New Zealand International;* Loyd Van Horn, Brasstown, NC; Jeff White *Radio Miami International*; NASWA *Journal*; BBCMS; BBC *Worldwide*; BBC *Summary of World Broadcasts*; Grove Enterprises BBS; Internet Shortwave Newsgroup via Larry Van Horn.

HAUSER'S HIGHLIGHTS

VANUATU: R. VANUATU

- on new 4960 ex-7260, quite good //3945 +0630-0900+ (David Martin, Australia, *Fine Tuning*)
- New 4960 from *1900 and +0500-1115*; opens at 1900 with anthem, "Yellow Bird," Pidgin (Arthur Cushen, RNZI *Mailbox*)
- Very good at 0900 on both 4960 and 3945 until Japan fades in on latter, heard past 1000 without English (David Norcross, GU)
- Then in mid-Aug missing from 4960 several local evenings, still on 3945 (David Martin, Australia, *Jihad DX*)

FREQUENCIES

1600-1700	Australia, Radio	5995pa	6060pa	6080pa	7260as
		9710pa	9770as	9860pa	11660pa
		11695pa	11800pa		
1600-1613	Bangladesh, Radio	15520as			
1600-1700 vl	Canada, CBC N Quebec Svc	9625do			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, China Radio Intl	4130af	11575as	15110af	
1600-1700	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1600-1700	Ecuador, HCJB Quito	12005am	15115am		
1600-1630	Ethiopia, Radio	7165af			
1600-1700	France, Radio France Intl	6175eu	11615af	11700af	12015af
		15210af	15460af	15530af	
1600-1650	Germany, Deutsche Welle	6170as	7225as	9735af	9875as
		11695af	13690as	15595as	17800af
		17810as			
1600-1700	Guam, AWR/KSDA	9370as			
1600-1615 mt	Guam, TWR/KTWR	11580as			
1600-1630 whfas	Guam, TWR/KTWR	11580as			
1600-1630	Iran, VOIRI Tehran	11875as	15260as	17750as	
1600-1700	Italy, AWR Europe	7230eu			
1600-1700	Malaysia, Radio	7295do			
1600-1625	Netherlands, Radio	9810as	15150as		
1600-1649 occsnal	New Zealand, R NZ Intl	9655pa			
1600-1630	Pakistan, Radio	7425af	9485af	11570af	11710af
		13590af	15555af		
1600-1700 vl	Palau, KHBN/Voice of Hope	9965as			
1600-1700	Russia, Voice of	7350eu	9480eu	9820af	9880af
		11630eu	11675eu	11775as	11860af
		11890as	11910as	11945sa	11990af
		12025as	15385as	15400af	15480as
		15540me	17570af	17875af	21740af
1600-1700	S Africa, Channel Africa	9695af			
1600-1700	S Africa, Trans World R	9500af			
1600-1700	Singapore, SBC Radio One	6155do			

1600-1700	South Korea, R Korea Intl	5975as	6480eu	9515af	9870af
1600-1630	Sri Lanka, SLBC Colombo	9720as	15425as		
1600-1640	UAE, Radio Dubai	13675eu	15320eu	15395me	17825me
		21605me			
1600-1700	United Kingdom,BBC London	3915as	5975as	6190af	6195va
		7180as	9410va	9510as	9515na
		9740va	11750as	11775va	11795va
		15070va	15400eu	17830va	21660af
1600-1615	United Kingdom,BBC London	5965as	6195as	11365am	11865va
		17705va	21470af		
1600-1630	United Kingdom,BBC London	11860af	11940af	12095va	
1600-1700	USA, KAIJ Dallas TX	13815am			
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	6120as			
1600-1700	USA, Monitor Radio Intl	9355af	17510va	21640af	
1600-1700	USA, VOA Washington DC	3970af	6040me	6110va	7125as
		7215as	9645as	9700as	9760va
		11920af	12040af	13710af	15205as
		15225af	15255as	15395as	15410af
		15445af	17895af		
1600-1700	USA, WEWN Birmingham AL	7425na	13615na		
1600-1700 irreg	USA, WGTG McCaysville GA	7355am	11760am		
1600-1700	USA, WHRI Noblesville IN	6120am	13760am	15105am	
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WRNO New Orleans LA	15420am			
1600-1700 a	USA, WVHA Green Bush ME	15665eu			
1600-1700	USA, WWCR Nashville TN	12160am	13845am	15685am	
1600-1700	USA, WYFR Okeechobee FL	11705na	11830na	17750na	21500eu
		21525af	21745eu		
1600-1630	Vietnam, Voice of	7250eu	9840eu	15010eu	
1615-1700	United Kingdom,BBC London	3255af	9630af		
1630-1700	Austria, R Austria Intl	11780as			
1630-1657	Canada, RCI Montreal	7150as	9550as		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	Finland, YLE/Radio	11900na	15400na		
1630-1645	Sweden, Radio	6065eu			
1630-1700 mtwhfa	USA, WRMI/R Miami Intl	9925am			
1645-1700 mtwhf	Canada, RCI Montreal	9555eu	11935eu	15325eu	17820eu
1650-1700 mtwhf	New Zealand, R NZ Intl	5960pa			

SELECTED PROGRAMS

Sundays

1609 Germany, Deutsche Welle: Arts on the Air. See S 1109.
1609 Germany, Deutsche Welle: The Week in Germany. A summary of the week's events in Germany by Deutsche Welle's Bonn correspondents.
1610 Australia, Radio: Business Weekly. Business and finance developments in the Asia/Pacific region.
1611 Russia, Voice of: Top Priority. See S 0511.
1618 France, R France Intl: Everywoman (biweekly). See S 1228.
1618 France, R France Intl: Health Concerns (biweekly). Reports on medicine, fitness, and ecology.
1619 Germany, Deutsche Welle: Religion and Society. See S 0137.
1622 France, R France Intl: Paris Promenade. See S 1223.
1626 France, R France Intl: African Analysis (biweekly). See S 1216.
1626 France, R France Intl: Echoes from Africa (biweekly). An African music program.
1629 Germany, Deutsche Welle: Through German Eyes. In-depth interviews with prominent German journalists.
1630 Australia, Radio: Report from Asia. See S 1230.
1632 France, R France Intl: Club 9516. See S 1234.
1632 Russia, Voice of: Moscow Yesterday and Today. Sit back and enjoy a great program about Russian history with magnificent sound effects.
1634 Germany, Deutsche Welle: German by Radio. See S 1134.
1634 Germany, Deutsche Welle: Hits in Germany. The German pop scene for listeners in Africa.

Mondays

1609 Germany, Deutsche Welle: Newsline Cologne. See M 1109.
1610 Australia, Radio: Australiana. See M 1210.
1611 Russia, Voice of: This is Russia. See S 1111.
1630 Australia, Radio: International Report. See M 0430.
1631 France, R France Intl: RFI Europe. See M 1231.
1632 Russia, Voice of: Interview. See S 0347.
1634 Germany, Deutsche Welle: Science and Technology. Magazine program presenting new developments in science and technology.
1639 Russia, Voice of: Music. See S 0432.
1640 France, R France Intl: Sports. See M 1241.
1643 Germany, Deutsche Welle: Science and Technology. See M 1634.
1647 France, R France Intl: Arts in France. See M 1247.

Tuesdays

1609 Germany, Deutsche Welle: Newsline Cologne. See M 1109.
1610 Australia, Radio: Australiana. See M 1210.
1611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1630 Australia, Radio: International Report. See M 0430.
1632 Russia, Voice of: Interview. See S 0347.
1633 France, R France Intl: RFI Europe. See M 1231.
1634 Germany, Deutsche Welle: Man and Environment. Various topics relating to the environment in industrial and developing countries.
1639 Russia, Voice of: Music. See S 0432.
1642 France, R France Intl: Books. See T 1242.
1644 Germany, Deutsche Welle: Man and Environment. See T 1634.
1647 France, R France Intl: Drumbeat. African feature.

Wednesdays

1609 Germany, Deutsche Welle: Newsline Cologne. See M 1109.
1610 Australia, Radio: Australiana. See M 1210.
1611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1630 Australia, Radio: International Report. See M 0430.
1631 France, R France Intl: RFI Europe. See M 1231.
1632 Russia, Voice of: Interview. See S 0347.
1633 Germany, Deutsche Welle: Insight. See W 0333.
1639 Russia, Voice of: Music. See S 0432.
1641 France, R France Intl: The Bottom Line. See W 1242.
1643 Germany, Deutsche Welle: Insight. See W 0333.
1646 France, R France Intl: Land of France. See W 1247.

Thursdays

1609 Germany, Deutsche Welle: Newsline Cologne. See M 1109.
1610 Australia, Radio: Australiana. See M 1210.
1611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1630 Australia, Radio: International Report. See M 0430.
1630 France, R France Intl: Sports. See M 1241.
1632 France, R France Intl: RFI Europe. See M 1231.
1632 Russia, Voice of: Interview. See S 0347.
1634 Germany, Deutsche Welle: Living in Germany. See M 0118.
1639 Russia, Voice of: Music. See S 0432.
1641 France, R France Intl: North/South (biweekly). See H 1249.
1641 France, R France Intl: Planet Earth (biweekly). See H 1249.
1643 Germany, Deutsche Welle: Living in Germany. See M 0118.
1646 France, R France Intl: Science Probe. See T 1249.

Fridays

1609 Germany, Deutsche Welle: Newsline Cologne. See M 1109.
1610 Australia, Radio: Australiana. See M 1210.
1611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1630 Australia, Radio: International Report. See M 0430.
1631 France, R France Intl: RFI Europe. See M 1231.
1632 Russia, Voice of: Interview. See S 0347.
1634 Germany, Deutsche Welle: Spotlight on Sport. Weekly magazine program with background stories and coverage of important events.
1639 Russia, Voice of: Music. See S 0432.
1641 France, R France Intl: Film Reel. See F 1241.
1643 Germany, Deutsche Welle: Spotlight on Sport. See F 1634.
1646 France, R France Intl: Made in France. See H 1448.

Saturdays

1609 Germany, Deutsche Welle: Africa in the German Press. What the German newspapers and weeklies have to say about Africa.
1609 Germany, Deutsche Welle: Feature of the Month (1). See S 0416.
1609 Germany, Deutsche Welle: International Talking Point. See S 0416.
1610 Australia, Radio: Asia Focus. See M 1310.
1611 Russia, Voice of: Focus on Asia and the Pacific. See T 0111.
1614 France, R France Intl: Focus on France. See A 1425.
1618 Germany, Deutsche Welle: Focus on Development (biweekly). Reports and interviews on projects and progress in Africa and Asia.
1618 Germany, Deutsche Welle: Women on the Move (biweekly). A magazine promoting intercultural understanding and portraying the role of women in society.
1623 Germany, Deutsche Welle: Development Forum. Reports and interviews on projects and progress in Africa and Asia.
1630 Australia, Radio: Background Report. See A 1230.
1631 France, R France Intl: Spotlight on Africa. See A 1228.
1632 Russia, Voice of: Music. See S 0432.
1633 Germany, Deutsche Welle: Economic Notebook. See T 0332.
1640 Germany, Deutsche Welle: Religion and Society. See S 0137.
1645 France, R France Intl: French Lesson. See A 1247.
1648 Germany, Deutsche Welle: The Jazz Corner. See F 2333.

FREQUENCIES

1700-1715	Albania, R Tirana Intl	7155eu	9760eu		
1700-1800	Australia, Radio	6060pa	6080pa	6090pa	7260as
		9580pa	9710pa	9860pa	11660pa
		11695pa	11880pa		
1700-1800 vl	Canada, CBC N Quebec Svc	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	9535as	11575af	
1700-1800 as	Costa Rica, AWR Alajuela	13750am			
1700-1800	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1700-1727	Czech Rep, Radio Prague	5930eu	17485af		
1700-1800	Ecuador, HCJB Quito	12005am	15115am		
1700-1730	France, Radio France Intl	15210af	15460af		
1700-1800	Egypt, Radio Cairo	15255af			
1700-1730	Georgia, Georgian Radio	11910eu			
1700-1800	Japan, NHK/Radio	6150na	9535na	9580as	11840as
		11930as			
1700-1730	Jordan, Radio	11970na			
1700-1800	Lebanon, Voice of Hope	6280me			
1700-1730	Lebanon, Wings of Hope	9960va			
1700-1800 mtwhf	New Zealand, R NZ Intl	5960pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785me
1700-1800	Pakistan, Radio	7485eu	11570eu		
1700-1800 vl	Palau, KHBN/Voice of Hope	9965as			
1700-1800	Russia, Voice of	9480eu	9880af	11630eu	11715me
		11890as	11960af	11990eu	12065me
		15400af	15480as	17570af	17875af
		21740af			
1700-1800	S Africa, Trans World R	9500af			
1700-1800	United Kingdom,BBC London	3255af	5965as	6180eu	6190af
		6195eu	7180as	9410va	9510as
		9740as	11750as	11860af	12095va
		15070va	15400va	17830af	
1700-1715	United Kingdom,BBC London	9515na	11775va		
1700-1745	United Kingdom,BBC London	3915as	9630af		
1700-1730	United Kingdom,BBC London	6005af			
1700-1800	USA, KAIJ Dallas TX	13815am			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	6120as			
1700-1800	USA, Monitor Radio Intl	9355af	21640af		
1700-1800	USA, VOA Washington DC	3980va	6040va	6110as	7125as
		7150va	7170va	7215as	9645as
		9700as	9760va	9770va	11870va
		11920af	12040af	13710af	15205va
		15255as	15395as	15410af	15445af
	17895af	19379va			
1700-1800 mtwhf	USA, VOA Washington DC	5990va	6045va	9550va	
1700-1800	USA, WEWN Birmingham AL	7425na	13615na		
1700-1800 irreg	USA, WGTG McCaysville GA	7355am	11760am		
1700-1800	USA, WHRI Noblesville IN	6120am	13760am	15105am	
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRMI/R Miami Intl	9955am			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WVHA Green Bush ME	15745af			
1700-1800	USA, WWCR Nashville TN	12160am	13845am	15685am	
1700-1800	USA, WYFR Okeechobee FL	21500eu	21745eu		
1715-1800	United Kingdom,BBC London	7160me			
1715-1730	Vatican State, Vatican R	6245eu	7250eu	9645eu	11810eu
1730-1800	Austria, R Austria Intl	9665me	11780as		
1730-1800	Netherlands, Radio	6020af	7120af	11655af	
1730-1800	Romania, R Romania Intl	11830af	15340af	15365af	17805af
1730-1800	Sweden, Radio	6065eu	13605me	15600af	
1730-1800	Vatican State, Vatican R	11625af	13765af	15570af	
1745-1800 mtwhf	Armenia, Voice of	4810eu	7480eu	9675eu	11960me
1745-1800	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as		

1800 UTC

1800-1900	Algeria, R Algiers Intl	11715me	15160eu		
1800-1900 mtwhf	Argentina, RAE	15345eu			
1800-1900	Australia, Radio	6060pa	6080pa	6090pa	9580pa
		9860pa	11660as	11695pa	11880pa
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1800-1827	Czech Rep, Radio Prague	5930eu	15640af		
1800-1900	Ecuador, HCJB Quito	12005am	15115am		
1800-1830	Egypt, Radio Cairo	15255af			
1800-1845	India, All India Radio	7412eu	9650me	9950me	11620eu
		11935af	13750as		
1800-1900	Kuwait, Radio	11990na			
1800-1900	Lebanon, Voice of Hope	6280me			
1800-1830	Netherlands, Radio	6020af	7120af	11655af	
1800-1849 mtwhf	New Zealand, R NZ Intl	5960pa			
1800-1830 s	Norway, Radio Norway Intl	5960eu	13805af	15220af	
1800-1900 vl	Palau, KHBN/Voice of Hope	9965as			
1800-1900	Poland, Polish R Warsaw	6095eu	7270eu	7285eu	
1800-1900	Russia, Voice of	6590eu	7350eu	9480eu	9755as
		9880eu	11675eu	11715me	11775as
		11890as	11910as	11945sa	11960af
		15400af	15480as		
1800-1830	S Africa, Trans World R	9500af			
1800-1900	Slovakia, AWR	13595am	15620am		
1800-1900 irreg	Sudan, Sudan Natl BC	9200af			
1800-1830	Switzerland, Swiss R Intl	9885af	9905eu	12075me	13635me
1800-1900	United Kingdom,BBC London	3255af	6180eu	6190af	6195eu
		9410va	9740as	11860af	11955au
		12095va	15070va	15400va	17830af
1800-1830	United Kingdom,BBC London	5965as	7160me	9410as	9510as
1800-1815	United Kingdom,BBC London	7180as			
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625au			
1800-1900	USA, Monitor Radio Intl	9355pa	13770me	17510af	
1800-1900	USA, VOA Washington DC	3980va	6040va	9760va	9770va
		11920af	12040af	13710af	15205va
		15410af	15580af	17895af	19379va
1800-1900 mtwhf	USA, VOA Washington DC	4875af			
1800-1900	USA, WEWN Birmingham AL	7425eu	13615na		
1800-1900 irreg	USA, WGTG McCaysville GA	7355am	11760am		
1800-1900	USA, WHRI Noblesville IN	9495am	13625am	13760eu	
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRMI/R Miami Intl	9955am			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WVHA Green Bush ME	15745af			
1800-1900	USA, WWCR Nashville TN	12160am	13845am	15685am	
1800-1900	USA, WYFR Okeechobee FL	21500eu	21745eu		
1800-1830	Vietnam, Voice of	7250eu	9840eu	15010eu	
1800-1900 irreg	Yemen, Yemeni Rep Radio	9780as			
1800-1900	Zambia, Christian Voice	4965af			
1815-1900	Bangladesh, Radio	7190eu	9647as	15520as	
1830-1900	Netherlands, Radio	6020af	7120af	9860af	9895af
		13700af	15315af	17605af	
1830-1857	S Africa, Trans World R	9525af			
1830-1900	United Kingdom,BBC London	6005af	9630af		
1833-1900	Cote D' Ivoire, RDTV	11920do			
1840-1850	Greece, Voice of	15650af	17525af		
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900	New Zealand, R NZ Intl	11735pa			

Loyal reader Gerry LeStrange, of East Brunswick, NJ, sent this bright QSL from Radio Japan.

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- Birdie log during frequency search automatically characterizes your R7000, then locks out those frequencies.
- Activity log function continuously monitors and logs all frequencies of a scan database while displaying active, was active and never active channels.

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- Log signal strength information to printer or delimited log file while DELTACOMM™ I-7000 is scanning or activity logging the selected database file.

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FREQUENCIES

1900-2000	Australia, Radio	6060pa	6080pa	6150as	7240pa
		7260as	9560as	9580pa	9860pa
		11660pa	11695pa	11880pa	
1900-1930	Azerbaijan, Voice of	4957eu			
1900-1945	Bangladesh, Radio	7190eu	9647as	15520as	
1900-1925	Belgium, R Vlaanderen Int	5910eu			
1900-1920	Brazil, Radiobras	15265eu			
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 vl	China, China Radio Intl	9440af	11515me		
1900-2000	Costa Rica, AWR Alajuela	13750am	15460am		
1900-2000	Costa Rica, R Peace Intl	6200am	9400am	15050am	
1900-1930	Cote D' Ivoire, RDTV	11920do			
1900-2000	Ecuador, HCJB Quito	12005am	15115am	15490eu	
1900-1930	Finland, YLE/Radio	9730eu	15440af		
1900-1950	Germany, Deutsche Welle	7170af	9670af	9735af	11740af
		11785af	13690af	13790af	
1900-1910	Greece, Voice of	7450eu	9380eu		
1900-2000	Guatemala, AWR	5980am			
1900-1945	India, All India Radio	7412eu	9950me	11620eu	11935af
		13750as			
1900-2000 mtwh/vl	Italy, IRRS Milan	7125va			
1900-2000	Japan, NHK/Radio	6150as	7140au	9535na	9580au
		11850au			
1900-2000 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
1900-2000	Kuwait, Radio	11990eu			
1900-2000	Lebanon, Voice of Hope	6280me			
1900-2000	Liberia, Radio ELBC	7275do			
1900-2000	Liberia, Radio ELWA	4760do			
1900-1925	Netherlands, Radio	6020af	7120af	9860af	9895af
		13700af	15315af	17605af	
1900-2000	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, FRCN/Voice of	7255af			
1900-2000	Romania, R Romania Intl	9550eu	9690eu	11810eu	11940eu
1900-2000	Russia, Voice of	7230eu	7350eu	9480eu	9755as
		9865af	9880eu	11675eu	11775as
		11890as	11910as	11945sa	11990af
		15400af	15480as	17570af	17875af
1900-2000	South Korea, R Korea Intl	5975eu	6480eu	7275as	
1900-2000	Swaziland, Trans World R	3200af			
1900-2000	Thailand, Radio	7200eu	9655eu	11905eu	
1900-2000	United Kingdom,BBC London	3255af	6005af	6190af	6195eu
		7160va	9410va	9630af	9740au
		11955au	12095va	15070va	17830af
1900-2000	USA, KAIJ Dallas TX	13815am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000 as	USA, KVOH Los Angeles CA	17775am			
1900-2000	USA, KWHR Naalehu HI	13625au			
1900-2000	USA, Monitor Radio Intl	9355me	13770me	17510af	
1900-2000	USA, VOA Washington DC	3980va	7375af	7415af	9525va
		9760va	9770va	11870va	11920af
		12040af	15180va	15205va	15410af
		15445af	15580af	19379va	
1900-2000	USA, WEWN Birmingham AL	7425eu	13615na		
1900-2000 irreg	USA, WGTG McCaysville GA	7355am	11760am		
1900-2000	USA, WHRI Noblesville IN	9495am	13635am	13760eu	
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRMI/R Miami Intl	9955am			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000	USA, WVHA Green Bush ME	15745af			
1900-2000	USA, WWCR Nashville TN	12160am	13845am	15685am	
1900-2000	USA, WYFR Okeechobee FL	21745eu			
1900-1930	Vietnam, Voice of	7250eu	9840eu	15010eu	
1900-2000	Zambia, Christian Voice	4965af			
1900-2000	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do	
1930-2000	Albania, R Tirana Intl	7260eu	9730eu		
1930-2000	Iran, VOIRI Tehran	7260af	9022eu		
1930-2000	Mongolia, R Ulan Bator	4080as	7530as		
1930-2000	Netherlands, Radio	7120af	7205af	9860af	9895af
		11655af	15315af	17605af	
1930-2000	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1930-2000	United Kingdom,BBC London	11835af			
1930-2000	Yugoslavia, Radio	6100eu	9720af		

2000 UTC

2000-2100	Algeria, R Algiers Intl	11715me	15160eu		
2000-2100 vl	Angola, Radio Nacional	9535do			
2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7260as
		9580pa	9860pa	11660pa	11695pa
		11855as	11880pa		
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bulgaria, Radio	9700eu	11720eu		
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	Canada, RCI Montreal	5995eu	7235eu	11985eu	13650eu
		13670eu	15150eu	15325eu	17820eu
		17870eu			
2000-2100	China, China Radio Intl	6950eu	9440af	9920eu	15110af
2000-2100	Costa Rica, R Peace Intl	6200am	9400am	15050am	
2000-2100	Ecuador, HCJB Quito	12005am			
2000-2100	Eqt Guinea, Radio Africa	15186af			
2000-2050	Germany, Deutsche Welle	7170eu	9615eu		
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
2000-2100	Guatemala, AWR	5980am			
2000-2030	Hungary, Radio Budapest	3955eu	6140eu	7130eu	9835eu
2000-2100	Indonesia, Voice of	9675as			
2000-2030	Iran, VOIRI Tehran	7260af	9022eu		
2000-2030	Israel, Kol Israel	7465na	9435eu	9845ca	11603na
		11685na	13750sa	15640af	
2000-2015 mtwh/vl	Italy, IRRS Milan	7125va			
2000-2100 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2000-2100	Kuwait, Radio	11990eu			
2000-2100	Lebanon, Wings of Hope	9960va			
2000-2100	Liberia, Radio ELBC	7275do			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2030	Lithuania, Radio Vilnius	9710eu			
2000-2010	Mongolia, R Ulan Bator	11790as	12015as		
2000-2025	Netherlands, Radio	7120af	7205af	9860af	9895af
		11655af	15315af	17605af	
2000-2100	New Zealand, R NZ Intl	11735pa			
2000-2005	Nigeria, FRCN/Radio	3326do	4990do		
2000-2100	Nigeria, FRCN/Voice of	7255af			
2000-2050	North Korea, R Pyongyang	6576eu	9345as	9640af	9977as
2000-2100	Russia, Voice of	7230eu	9480eu	9600eu	9755as
		9880eu	11675eu	11730na	
2000-2100	Slovakia, AWR	15620am			
2000-2015	Swaziland, Trans World R	3200af			
2000-2030	Switzerland, Swiss R Intl	6165eu	9770af	9885af	11640af
		13635af			
2000-2015	Uganda, Radio	4976do	5026do		
2000-2030	United Kingdom,BBC London	9410va	15070va		
2000-2100	United Kingdom,BBC London	3255af	6005af	6180eu	6190af
		6195eu	7160af	7325va	9410va
		9630af	9740au	11750sa	11835va
		11955au	12095va	15070af	17830af
2000-2100	USA, KAIJ Dallas TX	13815am			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100 as	USA, KVOH Los Angeles CA	17775am			
2000-2100	USA, KWHR Naalehu HI	15405as			
2000-2100	USA, Monitor Radio Intl	9355eu	13770eu	15665eu	
2000-2100	USA, VOA Washington DC	6040va	7375af	7415af	9760va
		9770va	11855af	15205va	15410af
		15445af	15580af	17755af	19379va
2000-2100	USA, WEWN Birmingham AL	7425na	13615na		
2000-2100 irreg	USA, WGTG McCaysville GA	7355am	11760am		
2000-2100	USA, WHRI Noblesville IN	9495am	13760eu	15405am	
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRMI/R Miami Intl	9955am			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100	USA, WVHA Green Bush ME	15745eu			
2000-2100	USA, WWCR Nashville TN	12160am	13845am	15685am	
2000-2100	USA, WYFR Okeechobee FL	17845af	21525af	21745eu	
2000-2030	Vatican State, Vatican R	9645af	11625af	13765af	
2000-2010	Vatican State, Vatican R	4055eu	5885eu	7250eu	
2000-2030	Zambia, Christian Voice	4965af			
2000-2100	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
2005-2100	Syria, Radio Damascus	12085eu	15095na		
2015-2100 f/vl	Italy, IRRS Milan	7125va			
2015-2045 s	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Rome	11800me			
2030-2100	Armenia, Voice of	11920na	11960na		
2030-2100	Austria, R Austria Intl	5945eu	6155eu		
2030-2100 mtwhfa	Austria, R Austria Intl	9665me	13730af		
2030-2100	Egypt, Radio Cairo	15375af			
2030-2055	Moldova, R Moldova Intl	11580eu			
2030-2100	Netherlands, Radio	7120af	9860af	9895af	11655af
		15315af	17605af		
2030-2100	Poland, Polish R Warsaw	6095eu	6135eu	7285eu	
2030-2045	Thailand, Radio	9555eu	9655eu	11905eu	
2030-2100	United Kingdom,BBC London	15400eu			
2030-2100	Vietnam, Voice of	7250as	9840eu	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15225pa		
2050-2100	Vatican State, Vatican R	4055eu	5885eu	7250eu	

FREQUENCIES

2100-2200	Australia, Radio	6060pa	6080pa	7240pa	7260as
		9580pa	9660pa	11660pa	11855as
		11880pa	11955pa		
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2110	Bahrain, Radio	6010do			
2100-2200 vl	Canada, CBC N Quebec Svc	9625do			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2130	Canada, RCI Montreal	5995eu	7235eu	11690eu	13650eu
		13670eu	15150eu	15325eu	17820eu
2100-2200	China, China Radio Intl	6950eu	9920eu		
2100-2130	China, China Radio Intl	15110af			
2100-2200	Costa Rica, R Peace Intl	6200am	9400am	15050am	
2100-2200	Cuba, Radio Havana Cuba	11705eu			
2100-2127	Czech Rep, Radio Prague	5930eu	11640pa		
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200	Eqt Guinea, Radio Africa	15186af			
2100-2150	Germany, Deutsche Welle	7115as	9670as	9735af	9765as
		11765af	11785as	15135af	
2100-2200	Guatemala, AWR	5980am			
2100-2200	India, All India Radio	7412eu	9910eu	9950eu	11620au
11715au	15225au				
2100-2200 mtwhfvl	Italy, IRRS Milan	7125va			
2100-2200	Japan, NHK/Radio	6035eu	7140eu	9580af	11850as
		11865as			
2100-2115	Japan, NHK/Radio	9660as	11915as		
2100-2110 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2100-2200	Lebanon, Wings of Hope	9960va			
2100-2200 mtwhfa	Liberia, Radio ELWA	4760do			
2100-2125	Netherlands, Radio	7120af	9860af	9895af	11655af
		15315af	17605af		
2100-2200	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4990do		
2100-2130	Poland, Polish R Warsaw	6095eu	6135eu	7285eu	
2100-2130 mtwhf	Portugal, R Portugal Intl	6130eu	9780eu	9815eu	15515af
2100-2200	Romania, R Romania Intl	7195eu	9550eu	9690eu	11940eu
2100-2200	Russia, Voice of	7350eu	7360eu	9480eu	9530af
		9755as	9820eu	11680eu	11750as
		11980eu	12070na	13615as	
2100-2115	Sierra Leone, SLBS	3316do			
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2200	Syria, Radio Damascus	12085eu	15095na		
2100-2200	Turkey, Voice of	9445eu			
2100-2110	Uganda, Radio	4976do	5026do		
2100-2200	United Kingdom,BBC London	3255af	3915as	3915as	5975na
		6005af	6180eu	6190af	6195va
		7325va	9410va	9580as	9740va
		11750sa	11835va	11945as	11955va
		12095va			
2100-2130	United Kingdom,BBC London	9630af	15070af	15400eu	
2100-2200	USA, KAIJ Dallas TX	13815am			
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200 s	USA, KVOH Los Angeles CA	17775am			
2100-2200	USA, Monitor Radio Intl	9355na	13770eu	15665pa	
2100-2200	USA, VOA Washington DC	6040va	6160va	7375af	7415af
		9535va	9760va	11870va	15185va
		15205va	15410af	15445af	15580af
		17735va	19379va		
2100-2200	USA, WEWN Birmingham AL	7425na	13615na		
2100-2200 irreg	USA, WGTG McCaysville GA	7355am	11760am		
2100-2200	USA, WHRI Noblesville IN	9495am	13760am	15405am	
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRMI/R Miami Intl	9955am			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200 a	USA, WVHA Green Bush ME	15745eu			
2100-2200	USA, WWCR Nashville TN	12160eu	13845am	15685am	
2100-2200	USA, WYFR Okeechobee FL	17845af	21515af		
2100-2145	USA, WYFR Okeechobee FL	21745eu			
2100-2130	Yugoslavia, Radio	6100eu	6185eu		
2100-2200	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
2115-2200	Egypt, Radio Cairo	9900eu			
2120-2130 mw	Estonia, Estonian Radio	5925eu			
2130-2200	Australia, Radio	9610as	9645as	15365pa	17860pa
2130-2200 vl	Australia, VL8A Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200	Finland, YLE/Radio	6120eu	9730eu	11755af	15400af
2130-2200	Iran, VOIRI Tehran	6175au			
2130-2200 as	Latvia, Radio	5935eu			
2130-2200	Liberia, Radio ELWA	4760do			
2130-2200 asmtwh	Moldova, R Dniester Intl	9620na	11750na		
2145-2200 a	Greece, Voice of	9425au	9935au		

2200 UTC

2200-2300	Australia, Radio	9580pa	9610as	9645as	9660pa
		11660pa	11695pa	11855as	11880pa
		11955pa	13755as	15365pa	17795pa
		17860pa			
2200-2300 vl	Australia, VL8A Alice Spg	4835do			
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2225	Belgium, R Vlaanderen Int	5910eu			
2200-2300	Bulgaria, Radio	9700eu	11720eu		
2200-2300 vl	Canada, CBC N Quebec Svc	9625do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5960am	9755am	11705as	11895am
		13670am	13740am	15305am	
2200-2230	China, China Radio Intl	3985eu			
2200-2300	China, China Radio Intl	9880eu			
2200-2300	Costa Rica, R Peace Intl	7385am	9400am	15050am	
2200-2300	Cuba, Radio Havana Cuba	6180na	11960na		
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eqt Guinea, Radio Africa	15186af			
2200-2215	Ghana, Ghana Broadc Corp	4915do			
2200-2300	Guatemala, AWR	5980am			
2200-2230	Hungary, Radio Budapest	3955eu	5935eu	7250eu	9835eu
2200-2230	India, All India Radio	7412eu	9910eu	9950eu	11620au
		11715au	15225au		
2200-2230	Iran, VOIRI Tehran	6175au			
2200-2215 as/vl	Italy, IRRS Milan	7125va			
2200-2225	Italy, RAI Rome	9710as	11800as		
2200-2300	Lebanon, Voice of Hope	6280me			
2200-2205	Lithuania, Radio Vilnius	9710eu			
2200-2300	Malaysia, Radio	7295do			
2200-2205	New Zealand, R NZ Intl	11735pa			
2200-2205	Nigeria, FRCN/Radio	3326do	4990do		
2200-2300	Russia, Voice of	9720af	11730na	11750as	
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, AWR	11610am			
2200-2230	South Korea, R Korea Intl	5965eu			
2200-2300	Spain, R Exterior Espana	9675af			
2200-2205	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	17750eu	21750eu		
2200-2300	UAE, Radio Abu Dhabi	11885na	11970na	13605na	
2200-2300	Ukraine, R Ukraine Intl	5905eu	6010eu	6020eu	6080eu
		6090eu	7240eu	7285eu	9560eu
		11825eu			
2200-2300	United Kingdom,BBC London	6195eu	7110as	7325va	9590va
		9890as	11695au	11750sa	11835af
		11955va			
2200-2230	United Kingdom,BBC London	6180eu	9410va	12095eu	
2200-2300	USA, KAIJ Dallas TX	13815am			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	7510eu	13625eu	13770sa	15405as
2200-2300	USA, VOA Washington DC	7215va	7340af	7375af	7415af
		9705va	9770va	11760va	15185va
		15290va	15305va	17735va	17820va
2200-2300	USA, WEWN Birmingham AL	7425na	13615na		
2200-2300	USA, WHRI Noblesville IN	9495am	13760am		
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 w	USA, WVHA Green Bush ME	9852eu			
2200-2300	USA, WWCR Nashville TN	12160am	13845am		
2200-2245	USA, WYFR Okeechobee FL	17845af	21525af		
2206-2300	New Zealand, R NZ Intl	15115pa			
2230-2300	Finland, YLE/Radio	9650na	9665na	11845na	
2230-2300	Lithuania, Radio Vilnius	9710eu			
2230-2300	Sweden, Radio	6065eu			
2240-2250	Greece, Voice of	9425au	9935au		
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
2245-2300	Vatican State, Vatican R	9600au	11830pa		

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

FREQUENCIES

2300-0000	Australia, Radio	9610as	9660pa	11645as	11660pa
		11695as	11855as	13755as	15365pa
		17795pa	17860pa		
2300-0000 vl	Australia, VL8A Alice Spg	4835do			
2300-0000 vl	Australia, VL8K Katherine	5025do			
2300-0000 vl	Australia, VL8T Tent Crk	4910do			
2300-0000 vl	Canada, CBC N Quebec Svc	9625do			
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000	Canada, RCI Montreal	5960am	9755am	11940am	13670am
		15305am			
2300-0000	Costa Rica, AWR Alajuela	5030am	7375am	9725am	13750am
2300-0000	Costa Rica, R Peace Intl	7385am	9400am	15050am	
2300-2310	Croatia, Croatian Radio	5895eu	7370eu	11635eu	13830eu
2300-0000	Egypt, Radio Cairo	9900na			
2300-0000	Germany, Deutsche Welle	7235as	9690as	11705as	
2300-0000	Guam, AWR/KSDA	11980as			
2300-0000	Guatemala, AWR	5980am			
2300-0000	India, All India Radio	9705as	9950as	11745as	13750as
		15145as			
2300-0000 f/vl	Italy, IRRS Milan	7125va			
2300-0000	Japan, NHK/Radio	5965eu	6155eu	7140eu	9580as
		11850as			
2300-0000	Lebanon, Wings of Hope	9960va			
2300-0000	Malaysia, Radio	7295do			
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	Russia, Voice of	7300na	9530na	9620na	9720af
		11730na	11750as		
2300-2317	Sierra Leone, SLBS	3316do			
2300-0000	Slovakia, AWR	9965eu			

2300-0000	Spain, R Exterior Espana	6125eu			
2300-0000	Turkey, Voice of	7185me	9445na	11710eu	
2300-0000	UAE, Radio Abu Dhabi	11885na	11970na	13605na	
2300-0000	United Kingdom,BBC London	5975na	6175na	6195va	7110as
		7250as	7325va	9580as	9590va
		11750sa	11945as	11955va	
2300-2330	United Kingdom,BBC London	3915as	11835eu		
2300-2330	USA, KAIJ Dallas TX	13815am			
2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	USA, KWHR Naalehu HI	17510as			
2300-0000	USA, Monitor Radio Intl	7510eu	13625as	13770sa	
15405as					
		17555sa			
2300-0000	USA, VOA Washington DC	7215va	7340af	7375af	7415af
		9705va	9770va	11760va	
15185va					
		15290va	15305va	17735va	
17820va					
2300-0000	USA, WEWN Birmingham AL	7425na	13615na		
2300-0000	USA, WHRI Noblesville IN	5745am	9495am		
2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000	USA, WRMI/R Miami Intl	9955am			
2300-0000	USA, WRNO New Orleans LA	7355am			
2300-0000 w	USA, WVHA Green Bush ME	9852eu			
2300-0000	USA, WWCR Nashville TN	5065am	9475am	12160am	
13845am					
2330-0000	Australia, Radio	9645as	9850as	13605as	
15240pa					
2330-0000	Netherlands, Radio	6020na	6165na	9845na	
2330-0000	Palau, KHBN/Voice of Hope	15140as			
2330-0000	Vietnam, Voice of	7250eu	9840eu	15010eu	
2335-2345	Greece, Voice of	9935sa	11595sa	11645sa	

SELECTED PROGRAMS

Sundays

2300 Guam, AWR/KSDA: Wavescan. A program for DXers and shortwave listeners produced at AWR's British studio.
2309 Germany, Deutsche Welle: Asia-Pacific Report. Correspondent reports, interviews and background news from the Asia-Pacific region.
2310 Australia, Radio: Sports Bulletin. See S 1120.
2311 Russia, Voice of: Top Priority. See S 0511.
2315 Guam, AWR/KSDA: Pacific Island Journal. News and stories about the Pacific Islands.
2320 Australia, Radio: Network Asia. John Westland hosts this program of in-depth interviews and information about world, regional and Australian issues (Sun-Thu). The best from the broadcast week and the domestic network on Sat-Sun.
2324 Germany, Deutsche Welle: European Journal. A review of major events in Europe and Germany through interviews, analyses and background reports.
2330 Guam, AWR/KSDA: AWR Magazine. News and interviews on Asian topics.
2332 Russia, Voice of: Audio Book Club. See S 0132.
2345 Guam, AWR/KSDA: Digging Up the Past. A look at archeological discoveries and research.

Mondays

2300 Guam, AWR/KSDA: Sounds of Inspiration. An adult Christian music program.
2309 Germany, Deutsche Welle: Asia-Pacific Report. See S 2309.
2310 Australia, Radio: Sports Bulletin. See S 1120.
2311 Russia, Voice of: Commonwealth Update. Commonwealth of Independent States (CIS) developments.
2315 Guam, AWR/KSDA: Discovering the Bible. Recitation of scripture in story form.
2320 Australia, Radio: Network Asia. See S 2320.
2324 Germany, Deutsche Welle: European Journal. See S 2324.
2330 Guam, AWR/KSDA: The Bible in Living Sound. A dramatic look at the bible.
2332 Russia, Voice of: Russian by Radio. See S 1532.
2345 Guam, AWR/KSDA: Voice of Prophecy. An adult bible study program.

Tuesdays

2300 Guam, AWR/KSDA: Sounds of Inspiration. See M 2300.
2309 Germany, Deutsche Welle: Asia-Pacific Report. See S 2309.
2310 Australia, Radio: Sports Bulletin. See S 1120.
2311 Russia, Voice of: Commonwealth Update. See M 2311.
2315 Guam, AWR/KSDA: Discovering the Bible. See M 2315.
2320 Australia, Radio: Network Asia. See S 2320.
2324 Germany, Deutsche Welle: European Journal. See S 2324.
2330 Guam, AWR/KSDA: The Bible in Living Sound. See M 2330.
2332 Russia, Voice of: Audio Book Club. See S 0132.
2345 Guam, AWR/KSDA: Voice of Prophecy. See M 2345.

Wednesdays

2300 Guam, AWR/KSDA: Sounds of Inspiration. See M 2300.
2309 Germany, Deutsche Welle: Asia-Pacific Report. See S 2309.
2310 Australia, Radio: Sports Bulletin. See S 1120.
2311 Russia, Voice of: Commonwealth Update. See M 2311.
2315 Guam, AWR/KSDA: Discovering the Bible. See M 2315.
2320 Australia, Radio: Network Asia. See S 2320.
2324 Germany, Deutsche Welle: European Journal. See S 2324.
2330 Guam, AWR/KSDA: The Bible in Living Sound. See M 2330.
2332 Russia, Voice of: Russian by Radio. See S 1532.
2345 Guam, AWR/KSDA: Voice of Prophecy. See M 2345.

Thursdays

2300 Guam, AWR/KSDA: Sounds of Inspiration. See M 2300.
2309 Germany, Deutsche Welle: Asia-Pacific Report. See S 2309.
2310 Australia, Radio: Sports Bulletin. See S 1120.
2311 Russia, Voice of: Commonwealth Update. See M 2311.
2315 Guam, AWR/KSDA: Discovering the Bible. See M 2315.
2320 Australia, Radio: Network Asia. See S 2320.
2324 Germany, Deutsche Welle: European Journal. See S 2324.
2330 Guam, AWR/KSDA: The Bible in Living Sound. See M 2330.
2332 Russia, Voice of: Audio Book Club. See S 0132.
2345 Guam, AWR/KSDA: Voice of Prophecy. See M 2345.

Fridays

2300 Guam, AWR/KSDA: Sounds of Inspiration. See M 2300.
2309 Germany, Deutsche Welle: Commentary. See S 0208.
2310 Australia, Radio: Asia Focus. See M 1310.
2311 Russia, Voice of: Commonwealth Update. See M 2311.
2312 Germany, Deutsche Welle: The Week in Germany. See S 1609.
2315 Guam, AWR/KSDA: Discovering the Bible. See M 2315.
2323 Germany, Deutsche Welle: Economic Notebook. See T 0332.
2330 Australia, Radio: At Your Request. See S 0330.
2330 Guam, AWR/KSDA: The Bible in Living Sound. See M 2330.
2332 Russia, Voice of: Timelines. See M 0332.
2333 Germany, Deutsche Welle: The Jazz Corner. A musical change-of-pace from the world of jazz.
2345 Guam, AWR/KSDA: Voice of Prophecy. See M 2345.

Saturdays

2300 Guam, AWR/KSDA: Wavescan. See S 2300.
2309 Germany, Deutsche Welle: Commentary. See S 0208.
2310 Australia, Radio: That's History. Interpretations of past events by Bill Bunbury/Steven Rapley.
2311 Russia, Voice of: World War II (1939-1945). See M 0111.
2312 Germany, Deutsche Welle: Sports Report. See S 0212.
2315 Guam, AWR/KSDA: Pacific Island Journal. See S 2315.
2323 Germany, Deutsche Welle: Mailbag Asia. See S 0216.
2332 Russia, Voice of: Timelines. See M 0332.

Your Name in Lights!

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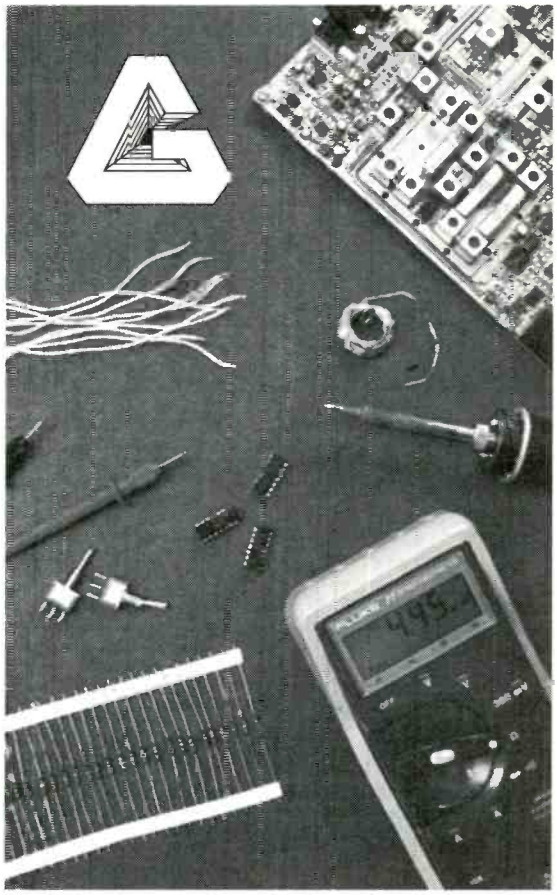

REPAIRS:

- **Repair for receivers and scanners.**
- **We specialize in equipment less than five years old from Radio Shack, Uniden, ICOM, Kenwood, and Sony.**
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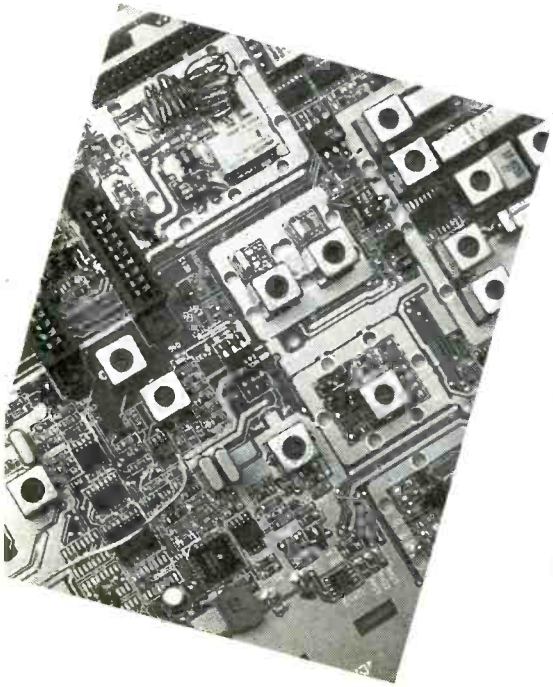


Here's All You Need to Do:

1. **Call the Grove Technical line at 704-837-7081 to discuss your request.**
2. **Grove will issue you a service order (SO) number and shipping instructions which include sending a non-refundable $39 diagnostic fee (which will be applied toward your repair fee) plus return shipping. After our expert assessment, we will notify you if there will be any additional labor and/or parts charge.**

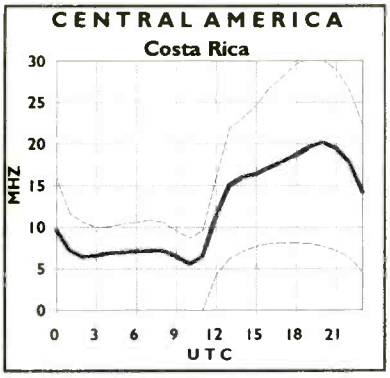
We LOVE trade-ins at Grove Enterprises!

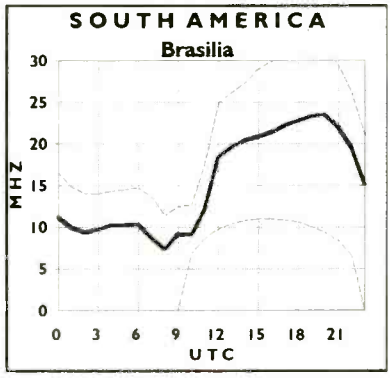
Call 704-837-7081

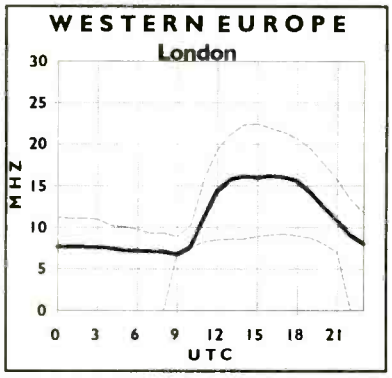
Grove Enterprises, 300 S. Highway 64 W., Brasstown, NC 28902

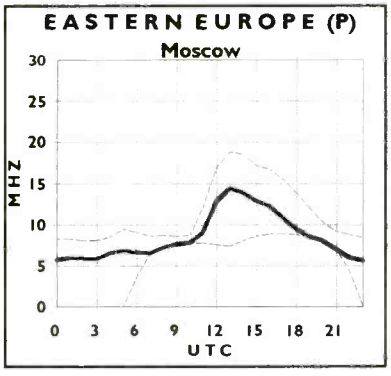
Propagation conditions: Eastern United States

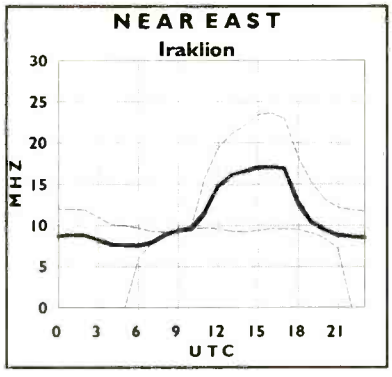
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear. The Sun Spot Number used this month for forecasting purposes is 8.

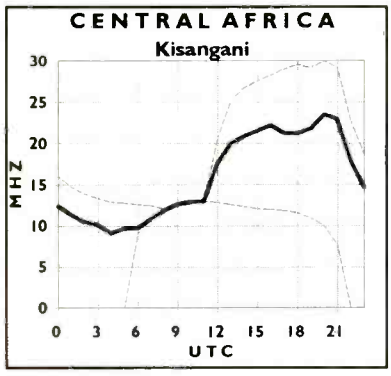


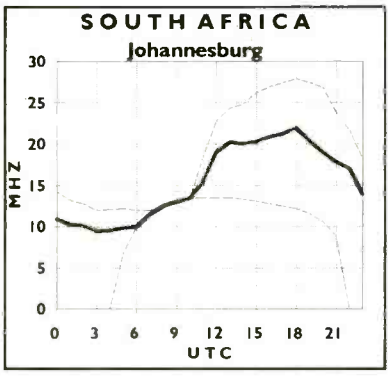


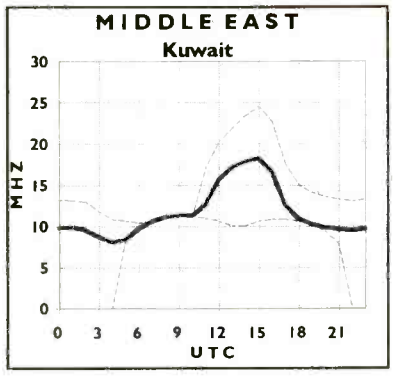


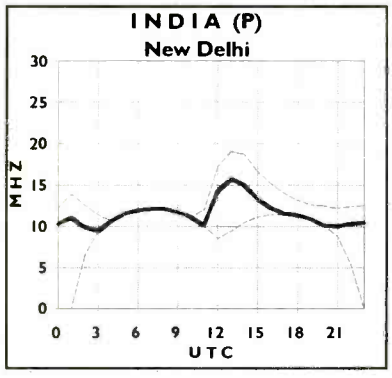


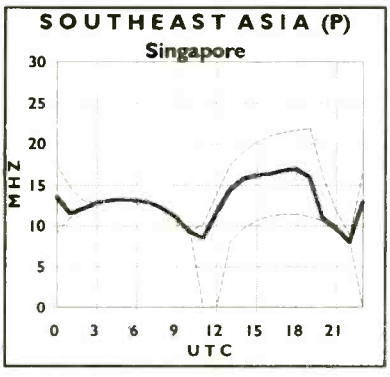


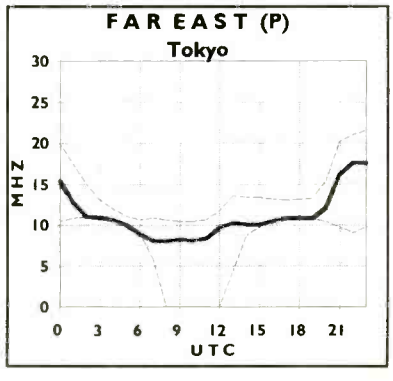


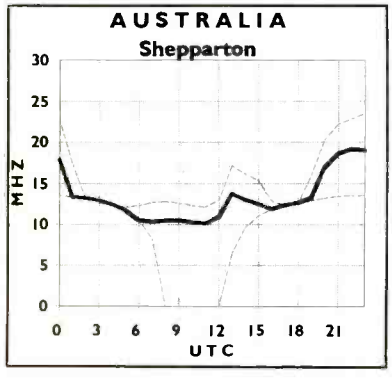






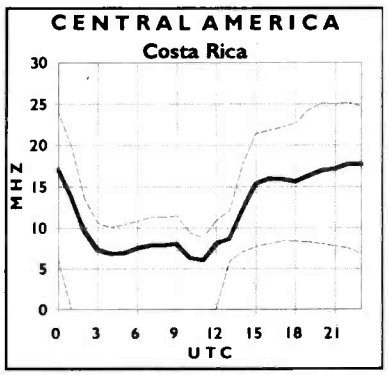


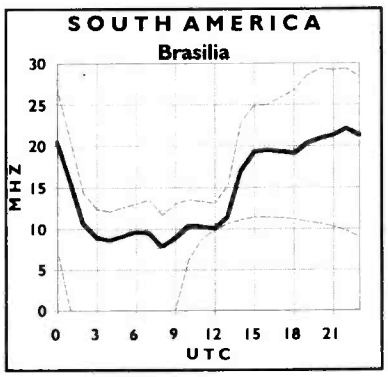


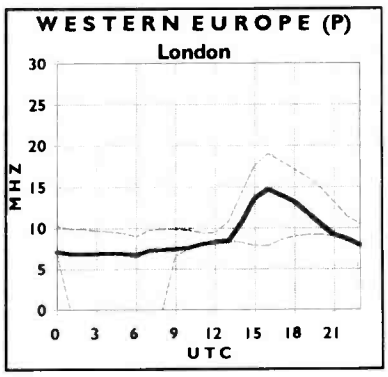


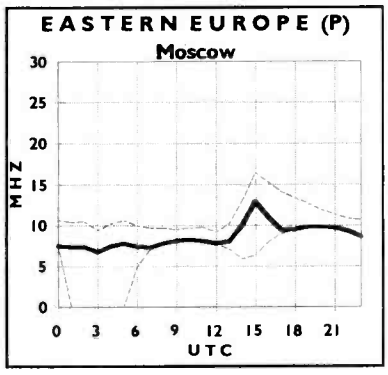
Propagation Conditions: Western United States

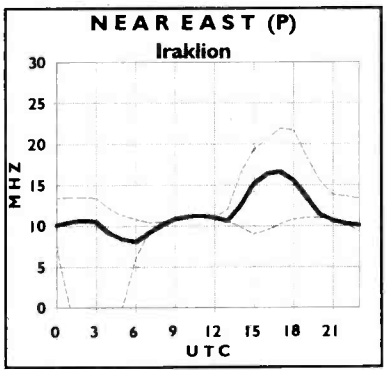
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom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

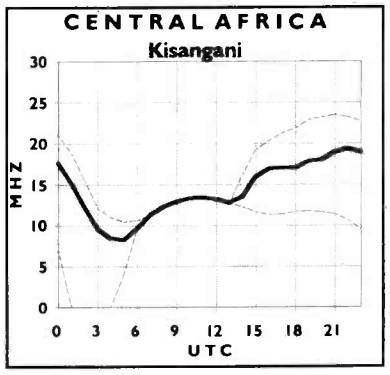


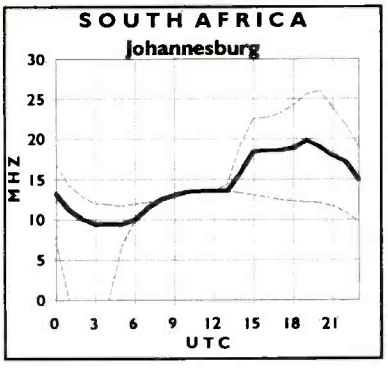


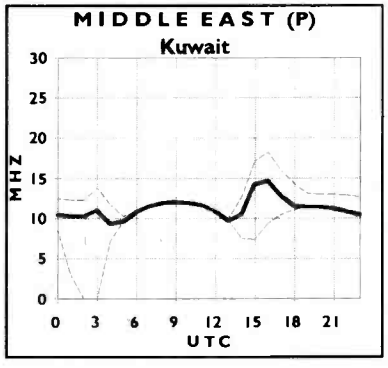


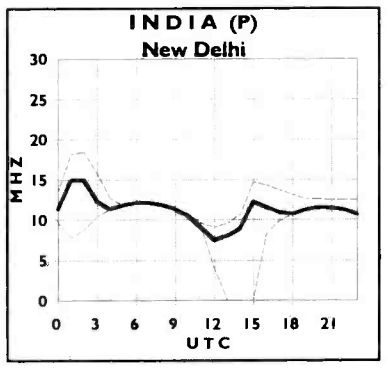


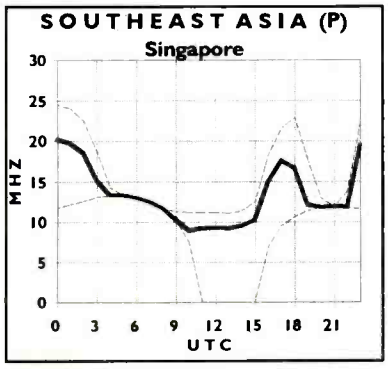


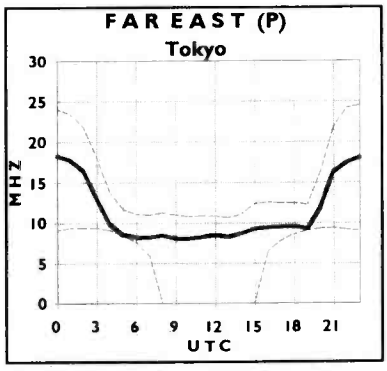


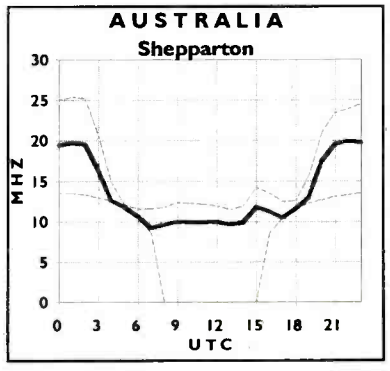












By Bob Evans
revans@astral.magic. ca

What's in a Name? Plenty, if You're the French Military

In July, we looked at the formation of the RF NATO Routing Indicators (callsigns) used in French military digital communications. This month we'll examine the naming conventions used in message addresses.

Consider the following French Forces (FF) transmission from Cayenne on 10798.2 in ARQ-E3 96/400

```
ZCZC IZW 465
PP RFLIGC
DE RFLIF 0002132215
ZNR UUUUU
FM GROUPGEND FORT DE FRANCE
TO RFFAAX/GENDARMERIE PARIS
RFFAAX/INSPEGEND PARIS
RFFAAX/COMGENDOM ARCUEIL
ZEN/LEGEND FORT DE FRANCE
INFO RFLIDA/GROUPGEND ST CLAUDE
RFLIGC/GROUPGEND CAYENNE
ZEN/CIGEND FORT DE FRANCE
ZEN//GROUPMOBGEND TRINITE
ZEN/ESRONGENDMOBIL 15 DEPLACE
FORT DE FRANCE
BT
NON PROTEGE
. . . . . .actual message starts here . . . .
```

You will note that each Routing Indicator (RFFAAX in the above example) is generally followed by an addressee designator. In this example, the one RF callsign refers to three distinct addressees:

GENDARMERIE PARIS
INSPEGEND PARIS
COMGENDOM ARCUEIL

It is not unusual for one Routing Indicator to have multiple addressees. RFLIC, for example, usually refers to MARINE FORT DE FRANCE. However, some other addressees that have used this same callsign are:

COMAR FORT DE FRANCE
COMSUP FORT DE FRANCE
MAIN FORT DE FRANCE
MARINE SERTIM FORT DE FRANCE
SERNAV FORT DE FRANCE
BATIMENT "JULES VERNE"
UNIMAR FORT DE FRANCE

It is logical to assume, then, that the main communications center at the naval base also handles traffic for other units stationed there as well.

At first glance these addressee names seem unintelligible, but you will soon realize that they are actually a contraction of several words (in French, of course). The practice of combining parts of words to form military acronyms is by no means reserved to the French. Consider the U.S. Coast Guard's designator CAMSATLANT (Communications Area Master Station—Atlantic), or the U.S. Navy's CINCPAC (Commander-in-Chief—Pacific), as examples of this practice.

More examples from the French:

CECLANT	Commande Et Controle, atLANTique (Command and Control Atlantic)
REGARTIMA	REGiment ARTIlleriede MARine (Marine Arleillery Regiment)
RFFLCSYR "SYRACUSE"	"BATIMENTS CECMED where
BATIMENTS =	the French word for "Ships"
CECMED =	Commande Et Controle, MEDiterannee
SYRACUSE =	Systeme de Radio Communication Utilisant un Satellite

Syracuse is the designation for the French Ministry of Defence satellite system. The space segment of the system employs transponders carried on French Telecom satellites. The ground segment comprises fixed stations within France, together with mobile, transportable and shipborne stations. Data is encrypted for link security and the satellite is accessed using the code-division multiple access technique.

French Naval Vessels

One of the more challenging aspects of monitoring French Military digital traffic is to correctly identify the NATO Routing Indicators and names of vessels of the French Navy.

Fortunately, the formation of their addresses follows a prescribed formula. The major French naval ports located in France are as follows:

RFFJ	CHERBOURG
RFFK	BREST
RFFL	TOULON
RFFN	LORIENT
RFFO	ROCHEFORT

By way of example, while stationed at its home port in LORIENT, the address for the vessel LA RIEUSE is formed by using the four-letter port prefix (RFFN in this case) together with a three-letter suffix that is an official abbreviation of the vessel's name—RFFNRES.

On many occasions, French traffic actually contains the word BATIMENT (ship in French) before the name of the vessel. If several vessels are cited in the message, the plural BATIMENTS may be used. Transmissions originating from Fort de France or Cayenne often use the following phrase: TOUS BATIMENTS EN ZONE PETITES ANTILLES (All vessels in the zone of the Lesser Antilles).

By their very nature, however, ships do not remain anchored at their home port forever. You can often follow a voyage by intercepting traffic addressed to a vessel at various different French outposts. For example, the vessel LA RIEUSE did a tour of duty in the Indian Ocean. On its voyage, it passed the coast of West Africa and called in at the French base at Djibouti. The vessel address was given as RFQPMRES where RFQPM is MARINE TRANSPORT DJIBOUTI.

When it reached the French base at LE PORT in the Reunion Islands, traffic was addressed to the vessel as RFVIRES where RFVI is the designator for LE PORT MARINE.

So much for the general rules; now for the exceptions. Many times when a vessel is anchored at an overseas base, only the actual designator of the base address is used since the traffic is actually being passed through the base to the ship. For example, while anchored at Djibouti, the address indicator may also read RFQMP LA RIEUSE and at Le Port, RFVI LA RIEUSE. This is one reason that many monitor's logs (including your editor's) often contain multiple addresses for the same vessel.

Another common practice when sending traffic to more than one vessel, is to specify the address indicator for the first ship only. For example: RFlLIGJVN JULES VERNE FRANCIS GARNIER MARNE ORAGE. (RFLIG is Cayenne).

Although unconfirmed, there is evidence that when a vessel is operating on the high

seas, the prefix RFFM (M for "mer" = "sea" in French) is used. See Table 1 for a listing of confirmed vessel suffixes.

A common misconception among many monitors is that "ALINDIEN" is the name of a French naval vessel. Actually, it is a contraction used to identify French Forces in the Indian Ocean. Hence the phrase "BATIMENT(s) ALINDIEN" is intended as a general routing message to all French naval vessels operating in the Indian Ocean.

Government Maritime Forces - Police

Police forces of the GENDARMERIE MARITIME (GM) and the GENDARMERIE DEPARTEMENTALE (GT) man patrol craft that are operated and maintained by the French navy. Their mandate is to protect naval bases and establishments ashore—in effect, they function as military police. You will often encounter addressees such as COMGEND, GROUPGEND, LEGEND and the like, especially in Cayenne/Fort de France traffic. When you spot the word "GEND" in an address, you can be sure it has something to do with the GENDARMERIE. Some common ones you may encounter are:

COMGENDAR Compagnie Gendarmarie
RFLIF GROUPGEND
FORT DE FRANCE
Group Gendarmerie (Police Group - Fort de France)

TABLE 1 - French Naval Vessel Suffixes

HULL #	VESSEL NAME	SUFFIX	VESSEL TYPE
D 609	Aconit	ACT	Destroyer
P 682	L'Audacieuse	ADC	Light Forces
F 782	Amyot d'Inville	ADV	Frigate
M 647	Aigle	AGE	Mine Warfare Forces/Minehunter
P 681	Albatros	ALB	Light Forces
M 612	ALENCON	ALN	Deleted 1993
S 605	Amethyste	AMT	Submarine
M 643	Andromede	AND	Mine Warfare Forces/Minehunter
F 786	Quar. Moit. An	ANQ	Frigate
M 623	BACCARAT	BAC	Deleted 1993
P 683	La Boudeuse	BDS	Light Forces
L 9077	Bougainville	BGV	Amphibious Forces
F 729	BALNY	BLN	Deleted 1992
F 793	Commandant Blaison	BLS	Frigate
M 620	BERLAIMONT	BLT	Mine Warfare Forces
M 613	BERNEVAL	BNL	Mine Warfare Forces
F 797	Commandant Bouan	BOU	Frigate
F 796	Commandant Birot	BRT	Frigate
F 726	Commandant Bory	BRY	Frigate
M 712	Cybele	CBL	Mine Warfare Forces/Minehunter
M 716	Ceres	CER	Mine Warfare Forces/Minehunter
F 727	ADMIRAL CHARNER	CHR	Frigate
C 611	COLBERT	CLB	Deleted 1992
R 98	Clemenceau	CLM	Aircraft/Helicopter Carrier
M 714	Clio	CLO	Mine Warfare Forces/Minehunter
M 713	Calliope	CLP	Mine Warfare Forces/Minehunter
M 615	CANTHO	CNO	Mine Warfare Forces
P 684	La Capricieuse	CPC	Light Forces
L 9030	Champlain	CPL	Amphibious Forces
M 737	CAPRICORNE	CPR	Mine Warfare Forces
M 715	Circe	CRC	Mine Warfare Forces/Minehunter
M 642	Cassiopee	CSP	Mine Warfare Forces/Minehunter
D 614	Cassard	CSR	Destroyer
M 646	Croix du Sud	CXS	Mine Warfare Forces/Minehunter
F 795	Commandant Ducuing	DCG	Frigate
D 630	DU CHAYLA	DCH	Deleted 1992
F 728	DOUDART DE LAGREE	DDL	Deleted 1991
F 781	D'Estienne d'Orves	DDO	Frigate
D 612	De Grasse	DGS	Destroyer
D 611	Duguay-Trouin	DGT	Destroyer
L 9032	Dumont D'Urville	DMT	Amphibious Forces
D 633	DUPERRE	DPR	Deleted 1992
D 625	DUPETIT THOUARS	DPT	Destroyer
D 641	Dupleix	DPX	Destroyer
D 603	Duquesne	DQN	Destroyer
A 629	Durance	DRC	Aux/Underway Replenish. Tanker
F 783	Drogou	DRG	Frigate
A 757	D'Entrecasteaux	DTX	Survey and Research Vessel
F 784	Detroyat	DTY	Frigate
A 766	L'ESTAFETTE	EFF	Deleted 1991
M 641	Eridan	ERD	Mine Warfare Forces/Minehunter
R 99	Foch	FCH	Aircraft/Helicopter Carrier
L 9011	Foudre	FDR	Amphibious Forces
L 9031	Francis Garnier	FGR	Amphibious Forces
P 685	La Fougueuse	FGS	Light Forces
P 687	La Gracieuse	GCS	Light Forces
M 617	GARIGLIANO	GGO	Mine Warfare Forces
D 640	Georges Leygues	GLG	Destroyer
D 638	LA GALISSONNIERE	GLS	Destroyer
P 671	Glaive GM	GLV	Government Maritime Forces
P 679	Grebe	GRB	Light Forces
A 617	Garonne	GRN	Aux/Depot & Support Ship
P 686	La Glorieuse	GRS	Light Forces
F 791	Commandant l'Herminier	HMN	Frigate
F 749	EV HENRY	HNR	Deleted 1992
A 603	Henri Poincare	HPC	Deleted 1992
A 610	Ile d'Oleron	IDL	Survey and Research Vessel
D 615	Jean Bart	JBT	Destroyer
F 794	Enseigne de Vaisseau Jacoubet	JCB	Frigate
L 9033	Jacques Cartier	JCR	Amphibious Forces
R 97	Jeanne d'Arc	JDA	Aircraft/Helicopter Carrier
D 643	Jean de Vienne	JDV	Destroyer
F 785	Jean Moulin	JML	Frigate
A 620	Jules Verne	JVN	Aux/Maintenance & Repair
F 788	Second Maitre Le Bihan	LBN	Frigate
F 710	La Fayette (bldg)	LFY	Frigate
L 9034	La Grandiere	LGD	Amphibious Forces
F 792	Premier Maitre l'Her	LHR	Frigate
D 645	La Motte-Picquet	LMP	Destroyer
F 789	Lieutenant de Vaisseau le Henaff	LNF	Frigate
A 615	Loire	LRE	Aux/Depot & Support Ship
D 646	Latouche-Treville	LTT	Destroyer
F 790	Lieutenant de Vaisseau Lavallee	LVL	Frigate
M 648	Lyre	LYR	Mine Warfare Forces/Minehunter
D 627	MAILLE BREZE	MBZ	Destroyer
D 642	Montcalm	MCL	Destroyer
P 688	La Moqueuse	MQS	Light Forces
A 630	Marne	MRN	Aux/Underway Replenish. Tanker
A 607	Meuse	MSE	Aux/Underway Replenish. Tanker
M 618	MYTHO	MTH	Mine Warfare Forces
L 9022	Orage	ORG	Amphibious Forces
M 645	Orion	ORN	Mine Warfare Forces/Minehunter
M 610	Ouistreham	OTH	Mine Warfare Forces/Minesweeper
L 9021	Ouragan	OUR	Amphibious Forces
P 760	Petulante (GM)	PCW	Government Maritime Forces
M 644	Pegase	PEG	Mine Warfare Forces/Minehunter
M 749	PHÉNIX	PHX	Deleted 1992
F 787	Commandant de Pimodan	PMD	FrigateD 644
	Primauguet	PMG	Destroyer
A 625	PAPENOO	POO	Deleted 1993
M 649	Persee	PRS	Mine Warfare Forces/Minehunter
F 748	PROTET	PRT	Deleted 1992
P 673	Pertuisane GM	PSN	Government Maritime Forces
A 632	Punaruu	PUU	Auxiliaries Survey and Support Ship
P 690	La Rieuse	RES	Light Forces
A 621	Rhin	RHN	Auxiliaries/Depot & Support Ship
A 622	Rhone	RHO	Auxiliaries/Depot & Support Ship
P 689	La Railleuse	RLL	Light Forces
A 618	Rance	RNC	Auxiliaries/Depot & Support Ship
A 733	CDT RIVIERE	RVR	Deleted 1992
D 602	Suffren	SFN	Destroyer
A 631	Somme	SOM	Aux/Underway Replenish. Tanker
P 680	Sterne	STE	transferred to Navy, Brest
A 785	Thetis	THT	Survey and Research Vessel
A 669	Tenace	TNC	Auxiliaries Survey and Support Ship
L 9007	TRIEUX	TRX	Amphibious Forces
A 646	TRITON	TTN	deleted 1993
D 610	Tourville	TVL	Destroyer
A 608	Var	VAR	Aux/Underway Replenish. Tanker
F 725	VICTOR SCHOELCHER	VCH	Frigate
M 619	VINH LONG	VLG	Mine Warfare Forces
F 733	Ventose	VNS	Frigate
M 757	VERSEAU	VRS	Mine Warfare Forces

NOTE: Vessels whose names appear in upper case are identified as "Inactive" in the latest issue of Jane's Fight Ships.

Mobile DXing

I'm sure many of you have experienced brief bouts with electrical noise [*Ed. Note: See this month's lead feature story.*]. Defective insulators on high-voltage power lines, power tools on construction sites, and failing fluorescent lights are just a few of the possible causes. These can sure make AM DXing miserable—imagine living in a place where this noise is present all the time!

Many of us have also heard two or more stations mixing and filling most of the dial as we drive past a radio tower. In many cases, some unfortunate souls live near the tower and have to deal with that continuously. (Just be grateful you don't live in one apartment complex in Schaumburg, Illinois — it's between the towers of 50,000 watt stations WGN 720 kHz and WBBM 780 kHz!) This latter problem also affects FM.

That's one excuse: time is also a problem for many of us. We just don't have time to sit down in front of a radio and DX. Or, we just don't have the spare cash to buy a decent radio for DXing.

If you're in one of these situations, you may have decided it's futile to get into domestic-band DXing.

But there's an answer, accessible to almost all of us: mobile DXing! Most people have already DXed from the car without even trying. While on vacation and looking for a news broadcast, we've stumbled across a station 300-400 miles away. Or we've been changing stations and stumbled across Chicago, New York, Cincinnati, or some other distant station.

Car radio DXing is an excellent solution for the would-be DXer in a noisy location; you simply drive somewhere quiet. It's also the solution for the time-limited individual; you can use the time spent driving to/from work to do something productive with the radio. Finally, most car radios are of especially high quality; you don't even need to buy another radio.

Where to go

If you have the luxury of parking for awhile to DX, you also have to decide where to park. Obviously, you want to stay away from high-voltage power lines and radio/TV towers. For AM, try to get as far from busy roads as possible; you don't want ignition noise from a poorly-maintained vehicle to wipe out that long-sought station ID.

Normally, you'd think you'd want to be on high ground for FM car radio DXing. And usually, you'd be right. But if you live in hilly country, you can use the hills to assist your DXing. Drive to a place as close to a high hill or bluff as possible, using the hill to shield you from some of the stations you normally hear. If you're lucky, you'll knock down the signals of the "pests," and something new will come in. In some places, it may be possible to drive around a hill and receive several different stations on the same frequency!

KWNO 1230, KAGE 1380, and KAGE FM 95.3 are all part of a commercial LMA in Winona, Minnesota.

Safety first

Safety is always first priority. If you're not sure you can tune the radio without taking your eyes off the road, you should park before DXing. Don't just pull off to the side of a busy highway—pick a safe parking spot. City/county parks are probably the best places to go; they're usually safe, and you can watch nature while you DX.

Writing while driving is almost never a good idea. Some hams who operate mobile carry a small tape recorder in the car. They read their log information onto tape, writing the information into their paper log when they get home. This is an excellent idea for the domestic-band mobile DXer, too. And there's an added advantage: you have a recorder handy to preserve those DX catches for posterity.

What to take

Again, a small tape recorder is a good thing to carry if you plan to DX while driving. If you plan to do your DXing from a parking space, you may want to carry the same reference books you use at home. The *FM Atlas* (see March 1995 American Bandscan) is especially handy, as it fits nicely in the glove compartment or the pockets in the doors of many cars. Unfortunately, I know of no AM guide of similar size.

Some drugstores and office supply stores sell notepads that stick to the dashboard or windshield with a suction cup. These are very handy for logging your DX. (But again, only while parked, please)

Bits and Pieces

- If you're willing to drive your mobile DX station a few hundred miles, John Ballard of Richmond, Virginia, suggests a particularly good place to take it. John recently did some DXing from Cape Hatteras, North Carolina. He writes, "Being out on the point, where many people surf fish, the entire AM band on an ordinary car radio is filled. 880 WCBS in NYC comes in at noon just like on a crisp, fall night."

Cape Hatteras is also an excellent location for FM and TV DX; serious DXers have been known to spend their vacations there simply watching for DX. 400-mile reception into the NYC area or northern Florida is quite com-

SKIPPING IN

This month, we have some of Harold Frodge's DX from eastern Michigan. Harold logged a number of Caribbean stations; other DXers in the East stand a good chance of hearing these, too.

ZIZ-555	St. Kitts
DBC-595	Dominica
Rebelde-600	Cuba
WHGH-840	Thomasville, Ga.
WMAZ-940	Macon, Ga.
YVNR-1080	Maracay, Venezuela
WFBC-1330	Greenville, S.C.
"WDAB"-1660	Chicago

We're quickly entering the AM DX season; send your catches to me at Box 98, Brasstown NC 28902.

This impressive tower belongs to WSM 650. If you come to Middle Tennessee, you can see it along Interstate 65 in Brentwood. As there's only one tower on the site, you can tell WSM is a non-directional station (see September 1995 American Bandscan).

mon there. Indeed, John placed a cellular phone call—and discovered he was working through a cell in Atlantic City, New Jersey, almost 300 miles away!

• A Florida FM DX target is increasing power. Martin Theil forwarded an item from the Tampa *Tribune* regarding the former big-band station WGUL 105.5. In March, WGUL moved to 96.1 and sold the 105.5 frequency to Citicasters, owners of WXTB 97.9 "98 Rock," who changed the format to classic rock and the call letters to WTBT. Now, the station's program director tells the paper WTBT has applied to increase power from 6,000 watts to 100,000. The station will also move its antenna to the WXTB tower.

• Among Harold Frodge's DX (see Skipping In) is a "WDAB" Chicago. Harold heard this station in late February relaying WFRL 1570 kHz from Freeport, Illinois. If you heard this experimental digital radio station, Harold says you can write Jeff Andrews, 332 South Michigan Avenue, Suite 605, Chicago IL 60604 for a QSL.

• A new technology blurs the distinction between radio and television. RBDS stands for "Radio Broadcast Data System," a system that transmits data along with an FM radio signal. This system has been in place in Europe for years, where it's known as RDS. A variety of text can be transmitted—traffic information, weather, emergency information, program schedules, even advertising.

Car radios can be set up to automatically turn on when emergency bulletins are transmitted. Also, stations can transmit a code for the type of music played. You could, upon arrival in a strange city, press a few buttons, and your radio would automatically switch to the strongest country music station.

The Electronic Industries Association is spending over $500,000 to install RBDS equipment at radio stations in the 25 largest U.S. cities. Stations equipped so far include WNYC, WNEW, and WHTZ in New York, KTWV in Los Angeles, and KYXY in San Diego. At this time, only FM stations can transmit RBDS data, but a scheme for AM RBDS is being developed.

• Local Marketing Agreements—LMAs—for separately-owned stations to carry each other's programming have become quite popular. These agreements almost always involve commercial stations. Now, an agreement between two non-commercial stations is proposed in Winona, Minnesota. Alan Masiga sent information on a proposal for KQAL 89.5 to receive some of its programming from WLSU 88.9 in La Crosse, Wisconsin.

Under the proposal, WLSU would provide National Public Radio programming to KQAL in return for KQAL's transmission of WLSU fund-raising drives. KQAL would receive 25% of money raised in the Winona area. The overall types of programming carried on KQAL wouldn't change much; the station currently airs news, classical music, and jazz during the day, and alternative rock at night.

As October continues, AM DX conditions will improve considerably. This is a good time to make sure your antenna and radio are in good shape, and your station references are up to date. And don't forget to send me your DX catches!

DX TEST BULLETIN

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.

Monday Oct 2 - KLZ-560, 2150 West 29th Avenue, Denver, CO 80222, will conduct a DX test 2-2:30am EDT. The test will include voice IDs, contemporary Christian music, and Morse code. Send receptions reports to: Mr. K.C. O'Brien, Chief Operator.

Thursday, Oct 2 - WOBL-1320, P.O. Box 277, Oberlin, OH 44074, will conduct a DX test 12-12:30am EDT. The test will include test tones and Morse code IDs. Send reception reports to: Mr. Tracey Liston, Chief Engineer.

Saturday, Oct 7 - WZEP-1460, P.O. Box 627, Defuniak Springs, FL 32433 will conduct a DX test 5-6:00am EDT. The test will include voice IDs, test tones, and Morse code IDs.Send reception reports to Mr. Art Dees, General Manager.

Monday, Oct 30 - KFAY-1030, P.O. Box 878, Fayetteville, AR 72702, will conduct a DX test 3-4:00am EST. The test will include Morse code IDs. Send reception reports to Mr. Andrew Stephens (KB5ZSV), Chief Engineer.

These tests were arranged by J.D. Stephens for the International Radio Club of America Courtesy Program Committee (P.O. Box 1831, Perris, CA 92572-1831, USA; 32 cent stamp (US$1 or 1 IRC overseas) for sample bulletin.

John Fulford, WA4VPY

Who's on What and Where ...

The federal government radio frequencies are not enforced by the Federal Communications Commission: They are allocated and enforced by the National Telecommunications and Information Administration, a branch of the Department of Commerce. The NTIA enforces the federal portion of the radio spectrum and also develops telecommunications policy for the executive branch of the government.

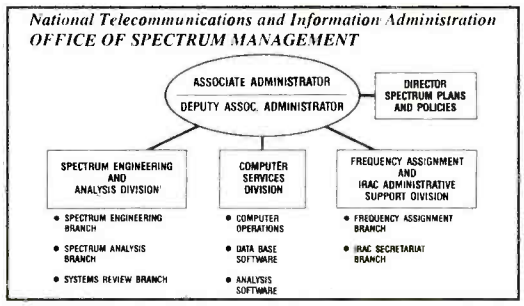
In 1993, Congress passed the Omnibus Budget Reconciliation Act. Title VI of this Act required the government to turn over 200 MHz of the spectrum—all below 6 GHz—to the private sector. With the development of new and emerging technologies, it was felt that more spectrum would be needed.

Three requirements were to be met before any frequencies could be reallocated. They were:

1. The frequencies must be allocated currently to the federal government.
2. The frequencies are not needed for present or immediate future needs.
3. The frequencies must be made available over the next 15 years

When the report was made available to the public on the final decisions of reallocation of frequencies, no mention was made of the 7 MHz used by the government between 30 and 50 MHz. There are some federal land mobile allocations in this range, particularly between 40 and 42 MHz. Most of the allocations are made to the military. Some of these are for land mobile military base and mobile units. Others are tactical military frequencies. As was mentioned in a previous column, the military uses backpack radios in the 30 to 75 MHz range. These are generally low power allocations, with mobile units running less than 50 watts and the backpack units running less than 5 watts.

The NTIA decided that the best portion of the spectrum to carve up would be above 75 MHz. It was decided that any spectrum had to be at least 2 MHz wide for any new service. They further went on to say that a small slice of the spectrum would be useless for new technology, but if this 2 MHz was next to an existing federal assignment, it would allow this expansion to happen.



And who's going to move ...

The first segment of spectrum which is eligible under the above criteria would apply to the **74.8 to 75.2 MHz** range used for Instrument Landing Systems. However, these frequencies are used worldwide and are critical to aeronautical navigation.

The same is true of the **108 to 118 MHz** range, which is used by ILS (Instrument Landing Systems) and VOR (VHF Omnidirectional Range) systems. The range from **118 to 137 MHz** is used by government and private users for worldwide aeronautical voice communications. Therefore, any reallocation of this portion of the spectrum is out of the question.

A number of meteorological satellites operate in the **137 to 138 MHz** band. This portion of the band had been previously allocated for navigation satellites, and is safe from reallocation.

The band from **138 to 150.7625 MHz** is used extensively for land mobile and fixed base station use. This range is used almost exclusively by the military, except for 144.0 to 148.0 MHz which is allocated to the two-meter amateur band. As reported in previous columns, in the New York City area the FBI has also been heard in this portion of the spectrum using frequencies in the 150-151 MHz range.

Forty-eight Federal agencies are allocated to the **162 to 174 MHz** portion of the spectrum. The Department of Justice is the largest user of this range, with over 17,000 allocations, followed by Agriculture with over 9000, Treasury with 5000, FAA with 4000, and the Army with 3300.

As was stated in the report, the Federal government use of this band is essential. It meets a wide range of law enforcement and administrative two-way radio needs. With a high investment in this band, and with no alternative portions of the spectrum available, this portion of the band is safe.

The range of **216 to 220 MHz** is shared by the Government and civilians for low power telemetry and wildlife tracking. In the Southeast and Southwest there is an extensive fence radiating upward, looking for anything coming from space back into our atmosphere. This fence was designed for tracking incoming rockets in the event of a hostile attack, but now it is also used for looking for "objects" coming in from outer space.

Also in use in this range is non-Government marine use along the Mississippi river, plus some broadcast services.

As mentioned in previous columns, the Federal government has access to the private land mobile channels in the **220 to 222 MHz** band. The Federal government will fit in right alongside the civilian, two-way users of this new band.

225 to 400 MHz is used widely by the military. The segment of 328.6 to 335.4 MHz is used for ILS glide slope transmitters. The FAA operates over 1000 transmitters in this band. Numerous military functions, such as airborne, sea, and land-based exercises use this band. Most military satellite downlinks are in the 240-270 MHz range.

The Department of Defense calls the 225-400 MHz band the most critical part of the radio spectrum. There are over 23,000 allocations, so any reallocation of any portion of this band would cause major disruption. Scratch this from the list.

The range of **400 to 402 MHz** is used for space research, with the range of 400.15 to 401.0 allocated to the satellite service. The range of **402 to 406 MHz** will see increased use, including some wind profile radar, which is currently allocated to the 449 MHz range.

The **406.1 to 420 MHz** range is Federal Government land mobile, with 47 federal agencies using this range. No potential for reallocation here.

The range of **420-450 MHz** is allocated to the Federal Government for radiolocation use and for some high power, long range, radar systems critical to national defense. This portion is also shared with the Amateur Service. Congress thought it best to leave this range alone.

The range of **902 to 928 MHz** is a catch-all range, shared by a number of services. These include Part 18 industrial, scientific and medical (ISM), diathermy machines, industrial ovens, cordless phones, and many others. The FCC has allocated the Automotive Vehicle Monitoring Systems there. The Teletrac Company uses a number of frequencies in major metro areas. The Amateur Radio Service is also found there, along with the Federal Government. The U.S. Navy is the biggest user, with shipboard radar in the 890-960 MHz range. Congress will leave this band alone, also.

The range of **932 to 935 and 941 to 944 MHz** is shared with the Private Radio service. The FAA and the Department of Agriculture are major users, along with the Department of Energy. The latest CD-ROMs that provide frequency range information show new allocations for the Federal Government in this range. Congress will leave this band alone. The range of **960-1215 MHz** is used for airborne transponders and distance-measuring VOR stations. It also is used by the military for TACAN operations and the AWACS military frequency hopping systems. It is left alone also.

The band of **1215 to 1240 MHz** is used for Global Positioning Systems. The entire range of 1240 to 1400 MHz is used for long range radars of various types. The band of **1240-1300 MHz** is allocated to the Amateur Radio Service.

Three frequency ranges were determined to be critical for national defense. They are:

A. **1240-1400 MHz**
B. **3100-3600 MHz**
C. **1240-1350 MHz**

In the range of 1240-1350 MHz, the Air Force and FAA operate long range surveillance radar systems. The frequency of 1381.05 is used by the Department of Defense for downlinks from the Nuclear Detonation Detection System satellites.

The range of **1370 to 1400 MHz** will be reallocated to the private sector, but not until January 1, 1999. This will give time to provide protection to adjacent bands, including the **1400-1427 MHz** radio astronomy band. The reallocation of this radio astronomy band will not occur—the worldwide scientific community would be in an uproar.

The range of **1427-1435 MHz** is used by the military, both for tactical radio relay systems and airborne telemetry, generally at test ranges. The range of 1427-1432 MHz will be given to the private sector in 1999, reserving 1432-1435 MHz for use at certain military bases.

The bands of **1435-1525 and 2360-2390 MHz** are used by Government agencies and their contractors for flight test telemetry. The segments from **1525-1530 and 2310-2360 MHz** will be reallocated to the private sector.

The range of **1670 to 1710 MHz** is for meteorological aids, with GOES operating at 1680. The range of 1670 to 1675 MHz will be given to private use.

The range of **1710 to 1990 MHz** is used for a multitude of point-to-point fixed links of Government agencies. The range of 1761-1842 is for Space use. The Department of Justice has some interesting point-to-point links in the above region; look/listen for them in large cities. Reallocation of this band to higher frequency ranges would be cost-prohibitive. There will be mixed use from 1710-1755 MHz, but not until the year 2004.

The range of **2200 to 2300 MHz** is critical for Space operations and Federal Space programs. The range of **2300 to 2310 MHz** is for low power radar test systems. NASA has deep space operations in the range of 2290-2300. This band is safe.

The range of **2390 to 2400 MHz** is also used for radar test systems. The Budget Act requires the first 50 MHz be turned over to public use immediately. The same for 2402-2417 MHz also.

The band of **2400 to 2450 MHz** is shared with Amateur and ISM service, with amateur satellite use at 2400-2402. Microwave ovens operate at 2450 MHz, and this is the greatest obstacle to the reallocation of this section of the band.

The band of **2700 to 3100 MHz** is used by aircraft and maritime radars. The range of **4200 to 4400 MHz** is used by airborne radar altimeters. These bands are safe.

The range of **3100 to 3600 MHz** is used by a wide assortment of radar systems, including AWACS and tethered balloon, drug interdiction systems.

The **3600-3700 MHz** range is used for shipboard radar. However, the 3650-3700 range will be given to public use. **4400-4990 MHz** is used for everything from troposcatter systems to point-to-point aeronautical telemetry. Worldwide military tactical users are numerous. The Navy LAMPS wideband ship-helicopter duplex system uses this range. The Department of Energy uses it for fixed links, and the Treasury Department makes use of these frequencies for their tethered balloon radar systems for drug interdiction.

The range of **4635-4685 MHz** range will be turned over to the public in 1997. The range of 4660-4685 MHz range is to be turned over to public use immediately.

So, what's left? Eliminating the protected ranges, it looks like the major reallocations will be in the 2390-2400, 2402-2417, and 4660-4685 MHz ranges.

Intercepts

We only have room for a few this month. A reader from Portland, Oregon, who wishes to remain anonymous, sends in the following FBI allocations:

FBI, Portland Area

Rptr Out	Rptr In	Channel
167.2125	163.6375	BRAVO 1&2
167.2875	162.7375	MAIN CHANNEL
167.5125	167.6375	also 167.2125 out
167.6125	163.8375	ALPHA 1&2 (TAC OPS)
167.7625	163.9625	MAIN CHANNEL

Portland Area, Miscellaneous

Frequency	Comments
170.925 and 170.875	Sheridan Correctional Facility
168.125 rptr out	APHIS--animal damage control
169.900 rptr in 169.625 165.850 rptr out	Air-to-air APHIS use Bonneville Power Admin
172.700 rptr in 419.975	Veterans Hospital maintenance
167.3375 simplex 163.8625 Delta-6	FBI, Vancouver FBI Channel--used by SWAT Teams

If you live on the East Coast and want a little thrill for Halloween, listen to the spooky sounds on 1711 kHz. I found it one night driving down a deserted I-95. I thought the mother ship was landing! The signal is part of the differential GPS system—probably in the vicinity of Mobile, Alabama, according to our direction-finding fix.

See you at the Grove Expo!

PLANE TALK

MAKING SENSE OF CIVILIAN AERONAUTICAL COMMUNICATIONS

Jean Baker, KIN9DD

Brush Up Your Basics

Welcome aboard! This month we are going to do an overview of our hobby for the beginning scanner (VHF) and shortwave (HF) monitors. We'll catch up with the intermediate and experienced listeners in future columns.

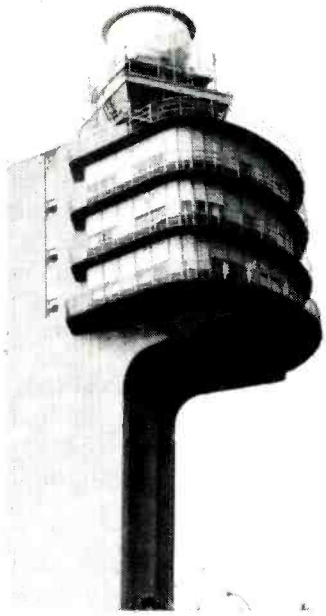
"Gearing" Up

Let's start off by going back to the very basics—buying your first shortwave receiver or scanner. It's not a wise choice to buy an expensive piece of equipment if you're just starting out as a monitor. Suppose you find out that this hobby isn't for you and you're really not interested in monitoring the air bands—or any type of radio transmissions for that matter; you've blown a lot of money for something you're not going to use.

For the beginning monitor, $150 to $375 will buy a very nice scanner or shortwave unit. Nowadays, most scanners and HF receivers come equipped with digital readouts, direct frequency entry, and anywhere from 10 to 1000 memories! There are many manufacturers that produce HF receivers and scanners that are ideal for newcomers to our hobby. Radio Shack, Bearcat, Sangean, and Sony are just a few of these. The Sony 2010 is distinctive because it receives both the VHF *and* HF aero bands!

When purchasing an HF receiver, remember that if you're going to monitor the aero bands, your equipment *must* be able to receive sideband transmissions. Almost all air\ground\air transmissions are in upper sideband (USB) on HF. So make sure that the set you purchase has sideband reception capabilities. You can check this by looking for a button or knob that says BFO (beat frequency oscillator) or SSB on the receiver. Without it, everything that's said will sound as if Alvin and the Chipmunks are talking.

There are only a few companies that make scanners which receive the VHF aero band exclusively; one of them is Sony (a handheld model). Most scanners that have the aero band also include other bands such as fire, police, ambulance, and other public services. So if your interest lies in monitoring the aero band only, you're going to have a bunch of other bands that you may never listen to. However, it wouldn't hurt to give some of the other bands a listen occasionally. Many monitors are also interested in other transmissions outside of the VHF aero band.



The Newark Air Traffic Control Tower, contributed by Bill Wolf.

I am not going to say too much about outdoor antennas as that's not my area of expertise. If you have questions about antennas, please write to *MT*'s antenna columnist Clem Small (**Antenna Topics**), or "Uncle" Skip Arey who writes **The Beginners Corner**. I will mention that indoor antennas, amplifiers, and preamps for the apartment dweller are easy to use, and Grove Enterprises, our parent company, has a great selection to choose from. In some instances, just a plain old length of wire will do. Some monitors are fortunate not to need any antenna except the extendable whip that comes with the scanner or HF rig! This will depend on where you live, however.

Finding the Frequencies

Well, now that you've gotten your receiver out of the box and plugged in—what next? For the VHF aero band, the savvy monitor will first contact his or her local air traffic facility (tower, tracon, center, or flight service station) and ask the air traffic manager for a list of frequencies used in their area. If you don't live close to an air traffic control (ATC) facility, please let me know and I'll locate the nearest one for you.

What will you hear on the VHF aero bands? Pilots communicating with ATC or their companies (frequencies from 128.850 through 132.000 megahertz are allocated to airlines and ARINC—a company providing phone patches and additional types of support for the airlines.). Depending on the location and distance from the ground transmitters, you may also hear the pilots *and* the controllers talking. Another interesting portion of the band is that used by flight service stations (122.100 - 123.000 MHz). Although FSSs are mostly utilized by private pilots, you'll hear commercial flights talking to them also.

Incidentally, the controllers at the tower handle flights taking off and landing; the Tracon (Terminal Radar Control) controllers take care of approach and departure; the Air Route Traffic Control Centers work the flights en route. Flight Service Station personnel give weather briefings, file flight plans, assist in finding missing aircraft, keep navaids in working order, etc. So if you're just starting out and already have obtained the local frequencies, enter them in to your station's memories and listen up!

Of course, you can always do a search scan on the VHF aero communications band which runs from 118.000 through 135.750 megahertz, but that can be frustrating if you don't know what facilities use which frequencies and have to stop scanning to wait until you hear either a pilot or controller identify it!

Mail order catalogs and electronic outlets also sell frequency guides. The only problem with using VHF frequency guides is that frequencies are changed so often these guides would have to be published every six months to keep current frequencies in print. Consequently, frequencies will sometimes be listed that are no longer in use, and their replacements will not be found.

Transmissions on the HF aero bands can be heard from 2.8 through 26 megahertz. As a new HF aero monitor, the best assistance you can have is a friend or acquaintance who already has some experience with monitoring HF aero transmissions. If you don't have someone who can walk you through the basics, remember, that's what Plane Talk is here for! Write to me with your questions any time. There are also frequency guides for HF aero monitoring (Grove's *Shortwave Directory* is

Aero communications operators on HF, contributed by David Eason.

one that comes to mind), and these may be easier to use than their VHF counterparts, as the freqs on the HF bands don't change half as often as do the ones on the VHF band.

A lot of factors come into play regarding monitoring the HF aero bands because how well you hear air/ground transmissions will depend on weather, sunspots, interference from electrical appliances, and other variables. When conditions are ideal and transmissions come in clearly, sometimes you'll monitor pilots talking with ground stations half a world away! They'll give position reports giving exactly where they are at that time, weather conditions aloft, location and time for the next position report, and other information. Just as you'll find on the VHF aero comms band, there are also frequencies that are allocated for aircraft to communicate with their companies, either directly or with the assistance of ARINC and other communication carriers.

To end this chapter on tips for monitors, remember that monitoring is a hobby and hobbies should be fun and interesting, not frustrating; it's the quality, not the quantity of monitoring, that makes it exciting.

Readers' Corner

Jack Tilson sends us a report on Baltimore/Washington International Airport's new observation deck. He says that it's a two-story indoor observation gallery in the center of the terminal. The gallery has a 147-foot wide wall of windows that look directly out onto the airfield. Comfortable lounge chairs and a restaurant face the windows on the second floor, and a children's play area faces them on the first level.

While the kiddies are checking out the airplane theme toys, adults can climb inside a flight simulator to do a mock landing of a plane at BWI. They can also touch the three-foot high wheels, nose cone, first class seats, tail fin, and other parts of a 737 that once belonged to the Baltimore Orioles.

Around an 88-foot curving wall are displays on the history of aviation, interactive computer screens give up-to-date weather and air traffic information. Last, but not least, a three-dimensional acrylic-and-glass model illustrates how the airspace around BWI is divided for various types of flying.

Naturally, there's also a place to shop. The Smithsonian Institute has 1,000 square feet for its first permanent gift shop outside its Washington museums. The shop sells aviation related items, including many of the same products featured in its Air and Space Museum gift shop. Baltimore, here I come!

Other airports are also starting to bring back the observation deck or lounge. Philadelphia International Airport has an architect looking at the feasibility of adding a viewing area to an expanded and renovated building that will connect Terminals B and C, used by USAir. The renovations are scheduled for completion in about two years.

One of the most recent—and dramatic—observation decks is in Frankfort (Germany) Airport's Terminal 2, used by Delta, USAir and British Airways among others. The outdoor deck runs most of the length of the 10-gate building. Frankfort's original building, now called Terminal 1, also has a large observation deck on its roof, as does Amsterdam's Schipol Airport.

Monitoring the Comics

Bob Bell, our correspondent from Australia, writes a column called "On the Airbands" for *Australian Aviation Magazine*. Bob says Dr. Stephen Downes contributed the following two stories:

After departing Sydney, Qantas Airlines #153 had just been passed to Brisbane Control. CONTROL: "Qantas 153, transmission check. Could you do a quick count for me?" QANTAS 153: "Eenie meenie minie mo, can you hear my radio? If it squeals, please let me know. Eenie meenie minie mo." CONTROL: (making absolutely no comment) ... "Qantas 153, reading you fives." (Five by five—perfect reception.)

Overheard at Houston Intercontinental Airport one morning some years back: TOWER: "Eastern 702, clear for takeoff." The aircraft commences its takeoff roll, gathers speed, reaches V1 and V2 and rotates out of the airfield. The pilot speaks with the Tower again. EASTERN 702: "Er...Tower, Eastern 702. We're switching to Departure right now, but thought you'd like to know, by the way...as we lifted off, we saw some kind of dead animal on the far end of the runway!" TOWER: "National 63, you're clear for takeoff, and did you copy those remarks from Eastern 702?" NATIONAL 63: "Roger, Tower, we're cleared for takeoff, and yes...we've already notified our caterers!"

Sick, . . .but funny! Here's one from my own collection. One morning on my scanner I overheard this exchange: CONTROLLER: "United 43, can you increase your airspeed as much as possible?" UNITED 43: "Affirmative—we'll flog the beast!"

This old story has been around for years: "From the guy in the plane to the gal in the tower, I'm ready to go—can I give 'er the power?" CONTROLLER: "To the guy in the plane from the gal in the glass, you have my permission, now give 'er the gas!"

That's all for now. If you have any funnies you'd like to contribute, send 'em in to Plane Talk. Next time we'll visit the San Francisco Air Traffic Control Tower, share more contributions from readers, and look at some HF and VHF aero frequencies.

Until then, 73 and out.

Ken Reitz, KS4ZR

The Ethnic Face of Satellite TV

Ever since Mongol nomads scampered across the frozen Bearing Strait and Norse sailors braved the black flies of the northeastern edge of this continent, we have been a nation of immigrants.

As always, for all of us, there's nothing like a letter from home to cheer things up—unless, of course, it's a television beam from home. Over the last few years ethnic programming has been widely available on virtually every satellite in our nook of the Clarke Belt.

An Early Start

Prior to the advent of cable and satellite technology, folks a long way from home had to rely on shortwave broadcasts, local low-power radio stations (if they were lucky), or reading week-old newspapers from the homeland.

A glance at a 1981 Westsat Satellite Channel Chart shows that even though there were only nine satellites in our skies—most with only a few channels—ethnic programming already abounded.

Among the first to transmit such programming were the Inuit of Canada's First Nation and Mexico's XEW-TV from Mexico City. Programmers such as Spanish International Network (SIN), Galavision, National Jewish Television (NJT), and Black Entertainment Network (BET) served a narrow audience niche largely ignored by the conventional entertainment networks.

The Current View

Today's technology has kept up with the growing audience of immigrants, and now dozens of channels provide an abundance of programming in many languages. Some of these services are subscription regulars on big city cable systems, while others are hoping to reach their target directly via satellite.

Continuous feeds from Russia, Portugal, the Philippines, Dubai, and South America are found on both C and Ku bands. Daily feeds of programming for America's burgeoning Asian population can be found as well. English-speaking viewers will be delighted with the chance to watch movies from these various cultures with English subtitles. It's a great way to learn about the history and customs of recent arrivals.

Marketing Choices

Programmers are eager to provide native language programming to today's immigrants because it represents a substantial marketing opportunity. Ads on these services will help pave the way for expanded future services.

Right now, programmers are experimenting with various ways to reach the target audience. The first is cable TV. Pockets of particular ethnic peoples can be reached relatively cheaply by convincing cable companies in cities of such populations to carry the programming.

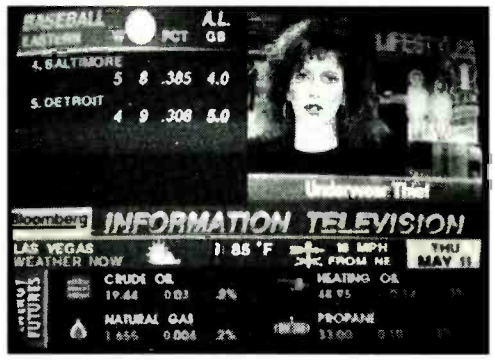
Others are hoping to reach individual households directly via small dish Ku band systems. Programming may or may not be encrypted depending on estimates of purchasing ability.

At this point ethnic programming is not a part of either DirecTV or Primestar's line-up and there is no indication that either will pursue this audience. It's clear that the first one up with the programming will see a surge in new subscribers.

Transponder Notes

• For many years the BBC has maintained a feed intended for Australia, and throughout the years I've followed them dutifully from bird to bird and transponder to transponder, always letting my readers in on the fun. This past winter they were also feeding the BBC Breakfast News on two channels and, again, I dutifully set my VCR to record the program at 3:00 am to watch the following morning. At the end of June both feeds apparently disappeared. Just as my agony had reached its depths I stumbled upon a feed of the BBC World. This 45-minute feed is found on Anik E2 (107.3 degrees West) channel 15 from about 8:50 am (ET) to 9:30 am (ET). This is a direct feed for Fuji TV from Panamsat with the English at 6.20 MHz and a Japanese translation on 6.80 MHz.

• Those who have watched the Bloomberg Business Report mornings on PBS (which replaced AM Weather after a 17 year run) will be thrilled to catch their afternoon act on the Ku side of T401. The photo on this page of "Bloomberg Information Television" is the best example I've ever seen of info-glut.



An example of info-glut from Bloomberg Business Report

Here the screen is divided into odd-shaped slices, and information scrolls, flashes, or crawls to your attention. We even get an inset newsprogram with its own captions and insets. In this picture, an earnest news presenter is giving us the scoop on an underwear thief. BBC World should be running scared.

• Those of you with sharp memories or who keep your back issues of *MT* will recall that, in the June 1994 issue of this column, I said, "...General Instrument is said to be pacing the DigiCipher I technology to be incorporated into TVRO receivers by the summer of 1995." DigiCipher is the system PBS uses to compress its various educational feeds and is used by a wide variety of other programmers in these times of dwindling transponder space.

A report on TVRO receivers in a recent trade journal states, "...The transition from VideoCipher to DigiCipher could take years." Once again, the real pace of progress is considerably longer than the pace of the press release. Meanwhile, you may look ahead to a new breed of receivers which have DBS reception circuitry built-in. According to another industry report, Uniden is now marketing its SQ-590 IRD which, in addition to being a full featured receiver, has a built-in SCPC receiver.

• NASA is putting more than $100 million into a project which will create two new satellites in its Small Satellite Technology Initiative. The two, which will forge ahead into the frontier of new space technology will be called, appropriately enough, Lewis and Clark. Launch date will be mid-1996.

• It was the best kept secret in the satellite industry: when would RCA's DSS DirecTV

A sports interview in any other language looks the same! Here a coach explains the outcome of a Russian soccer match as relayed by WMNB.

hit the one million unit mark? Even if sales never reached a million, 18 months after the introduction of DSS, Sony would be able to market its own version of the system. But, it was a rip-roaring success, and now Sony is poised to enter the fray.

I'll bet you thought this kind of capitalist competition would mean these DSS systems would become so cheap they'd be giving them away as premiums with the purchase of a TV. No chance! Sony plans to sell their units from $750-950. (Thanks to Richard Sklar of Seattle, WA, for that little tidbit.)

• The replacement dish for the National Radio Astronomy Observatory in Green Bank, WV, is nearing completion. The original 300-foot telescope collapsed in 1988. The new one, while the same size, will be considerably more sensitive. Why? Well, it's the same old cliche I've babbled about in this column for the last seven years: it's not the size but the accuracy of the surface that counts. The new dish surface will be comprised of 2,204 collection panels which will all be adjustable by laser-guided sensors.

So, how's DX? According to a newspaper report sent in by Rick Robinson, KB8JUI, "...it should be able to detect...molecules of water half-way across the known universe." Yeah, well, how about another example? Site director Jay Lockman is quoted as saying, "...The total amount of radio energy that's been collected by all radio telescopes wouldn't even light a tiny light bulb." Now that's QRP!

• Phase 3-D update: According to AMSAT "...the launch of Ariane 502, the mission on which Phase 3D is manifested, is now set for May 29, 1996. So, you hams start boning up on your AMSAT operating skills and you SWLers stand by for some new listening experiences. It's just six months away!

Mailbag

• Bill Perrelli, of Hamden, CT, notes that CNN Airport channel has been missing for some time from its longtime berth on GSTAR 2, 13. Well, Bill, we've said good bye to the Airport Channel in its analog form. Its new incarnation is found on Galaxy 4 channel 10 (Ku) in a digital mode via Scientific-Atlanta gear.

• Grant Manning, a TVRO dealer in Smithville, TN, wrote to correct my instructions on peaking in the July '95 issue. I meant to say "...adjust the declination" (instead of inclination).

If you're missing a channel or mystified by my inarticulation or just have something you'd like to know about this subject, I have a suggestion: write!

TABLE 1: Chart of Ethnic Programming

Service	Satellite	Channel	Notes
The International Channel	C1	20	VCII encrypted
Deutsche Welle TV	C4	5	VCII encrypted
Russian American TV	G4	12(Ku)	not encrypted
J-Satellite	G4	18(Ku)	Hong Kong not encrypted
The Filipino Channel	G4	24	Live from Manila encrypted
Asianet	SBS 6	13	India not encrypted
RAI USA	G3	7	Live from Rome unencrypted
Antenna Satellite	G3	9	Greece VCII encrypted
EDTV (Emirates Dubai TV)	G7	10	Live from Dubai unencrypted
La Carpa	G7	11	Religious from Puerto Rico unencrypted
La Cadena Del Milagro	G7	21	Spanish religious & variety
AATV (Asian American TV)	G7	12	Taiwan, Hong Kong, Singapore
TAN (The Asia Network)	G7	15	South Korea unencrypted
MTA (Muslim TV Ahmadiyya)	G7	16	From London unencrypted
Univision	S3	5	Spanish variety and news VCII encrypted
RTP Internacional	T302	9	From Portugal unencrypted
CCC (Chinese Com. Channel)	K2	8	Taiwan encrypted
ANA (Arab Network of Am.)	G6	10	Arabic unencrypted
TV Asia	G6	12	Variety programming from Asian VCII encrypted
Gems Television	S2	2	Entertainment for Hispanic women VCII
SUR	S2	4	Live from Argentina, Chile, & Peru VCII encrypted

Note: Does not include wild feeds, backhauls, sports or shopping channels aimed at various groups.

Kevin Carey, WB2QMY

A Trip to Newington

Radio wasn't always a game where you could order a brand new set from the factory, hook up an antenna and go on the air. There was a time when experimenters built every bit of their stations from scratch using huge spark coils, storage batteries, and as much wire as they could possibly get into the air. At that time, the shortwaves were considered useless for long range communication, so most serious work was being done on the longwaves.

Even the longwaves offered no guarantee of success, however. A spark station screaming along at a full kilowatt could achieve a range of only 100 miles or so, and that was when conditions were good. Something different had to be done if ranges were to be increased.

Hiram Percy Maxim, a Hartford inventor and pioneer ham operator, knew about the problem first hand. In the Spring of 1914 he attempted to reach a fellow ham in Springfield, MA, but was unsuccessful because of poor radio conditions. This particular contact was very important to him because the Springfield ham had a rare Audion tube for sale that Maxim needed to complete a receiver project.

Although Springfield was out of reach that night, he was able to raise a station halfway between Hartford and Springfield who could hear both cities well and offered to relay Maxim's message on to Springfield.

Now keep in mind, there was nothing new about relaying messages; it had been done before, especially among commercial stations. But there was no formal procedure in place to ensure that a given message would reach its destination in a timely manner. The next day Maxim thought about his contact and pondered how amateur stations might be organized to form a nationwide network of relay stations. That day the idea for the American Radio Relay League (ARRL) was born.

Maxim organized his thoughts and took his idea straight to the Radio Club of Hartford, which agreed to oversee the formation of the new League. The first officers of the ARRL were: Hiram Percy Maxim (Chairman), Clarence D. Tuska (Secretary), and Lawrence A. Howad (Counsel).

Rigid guidelines had to be met before a ham could be appointed as an Official Relay station. Applicants were asked several questions about their stations and their operating skills: "Do you obtain your power from batteries or city current?" "Is your spark gap Rotary, Fixed Gap, or Quenched?" "What tone is your spark?" "What is your approximate wavelength?" "How many words-per-minute can you receive with certainty? "How long is your Aerial?" and so on. Over 200 Relay Stations were appointed by the summer of 1914. Though still in its infancy, the League was clearly a success.

Photo of Spark Xmtr at ARRL.

The League Today

The League is still going strong from its headquarters in Newington, CT, just outside of Hartford. It is the largest organization representing the legislative, technical, and publishing interests of amateur radio operators.

In June, I visited the League in person—something I'd been wanting to do since first becoming a ham in 1977. Upon arriving I was greeted by Station Operator Al Alvareztorres (AA1DO). He explained a little bit of history about the League and then gave me a complete tour of the ARRL station. He showed me the Harris radios that are used to broadcast the League bulletins, the operating studios where visiting hams can go on the air, and then the best part (for me at least)—a view of Hiram Percy Maxim's personal longwave transmitter which is nicknamed "Old Betsy." (See Photo 1.)

Old Betsy is on display in the lobby of the building and is accompanied by a framed *QST* write-up describing its construction. It is a beautiful example of early wireless gear. According to Al, the transmitter used to be fired up from time to time, but its powerful spark signals wiped out some computers in the building and the practice had to be stopped!

As I gazed at the transmitter, I imagined the excitement that must have been present on the night that Maxim set out to contact Springfield.

I ended my visit as a guest operator of W1AW, the League's station. With just one CQ call, three stations responded, and I had one of the most enjoyable operating sessions I can remember. If you're in the Hartford area, be sure to stop by the League. It's a trip you won't regret.

If You Go ...

The American Radio Relay League is located at 225 Main Street, Newington, CT. Visiting hours for the W1AW station are as follows: Mondays 1pm to 1am, Tuesday through Friday 9am to 1am, Saturday 1pm to 1am, and Sunday from 3:30pm to 1am. FCC licensed amateurs may operate the station from 1 to 4pm Monday through Saturday. If you wish to operate, be sure to bring your current FCC license (or a photocopy).

The headquarters building is directly across from the W1AW station, and includes ARRL administrative offices, technical operations, and an amateur radio museum. Tours

ARRL Station Operator, Al Alvareztorres (AA1DO) demonstrating Hiram Percy Maxim's Personal Transmitter.

of the headquarters building are available on weekdays during business hours.

No GPS Required

"Beacons Led Man to Plane Door" was the title of a Chicago *Sun-Times* article sent in by Bill Hassig (IL). According to the article, when the 400 pound door blew off an American Eagle jet shortly after takeoff, nobody knew where it had landed; that is, until Paul Masching showed up with his beacon receiver.

Masching located the door in less than 90 minutes. He used beacon signals marking the air routes around the airport to trace the path of the plane. Then he conducted a ground search. While walking through the woods, he spotted the white door sticking out of the Des Plaines River. The National Transportation Safety Board (NTSB) credited Masching with the find, and is continuing to investigate the incident.

TABLE 1: Selected Loggings

FREQ.	ID	LOCATION	BY
198	DIW	Dixon, NC	A.H. (RI)
216	CLB	Wilmington, NC	A.H. (RI)
227	SJY	San Jacinto, CA	D.T. (CA)
289	MR	Marina del Ray, CA	D.T. (CA)
292	DP	Dana Point, CA	D.T. (CA)
300	UGT	Guantanamo, Cuba	A.H. (RI)
305	ONO	Ontario, OR	D.T. (CA)
323	BSD	David's Head, Bermuda	A.H. (RI)
326	MCY	Desert Rock, NV	D.T. (CA)
338	DE	Detroit, MI	A.H. (RI)
356	PB	West Palm Beach, FL	A.H. (RI)
360	KIN	Kingston, Jamaica	A.H. (RI)
365	FT	Ft. Worth, TX	D.T. (CA)
367	HA	Hao Atoll, Fr. Polenesia	D.T. (CA)
368	ZP	Moresby Island, BC	D.T. (CA)
370	UCM	Camaguey, Cuba	A.H. (RI)
382	UPA	Punta Algre, Cuba	A.H. (RI)
394	ENZ	Nogales, AZ	D.T. (CA)
397	LLJ	Challis, ID	D.T. (CA)
400	PTD	Pottsdam, NY	A.H. (RI)
403	R	Toronto, ONT	A.H. (RI)
406	FLR	Fall River, MA	A.H. (RI)
407	ISS	Wiscassett, ME	A.H. (RI)
411	RD	Redmond, OR	D.T. (CA)
412	CTZ	Clinton, NC	A.H. (RI)
413	OEG	Eagle, AZ	D.T. (CA)
414	PYD*	Unidentified Beacon	D.T. (CA)
415	IEE	Platform Irene, CA	D.T. (CA)
416	BKL	Cleveland, OH	A.H. (RI)
417	HQT	Coats, NC	A.H. (RI)
423	OC	Ocala, FL	A.H. (RI)
426	FTP	Ft. Payne, AL	A.H. (RI)
428	EEJ	Sanford, NC	A.H. (RI)
521	INE	Missoula, MT	D.T. (CA)
526	RWE	Camp Roberts, CA	D.T. (CA)
526	ZLS	Stella Maris, Bahamas	A.H. (RI)

* Reception reports or directional bearings on this beacon can be sent to Below 500 kHz, P.O. Box 98, Brasstown, NC 28902.

Notes and Loggings

This month's loggings are from two veteran DXers: Don Tomkinson (CA) and Al Hemmalin (RI). There wasn't room to include all of their loggings, but Table 1 shows a representative sample of the best DX and stateside catches. PYD (414 kHz) is still an unidentified catch. Many listeners on or near the West Coast have reported this beacon over the past year, but so far its location has eluded everyone.

I would be interested in receiving any reception reports or directional bearings (no matter how coarse) on PYD. By plotting the signal strength information from several listeners, and any directional coordinates, we may be able to pin this one down.

If you cut back on your monitoring because of summer noise, now might be a good time to take another spin through the band. Also, the cooler weather generally brings more activity among experimenters in the 160 to 190 kHz license-free band, so be sure to include these frequencies in your plan.

As always, I would enjoy hearing from you with your news, loggings, or questions. You can drop me a line c/o Monitoring Times, or, if you prefer, you can reach me on the Internet at: koc@mdsroc. That's it for now. In November, we ll take a look at a high performance receiving antenna made by LF Engineering.

Ike Kerschner, N3IK

Six Meter FM

The summer of 1995 saw a tremendous up-surge of interest in six meter FM activity. It was possible to turn up a contact on a simplex channel nearly at will. For the most part, contacts were solid with many openings lasting several hours.

This renewed interest in six meter FM was sparked by the large number of No Code Technicians coming into our ranks and looking for new and interesting areas of the hobby. Several manufacturers recognized the potential of this interest and began producing gear for six meter FM (at last!).

Having Fun on Six FM

You do not need a lot of power or large antennas to have a good time with six meter FM; a simple 5 to 10 watt rig and quarterwave vertical will provide you with many contacts and lots of fun when the band is open. Average simplex range will be on the order of 50 to 75 miles, and repeater ranges of 200 miles or more are possible.

Improved results can be had by using directional gain antennas. Use of a two element quad enables me to regularly work simplex stations well over a hundred miles from a very average QTH.

An activity I enjoy a lot is mountain topping. From a high location, using my regular mobile rig, I search the band for contacts. A good, high location will greatly extend your normal operating range even with a simple antenna. When I have the time I take my two-element, portable, six meter quad (a forthcoming construction project in this column), and mount it on two 10-foot TV masts and DX from my favorite mountaintop QTH. What a blast—usually I become the rare DX that everyone is trying to work!

After becoming active on six FM, you will find many activities worth looking into. For example, packet radio is becoming a lot more common on the band, and a few hardy souls are exchanging photos via slow scan TV (SSTV) on six FM. SSTV is a really great activity that does not cost a lot of money to get into (50 bucks or so—more on this at a later date as well). Of course, DXing, award hunting, and rag chewing are all here, too. Just for kicks, why not try SIX?!

The ALINCO DR-MO6

In the spring of 1995, I purchased an ALINCO DR-MO6 six meter FM transceiver. My desire for this particular piece of equipment was spurred by the unit's 100 memory channels, plus my prior experiences with ALINCO equipment.

The Alinco DR-M06

100 memories allows me to check all of the simplex frequencies and a large number of repeaters in short order. With 100 memories you can program frequencies popular in various parts of the country, thus increasing your chances of being alerted of an opening.

The receiver section in this rig is excellent; sensitivity is claimed to be 12dB SINAD, which seems to be verified by its performance. The receiver did outperform a very expensive, multi-mode, six meter rig in every case on FM, hearing stations that the multi-kilobuck rig was unable to receive. The antenna used for the test was a quarterwave Lakeview ground plane mounted at 25 feet.

Transmitter power at 52 MHz into 50 ohms was exactly one watt on low power and 12.8 watts on high, when measured with a Bird wattmeter. Audio output is 2.5 watts and more than adequate even for my tin ears. Frequency resolution is switchable from 5, 10, 12.5, 15, 20 or 25 kHz steps.

Operation

My initial operating test was with the 25 foot high, ground plane antenna. Simplex stations were easily worked locally (25 to 35 miles). Subsequent test periods with the same antenna produced contacts out to 2000 miles with excellent signal reports. When mobile with a Lakeview quarterwave mobile antenna, both local and DX stations were worked, all reporting excellent reception.

I am very pleased with the performance of the DR-MO6 and recommend this rig to anyone searching for a top quality FM transceiver for six meters. The DR-MO6 is available from most ham dealers. The price is in the $450.00 range.

HF Activity

The last few months have been very interesting when it comes to propagation. Activity on the higher bands has been rather brisk, with lots of good DX on 20, 15, and 10. It appears we may be pulling out of the terrible conditions of early summer (sure hope so).

Drop me a card or note and let me know what has been happening at your QTH. Please address all correspondence to me at PO Box 98 in Brasstown, NC 28902. *Please note:* Do NOT use my call book QTH; it is no longer correct and mail addressed there will take longer to reach me. CU next month, 73 de Ike, N3IK.

Rob Leonard's Ham DX Tips

DXing is quite a bit like fishing. There is a peak season for it—though you can do it anytime—and that peak begins now! I hope you have checked all your equipment and are ready to throw your line in those DX waters. Like all good fishermen you'll need to know where "they are biting," and that's where we come in.

AUSTRALIA Special events station VI50PEACE will be active till October 31st to celebrate the end of World War II in the Pacific, using the following frequencies. CW: 1820, 3615, and 10150, as well as unannounced frequencies on 20,17,15,12, and 10 meters. SSB: 7058, 14215, 18120, 21195, 24945, and 28588 kHz. QSL requests should be sent to: Hervery Bay ARC, PO Box 829, Hervery Bay 4655, Queensland, Australia. A special commemorative certificate is available for $5 US to cover postage and printing fees. **BAHRAIN** A92MM (Adam, Box 116, Manama, Bahrain, Persian Gulf) has been active on 14180 to 14230 kHz SSB between 2100 and 0100 UTC daily. **BURKINA FASO** XT2CH has been on 14160 kHz SSB at 1930 UTC. QSL c/o American Embassy Burkina Faso, Department of State, Washington, DC 20521-2440. **COCOS ISLAND** TI9JJP (Jose Pastora, PO Box 330, 1000 San Jose, Costa Rica) plans to operate from here 4 to 20 October mostly SSB. Check the usual DX frequencies. **CONTESTS** The 28th and 29th will see the annual CQ (magazine) World Wide SSB DX contest. Hams everywhere work hams everywhere, though the object is also to work as many different countries and zones per band as possible. The bands are 160, 80, 40, 20, 15 and 10 meters only! The exchange is callsign, signal report, and CQ Zone number. **INDONESIA** YB2ARW is active daily on 20 meters (the exact frequency varies) starting at 1200 UTC. QSL to his manager, John Spoat Jr, PO Box 7009, Pasadena, CA 91109. **MONACO** I1YRL will operate 3A2/ in October, possibly near the CQ World Wide SSB contest. QSL to his home callsign Luc Glarey, Via San Martino 11, I-10091 Alpignano, Italy. **NETS** "The Central Alabama 2 meters Side Band Net" meets every Monday night at 9:30 pm Eastern Time (regardless of time changes) on 144.215 MHz. Net control is N4ION, Bill, in Grid Square EM-62. **NORTH KOREA** has been added to the DXCC countries list because of the July "demonstration" operation of P5/OH2AM, which, while only making 16 contacts, was the first legitimate amateur operation from this country. Noted DXer Marti Lane, OH2BH, has stated that a much longer operation has been scheduled for October and will probably be centered around the 15th of the month.

I hope you enjoy your "DX fishing," and remember: you don't have to throw the little ones back, you can keep each and every one you "catch." 73 de Rob

Watch this Space

Coming next month will be a regular column providing news briefs, surfing tips, and addresses, etc. of interest to the turned on and plugged in hobbyist. Send MT your internet questions (or e-mail to bill @grove.net) and join the adventure.

Don't Panic...

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

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

George Zeller

Is Chiapas Libre Active?

La Voz de Chiapas Libre has probably been the strangest clandestine radio story of 1995. Their maildrop operator and public advocate, Jay Murley, sends in some additional information on the station. Multiple Chiapas Libre postage stamps have been issued, which we picture this month. A first day cover issue for these stamps arrived at *Monitoring Times*. As stamp collectors know, rebel groups often issue their own postage stamps as they attempt to increase their political legitimacy.

Murley indicates that there are two means for contacting this anti-Mexican government station. Their full postal maildrop address is PO Box 434106, San Ysidro, CA 92143-4106. Alternatively, Jay's jaymurley@aol.com e-mail address works as a point of contact. As we pointed out in the May Outer Limits, Murley says that four reception reports have been verified for the station's irregular 41 meter operations from southern Mexico and northwestern Guatemala.

However, nobody (including Murley) has yet provided precise logging details for an actual shortwave broadcast that has been transmitted by Chiapas Libre. This has led some DXers to wonder if the station is really active. *MT* inquiries to Murley about actual station logging details have not yet been successful. Has anybody else heard this clandestine? Let us know.

Mexican rebels issue Chiapas Libre postage stamps.

Thanks go to Dave Schmidt of DE and Margaret Wendall of San Jose, CA who forwarded press clippings on Dunifer from the *Radio TechCheck* newsfax and *San Jose Mercury News*.

Radio Free Berkeley Fined

Radio Free Berkeley, a longtime Bay Area FM pirate, was fined $10,000 by the FCC on August 3 for unlicensed broadcasting. As noted in the April issue of *MT*, U.S. District Judge Claudia Wilken had previously refused to grant the FCC's request for an injunction prohibiting future broadcasts from the station. The FCC utilized Sections 301 and 303 of the Communications Act as its authority to issue the fine, as it usually does with busted pirates.

Station operator Steven Dunifer complained that he did not receive either a citation or warning before the FCC issued its $10,000 Notice of Apparent Liability. He also claims that the FCC violates his First Amendment free speech rights and various international agreements.

Nevertheless, the FCC issued a maximum fine in the incident, citing the "intentional nature" of Dunifer's unlicensed broadcasting.

SIO Codes

Basil Shelley of Blythe, CA, asks about the mysterious set of three numbers that appear within loggings printed by various pirate radio publications. These figures are the "SIO" code, an abbreviated version of the SINPO scheme. "S" stands for signal strength, "I" for interference, and "O" is an overall signal quality evaluation. All are listed on a 1 to 5 scale, with 1 being a weak unreadable signal and 5 being a local quality powerhouse signal. A "333" reading would be average signal quality with moderate interference, for instance. The numbers are useful for evaluating reception quality at a particular location.

Piraña Moves

Radio Piraña International Director Jorge R. Garcia writes in to report that this station has moved from its former European location to South America. Jorge reports that they plan to be active in lower sideband on their traditional 13950 kHz frequency, but he intends to experiment on 11410 kHz, 19 meters around 15013 or 15040 kHz, and perhaps other frequencies on 41, 48, and 60 meters. South American pirate activity has been fairly sparse in the past, but the 400 watt Piraña transmitter might make this continent more widely heard on the pirate bands. They use the Wuppertal maildrop address.

Black Book Address

We often have recommended Kirk Trummel's *Black Book* address list of hundreds of pirate and clandestine stations from throughout the world. However, the e-mail address to order a copy of this excellent list has changed suddenly since we printed it in August. A new ktrummel@mail.orion.org address can be used to order a copy of this extremely useful tabulation.

New ACE Publishers

A release from the Association of Clandestine radio Enthusiasts has announced that Yolanda Lewis and Scott Gentry of Illinois have assumed the publishing duties for *The ACE*, replacing Rob Keeney. However, the club's correspondence and subscription address remains with club President Kirk Baxter at PO Box 11201, Shawnee Mission, KS 66207.

For thirteen years *The ACE* has been the largest North American hobby club bulletin devoted to pirate and clandestine radio. Current annual subscription rates are $20 to the USA, $21 to Canada or Mexico, and $27 airmail elsewhere.

What We Are Hearing

Your pirate loggings are always welcome via PO Box 98, Brasstown, NC 28902. Maildrop addresses used by pirates reported this month include PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; PO Box 28413, Providence, RI 02908; PO Box 293, Merlin, Ontario N0P 1W0; c/o JRR, PO Box 39, Waterford City, Republic of Ireland; Postfach 220342, D-42373, Wuppertal, Germany; and 95 Ostra Porten 29, S-44254 Ytterby, Sweden. USA pirates require three mint stamps to defray return postage, with $1 US necessary for foreign addresses. Frequencies are in kHz, with times in UTC.

Altered States Radio- 6956 at 0045. William Hurt's odd shows produce QSL's in the "Dead Rock Stars" series, all of which picture deceased rock and roll musicians. Addr: Merlin. (Michael Prindle, New Suffolk, NY; J. C. Mello, North Scituate, RI; Dick Pearce, Brattleboro, VT)

Black Rider Radio- 6955 at 0030. Their music selections vary from rock to bluegrass to Louis Armstrong, and their signal seems to get out very well. Addr: Wellsville. (Jesse Rose, Hampton, VA; Barry Williams, Enterprise, AL; Prindle; Mello; Pearce)

Bullfrog Radio- 7416 at 0215. Dick submitted this one as unidentified, but this rocker proves that some stations are still using 41 meters for pirate transmissions, even in the evening. Addr: Wellsville. (Pearce)

Soldiers of the New Dalek Order (not Garlic) on the Voice of the Daleks QSL.

CSIC- 7413 at 0000. Longtime veteran broadcaster Pirate Rambo puts a Canadian spin on unlicensed broadcasting. He always uses the song "Psycho Chicken" at the beginning and end of shows, and every 50th correct reception report receives a genuine Rubber Chicken QSL. Addr: Blue Ridge Summit and Merlin. (Chris Lobdell, Tewksbury, MA; Mello; Pearce)

Down East Radio- 6956 at 2330. Oscar Guggins has a very consistent format. A standup comic with a New England accent always tells corny jokes with regional content before a laughing audience. Addr: Blue Ridge Summit. (Mello)

East Coast Music Radio- 6959 at 0100. This miscellaneous music station has been more active lately, often with a low power AM transmitter that makes it a good DX catch. Addr: Wellsville. (Lobdell)

Freedom 40- 6956 at 2345. We're still getting loggings from this one's mid-summer commemorative broadcast that celebrated 1994's "Shortwave Liberation" pirate marathon event. But, be advised that the station announced that it would not return to the air until July 1996, if then. Addr: Stoneham. (Rose; Pearce; Mello)

He Man Radio- 6956 at 0030. He Man's male advocacy format in upper sideband, "the manliest of all modes," has recently included rather frequent relays of commercial oldies rock station **WMJI** in Cleveland, OH. Addr: Blue Ridge Summit. (Mello; Prindle; Pearce)

JAZZ- 6956 at 0015. The programming on this one is accurately summarized in the call letters. If you like jazz music, then you'll like the station. Addr: Wellsville. (Scott Gentry, Matteson, IL)

Jolly Roger Radio International- 6955 at 0000. This Irish country-western Europirate should not be confused with the USA pirate that uses the same name, except that the North American station omits "Radio" from its name. Addr: Waterford City. (Mello)

KDED- 6955 at 0415. The "Voice of the Grateful Dead" always plays long rock tunes by this band, but lately they have mixed some comedy and sketches among the songs. They offer a new QSL card for correct reports. Addr: Wellsville. (Diane Mauer, Pulaski, WI; Rev. Dennis Myhand, Mercedes, TX; Mello; Williams; Rose; Prindle; direct from the station)

Key West Radio- 6955 at 0315. This new one was widely heard with tests during the late summer, which were long sketches from Firesign Theatre albums. Their bilingual announcer (English and Spanish) promised that they would return later this year. Addr: None, but said they would verify logs in *The ACE*. (George Zeller, Cleveland, OH)

KMCR- 6955 at 0315. West Coast DXers sometimes have trouble hearing pirates on the east coast, but Magic Mike of Magic Carpet Radio is heard much easier out west than it is in the rest of the country. Sometimes he provides identifications in CW Morse code. Addr: Blue Ridge Summit. (Shelley)

KTLA- 7415 at 1400. Here's a relative newcomer that always features an oldies rock format, spiced with genuine commercial advertising oldies from decades ago. Addr: Providence. (Prindle)

Northern Music Radio- 6955 at 0200. The Scandinavian teenage announcer on this Europirate has established a transmitting arrangement with Dick Pistek of the **North American Pirate Relay Service.** Addr: Ytterby. (Lobdell; Pearce)

Outlaw Radio- 6957 at 2330. Their 70's rock programming is supposed to be coming from high atop the FCC building in Washington, but the FCC has failed to confirm this. Addr: Providence. (Williams; Rose; Mello)

Radio Doomsday- 6957 at 0100. Basil heard Nemesis give an e-mail contact address that supplements this station's maildrop. Try "an260310@anon.penet.fi" that was announced as an anonymous means of message forwarding. Look at this log list; is there anybody who *didn't* hear them? Addr: Ytterby announced; Wellsville should work. (William Hassig, Mt. Prospect, IL; Rose; Shelley; Mello; Lobdell; Prindle; Mauer; Williams)

Radio Lollipop- 7415. Rob's report to this unusual children's programming pirate produced a "baby screaming into microphone: card signed by Boy Lollipop for a North American relay. Addr: Wuppertal. (Robert Ross, London, Ontario)

Radio Mindwebs- 7415 at 0100. Scott heard "radio from the 21st century" from this on multiple occasions recently. Addr: Wellsville. (Gentry)

Radio Mirage International- 6955 at 2315. North American relays of Europirate stations are increasingly common. The rock songs on this one come from the United Kingdom, but the announcer is German. Addr: Wuppertal. (Pearce; Prindle)

RBCN- 6955 at 0045. Radio Bob, perhaps tuning up for the October Grove Communications Expo in Atlanta, has been airing his elaborately produced and very funny comedy broadcasts. When this one is on, you're in for a treat. Addr: Atlanta. (Zeller)

Revolution Radio- 6954 at 0330. Voice announcements by this rock music station's male announcer are sometimes difficult to understand because of a heavy reverb effect in his voice. Basil had a good catch with an infrequent test from them. Addr: Blue Ridge Summit. (Shelley)

The Asylum- 6955 at 0400. Their announcer claims that his mental instability forces him to transmit pirate broadcasts. We just report the news in *MT*; we don't necessarily endorse it, hi. Addr: Blue Ridge Summit. (Shelley; Pearce)

The Free Hope Experience- 6956 at 0315. After a flurry of mid-summer broadcasts, this one has been less active lately. They feature strange programming including coverage of the aliens invading from space. Addr: None; said would verify logs in *The ACE* and *PiPa*. (Shelley; Myhand; Mello; Prindle; Pearce)

Up Against the Wall Radio- 6956 at 0115. Owlsley still programs 60's and 70's political protest rock music with a distinctive "oogah" horn interval signal, but he throws in satire material such as the "Newt (Gingrich) in Space" sketch, where NASA budget cuts mean that Mr. Speaker's oxygen supply is insufficient. Addr: Providence. (Prindle; Mauer; Pearce; Mello; Rose)

Voice of the Daleks- 6955 at 0100. Many DXers have now received the unusual QSL that we picture this month, showing soldiers of the "New Dalek Order." In case you missed the correction, this station was misidentified in the June *MT* as "Garlic," not the correct "Dalek." Addr: Wellsville. (Mello; Pearce; direct from the station)

WPMS- 7375. Rob reports that it took five months, but he received QSL #4 on a toilet paper roll from She-Woman's station for a report to Merlin. Addr: Obviously Merlin. (Ross)

WREC- 6956 at 0000. P. J. Sparx, now a veteran pirate broadcaster, usually programs a mix of rock music and comedy material. But, sometimes he relays shows from other pirate stations. Addr: Wellsville. (Pearce; Prindle; Mello)

WRFW- 6957 at 0245. Radio Free Wisconsin is active again with rock and reggae music combined with commentary on the current pirate scene. Addr: Blue Ridge Summit. (Pearce)

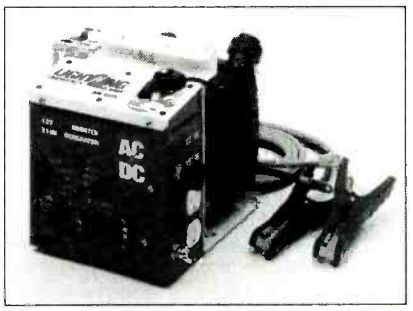
WHAT'S NEW?

BOOK REVIEWS AND NEW PRODUCTS

by Larry Miller

Guest reviewers: Bob Grove, Charles Lowrance, Lee Reynolds

Radio Power



Power. Everybody wants it. In the case of radios, everybody needs it—or the radio doesn't work. Sure, you've got a wall socket, but what happens when the power goes off? Or what happens when you're out at the airshow and the batteries in your handheld are drained? The action won't stop so you can go out to the drug store and pick up a fresh batch of double-A's.

Two different companies have come up with two different answers.

■ Power Pocket

Power Pocket is a small (3.5" x 1" x 6.5") rechargeable, 12 volt, sealed-cell, lead-acid battery. The "pocket" refers to the case in which the battery is held, not to where you carry it. The unit is worn on the belt next to your scanner. (The Power Pocket comes with a shoulder strap as well; at 30 ounces, some may find the weight slightly uncomfortable.) All you need to do is to get a cigarette lighter adapter cord—the kind used to plug your radio into the car dashboard—and plug one end into the power pocket and the other end into your radio.

The Power Pocket comes with a charger. Plug it into the wall for about six hours and in the morning you'll have 2.0 amp hours of back-up power. In most cases, that can work out to as much as six times the normal power of your scanner. According to the manufacturer, the life expectancy of the battery is three to five years and it's good for up to 1,200 cycles (at 30% rate of discharge).

The Power Pocket is available from Grove (1-800-438-8155), DX Radio Supply (1-800-753-2060, and other *MT* advertisers.

■ Mini Generator

Once a year, ham radio operators test their emergency communications readiness by conducting an event called "field day." During field day, hams leave behind the conveniences of home and rough it, trying to simulate conditions during an emergency. It's too bad that the radio monitoring hobby does not do the same thing. We could learn a lot.

Hams—and anyone who wants a reliable source of emergency power—now have access to what was once exclusive Defense Department technology. A company called Active Technologies Inc. (ATI) of Alamogordo, New Mexico, that once produced power systems for drone planes, has now unveiled a civilian sector product that'll find wide use in the hobby radio community.

The Lightning Emergency Power Generator is a 115V AC/12 and 24V DC unit that's about the same size and weight as a bowling ball. (By comparison the Onan generator that backs up my office is 800 pounds and about 1/4 the size of a Dodge Neon.) Power can be taken from the front panel of the unit by simply plugging appliances into a regular wall-type socket. The entire unit is powered by a 2 HP Tecumseh engine. Best of all, the Lightning Emergency Power Generator is affordable, just $489.85 (again, compare it to our Onan, which rings in at $4,000).

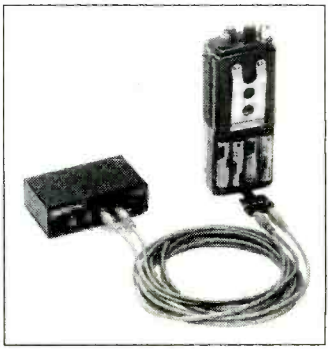
Check one of these units out. We've already had the unit cranking but we'll need more time for a formal evaluation. In the meantime, you can call ATI and request a free brochure. Their number is 800-545-5348. Be sure to mention *Monitoring Times*.

Computer Control from Opto

Proud owners of the PRO-2035 scanner can now computer control their radio with the Optoelectronics **OptoScan 535** board. According to the manufacturer, a PRO-2035 equipped with the PS535 scans faster than an ICOM R7100, AOR 8000, or any other scanner using computer control. It also makes operating the scanner a breeze, allowing unattended search and record.

The OS535 provides signal decoding of CTCSS tones, DCS codes, and DTMF characters. It's supported by software programs like Probe, ScanStar, Scancat, Scanner Ware for Windows, Radio Manager for Windows, and Wave for Mac. Suggested retail price is $299.

Opto has also announced the **CX12AR interface** for the AOR 8000, ICOM R7000, and R7100 receivers. The interface is the only converter with two operating modes, switchable between full and half duplex. Dedicated squelch status input is wired for high speed scanning and a software controlled tape recorder output lets you record what you hear.

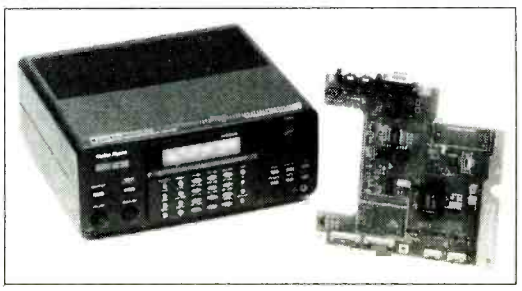


The CX12AR converts TTL serial interface signal levels compatible with most personal computers, and allows up to four different Opto devices equipped with serial ports to be connected to one computer port. You can also download Opto Scout memory into a PC with this device. In RS232 mode, the CX12AR can be used as a logging device for the M1 Frequency Counter. Suggested retail price is $99.

Both products are carried by Grove Enterprises Call 1-800-438-8155, or call (704) 837-7081 for more information.

Black Box Antenna

A few issues ago, *Monitoring Times* featured a "hands-on" comparison between two competing broadcast band loop antennas. The match-up pitted the long-time favorite, the Select-A-Tenna, against a new challenger, The Black Box Antenna. Both fighters were given a thorough work-out by DXer Stephen



Price. When the bell sounded, the Select-A-Tenna had won the bout—though not by much.

Last week, without fanfare, the all-new and improved Black Box Antenna appeared at our door. Sleeker than it was in the past, it now weighs in at a pound and a half, and measures 12-1/2 x 10 x 1-1/4 inches. And it does drag in those signals.

The actual Select-A-Tenna vs. Black Box rematch isn't scheduled for another few issues but we did have a chance to see The Black Box work out solo. We can tell you this; this is going to be a close one! Stay tuned!

The all-new Black Box Antenna for broadcast band DXing is available from Black Box Antenna, 14624 Deon Dr., Sonora, CA 95370 or call 1-800-99RADIO. The price is $63.95 plus $6.00 shipping.

One late note: Ron McClintock tells me that if you have one of his old Black Box Antennas, he'll upgrade you to a new version for just $35.00. All you have to do is send back the old antenna. Contact Ron for more information.

Computer-Aided Antennas

Sooner or later someone had to find a way to design antennas without going through laborious, hand drawn calculations. Now, Paragon Technology has created a software package using modeling techniques developed by a Pennsylvania State University engineer. Called NEC-WIN, the software promises to replace trial and error methods of calculation with quick, easy, point and click precision.

NEC-WIN works in three modes: expert, intermediate, or novice. Users can input their requirements and see a 3-D graphic view of the selected antenna. Output patterns can also be displayed, making antenna design an art, not an experiment. NEC-WIN is a Windows version of the company's NEC-OPT software released in 1994. For more information contact Penn State Department of Public Information, 312 Old Main, University Park, PA 16802-1504.

BIG Law Book

If you really, really wanted to know what was going on the in the new wireless technologies, it would probably take you a lifetime. Wireless has penetrated just about every service imaginable, from tracking to specialized mobile radio systems and radio paging. And with the new personal communications systems just around the corner, you can expect to hear about this more and more.

The *Spectrum Regulation Handbook* is a professional publication nearly two inches thick. In addition to an excellent introduction to the wireless services, the book is divided into five major sections: Cellular Radiotelephone, Personal Communications, Specialized Mobile, Radio Paging, and Spectrum Auctions and Regulatory Treatment. Each subject receives exhaustive but easy-to-understand treatment. Nothing—absolutely nothing—is left out. Read this book and you will truly be on the cutting edge of wireless regulation.

For those who have a need to know, this book offers unparalleled coverage of this new technology, focusing on the regulatory. To get your copy, call Business Research Publications at 800-822-6338. The price will keep the casual away: $695 postpaid. BRP's address is Box 675 Cooper Station, New York, NY 10276.

Inventor's Bulletin Board

Each year, over 100,000 new patents are granted to United States inventors. Unfortunately, as Jerry Widawsky, President of Fontel Foundation says, "there is presently no national forum where inventors on limited budgets can bring their inventions from inception to the marketplace."

Dr. Kazuo Hashimoto, father of the telephone answering system and holder of more than 1000 patents, has changed all that. Searching for a way to pay back the benefits given to him by the US patent system, Hashimoto teamed with Widawsky to found

Jerry Widawsky, President of Fontel Foundation; Dr. Hashimoto, holder of 1042 patents; and two students from NJIT.

MT REVIEW

Franklin Converter: A Wefax Converter Plus

By Charles Lowrance WA4MCK

Logic Limited has a great, low-cost converter that decodes the modes of most interest to hobbyists: weather facsimile (Wefax), slow scan TV (SSTV), radioteletype (RTTY), Morse code (CW), plus AMTOR ARQ/FEC, SITOR A/B, NAVTEX, and Packet. The converter comes in three configurations: the RWC1 receive only, the RTC1 Transmit only which plugs into the RWC1, and the RTB1 for both transmit and receive.

The system comes supplied with many different software programs, full instructions, and an easy-to-understand manual, frequency list, and set-up guide.

With your PC and a shortwave radio you can receive and transmit most of the above signals. The converter plugs between an audio output of your receiver and a serial port on your PC, and the software set-up is just as easy. The system will also work with other commercial software programs that deal with Wefax.

In our test the Franklin converter did produce excellent Wefax pictures from the HF Wefax signals, (though direct from the GEOS satellites was poor). It also copies RTTY, CW, and SSTV very well. The programs that come with the Converter make tuning a breeze with the built-in tuning scope.

In my opinion, this is a very good buy. I have not seen any other unit that will do all that this one will, at these prices.

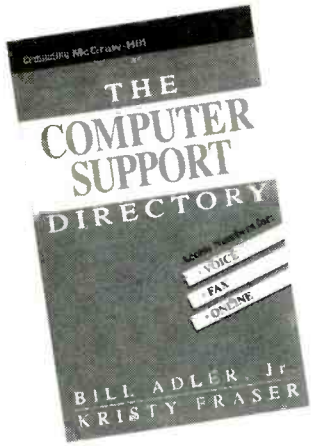
RWC1	$24.95	Receive only
RTC1	$24.95	Transmit plug-in unit for RCW1
RTB1	$49.95	Both receive and transmit with PTT (press to transmit)

For more information call Logic Limited (113 Cascade St., Morganton, NC 28655) Order line 800-439-8898; BBS/fax/ and tech support (704) 437-1833.

the Fontel Foundation. Linked with the New Jersey Institute of Technology, the Fontel Foundation has started an Inventor's Bulletin Board to assist inventors with technical, administrative, manufacturing, and marketing problems associated with developing new inventions.

The BBS can be reached by setting your modem at 8 data bits, 1 stop bit, and no parity, and dialing(201) 643-7219 or (908) 463-5434. The BBS supports modem speeds from 2400 to 9600 and is online continuously.

Computer Support



Where is help when you need it? That is a question we all ask while we struggle with a computer or software problem. *The Computer Support Directory*, by Bill Adler, Jr., and Kristy Fraser, is an attempt to provide fax, voice, and on-line support for computer users. Arranged alphabetically by company name, the book claims to contain listings "for virtually every major DOS and Windows application and hardware company." But when we attempted to find our first three choices—Gateway 2000, Western Digital, and Intel—they were all missing.

Nonetheless, the soft-cover directory does contain listings for a good 200 companies, making it a useful accessory for the computer library. *The Computer Support Directory* is $12.95 from book dealers and is published by McGraw-Hill.

— BG

Gordon West's Radio School

Searching for a radio telegraph course that will prepare you to pass the commercial first, second, or third class radiotelegraph test or any level of amateur radio exam? Gordon West's Radio School has what you need. West is now offering high-fidelity, long-play code cassettes on everything from learning the code to CW speed-building. West says "the commercial radio operator radiotelegraph license could fulfil the requirements of cruise ships and excursion boats needing trained operators."

Each course is $29.95 plus $5 postage and handling. West also offers an updated Advanced Class FCC license prep book covering all 582 Element 4A questions and answers for $11.95.

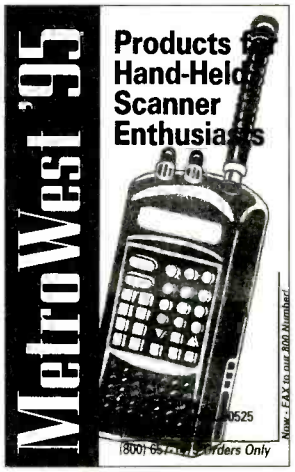
In addition, if you're teaching an amateur radio class or training sessions as an elmer, you'll like to know that West Radio School registered instructors get free materials from selected equipment and accessory manufacturers. Discount coupons, wall charts, certificates, and more are available for students. Training materials from the Radio School are also available at half-off retail prices.

For more information or to order any of these courses, contact Gordon West Radio School, 2414 College Drive, Costa Mesa, CA 92626.

Radio Talk Online

Log On USA, a radio talk show devoted to online computing, has made the jump and is itself going online. The program launched recently on the Internet World Wide Web and bills itself as the first, online, "desktop broadcast." The program's focus is the online lifestyle, discussing hundreds of ways that people can use a modem and the benefits they derive from the Internet and major online services. Log On USA can be found at http://www.LogOnUSA.com/logonusa.

MetroWest Catalog



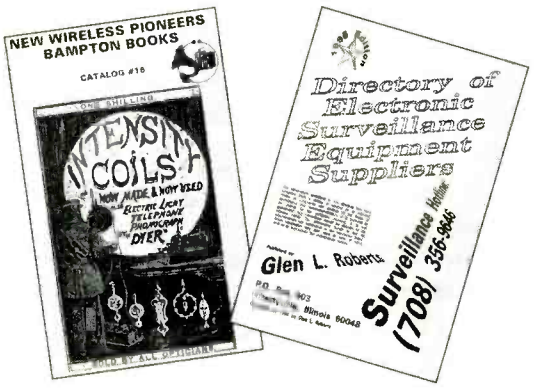
MetroWest has a catalog that caters primarily to handheld scanner enthusiasts. If you own a handheld, you owe it to yourself to get a copy. In its pages you'll find power chargers, high quality NiCds, shoulder speakers, scanners, antennas, external speakers, earphones, books, and even a scanner T-shirt. For your copy contact MetroWest at 822 LaGrange Park, IL 60525 or call (708) 354-2125. Tell 'em their friends at *MT* sent you!

More Catalogs

If your interest lies in antique electronics, "New Wireless Pioneers" is a book catalog which deals with original volumes from the late nineteenth and early twentieth century. Topics covered include electricity, broadcasting, amateur radio, biographies of early experimenters, wireless, television, telegraphy, telephony, radio, light bulbs, high voltage, and much more. Fun reading and very informative. Original copies run $10 to near $1000 depending upon rarity and condition. Write for "New Wireless Pioneers," Box 398, Elma, NY 14059; ph. 716-681-3186.

On another subject altogether, the "Directory of Electronic Surveillance Equipment Suppliers" is a 57-page sourcebook which lists alphabetically over 200 U.S. suppliers of privacy and security-related equipment, from audio and visual surveillance to countermeasures devices. Addresses and phone numbers are included. $9.95 postpaid from Glen L. Roberts, PO Box 903, Libertyville, IL 60048; ph. 708-356-9646.

— BG



Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 300 S. Hwy 64 West, Brasstown, NC 28902.

GRUNDIG Yacht Boy 400

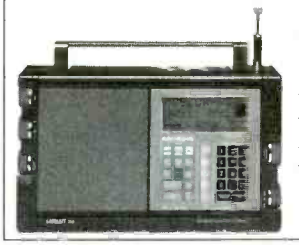
Now the award winning YB-400 at a very special price!

The Yacht Boy 400 is praised in the ***1994 Passport To World Band Radio*** as *"Best performance for price/size category ... right up there with the very best among world band radios."* ***Passport'95*** rates the YB-400 as *"The compact model most preferred by our panelist in Eastern North America and Europe for listening to major world band stations."* This radio has it all.

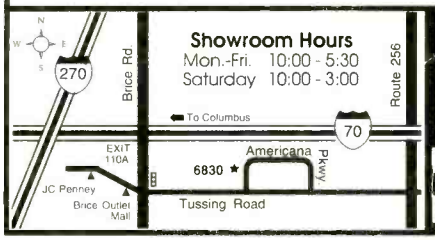
- AM/FM/LW and *continuous* shortwave coverage from 1.6 - 30 MHz.
- Super-accurate digital display (to 1 kHz on shortwave).
- Keypad entry for instantaneous tuning.
- Wide and narrow selectivity separates stations.
- 40 Presets with memory *or* band scanning.
- Excellent Single Side Band reception with fine tuning knob.
- The dual digital clock displays even when the radio is on.
- External jacks for: stereo earphone, 9 VDC or antenna input.
- Switches for Local/DX, S.S.B., Tone, and UP-DOWN tuning.
- Supplied with: six AA cells, case, stereo earplugs, wind-up antenna, *Owner's Manual* and *Grundig Shortwave Guide*.

■ **Yacht Boy 400** ***Factory Reconditioned***. Excellent like-new condition, same 1 yr. warranty, accessories, manuals etc. *#1704* ..... **$149.95** (+$6 UPS)

■ **Yacht Boy 400** ***New*** *#0040* ..... **$199.95** (+$6 UPS)



For the discriminating listener! Perhaps the most sophisticated portable available, the **Grundig Satellite 700** offers every high-technology feature along with exceptional audio fidelity and the most advanced memory system of *any* radio. Are you ready for the best? **$449.95** (+10 UPS)



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Accessories and learning aids for the new age of global communications

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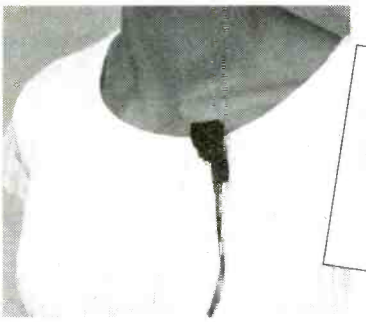
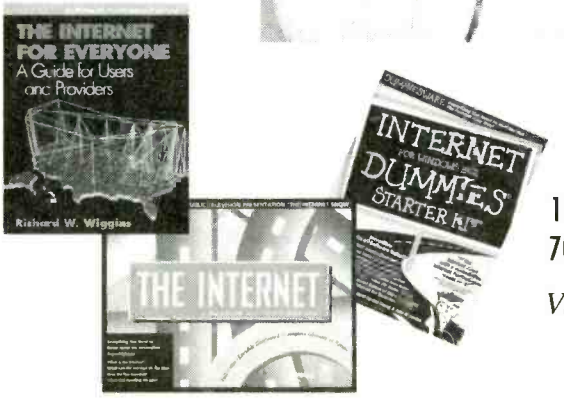
- **Sub-Compact Extension Speaker.** Perfect for computer audio/internet phone applications. Comes with 7-foot cord and 1/8" miniplug. Order SPK 14, only **$7.95** (free shipping!)
- **Clip-on Studio Mike.** Use for presentations, lecturing, tape recording and internet phone. Ten-foot cord with 1/8" plug. Order MIC 3, only **$19.95** plus $1.50 First Class Mail Shipping.
- **Surge Protectors.** Protect your delicate electronic equipment. Choose from single-outlet or six-outlet model. Order LAR 2 (single), only **$3.95** plus $1.50 First Class Mail Shipping. Order LAR 3 (six outlets), only **$4.95** plus $2.00 First Class Mail Shipping.
- ***The Internet for Windows for Dummies Starter Kit.*** Helps you get online fast and effectively. Order BOK 38, only **$39.95** plus $3.00 bookrate shipping.
- ***The Internet.*** An insightful look at the new "highway to the future"—and good reference book for beginners and intermediate level surfers. Order BOK 37, only **$24.95** plus $3.00 bookrate shipping.
- ***The Internet for Everyone.*** A guide for the more advanced user. Delves into the inner workings of networks and the internet. Order BOK 36, only **$19.95** plus $3.00 bookrate shipping.





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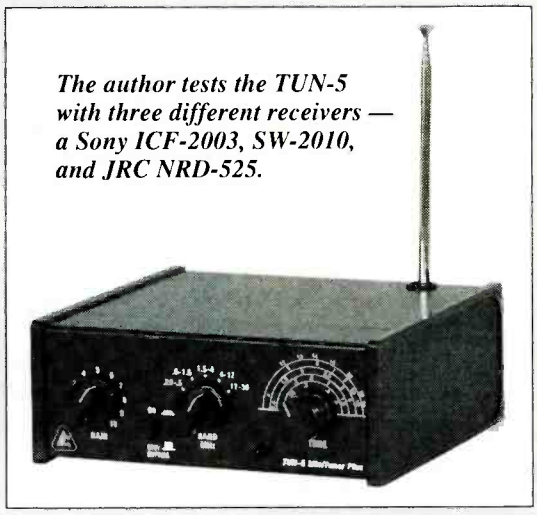
www.grove.net

Grove TUN-5

By Lee Reynolds

A wise man once said "There are lies, damned lies, and then there are benchmarks!" I'd like to change that last line to—"and then there are active antennas!"

Active antennas are much hyped, much maligned, and much misunderstood. An active antenna will not replace a halfway decent, random length wire, nor pull in those tiny South Pacific stations under most conditions. If you use an active antenna incorrectly it will produce all kinds of exotic (and unwanted) effects on your reception.



The author tests the TUN-5 with three different receivers — a Sony ICF-2003, SW-2010, and JRC NRD-525.

That said, an active antenna can be a godsend to the apartment dweller or anyone else that cannot erect any kind of real outside antenna. Run it with a short whip antenna or a short length of wire and it'll perform more than adequately for the broadcast band listener and reasonably well for the ham band and utility afficionados. Used with an inexpensive shortwave portable it will add an extra stage of selectivity to the front end of the radio, which helps block out strong signals that will otherwise overload the receiver. — In other words, if used wisely, the active antenna can be of great use to the listener.

Grove has a new entry in the AA field — the TUN-5. Measuring approximately 6" by 6-1/2" by 2-1/2", the TUN-5 is a modest and workmanlike device for the listening shack. The unit covers .29 to 30 MHz in five ranges with variable gain, runs on a 9V internal transistor battery or an external power supply (provided) and comes with a telescoping whip antenna. SO-239 connectors are provided for both the receiver and an external antenna. The front panel sports a bypass/power-on switch, power LED, gain control, band selector, and tuning control. Claimed gain is a maximum of 20dB (that's roughly 3 to 6 S-points, depending on how your receiver's S-meter is calibrated).

The specifications look good, but how did the device perform? The author tested the TUN-5 with three different receivers — a Sony ICF-2003, SW-2010, and JRC NRD-525. These three radios represent the low to high performance range. For fun, two antennas were used with the TUN-5 — the unit's own telescopic whip and a 7 MHz folded vee antenna. Another manufacturer's AA was also used for purposes of benchmarking.

The review unit arrived nicely packaged but lacking documentation (an oversight only). This was not a major issue, as setup and operation of the unit were easy to deduce. The TUN-5 has a case which is mostly metal but has plastic end plates. Cosmetically, these end plates look okay, but reduce the overall mechanical strength of the case and allow stray RF to more easily get into the amplifier's circuitry. This may be of concern to the hams amongst us. That aside, the unit looks good and the controls are well laid out and easily accessible.

Actual testing was carried out by comparing reception results on the three receivers at frequencies ranging from 500 kHz up to 17 MHz (not too much to receive above that frequency with the sunspot cycle at its present low!) and by switching antennas and observing the results. The other AA was also tested on the same signals to get an idea of how well the TUN-5 device performed in comparison.

As could have been predicted, the ICF-2003 benefitted most from the AA, the NRD-525, least. The gain of the TUN-5 was good across the entire range of its operations; some rolloff was noticed (as is to be expected) above 20 MHz. Tuning of the unit for maximum gain was simple and quite broad at lower frequencies, but became very sharp at the high end of the range. As is usual with a device of this type some false peaks were noticed when adjusting for best signal, but these can easily be identified with a little practice.

The TUN-5 did a very nice job of bringing signal levels up on all the frequencies it was used on. The noise level also increased but was offset by the improvement in signal audibility.

Using the telescopic whip the unit performed quite well on both broadcast and amateur bands. When connected to the 7 MHz antenna results were what you would expect — a tendency to overload unless gain was kept down to a reasonable level. Once that was done, the unit again did a credible job of amplifying the weaker signals. At the lower end, in the mediumwave broadcast band, careful use had to be made of the gain control whether using the whip or the 7 MHz antenna. Very strong signals at various points on the band would be amplified and mixed in with the signal that you were listening to if you used too much gain.

Some testing was made of the unit's ability to act as a preselector for lower end receivers by using it to suppress interference to weak signals by relatively close, much stronger signals. With very careful tweaking, a moderate improvement was possible which can be of great help when you're using an inexpensive radio with, say, 8 kHz wide ceramic filters.

Overall, the TUN-5 performed well, displaying the common strengths and weaknesses of this type of device. It offered slightly less gain than the comparison AA, but this is probably an advantage rather than disadvantage, particularly if you're any kind of broadcast band listener. As stated before, the plastic case components detract from the overall quality of the device but should not be viewed as a serious defect.

The TUN-5 performs well and is generally well designed. For the antenna-impaired individual it could be a very useful addition to the shack. At the recommended price of $99.95 it represents resonable value; if Grove were to drop the price a little it could represent excellent value.

BOB'S BARGAIN BIN

Bob's Bargain Bin
and Trade-Ins

Most equipment in **Bob's Bargain Bin** are demos and customer returns and have only slight cosmetic damage. **All equipment comes with a 30-day money-back guarantee (minus our shipping costs) from Grove and most equipment has the original manufacturer's warranty. UPS second day air shipping is included in the purchase.** Quantities limited.

ACC118D	STORAGE POUCH FOR INNOVA POWER PACK	9.95
ACC145D	POCKET BANKPACK 100A	7.95
ACC146D	POCKET BANKPACK 100B	10.95
BOK34D	DIRECTORY NORTH AMERICA MILITARY AVIATION, WESTERN	24.95
BOK59D	PROPAGATION PROGRAMS GUIDE	5.95
BOK63D	2ND ED. MONITOR AMERICA	19.95
CTR06LD	OPTO 3000A FREQUENCY COUNTER	289.95
RCV15D	SONY SW-55	309.95
SCN08	BEARCAT 855-XLT	169.95
SCN17D	PRO-43 (NON-RESTORABLE)	293.95
SCN31	PRO-62	229.95
UACC164	SCAN-STAR COMMERCIAL	109.95
UACC39	MFJ-1282B COMMODOR ADAPTER	19.95
UACC40A	MFJ-1289 HI-RES. ENHANCER 5 1/4"	31.95
UACC41	MFJ-5084 ICOM 8 PIN	6.95
UACC42	MFJ-5080 YAESU 8 PIN	6.95
UACC44	MFJ-5026 KENWOOD HT	6.95
UACC45	MFJ-5024 CABLE	6.95
UACC46	MFJ-5086 CABLE	6.95
UACC61	MFJ-1290 AMIGA ADAPTER	29.95
UACC95	AC ADAPTER, 1.2 VOLT	5.95
UANT07	SCANTENNA	35.95
UBOK10B	RADIO TECH MOD VOL. 6B	15.95
UBOK22	1994 POLICE CALL BOOK, VOL. 2	5.95
UBOK23	1994 POLICE CALL BOOK, VOL. 3	5.95
UBOK25	1994 POLICE CALL BOOK, VOL. 5	5.95
UBOK29	1994 POLICE CALL BOOK, VOL. 9	5.95
UBOK42	HIDDEN SIGNALS ON SATELLITE TV	14.95
UBOK50	3D. ED. WORLD HAM NET DIRECTORY	9.95
UCHT01	COLOR WALL FREQUENCY CHART	6.95
UCTR08	OPTO FREQUENCY SCOUT, VERSION 2	329.95
UDEM01	SOMERSET ELECTRONICS DEMOD. M100	150.95
UDEM01B	SOMERSET ELECTRONICS DEMODULATOR M100B (WITH BATTERY)	170.95
UDEM02	SOMERSET ELECTRONICS DEMOD. M200	220.95
UGP22	ICOM GPS	489.95
UPHN03	UNIDEN EXP-9100 CORDLESS PHONE	259.95
UPRE05	GROVE PREAMPLIFIER	85.95
URCV09S	SANGEAN ATS-818 (NO TAPE DECK)	189.95
URCV10	SONY ICF-SW-77	449.95
URCV11	SONY SW7600G (NO WHEEL ANTENNA)	184.95
URCV19	DRAKE SW-8	565.95
URCV19S	DRAKE SW-8 (NO DISPLAY BOX, MARKED MAN)	559.95
*USCN15-C	ICOM R-7100 (FULL COVERAGE RESTORED) LOOKS USED	1309.95
*USCN15-S	ICOM R-7100 (FULL COVERAGE RESTORED)	1329.95
USCN16	PRO-2026	189.95
USCN18	BEARCAT 8500-XLT	356.95
USCN23	SPORTCAT 150-XLT	179.95
USCN24	BEARCAT 220-XLT	209.95
USCN26	AR-3000A (CELLULAR RESTORED)	1069.95

USCN27S	AR-1000 (CELLULAR RESTORED/SCRATCHED)	579.95
USCN28	PRO-2035	359.95
USCN29	BEARCAT 3000-XLT	379.95
USCVR01	800-950 MHZ SCANNER CONVERTER	69.95
USFT02	SCAN-CAT GOLD	89.95
USPK11	NAVAL SPEAKER, HTS-3	31.95
USPK13	GROVE SOUND ENHANCER	229.95
UTST01	TRIFIELD ENVIRONMENTAL MONITOR	104.95
UVID100	9" CTR MONITOR	89.95
UVID200	9" CTR MONITOR	109.95

Trade-Ins

All trade-ins are thoroughly checked out by our technicians and have a 90-day Grove warranty and UPS second day air shipping included in the price.

TIN01	BEARCAT 100-XLT	149.95
TIN05	PRO-2035	385.95
TIN14	PRO-2035	359.95
TIN16	SONY SW-55	289.95
TIN17	PRO-62	199.95
*TIN23	ICOM R-100	629.95
TIN26	KENWOOD R-5000 W/INTERFACE/SSB FTR/ CW FTR/AMPLIFER	899.95
TIN27	REGENCY R-4030 (800 MHZ)	189.95
TIN28	SONY SW-7600 W/AC POWER SUPPLY	125.95
TIN31	ICOM R-72	594.95
TIN32	KENWOOD R-5000	648.95
TIN33	DRAKE R8 W/R8-PC SOFTWARE	898.95
TIN37	BEARCAT 100-XLT	178.95
TIN43	BEARCAT 140	64.95
TIN44	STARTEK MODEL 1350 FREQUENCY COUNTER	74.95
TIN45	SONY SW-30	99.95
TIN46	DRAKE R-8 W/R8 PC SOFTWARE	799.95
TIN47	BEARCAT 8500XLT	249.95
TIN48	BEARCAT 8500XLT	195.95
TIN51	PRO-2036	249.95
TIN54	REALISTIC DX-392	169.95
TIN55	BC-8500XLT	249.95
TIN56	ICOM R7100/ W/CT-17 INTERFACE (FULL COVERAGE)	1025.95
TIN57	FAIR MATE HP-2000 (LIKE AR-1000)	225.95
TIN58	SONY SW-77	399.95
TIN59	ICOM R-71A	895.95
TIN60	SONY SW-55	178.95
TIN61	AR-1000	228.95
TIN62	AR-2800	228.95

* = Note: Full Coverage Restored

Bob Parnass, AJ9S

The AOR AR2700 Portable Scanner

The AOR AR2700 handheld scanner is about the same size as the deluxe AR8000 but covers 500 kHz - 1300 MHz. AOR's US importer lent us a full-coverage AR2700, S/N 51143, for evaluation, although the cell phone band frequencies are deleted on the version marketed in the USA. Our AR2700 was delivered slightly misaligned—about 5 kHz off frequency at 900 MHz.

We tested it against a portable Uniden/Bearcat BC3000XLT, S/N 45000433. See April 1995 *MT* for a complete BC3000XLT review.

Lots of Features

The AR2700 has more features than we have space to explain. It is supplied with four NiCd AA batteries and a wall charger—a lineup many appreciate.

Users may select among AM, NFM, and WFM modes independent of frequency. Step sizes of 5, 6.25, 9, 10, 12.5, 20, 25, 30, 50, and 100 kHz are available in AM and NFM modes, but are restricted to 50 or 100 kHz in WFM mode.

The AR2700 contains 500 channels divided into 10 banks of 50 channels each. An adjustable rescan delay is global to all channels. A better scheme would be to have the delay selectable on a per-channel basis so one could scan a mixture of conventional simplex, two-frequency simplex, trunked, and other systems.

An adjustable pause timer is also global and can be enabled to force scanning to resume on busy channels after a 1 - 99 second pause.

One can key a frequency into the AR2700's VFO (variable frequency oscillator) without using an ordinary memory channel. Frequencies can be written from the VFO to any memory channel and vice-versa.

The top-mounted tuning knob is very convenient and missing on the BC3000XLT. It helped us uncover new frequencies on a recent dining/scanning trip to a riverboat casino operation. The tuning knob and UP and DOWN arrow keys can be used in several ways: to change the VFO frequency, to select a channel, to choose tuning step size, reception mode, and delay/pause times when used in conjunction with the associated keys.

There are 10 search banks and they can be linked together, permitting sequential searches of disparate frequency ranges—very impressive for a portable. As in the BC3000XLT, a total of 50 frequencies may be locked out of the AR2700 search.

A switchable attenuator may be programmed on or off with each memory channel. Although the attenuator is rated at 10 dB, we measured between 8 and 13 dB attenuation in the 72 - 940 MHz spectrum, which is more consistent than the BC3000XLT attenuator.

A built-in sleep timer can be used to turn off the AR2700 up to 120 minutes later. Internal voice recorder and speech inversion descrambler options are available, as are computer control and the ability to clone one AR2700 from another, but none of these options were furnished with our review unit.

Despite the large number of features, the AR2700 lacks Auto Store and Data Skip facilities.

Keypad and Display

Among the AR2700's strongest assets is the rich LCD display, which is large and fairly easy to read. Not only does it contain a nine-segment S-meter, but a three-segment battery voltmeter!

The rubberized keypad is translucent. Most keys have two labels: one printed on the keytop and another printed below the key. Placing the second label below rather than above the key is opposite to the keys on other scanners and computer keyboards, and makes hunting for the right key needlessly confusing.

Both display and keypad can be lit by green LEDs (light emitting diodes) for night viewing. It takes some work, though, as enabling the light is a two keystroke sequence.

Circuitry and Construction

The AR2700 employs triple-up conversion circuitry, but as Table 1 shows, the first and second IFs (intermediate frequencies) are different from the upscale AOR AR8000.

Unfortunately, the AR2700 uses a carrier-operated squelch rather than the more sensitive noise-operated squelch found in other scanners.

Most AR2700 circuitry is distributed among three large PCBs (printed circuit boards): one for keypad/display/logic, a second for RF and synthesizer, and a third for IF and AF circuits. A small board holds two side-mounted keys and a keypad lock switch. Layout is very clean, but there isn't much shielding. Surface-mount components are widely used, save for several coils in the front end.

The AR2700 has a simple, yet strong, metal belt clip which shames the breakable plastic clips on Uniden and Radio Shack counterparts.

Difficult to Use and Program

The programming keystroke sequences are complex and confusing, especially for those comfortable with Bearcat and Radio Shack models. By way of example, the SCAN key has five functions, depending on how many times it is pressed, whether it is held down, whether the side-mounted second F key (second function) is pressed first, and the whether the AR2700 is in search mode!

The 64-page user manual omits several specifications but does a commendable job of trying to explain AR2700 operation.

Heard Signals We Didn't Want

Our AR2700 had several birdies of the "dead carrier" variety, and the digital circuitry within the scanner interfered with reception in too many parts of the spectrum. The raspy, buzzing sounds, often 200 kHz wide, were especially troublesome in the 30 - 50 MHz range.

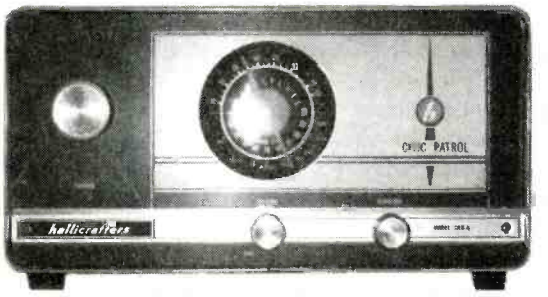
TABLE 1

Intermediate Frequencies (in MHz)

	AR2700	AR8000
1st IF	287.55	275.45
	749.25	736.25
2nd IF	58.05	45.05
3rd IF	10.7 (AM/WFM)	10.7 (AM/WFM)
	.455 (NFM)	.455 (NFM)

COLLECTOR'S CORNER

1965 vintage Hallicrafters CRX-4 Civic Patrol monitor receiver tuned 30 - 50 megacycles FM. Transformerless, it contained seven tubes and could be powered from 117 volts AC or DC. (Photos by Pam Parnass, N9HRZ)



Here is a sampling of birdies in the 30 - 50 MHz range strong enough to register two or more segments on the S-meter: 30.3, 30.45, 31.0 - 31.2, 34.21, 36.0, 36.53 - 36.8, 37.8, 39.1, 41.51 - 41.79, 43.2, 46.32 - 46.51, 48.0, 48.88. Consultation with another AR2700 owner confirmed that birdies were a problem in his scanner, too.

To explore the interference problem further, we used a small Sencore PL207 pickup loop probe connected to the antenna jack of an ICOM R7100 receiver. Moving the "sniffer" probe over various parts of the AR2700 case, we found radio frequency emissions leaking through the keypad, the strongest producing readings of S7 on the R7100 S-meter. We tried the same procedure on the BC3000XLT and the emissions were much weaker, S1 at most.

Although we restricted the emission test to the 30 - 50 MHz range, the internally-generated noise was a problem up through the VHF-high band. Also, our AR2700 heard television audio where it shouldn't: channels 35, 20, and 66 audio were heard on 853.4, 857.35, and 863.91 MHz, respectively.

Missed Signals We Wanted

Scanning with the AR2700 was a frustrating experience. The squelch had to be set tighter on several VHF-high band frequencies to avoid having the scan interrupted by the broadband birdies. The tighter setting, in combination with the stingy squelch action described later, forced the AR2700 to miss signals during a scan unless they were fairly strong.

Even after locking out the birdie frequencies and carefully readjusting the squelch to its most sensitive position, our AR2700 still skipped weaker signals.

We switched an outdoor Antenna Specialists AV-801 antenna back and forth between the AR2700 and our BC3000XLT while in manual mode. With the squelch completely open, our AR2700 was more sensitive in the 90, 162, and 460 MHz ranges, and slightly more sensitive in the 43 and 120 MHz ranges. Our BC3000XLT was more sensitive in the 855 MHz range.

We then set the squelch control on both scanners to the threshold point to silence the audio with no signal present. Except on the VHF-low band, the AR2700 squelch required a stronger signal to open than did the BC3000XLT.

We checked the squelch sensitivity of both scanners using an FM signal generator. In the 160 MHz range, the BC3000XLT squelch opened on signals of 0.3 microvolts, but the AR2700 wouldn't open unless signals were at least 0.4 microvolts. The AR2700 squelch became even stingier at higher frequencies. In the 460 MHz range, the BC3000XLT squelch opened on signals of 0.4 microvolts, but the AR2700 refused to open unless signals were at least 0.7 microvolts.

Once the squelch opened, our AR2700 heard the same signals with less noise than the BC3000XLT. That's consistent with our earlier sensitivity tests using an outdoor antenna.

The bottom line? Although our AR2700 was sensitive to weaker signals under lab conditions with squelch open, it skipped them during ordinary use—while scanning, searching, or sitting on a channel with the squelch closed. This is a consequence of using a carrier-operated squelch instead of a noise-operated squelch as mentioned earlier.

We spent little time using the AR2700 below 30 MHz. It was sensitive on shortwave frequencies, but the spectrum was overloaded by local broadcast stations when connected to a 132' dipole.

Decent Audio

The AR2700 audio was crisp and clear except for some distortion above 800 MHz, due, we believe, to being slightly off frequency. The speaker emitted a high frequency hiss even when the receiver was squelched.

The top panel is fitted with an old fashioned 1/8" monaural earphone jack which will feed audio to only one side of lightweight stereo headphones.

Current Consumption

The current consumption of our AR2700 was high but within reason. While scanning or stopped quietly, it drew about 100 mA, the same as the Radio Shack PRO-60 reviewed in September 1995 *MT*. We measured 75 mA drawn by the BC3000XLT and 88 mA by the PRO-62 reviewed in February. While receiving signals, consumption rose to the 100 - 130 mA range. The keypad and display light drew an additional 60 mA. We found no evidence of a battery saver circuit as contained in the PRO-62 and BC3000XLT. While turned off, our AR2700 consumed only 0.04 mA.

Summary

The AR-2700 incorporates a good set of features and options, but we found it difficult to program and manipulate. More importantly, our AR-2700 scanned and searched poorly because there was so much internally-generated noise, and the squelch opened only on moderately strong signals, missing transmissions we wanted to hear.

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

Aroma SED-ECL88C—A Real Little Stinker

Leaf through back issues of *MT*, and you'll find that we've been keeping a close eye on the progress of the Chinese world band radio industry for some time, now. The cost of production is so low in China relative to other countries, and the work force so industrious, that if they would go about it right, they could redefine the world band radio market by producing high-quality radios at genuinely affordable prices.

Alas, their initial efforts have not been inspiring. Yet, graybeards will recall that the first manufactured items from Japan after World War II, and even well into the Sixties, often were nothing more than cheap imitations of Western products. (Yes, their cars, too.) And you don't have to be all that long in the tooth to recall when "Made in Hong Kong" and "Made in Taiwan" were synonymous with shoddiness. Of course, all three places are now noted for the superior quality of their manufactured goods.

But in China, things were complicated by the Cold War and Mao Zedong's various upheavals, which set the Chinese economy back at least a generation. Now, though, "Made in China" is appearing, like mushrooms after a spring rain, on goods of all sorts. Some are shoddy, some okay, but the overall picture is of a country still in the early stages of industrial growth. Yet, whereas five years ago nearly nothing seemed to come out of China, and two years ago nearly everything was of poor quality, now we are beginning to see occasional serious products approaching world-class quality. CD players and computer diskette drives, for example, and—yes—world band radios.

Two worthy models from China

But thus far, the only quality world band radios we have tested out of China have been under the Grundig label: first, the Yacht Boy 400, and more recently the Yacht Boy 305. Although the small number of radios we test is hardly a solid sampling of the vast numbers of world band receivers produced each year, the fact is that we've had no problems with any tested Grundig models out of China, whereas we have had occasional problems with, for example, Grundig products out of Portugal, and Sony products out of Japan. (In all fairness, the Sony products in question have been technologically advanced, and thus more likely to have things which can act up.)

But while Chinese factories under close supervision by Western firms are now clearly able to produce radios with good engineering and build quality, those made by Chinese manufacturers on their own have left much to be desired. None have performed well, and some have amounted to little more than throwaways.

Improvements in Shenzhen Electronic's latest model

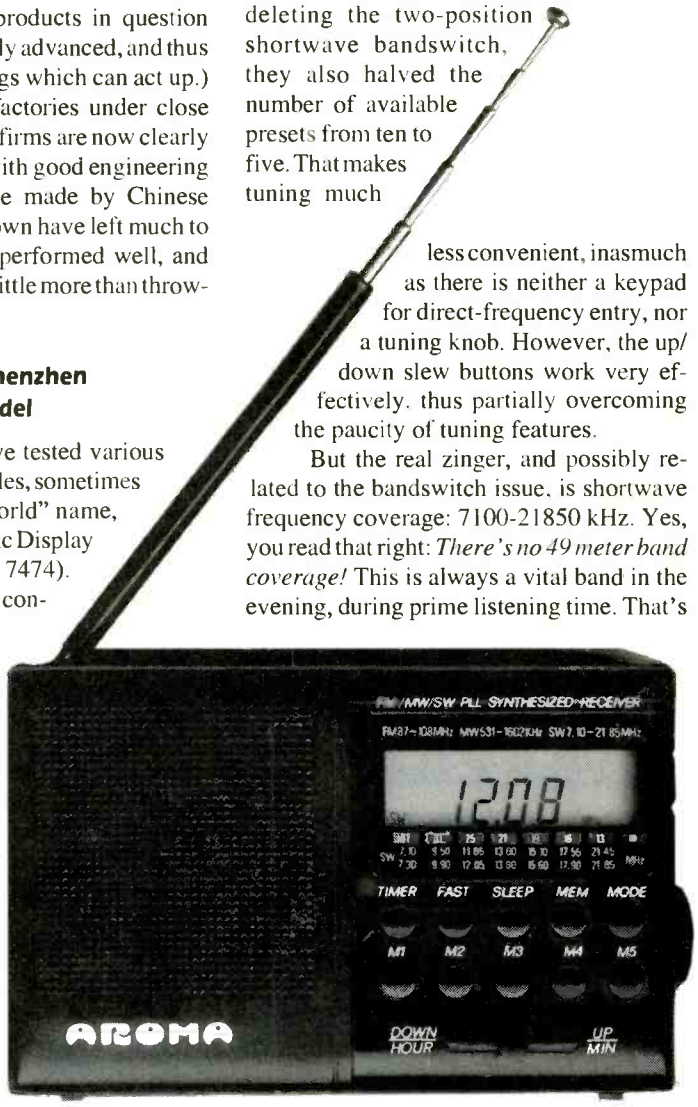
In recent years, we've tested various analog and digital portables, sometimes under the "Precision World" name, from Shenzhen Electronic Display Ltd. (fax 011 86 755 335 7474). We've found them to be consistently mediocre, but by the abysmal standards of Chinese portables to be relatively okay for the price. Now, Shenzhen has introduced a new model, the Aroma SED-ECL88C, a compact portable with digital tuning.

There are some obvious improvements over the last such model from Shenzhen. To begin with, you don't have to use a bandswitch to go from the upper to the lower reaches of the shortwave spectrum, or vice versa. And sensitivity to weak signals has also been improved.

Too, the 22 meter segment is covered. This is nothing new for Shenzhen, but it is something that firm has led Chinese manufacturers in doing. FM is also in stereo through earphones. That pretty well wraps up the good news.

Great Leap Backward: Where are the stations?

But from then on it's all downhill. By deleting the two-position shortwave bandswitch, they also halved the number of available presets from ten to five. That makes tuning much less convenient, inasmuch as there is neither a keypad for direct-frequency entry, nor a tuning knob. However, the up/down slew buttons work very effectively, thus partially overcoming the paucity of tuning features.



But the real zinger, and possibly related to the bandswitch issue, is shortwave frequency coverage: 7100-21850 kHz. Yes, you read that right: *There's no 49 meter band coverage!* This is always a vital band in the evening, during prime listening time. That's especially true now, while the solar system is in the trough of an 11-year sunspot cycle, and reception concentrates in bands somewhat lower than at other stages in the sunspot cycle.

So evenings, when most people listen, 49 meters is by far the most important segment to be found. Indeed, during winter in the Americas it is sometimes the *only* band with much to receive in the way of international broadcasts. Designing a radio with no 49 meter coverage in the depths of the sunspot cycle is like offering bikinis during the Ice Age. Yet, somehow Shenzhen has managed

to pull it off.

Other shortcomings pale, but are real: poor image rejection; a weird readout (e.g., 5910 kHz reads 5.91 MHz); mediocre dynamic range; an antenna that does not rotate and which is inclined to snap; no signal-strength indicator; and no travel power lock. AM coverage and channel spacing are fine for many parts of the world, but not for the Americas (however, they might correct this in any version sold in the Americas, if and when that comes about).

The Aroma, a real little stinker, sells for the equivalent of about $40 in China. Nobody expects the sun, the moon and the stars for $40, but they do expect that it will receive signals.

Although we picked up our test unit in China, thanks to *Passport to World Band Radio* collaborator Prof. Harlan Seyfer, other Shenzhen models have been sold in North America by such catalog houses as Heartland America. Perhaps before Shenzhen's latest plastic wonder works its way to our shores, somebody will have the good sense to redesign it for sensible frequency coverage. In the meantime, though, this is one model to steer clear of unless you listen mainly by day, when the higher bands are active.

Common sense needed

What does this all mean in the larger scheme of things? Obviously, the hoped-for renaissance of world band radio production in China continues to elude, except where savvy foreign firms rule the roost. If any electronics designers in China are reading this and wondering what to do, here is a simple suggestion: If you are going to design and build shortwave radios, first spend some time listening to shortwave. You can't compete in horse races if you don't even know which end of the horse eats the oats.

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.

John Catalano, PhD

Collins' PropMan

When we started this column a few years ago the price of a typical monitoring program ranged between $50 and $150. One trend we're seeing in 1995 is monitoring software companies now offering a basic software package, plus a professional or gold version. However, the typical price range has drifted upwards toward the $75 to $175 range.

Well, we cannot expect prices to stay constant—or can we? This month we'll take a look at a propagation program which not only bucks the trend, but is produced and sold by a company that can only be described as a world leader in communications. That company is Collins, a division of Rockwell International Corporation. At $49.95, Propman—PROPagation Resource MANager—beats the pants off any propagation program I've seen, in price and performance. To find out why, read on.

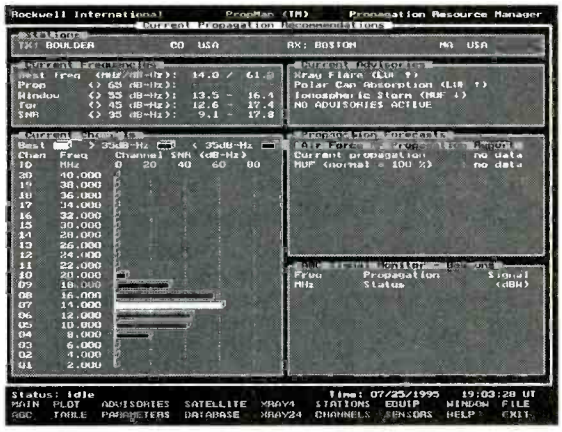


FIGURE 1: Propman Main Menu Screen

Gazing into the Ionic Soup

Propagation programs try to predict the interaction of many geophysical parameters and their resultant effect on the propagation of electromagnetic waves through the charged medium called the ionosphere. These programs rely on mathematical models of this "soup" of charged particles. One of the most common models is the IONCAP model (now a program, PC.25). The main parameters of IONCAP are sunspot number, geographical location of stations relative to the earth's magnetic field and each other, and calendar date.

Propman uses IONCAP, but so do some of the others we have reviewed. So where is the difference? Well, for one thing, Propman includes a built-in 11-year typical sunspot cycle in the $49.95 price. But let's keep going.

Too Many Parameters Confuse The Broth

The validity of any "prediction" is always questionable. In contrast to public opinion, science is only able to solve a very few problems in our real world without the use of a fudge factor. When I say "solve" I mean exactly, to the last decimal place, and universally, at any place in space and time. What we, as scientists, do all the time is come to a final answer via a number of well-known approximation methods. In most cases the result is still valid for use in our everyday lives. But making predictions is really trying to say what the future is going to be by looking at what trends happened in the past. Where history repeats itself exactly, this method works well. But when a totally new revolutionary situation occurs, never before experienced in our knowledge of the past, all hindsight prediction methods go badly wrong.

One method of minimizing this "revolutionary" situation effect is to gather real-time data prior to prediction and adapt the past trends to include this new data in future predictions. This is called an adaptive, or self-learning system. Propman, although not being strictly an adaptive system, does include some important real-time data capture methods. Before we get ahead of ourselves, let's look at the basic program format.

Screening Propman

Propman version 3.1 comes on two 3.5 high density disks and has the following minimum system requirements: IBM PC 286 (486DX recommended), 2MB hard drive space, 490K conventional RAM memory, EGA or VGA monitor, and DOS 3.2 or higher.

Hard drive installation is easy and fast. Running Propman brings up the Main Menu (Figure 1), which is one of the ten primary menus. All menu screens are accessed by pressing the desired key listed at the bottom of each screen. This format is so easy that the nine-page quick reference guide which comes with the program is superfluous. No matter which screen you wish to explore, you cannot get lost with Propman's format. In addition, pressing "H" at any time brings up a very extensive help file. Even the help file was easy to use, not something that can be said for all programs.

Back to the Main Menu. The screen is divided into six boxes or windows. The user customizes the data in each of the six boxes via the keys at the bottom.

Trying An Actual Skywave Prediction

Let's say you are in Boston, MA, using a dipole antenna and you want to know what is the best frequency to receive WWV's time signals, which are broadcast on 2.5, 5, 10, 15, and 20 MHz from Boulder, CO. At the bottom of the Main Menu (Fig 1) we see that pressing the "S" key will bring up the station menu (Figure 2). The transmitter station, TX, can be changed by pressing the Enter key when TX is highlighted via the arrow keys.

You are then presented with a database of city locations all over the world. For example, over one hundred and forty cities in England are included. Again, highlighting the desired transmitter city and pressing Enter does it all. A similar procedure is done for the receiving (RX) station. New stations can be added to the database via the "Database" screen.

Now, to get a more accurate view of our exact situation we should input equipment details. This is done by pressing the "Q" key as shown at the bottom of the screen (figure 3).

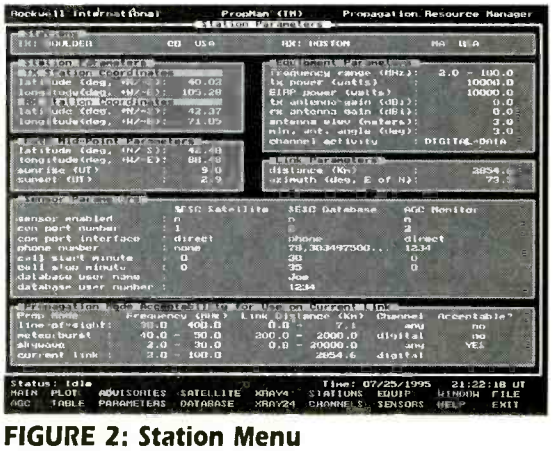


FIGURE 2: Station Menu

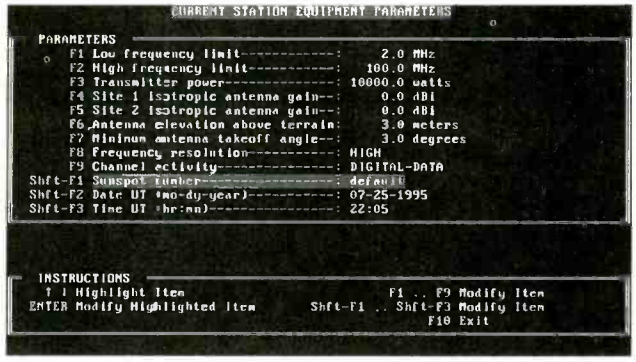


FIGURE 3: Equipment Menu Screen—Note Sunspot Input Line

Looking in the *WRTV Handbook* we can find that most WWV transmitters have an output of 10,000 watts. This information plus any antenna data (we assumed our receiver antenna was a dipole and therefore 0 dB gain), type of signal we wish to monitor (in this case analog-voice) and the actual sunspot number is entered on this Equipment screen. For the sunspot number you have the choice of using a program-generated default value which is based on the model, or entering a number from another source, such as WWV. The sunspot number is estimated to be the solarflux value reported by WWV minus 50.

Looking Into The Crystal Ball

So where is the prediction of which WWV frequency will provide the best reception? Propman can present this information in several forms. The two I find most useful are the Plot screen and the Main Menu. Looking back at Figure 1, on the left side we can see a horizontal bar screen in the "Current Channels" window. The longer the bar, the better your chance of hearing signals on that frequency. In Figure 1 the bar next to 14 MHz is largest, and therefore the best for this situation and time.

The PLOT screen, Figure 4, is a more sophisticated graphic representation providing even more information. The primary display shows the propagation conditions for the whole shortwave range of frequencies and how they will change with time. The solid line within the horizontal band is the best frequency as a function of time of day.

Using Propman in this simple way will yield results as good as any propagation program on the market but for much less effort and less cost.

Let's Get Professional

As we have just seen, getting a simple prediction from Propman can be done within ten minutes of installing the program. But what about all this real-time stuff, John? (I knew you wouldn't forget.) Take a look back at the Main Menu in Figure 1. Do you see the three windows on the right side of the screen? There you have the power which has made a version of Propman the program of choice for many professional and military communications agencies. Here is where Propman brings reality into the equation.

The Space and Environmental Services Center (SESC) provides geomagnetic data in two ways that can be automatically read by Propman and taken into account when it makes a forecast. The first one is real-time via a satellite downlink—and therefore real-expense (a new, but common, technoterm). For $2000 you can have the equipment to receive this digital data via the Spacenet 4 satellite. This data is updated each minute. That's pretty close to real-time!

For those of us with less stringent real-time requirements, and less real-time money, Propman is equipped with an SESC bulletin board data capture feature, using your modem and phone lines. This board inputs the US Airforce's six-hour HF propagation report. Propman will automatically modify its prediction to include this data. It will even sound an audible alarm if a solar or ionospheric "event," that will affect propagation, begins or ends. As this information comes in it is integrated into Propman's forecasting data and displayed in the first two windows on the right side of Figure 1.

Can It Do The Lawn?

No. Keep mowing. But Propman does have another connection to the real world—one that could be the best, at the least expense for hams and listeners. The AGC (automatic gain control = signal strength) sensor feature constantly checks the relative signal strength of known stations, or beacons. This provides some of the most accurate real-time propagation data possible to Propman. By monitoring signals on given frequencies Propman adapts its forecast to fit with reality. The AGC station/beacon data is displayed in Figure 1 in the window at the lower right.

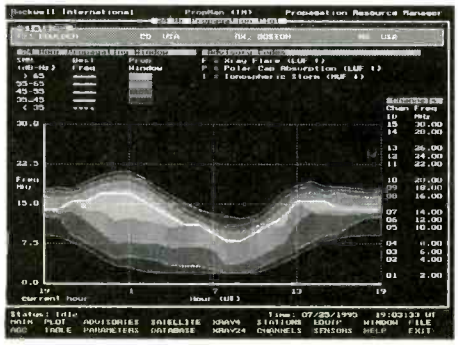


FIGURE 4: The Plot Screen

Of course a receiver with an output for its AGC voltage, an analogue to digital (A/D) converter, and a second computer to encode the data and then send it to the computer Propman is running are required. Let me clearly state that I did not try this AGC feature. However Propman includes hardware details using commercially available A/D converter PC cards and includes all the software required for the second computer. With the price of used 286/386s today this is cheaper than it sounds.

Now, What Didn't You Like?

Only one thing that comes to mind here. The program makes you change your computer system's clock to UTC time. I think the very creative people at Collins could include a field in the station database that would include local time information relative to UTC (GMT). By reading the system calendar, even the summer and daylight saving time could be automatically taken into account without manually setting the computer system clock to UTC.

Waiting for more? Sorry, that's the only complaint. Either in its relative simple form—which is better than any other propagation program we have tested—or in its all singing and dancing SESC and AGC real-time configurations, Propman is a "real-time" bargain in my opinion. Propman is available from Collins Avionics and Comms Division for $49.95 plus tax, shipping and handling. Credit card orders and further ordering information is available at (800) 321-2223 or (319) 395-5100.

In the coming months we'll look at software available from the Grove catalog, AEA's FAXIII, the ever-important reader's letters, and the latest equipment and software for using computers and radios. . . . See you on the 13th at the Grove Expo!

Doug Demaw, W1FB

Multiband Reception with Tuned Antenna Feeders

Getting quality multiband reception with a single antenna is not difficult if we adopt some simple, established procedures. It is not uncommon to find an SWL using coaxial cable to feed a dipole that has been dimensioned for a particular frequency in the 1.6 to 30 MHz range. The operator utilizes this less-than-optimum system for monitoring all of the frequencies within the 1.6 to 30 MHz spectrum, when in fact the performance is best at only the resonant frequency of the antenna.

At other frequencies the feed line is not matched to the antenna feed-point impedance. This reduces the signal-energy transfer from the antenna to the receiver because of the severe mismatch (maximum power transfer occurs only when unlike impedances are matched). The standing waves (SWR) on the feed line can cause decibels of signal loss at the high end of the frequency range, especially if RG-58 coax or old, lossy line is used.

Some SWLs use only a random length of wire (wrongly referred to as a "long wire," the latter of which is defined as one wavelength or greater at the operating frequency) that is connected directly to the antenna jack of the receiver. Again, a mismatch exists between the wire and the 50-ohm input circuit of the receiver, even though signals can be copied over a wide range of frequencies. Weak signals, especially, will be enhanced if the feeder is matched to the antenna, or if the end-fed wire is matched to the receiver (normally 50 ohms).

A Better Multiband Antenna

There is nothing wrong with the dipole concept for use over a wide frequency range. The antenna can be a vertical, sloping, or horizontal dipole, or you might prefer the inverted-V (drooping dipole) format. Rather than using coax as the feeder, you will feed the antenna with balanced line. For this you may use ordinary 300-ohm TV ribbon, 450-ohm ladder line,[1] or homemade open-wire line. The impedance of the feed line is not important for this application.

Ideally, the dipole would be cut for the lowest frequency of interest, such as 1.8 MHz. The feeders are tuned by means of an antenna coupler that matches the feed line to the receiver or transmitter. The tuner or some external device, such as a balun transformer, must also convert the balanced condition to 50 ohms unbalanced. More on this later.

Actually, the dipole can be any convenient length, but the longer the better. For example, a 10-MHz dipole can be used at 3 MHz if the overall system is tuned to 3 MHz. Figure 1 shows a system that uses tuned feeders, a tuner and an RF isolation device. The feed line can be any convenient length, but the shorter it is the lower the losses.

Matching and Balancing

A convenient but "iffy" method for interfacing balanced feeders to a 50-ohm unbalanced system is to place a 1:1 or 4:1 balun transformer between the output of an unbalanced antenna tuner and the balanced feeders. However, at many frequencies the transformer is forced to look into some very high impedances (such as 1500 ohms), and this prevents the balun from performing effectively (baluns are designed to operate at impedances below approximately 600 ohms).

A preferred technique calls for "floating" the antenna tuner at radio frequencies (no earth ground connected to it) and using an isolation choke, 1:1 balun or broadband 1:1 transformer between the tuner input port and the rest of the station gear (see Figure 1). The receiver and/or transmitter do, however, have an earth ground connected to them.

When placing the balun or isolation choke before the tuner it is then possible to make a single-ended tuner operate as a balanced one. One conductor of the balanced feed line connects to the normal single-wire terminal of the tuner, and the remaining feeder wire is attached to the chassis of the tuner.

Figure 2 provides details for constructing your own balun or broadband isolation transformer. Each device is wound on a ferrite toroid core.[2] Parallel or twisted (eight twists per inch) lengths of wire are placed on the T1 core at the same time. An ohmmeter can be used to identify the correct ends of the windings, or two wires of different colors may be used to simplify the job. An isolation choke can be used in place of the 1:1 balun. It is constructed by winding a 7-1/2 x 0.5 inch 125-mu ferrite rod full of RG-58 coax cable. Electrical tape may be used to hold the winding in place.

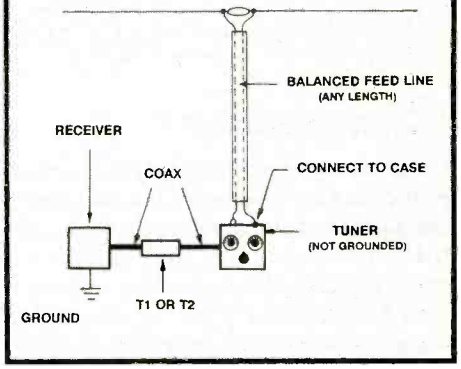
Adjustment and Use

Any conventional antenna tuner is suitable for use with a multiband antenna of the type seen in Figure 1. It can be a L network, T network or pi network, provided it will match a wide range of impedances.

Tune in a weak signal and adjust the tuner controls for a peak signal response while observing the S meter. If you own a noise bridge or an MFJ-259 SWR analyzer you will be able to set the tuner controls for a 1:1 SWR condition, which will indicate a perfect match.

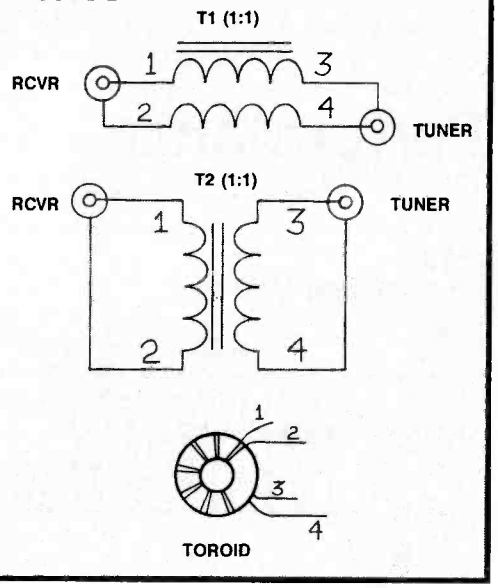
If you are an amateur operator, and are interested in only the ham bands, you may use your transmitter and an SWR bridge to adjust the system for a 1:1 SWR. The isolation devices described in Figure 3 are suitable for RF power levels up to 100 watts. Substantially larger toroid cores are required for higher power in order to prevent overheating and

FIGURE 1 DIPOLE ANTENNA



Example of a multiband dipole that is fed with balanced transmission line, a tuner and a tuner-isolating device. The dipole is cut for 3.5 MHz and is suitable for use through 30 MHz. Note that the tuner is not grounded, but that the receiver is connected to an earth ground. The RF isolation device may be T1 or T2 of Figure 2, or you may use a Radio Works 4K-L1 isolation choke in place of T1 or T2. See note 1.

FIGURE 2



Details for building and using RF-isolation transformers between the receiver and the tuner input. T1 is a 1:1 phase-reversal "un-un" (unbalanced to unbalanced) transmission-line transformer. It uses 16 turns of twisted or parallel no. 22 enamel two-wire conductor (see text) wound on an Amidon Assoc. FT-140-61 ferrite toroid (125 mu). T2 is a conventional transformer that has two identical windings of no. 22 enamel wire on an FT-140-61 toroid core. The secondary winding is wound over the primary winding. Be sure to use clockwise or counter-clockwise rotation for both windings.

core saturation. Commercially made 1:1 baluns are available for power levels as great as 1.5 kW, as are ferrite-rod isolation chokes.[3]

Some Final Thoughts

You can eliminate the need for baluns, isolation chokes, and broadband transformers if you have a balanced antenna tuner. The old E. F. Johnson Matchboxes are balanced tuners. They are frequently available as used equipment in magazine ads and at radio flea markets.

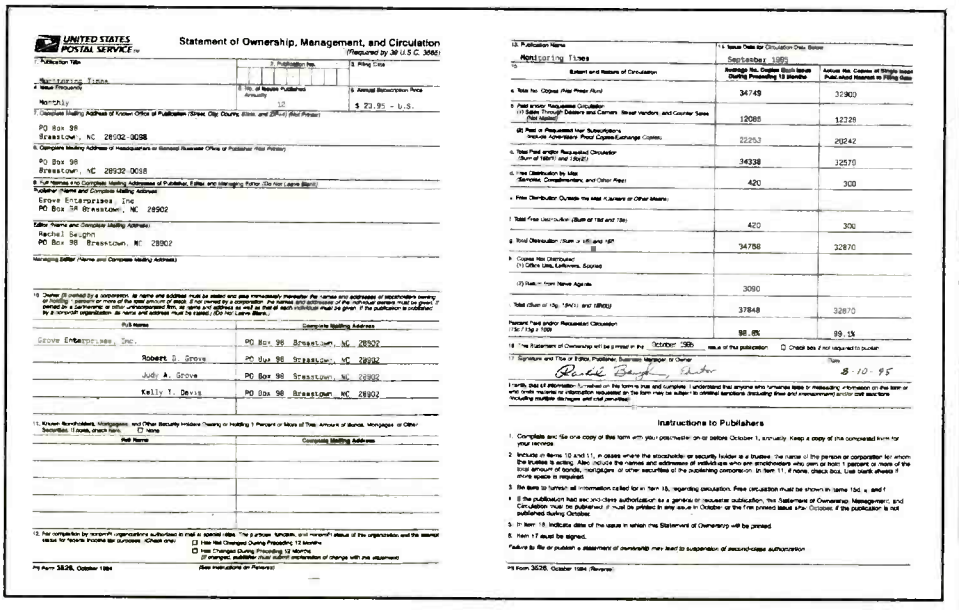
If there is a shortcoming associated with antennas that use balanced feeders, it is the detuning effect caused by a wet or ice-covered antenna and feed line. A slight readjustment of the tuner will correct the problem quickly, so it should not be a major concern for hams or SWLs. The improvement of multi-frequency reception when using a single tuned antenna system outweighs this minor problem. Low and high power antenna tuners are available from MFJ Enterprises.[4]

Notes

1, 3—You can purchase ladder line, baluns and isolation chokes from The Radio Works, P.O. Box 6159, Portsmouth, VA 23703. Phone: (804) 484-0140. Catalog available.

2—Ferrite and powdered-iron cores are available from Amidon Assoc., Inc., 3122 Alpine Ave., Santa Ana, CA 92704. Phone: (714) 850-4660. Catalog available.

4—MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762. Phone: (601) 323-5869. Catalog available.


UNITED STATES POSTAL SERVICE

Statement of Ownership, Management, and Circulation
(Required by 39 U.S.C. 3685)

1. Publication Title	Monitoring Times
2. Publication No.	
3. Filing Date	
4. Issue Frequency	Monthly
5. No. of Issues Published Annually	12
6. Annual Subscription Price	$ 23.95 - U.S.

7. Complete Mailing Address of Known Office of Publication (Street, City, County, State, and ZIP+4) (Not Printer)
PO Box 98
Brasstown, NC 28902-0098

8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not Printer)
PO Box 98
Brasstown, NC 28902-0098

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do Not Leave Blank)
Publisher (Name and Complete Mailing Address)
Grove Enterprises, Inc
PO Box 98 Brasstown, NC 28902

Editor (Name and Complete Mailing Address)
Rachel Seighn
PO Box 98 Brasstown, NC 28902

Managing Editor (Name and Complete Mailing Address)

10. Owner (If owned by a corporation, its name and address must be stated and also immediately thereafter the names and addresses of stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Do Not Leave Blank.)

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PS Form 3526, October 1994 (See Instructions on Reverse)

13. Publication Name	14. Issue Date for Circulation Data Below
Monitoring Times	September 1995

Extent and Nature of Circulation	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
a. Total No. Copies (Net Press Run)	34749	32900
b. Paid and/or Requested Circulation (1) Sales Through Dealers and Carriers, Street Vendors, and Counter Sales (Not Mailed)	12086	12226
(2) Paid or Requested Mail Subscriptions (Include Advertiser's Proof Copies/Exchange Copies)	22253	20242
c. Total Paid and/or Requested Circulation (Sum of 15b(1) and 15b(2))	34338	32570
d. Free Distribution by Mail (Samples, Complimentary, and Other Free)	420	300
e. Free Distribution Outside the Mail (Carriers or Other Means)		
f. Total Free Distribution (Sum of 15d and 15e)	420	300
g. Total Distribution (Sum of 15c and 15f)	34758	32870
h. Copies Not Distributed (1) Office Use, Leftovers, Spoiled		
(2) Return from News Agents	3090	
i. Total (Sum of 15g, 15h(1), and 15h(2))	37848	32870
j. Percent Paid and/or Requested Circulation (15c / 15g x 100)	98.8%	99.1%

16. This Statement of Ownership will be printed in the October '95b issue of this publication. ☐ Check box if not required to publish.

17. Signature and Title of Editor, Publisher, Business Manager, or Owner — Date: 8-10-95

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Optimizing Your Scanner's Performance

Mark A. Cobbledick of Ft. Payne, AL, is the recipient of our first *Ultimate Scanner* book award for submitting an idea so absolutely elegant, I can't imagine why I overlooked it all these years. The only thought I gave it was as a related, but more complex, idea in my *Scanner Modification Handbook*, Vol-2, pg 217. My idea was to use a PRO-2004/5/6 scanner's bandswitching signals to electronically switch antennas so that an optimum antenna is always on line for a given frequency band.

Trouble is, who has time or space for up to seven antennas? Apparently not many, because I am aware of no one following up on my idea. Well, many of you will follow up on Mark's idea, because it is so simple and yet so effective. I'll open with Mark's words:

"I was impressed with the circuits and ideas you presented in your *Scanner Modification Handbooks*. One of special appeal was the antenna switching scheme that used the scanner's bandswitching IC to switch antennas. After reading this, I wanted to tell you of my solution for an optimum antenna in line for every band in the scanner. You need only a little mechanical skill and two or three antennas: one for VHF-Lo, one for VHF-Hi, and one for UHF. My application was for mobile use, but the principles readily apply to base stations as well, because whips, dipoles, and Yagi antennas for these bands are easily available."

"In a word, I disconnected the BNC antenna input on the inside of my PRO-48 scanner and mounted two more, identical BNC connectors. I rewired the first one to the VHF-Lo RF-Amp-Mixer input; the second to the VHF-Hi RF-Amp-Mixer input, and the third to the UHF RF-Amp-Mixer input. (Block diagrams and schematics enclosed)."

Mark's solution is on the money, and it applies to the majority of all scanners. This principle can be applied to the PRO-2004/5/6 and PRO-2035, but it is best to wait for a special article on these top end scanners.

A Few Cuts, A Few Holes ...

The block diagram and schematics shown are for the PRO-48, but can be considered typical for most scanners. In fact, most scanners have only two or three RF front-ends—one for VHF and one for UHF—but sometimes VHF is broken up into VHF-Lo and VHF-Hi. Newer scanners might also have a UHF-Lo and UHF- Hi, giving four RF front-ends.

The idea is to isolate each specific RF Amp/Mixer front-end from the factory-stock BNC antenna connector, except for the one closest to the original antenna jack. Leave it connected to the BNC, but cut and isolate the remaining front ends as shown in Figures 1 and 2. Install new BNC jacks on the rear of the scanner, and connect the center lug of each to a different RF Amp/Mixer front end. Label all BNC jacks for their specific bands. It may be a good idea to run a common ground wire from the outer lug or shell of each BNC connector to the next, and then to a circuit ground trace. The important thing is that the ground shell of each BNC goes straight to circuit ground.

FIGURE 2:
Typical Modification (PRO-48)

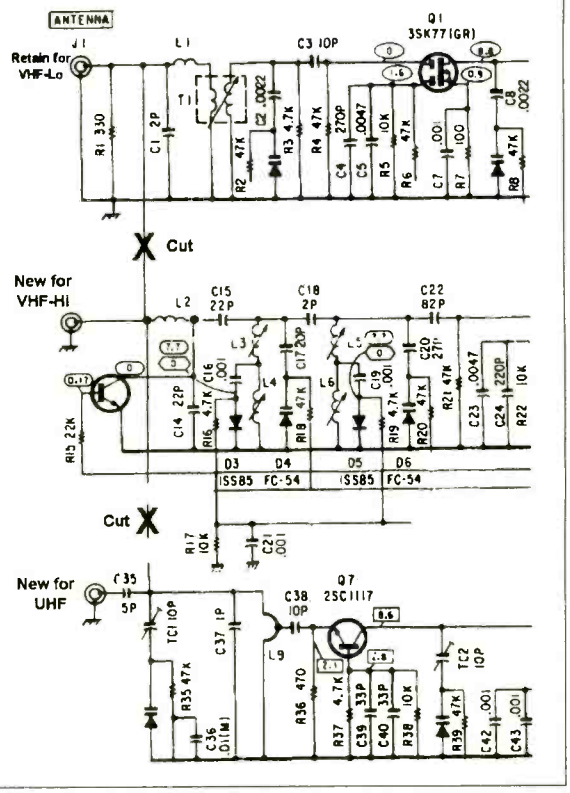
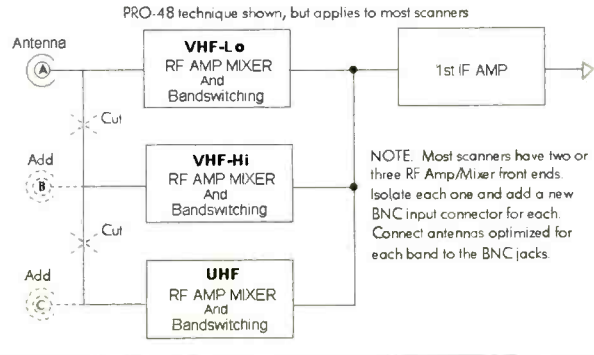


FIGURE 1: General Approach



Connect Antennas

Acquire or make an antenna that's optimized for the center of each band or RF Amp/Mixer front end. VHF-Lo is generally defined as 30-138 MHz while VHF-Hi is 138-300 MHz. UHF is 300 MHz and up, but if UHF is divided into Lo and Hi bands, then it's loosely 300-520 MHz, and 760 MHz and up.

Optimized antennas can be as simple as dipoles and groundplanes or as complex as yagi and log-periodics. The benefits of this interesting modification to your scanner include greater range and better performance across the bands of interest by virtue of better performing antennas.

Caveats

Warnings are few for this simple hack. Just keep track of your work and make a note of everything you do in case you need to go back and reverse the process. Isolate the different RF Amp/Mixer front ends by cutting circuit traces where possible, and leave a 1/8" gap in the cuts. If reversal is ever required, you can bridge the cuts with soldered copper jumpers.

VHF-UHF Propagation Analysis, Continued

In June/95, I presented a spreadsheet method for calculating distances between two points. In August, I showed how to calculate or model the Free Space Loss of a VHF-UHF radio wave between two points, as long as those two points were high enough above the surface of the ground to communicate via the space wave: i.e., mountaintop to mountaintop, air-to-air, or air-to-ground, etc. Line-of-sight was one characteristic of free space propagation, with the qualifier being that signals are never closer to the ground than 2-3 wavelengths.

Radio signals do not always propagate by the free space wave, however. The ground wave is a common medium of propagating radio signals, but its loss is calculated somewhat differently from the free space wave. This Plane Earth propagation is another line-of-sight mode, and is just as easy to model when you know the pertinent characteristics.

Plane Earth Loss

Free space radio signals weaken at predictable rates. But, when radio waves come within that nebulous "freznel zone," they take on different characteristics. Line-of-sight remains a condition for Plane Earth propagation, but proximity to the earth introduces two new variables—the distance and relative heights of the transmit (Tx) and receive (Rx) antennas.

Mathematically, Plane Earth propagation behaves as if the earth were a flat surface (hence the name), with a fixed influence. The conditions of validity for Plane Earth analysis are that the Tx and Rx antennas must be within radio line-of-sight of each other and that line must pass within 0-3 wavelengths of the earth's surface at one or more points along the path.

Incidentally, obstacles between the two antennas may obstruct the line-of-sight. Obstacles introduce additional loss, additive to the Plane Earth Loss. I'll show you how to calculate Shadow or Obstacle Loss in a future column, but for now, we will assume there are no obstructions in the line-of-sight path. Trees, shrubbery, foliage, and light building materials do not count as obstacles, and do not normally affect VHF-UHF propagation within scanner considerations.

The Calculations

$$\alpha_{db} = 10 \text{ Log}_{10} \frac{P_t}{P_r} = 10 \text{ Log}_{10} \left[3.45 \times 10^{-15} \left[\frac{R_h \times T_h}{d_2}\right]^2\right]$$

where: α_{db} = attenuation, decibels
P_t = power transmitted, watts
P_r = power received, watts
d = distance between antennas, miles
R_h = height of receiving antenna above ground, ft
T_h = height of transmitting antenna above ground, ft

Let's do an example to ensure that we're playing to the same sheet of music. Find the Plane Earth Loss of a signal thirty miles away, where the antenna is 100-ft above ground, and your monitor antenna is 40-ft above ground level, and where there is radio line-of-sight to that distant source.

α_{db} = $10\text{Log}_{10}(3.45 \times 10^{-15}(100\times40\div30)^2)$
= $10 \text{ Log}_{10}(3.45 \times 10^{-15})(133.3)^2$
= $10 \text{ Log}_{10}(3.45 \times 10^{-15})(17{,}777.8)$
= $10 \text{ Log}_{10}(6.133 \times 10^{-11})$
= 10 (-10.21230)
= -102.1 dB

Clarifying, let's drop the (-) sign and just refer to the Plane Earth Path Loss as 102 dB. From here, the actual signal strength into your scanner is calculated just like that in August for free space waves. The path loss is 102 dB, so we modify that loss by factoring in other path gains and losses, including: transmitter power, dBW (dB relative to 1watt); transmitter antenna gain, dBi; receive antenna gain, dBi; and transmitter and receiver site losses, dB. Suppose the transmitter is 100-watts: then 10 Log_{10} 100/1 = (10)(2) = 20 dBW of power gain.

You probably use a 0 dBi gain discone antenna, but the transmitter antenna likely has 5 dBi gain, so add the path gains: 20 + 0 + 5 = 25 dB gain. Now subtract site losses. The Tx site is a professional installation with a 2 dB loss, but you're using some lossy coax, so figure 6 dB loss at your end, for a total of 8 dB loss. Subtract that from the 25 dB gain for a net gain of 17 dB to be combined with the 102 dB Plane Earth path loss. Therefore, net received power at your scanner will be 102 - 17 = 85 dB below 1-watt.

Remember:

$$\alpha_{db} = 10 \text{ Log}_{10} \frac{P_t}{P_r}$$

So: 85 = $10 \text{ Log}_{10}(1 \div Pr)$
8.5 = $\text{Log}_{10}(1 \div Pr)$
316,227 = $1 \div Pr$
Pr = $1 \div 316227$
Pr = $3.16\text{x}10^{-9}$ watts

Figuring your antenna is a nominal 50-ohms, we use Ohms Law to calculate the RSL (received signal level) in microvolts as follows:

$P = E^2 \div R$
$E = \sqrt[2]{P \times R}$
$E = \sqrt[2]{3.16 \times 10^{-9} \times 50}$
$E = \sqrt[2]{1.58 \times 10^{-7}}$
E = 0.0004 volts or 400-µV

This 400-µV is a very healthy signal, equal to about 10 or 20 dB over S-9 if your receiver has an S-meter. Rarely will this analysis be complete, because not only must the aforementioned Shadow Loss(if any) be added to the Plane Earth Loss to get the overall Path Loss, but there is one other loss to be considered that we have not discussed yet: Diffraction Loss. This smaller, but potent, loss is added to Plane Earth Loss as the radio waves bend along the surface of the earth. Real world signal loss analysis consists of an assessment of Plane Earth Loss, Diffraction Loss, and Shadow Loss. The result can be a very accurate model of a VHF-UHF radio path, and a very interesting and fun challenge for the half-serious hobbyist.

Spreadsheet buffs can refer to the sidebar for guidance to incorporating the Plane Earth Loss model into our on-going VHF-UHF propagation spreadsheet.

SPREADSHEET CALCULATIONS

Remember the Great Circle spreadsheet from June-95? It has a lot of blanks. We filled in some in the August issue, and now more as follows:

Plane Earth Loss, dB, Analysis

Enter the Frequency (MHz) into Cell E16. Enter distance (mi), A-B, in Cell E47 or let the Great Circle spreadsheet in MT, June-95, do it for you.

Plane Earth Received Signal Level (RSL), µV

Enter Tx Power (watts) into Cell E23
Enter Rx Antenna height (ft) into Cell E17
Enter Rx Antenna Gain (dB) into Cell E18
Enter Rx Site Loss (dB) into Cell E19
Enter Tx Antenna height (ft) into Cell E20
Enter Tx Antenna Gain (dB) into Cell E21
Enter Tx Site Loss (dB) into Cell E22
Cells E24-26,E29,E30 (leave blank for now)

Enter the below formula exactly as shown into Cell E31:

=-1*10*LOG(3.45E-15*((E17*E20)/(E47 ^ 2)) ^ 2)

Cell E31 calculates and displays the Plane Earth Loss, dB, of the radio wave. Enter the below formulas exactly as shown:

E27	=10*LOG(E23)	Tx Power, dBW
E28	=E18+E21+E27	Sum of Gains
E36	=E31+E30+E33+E19+E22	Sum of Losses
E39	=E36-E28	Plane Earth Received Power
E42	=SQRT(50*(1/(10 ^ (E39/10))))*10 ^ 6	

E42 displays Plane Earth RSL in microvolts (µV).

The complete Great Circle and VHF-UHF Analysis Spreadsheet is available for free download from the Hertzian Intercept BBS at (619) 578-9247 before 1:30pm & after 5:30pm, PDT, if you don't want to construct it yourself.

Contest Time

Remember my offer for the next nine months: submit an idea or a project for this column and if selected, you'll receive an autographed copy of my latest book, *The Ultimate Scanner*.

W. Clem Small, KR6A, CET

"Easy-Up" Antennas

In August we discussed a number of simple antennas that can be made by utilizing familiar objects around the home or office as antennas. Since these antennas are made by utilizing familiar objects, they are called "UFO" antennas. This month we discuss a different, easy-to-make category of antennas called "easy-up" antennas.

Like UFO antennas most of these easy-up antennas take little space, but unlike UFO antennas they are made from wire or some other conductor, not from familiar objects. Also unlike UFO antennas, you must find a place to mount easy-up antennas, but usually this is really easy; thus the name "easy-up."

Easy-up space savers

Some easy-up antennas might be called "space saver antennas" because they don't require a special mounting space, they fit into the existing environment without needing a special space of their own. One common form of easy-up space saver antenna is made by running a long wire under a rug or around the baseboard in a room and attaching its end to the antenna input connector on your receiver.

Antennas usually work better the higher they are mounted, and so another favorite location is in the attic or crawlspace above your ceiling; run the wire for the maximum distance the space allows. If you can't get into the attic or crawlspace, a small wire can be run inside the room where the wall meets the ceiling; running the wire along this junction of the ceiling and wall makes the antenna less visible than it would be if you ran it directly across the ceiling. The antenna may work better if you string the wire all the way around the room.

One really useful location which puts the top end of the antenna up high is inside an unused chimney. I once had a vertical antenna in a chimney and it worked out really well. Unfortunately the janitor began using the furnace again to burn trash, and I lost my antenna!

Other Easy-Up Antennas

If your monitoring post is located on an upper level you can sometimes make a really easy-up antenna by dropping a wire out a window and letting it hang down while you operate, retrieving it and putting it away when it is not in use. Make sure such an antenna doesn't come too close to the ground or other lower windows, as it could be a problem to other persons. The space under the eaves of the roof is another good place for an easy-up antenna; you can run such an antenna completely around the house for maximum pickup.

Antennas strung under the floor (i.e., the ceiling of your basement) will sometimes provide fair reception, although they cannot be expected to work as well as elevated antennas. Another unusual location is to lay the antenna out on the ground. This location is not ideal, but if it's the only option you have it may be worth a try.

General Rules

As with other antennas, easy-up antennas should generally be mounted as high and clear of other conductors as possible. For receive-only antennas, such as we use in monitoring or shortwave listening, the size of the wire is seldom of importance. Any wire that is strong enough to stand the usage it will get, will work fine. An alternative to wire can be had with aluminum foil—sometimes useful for an "under the rug" antenna as the foil will not cause a ridge in the rug as some larger size wires will do.

Usually we don't want an easy-up antenna contacting metallic objects such as gutters or metal roofing. An exception to this is when we want the metallic object to be part of our antenna, in which case we should make a good electrical connection between the wire of our antenna and the metallic object. An antenna wire which crosses a metallic object and makes poor or intermittent contact with it can cause interference to reception with loud, distracting, static-like popping sounds.

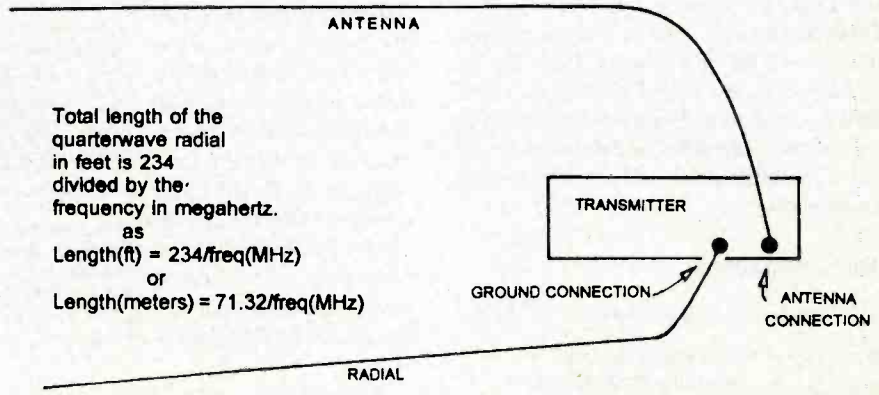
For safety keep the antenna well away from electrical power lines, and the farther you are from electrical wiring the less interference your receiver will receive from the electrical noise which that line carries.

Transmitting with Easy-Up Antennas

Many easy-up antennas are not well insulated from their environment; usually just the insulation on the antenna wire itself satisfactorily insulates them from objects in their environment for receiving purposes. But for transmitting, except for really low power levels, an antenna should be well insulated from objects in its environment to avoid power loss, arc-over and electrical shock. Actually, indoor antennas should probably not be used for transmitting above a few watts power in any case, due to the concern about the effect of RF radiation on humans and pets.

If your easy-up antenna is located on an upper story it may be impractical to have an earth ground connection available for your antenna system. This is usually no problem for

FIGURE 1



Length equations and connection diagram for using quarter wavelength radials with an antenna.

a receive-only antenna, but having no earth ground may cause loading problems or may even give you RF burn problems when transmitting. In such cases the use of one or more quarter-wavelength radials as a substitute for a ground connection will often cure the problem; just connect one end of the radial to the ground connection of your transmitter. Understand, however, that radials are not to be substituted for an earth ground for lightning-induced damage protection devices.

Safety Considerations

Lightning-induced damage protection is usually not needed for indoor antennas, but if you have an extensive indoor antenna, especially if it is vertically oriented, it would not be unreasonable to use gas-discharge lightning-induced damage protectors.

Keep in mind also that wires hanging where people walk can be a safety hazard, and low or on-ground antennas can trip pedestrians if left in places where people may walk.

And So . . .

What we've covered here should give you the idea of what's involved in making an "easy-up" antenna. Most likely now you can think of several other easy-up antennas which you can check out in your own location. Happy monitoring!

RADIO RIDDLES

Last month:

Last month our riddle was: if a 1/4 wave antenna has reasonable gain, a 5/8 wave even more, then why not use a full wave antenna for even more gain?

Well, actually full wavelength antennas are used in some situations and there are a number of designs, such as collinear, longwire, and loop antennas, that make use of a full wavelength in their design.

These antennas give higher gain and more directivity (vertical or horizontal depending on the application) than their shorter cousins, but we do not see them in use as frequently as the shorter antennas for various reasons. Perhaps the most important reason is that smaller antennas, although they have less gain and less directivity, are satisfactory performers in many situations so we don't need a larger antenna. And the larger antennas do present some problems not present with the shorter antennas; some must have phasing circuits. All are larger in size and tend to be more unwieldy, harder to manufacture, and more expensive than their smaller cousins.

This month:

What famous tower was saved from destruction by the fact that it proved to be a great antenna platform for intercepting enemy radio messages? By the way, it wasn't built to be a radio tower.

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ

Q. *Haverhills™ recently advertised an "Antenna Multiplier" in the Wall Street Journal for $29.95. What does it do? (Tom Newman, Doylestown, PA)*

A. In a word, nothing. This classical quackery has been around since snake oil was being hawked in medicine shows. The ad states that it contains "an array of electronic components that literally multiplies the reception power of your TV" and that it "stabilizes your TV picture, eliminates 'ghosts' and static, and brings in stations that were...only visible as flickers and annoying shadows." More preposterous, "you will be able to eliminate any outdoor antenna completely...you can bid your messy and ineffective rabbit ears, loop, rod, or dish antennas good-bye," and it will vastly improve AM/FM radio reception and bring in new stations on shortwave receivers!

We tested one of these several years ago and reported our findings—or lack thereof—in the pages of *MT*. It failed miserably. Since it has small aperture (small signal-capture area) it doesn't receive much signal at all, and since it is unpowered, it can't amplify what little it does receive. Even the patent was granted in the early 1900s, way before TV.

This is hucksterism at its finest. Haverhills should know better than to try to scam their customers with this fraud.

Q. *If digital radio becomes the norm in the future for shortwave and ham bands, will we need new digital receivers to receive it, or will some kind of adaptor allow reception of these new modes? (Donald Kidder, Ashland, ME)*

A. Digital-capable receivers could become the norm, but any conventional receiver will work on these modes when connected to an adaptor.

Q. *Since silver is so much better at conducting electricity than copper, why isn't it used more for antennas, thus improving radiation efficiency? (Hugh Waters, Singapore)*

A. The difference in efficiency translates to an imperceptible improvement in signal strength.

Q. *I have one of the old Electra Bearcats. Could you reprint the frequency-extension routines for*

Bob's Tips of the Month

Full-Frequency Coverage on the AR8000 and PRO46

Although it is illegal to import to or manufacture in the United States a cellular-capable or cellular-restorable scanner, it is lawful to own such a device. There are even full-frequency-coverage restoration procedures available for some currently-manufactured, cellular-censored scanners. It is against the law, however, to listen to conversations in the cellular frequency range (or any other telephone calls, including cordless).

The AOR AR8000

The AR8000, its optional computer interface plugged into the Scancat Gold computer program, can be permanently cellular-restored.

(1) Press FUNCTION, then LOCAL key. Set radio to EXPERT mode.

(2) Press the down arrow key until you reach the REMOTE setting. Set BPS to 9600.

(3) Press the down arrow key to access DELI mode. Set to CR ONLY. Press ENTER.

(4) Press FUNCTION, then 0 key to access SET COPY mode. Press arrow down key to access SEND/RECEIVE mode. Set to RCV mode.

(5) Press arrow down key to select ALL-DATA mode. Switch to SYS-DATA.

(6) Insert the interface unit into the radio with exposed connections down in preparation for receiving ScanCat Gold commands.

(7) In the first main directory, select R.

(8) In the Radio Select pop-up menu, enter D (AOR 8000).

(9) In the Main Directory select B.

(10) In the Disk File Utilities select A.

(11) In the AOR 8000 Directory select 5.

(12) In the next directory choose Com Port #1, then C.

(13) Follow the instructions at the bottom of the screen to load the program. After 3-4 minutes the display will signal it is finished loading; disconnect the interface, press the CLEAR key and return to 2 VFO mode. The scanner is now fully restored.

The PRO-46

1. Remove the battery cover and battery holder, then remove the four Phillips head screws inside the battery compartment and the back cover; carefully remove the back cover.

2. Locate the gold-colored shield covering the microprocessor and unsolder the two bottom lugs; bend the shield upward to reveal the subcircuit beneath.

3. Locate the small circuit board glued above the microprocessor; cut any or all of the five wires to disable it.

4. Reassemble the radio, carefully plugging the boards back together.

5. With the radio off, press and hold 2, 9, and LOCKOUT; turn the radio on, then release the keys. It should now be scanning the first three banks.

6. Select channel 23 (888.960 MHz) by pressing MANUAL, 23, MANUAL. Use the UP or DOWN SEARCH key to step through the entire cellular telephone band. Pressing MONITOR stops the search sequence on an active frequency. To store the frequency, manually select any channel as above (other than 23) and press PROGRAM, MONITOR, ENTER.

Where Credit's Due

We wish to thank Jim Condon of Stockholm, NJ, for the R7000 IF signal improvement procedure published in the August "Hints."

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*.

some of these? (Jeff Hooper, Gainesville, GA)

A. Sure, but remember, these radios used track tuning, and sensitivity drops off dramatically beyond the advertised frequency ranges. For example, the following BC-100 frequency extension actually only produces receivable signals from about 50-53.4 and 361-406 MHz:

BC-100: To search 30-512 MHz, press in order: 49, LIMIT, 50, LIMIT, SEARCH, HOLD, MANUAL, 406, LIMIT, 405, LIMIT (displays "ERROR"), SEARCH, HOLD, LIMIT, SEARCH (down).

BC-300: To search 136-144 MHz, first close the squelch so that no hiss is heard; enter a low-band (30-50 MHz) or aero band (118-136 MHz) frequency, then press 157.6, LIMIT, 165.6, LIMIT, then open the squelch (background hiss will be heard); then press SEARCH, ENTER, and close squelch once again.

BC-250: To search upward from the highest frequency on any band (we'll use 174 MHz for an example), enter high search limits like 173.000 and 173.900 MHz, then open the squelch to stop the search routine, and enter that displayed frequency into the STORE memory, using the LOCKOUT key. Next, enter two new search limits of less than the stored frequency, push MANUAL, RECALL, to display that frequency. Now search upward from there.

You will need to stop on active channels with the squelch control, and you may press LOCKOUT to enter that frequency into STORE memory. You can enter that frequency into conventional memory by selecting a channel, retrieving the frequency by pressing RECALL, and turning the radio off and on (on some models it may be necessary to open the squelch first before turning the radio off and on).

Pretty bizarre, huh?

(Continued from Page 4)

Amateur Radio vs. Internet

We received many, wonderful responses to Bob Grove's August "Closing Comments," in which he shared the struggle between his feelings toward an older technology vs. an emerging one. The following are some representative responses.

• From Steven Johnson, WD8DAS, sbjohnston@aol.com, or York, PA: "Ham Radio for many folks is a much broader hobby than described in your editorial. I see it more as 'Hobby Radio,' encompassing a much wider variety of experiences—HF, VHF/UHF, VLF, both monitoring *and* talking, as well as building, collecting, fixing, and experimenting with radio equipment. Your magazines reflect a similar view, covering all sorts of radio communication and experimentation. But the key feature these activities all have in common is 'radio.'

"The magic of ham radio is the combination of a free, natural phenomenon (electromagnetic waves) with man's technology (transmitters, receivers, antennas) to talk at a distance. You cannot experience this on the Internet. ... I expect that the free-wheeling, frontier nature of the Internet will not last ... Being wired it will be controlled. And metered for billing. (You'll note that hamming is free of usage costs.)

"The new forms of digital communications (text, audio, video) are extremely useful and are certainly exciting, but they do not replace hamming—they are separate and different means of communications. Did early ham radio die when telephone became commonplace in homes? No. There is room for both ham radio *and* the Internet."

• Similarly, from Joseph Sabutis, NW0A, Glendale, CA: "Let me pass on a personal experience: a couple of days ago, I phoned an old friend in Pennsylvania. After about an hour we said our goodbyes. But last evening I 'talked' to a nice gentleman in North Carolina on 20 meter CW. Everything went wrong after we connected. The QSO lasted about 10 minutes.

"I felt a sense of accomplishment after my CW chat. I looked up my new acquaintance's callsign to see if I correctly copied it through the noise; I got out a CD-ROM atlas to locate his town; ran a DX program to see how many hops my radio signal had to make; and calculated the MUF to see if I had beaten any odds during the Sun's current quietness.

"Contrast my reaction after the phone call to that of the radio contact. As a radio operator, I had control of nearly all aspects of this conversation until the time it left my antenna. At that point, I am at Nature's mercy. After eight years as a ham and having a PhD in physics, I am still awed by the process. What is truly amazing is that I can do this with a handful of parts to generate radio oscillations, another handful to clean up the signal, and I send it out through a wire hanging in a tree.

"As you mention, some hams have become appliance operators, willing to demand and pay for the bells and whistles on a new rig, and ultimately never use 80% of these features. I feel that Internet phone is just a computer bell or whistle that will appeal to people because they can get similar results as an amateur radio operator without having to put in the time and effort to acquire a license... But at this time, I cannot see something as routine and technologically removed as internet phone ever replacing the pride and satisfaction of a successful amateur radio contact."

• Harold Eads, KE4APO, Fincastle, VA: "I love the diversity of opinion in *Monitoring Times*. Having just received the August issue, I find Bob Grove stating that Internet phone is the worthy successor to ham radio, Skip Arey trying to sign everyone up for a ham ticket, and Ike Kerschner reviewing two new ham rigs as though ham radio has a future!

"A couple of years ago, at age 51, I followed Skip Arey's advice and got my ticket, entering the amateur service as a novice, a few weeks later as a technician, and hope shortly to pass my 13 WPM for the general ticket. I am voting with Skip and Ike on this issue.

"Internet phone has its place, I'm sure, and I probably will give it a try, but I'm not tossing my rig away just yet. Two months after getting my ticket, a two-meter rig helped me steer my way through three tornadoes; several months after that I was reporting for weeks on road icing conditions in the Virginia mountains; and most recently, I was standing by, relaying traffic concerning flood conditions in the Shenandoah Valley. I really don't believe that Internet phone to South Africa would have helped in these situations.

"As well as being useful, I'm having a lot of fun with ham radio and enough excitement to keep from having my midlife crisis. P.S.: Ask Bob to tell us a little more about this Internet phone business." [*You'll be hearing more about it and other interesting developments in Internet in a new column, coming soon - ed.*]

• From Kenneth Blair, KC0GL, Lawrence, KS: "I too have had my peaks and valleys of interest in amateur radio over the years. I doubt that I will ever achieve the thrill experienced as a novice over 25 years ago on contacting an amateur on the USS *Thurman*. Your editorial really stopped me cold and made me think about amateur radio and where it is today. I still get a thrill out of operating contests, but many of the things you mention are true." (Kenneth asked permission to reproduce the thought-provoking editorial in his ham club's newsletter.)

• From Harry Helms, VP and Editorial Director of HighText publications, hightext@delphi.com at Solana Beach, CA: "Your 'Closing Comments' were right on the money. I saw a demonstration of 'internet radio' last November at Comdex. Like you, I felt I was witnessing the beginning of the end for ham radio as we know it. (In fact, several hams are already holding 'QSO's' over the internet).

"There's already a form of 'internet DXing,' especially on the Web, in which people try to find interesting stuff. People brag about cool stuff they find and even download copies of files to 'prove' they located an interesting site. Is this 'internet QSLing'?

"For us radio weenies, there's still hope. We'll see less QRM and maybe even a relaxation of rules to allow greater experimentation. Maybe radio hobbyists will eventually find themselves back in 'the good old days' when the only people on the air were dedicated experimenters. Everyone else will be on the Web!"

Changes

The above discussion notwithstanding, times and technology do change. In the next few months, we will be making room for covering some of the new wireless technology and, yes—the Internet. Sadly, a couple of long-standing regulars will be making way for these new topics: Rob Gerardi's "DX Tips" is the first one to which we say farewell. For five years, Rob has sifted through the many DX contests, DXpeditions, and unusual contacts reported in the amateur radio magazines and elsewhere, to bring *MT* readers a tantalizing taste of what's to be heard on the amateur bands. Please accept our heartfelt thanks, Rob, for a job well and faithfully done. Rob can still be found as editor of the "Ham Radio Report" in the Canadian International DX club's *Messenger*.

If you haven't already done it, make your plans to attend the Grove Expo in Atlanta October 13-15. It's as bigas a boost as a high sunspot count for great monitoring times!

—Rachel Baughn

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. Net Thurs 9:30 145.210/4.610. 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. Check for new meeting sked.
Northeast Scanner Club: Les Mattson, P.O. Box 458, Rio Grande, NJ 08242, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN).* $29 annual.
Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice & fax, (416) 444-3526 DX-Change information svce; (905) 841-6490 BBS. Predominantly Province of Ontario; All bands. *DX Ontario.* Meet 3rd Wednesdays, Toronto; bi-monthly, Ottawa.
Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. Pacific NW and BC Canada. DXing all bands. *PNBCDXC Newsletter.* Irregular meetings.
Pitt Co SW/Scanner Listeners Club: L. Neal Sumrell, P.O. Box 1818, Winterville, NC 28590-1818. Eastern NC; All bands. *The DX Listener.* Irregular meetings.
Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749, (808) 982-9444; Puna, HI; SW and MW. Meet 1st Tuesdays. No dues.
Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland, (410) 239-7366; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD.* Meet irregularly.
RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *Scanning Journal.*
Regional Communications Network (RCN): Jay Delgado or Public Information Unit, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.#10 SASE for info.
Rocky Mountain Radio Listeners: Mike Curta, P.O. Box 470776, Aurora, CO 80047-0776. Metro Denver, Colorado. All bands. Meets monthly 2nd or 3rd Sundays 1-4pm, Aurora Central Library.
Sandy River SW Radio DXers Assoc: Duncan or Brenda Steele, R.R. 1, P.O. Box 1560, Norridgewock, ME 04957. Worldwide. *The QSL* - irregular. No dues.
Scanning Wisconsin: Ken Bitter, Dept. MT, S. 67 W. 17912 Pearl Dr., Muskego, WI 53150-9608, (414) 679-9442. Wisconsin. VHF/UHF. *Scanning Wisconsin* ($2 for sample)
Signal Surfer DX Club: Darcy Jabs, RR2, Burns Lake, BC, Canada, V0J 1E0; (604) 694-3760. Canada and worldwide. MW and SW DXing.
Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.
Susquehanna Co Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801-0023. PA area; Scanning. Meets irregularly.
Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur. Meets 3rd Thursdays 7pm Holland Big Boy.
Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.
Vancouver Shortwave Association (previously British Columbia Shortwave Listening Club)**:** Box 500, 2245 Eton St., Vancouver, BC Canada V5L 1C9, (604) 255-8987 fax. Shortwave. *LOGJAM.* Meets 3rd Thurs. 7pm at 920 Davie St.
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. $24 annual in U.S. $2 for sample.
Worldwide Ute News: Rick Baker, ae411@yfn.ysu.edu for info - worldwide membership; non-broadcast under 30 MHz. Free electronic newsletter WUNNEWS, join by sending e-mail to majordomo@phoque.info.uqam.ca with following in e-mail message: "subscribe wunnews." Through World Wide Web: http://sun-gabriel.aero.org:8800/. For paper version: $14.50/yr to Tim Braun, 15915 Smithey Dr., Haymarket, VA 22069.

Monitoring Clubs Outside North America

Associazione Italiana Radioascioto (AIR): C.P. 873, 34100 Trieste, Italy. Broadcasting all bands, utilities, pirates. *Radiorama* (Italian) 70,000 lira. April 25 annual mtg.
Australian Radio DX Club Inc: P.O. Box 227, Box Hill, Victoria 3128, Australia. SW, MW, Utilities. *Australian DX News.* Sample 2 IRCs or $2US cash.
British DX Club: Colin Wright, 126 Bargery Road, Catford, London, SE6 2LR, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine. *Communication.* L10 UK, L12 Eur, L16 ww. Sample 3 IRCs or $2 US cash. Meets monthly in Twickenham (London).
DX Australia: P.O. Box 422, Moonee Ponds, Victoria 3039, Australia. MW, SW. *DXers Calling.*
DX Club of India: Navin Patel, 1-Dutt Niwas, 809 - M.G. Road, Mulund, Bombay-400 080, India. India; MW/SW/Ham. DX World (quarterly) Rs 50/-, 30 IRCs outside India. 3 IRCs sample.
DX Club Paulista: Marcelo Toniolo Dos Anjos, C. Postal 592, Sao Carlos - SP (Brasil), 13560-970. South America. Shortwave, including utilities. *Actividade DX* (in Portuguese).
Finnish DX Association: Mr. Arto Mujunen, Suomen DX-Liitto, P.O. Box 454, FIN-00101 Helsinki, Finland; +358-0-842146 fax. Finland and worldwide. SW and BCB. *Radiomaailma.*
Friendship DXers Club: Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. Venezuela and Caribbean. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 kHz. Venezuelan membership free.
International DX Association: Bedanta Das, 1 - No. Galiahati, Near Night School, Barpeta - 781301, Assam, India.
International Listeners Organization: Kalab Abbas, St. No. 1, H, No.231 Waris Rd, Sheikhupura, Pakistan 39350 South Asia. Broadcasting. *Listener Times.*
International Radio Youth Club: G.M. Mostafa Kamal, Amla Wapda Colony-1, Kushtia-7032, Bangladesh
National Society of Pakistani DXers: Mr. Liaqat Ali, E-161/1, Iqbal Park, Opposite Adil Hospital Defence Housing Society Road, Lahore Cantt., Pakistan. Worldwide. All wave. Has library, meets fortnightly 1400-1800 UTC at library. 4 IRCs for more info.
New Zealand Radio DX League: P.O. Box 3011, Auckland, New Zealand. MW, SW, FM, TV. *New Zealand DX Times.*
New Zealand DX Radio Association: Mr. R. Dickson, 88 Cockerell St., Brookville, Dunedin, New Zealand. MW, SW, amateur and utilities. *Tune-In.*
North Ontago Radio Listener's Club: P.O. Box 179, Oamaru, New Zealand.
Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhupura , 39350 Pakistan; Pakistan; SWBC.
QSL Club de France: Patrick Frigerio, 40 Rue de Haguenau, 67700 Saverne, France. SWBC, pirates, CB-DX, hams, etc. Courrier (in French). 6 bulletins, 72 FF, EEC=16 IRCs, elsewhere 20 IRCs.
Shortwave Radio Communications Club: Atiqur Rehman, Dawood Street, Khalid Road, Sheikhupura, P.C. 39350 Pakistan. South Asia; MW/SW. *The Amateur* (Urdu language). Meets 1st Fri on SW Complex, S.K.P.
South African DX Club (SADXC): P.O. Box 18008, Hillbrow 2038, South Africa; MW, SW, utilities. $60 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.
Swedish DX Federation (SDXF): Box 3108, S-103 62 Stockholm, Sweden. 10 issues *Eter-Aktuellt.* Membership in Sweden 160 SC annual. SweDX BBS +46-(0)8-53034727; Fidonet 2:201/339; Internet sysop@swedx.ct.se
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 (no individual memberships)
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
Oct 1	Port Huron, MI	American Red Cross AR Service / Darryl Smith, KA8UKO, 2817 16th Ave, Port Huron, MI 48060, 810-987-3818
Oct 1	Ashland, OH	Ashland Area ARC / Doyle Braun, KI8L, 1084 Township Rd 553, RD #2, Ashland, OH 44805, 419-281-2757
Oct 1	Huntington, IN	Huntington County ARS / Ray Tackett KC9DZ, PO Box 284, Huntington, IN 46750, 219-786-0029
Oct 1	Queens, NY	Hall of Science ARC / Arnie Schiffman WB2YXB, (night) 718-343-0172, Location: New York Hall of Science, Flushing Meadow Park, Talk-in 444.200 WB2ZZO rptr, 146.52 splx, 9am, Adm $5
Oct 1	Lima, OH	Northwest Ohio ARC / Greg Schwark N8WBD, 600 Sunset Dr, Spencerville, OH 45887, 419-647-6321
Oct 1	Warrington, PA	Mt. Airy VHF RC / Paul Drexler WB3JYO, 24 Main Blvd, Trenton, NJ 08618, 609-538-1687
Oct 7	Bullhead City, AZ	AZ Council, London Bridge, Hualapai, Dolan Springs ARC/ Charles Ellis, W6PNM, 1935 Devlin Ave, Kingman, AZ 86501, 520-757-7553
Oct 7-8	Pittsburgh, PA	Breezeshooters ARC / Bob Ferrey, Jr, N3DOK, 412-367-2393 Spec Event Station W3XX 1400Z-2100Z from submarine U.S.S. Requin. Vintage CW in lower half of novice sub-bands. Phone op in general class segment of 20M and 40M. QSL and 8-1/2 x 11 inch SASE to Ron Berry, WB3LHD, 326 Sunset Dr, Bethel Park, PA 15102
Oct 7-8	Biloxi, MS	Delta Division Convention / Donna Alexander KA5OER, 22 Yorkshire Pkwy, Gulfport, MS 39503, 601-896-4984
Oct 7-8	Durham, CT	Nutmeg Hamfest & Conn State Conv / Bill Wawrzeniak W1KKF, 5 Shire Dr, Wallingford, CT 06492, 203-269-8252, Location: Fairgrounds, Enter from Rt 17, Talk-in 145.29 MHz repeater, 9am-3pm, Adm $5
Oct 8	Springfield, OH	Independent R Assoc / Ron Chapman KB8JTD, POB 523, Springfield, OH 45501, 513-964-8618. Clark Co Fairgrounds. 145.45 MHz 8am, $5
Oct 8	Lincroft, NJ	NJ State Conv & Shore Area / Al Allen K2LG, PO Box 129, Belford, NJ 07718, 908-495-3246. Brookdale Community College, 8am, Adm $6
Oct 14	Lebanon, TN	So Mega Radio Swap Meet / Larry Chambers, 615-833-2448, Location: Ward Agricultural & Community Ctr (Fairgrounds), 6am
Oct 14-15	Louisville, KY	Kentucky State Convention / Herbert Rowe W4WQD, 5612 Highway 160, Charlestown, IN 47111, 812-294-4905
Oct 14-15	Memphis, TN	Mid-South ARA / Mary Moore AC4GF, 5140 Woods Landing Cove, Memphis, TN 38125, 901-758-0661
Oct 15	Centralia, IL	Centralia Wireless Association / Alva King WA9U, 776 Bethel Rd, Sandoval, IL 62882, 618-532-6606
Oct 15	Cambridge, MA	MIT Radio Soc & MIT Electronics Research / Steve Fineberg W1GSL, PO Box 397082 MIT Branch, Cambridge, MA 02139-7082. Electronics, computer, amateur FLEA MARKET - 9am-2pm. Albany & Main St.Talk-in 146.52, 449.725/444.725 - pl 2A. $2. Free parking.
Oct 15	W. Friendship, MD	Columbia ARA / Richard Frank W9RZ, 12933 Kentbury Dr, Clarksville, MD 21029, 410-531-2933
Oct 20-22	Concord, CA	Pacific Division Convention / Lauren Styles WA6CIE, 1910 Sunshine Dr, Concord, CA 94520, 510-676-2186
Oct 21	Medford, OR	Rogue Valley ARC / Van Sias WA7FAB, 641 Sunrise Av, Medford, OR 97504, 503-779-0723
Oct 21	Sumter, SC	South Carolina State Convention / Mike Dunlap KC4HUT, 2763 Tindal Rd, Sumter, SC 29150, 803-481-4611
Oct 21-22	W Palm Bch, FL	Palm Beach Repeater Asociation / James Schoech WD4LHF, 129 Dayton Rd, Lake Worth, FL 33467, 407-439-0569
Oct 22	Golden, CO	Colorado State Convention / Joe Dickinson WT0C, PO Box 3821, Littleton, CO 80161-3821, 303-771-9577
Oct 22	Sellersville, PA	RF Hill ARC / Linda Erdman KA3TJZ, 2220 Hill Rd, Perkiomenville, PA 18074, 215-679-5764, Sellersville Fire House. Talk-in 145.31, 9am, $5
Oct 27-29	Kingston, OK	Texoma Hamarama Assoc / Charles Bilbay KI5CG, Rt 2 Box 301, Bokchito, OK 74726, 405-924-0687
Oct 28	Franklin, KY	So Ky AR Group / Edmond V Schwab KA4REF, PO Box 9656, Bowling Green, KY 42102, 502-843-4389. Talk-in 146.055/.655, 146.52/.52, Open 8am, Adm $5
Oct 28	St. Paul, MN	Twin City FM Club / Clyde Green N0DVP, 5406 Zealand Av N, New Hope, MN 55428, 612-535-3311
Oct 28	Port St. Lucie, FL	Port St. Lucie ARA / John Fernandez KC4ZHH, 1830 SE Gaskins Circle, Port St. Lucie, FL 34952, 407-335-4951
Oct 29	Westminster, MD	Carroll County & Penn-Mar ARCs / Larry Martin N3DGK, 3240 Charmil Dr, Manchester, MD 21102, 410-374-4544
Oct 29	Lindenhurst, NY	Suffolk County RC & Great South Bay ARC / Andrew Feldman WB2FXN, 3 Walton Way, Coram, NY 11727, 516-928-3868
Oct 29	Newtown, PA	Penn Wireless Association / Stephen Ewall WB3IRC, 3090 Bogle Rd, Bensalem, PA 19020, 215-752-1202
Oct 29	Lebanon, IN	Boone Cty & Clinton Cty ARCs / Don West KF9OE, 6719 North 800 East, Sheridan, IN 46069-8860, 317-325-2764
Oct 29	Marion, OH	Marion ARC / Karen Eckard N8JDH, 6583 South Street Meeker, Marion, OH 43302, 614-499-3565

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Events Calendar

P.O. Box 98, Brasstown, NC 28902-0098

INDEX OF ADVERTISERS

STOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

Ads for **Stock Exchange** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.
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NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word — *Subscribers only!*
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COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue if camera-ready copy or, $85 if 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 85 this issue.

R-390-A SALES —SERVICE. Information SASE Miltronix, P.O. Box 80041, Toledo, OH 43608.

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SURVEILLANCE/PRIVACY SECURITY PROTECTION. Catalog $5. Spy Emporium, 6065 Hillcroft, Suite 414, Houston, TX 77081. (713) 774-1000.

EXPERT RADIO REPAIR! $30/hour. Worldcom Technology, (407) 466-4640.

R-390 POWER INPUT CABLES $25.00; Antenna Connectors $12.50 PPD. Have Quantity. (419) 255-6220.

WANTED: 5-NB noise blanker and DCPC 12 volt power cord. Both for Drake SPR-4 receiver. Call Bill (313) 676-5161 after 6 pm E.D.T..

WANTED: Realistic PRO-43 scanner. Gerry, (718) 332-0030, evenings.

WANTED: Squires-Sanders SS1BS, SS1RS, SS1R, SS1V. Weber 4845 W. 107th St., Oak Lawn, IL 60453-5252.

Yupiteru MVT-7100: 1,000 channels, full coverage excellent, both hard and soft cases. $500 firm. (516) 484-4218, 9-11 pm, Eastern time.

FORSALE: ICOM R7100-2 receiver with GRE converter (800 MHz) & UT36 voice synthesizer, 1 month old $1325. Call Bob (607) 785-3420 after 4 pm.

Multifax 5, weather satellite hardware decoder, software, all manuals. $115; Voicegate 1 noise reduction system, $75; MAR 6 microwave amplifier IC's, new, $5. Jeff Brown, 15961 W. Bethel, Alexandria, IN 46001.

Seeking a partner/investor to join our project in refitting our ship for use as an offshore shortwave broadcasting station that would be able to sail anywhere a radio voice is neeeded. If you are this individual or organization, please contact Lightwave Mission Broadcasting, (718) 853-4301.

Drake R-8. Absolutely mint! Less than 1 year old. Box, manuals, and shipping. $750. Victor (503) 235-7052.

FOR SALE: Kenwood R5000, $650; SP430 speaker, $45; R2000 with VCLO, $395; Radio Shack Pro-43, $195; PRO-2022, $150; Uniden BC890XLT, $175; Drake R4A. $145, Doug (206) 472-3478.

ICOM R7000, mint condition, full coverage, $1350 shipped. (712) 322-3496.

SELL: Watkins Johnson model RS160, 2-1000 MHz scanning receiver system, complete, $900. Call John (305) 341-1111 work, (305) 755-8725 home, Florida.

WANTED: Grundig Satellit 2000 or 2100 in mint or good condition. M. Horn (708) 548-4133 or (708) 952-0990.

Uniden MR8100 professional scanner with computer program, as new with box and manual $225 plus shipping. Victor (503) 235-7052.

SELL: AOR model AR2002, 25-550/800 - 1300 MHz Scanner. $350 new condition, in box. Call John (305) 341-1111 work, (305) 755-8725 home, Florida.

Kenwood R-5000 receiver, mint condition, box, manual. $625. I ship and insure. Nick Lang (614) 864-2270.

FOR SALE: Universal M7000V7 decoder, EpsonFX85 Printer, Goldstar 9" amber monitor. Low Hours, $950. Call Carl Days (516) 427-7782.

WANTED: Realistic CB. Any of TRC-40, 55, 57, 426, 458, 459, 490, or C.B. phone base station. Preferably mint and manual. Larry (409) 299-1897.

PRO-2006 and non-cellular PRO-43. $300 for both plus shipping. (601) 733-9277.

Sony ICF-2010, $225; collector item: CB Sonar FS-23, 1960, AC-DC, mint with service manual, $75; new Ranger 2970, 100w, covers 26.000-29.995 MHz, display 40 ch. CB at the flick of switch, $425; S-Meter-BFO (for SSB or Ducky voice)—CTCSS tone decoder—fit most scanners, $75; Sp-150 speaker for Realistic DX-150, DX-160, $40; two color Computers II, two disk drives, one back-up tape, $80. Phone/FAX (709) 944-5268.

Complete set of *Monitoring Times* magazines from the very first issue. If you are interested please call Bill at (409) 962-2213.

FOR SALE: ICOM R-1 full coverage, complete with BP-90. Excellent condition. $350. Jim, (810) 634-8099.

CLOSING COMMENTS

Bob Grove
Publisher

Spectacular Sound or Flim Flam Fidelity?

No sooner had I finished writing September's editorial on quack medical devices than I came across what I might consider the modern-day equivalent: high-end audio. There is no question that good audio sounds better than bad audio, but how good does it have to be before it is perfection? The answer seems to be, how much are you willing to pay?

My initial curiosity regarding this techno-phenomenon was aroused a couple of years ago when I discovered a variety of gigantic speaker cables on the market. Since it was intended for the automotive industry, I thought at first that these were battery cables. Silly me! So how many pounds of wire does it take to carry a few watts of audio to a speaker ten feet away?

At the auto audio show, pitchmen hawked the virtues of cables the size of Kansas, noting the remarkable benefits these speaker cables could provide, presumably on their off hours when they weren't delivering the entire power load to New York City.

I heard glowing terms like "lower ohmic resistance" and "reduced distributed capacitance" with reverential tones usually reserved for miracle cures. Possessing a flair for the theatrical myself, I am particularly sensitive to a sales pitch, listening intently to weasel words and buzz words. Just how likely would it be that, driving along a busy thoroughfare, road noises swathing me in "surround sound," I could actually note improved audio on my car stereo by switching to these behemoth speaker wires? It was time to take out a pocket calculator and do some figuring.

A 12-foot pair of #14 stranded copper speaker wire has a resistance of a mere 0.06 ohms, more than 99% efficient when connected to a typical 8-ohm system. Capacitive attenuation is a tiny fraction of a dB, undetectable by the human ear. And what would be the consequences of an inefficient speaker cable? Barely noticeable reduction in volume. How could you cope with this minuscule side effect? Turn up the volume, of course!

But this isn't a good enough answer to the audiophile; he needs perfection—and then some. Like a fine wine, his system needs ambience ... a bouquet ... shaken, not stirred. Snuggled in his overstuffed chair and lounging robe, reading a recent issue of *Stereophile* magazine, our audio superphile flips through the pages, making his selection. What does he see that vies for his affection?

A half-ton, $65,000 speaker system (apparently a concession to those indigent wretches who can't afford the full-size $130,000 system!), a $100,000 power amplifier (preamp extra, of course; what did you expect?), a set of $2000 headphones, a $20,000 turntable (would you also like a tone arm and cartridge to go with that?), a $5000 CD player and, to set the components on, a $500 equipment stand. Naturally, he will want BIG speaker cable—at nearly $20 a foot! But will he hear the difference? (If he has worked long enough to have saved this much money, it would be surprising if he can hear much at all!)

But with his self-indulgence satiated, he scans a few more pages, discovering an article instructing him on how to design a house around his hi-fi. I feel so inadequate in the midst of such splendor and largesse. I spent only about $1000 on my system, and my house is already built.

Then there's the tube-versus-transistor debate, with an entire cult waving the banner for the type 211 that was abandoned in the 1930s when really good tubes began coming out... But let's not get started again.

Are You Listening?

CATCH THE Action WITH an INTERCEPTOR!

R10 INTERCEPTOR

If searching out RF signals is your thing, then the R10 Interceptor is the answer. The R10 searches out nearfeild signals and locks on in 8ms. It provides a shield of protection that no RF signal can penetrate without being detected. Unlike scanners and receivers that must be tuned to a specific frequency or scanned through a fixed frequency range, the INTERCEPTOR will provide an exciting new dimension in recreational monitoring with near instant response to strong signals. Communications monitoring hobbyists will be able to take the R10 on cruise ships, to military bases, theme parks, zoos, airports, to space shuttle launches, parades, sporting events, car races and anywhere two way FM communications is used. **•Check Deviation with 10K or 100K range •Check Relative signal strength •Continuous 30MHz-2GHz coverage in less than 1 second •Built in Speaker •Thumb wheel volume and squelch control •Supplied with telescoping whip antenna, Internal NiCad battery pack, and an AC charger**

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The R20 is a compact RF signal strength detector with a 10 segment bargraph display. There is also an audio output from the detector for monitoring AM communications. The audio output is useful for room sweeps where in close proximity to a transmitter a quieting effect can be heard due to detector saturation. **•The 10 segment LED bargraph responds to all RF signals with nominal 3dB increments •Pocket sized with built in telescoping whip antenna •9 volt battery operation •Monitor Aircraft, CB, AM Broadcast transmissions •Check Microwave oven leakage •Wide .5MHz-2.5GHz range**

R20 $119.00 R10 $299.00

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Call ICOM's brochure hotline for more info: (206) 450-6088. Or contact ICOM Technical Support in the HamNet forum on CompuServe @75540,525 (Internet: 75540.525 @ compuserve.com) *IC-706 available September 1995, IC-2350H available October 1995. † This device has not been approved by the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained.

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