

New Regular Feature: "Tracking the Trunks"

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Monitoring Times®

Your Personal
Communications Source

- Send Your Receiver to DX Camp
- Rebuild the "Ocean Hopper"
- Reviews:

Drake SW-2 Receiver

Uniden PRO-64 Scanner



ELDOMROEP

Radio Netherlands Hits the Big "5-0"



Reaction Tune the
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ICOM IC-R10

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Another radio to tune, another reason to purchase the Scout.
Until now the AOR AR8000/2700 were the only hand held scanners to take advantage of the *Scout's* Patented Reaction Tune function. The Scout can now tune the new ICOM IC-R10 hand held scanner (shown below). Connection is easy: No modifications required - No custom cables to buy - Just plug and play.

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You won't miss a thing with Reaction Tune. The *Scout's* CI-V compatible output allows it to interface to the AOR AR2700/AR8000, ICOM R7000, R7100, R8500, R9000 and now the new IC-R10 (shown opposite). The *Scout* captures the frequency, then sends the serial data to the receiver and tunes the scanner to the frequency for instant monitoring in less than one second. Recorded frequencies can be downloaded to a PC using the optional OptoLinx universal interface •



U.S. Patent No. 5,471,408

Radio Not Included

Scout with ICOM IC-R10
Mono Cable required (shown)

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- ▶ 10MHz - 1.4GHz frequency coverage
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 - ▶ Interface to a PC for frequency download using optional OptoLinx PC interface
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 - ▶ 16 segment RF signal strength bargraph
 - ▶ Frequencies are automatically saved when unit is turned off
 - ▶ Reaction Tune the ICOM R7000, R7100, R8500, R9000, IC-R10, and AOR AR2700, AR8000, and the Radio Shack Pro 2005/6 using the Optoelectronics OS456, Radio Shack Pro 2035/42 using the Optoelectronics OS535

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Cover Story

Radio Netherlands Hits the Big "5-0"

By Jeffrey Poulin

Fifty years ago, in the aftermath of World War II, a radio service with a distinctly Dutch voice came on the air. The station recognized that a country half the size of South Carolina can't demand the world's attention, so Radio Netherlands set about winning the loyalty of its listeners by interesting and useful programming, the best in reproduction techniques, and a readiness to change with the times.

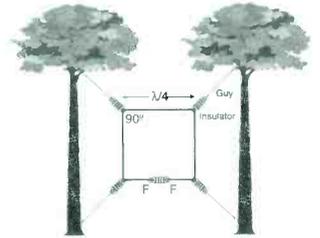
The formula has worked well for fifty years for this "European station with the Dutch accent." The story starts on page 8.

C O N T E N T S

Send Your Receiver to Camp 12

By Philip Gebhardt

... DX camp, that is, where the reception of distant signals takes precedence over eating and sleeping. Gebhardt gives examples of camps that vary from one to dozens of people, and antennas strung as Vs, Ts, Ls, squares, diamonds, and triangles. What will *your* receiver say when asked, "What did you do this summer...?"



The Under \$30 Antenna Launch 20

By Chuck DeLongfield



A slingshot, fishing reel, and a tree are all the ingredients you need to erect a great antenna, whether at home or in the field.

DMAT's Mobile Medical Teams 21

By Patrick Griffith

When a natural or man-made disaster requires medical care and evacuation, a number of federal agencies are equipped to respond. One such organization is the Disaster Medical Assistance Team. Here are some monitoring tips from CO-2's communications officer.

Upgrading the Ocean Hopper 22

By Al Cikas

Many readers will remember the Knight kits, especially the Ocean Hopper shortwave receiver. If you never had a chance to make one, you can build your own without the kit. This slightly revised circuit reduces the danger of electrical shock that was inherent in the original design.

Reviews:

Magne tests the SW2 shortwave receiver, and says Drake has nearly achieved the goal of producing a worthy performer for less than \$500 (page 92). The Radio Shack PRO-64 mobile scanner comes under Parnass' eye. He pronounces it a major improvement over the PRO-62 (page 94). Catalano checks out a communication mode decoding program, **Radioraft**, that works very well — and the lite version is free! (p.85)





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trunkcom For discussion about the new TrunkTracker scanners
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Frequency Coverage: 25,000-549,995 MHz., 760,000-823,995 MHz., 849,0125-868,995 MHz., 894,0125-1,300,000 MHz.

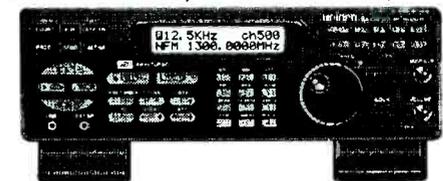
The Bearcat 3000XLT is the ideal handheld radio scanner for communications professionals. This handheld scanner scans at 100 channels per second and searches at a rate up to 300 steps per second. A selectable attenuator eliminates annoying intermodulation from adjacent frequencies in highly populated areas. Selectable AM, Wide FM and Narrow FM modes allow you to change the default receiving mode of the BC3000XLT. For maximum scanning pleasure, order the following optional accessories: UA502 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; LC3000 Deluxe swivel leather carrying case \$34.95; BP2500 rechargeable nickel-cadmium battery pack for up to five hours of dependable use \$29.95; ANTMBCB Magnetic mount scanner antenna with BNC jack and 12 feet of cable \$29.95; ANTSGBNC Glass mount scanner antenna with BNC cable \$29.95. The BC3000XLT comes with AC adapter, belt clip, flexible rubber antenna, earphone, owner's manual and one year limited Uniden warranty. Order today.

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Mfg. suggested list price \$769.95/Special \$344.95
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Frequency Coverage: 25,000-549,995 MHz., 760,000-823,995 MHz., 849,0125-868,995 MHz., 894,0125-1,300,000 MHz.

The Bearcat 9000XLT is superb for intercepting communications transmissions with features like TurboSearch™ to search VHF channels at 300 steps per second. This base and mobile scanner is also ideal for intelligence professionals because it has a selectable attenuator to help eliminate annoying intermodulation from adjacent frequencies in highly populated areas and selectable AM, Wide FM and Narrow FM modes that allow you to change the default receiving mode of the BC9000XLT. Other features include **Auto Store** - Automatically stores all active frequencies within the specified bank(s). **Auto Recording** - This feature lets you record channel activity from the scanner onto a tape recorder. **Hi-Cut filter** to help eliminate unwanted static noise. You can even get an optional **CTCSS Tone Board** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; BC005 CTCSS Tone Board \$54.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC9000XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty.



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The Bearcat TrunkTracker BC235XLT, is the world's first scanner capable of tracking a selected radio transmission as it moves across a trunked radio system. Now it's easy to monitor fleets and subfleets in analog trunked radio systems. The BC235XLT can also work as a conventional scanner. This 300-channel, programmable handheld scanner provides scanner users with uninterrupted monitoring capabilities of Type I, II, III and hybrid trunking systems. One of the biggest obstacles in the scanner industry has been the increasing use of trunking radio systems in business and public agencies throughout the United States and Canada. This makes it nearly impossible to track a conversation as it moves within a trunk system from frequency to frequency. According to Ken Ascher, WB8LIT, Chairman & CEO of Communications Electronics, "The Bearcat 235XLT is a revolutionary breakthrough in scanner technology. Now it's easy to continuously monitor conversations even though the message is switching frequencies." The BC235XLT comes with AC adapter, CRX120 battery charger, two rechargeable long life nickel battery packs, belt clip, flexible rubber antenna, earphone, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, EDACS, ESAS and LTR systems. Call 1-800-USA-SCAN to order your scanner now.



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Offer valid only on prepaid orders mailed to Communications Electronics Inc., PO Box 1045, Ann Arbor MI 48106 USA. Offer valid August 1, 1997 to August 30, 1997. Limit one coupon per item. Coupon is not redeemable with any other coupon or any other offer. Mention offer number AM.

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DX Camping

Yes, I know, August doesn't exactly provide ideal conditions for distant reception (DX), but it may well be the only time you and your radio get away from man-made static and/or visit a new part of the world from which to monitor. And if you're on a beach near the salt-water, you're twice blessed!

[PIC]

Phil Gebhardt, author of this month's DX camp feature and a resident of Port Perry, Ontario, is an avid promoter of radio wherever he goes. He's pictured here giving an introductory shortwave presentation at a Barnes & Noble bookstore in St. Petersburg, Florida. The bookstore carries a wide range of radio magazines and books, including *Monitoring Times* and *Satellite Times*. Barnes & Noble encourages local hobby groups to introduce their activities to the community. (With sufficient notice we'll even give you complimentary magazines to entice the crowd.)

Arthur Jackson, KA5DWI, expressed his thanks to Phil Gebhardt for an earlier article on building a mediumwave loop (Nov 96), and credited the article with rekindling his 35-year love of mediumwave DXing.

"The article stirred my curiosity just enough to build one in my limited spare time. The results were better than I expected. Whether I used my Sony ICF-2003 or the 10 year old AM/FM Sony Walkman, stations barely audible suddenly sounded like local stations.

"I made several part and construction modifications:

1. Full size 365 pf capacitors are hard to find. Electronic surplus stores carry car radio AM/FM variable capacitors. Smaller but, just as useful.
2. I used adhesive Velcro strips to guide the wires around the ends of the crossed supports. The spacing is 1/16 inch, every other row is 1/8 inch.
3. If you are using a small radios (which mine are), mount a 1 inch by 4 inch board on a Rubbermaid, single level Lazy Susan. Mount wooden guards at each end of the board. The length should only be long enough to fit the radio and the loop antenna. Rotation becomes simple.

"My enthusiasm has resulted into the construction of two more loops. One for longwave (1/16 inch spacing, 200 ft. of #30 wire), and one for 1610-3500 kHz as described in the article. The longwave one has entered me into a new DX field (NBD Beacons).

"Currently, I am trying to figure out a way



Gebhardt shown giving an introductory shortwave presentation at the Barnes & Noble bookstore in St. Petersburg, Florida.

to take these loops with me on trips. I am concerned about how will these be accepted in my baggage. I only carry a portable personal tape player, Casio LCD TV, 2 Meter handheld, and my Sony ICF-2003 with antennas when I am on the road!

Another Reconstituted Radio Nut

Eric Tarini, N1YNT, of Marion, Massachusetts, wrote his gratitude to columnist Skip Arey. "After 35 years, I am getting back into the AM/shortwave listening that fascinated me when I was 11 and 12 years old, growing up in Detroit. My dad put up a random-length wire on the roof, and I'd listen to AM DX, hearing baseball games from faraway cities on my 6-transistor Matsushita (now Panasonic) — it seemed miraculous! We also had a very old shortwave radio from the 30s or 40s, back when all radios were furniture.

"A couple of months ago, I bought a shortwave radio, started listening to world band radio. I ordered a pile of *MT* back issues to catch up, and came across your 'mildew' column in the July 1996 issue. I loved *Electronics Illustrated* and *Popular Electronics* back then (around 1960-61 or so), even though I didn't understand most of what I read: I sure wish I had some of them today.

"I was also fascinated by amateur radio, but didn't know how to proceed. Back then, it seems like you needed a mentor, or someone who could point you in the right direction. Nowadays, there's a lot more, and a lot better, information about these topics.

"After Christmas, I bought a couple of study books on ham radio, and passed my

Tech Plus six weeks later. I'm still learning about all the 'new' stuff in amateur radio that's different from my childhood memory of it — so many new things like packet, QRP, tiny VHF transceivers, etc. But what really caught my eye was what you wrote about 'a ham transmitter for \$5 in 1960s dollars' that you built for under \$20 in 1990s dollars. I'd love to see what that looks like — and maybe build one. (One of my favorite pictures in the ARRL *Now You're Talking* book is of a CW transmitter built on a tuna fish can.)"

Tweaking the Crystal Set

Alert reader Howard, WA2AFD, noticed that there appeared to be two windings on the Quaker Oats box crystal set pictured on page 86 of the May '97 *MT*. He is correct. Author Ken Reitz elaborates.

"There are two tuning coils on the oatmeal box. The modification comes from old-time crystal set Guru Elmer Osterhoudt (now a silent key) who was issued the ham call 6NW in 1919 and who started Modern Radio Laboratories in 1932 and ran it until his death in 1987 at the age of 87. In a flyer he printed, following the publication of the 1970 *Mechanix Illustrated* article referred to in my piece, he added the extra coil saying, '...although the originals didn't use the primary winding [top coil]...this is essential if you want good selectivity in separating stations.'

"It's just more of the mystery of the crystal set. It's amazing what you can do with so little. Reprints of Osterhoudt's voluminous work with crystal sets were made available by Paul Nelson who resurrected MRL. However, reports in the *Crystal Set Society Newsletter* [P.O. Box 3026, St. Louis, MO 63130; fax 314-725-7062] indicate that MRL is again dormant. I was able to contact them in March of 1993 and received a number of the MRL reprints which detailed amazingly complex crystal sets. I didn't include them in the sources because of the unreliability of the company.

"However, nothing beats the masterly craftsmanship of K.E. Edwards' work in his *Radios that Work for Free* (published 1977—check with your library). He has elevated the construction of the crystal set to a fine art.

"Describing his 40 meter band crystal set he says, '...It will tune much above and below this, but the 40 meter band is where it will tune

(Continued on page 102)

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Assistant Editor, *Monitoring Times*



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And On It Goes

Newt Gingrich hopes to cash in on the cell phone/scanner controversy of earlier this year. According to reports, he is thinking that the might sue Democrat Jim McDermott for any role he had in the release of the illegally taped phone call. According to Rep. John Boehner, Gingrich could take civil action against McDermott on the basis that he violated the Electronic Communications Privacy Act.

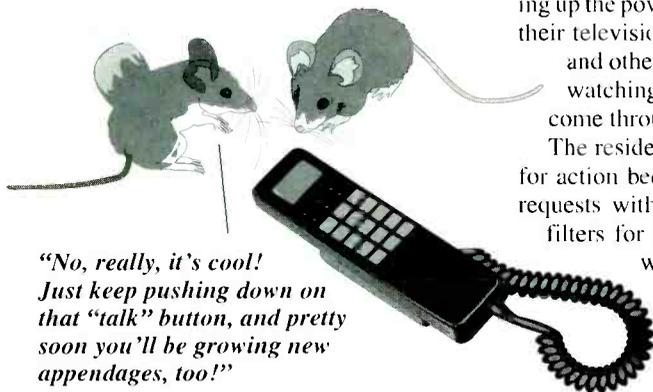
"We have been assured that the Justice Department considers the dissemination [of the tape] to be as illegal as the recording of the tape," says Boehner spokesman Terry Holt. However, the Florida couple who recorded the cell phone call was ultimately fined just \$500 each.

Double Digital Growth

The digital cellular phone market grew by a whopping 73% last year while the analog was up just 14%. According to the market research firm, Dataquest, however, Motorola is not sharing in the growth. Their sales of digital phones dropped 62% last year while Ericsson and Oy Nokia tripled. Some say Motorola's use of CDMA digital technology has dropped the anchor on its sales. Motorola disputes the numbers.

Double Cell Growth?

A study of mice exposed to radio signals similar to those given off by cellular phones may be the first concrete evidence linking the mobile phones with cancer. In an 18-month study, mice exposed to radio signals were twice as likely to develop cancer as their unexposed counterparts. Says John Moulder, professor at the Medical College of Wisconsin at Milwaukee, "It's certainly the first animal evidence that suggests that radio frequencies might cause cancer under some conditions."



"No, really, it's cool! Just keep pushing down on that 'talk' button, and pretty soon you'll be growing new appendages, too!"

Radio Waves Cure Snoring

Radio frequencies are now being touted as the cure for snoring. A company named Somnus Medical Technology has unveiled equipment that unblocks human air passages using radio waves. A radio frequency generator connected to a narrow needle penetrates the surface of the tongue, throat or soft palette and destroys a small area of inner tissue by

One way radio might be used to cure snoring.



generating heat between 158 and 176 degrees—"well below the boiling point," notes a company official. Seven to 18 million Americans suffer from sleep disorders. Five other companies — all owned by the same person as Somnus — also use radio waves to shrink swollen prostates and gynecological tissues, and kill cancer cells in lungs and kidneys.

Radio Waves Kill Civilization

CB radio. At one time it was America's favorite pastime, surpassing even baseball and sex. Now, unfortunately, the only time it gets any publicity is when an obnoxious CBER gets the neighbors going at a full boil.

In Ferndale, Michigan, 40 residents got together at a City Council meeting to demand action against a local CBER. According to residents, the unnamed operator uses a linear amplifier and torments neighbors by cranking up the power and cursing at them through their televisions, telephones, baby monitors and other electric appliances. "We'll be watching TV and hear a big 'f___ you' come through," says Tom Plain.

The residents have turned to city council for action because the FCC replied to their requests with a brochure on where to buy filters for their appliances. "It has to do with the product," says an FCC spokesman. If, however, the FCC determines that the CBER is using an illegal amplifier,

the FCC spokesman said that the Commission will then send the offending operator a warning letter.

Internuts

According to business week, internet growth continues at a staggering pace, doubling to nearly 40 million people. According to the Harris Poll, nearly 21% of all adults now browse the web, up from 21.5 million a year ago. The gender gap is closing quickly, too, with women now comprising 41% of all internet users. Other interesting data: 42% of all internet households have incomes of \$50,000 or more; 85% are white and 25% are in their 40s. The least common internet activity: shopping.

Internut II

One third of the state of Iowa doesn't have local internet service so, in 1990, the state formed the \$300 million Iowa Communications Network (ICN). The objective was to bring free internet service connections to school classrooms. This didn't go over too well. Phone companies and ISPs (internet service providers) complained that they couldn't compete with a state-subsidized network. GTE, which was to begin offering local internet access, canceled their plans. Two months ago, the people of Iowa — who also foot the \$37 million annual cost of the ICN — had enough and voted to get the state out of the telecommunications business, but the measure was vetoed by the governor. State legislators are now trying to figure out what to do with the \$300 million boondoggle.

Iridium, Bill Gates, and Blimps

You may have heard of Iridium, the \$5 billion, 66-satellite telephone system. Using a palm-sized phone, you'll be able to phone to and from anywhere on the planet. The first five Iridium satellites are already in space.

Teledesic Corp. is looking to launch 228 satellites to provide high speed global wireless internet access. This one is a Boeing Corp project backed by Bill Gates.

Now comes word of yet another low-earth system called Sky Station International (SSI). Sky Station International is a \$5 billion network of 250 helium-filled — no kidding — "blimps" stationed 13 miles above the earth. The blimps will relay communications in much the same way as satellite. A new solar powered "air treading" technology will reportedly keep the blimps stationary for up to

10 years. SSI is asking the FCC for a portion of the 47 GHz band for their project.

Programmable "Oops"

Radio Shack recalled all unsold stock of their new HTX-204 dual band hand-held radio when it was discovered that it could be programmed to transmit and receive out of band. Tandy VP Bob Miller said that "Radio Shack would never knowingly do anything that would compromise our standing with the amateur radio community or the FCC." So what's the future for the HTX-204? Says Tony Magoulas, Tandy's Public Information Officer in Ft. Worth, "The radio is gone and will not be replaced."

Pull Off the Road or Pay

A Texas jury has ordered an 18-year-old girl to pay about \$7 million in damages to the family of a boy killed when she lost control of her vehicle while answering a cellular phone call. Kayla Segerstrom crashed her family van head-on into another car in 1996, losing control when she reached for the phone. A three year old boy was killed in the accident. His baby sister's neck was broken and their father suffered serious brain damage. The case is said to be precedent-setting because it addressed the issue of responsibility in an accident caused by the use of a cellular phone.

Dead Air

Hundreds of radio stations in Ohio, Florida, and Louisiana were forced to transmit nothing but dead air when a closed-circuit Emergency Alert System test from FEMA jammed. A test, intended for just WLS in Chicago, affected all the other stations in the system when a FEMA operator failed to deselect stations in the other states. WLS, a primary entry point station, requested the test as it was completing installation of equipment to receive national level alerts.

Fred... Fred... What's going On?

Traffic at the airport in Groningen in the Netherlands was tied up for about 20 minutes earlier this year when pilot Wim de Nijs used air traffic control frequencies to serenade listeners with the theme from the Flintstones TV show. Clasp the microphone of his small aircraft and circling the airfield, De Nijs sang, "Flintstones. Meet the Flintstones, they're a modern stone-age family..." until one Air Traffic Controller thought of calling in the Dutch air force and having the cave man

"Oh, I know!
How about this:
'Jailbirds. Meet
the Jailbirds,
we're full of fun
and good
friv-o-li-ty ...'"



shot out of the sky. Calmer thoughts prevailed, however, and De Nijs was ultimately sentenced to four months in prison. No word on what song the Dutchman is singing now.

Television in Russia

After the fall of the Soviet Union it was hoped that Russia might begin to learn some lessons from the United States: democracy, capitalism... tabloid TV? It hasn't taken long for familiar trash to slither onto the Russian airwaves. Hosted by Vladimir Pozner, an apologist for the communist regime often seen on the Phil Donahue Show in the 1980s, is a bizarre show called, "Person in the Mask." Guests appear in the studio behind hideous metal masks. Topics include pimping teenage boys, a KGB agent who heads a powerful drug mafia, and old standard fare like adultery.

To Catch a Jammer

Police in Grand Rapids, Michigan, were trying to catch a woman who had robbed a

bank. Whenever dispatchers tried to communicate with pursuing officers, their transmissions were jammed. The robber escaped.

This was not the first time. Grand Rapids police transmissions have been jammed 35 times in the past two years. When police sent out an engineer with direction-finding equipment, they zeroed in on a man sitting in a Ford Escort. A large antenna was on the car's roof. When dispatchers broadcast a description of the car, the jamming stopped.

Police obtained a warrant and searched the man's house. Seized were at least a dozen hand-held radios, a half-dozen walkie-talkies, seven two-way radios, microphones, speakers and other transmitters. Though his name has not been released, the man is said to have been a volunteer sheriff's deputy and the traffic squad's communications officer.

Communications is compiled by Larry Miller with help from Rachel Baughn, and the art department at Grove Enterprises. Also on staff as official "Communications" monitors are the following good people who look for, clip out, and mail items of interest from their local newspapers: Anonymous, Albany, NY; George Beard, Kansas City, KS; Chanel Cordell, Brasstown, NC; Kenneth Dunn, Glassboro, NJ; Maryanne Kehoe, Atlanta, GA; Mr. and Mrs. Kevin Klein, Kimberly, WI; Ira Paul, Royal Oak, MI; Richard Statefield, Brooklyn, NY; Walter Szczepaniak, Philadelphia, PA; Peter Tams, Los Angeles, CA; and Michael White, Greensboro, NC. We also consulted the following publications and list their names in grateful appreciation. Dispatch Monthly, National Scanning, Radio World, Russia Review, Satellite Times and W5YI Report.

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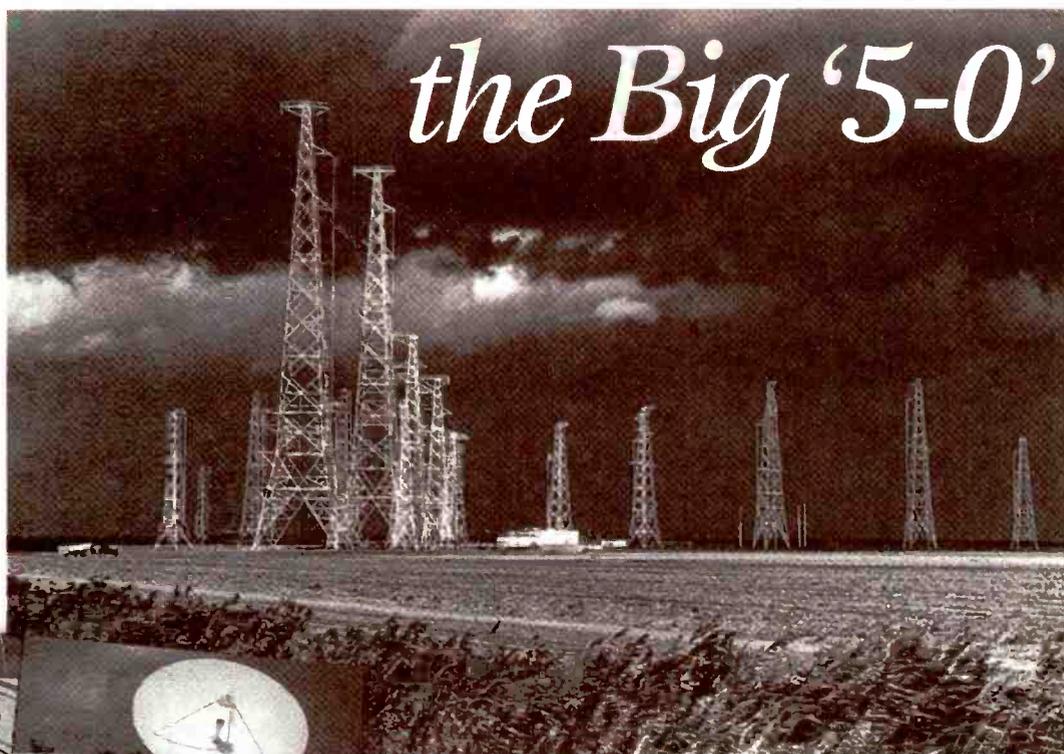
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Radio Netherlands Hits

The Dutch have a saying about a 50th anniversary. It goes: one has "attained their Abraham," a biblical reference to age, grace and wisdom. As Radio Netherlands reaches the half century mark, it lives up to that saying.



By Jeffrey M. Poulin, KF4JSV

It is 6:28 p.m. in Virginia. As usual, my shortwave radio is tuned to 6165 kHz. The lilting refrain of a traditional Dutch folk song, "Merch Toch Hoe Sterck" begins. The announcer's voice says "This is Radio Netherlands, the Dutch international service."

First comes news and commentary on topics that are seldom mentioned on our evening news reports. You probably won't hear about the O.J. Simpson trial (reason enough to listen to shortwave). But you can learn about the upheavals in Albania, which can affect U.S. troops in the Balkans. Or the successful launch of a new satellite by the European space agency, rioting in Africa, unrest in mainland China,

Dutch pork production, and the status of the European Union. The commentary helps put the stories in context for better understanding. The presentation rivals that of the BBC in my opinion.

What follows is just plain fun. Programs can cover any topic. One program will discuss the latest trends in music. The next broadcast might delve into the history of Gypsies in Holland, the legacy of the Marshall Plan, the Trappist Monk brewing industry, or environmental concerns. One of my favorites was a program about the changing customs of handshaking over the last 300 years. (I know what you're thinking: but that program actually turned out to be an entertaining

history lesson in European culture.)

1997 marks the 50th year of Radio Netherlands doing its job, and doing it well.

■ In the Beginning

Although Radio Netherlands officially started in 1947, its roots go back 30 years earlier. In 1917, Phillips, the Dutch electronics company, began making tubes for the fledgling radio hobby and industry.

Ten years later the Netherlands became the first European country to set up a regular international broadcast schedule. That station, PCJ, was established as an economical and very efficient way to communicate with the Dutch colonies in various parts of the world. Those colonies, especially Indonesia, also provided a market for the radios made by Phillips. Other European countries followed the Dutch lead. Within a few decades, most of those colonies would be independent countries, but their existence served as a significant catalyst in developing overseas shortwave broadcasting.

In 1928 Eddie Startz began a Sunday institution that would continue for over 60 years. Saying that the call sign PCJ stood for "peace, cheer, and joy" the Happy Station program went on the airwaves. His show's motto was the "happy station of a friendly nation." Significantly, the listener no longer had to speak Dutch to learn about the musical taste and cultural matters in Holland. And it proved that there was an audience for programs "with a Dutch accent."

The 1920's and 1930's also saw the establishment of four domestic services, each with an affiliation in religion or politics. These affiliations still pertain today. However, there was no unified, national voice going out to the world. Therefore, in 1937 The Hague (seat of the Dutch Government) appointed a commission to study the matter. It recommended an overseas shortwave service made up of existing domestic programs but run by a small, independent staff.

What might have formed Radio Netherlands was never realized. Before the new service could be established, the Nazis invaded Holland.



Weatherman Jan Pelleboer shown in 1974 photo.

■ World War II and British Influence

Holland was occupied quickly. The Nazis immediately took over the domestic radio services for propaganda and security purposes. The Dutch staffs were ordered to continue operating the stations under their new masters. Although this so-called collaboration was involuntary, it led to antagonisms after the war that would last for years.

With Holland occupied, a Dutch newspaper reporter in Paris, Hendrik van den Broek, got together with several colleagues and started clandestine radio broadcasts to Holland using French facilities. But France itself was falling to the Blitzkrieg, and the group escaped to London before Paris was taken. There they began Radio Orange, named for the Royal House of Orange, the official voice of the Dutch government in exile.

Using the BBC's Bush House facilities and powerful transmitters, their broadcasts were used to assist the Dutch underground and help maintain morale among their occupied countrymen. (BBC resources were used by several countries for the same purposes.)

By the autumn of 1944, a few months after D-Day, the southern half of Holland was liberated. Van den Broek and his team moved

back and began Radio Herrijzend Nederlands in Eindhoven. This was the station that announced the end of the war in Europe to the Dutch people.

Van den Broek, now a Major, was given authority over the established domestic stations in Hilversum. Among other duties, it was his responsibility to remove those staff members who had worked under the Nazi occupiers. This was the official government policy, not his own, but van den Broek bore the brunt of the resentments that arose. Many of these people, well-known voices in the Netherlands, never forgave van den Broek for the way in which he carried out this policy.

Another problem developed over the "tone" of the domestic services. Van den Broek had been heavily influenced by the understated, precise tone of BBC broadcasts. Dutch stations, indeed most of those in Europe, had had a more exuberant presentation before the war and expected to pick that up again. The clash of these expectations with van den Broek's wartime BBC influence caused more hard feelings.

The desires of the domestic broadcast services could not be easily ignored as they represented four influential parts of Dutch society: the Catholic and Protestant churches, and the two primary political factions. However, that still didn't answer the pre-war goal of a unified, distinctly Dutch voice for the world to hear.

■ Birth of a Station

A transitional stage began in 1946 for a Radio Netherlands. Part of the proposed station was a world service that would provide



Media Network crew: Diana Janssen and Jonathan Marks.

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the long-desired unified voice. Van den Broek vigorously promoted the idea of a world service, obtaining government funding, a separate staff, and virtual independence from government interference. The quote below explained his broadcast philosophy.

"There are really two reasons for the existence of Radio Netherlands and we do our work in two ways. Through our foreign language transmissions and through our transcription service, which produces and records programs on any phase of Dutch culture, we try to tell the rest of the world about life in the Netherlands, our institutions, and traditions. The other reason for our existence is our broadcasts in the Dutch language. As you know, many thousands of our countrymen emigrate each year to find a new life in a strange land. It's our aim, in our Dutch broadcasts, to supply a link between the homeland and the new country, to try to ease the shock of the completely new environment by providing news and entertainment straight from home."

With that philosophy as a guide, Radio Netherlands was officially launched in 1947.

Radio Netherlands faced opposition from the domestic stations from the start. They still resented van den Broek. They had assumed, based on the pre-war plans, that they would provide the programming for any world service. And the new station was a competitor for funding.

But the domestic services all had their own agendas and affiliations. Radio Netherlands did not. At that time the Dutch Government was eager to retain control of its Indonesian colonies. The Hague found it could rely on Radio Netherlands to broadcast accurately the Government point of view. The ploy, as a propaganda move, failed. Indonesia obtained its independence. But by that time, Radio Netherlands had established itself as a reliable, unbiased source of news and programming.

Distinctively Dutch

The first staff members knew they needed a plan to keep audiences interested while establishing a distinctive Dutch identity. The United States was the pre-eminent industrial and military power with world-wide influence. England's colonial empire was shrinking, but it still headed a Commonwealth that spanned the planet and worked from a tradition of authority in its broadcasts. France, even after five years of occupation, simply assumed a high degree of influence and acted accordingly.

The Netherlands is a small country. It is half the size of South Carolina with a population only a little more than New York City. The staff knew that what goes on in Holland is not necessarily earth-shaking. They realized a modest approach in their programming, as long as it was entertaining and informative, could lure an audience. Af-

ter all, the Netherlands has centuries of culture and history to draw on, magnificent artwork, orchestras, and a friendly, outgoing populace. There was no lack of material available.

If they weren't going to shout, they would make their broadcasts fun and conversational. This would not be "The Netherlands, the Country," broadcasting to other countries: It would be Dutch people talking about matters of fun and interest to other people.

The first English language broadcasts consisted of twenty minutes of news and commentary three times a day. Audiences wrote in wanting to know more about the place producing these reports, which led to programs on Dutch culture and popular tastes. At first the programs focused on the symbols of Holland: windmills, wooden shoes, tulips, and so forth. But it didn't take long to go beyond that. A similar approach was employed in all the languages they used in their broadcasts.

Even though shortwave radio was their primary means to disseminate programs, they didn't rely on it alone. The station produced records of classical music and other programming, using the finest technology available, and sent them all over the world to be played by local stations as part of Radio Netherlands' transcription service. These transcriptions had the added benefit of being able to target specific audience needs. At one point in the 1950's they were sending out 150,000 recordings a year.

Program content was never considered sacred. It was changed to reflect changing tastes in the Netherlands and among the audiences. In the 1950's there was a shift from classical to jazz and folk music. In the 1960's audiences wanted more informative programs. Listeners could now get high quality music recordings from many other sources but the documentaries Radio Netherlands produced could not be found elsewhere. The current blend of programs dealing with cultures, history, education, and current events—some serious and some lighthearted—is a result of meeting the audience's wishes.

Technology for Tomorrow

Radio Netherlands always used the best technology to communicate with their audience. At first that was shortwave radio, records, and program guides sent by mail. It was among the first to use satellite relay stations to improve reception, such as the relay in Bonaire. Television, satellites, and the internet have all been brought into play as means to accomplish their goals.

For all the changes in technology, Radio Netherlands has not forgotten its purpose:





Ginger da Silva, host of A Good Life, conducts an interview.

to make the world aware of the Dutch people and culture. In the United States we generally hear the shortwave broadcasts. But Radio Netherlands is increasingly involved in television productions, often in collaboration with other countries. The old records have been replaced by top quality CDs of Dutch composers by Dutch performers. Satellite transmission of sound and picture lets them provide educational material in Latin America and Africa. The internet allows Radio Netherlands to maintain ever more information related to its broadcasts. Above all, the new technology permits the staff to target each audience with timely and relevant material.

A measure of the success of this approach is that their English language programs are carried by stations in Australia, Canada, and South Africa for domestic broadcasts. They recently opened a New York office to promote domestic radio coverage in the United States.

What about shortwave radio which started it all? It's not going to go away any time soon. After all, the gear is relatively inexpensive, light, easily powered, and available even in less developed areas. And there is no gatekeeper or intermediary to break the lines of communication.

Something that won't change is the voice of Radio Netherlands: "the European station with the Dutch accent." Even with the pro-

posed unified Europe, languages and the differing cultures will not disappear. The station has established an identity of its own that will continue its mission and traditions.

■ A Golden Half Century

Radio Netherlands has a rich history. There have been the serious domestic events, such as when the Queen of the Netherlands announced her abdication in favor of the next royal generation. There have been moments of fun. One April First broadcast gave the wavelengths, straightfaced, in feet and inches instead of meters. Or the undiscovered open microphone that sent a program production session over a satellite sub-carrier.

Radio Netherlands has always encouraged audience feedback and suggestions. Different views from around the world let the staff respond to changes in their listeners' needs and wants. This willingness to change is one of the reasons for Radio Netherlands' ongoing and increasing popularity.

Jonathan Marks, Director of Programs, revealed another reason. "Maybe [we remain so popular world-wide] because we're independent and we genuinely care about listeners. We listen to you because you listen to us. I don't think we're ashamed to admit we enjoy what we're doing, and that comes across in the way we compile the programs. This is a small country, so we have to try harder to share our information with others. Other countries shout information. We don't think that works [for us] in 1997."

Is Radio Netherlands meeting its goals? I believe so. With entertainment and information it provides a window into the Dutch world. And it makes me want to know even more about the country and its people.

■ Contacting Radio Netherlands

The station can be reached in a number of ways. The mailing address is: Radio Netherlands, English Department, PO Box 222, Hilversum, Holland. Telephone: +31 35 672 42 22 (in the U.S. the number should start with 011). E-mail: letters@rnw.nl

The staff always enjoys hearing from you with comments on their programs or even with suggestions for future shows. They also offer the usual goodies, such as QSL cards, post cards, bumper stickers, etc., as well as catalogues of their music recordings and television programs. Specify that you want the English language version.



Bumper stickers in four languages attest to RN's global reach.

Radio Netherlands also sends out upon request, at no charge, a quarterly newsletter with backgrounds on the staff, what's going on at the station and upcoming shows. I especially like it because it gives the schedules and topics for their excellent documentaries. Again, request the English version.

Don't want to wait for the mail? Radio Netherlands maintains a web site at: www.rnw.nl. In addition to station and program information, the web site offers real audio of programs, reading suggestions for books and magazines related to radio (including *Monitoring Times*), and links to other sites of interest.



The Roughly Speaking crew (from left): Max, Simone, Howie and Reza.

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Send Your Receiver to Camp



By Philip
Gebhardt,
VA3ACK

It doesn't matter if you DX on the longwave bands or the shortwave bands, the lament is always the same: The antenna isn't long enough (or high enough). Or, it may simply be that you're tired of using the same old antenna. It could be that your shack is located in a noisy environment so you can't dig those weak signals out of the noise.

So what do you do? You organize a DX camp.

Depending on your needs and the camp site, your DX camp may involve only one person—you. At other times, you may want to get a small group of listeners together. If you're really ambitious, you could involve dozens of radio enthusiasts. There's something to be said for each type of camp.

The main criterion in any case may be to find a site where you can string up a really long antenna—perhaps a beverage—or a



Picnic tables provide plenty of room to lay out equipment at the one-day DXpedition at Simeon Park organized by Joe Karthaus. The building provides shelter from the cold and wind, but easy entry for antenna lead-ins. Here Bernie Rataj has his mediumwave loop ready for DXing. (Photo credit: Jack Henshaw)

really high antenna. You might want to experiment with several antennas. Or maybe what you need is a place where the noise level is lower than it is at home.

If you only have access to a small space, then you may have to limit this year's camp attendance to you. My experience, however, has been that the event is always much more fun when you have company. It's easier to erect antennas with an extra pair of hands available. If you have a camp buddy, you can each put up an antenna and part way through the camp you can swap antennas. There is also the thrill of having someone to tell when you hear a really great DX catch. Conversely, your listening buddy can provide you with hot tips that you otherwise might miss.

Expanding the camp from a small group to a larger group increases the number of

(Continued on Page 14)

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The WiNRADiO card: plug it in and transform your PC.



The WiNRADiO software: enjoy the virtual control panel.



The optional WiNRADiO Database Manager

WiNRADiO Advantages

- WiNRADiO front-panel functions are more flexible and powerful than those of a traditional radio.
- WiNRADiO has practically unlimited memory capacity and can be customized for specialized applications.
- New functions, for example databases, can easily be integrated with WiNRADiO.

- A single PC can contain and control more than just one WiNRADiO. Observe activity on several bands simultaneously.
- The processing power of a PC can be used to process WiNRADiO signals, using a Sound Card.
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- No cables and power supplies are needed to use WiNRADiO with your PC. Get rid of that clutter on your desk!
- Programmer's information is supplied for special applications development.
- Specially developed shielding materials and innovative design methods prevent PC-generated interference from entering the receiver.



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See the bands with our Spectrum Scope!

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For the latest information on WiNRADiO visit us on <http://www.winradio.com>

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Joe Karthaus, organizer of the one-day Simeon Park DXpedition, uses his portable with a telescoping antenna to check signals against his receiver connected to an outdoor random-length antenna. (Photo credit: Jack Henshaw)



The cabin that Ken Alexander uses during his DX camps. The rural location near Coe Hill, Ontario provides noise-free listening while the trees and large lot size provide plenty of room for antennas. (Photo credit: Ken Alexander)

Harold Sellers (right), editor of the ODXA's DX Ontario magazine, enjoys a few quiet moments at his receiver during the ODXA's shortwave camp in Mansfield, Ontario. Harold's experience in DXing provides a wealth of information for both newcomers and veteran DXers.



The two-story building used for the ODXA's shortwave camp held each November provides shelter from the cold, a dining area for meals, sleeping quarters, a large common area for DXing and easy access to trees. The building is part of the Mansfield Outdoor Education Centre used by groups of students during the week. (Photo credit: Jack Henshaw)



Charlie Diamond tunes in to some DX at the ODXA's shortwave camp at the Mansfield Outdoor Education Centre in Mansfield, Ontario. The camp offers members an opportunity to compare equipment, discuss techniques and share DX tips. (Photo credit: Jack Henshaw)

hot tips, especially if you have a board on which to display the information as each DX catch is made. It can also increase the variety of antennas, although random-length wires often seem to predominate because of their simplicity.

What starts to happen at the larger DX camps is increased interaction. The camp almost becomes a social event. Novice listeners can get advice from the veterans; participants can compare receivers and accessories; the merits of the latest gadget on the market can be discussed. It's a bonus that all this happens spontaneously. There's no need to formalize the process with a program.

One thing is certain: Whether your camp is small or large, there are no rules. You organize the event however you want. Within the Ontario DX Association, there are always several such events in various stages of development.

When I have had the chance to exchange the noise of the city for the radio-quiet conditions in a rural setting, I've packed my receiver and seized the opportunity. I may take along a roll of wire or a prefab antenna. Obviously, organization is at a minimum.

Slightly more elaborate is the event organized by Joe Karthaus. He works for a company that owns a park. The park facilities are available to employees and their families throughout the year. Through the kindness of the company and the park staff, we have become Joe's extended family. The heated chalet provides protection from the winter weather and electricity eliminates the need for battery-operated receivers. The indoor washrooms make life easier, too! But best of all, there are large trees and wide open spaces for antennas.

What makes Joe's DXpedition easy to organize is that it is only a day-long event. We start DXing in the morning and pack up at night. Our main concerns are what band to listen to and when to eat.

Ken Alexander organizes a slightly more elaborate event because he has access to a cabin. He invites small groups (about six) to enjoy the DXing opportunities the rural location affords. Three-hundred-meter (1000-foot) random-length antennas are the order of the day. The wire is fed into an impedance matcher and then through coax to the receiver. Because several listeners might want to connect simultaneously to a single antenna, the club's multicoupler comes in handy in this situation. (A multicoupler allows several receivers to be connected to a single antenna.)

The organization is still minimal, but certain things need to be addressed. Since the

cabin is rented, Ken must collect money from the participants. Will the group eat together or will participants be responsible for themselves? Are there enough beds for everyone? I decided to take advantage of the opportunity to do some TV DXing using the rotatable beam at the cabin only to find out that the rotor caused interference on the lower bands. Oops!

Beyond that, the ODXA has an annual shortwave camp (although some members DX the medium and longwave bands while others move up to the FM band).

Because this event can involve two to three dozen members, a committee of four members headed by Jack Henshaw, the ODXA's current chairman of the board, oversees the camp organization.

Facilities are rented from the Mansfield Outdoor Education Centre for Friday night through Sunday afternoon. Meals are supplied by the center and sleeping accommodations are dormitory-style with bunk beds. A single listening area allows all participants to be together to facilitate exchanging hot DX tips. A blackboard is used to list stations and frequencies as they are heard. The club's multicoupler (several dozen receivers can be connected to a single antenna) gets a good workout at the camp.

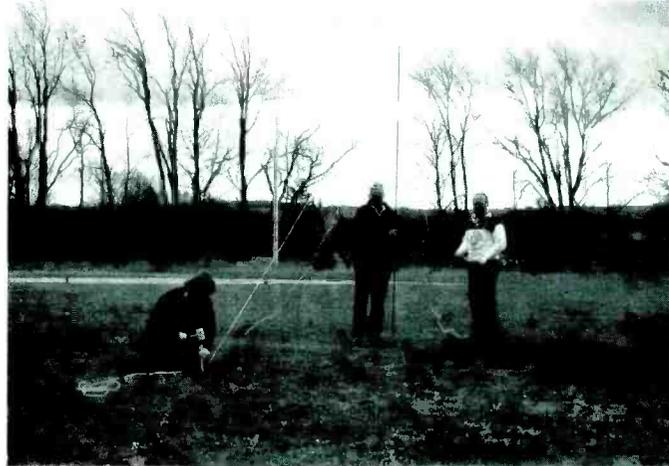
Experience has made organizing the event easier throughout the years. Experience has also taught us not to over-organize. The social aspects of the camp tend to keep things flowing smoothly simply because there are so many members in attendance. While organizing the camp is easier by committee, for many years two semiannual camps were singlehandedly organized by Steve Canney. That's not to say it was an easy job for Steve — just that it is possible for a single person to organize such an event.

■ The Antenna's the Thing

Over the past several years, we have encouraged members to try different antennas. For *MT* readers who wish to try some antennas that have already been tested and proven, here are some of the types we have used at the Mansfield site. You can try these either at your DX camp or at home.

RANDOM-LENGTH WIRES

In many cases, members simply string up random-length wires. True, they are often long wires (sometimes 100 to 300 meters long), but equally often they are simple



One of the attractions of a DX camp is the opportunity to try out new antennas. Here, Ontario DX Association chairman Jack Henshaw (center) holds a homemade quarter-wave vertical antenna in place as Norma Kennedy hammers pegs into the ground to act as anchors for guy ropes and Harold Sellers unrolls wire to be used as radials.

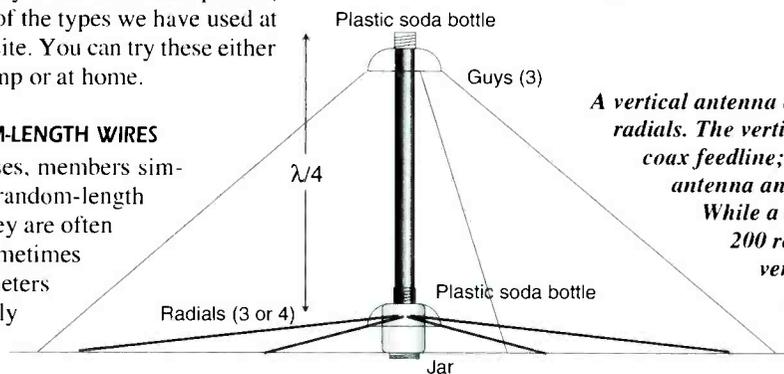
connected directly to the receiver input. The random-length antenna is attractive because of its simplicity and because it can be used over a wide range of frequencies.

Ken Alexander has designed a longwire impedance matcher that he now manufactures and sells. The baluns were one step in improving the performance of these antennas. Adding a balun is one of the simplest improvements you can make. Often Ken strings up 300 meters of wire that he then connects to a balun and through coax into the input of the multicoupler. This enables those members who want to attend the camp, but aren't particularly knowledgeable about antennas (or perhaps simply not interested in antennas) to participate.

In an effort to peak performance on specific bands, I erected several antennas on different occasions.

THE QUARTER-WAVE VERTICAL

One of the easiest antennas to erect is the quarter-wave vertical shown in Figure 1. One of its advantages is that it re-



sometimes avoid using vertical antennas because of the support problems. The vertical section (made of 13 mm or 1/2-inch copper pipe) must somehow be held in place and it must be insulated from the ground. Insulating the antenna is easy if you take a lesson from commercial broadcast stations. I set the antenna on a glass insulator. Not the type they use at broadcast stations—they're too expensive and they are designed for high power transmitting applications. Instead, I use a glass jar, such as a jam jar. The outside surface of the jar bottom is often concave. I invert the jar, sink it into the ground slightly and place the antenna on the concave bottom.

Supporting the antenna in a vertical position is almost as easy. You'll need two plastic soda bottles. Cut the top off both bottles and discard the bottom part. You also need one of the bottle caps. The first bottle top is simply placed over the top of the antenna and dropped to the bottom where it covers the jar. This bottle helps keep the antenna on the jar. The second bottle (with the bottle cap screwed on) is placed at the top of the antenna. Three guy

FIGURE 1

A vertical antenna consists of a single vertical leg and a set of radials. The vertical leg attaches to the center conductor of the coax feedline; the radials are joined at the base of the antenna and connected to the outer conductor of the coax. While a commercial broadcast station might use 100 to 200 radials, you'll only need three or four. In this version, the vertical leg is insulated from the ground using a glass jar as an insulator. The top of a 2-liter soda bottle and three guy wires support the top of the antenna.

ceives signals from all directions. The length can be calculated using Equation #1:

$$L = 75000/f \quad (1)$$

where L is the length in meters of the vertical section as well as the length of each ground radial, and f is the frequency in kHz. (If you want the length in feet, use $L = 246000/f$.)

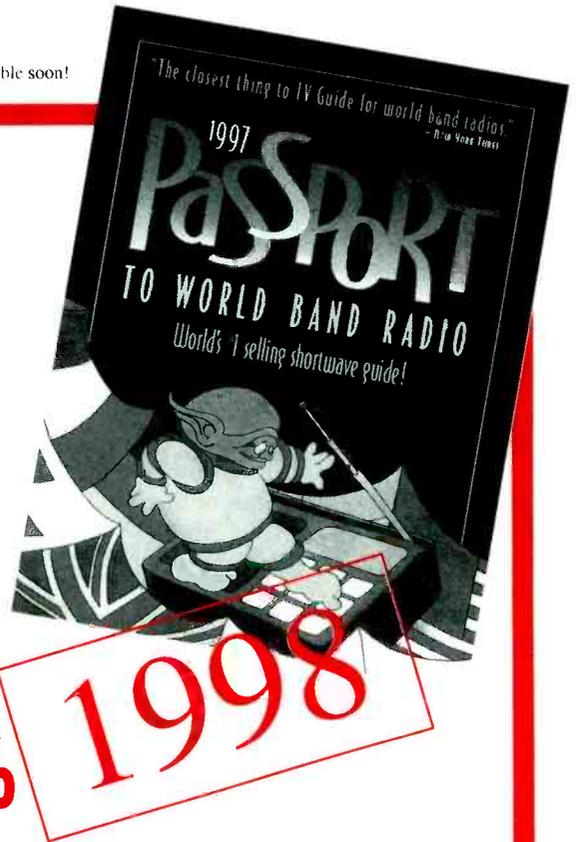
I generally select the middle of the band as the frequency. For example, for the 13-meter band, I would use 21650 kHz. In that case, the length (L) becomes $75000/21650$ or 3.46 meters.

Listeners some-

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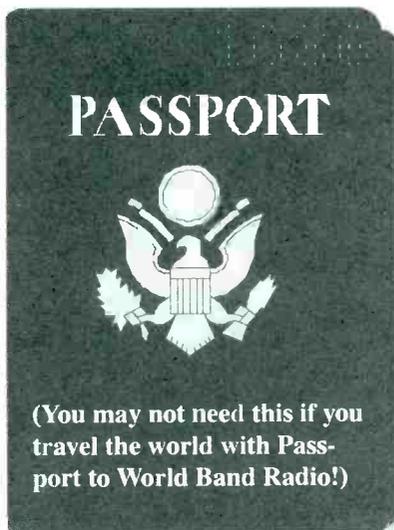
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wires (or plastic line) can be attached through holes you punch in the plastic.

Place three or four radials along the ground, attach the coax feedline (inner conductor to the vertical section; outer shield to the radials) and you're ready to receive shortwave broadcasts.

Our DX camp version of this antenna was designed for the 13-meter band.

FULL-WAVE LOOP

As its name implies, this antenna uses one-wavelength of wire. Construction is fairly straightforward—you form the wire into a square (each side is a quarter-wavelength long) and you string it up in the trees. See Figure 2.

Place an insulator at each of the four corners. The top two insulators are used to attach the antenna to tree branches; the lower two insulators are attached to anchor points in the ground.

The feedpoint of the antenna is at the middle of the bottom leg.

If you have the required height, you can rotate the square and mount the antenna in a diamond configuration. The feedpoint becomes the bottom vertex. Only one tree is needed to support this configuration.

Another variation is the delta loop. The wavelength of wire forms an equilateral triangle rather than a square. Normally, delta loops are suspended with the horizontal base at the top and a vertex near the ground. The easiest place to attach the coax feedline is at the vertex near the ground.

Equation #2 is used to calculate the total length of wire required for square loops and delta loops.

$$S = 306324/f \quad (2)$$

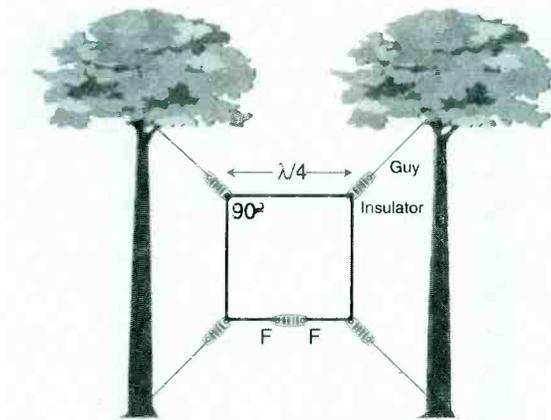
where S is the length of one wavelength in meters, and f is the frequency in kHz (f for feet, use $S = 1005000/f$).

For the 13-meter band, you'll need 306324/21650 or 14.15 meters of wire. (Each leg of the square will be $14.15/4$ or about 3.54 meters long.) We actually used this antenna on the 25-meter band.

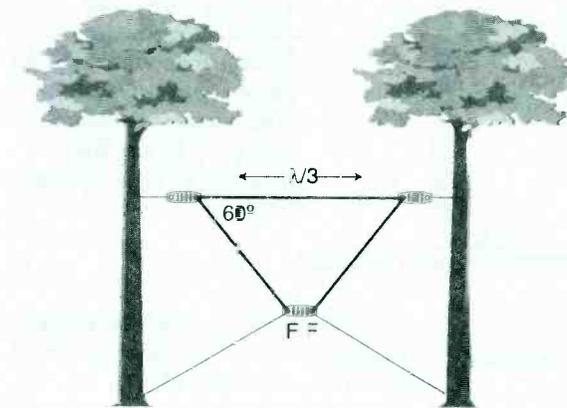
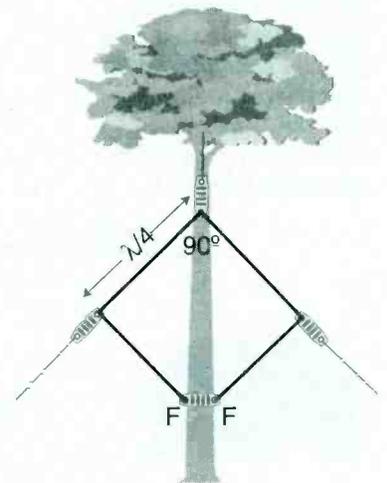
INVERTED L

Quarter-wave vertical antennas and full-wave loops are useful antennas on the higher bands where their dimensions are manageable. On the lower frequencies, we needed something else. The inverted L provided the answer. As shown in Figure 3, it is simply a bent quarter-wave vertical antenna. The overall length is determined from Equation (1).

This antenna lends itself well to wire rather than copper pipe construction. Each end of the horizontal section can be threaded through an insulator and supported by trees.



**FIGURE 2
(THREE VERSIONS)**



Wire is a favorite material for antennas. It is easy to work with and makes assembly and disassembly of an antenna a quick process. A one-wavelength piece of wire can be used to construct a square loop antenna (above), a diamond loop (right) or a delta loop (below). The feedline attaches to the two points labeled F.

Numbers Stations are found all over the shortwave spectrum. They emit unusual transmissions of synthesized voices reading sets of phonetic letters and/or numbers. The origin of these stations is in dispute. Their purpose is unclear. There are many dozens of different signal types on the air, each run by different organizations. Some of these organizations should have been closed down after the end of the cold war, yet they continue to transmit like clockwork. No one has ever compiled a set of Numbers Stations recordings for sale to the public. Until now.

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FIGURE 3

Due to space limitations or frequency, a vertical antenna is sometimes impractical. In that case you can bend the top of the antenna to form an inverted L antenna. Connect the feedline to the points labeled F.

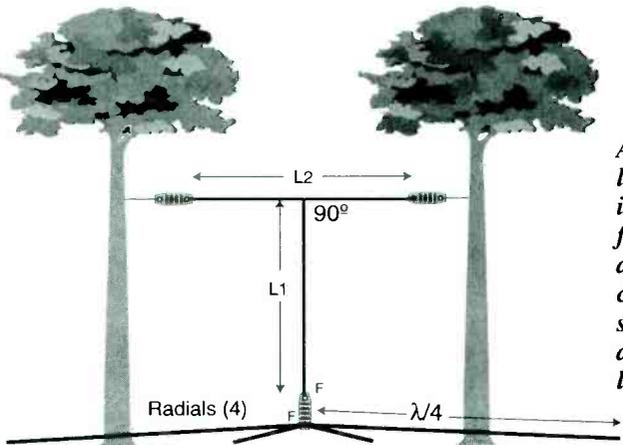
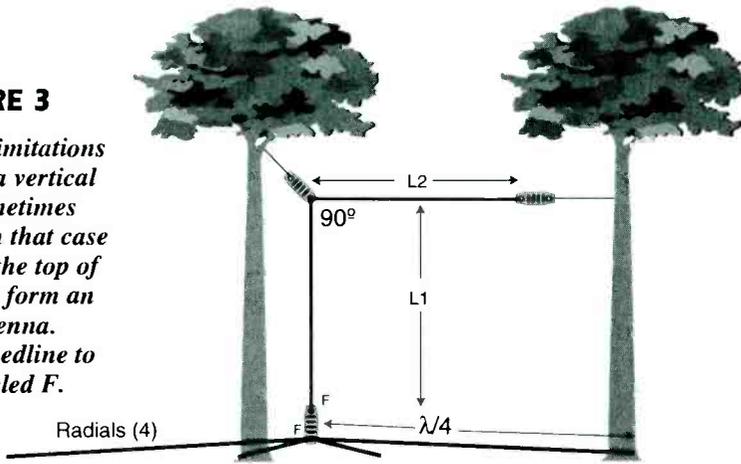


FIGURE 4

Although it uses the same length of wire as an inverted L antenna, the flat-top T antenna may be a more convenient configuration in some settings. The feedline attaches to the two points labeled F.

Generally, the longer the vertical section, the better the antenna performance. We used this antenna on the 41-meter band.

FLAT-TOP T

A modification of the inverted L, the flat-top T antenna, also uses a quarter-wavelength of wire. In the flat-top T, however, the horizontal leg is centered on the vertical leg. See Figure 4.

As with the inverted L, the longer the vertical leg, the better the antenna performance. This design was used on the 31-meter band.

PHASED VERTICALS

If you want to use a vertical antenna, but don't need (or want) to hear signals from every direction, you can use two quarter-wave vertical antennas. Depending on how far apart the antennas are and how long the coax cable is that joins them, you can produce an antenna array that receives better in some directions than in other directions.

Figure 5 shows one such array. You can use Equation. (1) to calculate the length of the antenna and the radials. By using

quarter-wavelength spacing between the two vertical antennas, you can also calculate that distance using Equation. (1).

To produce an antenna that receives best in one general direction, the two vertical antennas need to be connected together using a specific length of coax. This version uses a length equal to $5\lambda/4$. You'll need to use Equation #3 to calculate the length of the coax

Phased vertical antennas can provide a variety of reception patterns. Among them are the figure 8 pattern, the three-leaf and four-leaf rose patterns and the cardioid pattern produced by the configuration shown here. A single vertical antenna will receive signals from any compass direction while the two phased vertical antennas shown here receive signals best from the direction of Antenna 2 toward Antenna 1.

phasing line. (This equation takes into account the velocity factor of solid polyethylene coax.)

$$P = 247500/f \quad (3)$$

where P is the length of the phasing line in meters, and f is the frequency in kHz. (For DXers who prefer to think in feet, use $P = 812008/f$.)

If you want to listen on the 13-meter band, the antenna and each radial length is 3.46 meters as calculated earlier for the quarter-wave vertical antenna. The spacing between the two antennas is also 3.46 meters. The length (P) of the phasing line L1 is 247500/21650 or 11.43 meters. (By using a different feedline configuration, you can reduce the overall length of the phasing line. Refer to antenna manuals for suggestions.)

This antenna array receives best in the direction from Antenna 2 toward Antenna 1.

For use on the 22-meter band, the length of the verticals is a bit long, so I have to admit to resorting to using a pair of modified trap verticals designed for the 20-meter ham band.

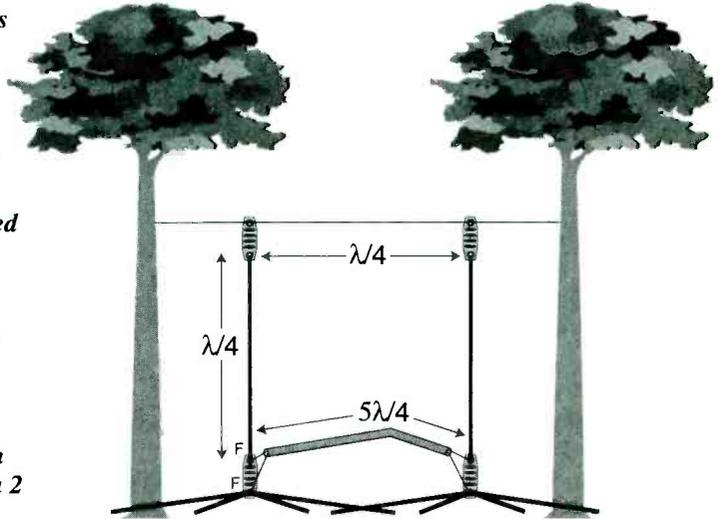
It's worth noting that while each of these antennas was designed for use on a specific shortwave band, they pull in signals on many bands—they simply perform better near the design frequency.

Go Fly a Kite

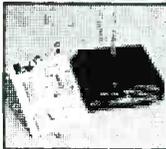
And for something a little out of the ordinary, try John Grimley's approach. At one of the camps, John attached his antenna (a random-length wire) to a kite and sent it aloft.

Whether you experiment with antennas or just enjoy the noise-free conditions in a rural setting, organizing a DX camp will add to everyone's enjoyment of the radio hobby.

FIGURE 5



Synthesized FM Stereo Transmitter



Microprocessor controlled for easy freq programming using DIP switches, no drift, your signal is rock solid all the time - just like the commercial stations. Audio quality is excellent, connect to the line output of any CD player, tape deck or mike mixer and you're on-the-air. Foreign buyers will appreciate the high power output capability of the FM-25; many Caribbean folks use a single FM-25 to cover the whole island! New, improved, clean and hum-free runs on either 12 VDC or 120 VAC. Kit comes complete with case set, whip antenna, 120 VAC power adapter - easy one evening assembly.

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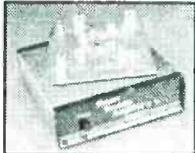
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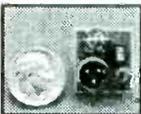


Add some serious muscle to your signal, boost power up to 1 watt over a frequency range of 100 KHz to over 1000 MHz! Use as a lab amp for signal generators, plus many foreign users employ the LPA-1 to boost the power of their FM Stereo transmitters, providing radio service through an entire town. Power required: 12 to 15 volts DC at 250mA, gain of 30dB at 10 MHz, 10 dB at 1000 MHz. For a neat, professionally finished look, add the optional matching case set.

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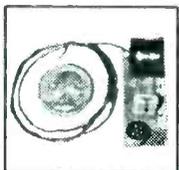


Micro FM Wireless Mike

World's smallest FM transmitter. Size of a sugar cube! Uses SMT (Surface Mount Technology) devices and mini electret condenser microphone, even the battery is included. We give you two complete sets of SMT parts to allow for any errors or mishaps-build it carefully and you've got extra SMT parts to build another! Audio quality and pick-up is unbelievable, transmission range up to 300 feet, tunable to anywhere in standard FM band 88 to 108 MHz. 7/8" w x 3/8" h x 3/4" h.

FM-5 Micro FM Wireless Mike Kit \$19.95

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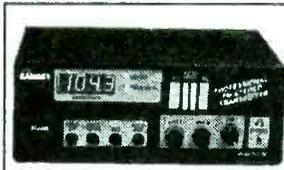
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FM-6WT Fully Wired FM-6 \$69.95

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FM-100WT, Fully Wired High Power FM-100 \$429.95

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Tone-Grabber Touch Tone Decoder / Reader



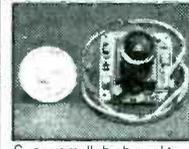
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The Under-\$30 Antenna Launch & Hoist

With this nifty antenna launch, you'll be the first to have your antenna high and in the clear at the next DX camp.



By Chuck DeLongfield KN6CF, AFA6FG

I've been sharing this idea with amateur radio friends for years and I have received many compliments on it. The antenna launch can be used to make your listening more enjoyable on camp-outs and picnics; it can be used to facilitate emergency communications by ham radio transmitters operating in difficult areas; or you can use it to get more altitude from your base station antenna.

The antenna hoist is used in conjunction with one of the 23 foot reel-type antennas such as those available from Radio Shack or Sangean. (Prices on these vary widely. I paid \$8.50 at Radio Shack; Grove Enterprises has the Sangean reel for \$14.95.)

This device enables you to easily extend your antenna to its full length *vertically*. This is accomplished by shooting a small lead weight over a tree branch, fastening your antenna, and reeling it up.

■ Assembly

Parts list: The weight is a Dipsy Swivel size 1/2. The fishing reel is a Zebco 202, approximately \$6. The slingshot is a folding Marksman, approximately \$8, available at Walmart or Kmart.

For assembly I used a 2-1/2 inch length of 1/2 inch outside diameter by 1/4 inch interior diameter fuel line and two 3/4 inch hose clamps. You should be able to get these items at any auto parts store; I got mine at Napa Auto Parts.

The wrist support slides right off the frame of the slingshot. Remove it and wet the hose to install; you can make it right or left handed, but install the hose clamps so that the screws face outward. Finally, slide the wrist support back on.

The Zebco reel is a fine product for the

price. It comes with plenty of 10 lb. test line already installed and works nicely right out of the bubble-pack. Although not necessary, I took the reel completely apart, mirror-polished the spool and reassembled it. They include full instructions and the only thing that they ignore is that Part #10, the anti-reverse pawl, must be reinstalled by putting the little tab into its rectangular slot with the flat side facing the gear (Part #7).

Should you ever need to replace the line, the assembly directions will come in handy, so hang onto them.

Launching

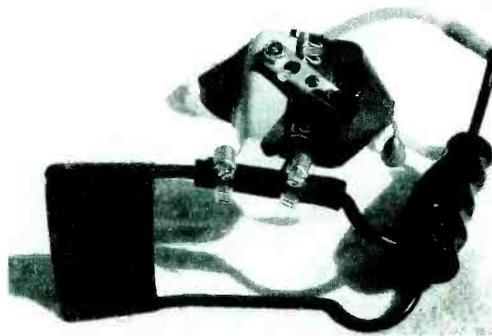
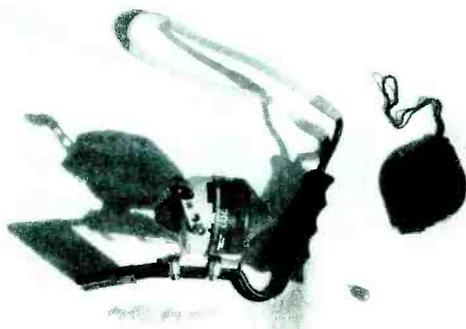
A few words of warning before you shoot—don't stand directly beneath the limb you are aiming at. Remember that the weight can ricochet. Also, make certain that there are no people, animals, or property that can come into your line-of-sight. *Do not aim this at or near power poles.* The launcher is very efficient. I have been able to reach several hundred feet with it. Fortunately, the installed reel does not prevent the slingshot from being used conventionally, so you can practice your aim all you want by plinking at tin cans, etc.

Your chosen branch should be clear and about 25 - 30 feet high. Be sure to release the thumb-stop before launching. After you have shot the weight over the desired branch and it has returned to the ground, turn the crank to lock the line. Fold and wrap a small slip-loop in the nylon antenna cord and hook it over the weight. After reeling the antenna up to the desired height, you can leave the launcher suspended just above your head for a counter-weight. When you're through using it, release the line, unhook the antenna and reel them both in.

If you are putting up a more permanent antenna, say, in your backyard, you will want to start with about twice the wire needed. After you have pulled the antenna wire completely over the branch, slip a couple of rubber bands over the long wire, then tie the loose end of the wire to the bands and gently pull the loop up to the branch. The rubber bands allow you to remove the antenna at a later date by pulling (with caution) rather than using a ladder.

Happy listening!

A slingshot, fishing reel, lead weight, and a reeled antenna are all you need for a go-anywhere vertical antenna. Rightmost photo shows how the reel attaches to the fuel line hose on the wrist support.



DMAT



MOBILE MEDICAL TEAM

By Patrick M. Griffith, NONNK
Communications Officer, DMAT CO-2

Disaster Medical Assistance Teams (DMAT) are an important part of the United States government's national emergency response network. Operating in a manner that is reminiscent of the legendary military M.A.S.H. units, DMAT's primary mission is to carry out Emergency Support Function #8 (health and medical services) of the *Federal Response Plan* by providing medical care and evacuation to victims of natural or man-made disasters.

DMATs have provided aid at many of the largest disasters in our nation in recent years, including hurricanes in Florida, Hawaii, and the Virgin Islands, the Northridge, California, earthquake, and the floods that ravaged the midwest. They also assisted at the bombing in Oklahoma City.

Though designed for response to federal disasters in the United States and its possessions, some of the 41 DMAT teams across the country can also be used in the "lean forward" standby mode for large scale events with the potential for many medical victims, such as for last summer's Olympic Games in Atlanta.

DMAT teams are organized under the National Disaster Medical System (NDMS) which is a nationwide medical mutual aid system established in joint cooperation with the Federal Emergency Management Agency (FEMA), the Department of Defense (DoD), the Veteran's Administration (VA), and the United States Public Health Service (USPHS). It is the USPHS that oversees the actual daily operation of the DMAT teams from their Office of Emergency Preparedness (OEP) in Rockville, Maryland.

Each team is typically comprised of 120 members. Many of these team members are medical professionals including physicians, dentists, nurses, paramedics, EMTs, respiratory therapists, pharmacy technicians, and more. The teams also include support personnel such as communications officers, logistics specialists, maintenance, security, and administrative personnel.

Team members hold full and part time positions outside of the DMAT team and serve on a voluntary basis until such time as they are activated for federal emergencies. When deployed on federal assignments, they are sworn in as compensated temporary employees of the USPHS. Deployments may last anywhere from a few days to a few weeks. Since teams are likely to be deployed into areas where the local infrastructure has been severely disrupted, each team member must carry enough supplies, including food and water, to be self-sufficient for at least three days.

Communications is a vital element in the operation of DMAT. When on deployment, teams must maintain communications links with their own team members, with local and state authorities in the disaster zone including local health care facilities, and with military authorities and other federal disaster relief agencies as well as with the team's home base and the NDMS national headquarters. The teams must also communicate with the USPHS Management Support Unit (MSU) which serves as the on scene command and control liaison between USPHS, DMAT, and the local community. These communications utilize a variety of methods including landline, cellular, and satellite telephone, VHF, and UHF, radio for short range communications, and high frequency (HF) radios for medium and long range communications.

Each team has developed its own communications system. Some are very elaborate, some are very basic, and some are in between. Table 1 is a list of UHF radio frequencies assigned to DMAT teams on a national basis. These frequencies are located in the govern-



CO-2 team member dons gear for toxic disaster readiness training.

ment "A" band. Most of these frequencies have shared use with other federal agencies, particularly FEMA, and may or may not be usable by DMAT in a specific geographic region.

DMAT teams are also authorized to operate on many of the federal HF networks including those of the Shared Resources high frequency radio program (SHARES) which is operated by the National Com-

munications System (NCS). The table lists some of the common HF frequencies that could be active with DMAT traffic in a disaster situation.

Many DMAT teams operate in other parts of the VHF and UHF bands as well, and may use business, itinerant, public safety, special emergency, medical service, and even GMRS frequencies. Teams also use amateur radio and most DMAT communications officers are licensed amateur radio operators. Since the purpose of DMAT is emergency medical service and disaster relief, and since these teams operate as an arm of the U.S. government, it is conceivable that they could show up on just about any frequency in an emergency situation.

Table 1

Frequently-used UHF channels (in MHz)	
408.400 (1)	409.000
418.050 (1)(2)	418.075 (1)
418.575 (1)	419.600

(1) Shared use with FEMA Urban Search and Rescue (USAR) teams
(2) May be used as itinerant repeater output

Channels to check for HF activity

All freqs kHz, generally upper sideband				
5211	5236	6809	9973	10493
10891	14396			

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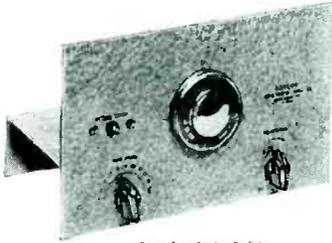
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- 5-744. Short Wave, 15.5-35 mc. (

Helping Hand for The Knight-Kit Ocean Hopper



By **Al Cikas KA9GDL**

Many radio enthusiasts began their hobby right here: with the whistling radio signals snared by the regenerative circuit of Knight's "Ocean Hopper." Now a collector's item, the little world band radio gets a safety update in this exclusive article.

Whether or not you were around in the late 1950s or early 1960s to experience them, the Knight "Ocean Hopper" shortwave receivers remain some of the most enigmatic and revered commercial units ever devised. A recent resurgence of interest in these receivers has driven the "collector's value" to many times the original cost. The history of these little units seems rather bland, but many owners firmly believe the final chapter has yet to be written. And if you cannot find one of these receivers for sale, take heart; we'll tell you how to build one right here.

The original Ocean Hopper was a two-tube beginner's kit available for around eleven dollars some 40 years ago. It had to be the world's lowest-priced commercially available shortwave set. Many hams got their start with one of these. Even more hams, the author included, only wished they could have owned one. Despite, or because of the low price, some inherent dangers existed.

Since they used rectified AC line voltage, a severe electrical shock hazard was part of the risk of using an Ocean Hopper. Allied Radio, marketer of the kit, was very cautious in the instructions. Never use the receiver on a sink or metal bench. Never ground the chassis. And never connect the unit to an outboard amplifier. The risk of an electrical shock was always present when using the finished kit. In spite of the risk, hams and shortwave listeners by the thousands built and used these kits and learned to love them. Allied Radio also sold improved step-up models, the Space Spanner and the Span Master, while competitors such as Lafayette Radio offered the nearly identical "Explore-Aire."

The Ocean Hopper possessed a unique and interesting characteristic. It was, believe it or not, possible to order a manual from Allied Radio, scrounge the chassis and parts, and build a working unit from scratch. This the author managed to do in 1963. Thirty years later, the author did so once again, as the original had long been discarded. Finally, the author developed a "safe" Ocean Hopper, which, while preserving the style and integrity of the original circuit, has brought improvements where they are most needed.

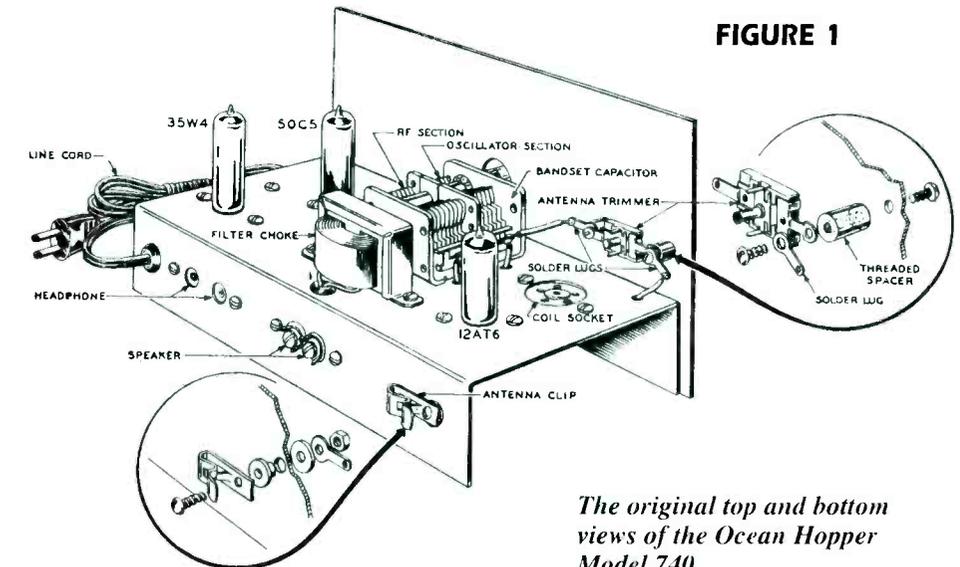
The original circuit consisted of two tubes, a regenerative detector (12AT6) and audio amplifier (50C5). A third "tube" was a 35W4 power rectifier, which did nothing for reception. In those days all the tube filaments were strung together in series and powered directly by the 110 Vac house current. That same house current was rectified into the B+ DC by the 35W4. This is what made the Ocean Hopper such a dangerous shock hazard.

As you can see, 12 and 50 and 35 volt filaments only add to 97 volts dropped by the circuit. The remainder of the 110 VAC household voltage was dropped by a 200 ohm resistor, which in effect just wasted power. In those days the recommendation was to power the receiver through an isolation transformer, but few owners bothered.

■ Building on a good idea

In 1995, the author sought a way to duplicate the Ocean Hopper's simplicity but with a safer power circuit. Using nothing more than junk box parts bought at a few hamfests, the author managed to construct a Safe Ocean Hopper. The original regenerative detector was preserved in its entirety; the 12AT6 was substituted with a 6AT6, a six-volt version of the same tube.

The 50C5, however, turned out to be a problem. No low-filament-voltage versions of the tube existed, so the audio stage had to be



The original top and bottom views of the Ocean Hopper Model 740.

redesigned. The author chose to use the popular 6AQ5 tube, cheap and easily available. The base diagram differences required the audio tube circuit to be completely rewired. Other major parts were obtained by carefully sifting through junk boxes at local hamfests.

The Safe Ocean Hopper circuit is shown in Figure 3. By using a power transformer with 6 and 125 volt secondaries, the circuits may be grounded, and the shock hazard virtually disappears. If a 12 volt filament transformer is available, use the 12AT6 and 12AQ5 tubes instead.

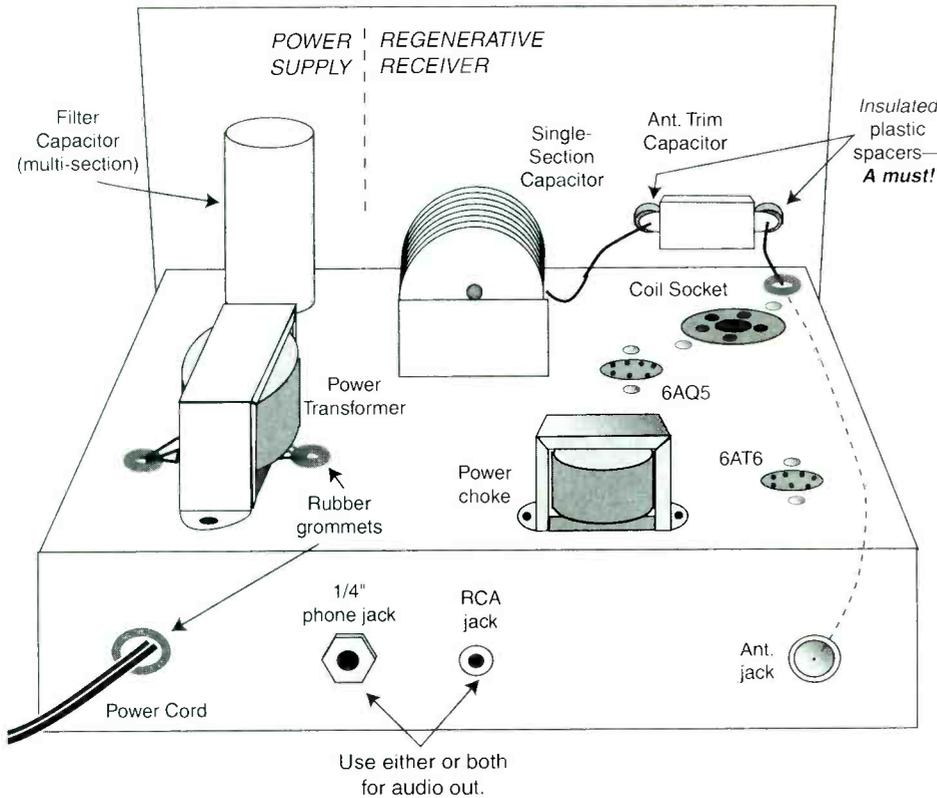
The original Ocean Hopper used a set of plug-in coil forms to accomplish band changing. The absence of a volume control was

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most notable. Audio output was available to either a 2000 ohm high-impedance headset or a 4 ohm speaker. Sad to say, Ocean Hoppers do not power a speaker very well.

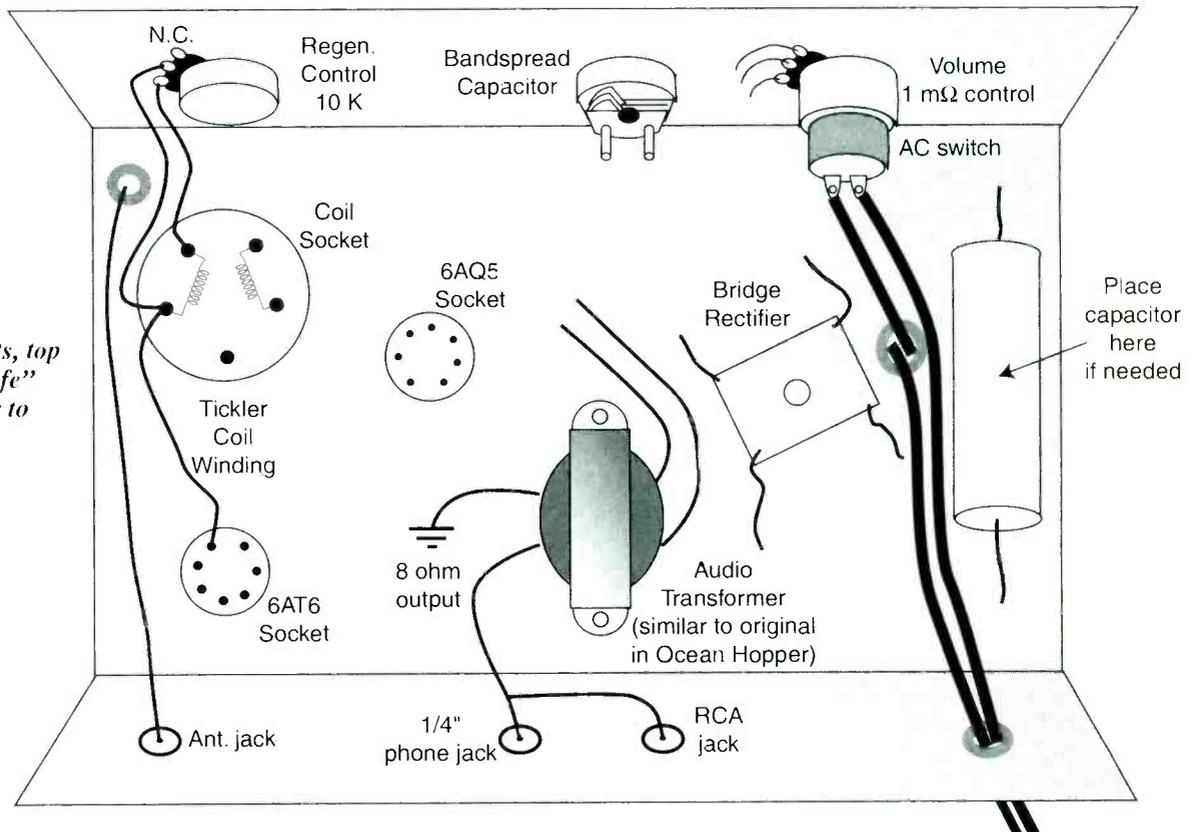
The Ocean Hopper regenerative circuit had another unique characteristic. The regenerative "tickler" winding was placed in the plate B+ high voltage circuit. This results in a superb regenerative detector circuit, when compared with the tuned "grid circuits" used in almost every other regenerative receiver. This means you should *never* change coils while the power is on. Ditto for the author's circuit.

One unique aspect of the Knight Ocean Hopper was the tuned frequency circuit. The tuning coil was placed across three separate tuning capacitors. The smallest was the band spread or fine-tuning capacitor. The other capacitors comprised two sections of a ganged circuit, only the smaller of which was used to tune the shortwave bands. The larger, or third, capacitor was tied to the final pin on the coil socket, and was connected by an internal jumper within the Broadcast Band and Longwave coils. (It is suggested that you not try to wind either of these yourself.)

The point of all of this is that you can use a single-section capacitor, as the author did, for the main tuning capacitance. This will simplify your needs. If you have a two-sec-

FIGURE 2

Recommended layouts, top and bottom, for a "safe" Ocean Hopper. Refer to text for precise descriptions.



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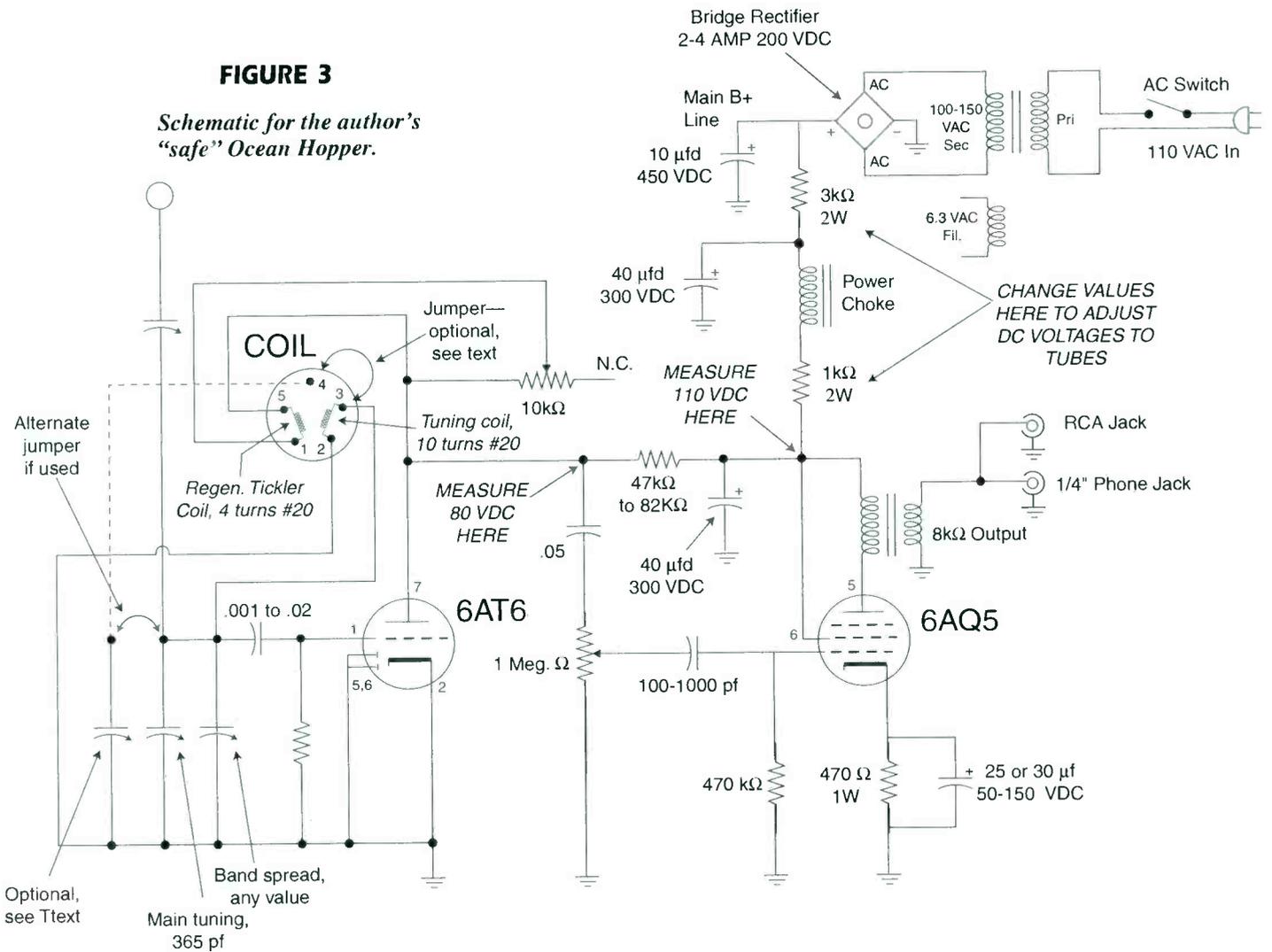
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FIGURE 3

Schematic for the author's "safe" Ocean Hopper.



tion capacitor, use only the smaller section and leave the larger section disconnected. The small antenna trimmer capacitor must be isolated from ground, as it is in series with the antenna input lead. If insulated (plastic, ceramic, etc.) spacers are not available, some means of isolating this capacitor will have to be substituted, i.e. wiring it across a terminal strip. Use a banana jack for the antenna input terminal.

The author's circuit replaces the output audio to an RCA jack, which can be connected to either a low-impedance "Walkman" style headset, or to a Radio Shack speaker-amp. When fed to an outboard amplifier, the Ocean Hopper makes a dandy, inexpensive short-wave set. It is especially appealing to the first-time builder. Parts are still available cheaply but you'll probably have to do some hunter-gatherer searching in order to get them. The

circuit is very forgiving on capacitance and resistor values, and you can wind your own coils easily. The original 5-pin socket and coil forms are used in the author's rig, but may be the most difficult items to locate.

Finally, the author used a chassis and front panel design as close to the original as possible. The front plate measures six inches by ten inches, the same as the original Ocean Hopper, and is lettered with white press-on

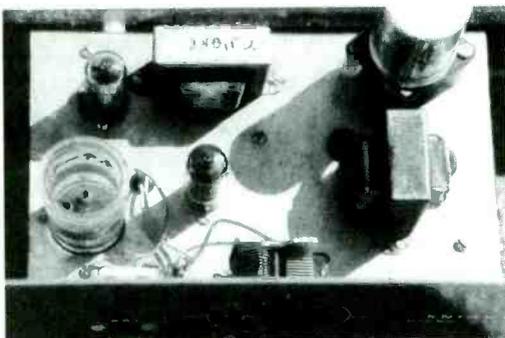


Photo of the chassis layout of the author's revised Ocean Hopper.



Author's revised model features an attractive front panel.

COIL FORM

Wind both coils in same direction

Minimum 4 pins if plug-in form is used with a socket



Coil pin # Go To

- | | |
|---|--|
| 1 | B+ |
| 2 | Ground |
| 3 | Ant. Tuning |
| 4 | N/C (extra capacitor section, if used) |
| 5 | Plate of 6ATC |

2 and 3 are tuning windings, 10-40 turns

1 and 5 are the regen. "tickler" windings, 3 or 4 turns \pm 1/2 turn

4 jumpers to 3 in original BCB and LW coils

lettering available through office supply stores. The chassis was taken from a defunct Heathkit "Lunch Box" style capacitance checker, and measures five inches deep. Parts placement is a bit tight. The author's recommendation for major parts location is shown in the drawings. The unit is extremely flexible, so any workable arrangement is OK. Since the tube filaments are now wired in parallel with the filament secondary, it is also possible to add a pilot lamp, if desired.

■ Operating, fine-tuning, and experimenting

Operating an Ocean Hopper is pretty easy. If you build the circuit with care, it operates immediately. There is no "alignment procedure" to follow. This makes it attractive to both the first-time builder, as well as the old-timer who perhaps wants to tinker with an easy project, perhaps to build as a loaner for a prospective new SWL.

The tuning process is a fine balance between adjustment of the antenna trimmer, the regen pot, and the band spread controls. The antenna trimmer is a "set and forget" affair. Adjustment is made with a small screwdriver in both the original Ocean Hopper and in the author's version. The antenna trimmer is tuned for max and only needs readjustment if you change coils or move to the main tuning capacitor between opposite ends of its range.

The regenerative control is delicate and mastery of the regen knob only comes with practice. Set the main tuning capacitor to a region that seems active and use the band spread capacitor to fine-tune the signal. Once the controls are balanced, you will enjoy hours of listening. As a bonus, the Ocean Hopper circuit can even process the stronger CW and SSB signals on the amateur bands.

Reprints of manuals for the original Ocean Hopper are available from Hi-Manuals, PO Box 802, Council Bluffs, Iowa 51502. Parts are where you find them.

Virtually any capacitor values can be used for the tuning circuits. Your first shortwave coil can be wound from #20 wire on a 1-inch or 1-1/4-inch form. Use 4 turns for the tickler winding and 9 and 10 turns for the tune wind-

ing. This will place you in approximately the 5 - 10 MHz portion of the shortwave spectrum. If plug-in coils forms and a socket are available, you can experiment with winding other coils for wider coverage. Use more turns of thin wire (#24, etc.) Or fewer turns of thicker wire (#18, etc.). With practice, you will easily be able to cover 3 to 12 MHz, or maybe more.

The turns count should be 4 to 10 turns for the "tickler" winding and 9 to 43 turns for the "tune" winding. For higher frequencies, fewer than 9 turns may be tried, but only the very strongest of signals will be received. Be sure to wind both coils in the same direction.

The author and *Monitoring Times* would appreciate hearing from any readers with interesting "Ocean Hopper" stories. The author's upgraded circuit is easy to build and fun to enjoy. Happy listening!

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Pick a Pock of Packets

The Internet has popularized the idea of the packet switched network. Instead of using a dedicated, direct connection between the source and the destination to move information, like a telephone call uses, a packet switched network moves chunks of information (packets) from one point in the network to another, allowing the communications channel to be shared among a number of users.

This month we'll take a look at three companies offering wireless packet data communication service, each of which allows mobile users to access and send information anytime from (almost) anywhere. A typical subscriber has custom software running on a laptop, notebook, or palmtop computer that is connected to a wireless modem. The most common application at this point in time seems to be electronic mail, although inventory management, sales and marketing information, and even web browsing are becoming popular.

Before cellular carriers began to market data communication solutions (see the March 1997 *PCS Front Line*), two major wireless providers were offering nationwide radio data communications service. Both services are similar in a number of ways, and offer the following features:

- Transparent nationwide roaming, allowing a user to travel from city to city and be able to use the service without a complicated registration process.
- Store and forward capability, holding messages in the network until the recipient is available.
- Group messaging, allowing a single message to be "broadcast" to a number of subscribers at once.
- Robust error detection and correction, identifying and fixing packets that may have been corrupted during transmission.
- Per use charges. Instead of paying by the minute, customers pay according to the amount of data they transfer, typically measured by the kilobyte (about a thousand characters).

■ ARDIS

Advanced Radio Data Information Services (ARDIS) started out in 1990 as a joint venture between IBM and Motorola, primarily to serve IBM field technicians. A few years later Motorola bought IBM's 50% share for about \$35 million. A network operations center (NOC) is maintained in Lexington, Kentucky, with a backup near Chicago, Illinois.

ARDIS claims to serve more than 44,000 customers in at least 400 of the top U.S. metropolitan areas. That figure includes many large corporations, and makes it the largest installed base of mobile data network users in the United States. ARDIS supports sending and receiving wireless messages from the

Internet, corporate and personal computer systems, and other ARDIS subscribers.

Every ARDIS service area supports, at a minimum, data rates of 4800 bits per second (bps) using a Motorola transmission protocol called MDC-4800. In a handful of major metropolitan areas another proprietary Motorola protocol, RD-LAP, is used to support speeds of up to 19,200 bps. Regardless of speed, each protocol makes use of error detection and correction information sent along with the data, as well as allowing badly garbled packets to be retransmitted. A single packet can hold up to 240 characters, although the average is about half that size.

More than 1300 base stations provide service to ARDIS users, transmitting at an average power of 45 watts. Mobile units transmit using three to four watts of power, and all radio communication takes place in the 800 MHz Specialized Mobile Radio (SMR) band.

The most recent pricing information I have shows a "DataPak 20," the least expensive plan, at \$19.95 a month for 20 kilobytes of data.

■ RAM Mobile Data

RAM Mobile Data is the second largest wireless data communications provider in the United States. Founded in 1989 by RAM Broadcasting Corporation, BellSouth spent more than \$300 million to buy 49% of the company in 1989. RAM Mobile maintains a Network Control Center (NCC) at their corporate headquarters in New Jersey, and a backup NCC in Dallas, Texas.

RAM Mobile Data claims to serve at least 40,000 customers in more than 260 of the 316 metropolitan statistical areas (MSAs) in the United States. This service area represents more than 90% of their desired customer base, the urban business population. In each MSA, no fewer than 10, and as many as 30 radio frequency pairs are available at numerous base stations with overlapping coverage areas.

RAM Mobile Data uses an open, non-proprietary protocol called Mobitex, which is used in at least 16 other countries for two-way wireless data communications. Mobitex follows the Open System Interconnection (OSI) model, and supports wireless Internet Protocol (IP) connectivity.

Like ARDIS, RAM Mobile Data uses frequencies in the Specialized Mobile Radio band. The mobile units transmit between 896 MHz

ARDIS	RAM Mobile Data	Metricom	Riccochet
Coverage	nationwide	nationwide	selected areas
Data rate (in bits per second)	4800 (19,200 in ltd. areas)	8,000	typically about 28,800
Packet size (in bytes)	240	512	500
Mobile transmit power (watts)	3	2 to 100	.6
Response time (seconds)	2 to 7	4 to 8	1 to 3
Transmit Frequencies (in MHz)	800 (SMR band)	Mobile: 896 to 901 Base: 935 to 941	902 to 928
Channels	600	200	162
Channel spacing	25 kHz	12 kHz	160 kHz
Pricing (representative)	\$20 / 20 kilobytes	\$30 / 100 kilobytes	\$30 / unlimited

and 901 MHz, and the base stations transmit 39 MHz higher, between 935 MHz and 940 MHz. Data is transmitted at 8,000 bits per second (bps) and uses automatic repeat and forward error correction to combat noise and fading typical in a mobile radio environment.

Messages may be sent to an individual mobile unit or to a group. If a subscriber is not reachable because the modem is turned off or the unit is out of a coverage area, the message may be stored in the network for up to 72 hours. When the modem is turned on or re-enters a coverage area, stored messages are automatically delivered. As an option, the sender can receive a confirmation notice when the original message is delivered to the recipient.

Mobile units stay in contact with the radio network through the roaming capabilities of the system, in many ways similar to a cellular telephone network. Mobile units monitor signal strength from nearby base stations and determine if and when a transfer to another base station is necessary.

Modems are available from major equipment suppliers such as Ericsson, GE, and Motorola. Pricing starts at \$25 per month for up to 100 kilobytes worth of messages, with each additional kilobyte costing 35 cents.

RAM Mobile Data claims the security is high on their system, and provides several mechanisms to discourage eavesdroppers. First, the mobile radio unit determines the frequency to use, and can hop through each frequency supported in the service area. As the mobile unit travels, it will inform the closest base station of the channel on which data will be communicated. Since packets from different modems will all be sent on the same radio channel, and each modem only uses the channel for short intervals, RAM Mobile believes that this interleaving of packets "discourages the isolation of messages within RAM's network" and makes the eavesdropper's task more difficult.

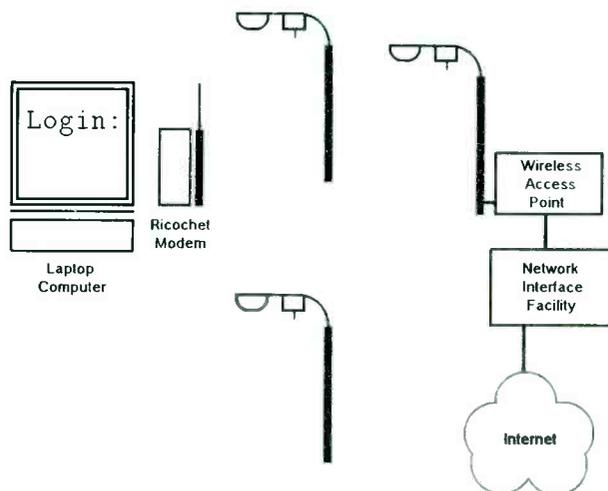
Second, each terminal in the network contains an electronic serial number (ESN) and is assigned a mobile access number (MAN). When a unit attempts to access the network the ESN and the MAN must match. If they don't, or if fraud is suspected, the Mobitex network has the capability of remotely disabling the modem. In addition, users may also have a password-protected subscription that can be accessed from any terminal.

■ **Metricom**

One of the winners in the recent Wireless Communications Service (WCS) was Metricom, Inc. (for more information on the auction, see the July 1997 *PCS Front Line* column). New spectrum in the 2.3 GHz range will help them expand an innovative service they currently offer in a few cities, university campuses, and airports across the country.

The Ricochet data network provides wireless access to the Internet and other data applications at speeds approaching 28,800 bits per second at an affordable price. For a flat monthly charge of about \$30, customers can move unlimited amounts of data using a 600 milliwatt paperback book-sized modem attached to the back of a personal computer. Many world wide web addicts have subscribed to Ricochet instead of ordering a second telephone line. As Metricom admits, "Our competitor is the wireline modem."

Ricochet transmits information in the unlicensed 902 to 928 MHz band with a technique called frequency hopping spread spectrum (FHSS). The 26 MHz of bandwidth is divided into 162 channels, each 160 kHz wide. A Ricochet modem selects a sequence of 55 channels and "hops" from channel to channel, spending only about 100 milliseconds on any one channel before moving to the next one in the



If Ricochet is available in your area and you like to surf the web, this is the way to go.

list. The sequence may gradually change as channels with high interference levels are dropped and replaced with new channels, causing the connection quality to improve over time. This technique also allows many users to share the spectrum without interfering with each other, and makes eavesdropping rather difficult.

Packets average 500 bytes in size, and are transmitted to and from one watt transceivers mounted on nearby lightpoles. Rather than building a tower and installing large, expensive, and complicated equipment, Metricom contracts with a local utility to mount a small rectangular box on a lightpole or similar structure, spacing them a quarter to half a mile apart. Each "pole unit" receives packets from local modems, adds an identifier and forwards it to either another pole unit or a wireless access point (WAP), where it is placed on a leased line and sent to a network interconnection point, eventually reaching the Internet.

At the end of 1996 Metricom had more than 9,000 Ricochet customers, but as great as it is, the service has one major drawback — availability. Metricom has networks in Seattle, San Francisco, and most recently Washington, D.C., as well as a dozen or so colleges and corporate campuses. If it's available in your area and you like to surf the web, this is the way to go.

There's more information on these services at the PCS Front Line website at <http://www.grove.net/~dan>, and I can be reached by electronic mail at dan@decode.com. Until next month, happy monitoring!



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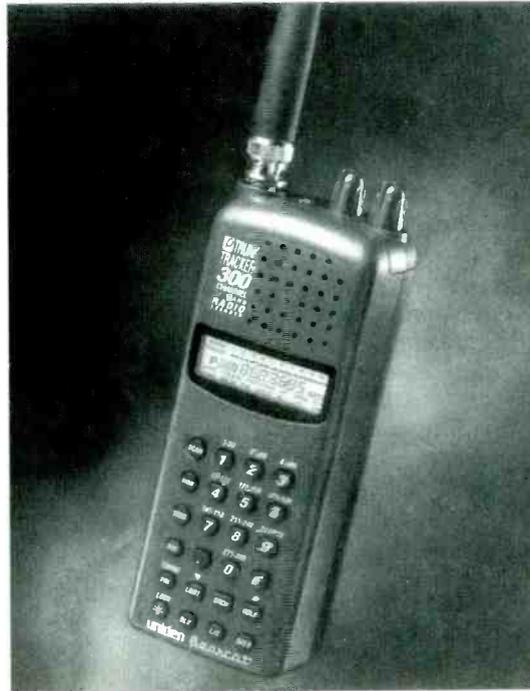
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Richard Barnett
ScanMaster@aol.com

The TrunkTracker Debuts!

This is our first article since the debut of the Uniden BC-235XLT Trunk Tracker and what a debut it was! The final numbers aren't in yet, but the 235 appears to be the hottest scanner introduction since at least the Bearcat 250, if not the 210. (The BearTrackers 10 and 12 had even a larger initial "sell-in," but those products have more of a general motorist/trucker appeal, as opposed to hobbyist and professional interest.) We're basing this "hot" introduction on a number of factors:



1. Pre-debut hype about the product.
2. The manner in which the outlook of both the hobbyists and the industry has done almost a complete 180° with the 235's debut, from doom-and-gloom to guarded optimism.
3. The number of units pre-sold by dealers and distributors.
4. The inability to fill the pipeline as a result of those orders.
5. Excitement over the product by those who have purchased the unit.
6. The explosion of interest and discussion about the product on-line, from AOL's World of Radio hobbyist area, to CompuServe Hamnet, Usenet, SCAN-L, and dozens of local web pages devoted to regional scanning. Everyone is trading IDs and discussing the 235's operational characteristics. A new list server, dedicated solely to the TrunkTracker and trunked radio communications, has been inaugurated by Grove. (More about "Trunkcom" later.)

Sales of the BC-235 have been tremendous. As Uniden's executive vice president of sales stated in mid-June, "The BC-235 is currently in full production and we are shipping the units as quickly as we can get them into our warehouse. The demand for the product has been so great, we suspect dealers and distributors are running out of stock almost as quickly as they receive the units. We are working to fill orders as quickly as possible."

What's the reason for the demand? As Mike Heightchew, an active member of BASE, the (San Francisco) Bay Area Scanner Enthusiasts club, said, "Even besides the incredible TrunkTracker feature, this radio (the 235) is a great scanner....it's not susceptible to intermod, and the sensitivity is excellent! Uniden has put the fun back into scanning and has saved the hobby!" Mike already owns two 235's.

Mike also reported that the system he listens to, the Alameda County (ALCO) trunked system, can no longer be monitored by some of the other agencies which border the county. One battalion chief in a neighboring department had wanted to monitor ALCO for some

time to be aware of potential mutual aid fires. But, with the trunked system, he had been shut out. As soon as the BC-235 hit the market, his county purchased a TrunkTracker for him and now he's considering buying more for his department.

This is only one of numerous examples we've heard of law enforcement, fire service, and emergency management entities buying and prizing their new Bearcat scanners. Best of all, it shows how scanners can provide a cost-effective answer to a very difficult and important public safety problem.

Another example of the TrunkTracker offering a valuable, and atypical, service, was told to us by a friend in the Dallas area. He was showing his new BC-235 to his next-door neighbor, who is a policeman in his town. The neighbor was impressed, as their town operates on a small trunking system and he was familiar with the complex technology. Best of all, this officer called his wife out of their house and showed her the radio. She instantly

lit up with a smile.

It turns out that they had moved to Texas from Chicago, where the wife could easily monitor her husband's radio calls on the Windy City's conventional UHF radio system. Now, though the city was smaller, the trunking system meant she was unable to keep track of her husband on his dangerous job. She wanted to know, right then and there, where she could purchase a TrunkTracker. She was going to feel much better being able to monitor her husband's radio calls and knowing he was safe.

As someone who was involved in the development of this project, these are the stories we love to hear. If you have any stories about the TrunkTracker, please pass them on via e-mail to Scanmaster@aol.com or by mail to me, care of the *Monitoring Times* mailing address.

■ TRUNKCOM: The all-new mailing list for trunking radio data

The Trunkcom mailing list server was suggested in June of '97 by Larry Van Horn, *MT's* assistant editor, and developed and maintained with the help of the Grove staff by myself (Rich Barnett), Greg Knox, and John McColman. The mailing list server permits the exchange of information between its subscribers, radio hobbyists, and professionals interested in monitoring trunked radio communications. Trunkcom provides its subscribers with a forum for the free exchange of information by reflecting e-mail messages sent to the list.

The Trunkcom mailing list is a non-membership group open to all

subscribers with a genuine interest in the hobby of monitoring trunk radio communications, and as such does not require dues. This list is provided as a public service to the radio hobby community free of charge by Grove Enterprises (publisher of *Monitoring Times* and *Satellite Times* magazines) in Brasstown, North Carolina, and is owned and managed by the Trunkcom staff.

Information posted on the list may be reposted with credit on the World Wide Web site www.trunktracker.com, which is a clearing-house of trunking-related data and Trunktracker questions and answers, tips, techniques, and more.

■ Subscription Information

- To subscribe to the Trunkcom mailing list, send an e-mail message (no subject required) to "majordomo@grove.net" with the following command in the body of the message:
subscribe Trunkcom <your e-mail address>
Substitute your e-mail address where indicated in the line above.
- If you would like to receive a digest of the messages posted to Trunkcom rather than each individual message, you should subscribe to the Trunkcom digest service. Send a message to majordomo@grove.net (no subject line or signature block). In the body of the text type:
subscribe Trunkcom-digest <your e-mail address>

■ Posting to the Trunkcom List

To send a message to the list, send e-mail to: trunkcom@grove.net
No anonymous posts are allowed on the Trunkcom list. All posters are required to sign at least their first name to each post to the list. Prior to your first post we encourage new subscribers to read the mail for a few days to become familiar with the current traffic being passed on the list. We also highly encourage new subscribers of the list to introduce themselves in their first post. You might wish to include some information about yourself, your equipment, and the type of agencies you monitor. We find that intros foster new friendships and facilitate the exchange of information among subscribers of our list.

Once you subscribe to Trunkcom, you will be presented with further details on the list, including rules of conduct. We hope that you will consider signing up and contributing to Trunkcom. For those interested in federal communications, may we suggest the Fedcom list; for military, try Milcom. Both these lists have the same subscription parameters for signing up; just replace Trunkcom with either Fedcom or Milcom.

For those interested in more general scanner topics, try Scan-L, an excellent resource hosted by Peter Laws. To subscribe to Scan-L, send a message to LISTSERV@UAFSYSB.UARK.EDU with the command "subscribe SCAN-L Your Name" in the body.

Now, back to Trunkcom, here's a June posting to Trunkcom to give you a flavor of what to expect on the mailing list:

Hi Ya'll - this is all the information I have collected for the San Antonio and Bexar County. This is a VERY long posting, but I promise the data is accurate. This information has also been sent to www.trunktracker.com.

If you have any questions please feel free to Email me. Enjoy.
Wayne (waynef@texas.net)



The Alamo in San Antonio

City: San Antonio

System: 20 Chan Type I
Name: System 1
Location: Tower of Americas
Fleet Map: S-13, S-12, S-12
Freqs: 856-860 2625, 4625, 7625, 9625
Talk Group Designators 000=Police Patrol 400=Fire/EMS 600=CID/Park Rangers

Talk Groups

Police Patrol	Patrol Units	Chan Name
000-1 North Patrol	31xx,32xx,33xx	1 ALPHA
000-3 West Patrol	51xx,52xx,53xx	1 CHARLIE
000-5 South Patrol	61xx,62xx	1 ECHO
000-6 East Patrol	41xx,42xx	1 FOXTROT
000-7 Central Patrol	21xx,22xx,23xx,24xx,25xx	1 GULF
000-8 Traffic Patrol	11xx,through 18xx	1 HOTEL
000-9 Information	Various	1 INDIA

Police Patrol Open Channels

000-2	1 BRAVO	000-12	1 LIMA
000-4	1 DELTA	000-13	1 MARY
000-10	1 JULIET	000-14	1 NOVEMBER
000-11	1 KILO	000-15	1 OSCAR

Police Central Intelligence Division

600-1	4 ALPHA Open Ch	600-8	4 HOTEL Open Ch
600-2	4 BRAVO Auto Theft	600-9	4 INDIA Open Ch
600-3	4 CHARLIE Open Ch	600-10	4 JULIET Vice
600-4	4 DELTA Detectives	600-11	4 KILO Police Academy
600-5	4 ECHO Rope	600-12	4 LIMA Open Ch
600-6	4 FOXTROT Open Ch	600-13	4 Mary Open Ch
600-7	4 GULF Gang		



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P.O. Box 360,
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19376

Park Rangers

600-14 Park Rangers 93xx

Fire/EMS Department

400-1 Fire Dispatch	1 ALPHA (CPS Patch)	400-9 Arson Unit	1 INDIA
400-2 Fireground	1 BRAVO	400-10 Fireground	1 JULIET
400-3 Fireground	1 CHARLIE	400-11 Fireground	1 KILO
400-4 Fireground	1 DELTA	400-12 Fireground	1 LIMA
400-5 Fireground	1 ECHO (Primary)	400-13 EMS-Airlife	1 MARY
400-6 Maint/Admin	1 FOXTROT	400-14 Fireground	1 NOVEMBER
400-7 EMS Dispatch	1 GULF	400-15 Fireground	1 OSCAR
400-8 EMS Info	1 HOTEL		

City: San Antonio Northeast Satellite

System: 20 Chan Type I
 Name: System 2 (Coopers Tower)
 Location: 1604 and Judson (Coopers Tower)
 Fleet Map: S-13, S-12, S-12
 Freqs: 856-860 2375,4875,7375,9875
 Controls in the lower end, i.e. 856-857 2375,7375
 Talk Group Designators
 000=Police Patrol
 400=Fire/EMS
 600=CID/Park Rangers

Police Patrol

000-1 Northeast 31xx,32xx,33xx (patched to system 1)
 000-9 Information (patched to system 1)

Police Central Intel Div

Not heard over here

Fire/EMS

All information is the same as system 1 except they use the 2 designators
 400-1 Fire Dispatch (multicast on all systems)

San Antonio NW Police Satellite

City: San Antonio	Freqs: 856-860 9375
System: 5 Chan Type I	Talk Group Designators
Name System 3 (Prue Road)	000=Police Patrol
Location Medical Center	400=Fire/EMS
Fleet Map: S-13,S-12,S-12	600=CID/Park Rangers

Police Patrol

000-2 Northwest 71xx,72xx
 000-9 Information (patched through to system 1)

Police Central Intel Div

Not heard over here

Fire/EMS

All info is the same as system 1 except they use the 3 designators
 400-1 Fire Dispatch (multicast on all systems)

Bexar County

County: Bexar	Freqs: 856-860 2375,4875,7375,9875
System: 20 Chan Type I	Controls in top 4 chans 860,9875 being ch 1
Name: None given	Talk Group Designators
Location: Tower of Americas	000=Public Works
Fleet Map: S-13, S-12, S-12	400=Sheriff
	600=Airport ops

Sheriffs Patrols

400-8 East Patrol
 400-9 West Patrol

San Antonio International Airport

600-0 Airport Police	600-2 Airport Maintenance
600-1 Airport Police Tac 2	600-3 Airport Operations

Other TrunkTracking Resources

A new Worldwide Web site, www.trunktracker.com, promoted in the manual and frequency guide included with the new scanner, was

up and running in mid-June of this year. Be sure to check out this site out for FAQs (Frequently Asked Questions), trunktracking tips, frequencies, and, of course, ID's and fleet maps around the United States and eventually around the world. We'll have more details on this and other relevant web sites in an upcoming issue.

■ L.A., My Kind of Monitoring Town

It is a question hobbyists often ponder, "What is the best place in the nation to scan?" Up until very recently, it was anywhere that did not have Motorola analog trunking. Atlanta? Forget it! Ft. Worth? No way. Miami? Nope.

The TrunkTracker has changed the playing field considerably. Still, regions with EDACS systems, such as Denver, New Orleans, Hartford, and the like, are still pretty much unmonitorable, or, at the very least, it's sure no fun to scan there! We've been over EDACS before, with its beeps and buzzing — not to mention the trunking, which is a nightmare to monitor.

Back to the issue at heart, though. Where is the best place to monitor, especially now that we have many cities we can lump back into the mix? I had long felt that Washington, D.C., and New York City were tied for the best. New York, of course, has, as one would expect, as much action on the airwaves as you'll find pretty much anywhere in the world — particularly police activity. Snowstorms and hurricanes spice up the day-to-day fare.

New York also covers five boroughs of cities which are themselves as large as almost any other city in the nation, three extraordinarily busy airports, lots of marine and rail traffic, sprawling suburbs, and three states in which to monitor (New York, New Jersey, and Connecticut).

Washington has the D.C. area, plus Maryland and Virginia. While it is a much smaller area, the District has, of course, a tremendous amount of federal and military communications to sniff out.

Here's a nomination, though, for Los Angeles. LA also has all the aforementioned radio features of New York, plus earthquakes, fires, and other disasters in place of snowstorms and hurricanes. It also has its share of unique monitoring challenges: movie studios, amusement parks, and much more. At this time, the majority of Los Angeles city and county police and fire communications are in the clear on UHF radio systems. However, many of the other city and county services operate on large-scale Ericsson trunking radio systems.

Still, monitoring in LA is a blast. There's tremendous action, from the mundane to the serious, on just about all police and fire channels. I was lucky enough recently to experience this action first-hand. Thanks to Gene Hughes of *Police Call Plus*, I got a taste of what it's like in a major-city precinct house and on patrol with an LAPD officer.

Gene volunteers at an LAPD station. He mans the front desk and assists citizens with all manner of situations. Gene also spends time meeting with home and apartment dwellers and advising them on the best way to protect themselves and their property against crime. As editor and publisher of *Police Call Plus*, it's a natural for Gene to work with the police. It's great to see people give something back to their community and local law enforcement agency.

The LAPD is most impressive, and I'll have more on my ride-along with this agency, my visit to the Los Angeles 9-1-1 communications center, and on the LAPD radio system, soon.

We're curious to hear your thoughts on this "Best City to Monitor" issue. We'll address this topic again in a later article and focus on specifics, such as how certain frequencies — NYPD's SOD (special operations division) channels, for example — make monitoring easier in such complex scanning areas.

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Another HF Maritime Station to Close

I have some more sad news for high frequency (HF) maritime buffs. The days of Holland's most famous utility station, Scheveningen Radio (PCH), are numbered. The services of Scheveningen Radio will be discontinued as of January 1, 1999. At the end of this year part of the radio telephone services will be discontinued.

The reason for the closure of PCH involves a European government regulation which states that as of January 2, 1999, all ship traffic will be carried via the 1.5 GHz maritime satellites of INMARSAT. This is also the date that the Global Maritime Distress and Safety System (GMDSS) service becomes operational via INMARSAT satellites.

So, PCH is another "catch-and-QSL-while-you-can" maritime coastal station. Thanks to *UW* regular Ary Boender in the Netherlands for this information.

■ FCC Approves KPH/WCC Transfer

Approval has finally been received from the Federal Communications Commission for the transfer of the licenses for KPH-San Francisco Radio, California, and WCC-Chatham Radio, Massachusetts, from WUI (a division of MCI) to Globe Wireless Radio Network. This changeover occurred on June 30, 1997.

Bahrain Radio, call sign A9M, has joined the Global Radio Network. The station is located on the island of Bahrain in the central Arabian Gulf and offers superb coverage of the Indian Ocean and Eastern Mediterranean Sea. Test transmissions began on May 7, 1997. The station is now in full commercial operation.

Bahrain Radio is operated by Batelco, the national telephone company of Bahrain. Test transmissions have been monitored on 4347.0, 8541.0, 12668.0 and 17066.5 kHz. Operation on 19726.0 kHz is expected soon.

The A9M transmit site is located at latitude 26 degrees, 12 minutes North, and longitude 50 degrees, 36 minutes East.

The antenna complement includes four half-wave dipoles. The transmitters for SITOR and GlobeEmail services are Henry model 5000. Ten Tec model 330A receivers are in use for the SITOR and GlobeEmail services.

■ Globe Wireless On-Air from the Great Lakes

Rogers City Radio, call sign WLC, has also joined the Global Radio Network. Full commercial operation from Rogers City began on March 31, 1997.

Rogers City Radio is a proud and historic radio station on the Western shore of Lake Huron and offers superb coverage of the Great Lakes Basin. It was originally constructed by United States Steel in the 1930s. The current owner, Central Radio & Telegraph Company, operates four transmitters and receivers for Globe Wireless as well as providing voice services to vessels on the Great Lakes.

The WLC transmit site antenna complement includes half-wave dipoles, and vertical towers. Four transmitters are in use for SITOR

service on medium frequency (2 MHz) and HF (4, 6, and 8 MHz) maritime bands. Additional transmitters are in use for voice services.

The receivers for WLC are located two miles south of the transmitting site. The antenna complement includes various dipoles. The receivers in use for Globe Wireless services are Ten Tec model RX-330A.

Below is a list of International Telecommunications Union (ITU) narrowband direct printing (NBDP) channels and associated frequencies, including those currently in use by Rogers City Radio.

■ Voice Services

In addition to being a node on the Global Radio Network, WLC provides upper sideband (USB) and very high frequency (VHF) voice service to vessels on the Great Lakes. Various MF, HF, and VHF channels are used for this service. The frequencies used are listed in the following table.

WLC Voice Channels

Channel Number	Shore Transmit	Ship Transmit	
-----	2182.0	2182.0	Distress & Calling
57	2514.0	2118.0	Primary MF
-----	2550.0	2158.0	
-----	2582.0	2206.0	
405	4369.0	4077.0	Primary HF 4 MHz
409	4381.0	4089.0	
418	4408.0	4116.0	
826	8794.0	8270.0	Primary HF 8 MHz
VHF-16	156.800 MHz	156.800 MHz	Distress & Calling
VHF-26	161.900 MHz	157.300 MHz	
VHF-28	162.000 MHz	157.400 MHz	

■ Global Radio Network® Channel and Frequency List

The frequencies listed below are used by the various stations in the Global Radio Network. Those with an entry in the ITU channel number column are standard ITU radio telex NBDP channels (500 Hz spacing). Most of these frequencies are on the air 24 hours a day and the most common mode you will encounter is SITOR-A/B.

Global Radio Network

ITU Ch Number	Shore Transmit	Ship Transmit	Station Callsign	ITU Ch Number	Shore Transmit	Ship Transmit	Station Callsign
228	1620.5	2155.5	SAB	617	6322.0	6271.0	ZSC
----	2137.5	2070.5	WLC	625	6326.0	6275.0	KEJ
401	4210.5	4172.5	WNU	626	6326.5	6275.5	SAB
402	4211.0	4173.0	ZLA	627	6327.0	6281.0	WNU
403	4211.5	4173.5	KFS	632	6329.5	6283.5	VCT
404	4212.0	4174.0	WLC	802	8417.0	8377.0	ZLA
406	4213.0	4175.0	VIP	803	8417.5	8377.5	KFS
408	4214.0	4176.0	ZSC	804	8418.0	8378.0	WLC
-----	4259.0	4166.5	SAB	806	8419.0	8379.0	VIP
-----	4300.4	4154.5	KEJ	819	8425.5	8385.5	WNU
-----	4347.0	4157.5	A9M	830	8431.0	8391.0	KEJ
602	6315.0	6263.5	ZLA	831	8431.5	8391.5	ZSC
603	6315.5	6264.0	KFS	837	8434.5	8394.5	SAB
604	6316.0	6264.5	WLC	838	8435.0	8395.0	VCT

ITU Ch Number	Shore Transmit	Ship Transmit	Station Callsign	ITU Ch Number	Shore Transmit	Ship Transmit	Station Callsign
-----	8541.0	8305.5	A9M	1602	16,807.5	16,684.0	ZLA
1202	12,580.0	12,477.5	ZLA	1606	16,809.5	16,686.0	VIP
1203	12,580.5	12,478.0	KFS	1619	16,816.0	16,692.5	ZSC
1206	12,582.0	12,479.5	VIP	1647	16,829.5	16,706.5	KFS
1210	12,584.0	12,481.5	VIP	1657	16,834.5	16,711.5	WNU
1219	12,588.5	12,486.0	WNU	1673	16,842.5	16,719.5	KEJ
1244	12,601.0	12,498.5	ZSC	1676	16,844.0	16,721.0	VCT
1257	12,607.5	12,505.0	WNU	1691	16,851.5	16,728.5	SAB
1263	12,610.5	12,508.0	VCT	-----	17,066.5	16,554.5	A9M
1265	12,611.5	12,509.0	KEJ	1824	19,692.5	18,882.0	ZSC
1291	12,624.0	12,522.0	SAB	-----	19,726.0	18,850.5	A9M
-----	12,668.0	12,373.5	A9M	2203	22,377.5	22,285.5	KFS

Global Traffic Lists

The combined Global Radio Network traffic list is broadcast (via radio telex SITOR Mode B) every other hour from the stations listed below.

Global Radio Transmit Schedule

Call	Station Location	Hour	Time
A9M	Bahrain Radio, Bahrain		

KEJ	Hoolehua Radio, HI USA	Even	H +15
KFS	Palo Alto (San Francisco) Radio, CA USA	Odd	H +25
SAB	Gothenburg Radio, Sweden	Even	H +35
VCT	St. Johns Radio, Newfoundland, Canada	Odd	H +05
VIP	Perth Radio, Western Australia	Even	H +45
WNU	Slidell (New Orleans) Radio, LA USA	Even	H +55
ZLA	Awanui Radio, New Zealand	Odd	H +45
ZSC	Cape Town Radio, South Africa	Even	H +25

■ USAF Getting New VIP Aircraft

The U.S. Air Force (USAF) is ordering some new aircraft for their VIP squadron, the 89 Air Wing at Andrews AFB, Maryland. They are ordering new Gulfstream V and Boeing 757 aircraft. The new USAF designators for these aircraft will be C-37A and C-32, respectively.

And speaking of the Air Force, an anonymous source has passed along an exclusive list of the new U.S. Air Force Scope Command automatic link establishment (ALE) frequencies. You should hear some very interesting transmissions on these frequencies as well as ALE bursts. All voice transmission should be in USB.

3059 3137 4721 5708 6715 6721 7632 8965 9025 9057 11126 11250 13215
15043 18003 20631 23337 27870 kHz.

My anonymous source also indicates that Thule Global in Greenland has a new discrete frequency of 11271 kHz.

And while you are scanning the Scope Command ALE frequencies, don't forget to check the Global HF System (GHFS) primary frequencies. You will hear a lot of the U.S. military voice traffic from aircraft, ships, and ground units on these Joint Chiefs of Staff sponsored network frequencies.

4724 6712 6739 8968 8992 11175 11244 13200 15016 17976

I recently asked a question in this column about who uses the callsign S4JG that you occasionally hear on the Global HF System. Two folks who will remain anonymous and are "in the know" answered my query and confirmed what I have been told privately on several different occasions.

S4JG is used by U.S. Navy maritime/anti-submarine warfare patrol aircraft (P-3 Orions) to conduct pre-flight comm checks prior to a mission. So the next time you hear that call on 11175 or 8971 kHz (USN Atlantic Safety of Flight freq), you're listening to a Navy P-3 getting ready to go flying.

■ Cuts put strain on Mayday monitor

We started on some bad news about HF maritime monitoring and unfortunately, we close on some more. Robert Williams forwards this interesting bit of information on the Australian maritime radio scene via an article that was published on June 2, 1997, in the *Sydney Morning Herald* by Anthony Hoy. The demise of HF marine frequencies continues.

Australia will have only one person in Perth monitoring 30 million square kilometers—or a thirteenth of the world's oceans—for distress calls on as many as 12 high-frequency radio channels, while simultaneously issuing weather forecasts.

Federal Government funding cuts have forced the closure from July 1 of key maritime communication stations responsible for Safety of Life at Sea (SOLAS) services to a total area of 47 million square kilometers, the Community and Public Sector Union (CPSU) says.

Stations at Perth and Brisbane will take on the workload of stations to be closed at Darwin and Townsville, doubling the weather forecasting and HF loads of stations "already responsible for the most climatically volatile areas of Australia's oceanic responsibilities," union secretary Mr. Adrian O'Connell said.

The stations are manned around the clock by one person on a 12-hour shift. Their main function is to listen for distress signals against the "exceptionally noisy atmospheric background" on HF radio channels.

"This situation is unprecedented in the world, and the risk of missing a distress call on HF radio is real and unacceptably high," Mr. O'Connell said.

"The Australian Government is putting at risk the lives of Australian and foreign sea-farers."

Australia is still basking in the glory of the spectacular rescues of Tony Bullimore, Raphael Dinelli, and Thierry Dubois in the Vendee-Globe Around the World Yacht Race in December. All were equipped with the latest global satellite tracking equipment.

"But the satellite technology is not being picked up as quickly as expected," the union's industrial officer, Mr. Jason Pascoe, said.

"Smaller yachts and fishing trawlers are not required to move from HF radio to satellite communications until February 1999. Most simply cannot afford to do so. They are the ones we are concerned about."

Telstra is contracted to provide SOLAS services to the Australian Maritime Safety Authority. The CPSU, says the Government, has pruned funding for this work by about \$2 million.

A spokesman for the Minister for Transport, Mr. Sharp, said Telstra had "guaranteed that the services can be provided adequately and satisfactorily," and that Mr. Sharp had been assured by the authority that its SOLAS obligations "would be properly fulfilled." "This is an industrial matter between Telstra and the union," Mr. Sharp's spokesman said.

But Mr. O'Connell said there was no industrial dispute. "Telstra is only the service provider for the Government's maritime safety obligations," he said.

After spending \$1 million on a two-day search, Australian rescue authorities last night called off the hunt for a ship reported missing in the stormy Tasman Sea, believing there was "a high probability that it's a hoax."

Now it's time to see what you have been monitoring this month in the world of utility communications.

Larry Van Horn

Abbreviations used in this column

AM	Amplitude Modulation	MERS	Mobile Emergency Response System
ANDVT	Advanced Narrowband Digital Voice Terminal	MOI	Ministry of Information
ARC	American Red Cross	NAS	Naval Air Station
CanForce	Canadian Forces	NASA	National Aeronautics and Space Administration
CFL	Confidential Frequency List	NECN	National Emergency Coordination Net
COMNAV	Communications and Navigation	RCC	Rescue Coordination Center
CP	Command Post	RTTY	Radioteletype
CW	Continuous Wave (Morse code)	SAM	Special Air Mission
DV	Distinguished Visitor	SATCOM	Satellite Communications
EAM	Emergency Action Message	SHARES	Shared Resources
ETA	Estimated Time of Arrival	UHF	Ultra High Frequency
ETB	Estimated Time to Base	Unid	Unidentified
FEMA	Federal Emergency Management Agency	USAF	U.S. Air Force
GEP	Ground Entry Points	USB	Upper Sideband
GHFS	Global HF System	USDA	U.S. Department of Agriculture
HF	High Frequency	UTC	Coordinated Universal Time
MARS	Military Affiliate Radio System	VIP	Very Important Person

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Time Universal)

- 2953.0 VLB2-Israeli Mossad number station at 2127. (Takashi Yamaguchi-Nagasaki, Japan)
- 4442.0 SPAR 65 working Andrews on F499 at 0502. (Anonymous-NE)
- 4458.0 Nightwatch 01 working Andrews at 0726 on F710. (Anonymous-NE)
- 4491.0 Snow Drift calling Deputy Dog at 0545. (Anonymous-NE)
- 4577.0 6PXJ-Unid station repeating "V ABY7 DE 6PXJ" in CW at 1027. (Yamaguchi-Japan)
- 4645.0 English female 3/2-digit number station at 0131. (Anonymous-NE)
- 4665.0 VLB2-Israeli Mossad number station repeating "Victor Lima Bravo Two" for more than 30 minutes at 2125 with heavy interference from Tokyo aeradio (4666 kHz). An abnormal Mossad transmission. On another day heard MIW at 2117. (Yamaguchi-Japan)
- 4670.0 English female 3/2-digit number station at 0131. (Anonymous-NE)
- 4721.0 SAM 29000 working Andrews on F877 at 0115. PACCOM 01 working Andrews at 0546 on F877 (also on 8026 F290, 8047 F752, and 10586 F974). Air Force Two working Andrews here on F877 and also on 6993 F117 and 11460 F295. (Anonymous-NE)
- 4742.0 Air Force 2 shutting down communications with Andrews VIP at 0222. (Jeff Jones-San Francisco, CA)
- 4780.0 KPA2-Israeli Mossad number station at 2117. (Yamaguchi-Japan)
- 5438.5 L9CC-Unid station repeating "V CP17 DE L9CC" in CW at 1245. (Yamaguchi-Japan)
- 5670.0 Madras aeradio, India, in contact with various aircraft at 2045 in heavily accented English. (Yamaguchi-Japan)
- 5696.0 NMN-CAMSLANT Chesapeake, VA, working Rescue 2126 regarding a SAR operation. Shifted to 8980 and was also talking to the *USS John Stennis* about the sailing vessel *Gull*. (Albert Byner-Hanahan, SC)
- 5705.0 Newsroom calls Nightwatch to enter the net at 0500. They move to 9016 for more better comms. (Duke Rumley-Mayodan, NC)
- 5715.7 Unid station repeating "ETT 40" in CW at 1040. (Yamaguchi-Japan)
- 5750.0 4XML-Unid station repeating "V BFR7 DE 4XML" in CW at 1245. (Yamaguchi-Japan)
- 6658.0 MIW-Israeli Mossad number station at 1515. (Yamaguchi-Japan)
- 6683.0 SAM 300 (DV-2 + 9) airborne at 0230, ETA Andrews 0310 working Andrews VIP. Preflight frequency checks included: 6730.0, 6683.0, 9120.0, 4610.0, and 9017.0 most of which were out of the Offutt site. (Jones-CA) Air Force Two (SAM 31681) working Andrews on F731 at 1627 then moved to 8026 F290. SAM 20375 with phone patch traffic via Andrews at 1423. Also used 11053 F354. (Anonymous-NE)
- 6694.0 Rescue 106 with a phone patch to RCC via Halifax military at 0330. (Anonymous-NE)
- 6730.0 SAM 202 working Andrews VIP regarding primary frequency at 2340. SAM 202 working Andrews VIP for signal checks on this new primary frequency at 0206. (Jones-CA) E1F (DV2+10) with phone patch to Andrews at 1334. Casey 01 calling Andrews on F267 at 1900 and moved to 6993 F-117. Air Force One working Andrews at 0231. SAM 29000 working Andrews in the clear and with ANDVT at 2032. Also heard 29000 at 0011 with patches to the State Department and also using 13440. (Anonymous-NE)
- 6736.0 Delta 3 Bravo working Oscar 0 Kilo at 0411. (Anonymous-NE)
- 6761.0 Gold 61 trying to raise Skybird. No joy at 1622. (Jones-CA)
- 6786.0 Unid station with 5 letter groups in CW at 1125. (J.L. Metcalfe-KY)
- 6840.0 EZI-English female Israeli Mossad numbers station at 2200 with coded message traffic. (Dean Burgess-Manchester, MA)
- 6870.0 FDG-French Air Force with CQ CW marker at 2140. 6871.5 is listed in the CFL. (Yamaguchi-Japan)
- 6993.0 SAM 974 (DV + 7) ETB Andrews AFB: 0615, working Andrews VIP for phone patch to SAM Command. Previously up on 11220.0 and 13211.0 at 0239. Air Force 2 (DV-2 + 27) departed at 0155, ETA "next destination" 0555, working Andrews VIP for a phone patch into Waldorf regarding using RF-4 out of various GEPs and another phone patch into SAM Command at 0205. (Jones-CA) Air Force One working Andrews on F117 (mostly ANDVT) at 0046. (Anonymous-NE)
- 7595.0 New Castle working Missouri at 2323 and calling Buckeye at around 0200. Clear and secure modes used over a couple of days. (Metcalfe-KY)
- 7862.3 AFA1NW in 300 baud packet at 1123. USAF MARS. (Metcalfe-KY)
- 7918.0 YHF-Israeli Mossad number station at 1330. (Yamaguchi-Japan)
- 8026.0 Executive-1-Foxtrot with ETA KLAX at 0155 and SAM 974 (DV-2 + 19) ETA Andrews at 0400, working each other and Andrews VIP at 0046. SAM 202 working Andrews VIP for signal checks on this new primary frequency at 0140. Navy 676 (DV-2 + 6) airborne at 2105, ETA Peterson AFB at 2315, working Andrews VIP with periodic signal checks at 2109. SAM 202 (DV-2 + 8) ETA to Sheppard AFB at 2040, working Andrews VIP regarding arrival at Sheppard. Final destination is Andrews AFB with an ETA of 0000. Communications heard at 1759. (Jones-CA) SAM 50050 calling Andrews at 2124. (Anonymous-NE)
- 8042.0 Trout 99 with a phone patch to Rhein Main Base Ops via Andrews on possible F-003. (Anonymous-NE) *My records indicate that this is F290. F003 should be 8036.0-Larry.*
- 8047.0 SAM 974 (DV-2 + 19) departed Ontario at 2345, for Andrews AFB, ETA 0400, working Andrews VIP and E-1-F at 2350. (Jones-CA)
- 8134.0 Another unid station with 5 letter groups in CW at 1213. Lots of these stations noted recently. Other frequencies have included: 7846.0, 8187.2, and 9320.0 kHz. (Metcalfe-KY)
- 8331.0 4XML-Unid station repeating "V BFR7 DE 3XML" in CW at 0855.
- 8464.0 English female 5-digit Lincolnshire Poacher number station at 2215. (Yamaguchi-Japan)
- 8638.0 VNG-Sydney, NSW, Australia, with AM time signal at 0524. (Anonymous-NE)
- 8641.0 KPA2-Israeli Mossad number station repeating "Kilo Papa Alpha Two" for more than 30 minutes at 1347. An abnormal Mossad numbers transmission. (Yamaguchi-Japan)
- 8843.0 NR16020-Linda Finch around the world flight working Honolulu. Later they went to 3413/5574. There was a navigator flying with Linda. Honolulu handed them over to San Francisco on 5574 when Honolulu lost contact with them. Support aircraft was aircraft number 44RD. (Anonymous-NE)
- 8957.0 Shannon, Ireland, VOLMET with aviation weather at 0409. (Anonymous-NE)
- 8989.0 Trenton military working unid station at 1459. (Anonymous-NE)
- 9016.0 PACOM 01 working Hickam with write-ups at 0035. SPAR 64 working Hickam with phone patches regarding arrival at Cairo. Previously up on 8968.0 and 15043.0 at 0459. (Jones-CA)
- 9023.0 Thumper working Deer Hunter at 1809, moved to 11214 at 1819. (Anonymous-NE)
- 9120.0 Cactus and Nightwatch 01 with clear/secure transmissions at 1424. (Metcalfe, KY) Nighthawk 12 working Cactus at 0104. Cactus told Nighthawk 12 to contact Desert on November in the clear. (Anonymous-NE)

- 9121.0 Wild Eagle calling Eagle's Nest for a radio check and then any station for a radio check. No joy on both at 1847. (Jones-CA)
- 9317.0 SAM 049 departed Gander at 0410, ETA Andrews AFB at 0710, working Andrews VIP on Air Force One's new secondary freq F-709 at 0420. (Jones-CA)
- 9320.0 SPAR 67 with a phone patch via Andrews at 1605. (Anonymous-NE)
- 9958.0 English female 3/2-digit number station in AM at 1801, parallel to 10783.5. (Anonymous-NE)
- 10202.0 SAM 204 working Andrews VIP with phone patch to COMNAV regarding SATCOM problems at 2322. (Jones-CA) SAM 60202 and SAM 60204 working Andrews on F904 (talked about going to F814) at 2140. (Anonymous-NE) *F814 would have been 6989.0 kHz-Larry.*
- 10493.0 KA80699-Unid station, in comms with WGY908-FEMA Denver, CO, and trying for WGY906-FEMA Denton, TX. KA80661 heard a couple of months ago on 5211.0 and possibly IDing as WV DES. Artistic Style with a H212145 message for WGY918-FEMA MERS at Denver, CO, at 2145. KCR873-USDA Boise, ID, and KCI615-ARC, Falls Church, VA, in FEMA's NECN net at 1658 and 1928, respectively. (Metcalfe-KY)
- 10581.0 ALE burst here at 0107. It's hard to be accurate on the frequency without a corresponding voice transmission. More ALE transmissions noted on 7622.0 at 1215. (Metcalfe-KY)
- 11053.0 Elmendorf GHFS with an EAM at 0440. McCellan GHFS with a Foxtrot EAM: "Skyking Skyking do not answer. 3SF, authentication: NM" at 2133. PACOM 01, enroute Andersen, checking Andrews VIP here for a possible new primary from their previous: 11460.0 at 0403. Last local night SAM 417 (a.k.a. WALT 01) was also enroute to Andersen. (Jones-CA) SAM 60202 () DV+01) with a phone patch to Andrews CP via Andrews on possible F655. (Anonymous-NE) *Interesting. My notes indicates that this is F354 and I do not have a current listing for F655-Larry*
- 11214.0 Executive-1-Foxtrot, working Andrews VIP regarding a 0155 arrival at KLAX and coming up on MUX with SAM 974 at 2142. SAM 683 working Andrews VIP reporting block time, and requesting preflights for 180009 at 0155. SAM 300 working Andrews VIP with signal checks at 1852. SAM 29000 (sounded like) working Andrews VIP with preflight signal checks at 1856. SAM 202 (DV-2 + 6) departed at 2220, ETA "KCVS" (Cannon AFB) at 2350, working Andrews VIP with phone patch to SAM Command at 2221. Gave UHF frequency for KCVS as 372.2 MHz. SAM 974 checking Andrews VIP for signal strength out of various comm levels at 2005. (Jones-CA) Darkstar November (USAF E-3 AWACS 965th AACS/552nd ACW, Tinker AFB, OK) with a phone patch via Trenton military at 1715. SAM 60203 (DV2+6) with a phone patch to Andrews at 1715. Thumper with a phone patch to Deer Hunter via Trenton military at 1758. (Anonymous-NE)
- 11217.0 Jaguar 45 working MacDill GHFS with phone patch traffic from calling party on board Delta-031 at 0200. Possie 62 enroute Pope AFB via Roosevelt Roads and Guantanamo Bay working MacDill GHFS with phone patch traffic to Hilda East at 2324. (Jones-CA) PACAF 01 working MacDill GHFS at 1635. (Anonymous-NE)
- 11220.0 SAM 682 (DV-2 + 19) ETA NAS North Island at 0430, working Andrews VIP with phone patch traffic at 0239. SAM 28000 trying to raise Andrews VIP for a signal check. No joy at 0038. And also on freq: NIGHTWATCH 01, apparently in connection with the above comms, working Andrews VIP with signal checks at 0142. SAM 417, also IDed as "WALT 01" (?) enroute Andersen, with an ETA of 1000z, working Andrews VIP with phone patches and signal checks at 0050. Casey 01 (DV-3 + 19) departed Randolph AFB, TX, at 2159, ETA Langley AFB at 0100, working Andrews VIP at 2204. Navy 511 (DV-3 + 8) enroute to China Lake working Andrews VIP with phone patches at 0005. (Jones-CA) Navy 50511 (2033), SAM 60203 (1510), PACAF 01 (2151), and SAM 26000 (2355) working Andrews on F-311. (Anonymous-NE)
- 11226.0 SAM 202 (DV-2 + 9) ETA Peterson AFB at 0100 working Andrews VIP with phone patch traffic at 2345. (Jones-CA) SPAR 64 with a phone patch to ECC Metro via Lajes GHFS at 0613. (Anonymous-NE)
- 11460.0 Air Force 1 working Andrews VIP and going to ANDVT at 0012. SAM 206, ETA to MacDill AFB at 2040 working Andrews VIP for phone patches into MacDill AFB at 1942. SAM 206 working Andrews VIP at 1758. SAM 26000 (0 DV + 31) enroute Dulles, ETA 1030 working Andrews VIP at 0015. (Jones-CA) Navy 49676 calling Andrews at 1738. SAM 56974 working Andrews at 0155. (Anonymous-NE) *My records indicate that this is a VP-3A flown in support of the Navy Chief of Naval Operations (CNO)-Larry.*
- 11570.0 English female 5-digit Cherry Ripe number station at 1300, also noted on 13866. (Yamaguchi-Japan) *OK, I'll bite, Takashi-san. What is a Cherry Ripe numbers station?-Larry*
- 12029.0 SVB3/4/5-Athens Radio, Greece, with a CW marker at various times. (Richard Parker-Rochester, NY) *That is an interesting frequency, Richard. I haven't seen them reported on this one in the past-Larry.*
- 12693.0 UGC-Unid station with CW marker at 2246. (Parker-NY) *This is Saint Petersburg Radio in Russia, Rich-Larry.*
- 12721.0 SPH61/81-Gdynia Radio, Poland, at 1614 with a CW marker. (Parker-NY)
- 12748.0 IRM-CIRM Rome Radio, Italy, with CW marker at 2300. (Parker-NY)
- 12750.0 CWA-Unid Brazilian station with CW marker at 2302. (Parker-NY) *This is actually Cerritos Radio in Uruguay, Rich-Larry.*
- 12780.0 D3E51/61-Luanda Radio, Angola, with CW marker at 2308. (Parker-NY)
- 12780.5 9AR-Rijeka Radio, Croatia, with a CW marker at 2307. Unusual frequency for this one. (Parker-NY) *My notes indicate that this is a listed frequency for Rijeka Radio-Larry.*
- 12829.5 XFM-Manzanillo Radio, Mexico, with a CW marker at 1647. (Parker-NY)
- 12984.0 VNG-Sydney, NSW, Australia, with AM time signal at 0438. (Anonymous-NE)
- 13077.0 BVA-Taipai Radio, Taiwan, with voice call, "all stations this is BVA with traffic list" at 1300. (Jack Dix-Yonkers, NY)
- 13211.0 SAM 974 working Andrews VIP regarding a 2315 arrival at KONT (Ontario, CA). Communications at 2003. (Jones-CA)
- 13242.0 Postcard working McClellan GHFS at 2015. (Anonymous-NE)
- 13248.0 SAM 26000 working Andrews VIP. Mentioned something about YSCB at 1020 (maybe departure). Heard at 0256. (Jones-CA)
- 13257.0 CanForce 2102 working Trenton military (moved to 15031) at 2031. (Anonymous-NE)
- 13440.0 SAM 26000 working Andrews VIP with block time (didn't catch the airport) at 1640. (Jones-CA)
- 13528.0 C-Single letter HF marker in CW at 1447. (Dix-NY)
- 13960.0 SAM 206 working Andrews VIP with phone patches regarding a 2015 ETA at Dallas/Ft. Worth International (KDFW). Heard at 1830. SAM 202 working Andrews VIP with phone patch to AFOC at 0033. 771 working unid station with phone patch to Toronto Maintenance regarding a new tire needed upon landing. Heard at 2015. SAM 202 checking Andrews VIP here for secondary frequency at 0022. (Jones-CA)
- 14396.5 KHA950-NASA Stennis Space Center, Picayune, MS, with a SHARES net check-in at 1639. Looks like the SHARES program has implemented a weekly (Wednesday) 1600-1700 check-in on 5236.0 and 14396.5. (Metcalfe-KY)
- 14531.0 Unid station repeating "1 855 855 855" continuously in CW at 1401. (Dix-NY)
- 14977.0 Unid station sending 5-digit groups in CW at 1407. (Dix-NY) *I have seen O LX-MOI Prague, Czech Republic, on this frequency with that kind of traffic, Jack-Larry.*
- 15011.0 SAM 26000 working Andrews VIP with phone patches and signal checks at 0203. PACOM 01 working Andrews VIP with move to a new primary, told to try F-825 (?) around 0115. SAM 049 and an unid SAM working Andrews VIP on Air Force One's secondary at 0015. (Jones-CA)
- 15043.0 PACOM 01 working Hickam with phone patch to SPAR operations regarding upcoming mods to HF comm gear at 02000. (Jones-CA)
- 16000.0 VNG-Sydney, NSW, Australia, with AM time signal at 0416. (Anonymous-NE)
- 16314.0 English female (British accent) 5-digit number station in AM at 1444 followed by Lincolnshire Poacher tones. (Dix-NY)
- 16950.4 9MB-Penang Naval Radio, Malaysia, with V CW marker at 1249. (Dix-NY)
- 17053.0 XSX-Chilong Radio, China, with CO CW marker at 1253. (Dix-NY)
- 17064.8 EAD3/EDZ6-Madrid Radio, Spain. with CW marker at 1852. (Parker-NY)
- 18290.0 SAM 50050 working Andrews on F633 at 1910. (Anonymous-NE)
- 18317.0 SAM 683 working Andrews VIP here for new primary, F-623, at 0057. (Jones-CA)
- 18323.0 SAM 683 (DV-2 + 7) ETB MMTM at 0055, working Andrews VIP with phone patch to SAM Command regarding bottle of wine for the DV upon landing at MMTM. The answer was no. (Jones-CA)
- 18437.3 Diplo circulars in Spanish at 1602 using 50 baud RTTY. (Metcalfe-KY)
- 19047.0 PACOM 01 working Andrews on F-825 (not confirmed here) with a phone patch at 0205. (Jones-CA)
- 22473.0 CBV-Valparaiso Radio, Chile, with CW marker at 1933. (Parker-NY)



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Shortwave Situation Mirrors the World

Unexpected new relay deals have cropped up: Croatia via Germany, Switzerland via Germany, Maryja via Russia, Mexico via Canada and vice versa, another Irish station via WWCN; India is finally looking for a new site to get its signal to us; Greece has the right idea, using VOA in the US, but why doesn't Thailand? Meanwhile, one of VOA's Philippine sites is threatened as its Portugal relay is closed down.

Monitor Radio seemed kaput, when a deal fell through for

another Boston publisher to take over the news operation; the unsold shortwave stations went to Plan B, converting to all-religious programming. As does WGTG after flirting with the "patriots."

The military dictatorship in Nigeria faces a second clandestine operation dedicated to its overthrow. Conflict in Congo, Dem. Rep. of Congo, and Sierra Leone made for newsworthy monitoring. Read on...

AUSTRALIA Evidence given at Senate inquiry into RA states at least ten broadcasters had approached RA in the last few years to use its transmitters, including R. Japan and R. Netherlands (Matt Francis, *Australian DX News*)

BOLIVIA R. El Mundo back after many months' silence, 6014.8 weekdays until 0100* (sometimes later for soccer), Saturday until 0200*, Sunday 2400* (Tony Jones, Paraguay, *Cumbre DX*) R. Carlos Palenque, La Paz, 6194.60 at *0903-0930 with folk music (Takayuki Inoue N., Japan)

BRAZIL R. Cultura, São Paulo, 9615.05 with intriguing music from the 30s and 40s, quality audio, from 2300 past 0215 (Jay Novello, NC)

CANADA RCI has signed an agreement with IMER, the Mexican national radio, for RCI programs in Spanish to be broadcast on the IMER network, and RCI will rebroadcast programs from Mexico (RCI news via BBCM) Following the June election, Sheila Copps, who helped find funding to keep RCI alive, retains her post as Heritage Minister, but not Deputy Prime Minister (RCI news via gh) The New Democratic Party, which unexpectedly won a few more seats in the election, opposes CBC funding cuts, unlike the other three (B. Cooley, BC)

Several well-known voices on CBC/RCI called it quits in June, mostly due to drastic budget cuts, though some may still be heard in repeats or in the fall on other programs: Clyde Gilmour, Ian Brown, Vicki Gabereau. Peter Gzowski, Linda Cullen, Bob Robertson, Mary Lou Finlay (gh, from various sources via Cooper, Westenhaber)

RCI heard on subharmonic 4877.5 = 0.5 x 9755 at 2340, as well as 4812.5 = 0.5 x 9625 (Bob Hill, MA, *DSWCI DX Window*)

CHINA A survey of regional stations in April/May found that about 40% of the Chinese SW regional frequencies as compared to *WRTH 97* listings have gone inactive, most doubtless replaced by MW and especially FM ... But 45 channels were logged so there are still plenty of DX targets; from 20 of China's 30 regions if you count CRI sites (David Foster, *OzDX*)

COLOMBIA R. Patria Libre heard Mayday on 6250 at 2200 for an hour. Heard very well when it's on, suggesting it is very near the Venezuelan border on the eastern plains of Colombia (Santiago San Gil, Barinas, Venezuela via Jorge Garcia Rangel, Club Dixistas de la Amistad) Also audible here until 2225* (Brian Alexander, PA, *World of Radio*)

CONGO R. Congo, Brazzaville, regular on reactivated 4765 with French around 1800 (Edwin Southwell, England) Following news of coup, checked 4765, but no signal; good instead on 5985.15 at 2100 political announcements in French (Finn Krone, Denmark, *DSWCI DX Window*) RTVC very good on 4765 at *0350-0450+, much weaker at 2120-2130* (Brian Alexander, PA, *World of Radio*)

CONGO D.R. Voix du Zaire renamed RTNC, Radio-Télévision Nationale Congolaise, also "la voix du peuple" on 15244.5 around 0500-1830 (BBCM) La Voix du Congo, Kinshasa, 15244.51, two days after rebels took over, 1800 until 1916 carrier cut (David M. Clark, Ont., *DSWCI DX Window*) Before the rebel victory, a station they controlled in Butembo, eastern part of the country, was heard on 7060 at 0510 in French and Swahili, drum beats, closed at 0730* (BBCM) V. of the People, 5066, Bunia, formerly R.

CANDIP, expanded schedule to 0400-0800, 1000-1700 (BBCM)

COSTA RICA RFPI has vacated 6205-USB following a complaint of interference to maritime communications from Australian Maritime Safety Authority; replaced with 7585 provisionally at 0000-1200 (RFPI) Rather weak at first, using standby third transmitter, as 7385 and 15050 AM also remained on into the evening, with 15050 holding up as late as 0500 in solstice conditions, often stronger than 7385 and with less noise (gh, OK) 7585 doing quite well here (Joe Hanlon, PA) see also INDIA



Continuous ratchety sound has bothered over most of the 31 meter band for months, caused by someone's maladjusted transmitter. Finally traced it to T1FC on 9645, which is undermodulated. It's most obvious on vacant channels such as around 1200 on 9535, 9590, but strong enough to bother Havana on 9550, and also at 2200. T1FC was begging for donations to fix its equipment, offering to send a brother around to pick up the loot. *Meanwhile they should turn this one off!* -gh. *World of Radio*

CROATIA [non] Deutsche Telekom, Jülich is relaying HRT, Croatian Radio, Zagreb.; 0900-1100 on 9470 to SAM/Au/NZ; 1800-2000 on 9595 to SAF; 0100-0300 9520 to SAM; 0300-0500 9495 to ENAm, to be moved to 49mb in Sept (*BC-DX*) And on new 9520 from 0100 starting with Spanish news (Randy Stewart, MO)

ETHIOPIA R. Ethiopia sent QSL for 0300-0400 on 7110 and undated schedule showing English: National Service, M-F 1030-1100 on 9705, 7110, 5990; External 1600-1700 on 11800, 9560, 7165 (Ed Rausch, NJ)

R. Fana, 6210, *0325-0355+ IS, 0329 ID, exotic vocals, weak here but stronger on //6940 which had RTTY QRM (Brian Alexander, PA)

[non] V. of Oromo Liberation, 1700-1900 Mon/Wed/Sat to ME/AF on 9925 via Ukraine. Address: SBO, PO Box 73247, Washington, DC 20056 (BBCM)

GEORGIA New service mentioned last month from Voice of Hope began regular broadcasts June 4, 100 kW to Asia in English at 120° daily at 1355-1600, produced in England, and QSL reports can be sent to: Voice of Hope, PO Box 109, Hereford HR4 9XR, England; IRC requested for airmail response (HAM)

GREECE [non] In a few months we should be able to transmit from Delano and Greenville (Dionysios Angelogiannis, V. of Greece frequency manager, April 24 via John Babbis) This would be the 1200-1350 broadcast via Delano 9590, heading 75° across the US; gh's crystal ball was working very nicely when *World of Radio* reported last August such a registration. (Babbis, *W.O.R.*) I suspect that

beam is just a reversal of an antenna aimed 255° to the Pacific (gh) VOA engineers confirm this will be the case; some 12 hours a day of VOG will be transmitted from VOA Greenville and Delano, probably by the end of August, as soon as VOG completes installation of a satellite earth station in Greece (Kim Elliott, VOA *Communications World*)

*All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel program-ming; + = continuing but not monitored; 2 x freq = 2nd harmonic; J-97=May-Sept; Z-97=Summer season; W-97=Winter season; [non] = Broadcast to or for the listed country, but not necessarily originating there.*

GUATEMALA On 6180, marimba music heard again at 2300 check amid T-storm noise but no Cuba or Brazil QRM; 2307 quick announcements by man and woman seemed to mention "concierto" and "nacional," then off (gh, OK) You're right, it is La Voz de Guatemala, heard with Los Maestros de la Marimba TGW in a *Chapinlandia* program for abroad. Had not been on SW for many a year (Henrik Klemetz, Colombia)

INDIA All India Radio, Gangtok, Sikkim: 0025-0330 on 3390, 0700-0930 on 6085, 1200-1730 on 3390, all 50 kW. Port Blair, Andaman Islands: 0000-0300 on 4760, 0315-0345 & 0700-0850 on 7115, 1030-1630 on 4760, all 20 kW. But Leh is also on 4760 overlapping: 0125-0430 & 1130-1600 with 50 kW; and 0530-1100 on 6000 (Alok Das Gupta, India via Wolfgang Büschel)

AIR External Service sked on 15050, which might conflict with RFP1: 0400-0430 Persian, 0430-0530 Arabic, 0845-0945 Indonesian, 1000-1100 English, all 250 kW from Aligarh; and 1145-1315 Chinese, 250 kW from Delhi. The complex multi-site sked on 10330 for the Vividh Bharati homeservice: 0025-0430 from Bombay 100 kW, Delhi 100, Guwahati 50; plus 0100-0430 Madras 100. 0630-1200 from Bombay, Delhi, Madras. 0630-1730 Guwahati. 1245-1730 all four sites again (*ibid.*) Several broadcasts suspended due to lack of spare parts, including 1000 on 15050 (*DX Grapevine* via *EDXP*)

[non] AIR is going to have a relay station in either West Africa or the West Indies, enabling it to reach the Americas where there is a large concentration of Indians. Negotiations are underway with friendly countries of these areas (Sudipto Ghose, Calcutta, *WRTH* via *DSWC! DX Window*)

IRAN [non] Democratic Voice of Iran, first reported by *World of Radio* (see last month) was subsequently confirmed by BBC Monitoring which reported further info about it: Persian ID is *radio-ye seda-ye azadi-khahan-e iran*, literally "Voice of Iran's Freedom-Seekers," but prefers to be known in English as DVOI. Says it is not affiliated to any particular group, religion, or political faction. Expected to add a second SW frequency in near future (BBCM) Immediately followed at 1800 on 5900 by V. of Russia World Service (Bjorn Fransson, Sweden, *DSWC! DXW*) One day carried V. of Tibet by mistake; must share site (Victor Goonetilleke, Sri Lanka, UADX via *BC-DX*)

IRELAND [non] Emerald Radio Productions had 7-part series via WWCR-3 in June and July, Sun 1900 on 12160, repeat Sat 0800 on 5070. Might be extended. See www.emeraldradio.com (Chuck Adair, WWCR, *World of Radio*)

JAPAN R. Japan cancelled numerous programs, but some elements survive as features within *Hello from Tokyo*, such as *ABC of DXing*, *Japan Diary*, UT Sun 0110-0200 on 5960 via Canada, and several repeats (gh)

KENYA KBC, Nairobi on new 6990 at 1640-1800, booming in, vernacular but good IDs, not //4915, 4934; site? (Bjorn Fransson, Sweden, *DSWC! DX Window*) Also next day 1515-1605 in Swahili request program, ads, 1600 news (Godfrey Clemitson, RSA, *ibid.*) No sign of it around 0300 (gh)

KIRIBATI R. Kiribati, 9810, music at 0620 on both side bands; awful splatter from Cuba-9820 (Volodya Salmariw, B.C.)

KOREA SOUTH RKI invited listeners to suggest new name for *Shortwave Feedback* which is now considered outdated; also says it will QSL reports of "reception" via Internet (gh)

LITHUANIA Following a visit by Tibetan exile officials, the Lithuanian Minister of Communications is looking into broadcasting English-language radio programs dedicated to Tibetan independence; also plans to launch Mongolian and Chinese language broadcasts to communicate unbiased info about Tibet to the public in China (Lithuanian Radio via BBCM) [non] After using both 9875 and 9855 for a while via Germany in English at 0030-0100, Vilnius dropped 9875 (Ivan Grishin, Ont.) Had a ham DX program until 0100 UT Tue (George Thurman, TX) *Anyone have a schedule?*

MALTA [non] VOM heard Sunday *1859-2000 in English on 12060 via Russia, //9765 weak (Brian Alexander, PA) VOM to North America in English UT Monday 0100-0200 on 13605 (BBCM) *Not when I checked, heard Golas Rossii instead* (gh, OK, and Randy Stewart, MO)

MÉXICO XERTA, 4800 and 15120 with 5 kW from Ajusco volcano plans to use ten languages, include *Torre DX* program with Julián Santiago (Luis Antero Aguilar via Ruben Guillermo Margenet)

The agreement between IMER and RCI (see *CANADA*) includes a potential program exchange with R. México Internacional. We would broadcast some programs about Mexico in English on some of their frequencies (Juan Mort, XERMX, *W.O.R.*)

Great music and interesting talk segments on a strong signal are available for the insomniac from R. Educación, 6185, which during DST signs off around

1100. One of the *locutoras* doubles in French, but little English is heard (gh, OK) XEQM reactivated on 6104.85 from Mérida at 1115 with music and rapid talk; somewhat distorted but readable on peaks (Jay Novello, NC)

MONACO [and non] TWR on 9745 reported last month is from Albania, 9755 Monte Carlo (David French, World DX Club *Contact*) see also ALBANIA

MYANMAR [non] Democratic Voice of Burma, on SW via Norway, has added Internet RealAudio; daily program uploaded at 1200 on: <http://www.communicue.no/dvb/> (BurmaNet News via BBCM)

NIGERIA [non] V. of Free Nigeria was inaugurated June 12 at 0400-0500 on 7180, but then broadcast weekly on Sat at 1900-2000 on 11680; sponsored by the Free Nigeria Movement which calls for boycott of business with Nigeria, and an end to the military dictatorship. Address: P.O. Box 441395, Indianapolis, IN 46244. More info at: <http://pw2.netcom.com/~fmm> (FNM via rec.radio.shortwave) This appears to be unrelated to the previous clandestine, R. Kudirat.

NORWAY NRK, English Sunday at 1500 said it would replace 11840 with 13805 for WNA (Joe Hanlon, PA)

PERÚ New on SW is R. Huamachuco, 6676.2 at 2330 esoterica, folklore (Henrik Klemetz, Colombia) R. San Ignacio, 7040.8 ex-6997.6 with long adstring 2235; ID at 2253 (Horacio Nigro, Uruguay) 7040.4, R. San Ignacio at 2330 ID (Felipe Asenjo, Chile, *hcdx*)

PHILIPPINES Government has notified US officials that it must close VOA facilities in North Luzon by end of May. Dept. of Foreign Affairs says it wants to convert the 20-hectare property, once a USAF facility, into an ecotourism park (Asian magazine via Hans van den Boogert, *hcdx*) IBB, of which VOA is a part, has no comment about any discussions between the USA and the Philippines about the future of this VOA site. It is still transmitting (Kim Andrew Elliott, VOA) The VOA Poro transmitter is on part of Club John Hay, a former recreational base for US forces, not far from Baguio, the hot weather retreat of the rich. CJH is being redeveloped for the use of the even richer, and the transmitter is in the way, so the Filipinos want it out (John Orford, Philippines, *WDXC Contact*)

PBS, Radyo Pilipinas, English at 0230-0330 on 11885, 15120, 15270 Mon-Sat starts with *Voice of Democracy*, ends with *World News*; in between: Mon, *Save the Earth*, Tue, *The Phils. Today*, Wed, *Our Changing World*, Thu, *Business Updates*; Fri, *Brotherhood of Men*; Sat, *Listeners & Friends*; Sun: *Deutsche Welle*, *Sports Focus*, *News Round-Up* (PBS)

R. Mindoro, religious, active again on 3345.5v, fade-in at 0840 (Roland Schulze, Philippines, *BC-DX*) From the hill above the Mangyan Bible School; on air three times a week, Wed and Sat mornings, Sun afternoons, totalling 6 hpw., has to use a diesel generator, since hydro station was destroyed in 1993 typhoons (John Richards, Mindoro via H. J. Biener, *Kirche in Rundfunk* via *BC-DX*)

R. Veritas Asia, Filipino at 1500-1525 (-1555 Wed, Fri, Sun) on 9680 ex-11715/9540 (*Pantview*, Bulgaria via *BC-DX*) Used to include some English segments; and "Filipino" includes English, Spanish words (gh)

PORTUGAL RARET, the Portuguese company relaying RFE/RL/VOA at Glória and Maxoqueira is about to close down, as Glória is inoperative since 1996 and Max is being dismantled, said to be moving to Tinian island for R. Free Asia. Some of the oldest transmitters at Glória belong to the Portuguese state and will be returned (Carlos L. Relvas Assunção Gonçalves, *DSWC! SW News* via *EDXP*)

SIERRA LEONE SLBS, 3316, on extended schedule after military takeover, mostly non-stop music, but at 0102 anthem and message from military commander (John Ekwall, Sweden, *Cumbre DX*)

SOUTH AFRICA World Music Radio, Sat and Sun 1800-2200 uses 6290 with 250 kW, 21 dB gain, 342° and 3345 with 100 kW, 12 dB gain, 5°. If it becomes popular, tentative date for expanding to a daily service is Nov 1 (Stig Hartvig



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Nielsen, WMR, Denmark)

The Investment Channel had a two-year contract with SENTECH but it was terminated after only seven weeks by Jerry Hoffman. He said they had tremendous response from Africa but phones and faxes do not work well and it takes six weeks for a letter to reach Atlanta from Africa. It would take almost four months just to establish what a listener really wants (Rodgers Gamuti, SENTECH via Hans Johnson, *Cumbre DX*)

SWITZERLAND [non] One of the many SRI transmissions on 13635 is shown as relay via Jülich, Germany: 1645-1830 to EAF, no English (Swiss Telecom via Bob Padula, *EDXP*) 100 kW whilst all the Swiss transmitters are more (gh)

TAIWAN The government has decided to establish a single overseas service by merging Voice of Free China and Central Broadcasting Station in July. Expected to be called Central Broadcasting System (*WRTH* via *Electronic DX Press*)

THAILAND R. Thailand, new 15370 with two different English programs at 0030, 0300, Thai in between and after 0330, very strong (Hans van den Boogert, Taiwan, DSWCI *DX Window*) *Actually North American service via Udorn; occasional traces of it here. When will they catch on like the Greeks that they can use VOA USA sites?* (gh)

TIMOR EAST [non] Indonesian authorities are arresting and persecuting people caught listening to RDP International, Lisbon, on SW (RDP via BBCM)

UK OGBANI R. Free London, pirate with 40 watts according to E-mail QSL, heard on new 5804.7 at 0435-0500+ on a UT Sunday, weak but readable on peaks with rock music, announcements (Paul Ormandy, New Zealand and via *The Four Winds*) *Quite a catch! KAIJ-5810 a problem here* (gh)

USA Sale prices for SW stations: WRMI, \$850K; WVHA, \$5M; WSHB, World Class Station with two transmitters, \$13M (George Jacobs & Associates website) *What about KHBI Saipan? Not mentioned. Does this mean it's already sold, maybe to R. Free Asia?* (gh)

By late May, WVHA's Sabbath live service was missing, replaced by recorded programs 1330-1530 on 17535. Does this mean Prophecy Countdown's financial situation is so bad they can no longer afford satellite time, and WVHA's days are numbered? (Jim Moats, OH, *World of Radio*)

In early June, Monitor Radio reached a tentative agreement for World Times, Inc., to become its successor in producing radio news programming. World Times, also based in Boston, publishes the weekly newspaper supplement *WorldPaper* in six languages, only for distribution abroad. See www.worldpaper.com (Sue Schardt, Monitor Radio via C. Ed Evans, WSHB) This was contingent upon a sufficient number of affiliates agreeing to carry the program, and upon outside funding (Jerry Ackerman, Boston *Globe* via Mike Cooper) But BBC is greatly expanding its news operation, including the replacement for Monitor Radio at 5 a.m. ET via 500 U.S. public radio stations (William D. Montalbano, Los Angeles *Times* via Mike Cooper) *WorldPaper* deal fell through, as too many stations had already made other binding arrangements, so Monitor Radio is finished (Reuter, AP, Boston *Globe*, Miami *Herald* via Mike Cooper, David Alpert, Jim Moats, Peter Tatiner, Aaron Pilchick)

Throughout June, WSHB was announcing at :36 past every hour that from June 28 it would convert to all-religious format daily in seven languages (Ken Mason, Jim Moats, *W.O.R.*) *Ergo, no buyer found yet, as this was their backup plan* (gh) KHBI also was to go all-religious (C. Ed Evans, WSHB)

The owner and founder of WRNO has died in his mid-fifties. Joe Costello had a colorful and controversial broadcast career over the past fifteen years (Rachel Baughn, ed.) Costello's family is expected to put the station up for sale shortly (Paul Rusling, British DX Club *Communication*) In his written will, Joe Costello left the station to Loyola University. But on his deathbed he verbally left it to the archbishop. Whether WRNO will be kept or sold, who knows? For sure if kept by archbishop, anti-Catholic and similar programming unlikely to continue (George Jacobs via Larry Magne via Marie Lamb, *Cumbre DX*) In mid-June, WRNO was still on 7395 until 2300 with music tapes not matching outdated website sked, continuity tapes by Costello as if he were still in charge—(*hm-m-m, it is New Orleans, after all*)—then went to 7355 (gh) E-mail allegedly from Costello a month after he allegedly died said work was progressing slowly on transmitter for 15420 (via Orrin Edwards, rec.radio.shortwave via Jim Moats)

DXing with Cumbre added new times: Sat 1130 on 9930, Sun 2130 on 9495 (*DWC*) But old times no longer mentioned aren't always deleted (gh)

WEWN Z-97 schedule shows two 500 kW transmitters doubled on same frequency at times with different antennas: 6890 at 0000-0800, 7425 at 0800-1300 (via *BC-DX*)

The two neighbors who have caused trouble for WGTG refused my offer to help them fix interference problems. Besides second transmitter, CP for more antennas, rhombics and yagis, with a new rhombic aimed 340° ready to go. After building an audience with "New World Order baloney," WGTG planned to cancel "patriot" programming from Amerinet, and expand Fundamental Broadcasting Network in July; FBN might lease the entire station in keeping with our original goal of salvation. In the middle of a city, Macon [*see next item-ed.*] is likely to have even more complaints from neighbors (David Frantz, WGTG, *World of Radio*)

Charles Josey says the call letters WWBS he wanted for his new Macon, Georgia, SW station do not stand for anything in particular. He will retire in November and devote full time to building his station. A four element yagi cut precisely for 11910 kHz, the only frequency planned to be used at first, will be placed atop an old electric pole on top of a downtown building. Transmitter uses parts from a WWCR unit badly damaged by fire a few years ago (Kim Elliott, VOA *Communications World*)

Ham Radio and More has changed format and airs exclusively on WWCR, live Sun 220 (top of hour, no more news) on 5070, repeated Tue 0800 on 3210, Sun 0500 on 5070 (Len Winkler, *HR&M* via rec.radio.shortwave) The KFNN studio and network of AM stations are no longer involved. WWCR unexpectedly reduced the Brother Stair schedule in June on 2390 to 0500-1200, with 7435 expanded to 2200-0500 (gh)

VOA has added 15135 from Greenville at 1700-1800, including *Communications World* at 1730 Sat (Edwin Southwell, England) Helps in the Americas although too close to HCJB powerhouse on 15140—why not use 15580? Also contains *Talk to America* call-in at 1706 weekdays (gh) See also GREECE, PHILIPPINES, THAILAND

VOA conducted more digital SW tests from Delano on 17895, 13730, to evaluate the JPL system (VOA *CW*) Sound is tinny, less rich than local AM, but software to receive may be available within two years (Kim Elliott, VOA, *RNMM*)

The Clinton Administration is considering naming a new chairman of the advisory board for broadcasting to Cuba, Elena Diaz-Verson Amos, Democrat from Georgia. She would replace Jorge Mas Canosa who would become chairman emeritus with little power. A representative of the Cuban American Foundation said Mas would fight the ouster (Christopher Marquis, Miami *Herald* via Aaron Pilchick)

R. Liberty has new interval signal, music bed with people of all types, including kids giving both RFE and RL IDs in many languages, heard at 1458 on 11725 via Woofferton before Belarussian program (Jay Novello, NC) RFE has a new president, Thomas A Dine, former AID administrator, moving to Prague HQ (*Washington Post* via Chet Copeland)

The Supreme Court let stand a ruling that the US Information Agency discriminated against women in hiring, and that its treatment as a class-action lawsuit was valid (AP via Mike Cooper)

The Powder Springs, GA, FCC monitoring station is being investigated for prohibited personnel practices. A former employee charges minorities have never been hired and nepotism takes precedence over veterans' preference (Solutions, Ltd., rec.radio.shortwave)

VENEZUELA R. Nacional, 9540, an almost forgotten station, heard May 31 at 2140-2211+ in Spanish, no French or English as previously scheduled; fair signal (Jay Novello, NC, *World of Radio*) This was the day it reactivated, featured folk music (Jorge Garcia Rangei, Venezuela) Mostly inaudible here subsequently (gh, OK)

Currently inactive are stations on 4770, 4780, 4840—irregular, 4970, 5030, 5040, 6010; on the air is Ecos del Torbes, 4980 and 9640, mornings until 1400 and 1800-0400 including R. Rumbos news relays. The latter station may be QSLed via Torbes relay (Jorge Garcia, Venezuela, *Cumbre DX*)

R. Amazonas, 4940, will be verified with its own card if report sent with return postage and stickers from local stations to R. Continental's Francisco José Ocano, Urb. 23 de Enero, Calle Nicolás Briceño, No. 18-266, Barinas 5201-A (Ed Rausch, NJ)

VIETNAM Yên Bai provincial service on 6541.4v at 1030-1158*, ID with traditional music, 1130 tribal singsong; Lai Chau on 6396.7v 1130 similar music to 1200*, many IDs (Mike Ryan, Thailand)

ZIMBABWE Radio 4, which is on SW, is being privatized, sold off to a new company (*Zimbabwe Independent* online via Andy Sennitt, RN *Media Network*)

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

<http://idt.net/~khecht19/ghauser>

Gayle Van Horn

0000 UTC on 9550

UKRAINE: Radio Ukraine Int'l. Evening service to North America with national news, IDs and music. // 7150. (Lee Silvi, Mentor, OH/via email; Sue Wilden, Columbus, IN/via email) *Ukraine Today* heard on 9550 at 0315. (Howard J. Moser, Lincolnshire, IL)

0004 UTC on 4925

INDONESIA: RRI Jambi (Sumatra). News text format in Indonesian. RRI-Fak Fak (Irian Jaya) on 3646 at 1915-1940 with text and intermittent signal interference. RRI-Merauke (Irian Jaya) in Arabic on 3905, 1947-1955*. (Mahendra Vaghjee, Rose Hill, Mauritius)

0020 UTC on 9710

MALI: China Radio Int'l. Report on solar electricity for rural areas. (Bob Fraser, Cohasset, MA)

0115 UTC on 9905

SWITZERLAND: Swiss Radio Int'l. *Newsdesk* program. (Wilden, IN) Station noted on 9905 at 0402. (Brookman, AK)

0236 UTC on 7160

ALBANIA: Radio Tirana. English service to North America with news from Albania and the Balkan's region. Vocal pop music by lady singer to 0254, // 6140 with moderate static and minimal fading. (Stokes Schwartz, Madison, WI/via email; Gerald R. Brookman, Kenai, AK)

0248 UTC on 11910

HUNGARY: Radio Budapest. Music of Franz List with commentary. Email address and closing announcements at 0258 to 0300*. (Wilden, IN)

0300 UTC on 6095

VATICAN STATE: Vatican Radio. Feature on the church in Czechoslovakia-Czech Republic during the last 50 years. Light static and interference from Deutsche Welle on 6100. Noted on // 7305 with heavy static. (Schwartz, WI)

0300 UTC on 15115

NEW ZEALAND: Radio New Zealand Int'l. Newstalk program on golfing. Great signal to fadeout at 0344. (Silvi, OH) Programming noted on 15115 to 0400. (Wilden, IN) New Zealand's **Kiwi Radio** on 7475 USB, 0717-0830. (Silvi, OH)

0305 UTC on 7300

TURKEY: Voice of Turkey. News from the Turkish press to folk music. (Moser, IL) VOT noted on 13695 at 1920. (Wilden, IN)

0320 UTC on 4845

BRAZIL: Meteorologia Paulista. Brazilian music to ID and listener phone-in calls. Brazil's Radio Aparecida noted on 5035, 0230-0245 with ads, jingles, and religious text format. (Vaghjee, MAU)

0335 UTC on 7520

MOLDOVA: Radio Moldova Int'l. Newscast and commentary segment. ID's at 0336 and 0352, with frequency schedule given. Intervals of fine jazz music. (Schwartz, WI)

0811 UTC on 9633.98

MALI: RTV Malienne. Afro music to vernacular text. Heard weakly with French news at 1301. Noted this frequency at 1252-1316 & 1552-1600. (Mark Veldhuis, Borne, The Netherlands/*Hard-Core-DX*).

1135 UTC on 15240

SWEDEN: Radio Sweden. Report on economy and European Monetary Union. (Moser, IL) Report on canal boat cruises at 1345 on 15240. (Fraser, MA)

1140 UTC on 9580

AUSTRALIA: Radio Australia. *Business Week* discussing Mitsubishi investment in auto industry, and Pakistan returns to favor with international bankers. (Fraser, MA) Noted on 9860 at 1321. (Wilden, IN)

1145 UTC on 6120

CANADA: Radio Japan relay. Japan celebrates *Children's Day*. (Fraser, MA)

1450 UTC on 3232

INDONESIA: RRI Bukittin (Sumatra). Regional music to newscast at 1500 and music program. Indo's **RRI-Bengkul** (Sumatra) on 3265 at 1506 with talk and ID. **RRI-Ujung** (Kalimantan) on 4754 at 1545. (Vaghjee, MAU)

1215 UTC on 13805

NORWAY: Radio Norway Int'l. Nordic Report on the economies of Norway, Finland, and Sweden. (Fraser, MA)

1225 UTC on 13625

FRENCH GUIANA: Radio France Int'l. *Asia File* program on the Freedom Movement in Indonesia. (Fraser, MA)

1404 UTC on 9560.2

ETHIOPIA: Radio Ethiopia. Arabic talk, music, ID and news mentions of Addis Ababa. SINPO=32432. (Veldhuis, NLD)

1503 UTC on 11840

DENMARK: Radio Denmark. Danish text to *Green Green Grass of Home* tune. Danish folk tune to station ID 1530. (Moser, IL)

1540 UTC on 7120

CHAD: Radiodiffusion Nat'l Tchadienne. Native music to vernacular talk. Drum internal signal, IDs, and frequencies in French. Repeat interval signal to sign-off. (Veldhuis, NLD)

1605 UTC on 17750

USA: WYFR. Piano music and *Christ Centered* program. (Wilden, IN)

1645 UTC on 15460

FRANCE: Radio France Int'l. National and world news to letters from listeners. (Brookman, AK; Moser, IL)

1701 UTC on 11775

ANGUILLA: Caribbean Beacon. Dr. Gene Scott's University Network programming. (Wilden, IN)

1825 UTC on 3210

MOZAMBIQUE: Emissao National. Portuguese. Report on parliament to commercials and "Radio Mozambique" ID. Carnival music to time pips and news intro as, "noticia internacional." Noted also on 9619, 0635-0700. (Vaghjee, MAU)

1830 UTC on 11990

KUWAIT: Radio Kuwait. Twelve minutes of news into western easy listening music. (Fraser, MA) Kuwait noted on 15505 at 1930. (Wilden, IN)

1855 UTC on 15315

NETHERLANDS ANTILLES: Radio Netherlands Bonaire relay. *Siren Song* with tribute and interview with Pete Myers. (Fraser, MA)

1855 UTC on 5800

TAJIKISTAN: Radio Tajikistan. Regional music to newscast. Clear station ID to poem by Zabraxhan closing program segment, anthem to 1900*. (Vaghjee, MAU)

1900 UTC on 12015

ECUADOR: HCJB. News and *Studio 9* show on environmental issues. (Fraser, MA) Discussion on leadership issues at 1552 on 15115. (Wilden, IN)

1900 UTC on 9435

ISRAEL: Kol Israel. *Holocaust Remembrance Day* discussed. (Fraser, MA)

1915 UTC on 11720

BULGARIA: Radio Bulgaria. English service to Europe with program *Events & Developments*, hosted by lady announcer. Light static and fading for overall decent signal. (Schwartz, WI)

1925 UTC on 15430

RUSSIA: Voice of Russia WS. Report on Russian explorer Georgi Sedov and his death while trying to reach the North Pole in 1914. (Fraser, MA)

1935 UTC on 11804.9

BRAZIL: Radio Globo. Portuguese talk and news of Rio de Janeiro. Sports report with sound effects and "Globo" identification. (Veldhuis, NLD) Brazil's **Radio Nacional de Amazonia** on 11780 at 1951-2027, broadcasting from Brasilia. Portuguese sports report to ID. SINPO=34434. (Veldhuis, NLD)

1945 UTC on 9895

NETHERLANDS: Radio Netherlands. *Sincerely Yours* mailbag program. (Fraser, MA)

2000 UTC on 7170

GERMANY: Deutsche Welle. Report on the economy-with no cuts in aid to eastern Germany. (Fraser, MA) German service on 11980 at 1550. (Moser, IL) and 17810 at 2008. (Wilden, IN)

2012 UTC on 9680

THAILAND: Radio Thailand. English ID and preview of upcoming French programming at 2013. (Veldhuis, NLD)

2030 UTC on 9965

ARMENIA: Voice of Armenia. English to Europe monitored to 2100. Spanish noted 2100-2115*. (Silvi, OH)

2037 UTC on 6055

RWANDA: Radio Rwanda. English talk to pop music, including George Michael's *Faith* tune. Multilingual IDs in vernaculars, French and English. (Veldhuis, NLD)

2220 UTC on 9721.6

PERU: Radio Victoria. Spanish. Singing children's chorus to announcer's chat to ID and talk of Lima. (Veldhuis, NLD)

2220 UTC on 11775

SPAIN: Radio Exterior Espana. Music program on Spanish composers. (Brookman, AK)

2327 UTC on 4790

PERU: Radio Atlantida. Coca-Cola commercial to ID, informative health program discussing malaria. (Veldhuis, NLD) Peru's Radio **Los Andes** on 5030, 1000. (Jose Hauser, Newaygo, MI/via email)

2330 on 7040.4

PERU: Radio San Ignacio. Spanish. Local evening greetings to Peruvian folk music. "Esta transmitiendo Radio San Ignacio, Avenida Libertador 751." Station is located in Cajamarca Department bordering with Ecuador. (Felipe Asenjo/*Hard-Core-DX*)

Thanks to our contributors — Have you sent in YOUR logs?
Send to **Gayle Van Horn**, c/o *Monitoring Times* (or e-mail gayle@grove.net)
English broadcast unless otherwise noted.

Kudos to YLE!

YLE Radio Finland, the international radio service of the Finnish Broadcasting Company, is now offering full data QSL cards for correct reception reports! That is great news to hobbyists who have struggled for years with YLE's non-QSL policy. Reports may be sent to: P1 78, Fin-00024 Helsinki, Finland. For schedules, RealAudio, and more, go to YLE's website: <http://www.yle.fi/fbc/radiofin.html>



World Harvest Radio will confirm your report for RealAudio transmissions via their website. Frequencies, schedules, RealAudio from *DXing with Cumbre* and other World Harvest programs are also available at: <http://www.whri.com> or <http://www.kwhr.com> For written and taped reception reports: World Harvest Radio, P.O. Box 12, South Bend, IN 46624.

ALASKA

HAARP (High Frequency Active Auroral Research Program). Report for CW test transmission on March 8, 1997, 6990 kHz. Full data QSL card with a photo of antenna facility, signed by "Michelle." Received in 36 days for an English utility report and mint postage (used on reply). Station address: P.O. Box 271, Gakona, AK 99573 (Randy Stewart, Springfield, MO) For country counting, Alaska is considered a separate country-ed.

ARMENIA

Voice of Armenia, 9965 kHz. Full data blue folder card unsigned. Received in 45 days for an English report. Station address: Alek Manukian 5, Yerevan 25. Republic of Armenia. (Mahendra Vaghjee, Rose Hill, Mauritius)

CHILE

Radio Esperanza, 6090 kHz. Full data QSL folder card, along with picture postcard of Chilean mountains, plus personal letter in Spanish from Ramon P. Woerner K.-Director. Received in 22 days for a Spanish report and two IRCs. Station address: Casilla 830, Temuco, Chile. (Stewart, MO) Full data card received in 200 days, signed by Eleazar H. Jara. (G. Brown, Scotland, U.K./*The Four Winds*)

COASTAL RADIO

JFM-Muroto Fisheries Radio, 8508 kHz. Full data prepared QSL verified for a utility report in 38 days. Station address: 2318 Furushiro Murotsu Murotsu-city, Kochi-Prefecture, Japan. (Steve McDonald, Port Coquitlam BC, Canada)

JFG-Shizuokaken Fisheries Radio, 12811 kHz. Full data prepared QSL card verified plus photos for a utility report in 20 days. Station address: Shizuokaken Museum (Gyokyo), 1991-1 Tajiri, Yaizu-Shizuokaken-ken, 425, Japan. (McDonald, CAN)

JFZ-Kushiro Fisheries Radio, 16942.8 kHz. Full data prepared QSL card verified plus photos for a utility report in 37 days. Station address: 1-5-15 Yonemachi, Kushiro-city, Hokkaido 085, Japan. (McDonald, CAN)

JFC-Misaki Fisheries Radio, 12832.5 kHz. Full data prepared QSL card verified for a utility report in 36 days. Station address: 1-7 Harumi Miura, Japan 23802. (McDonald, CAN)

FINLAND

YLE/Radio Finland, 15400 kHz. Full data QSL card with aerial photo of coastline, stamped with station seal and initialed "MJ." Received in 29 days for an English report and one IRC to Pori transmitter site. Station address: Finnish Broadcasting Co., Short Wave Centre, Previki, FIN-28660, Pori, Finland. (Stewart, MO)

MEDIUM WAVE

WBBM, 780 kHz. Full data QSL letter signed by Mark Williams and station info sheet. Received in 22 days for an English AM report. Station address: 530 North McClure, Chicago, IL 60611. (Jose Moura, Washington, DC)

WLS, 890 kHz. Full data QSL letter signed by Warren Shulz and station info sheet. Received in 45 days for an English AM report. Station address: 190 North Street, Chicago, IL 60601. (Moura, DC)

NIGERIA

Radio Kudirat Nigeria, 6205 kHz. Full data verification letter with illegible signature. Received in 54 days for an English report, two U.S. dollars, SASE (unused for reply) and souvenir postcards. Station address: P.O. Box 9663, London SE1 3ZD United Kingdom. (Gayle Van Horn, Brassstown, NC)

FRCN/Radio Nigeria-Ibadan, 6050 kHz. Full data station card signed by Dare Folarin-Principal Public Affairs Officer. Received in 360 days for an English report and two U.S. dollars. Station address: P.M.B. 5003, Ibadan, Nigeria. (Sam Wright, Biloxi, MS) Now that Voice of Nigeria has reactivated, send your report and return postage to: P.M.B. 40003 Falomo Post Office, Ikoyi, Lagos, Nigeria. Refer to *MT's* Shortwave Guide beginning at 0500 UTC.-ed.

NORTHERN MARIANA ISLANDS

Radio Free Asia, 13800 kHz. No data verification on station letterhead. Letter did contain background information on Radio Free Asia. Received in 90 days for an English report. Station address: 2025 M Street NW-Suite 300, Washington, DC 20036. (Darren White, Hattiesburg, MS)

SHIP TRAFFIC

MV *Zenovia* EKMP6, 590 kHz (Bulk Carrier). Full data prepared QSL card verified and personal letter. Received for an English utility report and return mint postage. Ship address: c/o Colonial Navigation Co., Inc., 750 Lexington Avenue, 26th Floor, 59th Street, New York, NY 10022. (Holbrook, MD)

Cape Trinity KAFD, 500 kHz (Roll-On/Roll-Off). Full data prepared QSL card verified. Received for an English utility report and return postage. Ship address: Maritime Administration, MAR 745, Room 2126, 400 7th Street, SW, Washington, DC 20590. (Holbrook, MD)

SATELLITE SERVICES

Polskie Radio 5 via World Radio One. C-band satellite service-domestic satellite Galaxy 5/transponder 6, audio subcarrier 6.80 MHz. Full data station logo card unsigned, plus souvenir postcards, program schedule, friendly letter from Rafal Kiepuszewski-English Service Director, and a Radio Warsaw T-shirt won by lottery. Received in 42 days for details of broadcast via satellite on WRN. Station address: c/o English Language Service, P.O. Box 46, 00-977 Warsaw, Poland. (Van Horn, NC)

SINGAPORE

Radio Singapore International, 6015 kHz. Full data *Singapore's National Day Parade Card*, unsigned, plus personal letter from Sakuntala Gupta-Program Manager. Received in 65 days for an English report. Station address: Farrer Road, P.O. Box 5300, Singapore 912899. (Vaghjee, MAU) URL: <http://www.rsi.com.sg.8000/rsi/>.

SOUTH AFRICA

Radio Oranje-via SABC, 3230 kHz. Full data yellow logo card unsigned. Received for an English report and return postage. Station address: P.O. Box 7117, Bloemfontein, 9300 Republic of South Africa. (Vaghjee, MAU) SABC's URL: <http://www.sabc.co.za>.

STANDARD FREQ/TIME SIGNAL STATION

WWVH 15000 kHz. Full data verification on station letterhead signed by Dean T. Okayama-Engineer in Chief. Station booklet and color folder QSL card enclosed. Received in 35 days for an English report and return mint postage. Station address: P.O. Box 417, Kekaha, Kauai, HI 96752. (Tom Banks, Dallas, TX) *This station may be counted as Hawaii-ed.*

ZAMBIA

Radio Christian Voice, 3330 kHz. Date only QSL form letter with illegible signature. Received in 56 days for an English follow up report and one U.S. dollar. Station address: Private Bag E606, Lusaka, Zambia. Email: voice@zamnet.zm

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 Times, respectively.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC Sunday will be heard on Saturday evening in America (8:30 pm Eastern, 5:30 pm Pacific).

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.

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 "V" (various languages).

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

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

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

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

RADIO PROGRAMS

COMPILED BY JIM FRIMMEL

Sundays

0027 Radio Exterior de Espana: "Distance Unknown"
0109 HCJB (am): "DX Partyline"
0127 Radio Exterior de Espana: "Distance Unknown"
0200 WWCR #3 (Tennessee): "Spectrum"
0200 Radio For Peace Intl: "World of Radio"
0234 Radio Havana Cuba: "DXers Unlimited"
0249 Radio Romania Intl: "DX Mailbag"
0258 Vatican Radio: "On-the-Air"
0315 Voice of Turkey: "DX Corner (biweekly)"
0330 WHRI (Angel 2): "DXing with Cumbre"
0409 HCJB (am): "DX Partyline"
0410 Australia, Radio: "Feedback"
0430 Australia, Radio: "The Media Report"
0434 Radio Havana Cuba: "DXers Unlimited"
0505 WWCR #3: "Ham Radio and More"
0508 Vatican Radio: "On-the-Air"
0527 Radio Exterior de Espana: "Distance Unknown"
0610 Australia, Radio: "Feedback"
0634 Radio Havana Cuba: "DXers Unlimited"
0635 Radio Vlaanderen Intl: "Radio World"
0830 Radio Korea: "Shortwave Feedback"
0900 Radio For Peace Intl: "World of Radio"
0900 WWCR #1 (Tennessee): "World of Radio"
0905 Radio Vlaanderen Intl: "Radio World"
0905 BBC (all): "Write On"
0910 Australia, Radio: "Feedback"
0930 Australia, Radio: "The Media Report"
1040 Radio Korea: "Shortwave Feedback"
1100 AWR Latin America: "Wavescan"
1205 BBC (am/au/as): "Write On"
1215 Radio Bulgaria: "Radio Bulgaria Calling"
1215 WRMI (Florida): "Wavescan"
1230 Radio Korea: "Shortwave Feedback"
1235 Radio Vlaanderen Intl: "Radio World"
1240 Radio Korea: "Shortwave Feedback"
1352 Vatican Radio: "On-the-Air"
1501 BBC (af/as): "Waveguide"
1630 Radio Korea: "Shortwave Feedback"
1705 BBC (as): "Write On"
1805 Radio Vlaanderen Intl: "Radio World"
1830 KWHR (Hawaii): "DXing with Cumbre"
1930 Radio Korea: "Shortwave Feedback"
1940 Radio Korea: "Shortwave Feedback"

2010 Radio Korea: "Shortwave Feedback"
2015 WRMI (Florida): "Wavescan"
2100 AWR-Europe (Slovakia): "Wavescan"
2105 Radio Vlaanderen Intl: "Radio World"
2105 BBC (am/au/as): "Write On"
2113 Radio Budapest Intl: "Radio Budapest DX Show"
2130 Radio Korea: "Shortwave Feedback"
2135 BBC (af): "Write On"
2145 Radio Bulgaria: "Radio Bulgaria Calling"
2200 WHRI (Angel 2): "DXing with Cumbre"
2200 WWCR #3: "Ham Radio and More"
2230 Radio Canada Intl: "Now the Details"
2300 AWR Latin America: "DXing with Cumbre"
2300 KSDA (Guam): "Wavescan"
2300 Radio For Peace Intl: "World of Radio"
2315 WWCR #3 (Tennessee): "Ask WWCR"
2330 Radio Bulgaria: "Radio Bulgaria Calling"
2330 WWCR #3 (Tennessee): "World of Radio"
2335 Radio Vlaanderen Intl: "Radio World"

Mondays

0000 WRMI (Florida): "Wavescan"
0230 Radio Korea: "Shortwave Feedback"
0231 Radio Canada Intl: "Now the Details"
0245 Radio Budapest Intl: "Radio Budapest DX Show"
0305 BBC (am/au/af): "Write On"
0330 KWHR (Hawaii): "DXing with Cumbre"
0430 Radio New Zealand Intl: "Mailbox (biweekly)"
0445 Radio Bulgaria: "Radio Bulgaria Calling"
0500 WWCR #3 (Tennessee): "Ask WWCR"
0700 Radio For Peace Intl: "World of Radio"
0730 BBC (af): "Waveguide"
0805 WWCR #1 (Tennessee): "Spectrum"
1040 All India Radio: "DX-ers Corner (2/4)"
1350 Radio Romania Intl: "For Radio Amateurs"
1520 Radio Romania Intl: "For Radio Amateurs"
1615 KTWR (Guam): "Pacific DX Report"
1815 Radio Tallinn: "Radio Estonia DX Program"
1840 All India Radio: "DX-ers Corner (2/4)"
1950 Radio Romania Intl: "For Radio Amateurs"
2100 WWCR #1 (Tennessee): "Ask WWCR"
2130 All India Radio: "DX-ers Corner (2/4)"
2150 Radio Romania Intl: "For Radio Amateurs"
2350 Radio Romania Intl: "For Radio Amateurs"

Tuesdays

0245 WRMI (Florida): "Wavescan"
0255 Radio Romania Intl: "For Radio Amateurs"
0800 WWCR #1: "Ham Radio and More"
0900 KTWR (Guam): "Pacific DX Report"
1146 Radio Sweden: "MediaScan (1/3)"
1210 AWR Latin America: "Wavescan"
1230 WWCR #1 (Tennessee): "World of Radio"
1246 Radio Sweden: "MediaScan (1/3)"
1330 WRMI (Florida): "Wavescan"
1346 Radio Sweden: "MediaScan (1/3)"
1355 FEBC (Philippines): "DX Dial"
1730 BBC (am/au): "Waveguide"
1746 Radio Sweden: "MediaScan (1/3)"
1900 Radio For Peace Intl: "World of Radio"
1946 Radio Sweden: "MediaScan (1/3)"
1950 Polish Radio: "Polish Radio DX Club"
2109 Radio Havana Cuba: "DXers Unlimited"
2309 Radio Havana Cuba: "DXers Unlimited"
2340 All India Radio: "DX-ers Corner (2/4)"

Wednesdays

0135 Radio Havana Cuba: "DXers Unlimited"
0146 Radio Sweden: "MediaScan (1/3)"
0245 WRMI (Florida): "Wavescan"
0246 Radio Sweden: "MediaScan (1/3)"
0300 Radio For Peace Intl: "World of Radio"
0335 Radio Havana Cuba: "DXers Unlimited"
0345 BBC (as): "Waveguide"
0346 Radio Sweden: "MediaScan (1/3)"
0535 Radio Havana Cuba: "DXers Unlimited"
0830 HCJB (eu): "Ham Radio Today"
0930 HCJB (pac): "DX Partyline"
1000 Radio For Peace Intl: "World of Radio"
1230 BBC (am/au): "Waveguide"
1315 FEBC (Philippines): "DX Dial"
1330 WRMI (Florida): "Wavescan"
1720 Polish Radio: "Polish Radio DX Club"
1917 Radio Budapest Intl: "Radio Budapest DX Show"
1920 Argentina, RAE: "DXers Special"
1930 HCJB (eu): "Ham Radio Today"
2345 BBC (as): "Waveguide"

Thursdays

0117 Radio Budapest Intl: "Radio Budapest DX Show"

0130 HCJB (am): "Ham Radio Today"
0239 Argentina, RAE: "DXers Special"
0245 WRMI (Florida): "Wavescan"
0430 HCJB (am): "Ham Radio Today"
0754 Radio Netherlands Intl: "Media Network"
0830 Radio New Zealand Intl: "Mailbox (biweekly)"
0953 Radio Netherlands Intl: "Media Network"
1153 Radio Netherlands Intl: "Media Network"
1220 Polish Radio: "Polish Radio DX Club"
1352 Radio Netherlands Intl: "Media Network"
1753 Radio Netherlands Intl: "Media Network"
1954 Radio Netherlands Intl: "Media Network"
2030 WWCR #1 (Tennessee): "World of Radio"

Fridays

0053 Radio Netherlands Intl: "Media Network"
0053 Radio Netherlands Intl: "Media Network"
0245 WRMI (Florida): "Wavescan"
0253 Radio Netherlands Intl: "Media Network"
0453 Radio Netherlands Intl: "Media Network"
1045 KTWR (Guam): "Pacific DX Report"
1930 Radio New Zealand Intl: "Mailbox (biweekly)"
1946 Radio Bulgaria: "Radio Bulgaria Calling"
2000 WWCR #1 (Tennessee): "Ask WWCR"
2000 Radio For Peace Intl: "World of Radio"
2210 Australia, Radio: "Feedback"
2346 Radio Bulgaria: "Radio Bulgaria Calling"

Saturdays

0010 Australia, Radio: "Feedback"
0230 KWHR (Hawaii): "DXing with Cumbre"
0245 WRMI (Florida): "Wavescan"
0400 Radio For Peace Intl: "World of Radio"
0500 KWHR (Hawaii): "DXing with Cumbre"
0500 WHRI (Angel 1/2): "DXing with Cumbre"
0605 WWCR #1 (Tennessee): "World of Radio"
0809 HCJB (eu): "DX Partyline"
0909 HCJB (pac): "DX Partyline"
0915 WWCR #3 (Tennessee): "Ask WWCR"
0940 FEBC (Philippines): "DX Dial"

(Continued on Page 62)

FREQUENCIES

0100-0200	Anguilla, Caribbean Beacon	6090am				0100-0200	Philippines, FEBC/R Intl	15450as			
0100-0200	Australia, Radio	9660pa	11640as	12080pa	13605pa	0100-0200	Russia, Voice of Russia WS	7105na	12010na	12050na	13665na
		13755pa	15365pa	15415as	15510as			15180na	15595na		
		17715as	17750pa	17795pa	17860pa			5930na	7300na	9440sa	
		17880pa				0100-0130	Slovakia, R Slovakia Intl				
0100-0200 vl	Australia, VL8K Katherine	5025do				0100-0200	Spain, R Exterior Espana	6055am			
0100-0200 vl	Australia, VL8T Tent Crk	4910do				0100-0200	Sri Lanka, Sri Lanka BC	9730as			
0100-0200	Canada, CBC N Quebec Svc	9625do				0100-0130	Switzerland, Swiss R Intl	6135na	9885na	9905ca	
0100-0200	Canada, CFCX Montreal	6005do				0100-0200	United Kingdom, BBC WS	5965as	5970sa	5975am	6085am
0100-0200	Canada, CFRX Toronto	6070do						6145am	6175am	6195as	9410as
0100-0200	Canada, CFVP Calgary	6030do						9590am	9605as	11750am	11955as
0100-0200	Canada, CHNX Halifax	6130do						15280as	15310as	15360as	
0100-0200	Canada, CKZN St John's	6160do				0100-0200	USA, KAIJ Dallas TX	5810am			
0100-0200	Canada, CKZU Vancouver	6160do				0100-0200	USA, KJES Mesquite NM	7555am			
0100-0200	Canada, R Canada Intl	9535am	9755am	11715am	13670am	0100-0200	USA, KTNB Salt Lk City UT	7510am			
0100-0200	Costa Rica, RF Peace Intl	7385am	7585am	15050am		0100-0200	USA, KWHR Naalehu HI	17510au			
0100-0110	Croatia, Croatian Radio	5895na				0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	Cuba, Radio Havana	6000na	9820na	9830na		0100-0200	USA, Voice of America	11725as	15170as	15250as	11705as
0100-0127	Czech Rep, Radio Prague	6200na	7345na					17820as			17740as
0100-0200	Ecuador, HCJB	9745am	21455am			0100-0200 twhfa	USA, Voice of America	5995am	6130am	7405am	9445am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9640na			9775am	13740am		
		11810na						5825eu	6890na		
0100-0115	Ghana, Ghana Broadc Corp	3366do	4915do			0100-0200	USA, WGTG McCaysville GA	5085am			
0100-0130	Hungary, Radio Budapest	6075na	6190na	9580na		0100-0200	USA, WHRI Noblesville IN	5745am			
0100-0200	Indonesia, Voice of	9525na				0100-0200	USA, WINB Red Lion PA	11950am			
0100-0125	Iran, VOIRI	6050eu	9022eu	9635eu		0100-0200	USA, WJCR Upton KY	7490na			
0100-0200 th	Ireland, W Coast R Ireland	9875am				0100-0200	USA, WRMI/R Miami Intl	9955am			
0100-0110	Italy, RAI Intl	6010na	9675na	11800na		0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	Japan, R Japan/NHK World	5960na	11790as	11860as	11890na	0100-0200 mtwhf	USA, WVHA Greenbush ME	5850eu			
		13630am	15500as	15590as	17810as	0100-0200	USA, WWCR Nashville TN	5070am	5935am	7435am	13845am
		21610as				0100-0200	USA, WYFR Okeechobee FL	6065na	9505na	11550as	
0100-0200	Lebanon, Voice of Hope	9960va				0100-0130	Uzbekistan, R Tashkent	7190eu	9375eu	9530eu	9715eu
0100-0200	Liberia, LCN/R Liberia Int	5100do				0100-0126	Vietnam, Voice of	7240na			
0100-0200 smtwh	Malaysia, Radio	7295do				0130-0150	Greece, Voice of		7450na	9420na	9935na
0100-0200 m	Malta, VO Mediterranean	13605am				0130-0200	Netherlands, Radio	5905as	9855as	11655as	
0100-0125	Netherlands, Radio	6020na	6165na	9845na		0130-0200	Sweden, Radio	9435as			
0100-0200	Netherlands, Radio	5905as	7305as	9855as		0130-0200 s	Sweden, Radio	7290am			
0100-0200	New Zealand, R NZ Intl	15115pa				0140-0159	Vatican State, Vatican R	5980as	7335as		
0100-0200 vl	Papua New Guinea, NBC	9675do				0145-0200	Albania, R Tirana Intl	6115na	7160na		

SELECTED PROGRAMS

Sundays

0100	Canada, RCI Montreal: RCI News.
0100	Ecuador, HCJB Quito (am): Latin and International News.
0100	Switzerland, Swiss Radio Intl: News.
0105	Switzerland, Swiss Radio Intl: Newsnet.
0106	Germany, Deutsche Welle: Sports Report.
0109	Ecuador, HCJB Quito (am): HCJB DX Partyline.
0109	Germany, Deutsche Welle: Inside Europe.
0115	Switzerland, Swiss Radio Intl: The Name Game (1).
0130	Greece, Voice of: News.
0136	Cuba, Radio Havana Cuba: The World of Stamps.
0138	Germany, Deutsche Welle: Mailbag.
0145	Albania, Radio Tirana: News.

Mondays

0100	Cuba, Radio Havana Cuba: Sunday Edition.
0100	Ecuador, HCJB Quito (am): Latin and International News.
0106	USA, WHRI Noblesville IN (Angel 2): Radio Free America (live).
0110	Ecuador, HCJB Quito (am): Saludos Amigos.
0130	Cuba, Radio Havana Cuba: Musical Corner.
0151	Vatican State, Vatican Radio: The Backgrounder.

Tuesdays

0100	Canada, RCI Montreal: RCI News.
0100	Cuba, Radio Havana Cuba: International News.
0100	Ecuador, HCJB Quito (am): News.
0100	USA, WGTG, McCaysville GA: Blueprint for Survival.
0110	Ecuador, HCJB Quito (am): Studio 9.
0111	Canada, RCI Montreal: Spectrum.
0111	Russia, Voice of: Commonwealth Update.
0130	New Zealand, Radio NZ Intl: Cadanza.
0132	Russia, Voice of: Folk Box.
0138	Netherlands, Radio: Newsline.
0148	Vietnam, Voice of Vietnam: Vietnam--Land and People.

Wednesdays

0100	Canada, RCI Montreal: RCI News.
0100	Costa Rica, R for Peace Intl: FIRE (Feminist Int'l Radio Endeavour).
0100	Czech Rep, Radio Prague: News.
0100	Ecuador, HCJB Quito (am): News.

0100	USA, VOA Washington DC (am): VOA News.
0105	Switzerland, Swiss Radio Intl: Newsnet.
0106	Germany, Deutsche Welle: NewsLink.
0110	Czech Rep, Radio Prague: Talking Point.
0130	Ecuador, HCJB Quito (am): El Mundo Futuro.
0133	Germany, Deutsche Welle: Insight.
0135	Cuba, Radio Havana Cuba: DXers Unlimited.
0150	Cuba, Radio Havana Cuba: Cuba Today.

Thursdays

0100	Canada, RCI Montreal: RCI News.
0100	Cuba, Radio Havana Cuba: International News.
0100	Ecuador, HCJB Quito (am): News.
0100	New Zealand, Radio NZ Intl: RNZ News.
0100	Switzerland, Swiss Radio Intl: News.
0100	Vietnam, Voice of Vietnam: News.
0105	Switzerland, Swiss Radio Intl: Newsnet.
0106	Germany, Deutsche Welle: NewsLink.
0130	Ecuador, HCJB Quito (am): Ham Radio Today.
0145	Vatican State, Vatican Radio: Mailbox.

Fridays

0100	Canada, RCI Montreal: RCI News.
0100	New Zealand, Radio NZ Intl: RNZ News.
0106	Germany, Deutsche Welle: NewsLink.
0108	New Zealand, Radio NZ Intl: Correspondence School.
0110	Cuba, Radio Havana Cuba: National News.
0110	Ecuador, HCJB Quito (am): Studio 9.
0111	Canada, RCI Montreal: Spectrum.
0130	Ecuador, HCJB Quito (am): Woman to Woman.
0140	Vatican State, Vatican Radio: United Nations Radio.
0145	Albania, Radio Tirana: News.
0155	Canada, RCI Montreal: News.

Saturdays

0100	Japan, Radio: News.
0100	New Zealand, Radio NZ Intl: RNZ News.
0100	USA, WYFR Okeechobee FL: Patterns in Music.
0100	Vietnam, Voice of Vietnam: News.
0105	Switzerland, Swiss Radio Intl: Newsnet.
0107	New Zealand, Radio NZ Intl: National Radio.
0110	Ecuador, HCJB Quito (am): Studio 9.

0110	Japan, Radio: Asia Weekly.
0117	Vietnam, Voice of Vietnam: Talk of the Week.
0130	Ecuador, HCJB Quito (am): Musica del Ecuador.
0132	Russia, Voice of: The Jazz Show.
0136	Cuba, Radio Havana Cuba: Weekly Review.
0140	Vietnam, Voice of Vietnam: Important Events in North Vietnam History.
0147	Vietnam, Voice of Vietnam: Talk of the Week.

HAUSER'S HIGHLIGHTS TAJIKISTAN: R. DUSHANBE

monitored on

0100-0500 UTC 11620 kHz

1400-1800 UTC 7245 kHz

Dari, Persian, Arabic

0345, 1645 UTC 7245 kHz

English

Home Service-I

0030-0430 UTC 4635, 5800, 9905

1430-1830 UTC 4635, 5800, 7510

(*PaulView*, Bulgaria via *BC-DX*)

V. of Free Tajikistan

announced schedule change to:

0230 UTC 5965, 7100 kHz

0530 UTC 7100-7300 kHz

(VOFT via BBCM)

FREQUENCIES

0200-0300	Anguilla, Caribbean Beacon	6090am				0200-0300	Taiwan, VO Free China	5950na	7130as	9680na	11740ca
0200-0300 t-th/vl	Argentina, RAE	11710am						11825as	15345as		
0200-0300	Australia, Radio	13605pa	13755pa	15240pa	15365pa	0200-0300	United Kingdom, BBC WS	5970sa	5975am	6135af	6175am
		15415as	15510as	17715as	17750pa			6195eu	9410va	9605as	11955as
		17795pa						15280as	15310as	15360as	
0200-0300 vl	Australia, VL8K Katherine	5025do				0200-0230	United Kingdom, BBC WS	9590am	9915am		
0200-0300 vl	Australia, VL8T Tent Crk	4910do				0200-0300	USA, KAIJ Dallas TX	5810am			
0200-0210	Bangladesh, Bangla Betar	4880do				0200-0230	USA, KJES Mesquite NM	7555am			
0200-0300	Canada, CBC N Quebec Svc	9625do				0200-0300	USA, KTVN Salt Lk City UT	7510am			
0200-0300	Canada, CFCX Montreal	6005do				0200-0300	USA, KVOH Los Angeles CA	9975am			
0200-0300	Canada, CFRX Toronto	6070do				0200-0300	USA, KWHR Naalehu HI	17510au			
0200-0300	Canada, CFVP Calgary	6030do				0200-0300	USA, Monitor Radio Intl	5850na	7535am		
0200-0300	Canada, CHNX Halifax	6130do				0200-0300	USA, Voice of America	7115as	7205as	9635as	11705as
0200-0300	Canada, CKZN St John's	6160do						17125as	15170as	15250as	17740as
0200-0300	Canada, CKZU Vancouver	6160do						17820as			
0200-0300	Canada, R Canada Intl	6120am	9535am	9755am	11715am	0200-0300	USA, WEWN Birmingham AL	5825eu	6890na		
		13670am				0200-0300	USA, WGTG McCaysville GA	5085am			
0200-0300	Costa Rica, RF Peace Intl	7385am	7585am	15050am		0200-0300	USA, WHRI Noblesville IN	5745am	7315am		
0200-0210	Croatia, Croatian Radio	5895na				0200-0300	USA, WINB Red Lion PA	11950am			
0200-0300	Cuba, Radio Havana	6000na	9820na	9830na		0200-0300	USA, WJCR Upton KY	7490na			
0200-0300	Ecuador, HCJB	9745am	21455am			0200-0300 mtwhf	USA, WRMI/R Miami Intl	9955am			
0200-0300	Egypt, Radio Cairo	9475na				0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as	0200-0300	USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
		11965as	12045as			0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0230-0300	Albania, R Tirana Intl	6140na	7160na		
0200-0300	Lebanon, Voice of Hope	9960va				0230-0259	Austria, R Austria Intl	9655na	9870sa	13730sa	
0200-0300 smtwh	Malaysia, Radio	7295do				0230-0300	Hungary, Radio Budapest	6190na	9840na	11910na	
0200-0300 s	Malta, VO Mediterranean	15550au	17570as			0230-0300	Netherlands, Radio	9855as	11655as		
0200-0230	Netherlands, Radio	5905as	7305as	9855as	9855as	0230-0245	Pakistan, Radio	7255as	15120as	15485as	17705as
0200-0300	New Zealand, R NZ Intl	15115pa				0230-0300 v/m-a	Philippines, R Pilipinas	11885me	15120me	15270me	
0200-0230 m	Norway, Radio Norway Intl	7465na	9560na			0230-0300	Sweden, Radio	7135na			
0200-0300 vl	Papua New Guinea, NBC	9675do				0230-0300	United Kingdom, BBC WS	7325am	9895am		
0200-0300	Philippines, FEBC/R Intl	15450as				0230-0256	Vietnam, Voice of	7250na			
0200-0256	Romania, R Romania Intl	5990na	6155na	9510na	9570na	0230-0300 vl	Zambia, R Zambia/ZNBC 2	6165do			
		11940na	12990na			0245-0300	India, All India Radio	6045do	7110do	11830do	15135do
0200-0300	Russia, Voice of Russia WS	7105na	12010na	12050na	13645na	0250-0300 vl	Mozambique, R Mozambique	4855do			
		13665na	15180na	15595na		0250-0300 sf	Greece, Voice of	6260na	7450na	9420na	9935na
0200-0300	South Korea, R Korea Intl	7275as	11725am	11810am	15575am	0250-0300	Vatican State, Vatican R	7305am	9605am		
0200-0300	Sri Lanka, Sri Lanka BC	9730as				0255-0300 vl	Zambia, R Zambia/ZNBC 1	4910do			

SELECTED PROGRAMS

Sundays

- 0200 Costa Rica, R for Peace Intl: World of Radio.
- 0200 USA, WWCR #3 Nashville TN: Spectrum (WWCR) (live).
- 0215 Taiwan, Voice of Free China: People.
- 0230 Costa Rica, R for Peace Intl: RFPI's Mailbag.
- 0231 Taiwan, Voice of Free China: Mailbag Time.
- 0234 Cuba, Radio Havana Cuba: DXers Unlimited.
- 0250 Vatican State, Vatican Radio: With Heart and Mind.
- 0258 Vatican State, Vatican Radio: On-the-Air.

Mondays

- 0200 Germany, Deutsche Welle: News.
- 0205 Canada, N Quebec Svc: Sunday Showcase.
- 0215 Taiwan, Voice of Free China: Jade Bells and Bamboo Pipes.
- 0230 Albania, Radio Tirana: News.
- 0230 New Zealand, Radio NZ Intl: In Touch with New Zealand.
- 0230 Vietnam, Voice of Vietnam: News.
- 0245 UK, BBC London (AE/AF): The Lab. See M 1445.
- 0246 Albania, Radio Tirana: Music at Your Request.

Tuesdays

- 0203 Taiwan, Voice of Free China: News.
- 0211 Russia, Voice of: Newmarket.
- 0215 Taiwan, Voice of Free China: Taiwan Today.
- 0236 Costa Rica, R for Peace Intl: Hightower Radio.
- 0240 Costa Rica, R for Peace Intl: Earth and Sky.

Wednesdays

- 0203 Taiwan, Voice of Free China: News.
- 0215 Taiwan, Voice of Free China: Music Box.
- 0230 Albania, Radio Tirana: News.
- 0230 Ecuador, HCJB Quito (am): Unshackled.
- 0230 New Zealand, Radio NZ Intl: In Touch with New Zealand.
- 0237 Albania, Radio Tirana: PO Box Radio Tirana.
- 0250 Vatican State, Vatican Radio: The Rome Report.
- 0253 Albania, Radio Tirana: Press Review.

Thursdays

- 0200 Argentina, RAE: News.
- 0211 Russia, Voice of: Moscow Mailbag.
- 0222 Argentina, RAE: Music.
- 0230 Albania, Radio Tirana: News.

- 0230 UK, BBC London (AS): India: A People Partitioned (6th, 13th). See S 1130.
- 0239 Argentina, RAE: DXers Special.
- 0245 Albania, Radio Tirana: Albanian Music.
- 0250 Vatican State, Vatican Radio: The Pope and the People.
- 0254 Vatican State, Vatican Radio: Pilgrim City.
- 0255 Costa Rica, R for Peace Intl: Report from the Desert.
- 0259 Vatican State, Vatican Radio: Would You Believe It?

Fridays

- 0200 New Zealand, Radio NZ Intl: RNZ News.
- 0203 Taiwan, Voice of Free China: News.
- 0215 Taiwan, Voice of Free China: Perspective.
- 0230 Albania, Radio Tirana: News.
- 0230 Ecuador, HCJB Quito (am): Inspirational Classics.
- 0233 Taiwan, Voice of Free China: New Record Time.
- 0240 Costa Rica, R for Peace Intl: Earth and Sky.
- 0245 Albania, Radio Tirana: Current Affairs.

- 0250 Vatican State, Vatican Radio: Then and Now.

Saturdays

- 0200 Ecuador, HCJB Quito (am): On-Line.
- 0200 New Zealand, Radio NZ Intl: RNZ News.
- 0203 Taiwan, Voice of Free China: News.
- 0206 Germany, Deutsche Welle: NewsLink.
- 0211 Russia, Voice of: Moscow Mailbag.
- 0215 Taiwan, Voice of Free China: Kaleidoscope.
- 0217 Vietnam, Voice of Vietnam: Talk of the Week.
- 0230 Ecuador, HCJB Quito (am): On Track.
- 0232 Costa Rica, R for Peace Intl: Insight.
- 0232 Russia, Voice of: Audio Book Club.
- 0234 Germany, Deutsche Welle: Economic Notebook.
- 0240 Costa Rica, R for Peace Intl: Earth and Sky.
- 0245 Costa Rica, R for Peace Intl: Women.
- 0247 Vietnam, Voice of Vietnam: Talk of the Week.
- 0250 Vatican State, Vatican Radio: Facing the Challenge.

MT MONITORING TEAM

Next Reporting Deadline: August 20, 1997

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THANK YOU ...

ADDITIONAL CONTRIBUTORS TO THIS MONTH'S SHORTWAVE GUIDE:

John Babbis, Silver Spring, MD; Bob Fraser, Cohasset, MA; Clyde W. Harmon, Anniston, AL; George Jacobs & Assoc. Inc., Silver Spring, MD; Zelimir Klasan, Croatian Radio; Stig Hartvig Nielsen, World Music Radio; Paul M. Sorenson, Muskego, WI; BBCMS/World Media; *Cumbre DX: The Four Winds*; *DX Ontario: NASWA Journal*.

FREQUENCIES

0300-0400	Anguilla, Caribbean Beacon	6090am				0300-0400	Ukraine, R Ukraine Intl	7150na	9550na	12040na	
0300-0400	Australia, Radio	13605pa	13755pa	15240pa	15365pa	0300-0330	United Kingdom, BBC WS	5970sa	6135af	7325am	9895am
		15415as	15510as	17750pa	17795pa			15360as			
0300-0400 vl	Australia, VL8K Katherine	5025do				0300-0400	United Kingdom, BBC WS	3255af	5975am	6005af	6175na
0300-0400 vl	Australia, VL8T Tent Crk	4910do						6180ue	6190af	6195va	9410eu
0300-0400 vl	Canada, CBC N Quebec Svc	9625do						9600af	9605as	9895am	11760as
0300-0400	Canada, CFCX Montreal	6005do						12095af	15310as	17790as	21660as
0300-0400	Canada, CFRX Toronto	6070do				0300-0400	USA, KAIJ Dallas TX	5810am			
0300-0400	Canada, CFVP Calgary	6030do				0300-0400	USA, KTFN Salt Lk City UT	7510am			
0300-0400	Canada, CHNX Halifax	6130do				0300-0400	USA, KVQH Los Angeles CA	9975am			
0300-0400	Canada, CKZN St John's	6160do				0300-0400	USA, KWHR Naalehu HI	17510au			
0300-0400	Canada, CKZU Vancouver	6160do				0300-0400	USA, Monitor Radio Intl	5850na	7535af		
0300-0400	China, China Radio Intl	9690na	9710na			0300-0400	USA, Voice of America	6080af	6115af	7105af	7280af
0300-0400 vl	Costa Rica, Faro del Carib	5055do						7290af	7340af	9575af	9885af
0300-0400	Costa Rica, RF Peace Intl	7385am	7585am	15050am		0300-0330 smtwh	USA, Voice of America	4960af			
0300-0310	Croatia, Croatian Radio	5895na				0300-0400	USA, WENW Birmingham AL	5825ue	6890na		
0300-0400	Cuba, Radio Havana	6000na	9820na	9830na		0300-0400	USA, WGTG McCaysville GA	5085am			
0300-0327	Czech Rep, Radio Prague	5930as	7345as			0300-0400	USA, WHRI Noblesville IN	5745am	7315am		
0300-0400	Ecuador, HCJB	9745am	21455am			0300-0400	USA, WINB Red Lion PA	11950am			
0300-0330	Egypt, Radio Cairo	9475na				0300-0400	USA, WJCR Upton KY	7490na			
0300-0350	Germany, Deutsche Welle	6085na	6185na	9535na	9615na	0300-0400	USA, WRMI/R Miami Intl	9955am			
		9640na				0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400	Guatemala, Radio Cultural	3300do				0300-0400	USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
0300-0400 m	Honduras, LV Evangelica	4820do				0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0400	Japan, R Japan/NHK World	17685va						Vatican State, Vatican R	7305na	9605am	
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0300-0310	Zambia, R Zambia/ZNBC 1	4910do			
0300-0400	Lebanon, Voice of Hope	9960va				0300-0400 vl	Zambia, R Zambia/ZNBC 2	6165do			
0300-0400 vl	Lesotho, Radio Lesotho	4800do				0300-0400 vl	Zimbabwe, Zimbabwe BC	3396do			
0300-0400 vl	Malaysia, RTM Kuching	7160do				0310-0340	Vatican State, Vatican R	7360af	9660af		
0300-0400 s	Maita, VO Mediterranean	15550au	17570as			0330-0357	Czech Rep, Radio Prague	9480me	11600as		
0300-0330	Mexico, Radio Mexico Intl	9705na				0300-0355	Moldova, R Moldova Intl	7520na			
0300-0325	Netherlands, Radio	9855as	11655as			0330-0400 vl	Philippines, R Pilipinas	7730as	13770as	15330as	
0300-0400	New Zealand, R NZ Intl	15115pa				0330-0400 twhfa	Portugal, R Portugal Intl	6150am	9570am		
0300-0400 vl	Papua New Guinea, NBC	9675do				0330-0400	Slovakia, Adv World Radio	11610as			
0300-0330 vl	Philippines, R Pilipinas	11885as	15120as	15270as		0330-0400	Sweden, Radio	9430na			
0300-0400	Russia, Voice of Russia WS	12000na	12010na	12050na	13645na	0330-0400	Tanzania, Radio	5050af			
		13665na	15180na	15595na		0330-0400	United Kingdom, BBC WS	9610af	11730af	11955as	15280as
0300-0330	S Africa, Channel Africa	5955af				0333-0400 mtw	S Africa, Trans World R	7215af			
0300-0400	Sri Lanka, Sri Lanka BC	9730as				0335-0355 vl	India, All India Radio	7110do	11830do	15135do	
0300-0400	Taiwan, VO Free China	5950na	7130as	9680na	11745au	0340-0350	Greece, Voice of	6260na	7450na	9420na	9935na
		11825as	15345as			0345-0400	Burundi, Radio Nationale	6140do			
0300-0330	Thailand, Radio	9655na	11905na	15370na		0345-0400	Tajikistan, Radio Dushanbe	7245as	9905as		
0300-0400	Turkey, Voice of	7270as	7300eu	15190au		0345-0400 as	Uganda, Radio	4976do			
0300-0315 mtwhf	Uganda, Radio	4976do				0356-0400	Zambia, Christian Voice	3330af	6065af		

SELECTED PROGRAMS

Sundays

0300	Costa Rica, R for Peace Intl: CounterSpin.
0300	Germany, Deutsche Welle: News.
0303	Taiwan, Voice of Free China: News.
0309	Germany, Deutsche Welle: Inside Europe.
0315	Taiwan, Voice of Free China: Kaleidoscope.
0317	China, China Radio Intl: Chinese Folktales.
0323	China, China Radio Intl: The Cooking Show.
0327	China, China Radio Intl: China Scrapbook.
0332	Taiwan, Voice of Free China: Reflections.
0333	Vatican State, Vatican Radio: News of the Church.
0335	China, China Radio Intl: Music from China.
0338	Germany, Deutsche Welle: Mailbag.
0343	Vatican State, Vatican Radio: Panorama.

Mondays

0300	Costa Rica, R for Peace Intl: My Green Earth.
0300	New Zealand, Radio NZ Intl: RNZ News.
0303	Taiwan, Voice of Free China: News.
0306	New Zealand, Radio NZ Intl: In Touch with New Zealand.
0315	Taiwan, Voice of Free China: People.
0330	Costa Rica, R for Peace Intl: New Dimensions Radio.
0330	Ecuador, HCJB Quito (am): Joy International.
0330	USA, KWHR Naalehu HI: DXing with Cumbre.
0330	Vatican State, Vatican Radio: Panorama.
0335	China, China Radio Intl: Song of the Week.
0336	Taiwan, Voice of Free China: Mailbag Time.
0345	China, China Radio Intl: Listeners' Letterbox.

Tuesdays

0300	Ecuador, HCJB Quito (am): Chords of Love.
0304	Vatican State, Vatican Radio: Ask the Abbot.
0310	China, China Radio Intl: News about China.
0330	Costa Rica, R for Peace Intl: Insight & Outlook.
0333	Germany, Deutsche Welle: Man and Environment.
0345	China, China Radio Intl: Idioms and Their Stories.
0348	Portugal, Radio Portugal Intl: Visitors' Notebook.

Wednesdays

0300	Costa Rica, R for Peace Intl: World of Radio.
0300	Ecuador, HCJB Quito (am): Psychology for Living.
0306	Vatican State, Vatican Radio: What Can I Do?
0315	Taiwan, Voice of Free China: Taiwan Today.
0323	Turkey, Voice of: Popular Turkish Music.
0330	Costa Rica, R for Peace Intl: RFP's Mailbag.
0330	Taiwan, Voice of Free China: Journey into Chinese Culture.
0332	Turkey, Voice of: Islands in the Sea.
0338	China, China Radio Intl: Orient Arena.
0345	China, China Radio Intl: Listeners' Letterbox.
0350	Portugal, Radio Portugal Intl: Musical Kaleidoscope.

Thursdays

0300	Croatia, Croatian Radio: News.
0300	Czech Rep, Radio Prague: News.
0304	Czech Rep, Radio Prague: Current Affairs.
0304	Vatican State, Vatican Radio: Postcards from Rome.
0307	Czech Rep, Radio Prague: Press Review.
0310	Czech Rep, Radio Prague: From the Archives.
0315	Taiwan, Voice of Free China: Music Box.
0317	Czech Rep, Radio Prague: The Arts.
0338	China, China Radio Intl: Profile.
0340	Czech Rep, Radio Prague: From the Archives.
0347	Czech Rep, Radio Prague: The Arts.
0350	Portugal, Radio Portugal Intl: The Challenge of the '90s.

Fridays

0300	Costa Rica, R for Peace Intl: Alternative Radio.
0300	Ecuador, HCJB Quito (am): Words for Women.
0305	Vatican State, Vatican Radio: Think of It this Way.
0315	Taiwan, Voice of Free China: Jade Bells and Bamboo Pipes.
0344	China, China Radio Intl: Cultural Spectrum.
0345	UK, BBC London (AS): Crossing the Border. See H 1515.
0346	Portugal, Radio Portugal Intl: Spotlight on Portugal.

Saturdays

0300	Costa Rica, R for Peace Intl: New Dimensions Radio.
0303	Taiwan, Voice of Free China: News.
0305	Vatican State, Vatican Radio: Ask the Abbot.
0306	Germany, Deutsche Welle: NewsLink.
0310	Australia, Radio: Ockham's Razor.
0310	China, China Radio Intl: News about China.
0310	USA, VOA Washington DC (af): VOA Saturday.
0311	Russia, Voice of: News and Views.
0332	Taiwan, Voice of Free China: New Record Time.
0334	China, China Radio Intl: Life in China.
0346	Portugal, Radio Portugal Intl: Collector's Corner (triweekly).
0346	Portugal, Radio Portugal Intl: Listeners Mailbag (triweekly).

PROPAGATION FORECASTING

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FREQUENCIES

0400-0500	Anguilla, Caribbean Beacon	6090am				0400-0500	United Kingdom, BBC WS	3255af	3955eu	5975af	6005af
0400-0500	Australia, Radio	11880pa	13605as	15240pa	15365pa			6175am	6180eu	6190af	6195eu
		15415as	17750as	17795pa				7160af	9410na	9600af	11760va
0400-0500 vl	Australia, VL8K Katherine	5025do				0400-0430	United Kingdom, BBC WS	9605as	9610af	9895am	11730af
0400-0500 vl	Australia, VL8T Tent Crk	4910do				0400-0500	USA, KAIJ Dallas TX	5810am			
0400-0500	Bulgaria, Radio	9485na	11720na			0400-0500	USA, KTVN Salt Lk City UT	7510am			
0400-0500	Canada, CBC N Quebec Svc	9625do				0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	Canada, CFCX Montreal	6005do				0400-0500	USA, KWHR Naalehu HI	17780as			
0400-0500	Canada, CFRX Toronto	6070do				0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	Canada, CFVP Calgary	6030do				0400-0500	USA, Voice of America	6080af	7170af	7265af	7280af
0400-0500	Canada, CHNX Halifax	6130do						7290af	9575af	9885af	11965me
0400-0500	Canada, CKZN St John's	6160do				0400-0500	USA, WEWN Birmingham AL	5825eu	6890na		
0400-0500	Canada, CKZU Vancouver	6160do				0400-0500	USA, WGTG McCaysville GA	5085am			
0400-0430	Canada, R Canada Intl	9715me	11835me	15275me		0400-0500	USA, WHRI Noblesville IN	5745am	7315am		
0400-0500	China, China Radio Intl	9560na	9730am			0400-0500	USA, W/IN Red Lion PA	11950am			
0400-0500	Costa Rica, RF Peace Intl	7385am	7585am	15050am		0400-0500	USA, WJCR Upton KY	7490na			
0400-0410	Croatia, Croatian Radio	9495na				0400-0500 smtw/hf	USA, WMLK Bethel PA	9465eu			
0400-0500	Cuba, Radio Havana	6000na	6180na	9820na	9830na	0400-0500	USA, WRMI/R Miami Intl	9955am			
0400-0500 vl	Cyprus, BRT International	6150do				0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	Ecuador, HCJB	9745am	21455am			0400-0500	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0400-0450	Germany, Deutsche Welle	5990af	6015af	7225af	9565af	0400-0500	USA, WYFR Okeechobee FL	6065na		9985eu	
		11765af				0400-0430	Vietnam, Voice of	12020na		15010na	
0400-0500 tw/hf	Guatemala, Radio Cultural	3300do				0400-0500	Zambia, Christian Voice	3330af	6065af		
0400-0500 m	Honduras, LV Evangelica	4820do				0400-0500 vl	Zambia, R Zambia/ZNBC 1	4910do			
0400-0415	Israel, Kol Israel	7465na	9435na	17545af		0400-0500 vl	Zambia, R Zambia/ZNBC 2	6165do			
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0400-0500 vl	Zimbabwe, Zimbabwe BC	3396do			
0400-0500	Lebanon, Voice of Hope	9960va				0415-0500 vl	Malawi, MBC	5993do			
0400-0500 s	Malta, VO Mediterranean	15550as	17570au			0425-0440 vl	Italy, RAI Intl	5975eu	7270eu		
0400-0430 m-a/vl	Mexico, Radio Mexico Intl	9705na				0425-0500	Nigeria, FRCN/Radio	3326do	4990do		
0400-0458	New Zealand, R NZ Intl	15115pa				0430-0500	Australia, Defense Forces R	13525as			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as		0430-0459	Austria, R Austria Intl	6155eu	13730eu		
0400-0430 m	Norway, Radio Norway Intl	7485na				0430-0500 m-t/vl	Lesotho, Radio Lesotho	4800do			
0400-0500 vl	Papua New Guinea, NBC	9675do				0430-0455	Moldova, R Moldova Intl	7520na			
0400-0456	Romania, R Romania Intl	5990na	6155na	9510na	9570na	0430-0500	Netherlands, Radio	6165na	9590na		
		11940na	12990na			0430-0500	Serbia, Radio Yugoslavia	9580na	11800na		
0400-0500	Russia, Voice of Russia WS	12000na	12010na	12050na	13645na	0430-0500	Swaziland, Trans World R	3200af	4775af	6100af	
		13665na	15180na	15445na	15595na	0430-0500	Switzerland, Swiss R Intl	9905ca			
		5955af				0430-0500	United Kingdom, BBC WS	15420af			
0400-0404 mtw	S Africa, Channel Africa	7215af				0455-0500	Malaysia, Voice of	6175as	9750as	15295au	
0400-0430	Sri Lanka, Sri Lanka BC	9730as				0459-0500	New Zealand, R NZ Intl	9795pa			
0400-0430	Switzerland, Swiss R Intl	6135na	9885na								
0400-0430	Tanzania, Radio	5050af									
0400-0500	Turkey, Voice of	7340na									
0400-0415	Uganda, Radio	4976do									

SELECTED PROGRAMS

Sundays

0400	Costa Rica, R for Peace Intl: The Far Right Radio Review.
0400	Ecuador, HCJB Quito (am): Latin and International News.
0400	Switzerland, Swiss Radio Intl: News.
0400	USA, VOA Washington DC (af): VOA News.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0409	Ecuador, HCJB Quito (am): HCJB DX Partyline.
0410	USA, VOA Washington DC (af): VOA Sunday.
0415	Switzerland, Swiss Radio Intl: Capital Letters (2/4).
0438	Netherlands, Radio (am): Newslite.
0454	Netherlands, Radio (am): Weekend.

Mondays

0400	New Zealand, Radio NZ Intl: Pacific Regional News.
0405	New Zealand, Radio NZ Intl: Calling Cook Islands.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0408	Germany, Deutsche Welle: Inside Europe.
0410	Ecuador, HCJB Quito (am): Saludos Amigos.
0430	New Zealand, Radio NZ Intl: RNZI Mailbox (biweekly).
0430	New Zealand, Radio NZ Intl: Travel Pacific (biweekly).
0430	Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland.
0430	USA, VOA Washington DC (af): Daybreak Africa.
0437	Netherlands, Radio (am): Sincerely Yours.
0446	Switzerland, Swiss Radio Intl: Capital Letters (2/4).

Tuesdays

0400	Costa Rica, R for Peace Intl: Alternative Radio.
0400	New Zealand, Radio NZ Intl: Pacific Regional News.
0400	USA, VOA Washington DC (af): VOA News.
0405	New Zealand, Radio NZ Intl: Calling Tonga.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0410	Ecuador, HCJB Quito (am): Studio 9.
0430	Ecuador, HCJB Quito (am): You Should Know.
0430	Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland.
0430	USA, VOA Washington DC (af): Daybreak Africa.
0430	USA, VOA Washington DC (me): Studio 38.

0431	New Zealand, Radio NZ Intl: The World in Sport.
0438	Netherlands, Radio (am): Newslite.

Wednesdays

0400	Costa Rica, R for Peace Intl: UN World Chronicle.
0400	Ecuador, HCJB Quito (am): News.
0400	Guatemala, TGNA: Insight for Living.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0410	Ecuador, HCJB Quito (am): Studio 9.
0410	USA, VOA Washington DC (af): VOA Business Report.
0430	Ecuador, HCJB Quito (am): El Mundo Futuro.
0430	Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland.
0430	USA, VOA Washington DC (me): Studio 38.
0438	Netherlands, Radio (am): Newslite.
0453	Netherlands, Radio (am): Mirror Images.

Thursdays

0400	Switzerland, Swiss Radio Intl: News.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0410	Ecuador, HCJB Quito (am): Studio 9.
0415	Bulgaria, Radio: Events and Developments.
0430	Bulgaria, Radio: Answering Your Letters.
0430	Ecuador, HCJB Quito (am): Ham Radio Today.
0430	Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland.
0430	USA, VOA Washington DC (af): Daybreak Africa.
0430	USA, VOA Washington DC (me): Studio 38.
0438	Netherlands, Radio (am): Newslite.
0453	Netherlands, Radio (am): Documentary.

Fridays

0400	Costa Rica, R for Peace Intl: Micro-Power Radio in the U.S..
0400	Croatia, Croatian Radio: News.
0400	Ecuador, HCJB Quito (am): News.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0410	Ecuador, HCJB Quito (am): Studio 9.
0410	USA, VOA Washington DC (af): VOA Business Report.

0430	Costa Rica, R for Peace Intl: WINGS.
0438	Netherlands, Radio (am): Newslite.
0453	Netherlands, Radio (am): Media Network.

Saturdays

0400	Costa Rica, R for Peace Intl: World of Radio.
0400	Ecuador, HCJB Quito (am): News.
0400	New Zealand, Radio NZ Intl: RNZ News.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0406	Germany, Deutsche Welle: NewsLink.
0410	Ecuador, HCJB Quito (am): Studio 9.
0410	USA, VOA Washington DC (af): VOA Saturday.
0430	Costa Rica, R for Peace Intl: RFP's Mailbag.
0430	Ecuador, HCJB Quito (am): Musica del Ecuador.
0438	Netherlands, Radio (am): Newslite.

International Callsign Directory

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FREQUENCIES

0500-0600	Anguilla, Caribbean Beacon	6090am				0500-0530	Switzerland, Swiss R Intl	6165eu	9535eu		
0500-0600	Australia, Radio	12080pa	13605as	15240pa	15365pa	0500-0515	Uganda, Radio	4976do			
		15415as	15420pa	15510as	15530as	0500-0600	United Kingdom, BBC WS	3255af	3955eu	5975am	6005af
		17795pa	17880as					6175am	6180eu	6190af	6195va
0500-0600 vl	Australia, VL8K Katherine	5025do						7120va	7160af	9410va	9600af
0500-0600 vl	Australia, VL8T Tent Crk	4910do						9610af	9740as	11760as	11940af
0500-0600	Australia, Defense Forces R	13525as						12095as	15310as	15360as	15420af
0500-0600 vl	Cameroon, Radio Cameroon	4850do						15575va	17640af	17760as	17885af
0500-0600	Canada, CFCX Montreal	6005do						21660as			
0500-0600	Canada, CFRX Toronto	6070do				0500-0530	United Kingdom, BBC WS	15280as	17790as		
0500-0600	Canada, CFVP Calgary	6030do				0500-0600	USA, KAIJ Dallas TX	5810am			
0500-0600	Canada, CHNX Halifax	6130do				0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	Canada, CKZU Vancouver	6160do				0500-0600	USA, KVOH Los Angeles CA	9975am			
0500-0530 mtwhf	Canada, R Canada Intl	6050eu	7295af	11835af	15430me	0500-0600	USA, KWHR Naalehu HI	17780as			
0500-0600	Costa Rica, Adv World R	5030ca	6150ca	9725ca		0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600 as	Costa Rica, Adv World R	7375am				0500-0600	USA, Voice of America	5970af	6035af	6080af	7170va
0500-0600	Costa Rica, RF Peace Intl	7385am	7585am					7195af	9630af	11965me	12080af
0500-0600	Cuba, Radio Havana	9820na	9830na					13740af			
0500-0600	Ecuador, HCJB	9745am	21455am			0500-0600	USA, WGTG McCaysville GA	5085am			
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	6145na	0500-0600	USA, WHRI Noblesville IN	5745am	7315am		
		6185na	9615na	9650na		0500-0600	USA, WINB Red Lion PA	11950am			
		3290do				0500-0600	USA, WJCR Upton KY	7490na			
0500-0600 vl	Guyana, GBC/Voice of	3985va				0500-0600 smtwhf	USA, WMLK Bethel PA	9465eu			
0500-0600 vl	Italy, IRRS	7125va				0500-0600	USA, WRMI/R Miami Intl	9955am			
0500-0530 vl	Italy, IRRS	7125va				0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	Japan, R Japan/NHK World	6110na	7230eu	11840as	11895eu	0500-0600	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
		11920na	13630na	15230na		0500-0600	USA, WYFR Okeechobee FL	5985na	9985af	11580eu	
0500-0530	Japan, R Japan/NHK World	13630na	15230na			0500-0530	Vatican State, Vatican R	9660af	11625af	15570af	
0500-0600 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0500-0520	Vatican State, Vatican R	4005eu	5882eu	7250eu	
0500-0600	Lebanon, Voice of Hope	9960va				0500-0600	Zambia, Christian Voice	3330af	6065af		
0500-0505	Lesotho, Radio Lesotho	4800do				0500-0530 vl	Zambia, R Zambia/ZNBC 1	4910do			
0500-0600	Liberia, LCN/R Liberia Int	5100do				0500-0600 vl	Zambia, R Zambia/ZNBC 2	6165do			
0500-0510 mtwhf	Malawi, MBC	3380do				0500-0530 vl	Zimbabwe, Zimbabwe BC	3396do			
0500-0525	Netherlands, Radio	6165na	9590na			0505-0600	Swaziland, Trans World R	3200af	4775af	6070af	9500af
0500-0600	New Zealand, R NZ Intl	9795pa				0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0500-0505	Nigeria, FRCN/Radio	3326do	4770do	4990do		0530-0559	Austria, R Austria Intl	6015na			
0500-0600	Nigeria, Voice of	7255af				0530-0600 vl	Kiribati, Radio	9810do			
0500-0600 vl	Papua New Guinea, NBC	9675do				0530-0556	Romania, R Romania Intl	11790af	11940af	15250af	15270af
0500-0600	Russia, Voice of Russia WS	12000na	12010na	12050na	13645na			15340as	17720as	17790af	
		13665na	15445na	15595na		0530-0600 vl	Thailand, Radio	9655eu	11905eu	15115eu	
0500-0530	S Africa, Channel Africa	9675af				0530-0600 vl	Zambia, R Zambia/ZNBC 1	7220do			
0500-0556	Spain, R Exterior Espana	6055am				0530-0600 vl	Zimbabwe, Zimbabwe BC	5975do			
0500-0530	Swaziland, Trans World R	6100af									

SELECTED PROGRAMS

Sundays

0500	Costa Rica, R for Peace Intl: RadioNation.
0500	Ecuador, HCJB Quito (am): Musical Mailbag.
0500	Vatican State, Vatican Radio: With Heart and Mind.
0506	Germany, Deutsche Welle: Sports Report.
0508	Vatican State, Vatican Radio: On-the-Air.
0509	Germany, Deutsche Welle: Inside Europe.
0510	USA, VOA Washington DC (af): VOA Sunday.
0527	Spain, R Exterior de Espana: Distance Unknown.
0536	Spain, R Exterior de Espana: Spanish Poparama.
0538	Germany, Deutsche Welle: Mailbag.

Mondays

0500	Japan, Radio: Dateline Japan.
0500	New Zealand, Radio NZ Intl: RNZ News.
0500	USA, WWCR #3 Nashville TN: Ask WWCR.
0500	Vatican State, Vatican Radio: To the Ends of the Earth.
0511	Russia, Voice of: Moscow Mailbag.
0515	Japan, Radio: Asian Top News.
0522	Spain, R Exterior de Espana: Spanish Echoes.
0532	Russia, Voice of: This is Russia.

Tuesdays

0500	Costa Rica, R for Peace Intl: UN Caribbean Echo.
0500	Germany, Deutsche Welle: News.
0500	Japan, Radio: Dateline Japan.
0500	New Zealand, Radio NZ Intl: RNZ News.
0500	Vatican State, Vatican Radio: A Room with a View of the Vatican.
0507	New Zealand, Radio NZ Intl: Checkpoint.
0510	USA, VOA Washington DC (af): VOA Today.
0515	Vatican State, Vatican Radio: The Abbot.
0517	Costa Rica, R for Peace Intl: Earth and Sky.
0520	Costa Rica, R for Peace Intl: Hightower Radio.
0525	Costa Rica, R for Peace Intl: Earthwatch Radio.
0530	Costa Rica, R for Peace Intl: Micro-Power Radio in the U.S.

Wednesdays

0500	Costa Rica, R for Peace Intl: People's Radio.
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0500	Germany, Deutsche Welle: News.
0500	Japan, Radio: Dateline Japan.
0500	New Zealand, Radio NZ Intl: RNZ News.
0500	USA, VOA Washington DC (af): VOA News.
0500	Vatican State, Vatican Radio: The Environment.
0500	Vatican State, Vatican Radio: The Rome Report.
0510	Costa Rica, R for Peace Intl: Insight.
0510	USA, VOA Washington DC (af): VOA Today.
0510	Vatican State, Vatican Radio: News from the African Church.
0516	Vatican State, Vatican Radio: What Can I Do?
0531	Australia, Radio: Blacktracker.

Thursdays

0500	Germany, Deutsche Welle: News.
0500	Japan, Radio: Dateline Japan.
0500	New Zealand, Radio NZ Intl: RNZ News.
0500	South Africa, Channel Africa: News.
0500	USA, VOA Washington DC (af): VOA News.
0500	Vatican State, Vatican Radio: The Pope and the People.
0505	South Africa, Channel Africa: Dateline Africa.
0505	Vatican State, Vatican Radio: Pilgrim City.
0510	Costa Rica, AWR: Focus on God's Love.
0510	USA, VOA Washington DC (af): VOA Today.
0514	Vatican State, Vatican Radio: Postcards from Rome.
0515	Costa Rica, R for Peace Intl: UN Daily News.
0530	Costa Rica, R for Peace Intl: Vietnam Veterans Radio Network.

Fridays

0500	Germany, Deutsche Welle: News.
0500	Japan, Radio: Dateline Japan.
0500	New Zealand, Radio NZ Intl: RNZ News.
0500	USA, VOA Washington DC (af): VOA News.
0500	Vatican State, Vatican Radio: Then and Now.
0506	Germany, Deutsche Welle: NewsLink.
0510	USA, VOA Washington DC (af): VOA Today.
0515	Japan, Radio: Asian Top News.
0525	Costa Rica, AWR: Voice of Prophecy.
0530	Costa Rica, R for Peace Intl: My Green Earth.

Saturdays

0500	USA, KWHR Naalehu HI: DXing with Cumbre.
0500	Vatican State, Vatican Radio: By the Way....
0500	Vatican State, Vatican Radio: News.
0506	Vatican State, Vatican Radio: Roundtable Discussion.
0510	USA, VOA Washington DC (af): VOA Saturday.
0530	Costa Rica, R for Peace Intl: Second Opinion.
0530	Ecuador, HCJB Quito (am): On Track.
0530	UK, BBC London (AS): India: A People Partitioned (2nd,9th). See S 1130.
0530	USA, KWHR Naalehu HI: Christian Country Music.



Your Name in Lights!

... or at least in ink within the *Monitoring Times* Shortwave Guide. Please send us your "best catches" on the worldwide shortwave bands — QSLs, that is — and we will try to use them in future issues of *MT*. Your QSLs will be returned.

FREQUENCIES

0600-0700	Anguilla, Caribbean Beacon	6090am			
0600-0700	Australia, Radio	13605as 17750as	15415as	15530as	17715as
0600-0630	Australia, Radio	11880pa	17795pa		
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VLBT Tent Crk	4910do			
0600-0633	Australia, Defense Forces R	13525as			
0600-0700 vl	Canada, CBC N Quebec Svc	9625do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFPV Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Costa Rica, RF Peace Intl	7385am	7585am		
0600-0700	Cuba, Radio Havana	6000na	9830na		
0600-0700	Ecuador, HCJB	9745am	21455am		
0600-0650	Germany, Deutsche Welle	11915af 17860af	13790af 21680af	15185af	17820as
0600-0615	Ghana, Ghana Broadc Corp	3366do	4915do		
0600-0700	Guyana, GBC/Voice of	3290do			
0600-0700 vl	Italy, IRRS	3985va			
0600-0700	Japan, R Japan/NHK World	5975eu 11840as	7230eu 11910am	9835as 11920na	11740as 12030as
0600-0700 vl	Kenya, Kenya Broadc Corp	4885do	4935do		
0600-0700 vl	Kiribati, Radio	9810do			
0600-0700	Lebanon, Voice of Hope	9960va			
0600-0700	Liberia, LCN/R Liberia Int	5100do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295au	
0600-0700	New Zealand, R NZ Intl	9795na			
0600-0630	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0600-0700	Nigeria, Voice of	7255af			
0600-0650	North Korea, R Pyongyang	15180as	15230as		
0600-0630 s	Norway, Radio Norway Intl	7180eu	7295pa	9590af	13805af
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0700	Russia, Voice of Russia WS	12000au 12070as	12010as 13645pa	12040as 13665pa	12050as 15470pa
		15490pa	15560va	15580va	15595va
		17570au	17580au	17610au	17610pa
		17795va			
0600-0630	S Africa, Channel Africa	11900af			
0600-0657	S Africa, Trans World R	11730af			
0600-0610	Sierra Leone, SLBS	3316do			
0600-0630	Slovakia, Adv World Radio	11640af			
0600-0630 vl	Solomon Islands, SIBC	5020do			
0600-0630	Switzerland, Swiss R Intl	9885af			
0600-0700	United Kingdom, BBC WS	5975am 6190af 7325va 11760as 15310as 15575va 21660as			
0600-0700	USA, KAIJ Dallas TX	5810am			
0600-0700	USA, KTBN Salt Lk City UT	7510am			
0600-0700	USA, KVOH Los Angeles CA	9975am			
0600-0700	USA, KWHR Naalehu HI	9930as			
0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0630	USA, Voice of America	5970af 7170va 11950af	5995af 7195af 11955me	6035af 9630af 12080af	6080af 11805af 15205va
0600-0700	USA, WEFW Birmingham AL	5825eu			
0600-0700	USA, WHRI Noblesville IN	5745am			
0600-0700	USA, WJCR Upton KY	7490na			
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WRNO New Orleans LA	7355am			
0600-0700	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0600-0700	USA, WYFR Okeechobee FL	5985am	7355eu	9985eu	
0600-0645 vl/m-f	Vatican State, Vatican R	5882va 15595va	7250va	9645va	11740va
0600-0630	Vietnam, Voice of	5925as			
0600-0700	Yemen, Yemeni Rep Radio	9780do			
0600-0700	Zambia, Christian Voice	3330af			
0600-0700 vl	Zambia, R Zambia/ZNBC 1	7220do			
0600-0700 vl	Zimbabwe, Zimbabwe BC	5975do			
0605-0700	Swaziland, Trans World R	4775af			
0615-0630	Switzerland, Swiss R Intl	6165eu			
0630-0700	Belgium, R Vlaanderen Int	6035eu			
0630-0700	Georgia, Radio	11805eu			
0630-0658	Vatican State, Vatican R	11625af	13765af	15570af	
0631-0640	Romania, R Romania Intl	9550eu	9665eu	11810eu	15365eu
0645-0700 as	Monaco, Trans World Radio	9755eu			
0645-0700	Romania, R Romania Intl	11740pa 17720pa	11840pa	15250pa	15270pa
0655-0700 mtwhf	Monaco, Trans World Radio	9755eu			

SELECTED PROGRAMS

Sundays

0600	Costa Rica, R for Peace Intl: Disability Radio Worldwide.
0600	USA, VOA Washington DC (af/me): VOA News.
0610	USA, VOA Washington DC (af/me): VOA Sunday.
0615	Switzerland, Swiss R Intl (eu): News.
0620	Switzerland, Swiss R Intl (eu): Newsnet.

Mondays

0600	Costa Rica, R for Peace Intl: The Far Right Radio Review.
0600	Ecuador, HCJB Quito (am): Mountain Meditations
0600	New Zealand, Radio NZ Intl: RNZ News.
0607	New Zealand, Radio NZ Intl: Checkpoint.
0615	Japan, Radio: 44 Minutes.
0615	Nigeria, Voice of: Nigeria and Politics.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Ecuador, HCJB Quito (am): Musica del Ecuador.

Tuesdays

0600	USA, VOA Washington DC (af): Daybreak Africa.
0600	USA, VOA Washington DC (me): VOA News.
0610	USA, VOA Washington DC (me): VOA Worldwide.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Ecuador, HCJB Quito (am): Nightsounds.
0652	Vatican State, Vatican Radio: Panorama.

Wednesdays

0600	USA, VOA Washington DC (af): Daybreak Africa.
0610	USA, VOA Washington DC (me): VOA Worldwide.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Ecuador, HCJB Quito (am): Nightsounds.

Thursdays

0600	Nigeria, Voice of: West African Scene.
0600	USA, VOA Washington DC (af): Daybreak Africa.
0610	USA, VOA Washington DC (me): VOA Worldwide.
0615	Switzerland, Swiss R Intl (eu): News.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Ecuador, HCJB Quito (am): Nightsounds.

Fridays

0600	Costa Rica, R for Peace Intl: Second Opinion.
0600	USA, VOA Washington DC (af): Daybreak Africa.
0610	USA, VOA Washington DC (me): VOA Worldwide.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Costa Rica, R for Peace Intl: University of the Air.
0630	Ecuador, HCJB Quito (am): Nightsounds.
0652	Vatican State, Vatican Radio: Panorama.

Saturdays

0600	Australia, Radio: World News
0600	Costa Rica, R for Peace Intl: Steppin' Out of Babylon.
0600	USA, KAIJ Dallas TX: World University Network.

June schedule in English

1800-2100 UTC

Islam - Religion of Truth and Justice

Kuwait the Home and the Land

Kuwait's Existence & Boundary

The Gulf of Love

Let's We Forget

Pioneers & Personalities in Kuwait

Mostly music at other times except news at 1830

Entire Thursday broadcast is still relay of FM Super Station on 99.7 MHz (gh)

HAUSER'S HIGHLIGHTS KUWAIT: R. KUWAIT

11990 MHz

Fri-Tue 2000, Wed 1802

Fri & Sun 1802

Wed 1802

Sat 1802

Wed 1815, Fri-Tue 2030

Sun 2015



GROVE

BUYER'S GUIDE

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at Ground Rates on All
Products We Sell!**



Purchase any shortwave radio from this catalog and receive a free copy of 8th edition Shortwave Directory (BOK14-...)! \$9.95 value!

A Big Hit at Dayton!



For details on **WINRADIO** and its new **Spectrum Analyzer**, see page 3.

Grove Buyer's Guides are printed as integral sections of Monitoring Times magazine. Three distinct Guides are published on a rotating basis, featuring: scanners and accessories; shortwave products and accessories; and software, books and satellite communications equipment. More product information can be requested by phone, fax, snail mail or e-mail (see below). Please visit us on-line at: www.grove.net

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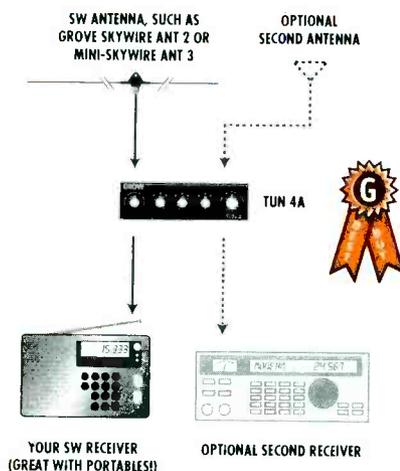
0397

SHORTWAVE

Great Receivers and Accessories for the SWL

Get Ready for Winter DXing with the Grove TUN-4A Minituner Plus and the Renowned Skywire Antenna

GROVE TUN-4A MINITUNER PLUS



Here's the shortwave listener's dream—a high performance, amplified, frequency-tunable antenna system for general coverage shortwave and medium wave monitoring. For indoor use, connect a short length of wire or the popular Grove ANT-6 Hidden Antenna. Connected to an outdoor antenna like the Grove ANT-2 Skywire or ANT-3 Mini Skywire, the TUN-4A Minituner Plus provides knockout signal strength and allows frequency preselection as well.

Continuous 400 kHz-30 MHz coverage, -20 to +20 dB gain/attenuation control, dual antenna switch, dual receiver output, amplified/unamplified preselection, band switch, fine tuning, and built-in lightning protection. Full instructions included. Requires 12VDC power (sold separately).

ACCESSORIES

ADP 6	UHF female to male 1/8" Mini-Plug	\$5.95
ADP 11	UHF female to RCA male	\$5.95
ADP 27	Banana Plug	\$2.00
ADPK 15	3foot PL259 Interconnect Cable	\$2.50
ANT 2	Skywire	\$39.95
ANT 3	Mini Skywire	\$29.95
ANT 25	Random Wire Antenna	\$7.95
PWR 19	12VDC 200 MA Power Supply	\$7.95

ORDER TUN 4A **\$99⁹⁵**

SHIPPING
\$6.50 UPS
\$5.50 US Priority Mail
\$7 Canadian APP
\$10 Canadian UPS

FAMOUS GROVE SKYWIRE

High performance and low cost—an unbeatable combination! Why restrict your frequency coverage with the gaps found in expensive trap dipoles or unpredictable random wire when you can get unsurpassed full-frequency reception with the Grove Skywire? Comes assembled with Budwig center connector ready for your PL-259 (UHF male) equipped coaxial cable (50 or 75 ohm, see page 11); includes two professional porcelain end insulators and complete instructions.

ATTENTION HOME EXPERIMENTERS: Build your own SW dipole! Order ACC101 (Budwig center connector) for only \$9.95 and add your own wire to construct a SW dipole!

HAMS! Ideal for transmitting when used with a transmatch. (1.8-30 MHz at up to 250 watts)

SPECIFICATIONS:

Length: 56 feet
Feedpoint impedance: 50 or 75 ohm (nominal)
Feedpoint location: 22 feet from end
Elements: 18 AWG (16 x 30) bare stranded copper
Connector housing: Heavy duty black phenolic

ORDER ANT 2 **\$39⁹⁵**

SHIPPING
\$6 UPS
\$5.50 US Priority Mail
\$7 Canadian APP
\$10 Canadian UPS

**Limited Space?
Try Grove's new
Mini-Skywire**



Similar to above, but 40-foot, dual-dipole design.

ORDER ANT 3 **\$29⁹⁵**
(Same shipping as ANT 2)

DRAKE R8-A

A Classic in the Great Tradition of R.L. Drake

The successor to the famous R8 is here — A new standard-bearer among shortwave receivers!



- Rapid scanning
- Enhanced tone control
- Tighter frequency stability
- Strong metal tilt bail
- Expanded-function RS232 computer control
- Removable/replaceable line cord



ORDER RCV 3
\$1059⁹⁵

SHIPPING
\$17 UPS
\$29 US Priority Mail
\$26 Canadian UPS
\$35.50 Canadian APP

For improved CW or sideband listening, use your R8-A with the new, improved Grove SP-200B Sound Enhancer, sold separately below (SPK 13) and on next page.



ACCESSORIES

ACC 43	VHF converter	\$219.95 + \$20 install.
ACC 5	Metal tilt replacement legs R8 & R8A	\$34.95
ANT 2	Grove Skywire antenna	\$39.95
ANT 24	Dymek active antenna	\$179.95
MAN 2	Service manual	\$39.95
SPK 2	External speaker	\$48.95 plus \$6 UPS
SPK 13	Grove Sound Enhancer	\$199.95

The Drake R8 has been internationally respected for its excellent audio, frequency agility (100 kHz-30 MHz, expandable to 33-55 and 108-174 MHz with optional converter), friendly control panel, synchronous detection, noise blanker, passband tuning, preamp/attenuator selection, universal power supply, dual clock timers, giant display, five filter bandwidths, and six receiving modes. Now Drake has added over a dozen important improvements to their legendary R8 receiver (see bullets below). See specifications in center of this Buyer's Guide.

- Single-keypress mode and bandwidth selection
- Alphanumeric display of station identification
- Improved overload immunity
- 440 memory records

The New and Improved SW8 from Drake!

This combination desktop/portable world band receiver from R.L. Drake—with its recent improvements in sensitivity, selectivity and noise reduction—is now an excellent value for all-around DXing. Not only continuous coverage 500 kHz-30 MHz, but 87-108 MHz FM broadcast (stereo at headphone jack) and 116-136 MHz aircraft as well! Standard and synchronous detection AM, upper and lower sideband on medium and shortwave, direct frequency entry keypad, 0.5 microvolt sensitivity, dual 6/4 kHz selectivity on AM, sharp 2.3 kHz selectivity on SSB. Up-conversion eliminates images, while +10 dB intercept point suppresses intermod. Also, now includes an amplified whip antenna on all frequencies. See specifications in center of this Buyer's Guide.

"The bottom line is that today's Drake enhanced SW8 is a much better offering than before, to the point where it now functions as an excellent tabletop receiver, as well as—beefiness aside—an unbeatable portable."

—Larry Magne
Monitoring Times
November, 1996



New, enhanced model in stock!

ORDER RCV19
\$779⁹⁵

SHIPPING
\$14 UPS
\$23.50 US Priority Mail
\$21 Canadian UPS
\$28 Canadian APP

ACCESSORIES

ANT 2	Grove Skywire antenna	\$39.95
ANT 24	Dymek active antenna	\$179.95
CAS 10	Carrying Case	\$49.95
SPK 13	Grove Sound Enhancer	\$199.95
TUN 4A	Grove TUN4A MinutunerPlus	\$99.95

Drake's New SW2 Receiver!



Now Drake has introduced a new, affordable receiver featuring the conveniences and simple operation of the popular SW1, but adding single sideband, selectable-sideband synchronous detection, bargraph S-meter, 50 Hz tuning steps, improved RF gain control, enhanced LED display with 100 Hz readout accuracy, and even a remote control option!

Continuous tuning from 100 kHz through 30 MHz, 100 memory channels, dual antenna inputs, double conversion design, compact size (10-7/8"W x 4-3/8"H x 7-5/8"D), lightweight (5.8 lbs), dual power supply (12 VDC; 120 VAC adaptor included), high sensitivity, wide dynamic range (100 dB), front-mounted speaker, and more make this receiver an excellent value. See specifications in center of this Buyer's Guide.

ORDER RCV18
\$489⁹⁵

SHIPPING
\$14 UPS
\$23.50 US Priority Mail
\$21 Canadian UPS
\$28 Canadian APP

ACCESSORIES:

BRK12	Carrying/tilt handle	\$4.50
ACC09	IR remote control	\$48.95
BRK13	Mobile mounting kit	\$14.95

GRUNDIG Yacht Boy 400

With great-sounding AM/FM stereo and continuous shortwave frequency coverage from 1.7-30 MHz in 5 or 1 kHz tuning increments, SSB, infinite fine tuning, FM broadcast reception, and battery or AC power convenience, the compact 400 also offers 40 scannable memories and simple pushbutton tuning.



Requires 6 AA cell batteries. See specifications in center of this Buyer's Guide.

ORDER RCV22
\$199⁹⁵

SHIPPING
\$9 UPS
\$16 US Priority Mail
\$18 Canadian APP
\$11.50 Canadian UPS



ACCESSORIES

ANT 3	Grove Mini-Skywire	\$29.95
ANT 21	Select-A-Tenna	\$65.95
ANT 32	Kiwa Pocket Loop Antenna	\$119.95
BAT 1	AA alkaline batteries	\$ 7.95ea
PWR 8	AC adaptor (Y.B. 400)	\$7.95
SPK 11	Naval HTS speaker	\$29.95
SPK 13	Grove Sound Enhancer	\$199.95
TUN 4A	Grove TUN4A MinutunerPlus	\$99.95

UPS Second Day Air at Ground Rates on ALL PRODUCTS!

Dynamic Duo: *New* JRC NRD-345 Receiver and *New* Grove SP-200B Sound Enhancer



Purchase them separately or combine them for the best ready-made DX post for under \$1,000!

NEW, IMPROVED SP-200B

Whether your listening interests include scanning, shortwave, or ham radio, or even if you need to "clean up" the audio on another sound system, the Grove SP-200B is an effective, multi-functional accessory to increase the intelligibility and sound quality of voice, music, and data.



Modern communications equipment and accessories are noted for their poor audio, making listening difficult and fatiguing. The Grove SP-200B improves sound dramatically, often bringing barely receivable signals out of the background mire. For privacy, the speaker may be switched off while audio is being monitored via a front-panel headphone jack, or redistributed from a rear-panel jack.

Using all-analog circuitry to avoid the distortion contributed by many digital signal processors (DSP), the SP-200B combines a powerful audio amplifier and four inch speaker along with separate bass and treble equalizers, a variable passband notch/peak filter to reject interfering tones or boost desirable audio, an adjustable noise limiter to reduce irritating pulse interference, a variable-hang 0-45 second squelch control to remove background noise between sound transmissions, and a tape recorder activator. Powered by 12 VDC, the SP-200B may be operated in a mobile environment or from an optional 12 VDC supply (sold below).

Housed in a stylish, hand crafted, oak cabinet, and constructed of sturdy, black finished aluminum with white legends.

NEW JRC NRD-345

Known for their luxury, high-performance receivers, Japan Radio company (JRC) has just released a high quality, double conversion receiver at a low, competitive price! The new NRD-345 offers wide frequency coverage (100 kHz-30 MHz), multimode reception (AM, synch. AM, SSB), sharp selectivity (2/4 kHz), high sensitivity (0.3 microvolts), wide dynamic range (100 dB), strong audio (1 watt), dual VFOs, scannable memory (100 channels) with channel lockout, computer control (RS232C), dual clock timer (12/24 hour), precision tuning (5/100 Hz., 1/10 kHz steps), and adjustable noise blanker.

Additional features include selectable AGC timing, 20 dB attenuator, adjustable tone control, one-watt audio with internal speaker, backlit S meter, large backlit LCD display, FAX output, and dual-voltage (12 VDC / 120 VAC) power supply. See specifications in center of this Buyer's Guide.

ORDER RCV 20

\$799⁹⁵

SHIPPING
\$17 UPS
\$29 US Priority Mail
\$26 Canadian UPS
\$35.50 Canadian APP



ORDER SPK 13

\$199⁹⁵

SHIPPING
\$9 UPS
\$16 US Priority Mail
\$18 Canadian APP
\$11.50 Canadian UPS

ACCESSORIES:

PWR04
12 VDC/800 mA Power Supply \$14.95

WiNRADiO

Now with Spectrum Analyzer!



The revised WiNRADiO with Spectrum Analyzer (shown above) was a big hit at the Dayton Hamvention this year. Step into the future!

ORDER RCV16

\$499⁹⁵

SHIPPING
\$9 UPS
\$14 US Priority Mail
\$16 Canadian UPS
\$15.50 Canadian APP

Software updates available for owners of previous version. Please call for details.

ACCESSORIES:

TUN 4A	Grove TUN 4A Minituner Plus	\$99.95
ANT 1	Grove Scanner Beam Antenna	\$59.95
ANT 2	Grove Skywire Antenna	\$39.95
ANT 3	Grove Mini Skywire Antenna	\$29.95
ANT 7	Scantenna	\$39.95
ANT 9	Wideband Discone Antenna	\$87.95
ANT 15	Skymatch Active Antenna	\$99.95
CVR 3	GRE SuperConverter	\$84.95

**See September and October, 1996, Monitoring Times for full review. Reprint \$4.*



This mouse controlled, simulated receiver and spectrum display (upper right) appear on your computer screen!

Imagine—plug a small PC card into your computer, load the simple software, and turn your PC into a potent, wide-coverage monitoring station! User-friendly software allows all the usual receiver controls, plus much more. Rugged shielding resists interference from the host computer. Enjoy continuous 500 kHz through 1300 MHz (less cellular) frequency coverage; multimode reception of AM, wide and narrow FM, and single-sideband; up to 16 memory banks with a virtually limitless number of channels; display records in memory by frequency,

callsign, or comments field; scan by bank, grouping, or mode; and automatically search for activity by entering your choice of frequency limits.

Call up a full-fledged spectrum analyzer and see signal presence on any span between 500 kHz and 1.3 GHz! Double-click the mouse on any signal spike and the receiver immediately tunes to that frequency! Storage feature allows recall of signal traces.

BNC connector allows attachment of your antenna system, while a mini-jack permits connection of speaker or earphones. One-microvolt nominal sensitivity assures weak-signal pickup.

Easy installation, full instruction manual included. Can be used with DOS 3.0 and a 286 platform, but this unique receiving laboratory unleashes its power with Windows 3.1, requiring 386 or higher, 1 Meg RAM, 1 Meg hard disk space, VGA monitor; or Windows 95, requiring 486 or Pentium, 4 Megs RAM, and an SVGA monitor. See specifications in center of this Buyer's Guide.

New from Universal!
SP-50 Audio Subcarrier /
FM² Satellite Receiver



The SC-50 opens a whole new world of audio for your C- and Ku-band satellite system. You can now receive audio subcarriers and FM2 audio from hundreds of interesting radio stations and satellite audio services. Music, talk shows, sports, news, religious programming, major radio stations, and even international shortwave broadcasters can be heard on the SC-50 satellite receiver.

The Universal SC-50 receiver is very simple to install and only takes 3 minutes to hook up. This is not a stand alone product and cannot be used with any 18-inch direct broadcast satellite systems. The SC-50 is designed to work with all C-band and 11.7-12.2 GHz home satellite systems.

It is simple and quick to tune, has a 16-character display with direct frequency readout, and a 50-channel memory bank for storing your favorite radio services for immediate recall. The SC-50 covers all FM2 and audio subcarrier channels from 100 kHz to 9 MHz, an area filled with hundreds of free channels and programming. No need to change your satellite receiver to tune in all of the audio subcarrier and FM2 services.

ORDER RCV29 SHIPPING
 \$399⁹⁵ \$17 UPS
 \$29 US Priority Mail
 \$26 Canadian UPS
 \$35.50 Canadian APP

Global E-Mail Capability
is Right in Your Hand!



It's big news: Magellan has created the GSC 100, the world's first hand-held global satellite communicator. The GSC 100 gives you the ability to send and receive e-mail messages to and from anywhere on Earth. It lets

you stay in touch wherever life takes you. And, with its integrated GPS receiver, the GSC 100 not only lets you know where you are, it guides you anywhere you want to go. You can also relay that position to anyone, anywhere—no matter how remote you may be—with a GSC 100 e-mail message. **Added services will allow you to send your message via fax or voice.**

These units are expected to ship soon from Magellan. Reserve yours today. Your credit card will not be charged until the unit is shipped by Grove. No returns except for defective units.

ORDER GPS-100 SHIPPING
 \$999⁹⁵ \$10 UPS

World-Class Receivers from AOR

AR-5000

Super-wide-coverage receiver ranks among the best ever made!



AOR has scooped the market with their new AR5000 extended-frequency coverage receiver, tunable from 10 kHz through 2600 MHz (less cellular) and offering 650 memory channels. For the first time, you can hear VLF time signals and naval communications, international shortwave broadcasting, worldwide single-sideband communications, civilian and military aeronautical transmissions, VHF/UHF public safety radio, ham repeaters, microwave earth satellites, and much, much more all on one receiver!

This triple-conversion luxury receiver offers outstanding sensitivity (0.15 microvolt SSB, 0.3 microvolt VHF/UHF FM, 0.6 microvolt AM), rapid 50-channel-per-second scan/search speed, 1 Hz to 1 MHz programmable tuning steps, all mode reception (AM/FM/LSB/USB/CW), selectable IF bandwidths (3/6/15/40/110/220 kHz), superb frequency stability (+/-1 ppm, 0-50 deg. C.), mobile or fixed power (12 VDC / 120 VAC), and much, much more. See specifications in center of this Buyer's Guide.

"For compact installation requirements, widest frequency coverage, and the greatest variety of options, select the AOR."

—Bob Grove
 11/96 Monitoring Times

ORDER RCV12 SHIPPING
 \$1895⁹⁵ \$17 UPS
 \$29 US Priority Mail
 \$26 Canadian UPS
 \$35.50 Canadian APP

See Bob Grove's comparison of the AR-5000 and the ICOM R8500 on the World Wide Web at <http://www.grove.net/groverev.html>. The receivers were also reviewed in the November issue of *Monitoring Times*.

NEW! AR7030 High Performance Shortwave Receiver is SWL's Dream



"Arguably the best receiver on the market, regardless of price."

—Larry Magne
 Monitoring Times,
 April, 1996

The sleek styling of the English-designed receiver symbolizes its superior performance. Its 105 dB dynamic range, +35 dBm third-order intermod rating, and razor-sharp selectivity guarantee signal overload immunity under conditions that would stagger other high-end receivers, yet its 0.3 microvolt SSB sensitivity snags even the weakest signals.

Continuous 0-32 MHz frequency coverage, high-stability TCXO oscillator, all-mode reception, synchronous detection, superb audio quality, compact portability, 2.6 Hz tuning increments, interference-resistant shielding, passband tuning, noise compressor, 100 scannable memory channels plus dual VFOs, enhanced AGC, programmable attenuator, and numerous other features combine to make this one incredible, affordable receiver. See specifications in center of this Buyer's Guide.

ORDER RCV17 SHIPPING
 \$1149⁹⁵ \$17 UPS
 \$29 US Priority Mail
 \$26 Canadian UPS
 \$35.50 Canadian APP

ICOM's R8500!

"Almost no other receiver is made like this, except some battle-ready military gear going for tens of thousands of dollars. The '8500's construction puts to shame virtually every other world band tabletop receiver on the market today."

—Larry Magne,
July 1997 Monitoring Times



Here is one of the world's best tabletop receivers with continuous 100 kHz-1999.99 MHz frequency coverage (less cellular), tunable in precise 10 Hz steps—longwave, shortwave, VHF/UHF, all services and modes (wide and narrow FM and AM, USB, LSB, CW). Add high sensitivity, IF shift, selectable AGC timing, audio peak filter to automatically enhance modes, built-in RS232C and CI-V for direct computer control, 1000 memory channels in 20 banks, multiple scanning selections with priority function and selectable delay, S-meter settable squelch, noise blanker, and 12 VDC / 120 VAC operation.

High stability crystal oscillators combine with automatic frequency control circuitry for outstanding stability. Multiple tuning speeds optimize signal hunting. Alphanumeric display aids in identifying memorized frequencies. Automatic memorizing of search-discovered active frequencies, skipping of unwanted channels, three antenna connectors for optimal choices for frequency ranges, even voice scan to ignore noisy channels, and even optional voice synthesizer—an incredible array of advanced features! See specifications in center of this Buyer's Guide.

ACCESSORIES

ACC 6	High Stability Crystal Unit	\$295.95	BRK 5	MB-23 Carrying Handle	\$12.95
ACC 7	FL-52A CW Narrow Filter	\$189.95	MAN 1	Service Manual	\$57.95
ACC 8	Voice Synthesizer Unit	\$57.95			
ACC 72	TV-R7100 Adaptor	\$339.95			
ACC 74	CT-17 Level Converter	\$134.95			
ANT 2	Grove Skywire Antenna	\$39.95			
BRK 4	Mobile Mounting Bracket	\$35.95			

ORDER SCN 1

\$1899⁹⁵

SHIPPING

\$17 UPS
\$29 US Priority Mail
\$26 Canadian UPS
\$35.50 Canadian APP

ICOM R-10: breathtaking performance from a handheld receiver is here!

This incredible, new scanning receiver is light years ahead of the competition. Featuring continuous 500 kHz-1300 MHz (less cellular) frequency coverage, multimode (AM/WFM/NEM/SSB) reception, rotary tuning control, programmable tuning steps from 100 Hz-1 MHz, on-screen spectrum display (200 kHz span), 1000 channel non-volatile memory, computer control, and second-radio cloning—and these are just the beginning!

The sleek, compact, lightweight R-10 has large, easy-to-read—and touch—keys. Its revolutionary zero-wait-state scanning seeks and holds in readiness the next active frequency while you are listening to another signal! Wide-dynamic-range triple conversion, tunable bandpass filters, and sharp selectivity assure dramatic improvement in interference-free reception.

Eight alphanumeric characters can be entered to identify any channel, and ten characters can be used identify banks. Voice scan control skips unmodulated carriers. Scan memory channels by bank, mode, or program. High-contrast display and powerful, dual-function keyboard provide incredible options to suit your listening requirements. Noise blanker and automatic noise limiter provide double noise reduction. Sleep timer and programmable attenuator are additional advantages. See specifications in center of this Buyer's Guide.



ORDER SCN06
\$499⁹⁵

SHIPPING

\$9 UPS
\$10 US Priority Mail
\$14 Canadian UPS
\$13 Canadian APP

ACCESSORIES

ACC 3	OPC-478 Cloning cable (PC to radio)	\$44.95
ACC 4	OPC-474 Cloning cable (radio to radio)	\$17.95
AADPK 4	Interface cable and adaptor for Opto Scout	\$8.95
CAS 1	LC-140 Carrying case	\$29.95
DCC 5	CP-12 cigarette lighter cable w/noise filter	\$29.95
SFT 1	CS-R10 Cloning software	\$12.50

Pre-Publication Specials on WRTV/Passport Save 35%

Order before the date shown and save \$\$\$ on these 1998 editions

1998 WORLD RADIO TV HANDBOOK



Valued by its readers for 50 years, **World Radio TV Handbook** is a "must have" resource for radio buffs and broadcasting professionals. This annual publication shows what's on the airwaves anywhere in the world at any time. It features country-by-country listings of long, medium, and shortwave

stations by frequency, time and language. Also, an hour-by-hour guide to broadcasts in English, a survey of high-frequency broadcasting reception conditions for the year and much more.

ORDER BOK 3-98
\$19⁹⁵

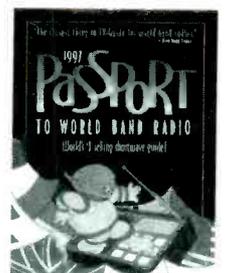
with FREE SHIPPING in U.S. if ordered before 12/31/97

(After Dec. 31, 1997, the price will be \$24.95 plus \$6.00 shipping. For foreign shipping, please add \$4.50 for foreign surface printed mail, \$6.00 for Air Mail in Canada, and \$7.50 for Air Mail elsewhere.)

1998 PASSPORT TO WORLDBAND RADIO

Edited by Lawrence Magne, *Passport* features a listener's program guide, arranged both by frequency (2-26 MHz) and easy-to-follow time chart. Listings show transmitter output power, language, favored listening times for North America, and program contents.

Reviews of the most popular shortwave receivers and listening accessories. Special alphabetized section of station addresses, contact personnel, phone/fax numbers.



ORDER BOK 18-98
\$16⁹⁵

with FREE SHIPPING in U.S. if ordered before August 31! **HURRY!**

(After August 31, 1997, the price will be \$19.95 plus \$6.00 shipping. For foreign shipping, please add \$4.50 for foreign surface printed mail, \$6.00 for Air Mail in Canada, and \$7.50 for Air Mail elsewhere.)

Order Line and Product Support Info.: 1-800-438-8155

Presenting the world's most popular shortwave radio!

SONY ICF-2010



This is a full-featured radio for the serious shortwave listener—with a reputation of distinction among the “powerful portables.” Synchronous detection allows interference-free reception on many stations difficult to hear on other radios. Narrow/wide selectivity switching; clock/timer allows up to 4 automatic on/off cycles per day for frequencies and times of your choice; 10-step LED signal strength meter, audio tone selection for speech or music; and 32 station direct-access keyboard combine to make this

Sony product a remarkable value for beginners or seasoned SWL's.

Frequency range includes 150 kHz-30MHz, 76-108, and 116-136 MHz. Requires 3D/2AA cell batteries. See specifications in center of this Buyer's Guide.

ORDER RCY 2
\$349⁹⁵
 SHIPPING
 \$9 UPS
 \$17 US Priority Mail
 \$18.50 Canadian APP
 \$18 Canadian UPS



ACCESSORIES

ANT 3	Grove Mini-Skywire	\$29.95
ANT 21	Select-A-Tenna	\$65.95
ANT 32	Kiwa Pocket Loop Antenna	\$119.95
BAT 1	AA cell alkaline bat.	\$.79ea
BAT 2	D cell alkaline bat.	\$1.19ea
SPK 13	Grove Sound Enhancer	\$199.95
TUN 4A	Grove TUN4A MinitunerPlus	\$99.95
WP04	RDI WHITE PAPER®	\$5.95

HIGH SENSITIVITY PLUS
 SYNCHRONOUS DETECTION!

SONY ICF-SW7600G



It was inevitable. The early compact models have been replaced by a tiny marvel with synchronous AM detection, SSB, and even FM stereo coverage! Measuring just over 7 inches wide and weighing 22 ounces, the SW7600G is loaded with features! DX/local switch reduces “pumping” on strong SSB signals; power switch lock prevents accidental battery depletion during transport.

Continuous 150 kHz-29.995 MHz frequency coverage plus 87.6-108 MHz FM headphone stereo, pushbutton tuning, tone control, external antenna jack, clock timer with sleep function, tilt bracket, keyboard lock, direct-entry keypad and 22 scannable memory channels keynote the high-tech features of this potent portable! See specifications in center of this Buyer's Guide. Requires 4 AA cell batteries.

ORDER RCY 11
\$189⁹⁵
 SHIPPING
 \$9 UPS
 \$14 US Priority Mail
 \$16 Canadian UPS
 \$15.50 Canadian APP

ACCESSORIES

ANT 3	Grove MiniSkywire Antenna	\$29.95
ANT 22	Select-A-Tenna	\$65.95
ANT 32	Kiwa Pocket Loop Antenna	\$119.95
BAT 1	AA alkaline bat.	\$.79
PWR 9	AC adaptor	\$19.95
SPK 11	Naval HTS speaker	\$29.95
TUN 4A	Grove TUN4A MinitunerPlus	\$99.95

SONY ICF-SW77

Has all the capabilities of the Sony ICF-2010 (except air band) plus more memory and other features. See specifications in center of this Buyer's Guide.



ORDER RCY 10
\$469⁹⁵
 SHIPPING
 \$9 UPS
 \$18 US Priority Mail
 \$20.50 Canadian APP
 \$18 Canadian UPS

SONY ICF-SW100

**Powerful
 Shirt-pocket
 Shortwave Radio**



Incredible! Imagine compressing the popular functions of the mighty Sony ICF2010 into a shirt-pocket radio! This tiny titan offers continuous 150 kHz-30 MHz and 76-108 MHz FM frequency ranges, Sony's famous synchronous detection, USB/LSB reception, 100 Hz tuning steps, 50 memory presets, 24 hour clock/timer, world time computer, station name display, illuminated LCD, and much, much more. See specifications in center of this Buyer's Guide.

AC adaptor, stereo earphones, active antenna, soft carrying case, station directory, and full instruction manual included at no extra charge! Two AA batteries required.

ORDER RCY 24
\$359⁹⁵
 SHIPPING
 \$9 UPS
 \$17 US Priority Mail
 \$18.50 Canadian APP
 \$18 Canadian UPS

ACCESSORIES

ANT 21	Select-A-Tenna	\$65.95
BAT 1	AA alkaline batteries	\$.79 ea
SPK 11	Naval HTS-3 Amplified Spkr.	\$29.95
SPK 13	Grove Sound Enhancer	\$199.95
TUN 4A	Grove TUN4A MinitunerPlus	\$99.95



GE Superadio III for AM/FM DXing



The GE Superadio series has been a popular receiver for AM/FM DXers for years. The smooth vernier dial features tuned RF on both AM and FM, while a ceramic IF filter and 7 tuned IF circuits provide outstanding selectivity. The two-way speaker system with separate bass, treble and loudness controls assures solid, clean sound, and the drift-cancelling, automatic frequency control (AFC) circuit can be switched out for weak-signal hunting. The internal AM loop and FM whip antennas provide convenient portability, while external antenna jacks accommodate your long-distance antennas.

Expertly designed and handsomely crafted, the GE Superadio III is powered by 120 VAC or six internal D cells (optional) with over 400 hours battery life!

ORDER RCY 5
\$59⁹⁵
 SHIPPING
 \$9 UPS
 \$16.50 US Priority Mail
 \$20.50 Canadian APP
 \$18 Canadian UPS

ACCESSORIES

ANT 3	Grove Mini-Skywire	\$29.95
ANT 21	Select-A-Tenna	\$65.95
ANT 31	Kiwa Loop Antenna	\$349.95
ANT 32	Kiwa Pocket Loop Antenna	\$119.95
BAT 1	AA cell alkaline bat.	\$.79ea
BAT 2	D cell alkaline bat.	\$1.19ea
SPK 13	Grove Sound Enhancer	\$199.95
TUN 4A	Grove TUN4A MinitunerPlus	\$99.95

Super Value and Performance from SANGEAN

Sangean ATS808

A great low cost radio featuring 150 kHz-30 MHz continuous tuning, 87.5-108 MHz FM reception (stereo earphones included!), dual AM selectivity, direct keyboard frequency entry, continuous tuning dial, scan and search modes, 45 memory channels, 24 hour dual-zone clock/timer, and distance/local sensitivity selection. See specifications in center of this Buyer's Guide.



ORDER RCV 13 SHIPPING \$9 UPS
\$129⁹⁵ \$14 US Priority Mail
 \$15.50 Canadian APP
 \$16 Canadian UPS

ACCESSORIES

ANT 3	Grove Mini Skywire Antenna	\$29.95
ANT 21	Select-A-Tenna	\$65.95
ANT 32	Kiwa Pocket Loop Antenna	\$119.95
BAT 1	AA Alkaline Batteries	\$.79
(2 required for memory; 4 more for portable operation)		
PWR 10	AC adaptor	\$9.95
TUN 4A	Grove TUN4A MinitunerPlus	\$99.95

ATS909 Multiband Radio

A great new challenger among full-featured SW portables!

This compact, new PLL-synthesized, portable receiver sets a new standard for Sangean. Features include continuous coverage longwave, mediumwave and shortwave reception plus FM (stereo with earphones), alphanumeric display for station identification, 306 channel memory, USB/LSB mode with 40 Hz step tuning, 29 memory banks with automatic search, world time for 42 cities, three independent timers, signal strength indicator, wide/narrow filter selection, RF gain and tone control. See specifications in center of this Buyer's Guide.



ORDER RCV 8 SHIPPING \$9 UPS
\$259⁹⁵ \$16.50 US Priority Mail
 \$20.50 Canadian APP
 \$18 Canadian UPS

ACCESSORIES

ANT 3	Grove Mini Skywire Antenna	\$29.95
ANT 21	Select-A-Tenna	\$65.95
ANT 32	Kiwa Pocket Loop Antenna	\$119.95
BAT 1	AA cell alkaline bat.	\$.79 ea
SPK 11	Naval HTS speaker	\$29.95
TUN 4A	Grove TUN4A MinitunerPlus	\$99.95

Top-of-the-line Sangeans With or Without Built-In Cassette Recorder

ATS-818

ORDER RCV 7
\$149⁹⁵

~~Retail \$399~~

ATS-818CS

w/cassette recorder
 ORDER RCV 9
\$219⁹⁵



Imagine—record your favorite programs automatically with the dual-zone clock timer on any frequency from 150 kHz through 30 MHz, 87.5-108 MHz FM as well! This impressive portable has SSB and CW reception, 45 memory channels, wide/narrow filter selectivity, signal strength indicator, AC wall adaptor and more! See specifications in center of this Buyer's Guide.

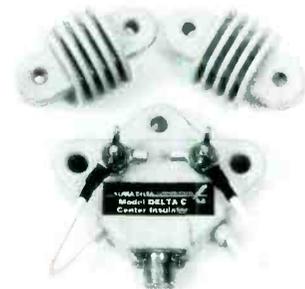
Requires 4 D cells.

Receivers are the same, excluding the tape recorder specifications.

ACCESSORIES

SHIPPING	ANT 3	Grove Mini Skywire Antenna	\$29.95
\$9 UPS	ANT 21	Select-A-Tenna	\$65.95
\$16.50 US Priority Mail	ANT 32	Kiwa Pocket Loop Antenna	\$119.95
\$20.50 Canadian APP	BAT 2	D cell alkaline bat.	\$1.19 ea
\$18 Canadian UPS	SPK 11	Naval HTS speaker	\$29.95
	TUN 4A	Grove TUN4A MinitunerPlus	\$99.95

FROM ALPHA DELTA:
 Build-your-own
 Antenna Kit



Design your own dipole for optimum shortwave, medium wave, or longwave reception, and use this famous insulator/connector hardware for high performance, long life. Includes two super-strength end insulators, molded center assembly with standard SO-239 connector, and replaceable gas-discharge lightning arrester. Full instructions and antenna design procedures included.

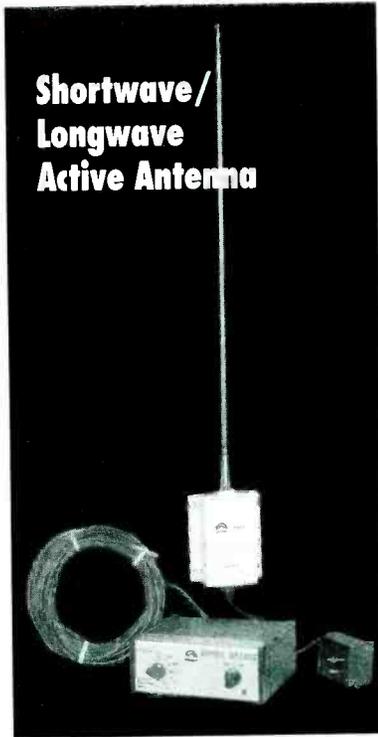


ORDER ANT 12 SHIPPING \$6 UPS
\$29⁹⁵ \$5.50 US Priority Mail
 \$7 Canadian APP
 \$10 Canadian UPS

Order Line and Product Support Info.: 1-800-438-8155

STONER-DYMEK

Grove's Shortwave Receiver Specification Guide



**Shortwave/
Longwave
Active Antenna**

If a large, outside dipole is out of the question, choose the Dymek DA-100E, the best 50 kHz-30 MHz active receiving antenna available! High sensitivity, low noise, wide dynamic range, step-selectable attenuator, static-discharge-protected, weatherproof remote amplifier/whip assembly. Includes AC power supply, indoor control unit, 50 feet RG-58/U coax, remote amplifier, 4' stainless-steel whip, receiver-interconnect cable, and full instructions. Requires adaptor kit (below).

ORDER ANT 24 SHIPPING
\$179⁹⁵ \$8 UPS
\$8 US Priority Mail
\$10.50 Canadian APP
\$15 Canadian UPS

ADPK 1 Adaptor kit (PL259 for antenna to customer's receiver connection--please specify)\$9.95

Receiver	AR 5000	AR 7030	Drake R8A	Drake SW2	Drake SW8	Grundig Yt. By. 400
Grove Order #	RCV 12	RCV 17	RCV 3	RCV 18	RCV 19	RCV 22
Grove Price	\$1895.95	\$1149.95	\$1059.95	\$489.95	\$779.95	\$199.95
Frequency Range	10 kHz-2600 MHz (less cellular)	0-32 MHz	100kHz-30MHz (35-55/108-174MHz with optional converter)	100 Hz-30 MHz	500 kHz-30 MHz, 87-108, 116-137MHz	160kHz-30MHz 87.5-108MHz
Keypad Entry?	Yes, plus tuning dial	Remote control (incl.)	Yes, plus tuning dial	Yes	Yes, plus tuning dial	Yes
Tuning Steps	Programmable 1 Hz-1 MHz	2.665 Hz SSB, 20.62 Hz AM/FM	10/100Hz 1 kHz	50 Hz-5 kHz	50 kHz FM 100 Hz AM	1/5 kHz
RIT/Fine Tuning	Tuning dial	Tuning dial	No	Not required	No	Yes
Display	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD
Dimmer	Yes	Yes	Yes	Yes	On/Off	On/Off
Recommended Use	Wide spectrum monitoring	Serious DXing and monitoring	Serious DXing and Monitoring	Casual SW and Utilities	AM/SSB, aircraft/FM	Casual SW and FM
Receiving Modes	AM/NFM/WFM/LSB/USB/LSB/CW	AM/synchronous AM/USB/LSB/CW, data, NFM	AM, NFM, USB, LSB, CW, RTTY	AM, AM Synchron, USB, LSB	AM, AM synchron, WFM, LSB, USB	AM, LSB, FM, CW, USB
Memory	650 Channels	100 channels	440 channels	100 channels	70 channels	40 channels
Scan	50 chan./sec. w. priority	Yes	Yes	No	Yes	Yes
Banks	65		10	No	7	No
Search	50 channels/sec.		No	No	No	Yes
Delay	Yes		Yes	No	5 sec. per step	Yes
Squelch	Yes	Yes	Yes	No	No	No
Clock	Yes	Clock timer	Dual time zone	No	Dual mode	12/24 hr./sleep
Audio Output Power	1 W	2 W @ 8 ohms	2.5 W @ 4 ohms		2 W @ 4 ohms	700 mW
Record Audio Output	Yes	Yes	Yes	No	Yes	No
Recorder Activator	No	Yes	No	No	No	No
Signal Strength Ind.	Analog S-meter		Analog S-meter	Analog S-meter	Analog S-meter	LCD bargraph
Computer Interface	RS232	RS232	RS232C	No	No	No
Conversion Scheme	Triple up-conversion (622.2/10.7 MHz, 455 kHz)	Double up-conversion (45 MHz/455 kHz)	Double up-conversion	Double up-conversion (55 MHz/455 kHz)	Double up-conversion	Double up-conversion
Sensitivity	0.6 uV or better	0.3 uV SSB, 0.5 uV AM	0.5 uV 1.5-30 MHz	0.5 uV	0.5 uV or better (SSB)	
Selectable Preamp.	Yes	Yes	Yes	No	No	No
Selectable Atten.	Yes	5 level	Yes	No	Yes	Yes
IF Selectivity	3/6/15/40/110/220 kHz	2.2/5.5, 7, 10 kHz	(-6/-60 dB): 6/4/2, 3/1.8 kHz; 500 Hz	(-6/-60 dB): 6/12 kHz AM, 2.3/5 kHz SSB	(-6/-50 dB): AM Narrow 4/6 kHz SSB 2.3/4.5 kHz	
Image Rejection			80 dB or better 1.5-30 MHz		70 dB or better	
Selectable AGC			Yes	No	Yes	No
Dynamic Range		105 dB	100 dB @ 20 kHz spacing		95 dB or better	
Passband Tuning	No	±4.2 kHz, all modes	±7.3 kHz	No	No	No
Noise Blanker/Limiter	Yes	Yes	Yes	No	No	No
Adjustable Notch Filter	No	No	500-5000 Hz, 40 dB	No	No	No
Tone Control	Yes	CW and data only	Yes	No	Yes	Yes
Antenna Connector	BNC & N, programmable frequency ranges	SO-239 and 600 ohm	Dual, switched SO-239	SO-239 and screw terminal	SO-239, Push terminals, Integral whip	1/8" mini whip
Dimensions	8.5"Wx3.5"Hx10"D	9.5"Wx3.5"Hx9"D	13.5"Wx5.25"Hx13"D	11"Wx4.5"Hx7.5"D	11.5"Wx5.25"Hx13"D	7.75"Hx4.62"Wx1.75"D
Weight	7 lb. 10.5 oz.	4 lbs. 13 oz.	13 lbs.	5.8 lbs.	10 lbs.	1 lb. 5 oz.
Power Requirement(s)	12.8 VDC @ 1 A or 12.0 VDC @ 60 Hz	120 VAC (supply included) or 15 VDC @ 1 A (12 VDC w/ less perf.)	100/120/200/245VAC; 11-16VDC @ 2A	12 VDC/120 VAC	6-9VDC/6 cells	6AA cells/9VDC
Warranty	One year	One year	One year	One year	One year	One year
Accessories Incl.	Manual/AC adaptor		Manual	AC adaptor	Tele. whip/AC adaptor	Real ant./case/earphone/SW Guide/6AA batteries

Top-Rated, High Performance KIWA Loop Antennas

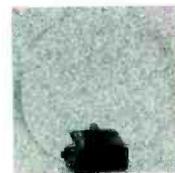
KIWA Medium Wave Air-Core Loop Antenna

Are you looking for an antenna that will improve medium wave reception on your communications receiver? Then look no more—this unique 12-inch, circular air-core antenna provides improved weak signal reception of medium wave broadcast signals and its electronically balanced circuitry minimizes pickup of electrical interference. Some of the other high performance features of the Kiwa loop include:

- Full 530-1705 kHz MW frequency coverage
- May be precisely rotated and tilted for maximum signal pickup and nulling of interfering stations.
- Equipped with local/DX pre-amp switch, variable output attenuator, and dual output amplifiers.
- May be powered by a low-noise AC supply, included, or by battery.
- Stands 17 inches (43 cm) high and weighs 16 pounds (7.25 kg).

ORDER ANT 31 SHIPPING
\$349⁹⁵ \$17 UPS
\$29 US Priority Mail
\$26 Canadian UPS
\$35.50 Canadian APP

**Winner of the 93/
94 World Radio
Television
Handbook Award!**



**The New KIWA
Pocket-Loop
Antenna**

This highly efficient signal grabber is 12" across when deployed, yet collapses to a tiny pocket size for transport! Designed to receive and amplify signals from 530 kHz through 20 MHz in four bands, no antenna jack on your portable radio is needed; it space-couples to your radio's existing whip and internal ferrite rod!

ORDER ANT 32 SHIPPING
\$119⁹⁵ \$8 UPS
\$8 US Priority Mail
\$10.50 Canadian APP
\$15 Canadian UPS

UPS Second Day Air at Ground Rates on ALL PRODUCTS!

Prices and other Specifications Subject to Change without Notice

ICOM R-10	ICOM R-8500	JRC NRD-345	Sangean ATS-808	Sangean ATS-818CS	Sangean ATS-909	Sony ICF-SW77	Sony ICF-SW100	Sony ICF-SW2010	Sony ICF-SW7600G	WINRAD10
SCN 06 \$499.95	SCN 01 \$1899.95	RCV 20 \$799.95	RCV 13 \$129.95	RCV 9 \$219.95	RCV 8 \$259.95	RCV 10 \$499.95	RCV 24 \$359.95	RCV 2 \$349.95	RCV 11 \$189.95	RCV 16 \$499.95
500 kHz-1300 MHz (less cellular)	100 kHz-1999.99999 MHz (less cellular)	100 kHz-30 MHz	150kHz-30 MHz, 87.5-108 MHz	150kHz-30MHz, 87.5-108MHz	150kHz-30MHz, 87.5-108 MHz	150kHz-29.99MHz, 87.5-108 MHz	150kHz-30MHz, 76-108 MHz	150kHz-30MHz, 76-108, 116-136MHz	150kHz-29.995MHz, 87.6-108MHz	500 kHz-1300 MHz (less cellular)
Alphanumeric	Yes	Yes	Yes	Yes	Yes	Yes, plus tuning dial	Yes, plus tuning dial	Yes, plus tuning dial	Yes	Yes
100 Hz-999.99 kHz	10/50/100 Hz, 1/2 5/5 8/9 10/12 5/20/25/100/1000 kHz custom	5/100 Hz, 1/10 kHz	50/100 kHz FM, 10/9.5/1 kHz AM	1kHz	40 Hz USB/LSB	50Hz/1kHz	100Hz/1.5kHz, 9/10kHz MW, 50kHz FM	100Hz/1kHz	1kHz	50 Hz-1 MHz
Yes	No	Not required	No	No	No	No	No	No	Yes	Yes
Backlit LCD	Backlit LCD, alphanum.	Backlit LCD	LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	On screen (PC)
On/Off	Yes	No	No	Yes	Yes	On/Off	On/Off	On/Off	No	N/A
Wide spectrum monitoring	Serious wide-spectrum monitoring	General Purpose SW and Utilities	Casual Broadcast	Casual SW	Casual SW and Utilities	Casual SW	Casual SW	SW/Air/Util./FM	Casual SW	Custom listening requirements
AM, WFM, NFM, USB, LSB, CW	AM/FM (w/AFK) /USB/LSB/CW/RTTY	AM, AM synch, USB, LSB	AM, FM	AM, LSB, WFM, USB	AM, FM broadcast, USB, LSB	AM, AM synch., LSB, WFM, USB	AM, AM synch., USB, LSB, CW, WFM	AM, USB, LSB, WFM, synch det	AM, WFM, USB, LSB, synch det	AM, wide/narrow FM, SSB
1000 channels	1000 channels	100 channels	45 channels	45 presets	307 channels	162 channels	50 channels	32 channels	22 channels	Virtually unlimited
ch./sec. (plus sero-wait state)	40 chan/sec multifunction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	50 ch./sec. (FM mode)
18	20	No	No	No	29	20	10	No	No	16
17 steps/sec.	Yes, w/ automemory write	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prgmbl. time, channel	1 second	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Programmable
Yes	Yes	No	No	No	No	No	No	No	No	Yes
No	No, sleep timer	12/24 hour clock/timer	24 hour UT/local, alarm/timer	Dual time with record	3 separate timers with alarm	12/24 hr.	24 hr./sleep	12/24 hr./alarm/sleep	w/ timer and sleep	Yes
120 mW @ 8 ohms	2 W @ 8 ohms	1 Watt	440 mW @ 10 @ THO	800 mW		400 mW	250 mW	380 mW		200 mW
No	Yes	Yes	No	No	Yes	138 mV	245 mV	.775 mV @ 1000 ohms	Yes	8 ohm minijack
No	Yes	No	No	Internal prog. cassette	No	Yes	No	No	No	No
Yes	S-meter w/ center tuning	LCD bargraph	No	Yes	LCD bargraph	LCD bargraph	No	LED bargraph	Single 'tune' LED	On PC screen
Yes	RS232C and CI-V	RS-232C	No	No	No	No	No	No	No	Expansion slot
Triple up-conversion 429/266, 10.7 MHz, 455 kHz)	Triple up-conversion	Double up-conversion	Double up-conversion	Double up-conversion	Double up-conversion	Double up-conversion	Double up-conversion	Double up-conversion	Double up-conversion	Triple up-conversion
0.35 uV or better	0.2 uV SSB, 0.5 uV NFM	0.3 uV								0.35 uV or better
No	No	No	No	No	No	No	No	No	No	No
Programmable 20 dB	-10/-20 dB	20 dB	Yes	RF gain control	RF gain control	Yes	Yes	Yes	Yes	Yes
(-6 dB) SSB 4 kHz, AM/NFM 15 kHz, WFM, 150 kHz	5.5/12/150 kHz FM, 2.2/5.5/12 kHz AM, 2.2 kHz SSB/CW	(-6/-60dB) 4/10 kHz wide, 2/6 kHz narrow	Wide/narrow AM	Wide/narrow switch 6.5 kHz AM	Wide/narrow AM			(-6/-50 dB) Wide @16 kHz Narrow @18 kHz		(-6 dB) AM/SSB 6 kHz, NFM 17 kHz, WFM 280 kHz
No	Yes	Off/fast/slow	No	No	No	No	No	No	No	No
	Yes	100 dB	No	No	No	No	No	No	No	No
	Yes	Adjustable	No	No	No	No	No	No	No	No
	Yes	No	No	No	No	No	No	No	No	No
Both	Yes	Yes	Yes	Yes	Yes	Sep bass/treble	Yes	Yes	Music/news switch	
BNC	SO-239 (UH/F) (0.1-30 MHz), N (30-2000 MHz)	SO-239 and 600 ohm	1/8" miniplug	1/8" miniplug	1/8" miniplug	1/8" miniplug	1/8" miniplug	1/8" miniplug	1/8" miniplug	BNC
2.25"W/5.1"H/1.25"D	11.25"W/4.5"H/8.25"D	10"W/4"H/9"D	7.5"W/5.1"H/1.5"D	11.25"W/7.37"H/2.75"D	8.5"W/5.1"H/1.5"D	10.87"W/6.87"H/1.87"D	4.37"W/2.87"H/ 93" D	11.37"W/6.25"H/2.160	7.27"W/4.72"H/1.25"D	PC expansion card
11 oz.	18 lbs.	7.7 lbs.	1 lb. 5 oz.	3 lbs. 13 oz.	1 lb. 12 oz.	3.25 lbs	8 oz.	3.75 lbs.	1.25 lbs	N/A
4.8-16 VDC, AC adaptor included	12 VDC/120 VAC @ 60 Hz	12 VDC/120 VAC	5 VDC @ 300 mA or 6 AA cells	120VAC/rt calls 40 cells	4AA batteries or optional AC adaptor, 6 VDC	6VDC or 4C cells	120VAC or 2AA cells	120VAC or 3D/2AA cells	120VAC or 4AA cells	PC bus powered
One year	One year	One year	One year	One year	One Year	One year	One year	One year	One year	One year
AC adaptor, flex whip, rechargeable batteries, manual.	Manual	Ac adaptor	Soft pouch/stereo earphones/external antenna adaptor	AC adapt./ ext. ant adaptor/ SW Guide	AC adapt./manual, carrying pouch, earphones, external antenna connection.	Stereo earphones/ AC adapt./tele. ant/ SW Guide	Stereo earphones/AC adapt./tele. ant/soft pouch/SW Guide	Earphones/ AC adapt./wire ant./tele. ant/strap/ext ant adapt./SW Gd	Carrying case/ Reel Ant.	3-1/2" disk, manual

JPS Noise Canceller / Active Antenna

Enjoy Crystal Clear Sound!



ORDER ACC 21
\$194⁹⁵
SHIPPING \$6.50 UPS
\$5.50 US Priority Mail
\$7 Canadian APP
\$10 Canadian UPS

Imagine, just connect this simple device between your receiving antenna and shortwave receiver or transceiver, and null out locally-generated interference of virtually *any* kind! Computer hash, line noise, TV synch buzz—they all go away when the ANC-4 is adjusted to your receiver to receive 100 kHz-80 MHz!

Use the attachable whip (provided) or, even better, a second external antenna to sample local noise. A simple adjustment from the front panel reduces or even eliminates virtually any electrical noise interference you are likely to encounter! The new ANC-4 can even be used as a frequency-selective active antenna/signal booster! Whip, random wire antenna, DC plug and full instructions provided. Requires 12 VDC @ 300 mA power.

ACCESSORIES
PWR 13 Universal power supply \$9.95

Universal Reel Antenna for Shortwave Portables



Whether you have a Sony, Sangean, Realistic®, Grundig, or other whip-portable shortwave radio, this 23-foot, reel-out antenna can be firmly attached for better reception. When not in use it can be conveniently stored in a pouch or even your pocket!

Comes with whip clip and 1/8" (3.5 mm) standard antenna adaptor.

ORDER ANT 16
\$14⁹⁵
SHIPPING \$6 UPS
\$4.50 US Priority Mail
\$6.50 Canadian APP
\$10 Canadian UPS

Order Line and Product Support Info.: 1-800-438-8155

Select-A-Tenna



"I was able to pull in stations that were absolutely inaudible without it."

—Stephen J. Price
Monitoring Times,
April 1995



Apartment dwellers and mobile home owners, boost your 530-1700 kHz AM broadcast reception up to 30 dB with the famous Select-A-Tenna! Improves adjacent channel rejection, reduces signal fading. Tuning knob selects your listening frequency.

No batteries or power required; simply set the Select-A-Tenna next to your radio, peak the tuning knob, and listen to AM broadcast signals soar out of the background noise!

This 11", high-Q loop antenna directs its captive signals to your radio's internal ferrite loop without any physical connection! If your receiver requires an external antenna, a convenient 3.5 mm (1/8") jack and plug are provided. Connect an outside wire to the Select-A-Tenna and receive medium wave signals like you've never heard before!

ORDER ANT 21 SHIPPING \$7 UPS
\$65⁹⁵ \$8.50 US Priority Mail
 \$11.50 Canadian APP
 \$15 Canadian UPS

The Stealthy Grove HIDDEN ANTENNA

The Hidden Antenna may be used alone with your scanner for improved signal reception, over your attachable whip or may be connected to the powerful GRE PRE1 for considerably increased signal strength on scanners and shortwave receivers.



This five-foot, thin-profile, flexible wire antenna can be hung in a corner, behind a drape—just about anywhere out of sight. Comes fully assembled with 20 feet of coax and F male connector, with 3 adaptors for PL259 (UHF), Motorola and BNC connections.

ORDER ANT 6
\$19⁹⁵

SHIPPING \$6.75 UPS
 \$4.50 US Priority Mail
 \$6.50 Canadian APP
 \$10 Canadian UPS



The Grove No-Tenna™

Turn Your Car into a
Giant All-Band Antenna!



Imagine: strong, clear, continuous frequency coverage of shortwave and scanner signals without having to mount an antenna anywhere on your car! No invitation to theft, suspicion, breakage, low overhangs, hole drilling, scraped paint, or cables through doors or windows. **No visible antenna whatsoever!** The 8' cable mounts in seconds, using your entire car body as a giant, 1-1000 MHz, all-band antenna!

Ideal for city dwellers, travelers, reporters, investigators—anyone who doesn't want a visible receiving antenna on his vehicle (not for transmitting).

Full instructions and universal connectors for RCA, BNC and 1/8" (3.5mm) miniplug included. If you own an ICOM R-100 be sure to specify a PL-259 adaptor.

ORDER ANT 20
\$19⁹⁵

SHIPPING \$5 UPS
 \$5 US Priority Mail
 \$6 Canadian APP
 \$6.50 Canadian UPS

ACCESSORIES
 ADPK 8 Motorola \$5.95

H800 Skymatch



NEW!

Compact Active Antenna

Imagine a two-foot antenna that performs like a 100 foot antenna; and what if that compact powerhouse could receive signals from 10 kHz through 50 MHz? That's VLF, medium wave, shortwave, and even VHF low band all rolled into one! Operates either from 120 VAC or optional 9 volt batteries for portable or emergency use.

Wide dynamic range resists strong-signal-overload problems, while high sensitivity enhances weak signals. Mounts inconspicuously on a porch, outside a window, on a roof, in a tree, or even in the radio room (not recommended because of electrical noise pickup).

Includes integrated active antenna, 50 feet of coax lead-in, control box, and AC adaptor.

Note: This antenna requires a kit that will adapt the RCA female plug on the box to your radio with a piece of coax in between.

ADP 32 RCA female to male miniplug \$5.95
 ADP 25 RCA female to PL259 male \$5.95

ORDER ANT 15 SHIPPING \$8 UPS
\$99⁹⁵ \$8 US Priority Mail
 \$10.50 Canadian APP
 \$15 Canadian UPS

Superb Magellan GPS Receivers



Ruggedly built and waterproof, yet barely more than 6" high and weighing only 10 ounces, these pocket precision receivers home in on 1.2-1.5 GHz global positioning satellites, using their signals to establish your exact location to within 100 yards in as little as 2-1/2 minutes from a cold start (35 seconds warm start), even your altitude, and allows you to plot and track your motion as well, so you can find your way back if necessary.

Ideal for pinpointing campsites, fishing holes, boating, travelers, trailheads, map locations, landmarks. Selectable graphic screens assist you in tracking and plotting where you've been, where you're going, and where you *ought* to be going! Shows distances, directions, times, speed, course corrections, latitude/longitude coordinates, all on a backlit LCD display.

Up to 17 hours of continuous use on one set of standard alkaline AA cells. Operates over a 14 to 140 degree Fahrenheit temperature range. Lanyard strap included.

All these features make the GPS 2000 Satellite Navigator (above) an incredible value. Or select the upgraded GPS 3000 (left) and get two additional navigation screens, a data port (RTCM 104 in, NMEA out), OSGB coordinates, 100 additional waypoints, 5 more routes, external antenna capability, celestial calculations, swivel mounting bracket, batteries, manuals, and a carrying case.



ORDER GPS 2000
\$149⁹⁵

ORDER GPS 3000
\$249⁹⁵



SHIPPING FOR EACH: \$9 UPS; \$13 US Priority Mail; \$15 Canadian APP; \$16.50 Canadian UPS

Accessories For BOTH
 ACC 13 Instr. video for 2000 \$14.95
 ACC 14 Instr. video for 3000 \$14.95
 BAT 1 AA Alkaline Batteries \$7.99
 BAT 13 AA Energizer Batteries \$2.75
 CAS 7 Carrying case (GPS 2000 only) \$9.95

GP 3000 EXTRA Accessories
 ACC 11 Power/ Data Module and External Antenna Kit, 20' Coax \$149.95

UPS Second Day Air at Ground Rates on ALL PRODUCTS!

SOFTWARE

*Because software is easily copied, it is not refundable.

Scan Manager Pro v.1.1



Powerful software for hams and SWLs from KC4ZGL. If you have a modern IBM compatible computer equipped with Windows 3.1 or higher, you can edit databases and control all Kenwood, Icom, Drake RSA (R8 not supported) and Yaesu (except FT-767) transceivers and receivers! Display your data in powerful spreadsheet style, controlled and edited by keyboard or mouse. Scan Manager 1.1 Pro includes SWL Manager 2.0. See complete list of features in our HighTech guide.

Order SFT 13, only \$68.95 plus \$6 UPS shipping.*

Scancat-Gold for PCs

Use your 640k (or better) computer to control your AOR, Drake, Kenwood, ICOM, Yaesu, JRC, Lowe, WJ, and Radio Shack PRO-2005/6/35/42 with this fast, all-new software program! Operates from the RS-232 port. See complete list of features in our HighTech guide.

Order SFT02, only \$94.95 plus \$4.50 UPS shpg.*

Scancat-Gold for Windows®

NEW! Offers all the Scancat-Gold features plus many more. See complete list of features in our software buyer's guide.

Order SFT 02W, only \$99.95 plus \$4.50 UPS shpg.*

ScanStar™ for Windows Plus

This powerful new software package, ready for Windows 95, 3.1, or WFW 3.11, will allow you to customize the band plan as well as display spectrum analysis and support printing on the Drake R8 and R8A.

Order SFT 09, only \$159.95 plus \$4.50 UPS shipping. Also available: ScanStar for Windows SE (Basic), order SFT 10, \$99.95; and ScanStar Commercial, order SFT 07, \$129.95.*

Digital Audio Logger

Use with version 6 or later ScanStar Plus or Industrial editions. Not a stand-alone product.

Order SFT 04, only \$49.95 plus \$4.50 UPS*

Order SFT 09DA (Digital Audio Logger w/ StarStar Plus) only \$196.95 plus \$4.50 UPS*

M-450 Universal Decoder

New Model!

Access an entire dimension of coded communications signals.

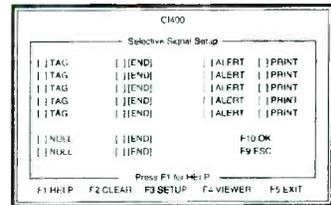


Now with Super POCSAG, 1200 baud, simple, pushbutton mode selection, this self-contained, compact, menu-driven decoder, when connected to your scanner's or VHF/UHF receiver's external speaker jack, will reveal CTCSS (PL) sub-audible tones, DCS (DPL) squelch tones, POCSAG and GOLAY digital paging messages, DTMF (Touch Tone®) telephone numbers, even air-to-ground ACARS digital aircraft messages! Connected to your shortwave receiver (SSB mode), you can read RTTY, SITOP, FEC-A, SWED-ARQ, and even FAX pictures when used with a printer! There is no Morse code or packet capability. A jack is included to attach an external speaker so that you can still listen if your internal speaker is disconnected when using the M-450.

This new, upgraded model also has a serial port for users who wish to capture text data in their PCs. The M-450 includes a free DOS based computer program (computer is not necessary to operate decoder) and provides a limited amount of control from the computer if desired.

Input jacks provided for either audio or discriminator interconnect. AC wall adaptor, full manual and pair of 1/8" (3.5 mm) plugs included. Your parallel printer will allow full page hardcopy.

ORDER DEM 10 SHIPPING \$9 UPS
\$399.95 \$18 US Priority Mail
 \$20.50 Canadian APP
 \$22 Canadian UPS



Add Screen Capture Interface!

Want to see a full-screen display of intercepted text messages? Connect the new CI-400 between the M400 and your IBM compatible computer (286, DOS 3.3 or better); requires 8 bit slot, 215 kB disk storage for program files, 3.5" floppy. Recommended: mouse, color monitor, hard drive. Includes interface card, cable, software, manual
 SFT 14 Scr. Capt. interface for M400 \$109.95

Premium Low-Loss RG6-U Cable with Adaptors

Have you had trouble finding the right coaxial adaptors for linking your antenna and receiver?



We can help! Simply tell us what adaptors you need, or what antenna and radio you will be using. We will provide you with a cable which is ready to attach between your antenna and receiver!

RG 59U

(25 feet w/ adaptors)
 ORDER CBL 25

\$9.95

\$5.50 UPS
 \$5.50 US Priority Mail
 \$7 Canadian APP
 \$12 Canadian UPS

RG 6U

(50 feet w/ adaptors)
 ORDER CBL 50

\$14.95

\$6.50 UPS
 \$6.50 US Priority Mail
 \$8 Canadian APP
 \$13 Canadian UPS

RG 6U

(100 feet w/ adaptors)

ORDER CBL 100

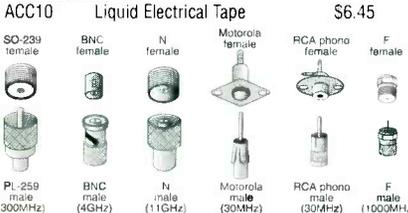
\$19.95

\$7 UPS
 \$7.50 US Priority Mail
 \$9 Canadian APP
 \$17 Canadian UPS

Sorry—no other lengths available

Cable loss per 100 ft:
 1.6 dB @ 50 MHz
 2.6 dB @ 170 MHz
 4.6 dB @ 450 MHz

ACCESSORIES



Liquid Electrical Tape

\$6.45

ADAPTORS AVAILABLE

- ADP 1 SO-239 Female to F male
- ADP 2 F Female to PL259 Male
- ADP 3 F Female to N Male
- ADP 4 F Female to Male 1/8" Mini-Plug
- ADP 5 N Female to BNC Male
- ADP 6 SO-239 Female to Male 1/8" Mini-Plug
- ADP 7 SO-239 Female to N Male
- ADP 9 F Female to BNC Male
- ADP 10 SO-239 female to BNC Male
- ADP 11 SO-239 female to RCA male
- ADP 12 BNC female to N male
- ADP 13 BNC/BNC (right angle elbow)
- ADP 14 F female to RCA male
- ADP 15 N female to F male
- ADP 17 BNC female to F male
- ADP 18 F female to 2 wires
- ADP 19 SO-239 female to 2 wires
- ADP 22 Motorola female to BNC male
- ADP 23 SO-239 female to SO-239 female barrel—\$1.50
- ADP 24 BNC female to PL259 male
- ADP 25 RCA female to PL 259 male—\$5.95
- ADP 26 F female to F female barrel—\$2.00
- ADP 27 Banana Plug—\$2.00
- ADP 28 F female to PAL fem. Satellite700
- ADP 29 3.5mm female to 2.5mm male min. plug—\$1.50
- ADP 30 Dual BNC fema. to BNC male T-adaptor—\$1.50
- ADP 31 BNC female to Motorola male—\$3.95
- ADP 32 RCA female to male miniplug—\$5.95
- ADPK 10 F female to Motorola male
- ADPK 13 F male to F male 3ft.cable—\$2.50
- ADPK 14 F/Motorola cable, 3ft.—\$2.50
- ADPK 15 PL259 male to PL259 male 3ft.—\$2.50
- ADPK 16 BNC male/ BNC male 3ft cable

Unless otherwise specified adaptors may be ordered separately for \$5.95 each. Free shipping if ordered with other products. \$2.50 for one or more shipped alone.

If you are unsure which adaptor is needed, call Chanel or Sue at 704-837-7081 tech@grove.net for assistance.

Order Line and Product Support Info.: 1-800-438-8155

GROVE'S SHORTWAVE ACCESSORY MART

Interference Eliminators



Ideal for suppressing overload interference from AM and shortwave broadcasters and more. Reject unwanted signals by 40 dB or more; reduce intermod interference by at least 120 dB! Filters can be combined for deeper rejection or multiple frequencies. Simply choose your filter(s) from the list below and specify your antenna connectors.

FTR 7: 540-1700 kHz Band Reject Filter. Removes AM broadcast interference from shortwave/longwave receivers

FTR 9: 30 MHz Low Pass Filter. Eliminates paging, FM and TV broadcast signals and other sources of VHF/UHF interference from shortwave receivers

ORDER FTR 7 or 9

\$29⁹⁵

SHIPPING
\$5 US Priority Mail
\$6.50 Canadian APP
\$10 Canadian UPS

ADAPTOR KITS:

ADPK 1 PL-259 (UHF) \$9.95
ADPK 3 BNC/F \$9.95
ADPK 6 Motorola/BNC \$9.95
ADPK 9 N/F \$12.95

Weather-Proof Flex-Tape!

Ideal for securely wrapping coax couplings and splices without heat or mess. Forms a tight, flexible, waterproof seal for wiring, plumbing, automotive, marine, and other hostile environments. Easy to apply; remains pliable for years without leaving a sticky residue like putty sealants. Resists water immersion, sunlight, abrasion, impact, and most chemicals. 22-foot roll.



ORDER ACC 168

\$1⁹⁵

SHIPPING
\$1.50 First Class
\$4 UPS
\$6 Canadian UPS
\$5.50 Canadian APP



NIGHTLOGGER II



Tape Automatic Recorder Activator

This respected product is now improved, offering manual-auto switch, line-spike protection, "record" indicator lamp, removable/replaceable cables, internal monitoring speaker, volume control, adjustable dropout time delay, and dry-contact relay switching. Ideal for unattended recording of scanner traffic, shortwave programs, events, and official communications record logging. AC adaptor, audio and control cables included.

ORDER ACC 2

\$69⁹⁵

SHIPPING
\$5.50 US Priority Mail
\$6.50 UPS
\$7.00 Canadian APP
\$10 Canadian UPS

Pro Antenna Switch

Switch your scanner, shortwave receiver, ham transceiver, or any other radio device operating at frequencies as high as 1000 MHz with this superb, die-cast, waveguide-cavity antenna switch. Handles up to 2500 watts PEP for transmitting, VSWR under 1:1.2, insertion loss only 0.2 dB, and port-to-port isolation 60 dB. Automatically grounds unselected port. Standard UHF (SO-239) connectors mate with PL-259 and other adaptors.



ORDER SWC 1

\$25⁹⁵

SHIPPING
\$5 UPS
\$4.50 US Priority Mail
\$10 Canadian UPS
\$6.50 Canadian APP

Lightning/EMP Protector

While nothing can withstand a direct lightning hit, the Grove LAR-1 connects between your antenna cable and radio to prevent induced voltages from nearby lightning strokes and high-powered transmitters from burning out your equipment* Uses state-of-the-art gas discharge technology. Extremely low signal loss—0.2 dB at 1500 MHz! Ideal for protecting scanners, shortwave receivers, CB and ham equipment, VCRs, TVs, satellite receivers, FM stereo systems, and more. May be used with transmitters up to 100 watts.



LAR1F (with F conn) \$19⁹⁵
LAR1B (with BNC conn) \$24⁹⁵
LAR1P (w/ PL-259 UHF conn) \$24⁹⁵
LAR1M (with Motorola conn) \$29⁹⁵

SHIPPING
\$5 UPS
\$4.50 US Pr. Mail
\$6.50 Can. APP
\$9.50 Can. UPS

*Will not prevent AC power line surges. Appearance may vary.



Variable Attenuator
Reduces Overload Interference!

Reduce scanner and shortwave intermod and desensitization with this variable attenuator. Adjustable from 0 to 20 dB attenuation from 0-1000 MHz or higher! Can also be used to reduce distortion when connected between a radio's audio output and your tape recorder! Equipped with F connectors; adaptors available from list below.

ORDER ATT 1

\$9⁹⁵

SHIPPING
\$5.50 UPS or Priority Mail
\$6.50 Canadian APP
\$7 Canadian UPS

Adaptor Kits

ADPK 1 PL-259 (UHF) \$9.95
ADPK 3 BNC \$9.95
ADPK 6 Motorola/BNC \$9.95
ADPK 9 N \$12.95

Pro Power Supply



Operating from 100-115 volts AC, this rugged, compact (5"W x 3"H x 5"D) lab power supply is ideal for powering those mobile and portable, battery-operated scanners, shortwave radios, CB rigs, and other equipment. Adjustable from 9 to 15 volts and provides up to 5 amps DC. Over-current protected. Includes binding posts as well as cigarette lighter jack for powering your accessories. Large meter shows voltage and current.

ORDER PWR 3

\$59⁹⁵

SHIPPING
\$6.50 UPS Ground
\$5.50 US Priority Mail
\$7.50 Canadian APP
\$10.50 Canadian UPS

Noise-Cancelling Speaker

Recommended for any communications accessories that would benefit from an external speaker. A pushbutton high-frequency-rolloff switch reduces crackling, pulse noise. Measuring approximately 4" square, this compact accessory speaker is rated at 10 watts and comes with 10' cable and 1/8" (3.5 mm) miniplug. Hinged mobile mounting bracket included.



ORDER SPK 6

\$16⁹⁵

SHIPPING
\$5.50 UPS
\$4.50 US Priority Mail
\$9 Canadian UPS
\$5.50 Canadian APP

Mobile DC Power Converter

It's hard to find a DC operated accessory that *won't* work with the new Grove DCC 3 cigarette lighter adaptor. Equipped with the six most popular power plugs and switchable among 1.5, 3, 4.5, 6, 7.5, 9, and 12 volts at up to 800 mA current, this mobile powerhouse is the most versatile we've ever seen!



ORDER DCC 3

\$12⁹⁵

SHIPPING
\$5.50 UPS
\$4.50 US Priority Mail
\$7 Canadian APP
\$9 Canadian UPS

Alkaline/NiCd Batteries

BAT 1 AA Batteries \$.79 ea.
BAT 2 D Batteries \$ 1.19 ea.
BAT 3 C Batteries \$ 1.09 ea.
BAT 4 9V Batteries \$ 2.25 ea.
BAT 6 AAA Batteries \$.75 ea.
BAT 6S 12-pack AAA Batteries \$ 6.00
BAT 13 AA NiCd rechargeable Batteries \$ 2.75 ea.



FREE SHIPPING w/PURCHASE OF ANY OTHER BATTERIES!
SHIPPING
\$3 UPS or US Priority
\$5.50 Canadian APP
\$6.00 Canadian UPS

GROVE'S SHORTWAVE ACCESSORY MART

Portable Power Station

A rugged, battery power source that can actually run your high-powered monitoring equipment and a few other accessories when needed with enough reserve power to start your car if that battery is dead. The Power Station is a compact powerhouse built around a 12 volt, 7 ampere-hour, rechargeable gel cell contained in a rugged ABS carrier. You can choose 3, 6, 9 or 12 volts output. Dimensions 7lbs, H8" x W7 x 4.5.



ORDER PWR 1
\$59⁹⁵
 SHIPPING
 \$6.50 UPS
 \$5.50 US Priority Mail
 \$7.50 Canadian APP
 \$10.50 Canadian UPS

Universal Power Supply

Our universal AC adaptor is especially rugged, capable of switching to your choice of 3, 4.5, 6, 7.5, 9 or 12 volts DC at a current of 500 milliamps (1/2 amp)! Another switch lets you choose + or - polarity.

An array of plugs on its interconnect cord assures proper mating to any electronic accessory. Plugs into standard house current (120 VAC, 60 Hz).

A \$15 Value!
 ORDER PWR 13
\$9⁹⁵
 SHIPPING
 \$5.50 UPS
 \$5.50 US Priority Mail
 \$6.50 Canadian APP
 \$7 Canadian UPS

AC Wall Adaptors

Grove's PWR 12 Universal power supply plugs into 120V AC wall socket and provides 3, 4.5, 6, 7.5, 9 and 12 volts DC switchable polarity, at up to several hundred mA (intermittent use). Has six different plugs for virtually every accessory. List price \$12.95.



The PWR 19 (not shown) provides 12VDC at 200 mA from standard 2.1 mm coax plug (center +). UL and CSA approved.

ORDER PWR 12
\$4⁹⁵
 SHIPPING
 \$4 UPS or Priority Mail
 \$5.50 Canadian APP
 \$6.50 Canadian UPS

ORDER PWR 19
\$7⁹⁵
 SHIPPING
 \$3.50 UPS or Priority Mail
 \$5.50 Canadian APP
 \$6.50 Canadian UPS

Tiny Sangean SR-77

Here's a great little companion for anyone on the go: a tiny FM/AM radio from Sangean that literally could get lost in your shirt pocket. Not only is it cute, but it somehow pulls in distant stations and delivers high quality FM stereo reception to its tiny earphones, included. This little dynamo even has Deep Bass Boost which kicks in at the flick of a switch.



Measuring only 3"x1.5"x.5", it's the perfect answer for recreational listening, emergency news and weather monitoring. Runs on one AAA battery included.

ORDER RCV15
\$29⁹⁵
 SHIPPING
 \$5 UPS
 \$3.50 US Priority Mail
 \$6 Canadian APP
 \$6.50 Canadian UPS

Naval HTS-3 Compact Amplified Speaker



Designed for handheld walkie talkies and scanners, this amplified speaker puts out a resounding one watt of audio in noisy locations!

Powered by AA nicads or alkalines (or 12V auto system via included cigarette lighter cord), battery saver automatically shuts off power when no sound is present. It activates a tape recorder whenever sound is present (1/8", 3/32" cables included)!

ORDER SPK 11
\$29⁹⁵
 SHIPPING
 \$6.50 UPS
 \$7 US Priority Mail
 \$10 Canadian UPS or APP

ACCESSORIES
 BAT 1 AA Alkaline batteries \$.79
 PWR 13 AC wall power supply \$9.95
 BAT 13 Nicad AA batteries (4 required) \$2.75/each

AC Surge Protectors

Protect your delicate radio, computer, TV, stereo, test equipment, and other electronic equipment from devastating power-line voltage spikes and current surges. For all standard U.S. and Canada power lines (120 VAC, 1875 W, 60 Hz, 15 A).



Not shown to scale

ORDER LAR 2 (single outlet)
\$3⁹⁵
 SHIPPING
 \$1.50 First Class
 \$4 UPS
 \$5.50 Canadian APP
 \$6 Canadian UPS

ORDER LAR 3 (6 outlets)
\$4⁹⁵
 SHIPPING
 \$2 First Class
 \$4 UPS
 \$5.50 Canadian APP
 \$6 Canadian UPS



Cassette Audio Adaptor

Listen to your scanner over your car or home stereo! Imagine—any electronic component that you own with an audio output jack (including your scanner or shortwave receiver) can be played directly through your home stereo system, portable "boom box," auto stereo or any other cassette player to provide full, rich sound! Shaped like a normal cassette, this adaptor slides into your cassette player. Your scanner or audio device then attaches to the adaptor with a 1/8" (3.5 mm) stereo or mono plug (included with flexible cord).



ORDER ACC 79
\$9⁹⁵
 SHIPPING
 \$2 First Class
 \$4 UPS
 \$5.50 Canadian APP
 \$6 Canadian UPS

Color Radio Spectrum Chart

Grove offers this incredible 30" x 40", full color, fold-out wall chart of the United States radio spectrum! Printed on heavy gloss paper, the chart of the spectrum shows both government and non-government frequency allocations from 9 kHz through 300,000 MHz (300 GHz)—the entire radio spectrum!



30 services are shown in separate colors
 ORDER CHT 1
\$9⁹⁵
 SHIPPING
 \$5.50 UPS
 \$2.50 Bookrate
 \$12 Canadian UPS
 \$12 Canadian APP

Great Caller ID Value!



The Bel-Tronics AD100 intercepts unwanted or unidentified calls and even displays the name and phone number of the caller!

- **Call Reject:** Reject up to 100 unwanted phone numbers; the AD100's computerized voice says politely that the call will not be accepted!
- **Block Buster:** If a caller has blocked his identity, the AD100 will not accept the call!
- **Call Screening:** Shows incoming name and phone number immediately for you to see.
- **Automatic Logging:** Memorizes and displays last 100 incoming calls for your reference.

Attractive off-white color; compact (5.3" x 3.4" x 2.1"). Requires 9-volt alkaline battery; low battery indicator on screen. Stand-up or wall-mount capable; telephone cord included.

ORDER PHN 04
\$69⁹⁵
 SHIPPING
 \$7 UPS
 \$9 US Priority Mail
 \$12 Canadian UPS
 \$12 Canadian APP

GROVE'S SHORTWAVE ACCESSORY MART

MFJ World Map Digital Clock



This new desk digital world map/clock adds a touch of golden elegance to your radio room. Time zones are available at the touch of a button, and the day of the week, date, and local 12 or 24 hour time with one second per day accuracy are also displayed in large LCD characters. Key cities across the globe are highlighted to make identification easier and an alarm tone can be set to alert you to any particular time. The MFJ-112 measures 4" H x 3-1/2" W and battery is included.

ORDER CLK 4
\$24⁹⁵

SHIPPING
\$6 UPS
\$5 US Priority Mail
\$10 Canadian UPS
\$7.50 Canadian APP

Also available from MFJ: Dual Digital Clock (CLK 2, \$19.95) and Giant Display Digital Clock (CLK 5, \$39.95). Call for more information.

24-Hour Analog Studio Clock



This studio clock from Grove Enterprises is a professional 13" Seth Thomas, featuring a 24-hour movement with bold, black numerals and a red sweep-second hand.

A convenient set knob allows precise set-up at installation; add an inexpensive alkaline AA cell (not included) and you have at least a year of unattended, accurate time — even during power outages.

ORDER CLK 1
\$24⁹⁵

SHIPPING
\$5.50 UPS
\$5 US Priority Mail
\$10 Canadian UPS
\$7.50 Canadian APP

Also available: Limited Edition Grove Expo Studio Clock (similar to above, but with Grove logo in center of dial). Order CLK 1C, same price and shipping charges.

GREAT BOOKS FROM THE GROVE RADIO LIBRARY

1997 SHORTWAVE FREQUENCY GUIDE

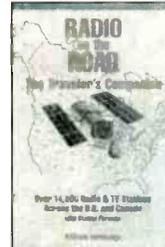


Whether you are an international broadcast monitor or a utilities DXer, this massive new frequency guide is an indispensable reference. Arranged by frequency from VLF through shortwave, its worldwide listings include station location, mode, name, call sign, and broadcasting times. An extensive introduction of listening hints and a glossary of abbreviations complete this essential volume. Use shipping code B. Target Audience: general.

BOK 34

\$29⁹⁵

New 2nd Edition! RADIO ON THE ROAD



By William Hutchings

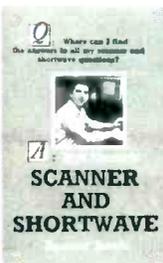
If you are a frequent interstate traveler, or even a medium wave or FM DXer, this directory of AM and FM broadcasters across the country — including Canada — will come in handy. Alphabetized by state and city, the "Traveler's Companion" lists virtually every domestic radio broadcaster you will be likely to hear, and classifies them by format (country, pop, classical, etc.), and includes call signs for ready identification. Use shipping code B.

New cover photo not available before print time.

BOK 33

\$14⁹⁵

SCANNER AND SHORTWAVE ANSWER BOOK



By Bob Grove

What is the best antenna for your requirements? When do you need a preselector rather than a preamp? What is the difference between "meter band," "megahertz" and "kilohertz"?

These are samples of the hundreds of questions expertly answered by Bob Grove's guide to monitoring. Liberally illustrated and professionally printed. Affordably priced for hobbyists, new and experienced. Use Shipping Code A. Target Audience: beginner.

BOK 5

\$12⁹⁵

RECEIVING ANTENNA HANDBOOK



By Joe Carr

This handy guide to home-brew shortwave antennas is the best in recent history. Authoritative and comprehensive, Carr's treatment of receiving antennas is first rate. Basic theory is easy to understand. Construction articles cover random wire, dipoles, multiband designs, disguise antennas, verticals, loops, longwires, direction finding, arrays, loops, and more. Use shipping code B. Target Audience: general.

BOK 74

\$19⁹⁵

WORLDWIDE AERONAUTICAL DIRECTORY

2nd Edition



By Robert E. Evans

The most complete and up-to-date aeronautical frequency guide in publication! Over 2,350 frequencies in the commercial and military air services, including voice and digital modes in the HF, VHF and UHF ranges.

RTTY, SSB, ACARS, and VOLMET services worldwide along with glossary of terms, source list, extensive codes, designators, waypoint data, and sector maps. Explanatory text reveals how to decipher the contents of messages. Use shipping code A. Target Audience: general.

BOK 86

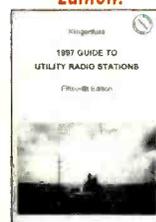
\$19⁹⁵

KLINGENFUSS GUIDE TO UTILITIES

New 1997 Edition!

By Joerg Klingenfuss

New CD-ROM available!



The most comprehensive directory of worldwide utilities ever produced for the first 30 MHz of the spectrum. Lists SSB, RTTY, Fax, CW and other modes as well. Extremely accurate; nearly 20,000 frequencies with call signs, station name, location and mode. Military, diplomatic, maritime, air, federal, press, etc. CD-ROM, sold separately, contains Klingenfuss database and other useful data. Use shipping code B. Target Audience: general.

BOK 54-97

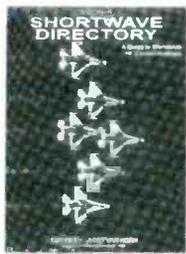
\$39⁹⁵

SFT 3 (CD)

\$34⁹⁵



8th Edition! **SHORTWAVE DIRECTORY**



By Bob Grove

Edited by MT's own Larry Van Horn, the 8th edition Shortwave Directory is the consummate DXer's bible for the first 30 MHz of radio spectrum. Completely revised and updated, the 256 page, loose-leaf, three-hole punched edition features every HF listening target. Worldwide military organizations are featured and include all new U.S. and foreign listings. Now includes RTTY, FAX and other digital listings, coastal stations, non-directional beacons, and much more! A matching, professional, 2" slant D-ring binder is available for only \$5! Use shipping code B. Target Audience: general.

BOK 14-94 \$9⁹⁵ With Binder \$14⁴⁵

CONFIDENTIAL FREQUENCY LIST



By Geoff Halligey

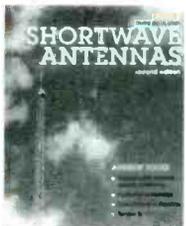
This 9th edition is the latest update to an excellent reference on 4-28 MHz communications. Listings by frequency include ship and shore stations, embassy communications, aeronautical radio, INTERPOL, spy numbers stations, military tactical communications, and more.

Thousands of utilities (two-way communications) frequencies, conveniently arranged in numeric order. If you hear it on the air, it is probably listed in this edition of the famous CFL. Use shipping code B. Target Audience: general.

New 9th Edition!

BOK 4 \$24⁹⁵

BUILD YOUR OWN SHORTWAVE ANTENNAS



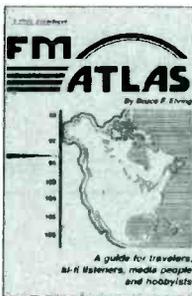
By Andrew Yoder

2nd Edition!

No other accessory can add so much to your listening satisfaction as the proper antenna. With the expertise that comes only from experience, Yoder presents this highly informative, profusely-illustrated handbook on how to design and install indoor, limited space, portable and directional antennas as well as tuners and couplers, providing optimal reception throughout the shortwave frequencies. Use shipping code A. Target Audience: general.

BOK 89 \$16⁹⁵

FM ATLAS



NEW 17th Edition. By Bruce Elving

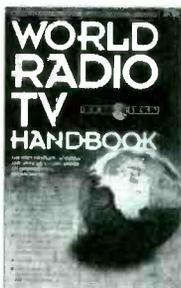
This is the authoritative reference on U.S., Canadian and Mexican FM broadcasting stations for FM DXers. All mapped by state and province with cross-reference by frequency, callsign and city.

Use shipping code A. Target Audience: general.

BOK 64 \$14⁹⁵

1997 WORLD RADIO TV HANDBOOK

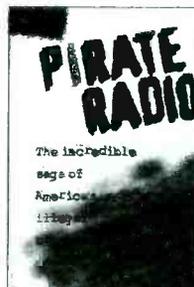
See p. 5 for pre-publication special on the 1998 edition of WRTH



Valued by its readers for 50 years, **World Radio TV Handbook** is a "must have" resource for radio buffs and broadcasting professionals. This annual publication shows what's on the airwaves anywhere in the world at any time. It features country-by-country listings of long, medium, and shortwave stations by frequency, time and language. Also, an hour-by-hour guide to broadcasts in English, a survey of high-frequency broadcasting reception conditions for the year and much more. Use shipping code B.

BOK 3-97 \$24⁹⁵

PIRATE RADIO



By Andrew Yoder

Yoder's reputation as an authority on pirate radio broadcasters is legend, and his newest book takes readers on a walk on radio's wild side!" Containing historical perspectives as well as insightful views into modern pirate broadcasting, we also learn of pirates' probable future. Included is an excellent CD recording of actual broadcasts from the most famous—and notorious—pirates of the Past. Use shipping code B. Target Audience: general.

BOK 47 \$29⁹⁵

THE ARRL 1997 HANDBOOK FOR RADIO AMATEURS

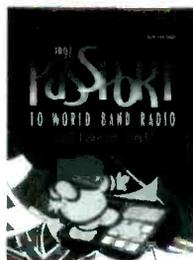


Lavishly illustrated, the Handbook's 1200 pages cover basic and advanced theory of radio communications, from low frequencies through microwave. A Windows software design package includes a directory of more than 1000 parts suppliers.

How-to articles instruct readers to build transmitters, receivers, antennas, test equipment, power supplies, and accessories. Advanced topics include moonbounce, repeaters, satellites, interference, and direction finding. Use shipping code B. Target Audience: advanced.

BOK 58-97 \$38⁰⁰

PASSPORT TO WORLD BAND RADIO, 1997



Edited by Lawrence Magne

Closeout!

Over 500 pages, features a listener's program guide, arranged both by frequency (2-26 MHz) and easy-to-follow time chart. Listings show transmitter output power, language, favored listening times for North America, and program contents. Reviews of the most popular shortwave receivers and listening accessories. Special alphabetized section of station addresses, contact personnel, phone/fax numbers. Use shipping code B. Target Audience: general.

Pre-publication special on 1998 Passport: Only \$16.95 with free shipping! See p. 5

BOK 18-97 \$12⁹⁵

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<i>NEW!</i> 6-month subscription to <i>MT</i> magazine		6 months*	\$12.95 (US)	-----	
<i>Satellite Times</i> magazine subscription		1 year**	\$19.95 (US)	-----	

* Two-year subscription to *Monitoring Times*, \$45.95; Three years, \$67.95. Canadian surface, one year \$36.50; Foreign surface, one year \$55.45; Foreign air mail, one year \$85.95

** Two-year subscription to *Satellite Times*, \$38; Three years, \$56. Canadian surface, one year \$28.50; Foreign surface, one year \$46.50; Foreign air mail, one year \$68.00

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FREQUENCIES

1100-1200	Anguilla, Caribbean Beacon	11775am				1100-1200	Singapore, R Singapore Int	6015as	6155as		
1100-1200	Australia, Radio	9580pa	9770pa	9860pa	11660as	1100-1130	Solomon Islands, SIBC	5020do	9545do		
		13605as				1100-1130	Sri Lanka, Sri Lanka BC	11835as	17850as		
1100-1130	Australia, Radio	11640as				1100-1130	Switzerland, Swiss R Intl	13635as	15415as	17515as	
1100-1200 vl	Australia, VL8A Alice Spg	2310do				1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200 vl	Australia, VL8K Katherine	2485do				1100-1200	United Kingdom, BBC WS	5965am	6190af	6195va	9410eu
1100-1200	Australia, VL8T Tent Crk	2325do						9580as	11750as	11760as	11940af
1100-1200	Canada, CFCX Montreal	6005do						11955as	12095eu	15220am	15310as
1100-1200	Canada, CFRX Toronto	6070do						15485va	15565as	15575va	17640na
1100-1200	Canada, CFPV Calgary	6030do						17705eu	17830af	17885af	21660af
1100-1200	Canada, CHNX Halifax	6130do				1100-1130 as	United Kingdom, BBC WS	15190am			
1100-1200	Canada, CKZN St John's	6160do				1100-1130	United Kingdom, BBC WS	9700as	11765va	15310as	17785as
1100-1200	Canada, CKZU Vancouver	6160do				1100-1145	United Kingdom, BBC WS	15400af	17790as		
1100-1200	Costa Rica, Adv World R	5030am	6150am	7375am	9725am	1100-1200	USA, KAIJ Dallas TX	5810am			
		13750am				1100-1200	USA, KTNB Salt Lk City UT	7510am			
1100-1200	Costa Rica, RF Peace Intl	7385am	7585am			1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	Ecuador, HCJB	12005am	15115am	21455au		1100-1200	USA, Monitor Radio Intl	6095na	7395sa	9355eu	9385au
1100-1200 as	Eq Guinea, R East Africa	15186af						9430au			
1100-1200	Eq Guinea, Radio Africa	9530as				1100-1200	USA, Voice of America	5985as	6160as	9645as	9760as
1100-1150	Germany, Deutsche Welle	15370af	15410af	17765af	17800af			11720as	15160as	15425as	
1100-1200	Iran, VOIRI	7180me	9585af	11875me	15260af	1100-1200	USA, WEWN Birmingham AL	7425eu			
1100-1200 vl	Italy, IRRS	7125va				1100-1200	USA, WHRI Noblesville IN	6040am	9495am		
1100-1200	Japan, R Japan/NHK World	6120na	7125na	11815as		1100-1200	USA, WJCR Upton KY	7490na			
1100-1200	Jordan, Radio	11690eu				1100-1200	USA, WRMI/R Miami Inti	9955am			
1100-1200	Lebanon, Voice of Hope	9960va				1100-1200	USA, WRNO New Orleans LA	7355am			
1100-1110	Liberia, LCN/R Liberia Int	5100do				1100-1200 as	USA, WVHA Greenbush ME	13825eu			
1100-1200	Malaysia, Radio	7295do				1100-1200	USA, WWCR Nashville TN	2390am	5935am	7435am	15685am
1100-1200 vl	Malaysia, RTM Kuching	7160do				1100-1200	USA, WYFR Okeechobee FL	5950na	11830na		
1100-1200 vl	Malaysia, RTM Kota Kinabalu	5980do				1100-1130	Vietnam, Voice of	7285as	9730as		
1100-1200	Mozambique, Radio Maputo	11820af	11835af			1100-1200	Zambia, Christian Voice	6065af			
1100-1125	Netherlands, Radio	12065as	13710as			1100-1200 vl	Zambia, R Zambia/ZNBC 1	7220do			
1100-1200	New Zealand, R NZ Intl	6100pa				1104-1120	Pakistan, Radio	15465eu	17865eu		
1100-1150	North Korea, R Pyongyang	3560na	4404na	6575na	9975na	1120-1140	Australia, Defense Forces R	4763as			
		11335na				1130-1140	Lesotho, Radio Lesotho	4800do			
1100-1130 as	Palau, KHBN/Voice of Hope	9730as				1130-1200	Myanmar, Voice of	5990do			
1100-1200 vl	Papua New Guinea, NBC	4890do				1130-1200	Netherlands, Radio	6045eu	9860eu		
1100-1200	Russia, Voice of Russia WS	4740as	11655as	11880as	15170as	1130-1200	Sweden, Radio	11650na	15240na		
		15460as	15490as	15510as	15560as	1130-1200	United Kingdom, BBC WS	6195am	17705va		
		17560as	17610as	17755as	17775as	1130-1200 f	Vatican State, Vatican R	15595as	17550au		
		17795as				1135-1140	India, All India Radio	9595do	11620do	11710do	15185do

SELECTED PROGRAMS

Sundays

- 1100 Costa Rica, R for Peace Intl: The Far Right Radio Review.
- 1100 USA, KAIJ Dallas TX: World University Network.
- 1100 USA, KTNB Salt Lk City UT: Breakthrough!
- 1130 Ecuador, HCJB Quito (am): The Christian's Hour.
- 1130 UK, BBC London (AE): India: A People Partitioned (3rd, 10th). A look at India and Pakistan 50 years after independence.
- 1130 USA, VOA Washington DC (as pac): Issues in the News.

Mondays

- 1100 New Zealand, Radio NZ Intl: Newsdesk (BBC).
- 1103 North Korea, R Pyongyang: News.
- 1110 USA, VOA Washington DC (as pac): American Gold.
- 1115 Japan, Radio: 44 Minutes.
- 1117 North Korea, R Pyongyang: Music.
- 1126 North Korea, R Pyongyang: Commentary.
- 1130 North Korea, R Pyongyang: Music of the Korean People's Army.
- 1130 Singapore, R Singapore Intl: News.
- 1131 Australia, Radio: Asia Focus.
- 1133 North Korea, R Pyongyang: The Spirit of Socialist Korea.
- 1134 Germany, Deutsche Welle: Africa Report.

Tuesdays

- 1100 Costa Rica, R for Peace Intl: Alternative Radio.
- 1103 North Korea, R Pyongyang: News.
- 1110 USA, VOA Washington DC (as pac): Now Music USA.
- 1115 Japan, Radio: 44 Minutes.
- 1115 North Korea, R Pyongyang: Music.
- 1121 North Korea, R Pyongyang: The Immortal Story.
- 1126 North Korea, R Pyongyang: Truth Idea.
- 1130 New Zealand, Radio NZ Intl: On the March.
- 1130 Singapore, R Singapore Intl: News.
- 1131 Australia, Radio: Asia Focus.
- 1134 Germany, Deutsche Welle: Africa Report.

Wednesdays

- 1100 Singapore, R Singapore Intl: News.
- 1100 USA, WWCR #3 Nashville TN: Newswatch Magazine.

- 1103 North Korea, R Pyongyang: News.
- 1109 Singapore, R Singapore Intl: Business and Market Report.
- 1110 USA, VOA Washington DC (as pac): Now Music USA.
- 1115 Japan, Radio: 44 Minutes.
- 1115 Singapore, R Singapore Intl: Star Trax.
- 1120 North Korea, R Pyongyang: The Reminiscences of the Great Leader.
- 1130 Singapore, R Singapore Intl: News.
- 1130 UK, BBC London (AF): Brain of Britain. Questions and answers as this popular quiz show continues.
- 1131 Australia, Radio: Asia Focus.
- 1139 North Korea, R Pyongyang: The Great Man of the Century.
- 1144 Japan, Radio: Close Up.
- 1151 Japan, Radio: Tumbling Dice.

Thursdays

- 1100 New Zealand, Radio NZ Intl: Newsdesk (BBC).
- 1103 North Korea, R Pyongyang: News.
- 1110 Australia, Radio: Sports Bulletin.
- 1110 USA, VOA Washington DC (as pac): Now Music USA (Top Ten).
- 1115 Japan, Radio: 44 Minutes.
- 1117 North Korea, R Pyongyang: Music.
- 1122 North Korea, R Pyongyang: Words of the Great Leader.
- 1127 North Korea, R Pyongyang: Music.
- 1130 New Zealand, Radio NZ Intl: Trading Post.
- 1130 Singapore, R Singapore Intl: News.

Fridays

- 1100 New Zealand, Radio NZ Intl: Newsdesk (BBC).
- 1100 USA, VOA Washington DC (as pac): VOA News.
- 1103 North Korea, R Pyongyang: News.
- 1106 Germany, Deutsche Welle: NewsLink.
- 1113 North Korea, R Pyongyang: Music.
- 1115 Japan, Radio: 44 Minutes.
- 1121 North Korea, R Pyongyang: Immortal Ideas of the Great Leader.
- 1130 Singapore, R Singapore Intl: News.
- 1130 USA, VOA Washington DC (as pac): Country Music USA.

- 1131 Australia, Radio: Asia Focus.
- 1131 North Korea, R Pyongyang: Music.
- 1138 North Korea, R Pyongyang: The Great Man of the Country.

Saturdays

- 1100 Costa Rica, R for Peace Intl: World of Radio.
- 1100 Papua New Guinea, NBC: News.
- 1103 North Korea, R Pyongyang: News.
- 1105 Papua New Guinea, NBC: Top of the Pops.
- 1105 Switzerland, Swiss Radio Intl: Newsnet.
- 1113 North Korea, R Pyongyang: Music/Commentary.
- 1130 Costa Rica, AWR: The Quiet Hour.
- 1130 Costa Rica, R for Peace Intl: RFPI's Mailbag.
- 1130 North Korea, R Pyongyang: All People Free.
- 1130 Singapore, R Singapore Intl: News.
- 1130 USA, VOA Washington DC (as pac): Press Conference USA.
- 1135 North Korea, R Pyongyang: Music.

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FREQUENCIES

1200-1300	Anguilla, Caribbean Beacon	11775am				1200-1300	Singapore, R Singapore Int	6015as	6155as		
1200-1300	Australia, Radio	5995as	9580pa	9710as	9860pa	1200-1300	South Korea, R Korea Intl	7285af			
		11660as	13605as			1200-1300	Switzerland, Swiss R Intl	6165eu	9535eu		
1200-1300 vl	Australia, VL8A Alice Spg	2310do				1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300 vl	Australia, VL8K Katherine	2485do				1200-1300	Ukraine, R Ukraine Intl	7150eu	7180eu	12045na	
1200-1300 vl	Australia, VL8T Tent Crk	2325do				1200-1300	United Kingdom, BBC WS	6190af	6195va	9410eu	9515am
1200-1300	Brazil, Radio Bras	15445na						9580as	9740as	11750as	11760as
1200-1230	Bulgaria, Radio	13790as						11940af	11955as	15220am	15310as
1200-1215	Cambodia, Natl Voice of	11940as						15485va	15565va	15575va	17640va
1200-1300 vl	Canada, CBC N Quebec Svc	9625do						17705af	17830af	17885af	21660af
1200-1300	Canada, CFCX Montreal	6005do				1200-1300	USA, KAIJ Dallas TX	5810am			
1200-1300	Canada, CFRX Toronto	6070do				1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	Canada, CFVP Calgary	6030do				1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	Canada, CHNX Halifax	6130do				1200-1300	USA, Monitor Radio Intl	6095na	9355as	9385au	9455sa
1200-1300	Canada, CKZN St John's	6160do				1200-1300	USA, Voice of America	6160as	9645as	9760as	11715as
1200-1300	Canada, CKZU Vancouver	6160do				1200-1230	USA, WEWN Birmingham AL	15160as	15425as		
1200-1230	Canada, R Canada Intl	9660as	9715me	11835me	11975me	1200-1300	USA, WGTG McCaysville GA	7425sa			
		15195as				1200-1300	USA, WHRI Noblesville IN	9400am			
1200-1300	Canada, R Canada Intl	9640am	11855am	13650am		1200-1300	USA, WJCR Upton KY	6040am	9495am		
1200-1300	China, China Radio Intl	7385pa	9565pa	9715as	11795pa	1200-1300	USA, WRMI/R Miami Intl	7490na			
1200-1230 vl	China, China Radio Intl	9660as	11700as	12110as		1200-1300	USA, WRNO New Orleans LA	9955am			
1200-1300	Costa Rica, RF Peace Intl	7385am				1200-1300	USA, WWCR Nashville TN	7355am			
1200-1300 vl	Cyprus, BRT International	6150do				1200-1300	USA, WYFR Okeechobee FL	7435am	9475am	13845am	15685am
1200-1300	Ecuador, HCJB	12005am	15115am	21455am		1200-1300	Uzbekistan, R Tashkent	5950na	6015na	11830na	17750na
1200-1300 as	Eq Guinea, R East Africa	15186af				1200-1230	Zambia, Christian Voice	7285as	9715as	15295as	
1200-1300	Eq Guinea, Radio Africa	9530as				1200-1300 vl	Zambia, R Zambia/ZNBC 1	6065af			
1200-1300	France, Radio France Intl	9805af	11600va	13625eu	15155eu	1207-1300 occsnal	New Zealand, R NZ Intl	7220do			
		15195eu	15540af	17575af		1215-1300	Egypt, Radio Cairo	6100po			
1200-1230	Iran, VOIRI	7180me	9585me	11875me	15260af	1215-1300	United Kingdom, BBC WS	17595as			
1200-1300 vl	Italy, IRRS	7125va				1230-1255	Austria, R Austria Intl	15220am			
1200-1300	Japan, R Japan/NHK World	7125as				1230-1300	Bangladesh, Bangla Betar	6155eu	13730na		
1200-1300	Jordan, Radio	11690eu				1230-1255 s	Belgium, R Vlaanderen Int	7185as	9550as		
1200-1300	Lebanon, Voice of Hope	9960va				1230-1300 mtwhf	Finland, YLE/R Finland	13785na	15535as		
1200-1300	Malaysia, Radio	7295do				1230-1300	Guam, AWR/KSDA	11900na	15400na		
1200-1300 vl	Malaysia, RTM Kota Kinabalu	5980do				1230-1300	India, All India Radio	13720as			
1200-1250	Myanmar, Voice of	5990do				1230-1235	Indonesia, RRI Sorong	4860do	6150do	17860do	
1200-1300	Netherlands, Radio	6045eu	9860eu			1230-1300 w	Mongolia, Voice of	4875do			
1200-1206	New Zealand, R NZ Intl	6100pa				1230-1300	Romania, R Romania Intl	12085as			
1200-1300	Nigeria, Voice of	7255af				1230-1300	South Korea, R Korea Intl	9690eu	11885eu	15365eu	17720eu
1200-1230 s	Norway, Radio Norway Intl	9590eu	13800as	13805na	15605au	1230-1300 mtwhf	Sri Lanka, Sri Lanka BC	9570as	9640as	13670as	
1200-1300 vl	Papua New Guinea, NBC	4890do				1230-1300	Sweden, Radio	9730as	15240pa		
1200-1255	Poland, Polish R Warsaw	6095eu	7145eu	7270eu	9525eu	1230-1300	Thailand, Radio	9655as	9885as	11850as	11905as
		11815eu				1230-1300	Turkey, Voice of	13750eu	15290as		
1200-1300	Russia, Voice of Russia WS	4740as	4975as	11655as	11785as	1230-1300	Vietnam, Voice of	5940as	7270as	7400as	9840as
		11880as	15110as	15170as	15230as			12020as	15010as		
		15430as	15435as	15490as	15510as	1240-1250	Greece, Voice of	11645af			
		17610as	17755as	17775as	17795as						

SELECTED PROGRAMS

Sundays

1200	France, Radio France Intl: News.
1215	Singapore, R Singapore Intl: Frontiers.
1216	France, Radio France Intl: African Analysis (biweekly).
1216	France, Radio France Intl: Asian Analysis (biweekly).
1223	France, Radio France Intl: Paris Promenade.
1228	France, Radio France Intl: Counterpoint (biweekly).
1228	France, Radio France Intl: Everywoman (biweekly).
1230	Finland, Radio: News/Weather.
1230	Papua New Guinea, NBC: Classical Music Concert.
1234	France, Radio France Intl: Club 9516.
1235	Finland, Radio: Finnish Press Review.
1238	Finland, Radio: YLE Features.
1245	Finland, Radio: Starting Finnish.
1254	Finland, Radio: Nuntii Latini.

Mondays

1200	Brazil, Radiobras: Brazilian Panorama.
1200	New Zealand, Radio NZ Intl: RNZ News.
1200	Papua New Guinea, NBC: News.
1204	Papua New Guinea, NBC: Music after Midnight.
1210	USA, VOA Washington DC (as pac): Stateside.
1215	Japan, Radio: Asian Top News.
1231	France, Radio France Intl: RFI Europe.
1238	France, Radio France Intl: News in Brief.
1239	Vietnam, Voice of Vietnam: Commentary.
1241	France, Radio France Intl: RFI Sports.
1247	France, Radio France Intl: Arts in France.

Tuesdays

1200	Canada, RCI Montreal: CBC Radio News.
1200	USA, VOA Washington DC (as pac): VOA News.

1205	USA, WWCR #3 Nashville TN: The Health and Home Show (live).
1210	USA, VOA Washington DC (as pac): Stateside.
1211	Canada, RCI Montreal: As It Happens.
1231	France, Radio France Intl: RFI Europe.
1236	France, Radio France Intl: Letter from a Listener.
1239	France, Radio France Intl: News Headlines.
1242	France, Radio France Intl: Books.
1249	France, Radio France Intl: Science Probe.

Wednesdays

1200	Brazil, Radiobras: Brazilian Panorama.
1200	Canada, RCI Montreal: CBC Radio News.
1200	France, Radio France Intl: News.
1200	Japan, Radio: News.
1200	USA, VOA Washington DC (as pac): VOA News.
1200	USA, WWCR #3 Nashville TN: UPI News.
1215	Taiwan, Voice of Free China: Music Box.
1231	France, Radio France Intl: RFI Europe.
1236	Finland, Radio: Finnish Press Review.
1238	France, Radio France Intl: News Headlines.
1242	France, Radio France Intl: The Bottom Line.
1247	France, Radio France Intl: Land of France.

Thursdays

1200	Brazil, Radiobras: Brazilian Panorama.
1200	Canada, RCI Montreal: CBC Radio News.
1200	France, Radio France Intl: News.
1211	Canada, RCI Montreal: As It Happens.
1220	Uzbekistan, Radio Tashkent: Life in the Village.
1222	Australia, Radio: Business Day.
1231	France, Radio France Intl: Sports.

1234	France, Radio France Intl: RFI Europe.
1241	France, Radio France Intl: News Headlines.
1244	France, Radio France Intl: The Americas Magazine.
1249	France, Radio France Intl: North/South (biweekly).
1249	France, Radio France Intl: Planet Earth (biweekly).

Fridays

1200	Brazil, Radiobras: Brazilian Panorama.
1200	Canada, RCI Montreal: CBC Radio News.
1210	USA, VOA Washington DC (as pac): Stateside.
1211	Canada, RCI Montreal: As It Happens.
1230	Finland, Radio: News/Weather.
1230	UK, BBC London (AF): Crossing the Border. See H 1515.
1231	France, Radio France Intl: RFI Europe.
1236	Finland, Radio: Finnish Press Review.
1239	France, Radio France Intl: News Headlines.
1240	Finland, Radio: YLE Features.
1241	France, Radio France Intl: Film Reel.
1248	France, Radio France Intl: Made in France.

Saturdays

1200	Brazil, Radiobras: The Best of Brazilian Popular Music.
1200	France, Radio France Intl: News.
1200	Papua New Guinea, NBC: News.
1204	Papua New Guinea, NBC: Top of the Pops.
1210	USA, VOA Washington DC (as pac): On the Line.
1228	France, Radio France Intl: Spotlight on Africa.
1230	Singapore, R Singapore Intl: News.
1230	UK, BBC London (AS): Brain of Britain. See W 1130.
1230	USA, VOA Washington DC (as pac): Communications World.
1245	France, Radio France Intl: News Headlines.
1245	Singapore, R Singapore Intl: Arts Arena.
1247	France, Radio France Intl: French Lesson.



FREQUENCIES

1300-1400	Anguilla, Caribbean Beacon	11775am				1300-1330	Turkey, Voice of	13695eu	13750va	15290as		
1300-1400	Australia, Radio	5995pa	9580pa	9770pa	11800pa	1300-1400	United Kingdom, BBC WS	5990as	6190af	6195va	9410eu	
1300-1330	Australia, Radio	13605as						9515am	9740va	11750as	11760as	
1300-1400 vl	Australia, VLBA Alice Spg	2310do						11865am	11940af	12095eu	15220am	
1300-1400 vl	Australia, VLBK Katherine	2485do						15310as	15420af	15485va	15565as	
1300-1400 vl	Australia, V18T Tent Crk	2325do						15575va	17640va	17705af	17830af	
1300-1325 mtwha	Belgium, R Vlaanderen Int	13785as	15535as					17885af	21470af	21660af		
1300-1320	Brazil, Radio Bras	15445na				1300-1400	USA, KAIJ Dallas TX	13815am				
1300-1400 vl	Canada, CBC N Quebec Svc	9625do				1300-1400	USA, KNLS Anchor Point AK	7365as				
1300-1400	Canada, CFCX Montreal	6005do				1300-1400	USA, KTVN Salt Lk City UT	7510am				
1300-1400	Canada, CFRX Toronto	6070do				1300-1400	USA, KWHR Naalehu HI	9930as				
1300-1400	Canada, CFVP Calgary	6030do				1300-1400	USA, Monitor Radio Intl	6095na	9355as	9430as	9455am	
1300-1400	Canada, CHNX Halifax	6130do				1300-1330	USA, Voice of America	6160as	9645as	9760as	11715as	
1300-1400	Canada, CKZN St John's	6160do						15160as	15425as			
1300-1400	Canada, CKZU Vancouver	6160do				1300-1400	USA, WEWN Birmingham AL	7425na	11875na	15375sa	15745eu	
1300-1400 mtwhf	Canada, R Canada Intl	9640am	11855am	13650am		1300-1400	USA, WGTG McCaysville GA	9400am				
1300-1400 s	Canada, R Canada Intl	11855am	13650am			1300-1400	USA, WHRI Noblesville IN	6040am	15105am			
1300-1400	China, China Radio Intl	6140as	7385pa	7405as	9715as	1300-1400	USA, WJCR Upton KY	7490na				
		11660pa	11980as			1300-1400 mtwhf	USA, WRMI/R Miami Intl	9955am				
1300-1400	Costa Rica, RF Peace Intl	7385am				1300-1400	USA, WRNO New Orleans LA	7355am				
1300-1330	Czech Rep, Radio Prague	13580eu	17485af			1300-1400 as	USA, WVHA Greenbush ME	15745na				
1300-1400	Ecuador, HCJB	12005am	15115am	21455am		1300-1400	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am	
1300-1330	Egypt, Radio Cairo	17595as				1300-1400	USA, WYFR Okeechobee FL	11830na	13695na	17750na	17750ca	
1300-1400 as	Eq Guinea, R East Africa	15186af				1300-1400	Zambia, Christian Voice	6065af				
1300-1400	Eq Guinea, Radio Africa	9530as				1300-1400 vl	Zambia, R Zambia/ZNBC 1	7220do				
1300-1330 vl	Italy, IRRS	7125va				1302-1400	USA, WYFR Okeechobee FL	11550as				
1300-1400	Jordan, Radio	11690eu				1330-1400	Canada, R Canada Intl	9535as	11795as	11935eu	15325me	
1300-1310	Liberia, LCN/R Liberia Int	5100do						17820af				
1300-1400	Malaysia, Radio	7295do				1330-1400	China, Heilongjiang PBS	4840do				
1300-1400 vl	Malaysia, RTM Kuching	7160do				1330-1400	Guam, AWR/KSDA	9650as				
1300-1400 vl	Malaysia, RTM KotaKinabalu	5980do				1330-1400	India, All India Radio	9545as	11620as	13710as		
1300-1400 occsna	New Zealand, R NZ Intl	6100pa				1330-1400 vl	Italy, IRRS	3985va				
1300-1400	Nigeria, Voice of	7255af				1330-1400	Netherlands, Radio	9890as	12090as	15585as		
1300-1350	North Korea, R Pyongyang	4405as	9345as	9640eu	11740as	1330-1400 vl	Pakistan, Radio	9485af	11565af	15595me		
		15230as				1330-1400 mtwhf	Portugal, R Portugal Intl	21515as				
1300-1400 vl	Papua New Guinea, NBC	4890do				1330-1400	Sweden, Radio	11650na	13740pa	15240na		
1300-1400	Philippines, FEBC/R Intl	11995as				1330-1355	UAE, Radio Dubai	15395eu	17630eu	21605me		
1300-1356	Romania, R Romania Intl	9690eu	11885eu	15365eu	17720eu	1330-1400	Uzbekistan, R Tashkent	7285as	9715as	15295as		
1300-1400	Russia, Voice of Russia WS	15430as	15460as	15560as	17610as	1330-1400	Vietnam, Voice of	5940eu	7270eu	7400eu	9840as	
		17795as						12020eu	15010as			
1300-1400	Singapore, R Singapore Intl	6015as	6155as			1335-1345	Greece, Voice of	9375eu	15175na	15630na		
1300-1400 mtwhf	Sri Lanka, Sri Lanka BC	9730as				1345-1400	Vatican State, Vatican R	11625as	13765au			
1300-1330	Switzerland, Swiss R Intl	7230as	7480as	13635as	15120as	1350-1400	South Korea, KBS-1	3930do				
		15415as	17515as			1355-1400	Georgia, Voice of Hope	12120as				

SELECTED PROGRAMS

Sundays

- 1300 Australia, Radio: World and Australian News.
- 1300 Singapore, R Singapore Intl: News.
- 1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
- 1305 Switzerland, Swiss Radio Intl: Newsnet.
- 1310 Australia, Radio: The Europeans.
- 1310 USA, VOA Washington DC (as pac): Critic's Choice.
- 1311 Russia, Voice of: Science and Engineering in the CIS.
- 1330 UAE, Radio Dubai: News.
- 1345 Vatican State, Vatican Radio: With Heart and Mind.
- 1352 Vatican State, Vatican Radio: On-the-Air.

Mondays

- 1300 Philippines, FEBC: News Insight.
- 1300 USA, VOA Washington DC (as pac): VOA News
- 1310 Australia, Radio: Dateline Asia Pacific.
- 1310 Brazil, Radiobras: Brazilian Reporter
- 1330 Philippines, FEBC: World News Update.
- 1330 Uzbekistan, Radio Tashkent: News.
- 1335 Philippines, FEBC: News from the Philippines.
- 1338 Netherlands, Radio: Newslines.
- 1340 Philippines, FEBC: Computer Corner.
- 1345 Vatican State, Vatican Radio: To the Ends of the Earth.
- 1353 Netherlands, Radio: Research File.

Tuesdays

- 1300 Australia, Radio: World and Australia News and Sport.
- 1300 Philippines, FEBC: News Insight.
- 1310 Australia, Radio: Dateline Asia Pacific.
- 1310 Brazil, Radiobras: Brazilian Reporter
- 1330 Philippines, FEBC: World News Update.
- 1338 Netherlands, Radio: Newslines.
- 1341 Canada, RCI Montreal: Spectrum.
- 1345 Vatican State, Vatican Radio: A Room with a View of the Vatican.
- 1354 Netherlands, Radio: Mirror Images.

- 1359 Vatican State, Vatican Radio: Ask the Abbot.

Wednesdays

- 1300 Philippines, FEBC: News Insight.
- 1305 Switzerland, Swiss Radio Intl: Newsnet.
- 1315 Philippines, FEBC: FEBC DX Dial.
- 1328 North Korea, R Pyongyang: The Reminiscences of the Great Leader.
- 1330 India, All India Radio: News and Commentary.
- 1330 Philippines, FEBC: World News Update.
- 1335 Philippines, FEBC: News from the Philippines.
- 1338 Netherlands, Radio: Newslines.
- 1339 North Korea, R Pyongyang: The Great Man of the Century.
- 1340 Philippines, FEBC: Computer Corner.
- 1345 Vatican State, Vatican Radio: The Rome Report.
- 1346 India, All India Radio: Indian Music.

Thursdays

- 1300 Philippines, FEBC: News Insight.
- 1310 Australia, Radio: Dateline Asia Pacific.
- 1310 Brazil, Radiobras: Brazilian Reporter.
- 1330 Philippines, FEBC: World News Update.
- 1330 UAE, Radio Dubai: News.
- 1335 Philippines, FEBC: News from the Philippines.
- 1340 Uzbekistan, Radio Tashkent: Correspondent Reports.
- 1345 Vatican State, Vatican Radio: The Pope and the People.
- 1350 Uzbekistan, Radio Tashkent: Life in the Village.
- 1350 Vatican State, Vatican Radio: Pilgrim City.
- 1352 Netherlands, Radio: Media Network.
- 1359 Vatican State, Vatican Radio: Postcards from Rome.

Fridays

- 1300 Australia, Radio: World and Australia News and Sport.
- 1300 Philippines, FEBC: News Insight.
- 1310 Australia, Radio: Dateline Asia Pacific.

- 1310 Brazil, Radiobras: Brazilian Reporter.
- 1330 Guam, AWR/KSDA: International Focus.
- 1330 Philippines, FEBC: World News Update.
- 1330 UAE, Radio Dubai: News.
- 1342 Portugal, Radio Portugal Intl: Visitors' Notebook.
- 1345 Vatican State, Vatican Radio: Then and Now.
- 1346 Portugal, Radio Portugal Intl: Listeners Mailbag (triweekly).

Saturdays

- 1300 Australia, Radio: World and Australian News.
- 1305 Singapore, R Singapore Intl: Chartbeat.
- 1305 Switzerland, Swiss Radio Intl: Newsnet.
- 1310 USA, VOA Washington DC (as pac): The American Agenda.
- 1315 Switzerland, Swiss Radio Intl: Capital Letters (2/4).
- 1330 Australia, Radio: Australia Today.
- 1340 Philippines, FEBC: Computer Corner.
- 1340 Singapore, R Singapore Intl: Regional Press Review.
- 1345 Vatican State, Vatican Radio: By the Way.
- 1351 Vatican State, Vatican Radio: Facing the Challenge.
- 1355 Netherlands, Radio: Weekend.
- 1356 Vatican State, Vatican Radio: What Can I Do?



Rob Green, host of Radio Netherlands' "Press Review" following "Newslines"



FREQUENCIES

1400-1500	Anguilla, Caribbean Beacon	11775am				1400-1500	Sri Lanka, Sri Lanka BC	9730as			
1400-1500	Australia, Radio	5995pa	9580pa	9860pa	11800pa	1400-1430	Thailand, Radio	9655as	9830as	11905as	
1400-1430	Australia, Radio	9770pa				1400-1500	United Kingdom, BBC WS	5990as	6190af	6195as	9410eu
1400-1500 vl	Australia, VL8A Alice Spg	2310do						9515am	9740as	11750as	11865am
1400-1500 vl	Australia, VL8K Katherine	2485do						11940af	12095eu	15220am	15485va
1400-1500 vl	Australia, V18T Tent Crk	2325do						15565as	15575va	17640va	17830af
1400-1500 vl	Canada, CBC N Quebec Svc	9625do						17840am	21470af	21660af	
1400-1500	Canada, CFCX Montreal	6005do				1400-1500	USA, KAIJ Dallas TX	13815am			
1400-1500	Canada, CFRX Toronto	6070do				1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	Canada, CFVP Calgary	6030do				1400-1500	USA, KTBN Salt Lk City UT	7510am			
1400-1500	Canada, CHNX Halifax	6130do				1400-1500	USA, Monitor Radio Intl	9355as			
1400-1500	Canada, CKZN St John's	6160do				1400-1500	USA, Voice of America	6160as	7125as	7215as	9645as
1400-1500	Canada, CKZU Vancouver	6160do						9760as	15160as	15225va	15395as
1400-1500 s	Canada, R Canada Intl	11855am	13650am					15425as			
1400-1500	China, China Radio Intl	7160as	7405na	7405as	11825as	1400-1500	USA, WEWN Birmingham AL	9455na	11875na	15745eu	
1400-1500	Costa Rica, RF Peace Intl	7385am				1400-1500	USA, WGTG McCaysville GA	9400am			
1400-1500	Ecuador, HCJB	12005am	15115am	21455am		1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500 as	Eq Guinea, R East Africa	15186af				1400-1500	USA, WJCR Upton KY	7490na			
1400-1500	France, Radio France Intl	11910as	15405me	17560me		1400-1500	USA, WRMI/R Miami Intl	9955am			
1400-1500	Georgia, Voice of Hope	12120as				1400-1500	USA, WRNO New Orleans LA	7355am			
1400-1500	India, All India Radio	9545as	11620as	13710as		1400-1500 as	USA, WVHA Greenbush ME	15745na			
1400-1430	Israel, Kol Israel	12080na	15650na			1400-1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400-1500 vl	Italy, IRRS	3985va				1400-1500	USA, WYFR Okeechobee FL	5950na	11550sa	11830na	17750ca
1400-1500	Japan, R Japan/NHK World	7200eu				1400-1405	Vatican State, Vatican R	11625as	13765au		
1400-1500	Jordan, Radio	11690eu				1400-1500	Zambia, Christian Voice	6065af			
1400-1500	Malaysia, Radio	7295do				1400-1500 vl	Zambia, R Zambia/ZNBC 1	4910do			
1400-1500	Malaysia, RTM Kuching	7160do				1415-1430 vl	Cyprus, BRT International	6150do			
1400-1500 vl	Malaysia, RTM KotaKinabalu	5980do				1415-1427	Nepal, Radio	5005do	7165do		
1400-1430	Mexico, Radio Mexico Intl	9705na				1420-1500 as	Palau, KHBN/Voice of Hope	9985as			
1400-1500	Netherlands, Radio	9890as	12090as	15585as		1430-1500	Australia, Radio	6080pa	6080pa	9615as	9850pa
1400-1500 occsnal	New Zealand, R NZ Intl	6100pa						11660as			
1400-1410	Pakistan, Radio	9485af	11565af	15595me		1430-1500	Guam, AWR/KSDA	7400as			
1400-1500 vl	Papua New Guinea, NBC	4890do				1430-1440	India, All India Radio	6150do	9565do	9835do	
1400-1500	Philippines, FEBC/R Intl	11995as				1430-1440 mtwlf	Indonesia, RRI Uj Pandang	4753do			
1400-1500	Russia, Voice of Russia WS	4740me	4940me	4975me	7345as	1430-1500	Romania, R Romania Intl	15335as	17720as		
		9595me	9800as	11665me	11835me	1430-1500 vl	Zambia, R Zambia/ZNBC 2	6165do			
		11985me	15350me	15430me	15540me	1440-1500	Myanmar, Voice of	5990do			
1400-1500	Singapore, R Corp of Sing	6155do									

SELECTED PROGRAMS

Sundays

1400	Australia, Radio: World and Asian News.	1410	USA, VOA Washington DC (as pac): Asia Report.
1401	UK, BBC London (All): A Question of Science (3rd, 10th, 17th). John Wilson looks at how science affects every aspect of our lives.	1411	Russia, Voice of: News and Views.
1416	France, Radio France Intl: Asian Analysis (biweekly).	1418	Australia, Radio: Business Day.
1422	France, Radio France Intl: Paris Promenade.	1426	Australia, Radio: Around Australia.
1430	Philippines, FEBC: Far East Forum.	1431	Australia, Radio: Science File.
1432	France, Radio France Intl: News in Brief.	1431	France, Radio France Intl: RFI Europe.
1432	Russia, Voice of: Kaleidoscope.	1432	Russia, Voice of: The Jazz Show.
1433	France, Radio France Intl: Club 9516.	1441	France, Radio France Intl: News in Brief.
1439	Netherlands, Radio: Wide Angle.	1443	France, Radio France Intl: The Bottom Line.
1445	Philippines, FEBC: Sound Words.	1446	France, Radio France Intl: Land of France.
1454	Netherlands, Radio: Siren Song.		

Mondays

1400	Australia, Radio: World and Asian News.	1400	Australia, Radio: World and Asian News.
1411	Russia, Voice of: News and Views.	1400	USA, VOA Washington DC (as pac): VOA News.
1426	Australia, Radio: Around Australia.	1426	Australia, Radio: Around Australia.
1430	Netherlands, Radio: News.	1431	France, Radio France Intl: Sports.
1431	Australia, Radio: Innovations.	1435	France, Radio France Intl: RFI Europe.
1431	France, Radio France Intl: RFI Europe.	1441	France, Radio France Intl: News in Brief.
1432	Russia, Voice of: Folk Box.	1443	France, Radio France Intl: North/South (biweekly).
1438	France, Radio France Intl: News in Brief.	1443	France, Radio France Intl: Planet Earth (biweekly).
1438	Netherlands, Radio: Newslines.	1443	France, Radio France Intl: The Americas Magazine (5).
1440	France, Radio France Intl: RFI Sports.	1448	France, Radio France Intl: Made in France.
1445	UK, BBC London (AE/AF): The Lab. A new magazine program on science and technology for young people.	1453	Netherlands, Radio: Research File.
1447	France, Radio France Intl: Arts in France.		
1454	Netherlands, Radio: A Good Life.		

Tuesdays

1400	Australia, Radio: World and Asian News.
1418	Australia, Radio: Business Day.
1426	Australia, Radio: Around Australia.
1431	Australia, Radio: Arts Australia.
1431	France, Radio France Intl: France Today.
1432	Russia, Voice of: Yours for the Asking.
1433	France, Radio France Intl: RFI Europe.
1441	France, Radio France Intl: News in Brief.
1442	France, Radio France Intl: Books.
1449	France, Radio France Intl: Science Probe.
1454	Netherlands, Radio: Music 52-15.

Wednesdays

1400	Australia, Radio: World and Asian News.
1401	Vatican State, Vatican Radio: What Can I Do?

Thursdays

1400	Australia, Radio: World and Asian News.
1400	USA, VOA Washington DC (as pac): VOA News.
1426	Australia, Radio: Around Australia.
1431	France, Radio France Intl: Sports.
1435	France, Radio France Intl: RFI Europe.
1441	France, Radio France Intl: News in Brief.
1443	France, Radio France Intl: North/South (biweekly).
1443	France, Radio France Intl: Planet Earth (biweekly).
1443	France, Radio France Intl: The Americas Magazine (5).
1448	France, Radio France Intl: Made in France.
1453	Netherlands, Radio: Research File.

Fridays

1400	Australia, Radio: World and Asian News.
1418	Australia, Radio: Business Day.
1426	Australia, Radio: Around Australia.
1431	France, Radio France Intl: RFI Europe.
1432	Russia, Voice of: Music at Your Request.
1438	Netherlands, Radio: Newslines.
1439	France, Radio France Intl: News in Brief.
1441	France, Radio France Intl: Film Reel.
1446	France, Radio France Intl: Silk Roads (biweekly).
1454	Netherlands, Radio: Documentary.

Saturdays

1400	Australia, Radio: World and Asian News.
1400	Vatican State, Vatican Radio: Faith by Numbers.
1411	Russia, Voice of: News and Views.
1425	France, Radio France Intl: Focus on France.
1430	Netherlands, Radio: News.
1430	USA, WHRI Noblesville IN (Angel 2): DXing with Cumbre.
1432	Russia, Voice of: Timelines.
1434	France, Radio France Intl: Asia File.
1438	Netherlands, Radio: Newslines.
1440	Philippines, FEBC: Mailbag.

1454 Netherlands, Radio: Roughly Speaking.

1455 Philippines, FEBC: FEBC DX Dial.

HAUSER'S HIGHLIGHTS RUSSIA : R. STANTSIYA TIKHIY OKEAN, VLADIVOSTOK

Daily 0715-0800 UTC
15490, 12070, 12055, 10344-USB,
9825, 9670, 7490-USB, 7210, 7185
kHz

1800-1845 UTC
11655, 9895, 9735 kHz
May also be relayed via Khabarovsk,
Magadan, Yuzhno-Sakhalinsk
(BBC Monitoring)

Low-power regional stations:

4040	5 kW	Tura	2100-1900
4485	17 kW	Ufa	2300-2100
4520	2 kW	Palana	1700-1500
5290	5 kW	Perm	2300-1430
7200	5 kW	Yoshkar-Ola	0100-1500
			not to be confused with...
7200	100 kW	Yakutsk	1900-1700
11650	5 kW	Perm	1500-2100
11840	15 kW	Yuzhno-Sakhalinsk	1700-1500

15165 5 kW Yoshkar-Ola 1530-2300
all one hour later Nov-Mar;
relay R. Rossii when not carrying their
own programs
(Nikolai Rudnev, Russia, BC-DX)

FREQUENCIES

1600-1700	Algeria, R Algiers Intl	11715af	15160me	15205af	1600-1640	UAE, Radio Dubai	15395me	17630eu			
1600-1700	Anguilla, Caribbean Beacon	11775am			1600-1700	United Kingdom, BBC WS	3255af	3915as	5975as	6190af	
1600-1700	Australia, Radio	5995pa	6060pa	6080pa			7160as	9410eu	11750as	12095eu	
		9615pa	9850pa	9860pa			15400af	15485eu	15565me	15575va	
		11800pa	12080pa				17830af	17840am	21470af	21660af	
1600-1700 vl	Australia, VLBA Alice Spg	2310do			1600-1615	United Kingdom, BBC WS	5990as	6195as	9515am	9740as	
1600-1700 vl	Australia, VLBK Katherine	2485do			1600-1700	USA, KAIJ Dallas TX	13815am				
1600-1700 vl	Australia, VLBT Tent Crk	2325do			1600-1700	USA, KTBN Salt Lk City UT	15590am				
1600-1610	Bangladesh, Bangla Betar	4880do	15520do		1600-1700	USA, KWHR Naalehu HI	9930as				
1600-1700 vl	Canada, CBC N Quebec Svc	9625do			1600-1700	USA, Monitor Radio Intl	18930af				
1600-1700	Canada, CFCX Montreal	6005do			1600-1700	USA, Voice of America	6035af	6110as	6160as	7125as	
1600-1700	Canada, CFRX Toronto	6070do					7215as	9645as	9700me	9760as	
1600-1700	Canada, CFPV Calgary	6030do					13600af	13710af	15205va	15225af	
1600-1700	Canada, CHNX Halifax	6130do					15255va	15395as	15410af	15445af	
1600-1700	Canada, CKZN St John's	6160do					17895af				
1600-1700	Canada, CKZU Vancouver	6160do			1600-1700	USA, WEWN Birmingham AL	11875na	13615na	15745eu		
1600-1700	China, China Radio Intl	15110af	15130af		1600-1700	USA, WGTG McCaysville GA	9400am				
1600-1700 as	Costa Rica, Adv World R	9725am	11870am	13750am	1600-1700	USA, WHRI Noblesville IN	13760am	15105am			
1600-1700	Costa Rica, RF Peace Intl	7385am			1600-1700	USA, WJCR Upton KY	7490na				
1600-1627	Czech Rep, Radio Prague	5930eu	17485af		1600-1700 smtwhf	USA, WMLK Bethel PA	9465eu				
1600-1700	Ethiopia, Radio	7165af	9560af	11800af	1600-1700 mtwhf	USA, WRMI/R Miami Intl	9955am				
1600-1700	France, Radio France Intl	11615me	11700af	12015af	1600-1700	USA, WRNO New Orleans LA	7355am				
		15460af	15530af		1600-1700	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am	
1600-1650	Germany, Deutsche Welle	6170as	7185af	7225as	1600-1700	USA, WYFR Okeechobee FL	11705na	11830na	15695eu	17750eu	
		9875as	11810af	13690as			21525af	21745eu			
				17800af	1600-1610	Vatican State, Vatican R	9940as	11635as			
1600-1630	Guam, TWR/KTWR	11580as			1600-1630	Vatican State, Vatican R	4005eu	582eu	7250eu	9645eu	
1600-1630	Iran, VOIRI	7215as	9550as				11810eu				
1600-1700 vl	Italy, IRRS	3985va			1600-1630	Vietnam, Voice of	9840af	15010af			
1600-1630	Jordan, Radio	11690eu			1600-1700	Zambia, Christian Voice	3330af	4965af			
1600-1610	Lesotho, Radio Lesotho	4800do			1600-1700 vl	Zambia, R Zambia/ZNBC 1	4910do				
1600-1700	Malaysia, Radio	7295do			1600-1700 vl	Zambia, R Zambia/ZNBC 2	6165do				
1600-1650 occsnal	New Zealand, R NZ Intl	6100pa			1610-1615	Bangladesh, Bangla Betar	4880do				
1600-1630	Pakistan, Radio	9485af	11565as	11935as	1610-1700	USA, WYFR Okeechobee FL	11550as				
		15595me		15570af	1615-1700 as	United Kingdom, BBC WS	9515am	11860af	15420af		
1600-1700 vl	Papua New Guinea, NBC	4890do			1630-1655	Austria, R Austria Intl	13730af	13730af			
1600-1700	Russia, Voice of Russia WS	7345as	7440eu	9440af	1630-1657	Canada, R Canada Intl	7150as	9550as			
		9615af	9635af	9675eu	1630-1700	Egypt, Radio Cairo	15255af				
		9765af	9775eu	9880af	1630-1700	Georgia, Radio	6180eu				
		11665me	11675af	11685me	1630-1700	Slovakia, Adv World Radio	11600as	13580me			
		11775va	11835va	11850va	1630-1700	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu		
		11985va	12025va	15350va	1645-1700 irreg	Afghanistan, Radio	7200as				
		15430eu	15540va	17875va	1645-1700	Tajikistan, Radio Dushanbe	7245as	9905as			
1600-1630	S Africa, Channel Africa	6120af	9685af		1650-1700	Eq Guinea, Radio Africa	15186af				
1600-1700	Singapore, R Corp of Sing	6155do			1650-1700 mtwhf	New Zealand, R NZ Intl	6145pa				
1600-1700	South Korea, R Korea Intl	5975eu	9515af	9870af							
1600-1700	Swaziland, Trans World R	9500af									
1600-1630	Switzerland, Swiss R Intl	12075as	13635as	15530as							

SELECTED PROGRAMS

Sundays

1600 Jordan, Radio: News Summary.
1603 Jordan, Radio: Listeners' Choice.
1605 Switzerland, Swiss Radio Intl: Newsnet.
1611 Russia, Voice of: Moscow Mailbag.
1615 UK, BBC London (AF): Opera of the Week. See S 1515.
1619 France, Radio France Intl: Everywoman (biweekly).
1619 France, Radio France Intl: Health Concerns (biweekly).
1622 France, Radio France Intl: Paris Promenade.
1626 France, Radio France Intl: Echoes from Africa (biweekly).
1631 France, Radio France Intl: News Headlines.
1632 France, Radio France Intl: Club 9516.
1632 Russia, Voice of: Timelines.

Mondays

1600 Jordan, Radio: News Summary.
1602 Vatican State, Vatican Radio: News.
1604 Jordan, Radio: On the Air if You Dare.
1606 Germany, Deutsche Welle: NewsLink.
1610 USA, VOA Washington DC (as): Mideast Edition.
1611 Russia, Voice of: Newmarket.
1630 USA, VOA Washington DC (me): American Gold.
1631 France, Radio France Intl: RFI Europe.
1632 Russia, Voice of: This is Russia.
1638 France, Radio France Intl: News Headlines.
1640 France, Radio France Intl: RFI Sports.
1647 France, Radio France Intl: Arts in France.

Tuesdays

1600 Jordan, Radio: News Summary.
1602 Vatican State, Vatican Radio: News.
1604 Jordan, Radio: Classical Jam.
1610 USA, VOA Washington DC (as): Mideast Edition.

1611 Russia, Voice of: Science and Engineering in the CIS.
1615 Vatican State, Vatican Radio: News.
1630 USA, VOA Washington DC (as): Now Music USA.
1633 France, Radio France Intl: RFI Europe.
1640 France, Radio France Intl: News Headlines.
1642 France, Radio France Intl: Books.
1647 France, Radio France Intl: Drumbeat.

Wednesdays

1600 Jordan, Radio: News Summary.
1604 Jordan, Radio: The Mix.
1605 Switzerland, Swiss Radio Intl: Newsnet.
1606 Germany, Deutsche Welle: NewsLink.
1610 USA, VOA Washington DC (as): Mideast Edition.
1611 Russia, Voice of: Science and Engineering in the CIS.
1630 USA, VOA Washington DC (as): Now Music USA.
1631 France, Radio France Intl: RFI Europe.
1633 Germany, Deutsche Welle: Africa Report.
1638 France, Radio France Intl: News Headlines.
1641 France, Radio France Intl: The Bottom Line.
1646 France, Radio France Intl: Land of France.

Thursdays

1600 Germany, Deutsche Welle: News.
1600 Jordan, Radio: News Summary.
1603 Jordan, Radio: Country Music.
1606 Germany, Deutsche Welle: NewsLink.
1611 Russia, Voice of: Moscow Mailbag.
1630 France, Radio France Intl: Sports.
1630 UK, BBC London (AS): The Lab. See M 1445.
1632 France, Radio France Intl: RFI Europe.
1632 Russia, Voice of: Moscow Yesterday and Today.
1639 France, Radio France Intl: News Headlines.

1641 France, Radio France Intl: North/South (biweekly).
1641 France, Radio France Intl: Planet Earth (biweekly).
1646 France, Radio France Intl: Science Probe.

Fridays

1600 Jordan, Radio: News Summary.
1602 Vatican State, Vatican Radio: News.
1604 Jordan, Radio: Country Music.
1610 USA, VOA Washington DC (as): Mideast Edition.
1630 USA, VOA Washington DC (as): Country Music USA.
1630 USA, VOA Washington DC (me): Now Music USA (Top 20 Countdown).
1631 France, Radio France Intl: RFI Europe.
1632 Russia, Voice of: Your Top Tune.
1638 France, Radio France Intl: News Headlines.
1641 France, Radio France Intl: Film Reel.
1646 France, Radio France Intl: Made in France.
1647 Russia, Voice of: You Write to Moscow.

Saturdays

1600 Jordan, Radio: News Bulletin.
1600 USA, VOA Washington DC (as): VOA News.
1605 Switzerland, Swiss Radio Intl: Newsnet.
1610 Australia, Radio: Asia Focus.
1610 USA, VOA Washington DC (as): On the Line.
1611 Russia, Voice of: Music and Musicians.
1613 Jordan, Radio: Music.
1614 France, Radio France Intl: Focus on France.
1615 Switzerland, Swiss Radio Intl: Capital Letters (2/4).
1630 USA, VOA Washington DC (af): News Summary.
1630 USA, VOA Washington DC (as): Press Conference USA.
1631 France, Radio France Intl: Spotlight on Africa.
1645 France, Radio France Intl: French Lesson.

FREQUENCIES

2100-2130	Albania, R Tirana Intf	7110eu	9515eu		
2100-2200	Anguilla, Caribbean Beacon	11775am			
2100-2200	Australia, Radio	7240pa	9660pa	9850pa	11695pa
		11855as	12080pa	13605pa	
2100-2130	Australia, Radio	6080pa	9860as	11880pa	
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2200 vl	Australia, VL8K Katherine	5025do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2200 vl	Australia, VL8T Tent Crk	4910do			
2100-2125	Belgium, R Vlaanderen Int	5910eu			
2100-2200	Bulgaria, Radio	9700eu	11720eu		
2100-2115 vl	Cameroon, Radio Cameroon	4850do			
2100-2200 vl	Cameroon, Radio Garoua	5010do			
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, R Canada Intl	11690af	13650af	13670af	15150af
		15325af	17820af		
2100-2130 mtwhf	Canada, R Canada Intl	5995eu			
2100-2200	China, China Radio Intl	5220eu	6950eu	9920af	
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2130	China, China Radio Intl	3985eu			
2100-2200	Costa Rica, RF Peace Intl	15050am			
2100-2130	Cuba, Radio Havana	13715eu	13725eu		
2100-2200 vl	Cyprus, BRT International	6150do			
2100-2200	Ecuador, HCJB	11990eu	21455am		
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200	Eq Guinea, Radio Africa	15186af			
2100-2150	Germany, Deutsche Welle	7115au	9670as	9735af	9765as
		11785au	11865af	15135af	
2100-2130	Germany, Adventist World R	9830af			
2100-2130	Hungary, Radio Budapest	3975eu	7250eu	9835eu	
2100-2200	India, All India Radio	7150eu	7410eu	9910eu	9950eu
		11620au	11715au		
2100-2200 vl	Italy, IRRS	3955va			
2100-2200	Japan, R Japan/NHK World	6035as	9535na	13630as	
2100-2107 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2100-2200	Lebanon, Voice of Hope	9960va			
2100-2115	Liberia, LCN/R Liberia Int	5100do			
2100-2107	Namibia, NBC	3270do	3290do		
2100-2200 smtwha	New Zealand, R NZ Intl	11735pa			
2100-2106 f	New Zealand, R NZ Intl	9845pa			
2100-2200	Nigeria, FRCM/Radio	3326do	4770do	4990do	
2100-2200	Nigeria, Voice of	7255af			
2100-2200 vl	Papua New Guinea, NBC	4890do			
2100-2156	Romania, R Romania Intl	7105eu	7195eu	9690eu	11810eu
2100-2200	Russia, Voice of Russia WS	7250eu	7350eu	7370eu	7440eu
		9620eu	9655eu	9665eu	9710eu
		9740eu	9765eu	9775eu	9880eu
		11840eu			
2100-2200	S Africa, World Music R	3345af	6290va		
2100-2130	Serbia, Radio Yugoslavia	6100eu	6185eu		
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2130	South Korea, R Korea Intl	3970eu			
2100-2200 as	Spain, R Exterior Espana	6125eu	11775af		
2100-2105	Syria, Radio Damascus	12085na	13610eu		
2100-2110	Uganda, Radio	4976do			
2100-2200	Ukraine, R Ukraine Intl	5905eu	6010eu	6020eu	6090eu
		7180eu	7240eu	9550na	9560na
		9640na	12040na	13590na	13720sa
2100-2200	United Kingdom, BBC WS	3255af	3915as	3955eu	5965as
		5975as	6005af	6180eu	6190af
		6195va	7325va	9410eu	9630va
		11750sa	11835af	11945as	12095eu
		15400af			
2100-2130	United Kingdom, BBC WS	9630af	15485af		
2100-2145	United Kingdom, BBC WS	11680sa			
2100-2200	USA, KAIJ Dallas TX	13815am			
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200	USA, Monitor Radio Intl	13770eu	15280as	15665eu	
2100-2200	USA, Voice of America	6035af	6040me	7375af	7415af
		9535af	9760eu	11870pa	11975af
		15185as	15410af	15445af	15580af
		17725af	17735as		
2100-2200	USA, WEWN Birmingham AL	5825am	13615na	15745eu	
2100-2200	USA, WGTG McCaysville GA	9400am			
2100-2200	USA, WHRI Noblesville IN	5745am	9495am		
2100-2200	USA, WINB Red Lion PA	13790eu			
2100-2200	USA, WJCR Upton KY	7490na			
2100-2200	USA, WRMI/R Miami Intl	9955am			
2100-2200	USA, WRNO New Orleans LA	7355am			
2100-2200 smtwhf	USA, WVHA Greenbush ME	13695af			
2100-2200	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
2100-2200	USA, WYFR Okeechobee FL	7355eu	11580af	15565eu	

2100-2200	Zambia, Christian Voice	3330af	4965af		
2100-2200 vl	Zambia, R Zambia/ZNBC 1	4910do			
2100-2200 vl	Zambia, R Zambia/ZNBC 2	6165do			
2100-2200 vl	Zimbabwe, Zimbabwe BC	4828do			
2108-2200 f	New Zealand, R NZ Intl	11735pa			
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130	United Kingdom, BBC WS	6175am	15390am	17715am	
2120-2200	Sweden, Radio	6065eu	9430af		
2130-2200	Australia, Radio	13755pa	17795pa	17860pa	
2130-2155	Austria, R Austria Intl	5945eu	6155eu	13730af	
2130-2157	Czech Rep, Radio Prague	11600af			
2130-2200	Ghana, Ghana Broadc Corp	3366do			
2130-2200	Guam, AWR/KSDA	15310as			
2130-2200	Iran, VOIRI	6165au	6175au		
2130-2200	Uzbekistan, R Tashkent	9540as	9545me		
2145-2200 a	Greece, Voice of	7480au	9425au		
2200-2300	Anguilla, Caribbean Beacon	11775am			
2200-2300	Australia, Radio	11695pa	11855as	13755pa	15365pa
		17795pa	17860pa		
2200-2300 vl	Australia, VL8K Katherine	5025do			

2200 UTC

2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2300	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, R Canada Intl	5960eu	9755am	11705as	13670am
		13740am	15305am		
2200-2300	China, China Radio Intl	9880eu			
2200-2300	Costa Rica, RF Peace Intl	7385am	15050am		
2200-2210	Croatia, Croatian Radio	5895eu	7370eu		
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eq Guinea, Radio Africa	15186af			
2200-2215	Ghana, Ghana Broadc Corp	4915do			
2200-2230	India, All India Radio	7150eu	7410eu	9910eu	9950eu
		11620au	11715au		
2200-2230	Iran, VOIRI	6165au	6175au		
2200-2225	Italy, RAI Intl	6150as	9565as	11815pa	
2200-2300	Lebanon, Voice of Hope	9960va			
2200-2215	Liberia, LCN/R Liberia Int	5100do			
2200-2300	Malaysia, Radio	7295do			
2200-2225	Moldova, R Moldova Intl	7520eu			
2200-2300 fa	New Zealand, R NZ Intl	11735pa			
2200-2215	Nigeria, FRCM/Radio	3326do	4770do	4990do	
2200-2230 s	Norway, Radio Norway Intl	9965sa			
2200-2300 vl	Papua New Guinea, NBC	9675do			
2200-2300	Russia, Voice of Russia WS	7125na	7250na	9620na	9655na
		9665na			
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, Adv World Radio	6055af			
2200-2300	Taiwan, VO Free China	15600eu	17750eu		
2200-2300	Turkey, Voice of	6135eu	7280eu	9560na	9655na
2200-2300	United Kingdom, BBC WS	5965as	5975am	6175am	6180eu
		6195as	7325va	9410va	9590am
		9660as	9890as	9915am	11750am
		11835af	11955as	12080as	15400af
2200-2230	United Kingdom, BBC WS	12095eu			
2200-2300	USA, KAIJ Dallas TX	13815am			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	13770eu	15280as		
2200-2300	USA, Voice of America	7215as	9705as	9770as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2200-2230 mtwhf	USA, Voice of America	6035af	7340af	7375af	7415af
		11975af			
2200-2300	USA, WEWN Birmingham AL	5825na	9975eu	13615na	
2200-2300	USA, WGTG McCaysville GA	5085am			
2200-2300	USA, WHRI Noblesville IN	5745am	9495am		
2200-2300	USA, WINB Red Lion PA	13790am			
2200-2300	USA, WJCR Upton KY	7490na			
2200-2300	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	7355am			
2200-2300 s	USA, WVHA Greenbush ME	5850eu			
2200-2300	USA, WWCR Nashville TN	7435am	9475am	12160am	13845am
2200-2300	USA, WYFR Okeechobee FL	17845af	21525af		
2200-2300 vl	Zambia, R Zambia/ZNBC 1	4910do			
2230-2300	Canada, R Canada Intl	5960am	9755am	13670am	
2230-2300	Cuba, Radio Havana	6000na			
2230-2227	Czech Rep, Radio Prague	7345na	11600na		
2230-2255	Moldova, R Moldova Intl	7520eu			
2240-2250	Greece, Voice of	7480au	9425au		
2245-2200	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	9705as	9950as	11620as	
2245-2300	Vatican State, Vatican R	7305as	9600as	11830au	

FREQUENCIES

2300-0000	Anguilla, Caribbean Beacon	6090am				2300-2356	Romania, R Romania Intl	5990na	6155na	9510na	9570na
2300-0000	Australia, Radio	9660pa	11695as	12080pa	13755as			11940na			
		15365pa	17795pa	17860pa		2300-0000	Russia, Voice of Russia WS	7125na	7250na	9665na	
2300-0000 vl	Australia, VL8K Katherine	5025do				2300-0000	Turkey, Voice of	6135na	7280eu	9655na	
2300-0000 vl	Australia, VL8T Tent Crk	4910do				2300-0000	United Kingdom, BBC WS	3915as	5965as	5975am	6175am
2300-0000	Bulgaria, Radio	7480na	9435na					9580as	9590na	9915am	11750sa
2300-0000	Canada, CBC N Quebec Svc	9625do				2300-2315	United Kingdom, BBC WS	11945as	11955as	15380as	
2300-0000	Canada, CFCX Montreal	6005do				2300-0000	USA, KAIJ Dallas TX	15400af			
2300-0000	Canada, CFRX Toronto	6070do				2300-0000	USA, KATN Salt Lk City UT	13815am			
2300-0000	Canada, CFVP Calgary	6030do				2300-0000	USA, KWHR Naalehu HI	15590am			
2300-0000	Canada, CHNX Halifax	6130do				2300-0000	USA, Monitor Radio Intl	17510as			
2300-0000	Canada, CKZN St John's	6160do				2300-0000	USA, Voice of America	13770af	15280sa		
2300-0000	Canada, CKZU Vancouver	6160do				2300-0000		7215as	9705as	9770as	11760as
2300-0000 mtwhf	Canada, R Canada Intl	9755am	11940am	13670am	15305am			15185as	15290as	15305as	17735as
2300-0000 as	Canada, R Canada Intl	5960am	9755am	11940am	13670am	2300-0000	USA, WEWN Birmingham AL	17820as			
		15305am				2300-0000	USA, WGTG McCaysville GA	5825na	9975na	13615na	
2300-0000	Costa Rica, Adv World R	5030am	6150am	9725am	13750am	2300-0000	USA, WHRI Noblesville IN	9400am			
		15460am				2300-0000	USA, WINB Red Lion PA	5745am	9495am		
2300-0000	Costa Rica, RF Peace Intl	7385am	15050am			2300-0000	USA, WJCR Upton KY	13790am			
2300-2310	Croatia, Croatian Radio	5895eu	7370eu			2300-0000	USA, WRMI/R Miami Intl	7490na			
2300-2330	Cuba, Radio Havana	6000na				2300-0000	USA, WRNO New Orleans LA	9955am			
2300-0000	Egypt, Radio Cairo	9900na				2300-0000	USA, WVHA Greenbush ME	7355am			
2300-2350	Germany, Deutsche Welle	5980as	7235as	9690as		2300-0000 mtwhf	USA, WWCR Nashville TN	9900af			
2300-0000	Guam, AWR/KSDA	11775as				2300-0000	USA, WWCR Nashville TN	5070am	7435am	9475am	13845am
2300-0000	Guatemala, Adv World R	11775am				2307-0000	New Zealand, R NZ Intl	15115pa			
2300-0000	India, All India Radio	9705as	9950as	11620as		2310-2315	Kyrgyzstan, Kyrgyz Radio	4010do	4050do		
2300-0000	Lebanon, Voice of Hope	9960va				2330-0000	Australia, Radio	13605as	17880as		
2300-2315	Liberia, LCN/R Liberia Int	5100do				2330-2355	Belgium, R Vlaanderen Int	9925sa	11690am		
2300-0000	Malaysia, Radio	7295do				2330-0000 vl	Ghana, Ghana Broadc Corp	4915af			
2300-2306	New Zealand, R NZ Intl	11735pa				2330-0000	Iraq, Radio Iraq Intl	6050eu	11890eu		
2300-2315	Nigeria, FRCN/Radio	3326do	4770do	4990do		2330-0000	Netherlands, Radio	6020na	6165na	9845na	
2300-2325	North Korea, R Pyongyang	11700na	13650na			2335-2345	Greece, Voice of	9395sa	9425sa	9935sa	11595sa
2300-0000 vl	Papua New Guinea, NBC	9675do				2335-2345	Sierra Leone, SLBS	3316do			

SELECTED PROGRAMS

Sundays

- 2300 Costa Rica, AWR: DXing with Cumbre.
- 2300 Costa Rica, R for Peace Intl: World of Radio.
- 2300 Guam, AWR/KSDA: Wavescan.
- 2305 Egypt, Radio Cairo: The Holy Koran and Its Meaning.
- 2315 USA, WWCR #3 Nashville TN: Ask WWCR.
- 2330 Egypt, Radio Cairo: Egyptian Songs.
- 2330 USA, WWCR #3 Nashville TN: World of Radio.
- 2331 Australia, Radio: The Sports Factor.
- 2331 Belgium, R Vlaanderen Intl: News.
- 2332 Russia, Voice of: Folk Box.
- 2339 Netherlands, Radio (am): Wide Angle.
- 2354 Netherlands, Radio (am): Siren Song.

Mondays

- 2300 Canada, N Quebec Svc: As It Happens.
- 2300 Canada, RCI Montreal: The World at Six.
- 2300 Vatican State, Vatican Radio: Ask the Abbot.
- 2310 USA, VOA Washington DC (as pac): VOA Worldwide.
- 2311 Russia, Voice of: News and Views.
- 2315 Egypt, Radio Cairo: News.
- 2345 USA, KWHR Naalehu HI: Reach Out.
- 2352 Costa Rica, R for Peace Intl: Hightower Radio.
- 2353 Netherlands, Radio (am): A Good Life.

Tuesdays

- 2300 Canada, N Quebec Svc: As It Happens.
- 2300 Canada, RCI Montreal: The World at Six.
- 2300 USA, VOA Washington DC (as pac): VOA News.
- 2305 Egypt, Radio Cairo: E-Mail.
- 2310 USA, VOA Washington DC (as pac): VOA Worldwide.
- 2311 Russia, Voice of: News and Views.
- 2315 Egypt, Radio Cairo: News.
- 2330 Costa Rica, R for Peace Intl: UN Perspective.
- 2332 Russia, Voice of: Your Top Tune.
- 2335 Greece, Voice of: News.
- 2338 Netherlands, Radio (am): Newslite.
- 2347 Russia, Voice of: You Write to Moscow.

Wednesdays

- 2300 Canada, N Quebec Svc: As It Happens.
- 2300 Canada, RCI Montreal: The World at Six.
- 2300 Cuba, Radio Havana Cuba: National News.
- 2300 Vatican State, Vatican Radio: Would You Believe It?
- 2306 Cuba, Radio Havana Cuba: Timeout.

- 2310 USA, VOA Washington DC (as pac): VOA Worldwide.
- 2311 Cuba, Radio Havana Cuba: Youth Speak Out.
- 2311 Russia, Voice of: News and Views.
- 2315 Egypt, Radio Cairo: News.
- 2335 Greece, Voice of: News.

Thursdays

- 2300 Canada, N Quebec Svc: As It Happens.
- 2300 Canada, RCI Montreal: The World at Six.
- 2300 Vatican State, Vatican Radio: Ask the Abbot.
- 2310 USA, VOA Washington DC (as pac): VOA Worldwide.
- 2311 Russia, Voice of: News and Views.
- 2315 Egypt, Radio Cairo: News.
- 2330 Costa Rica, R for Peace Intl: UN Scope.
- 2330 Egypt, Radio Cairo: Arabic Music.
- 2335 Greece, Voice of: News.
- 2338 Netherlands, Radio (am): Newslite.
- 2352 Costa Rica, R for Peace Intl: Hightower Radio.

Fridays

- 2300 Canada, N Quebec Svc: As It Happens.
- 2300 Canada, RCI Montreal: The World at Six.
- 2300 USA, VOA Washington DC (as pac): VOA News.
- 2305 Egypt, Radio Cairo: The Holy Koran and Its Meaning.
- 2310 USA, VOA Washington DC (as pac): VOA Worldwide.
- 2311 Russia, Voice of: News and Views.
- 2315 Bulgaria, Radio: Events and Development.
- 2315 Egypt, Radio Cairo: News.
- 2330 Bulgaria, Radio: Straight from the Horse's Mouth.
- 2330 Egypt, Radio Cairo: Arabic Music.
- 2335 Greece, Voice of: News.
- 2338 Netherlands, Radio (am): Newslite.
- 2346 Bulgaria, Radio: Radio Bulgaria Calling.
- 2352 Costa Rica, R for Peace Intl: Earth and Sky.
- 2353 Netherlands, Radio (am): Documentary.

Saturdays

- 2300 Guam, AWR/KSDA: Wavescan.
- 2300 Vatican State, Vatican Radio: On-the-Air.
- 2311 Russia, Voice of: News and Views.
- 2315 Egypt, Radio Cairo: News.
- 2315 Guam, AWR/KSDA: Pacific Island Journal.
- 2328 Egypt, Radio Cairo: Press Review.
- 2332 Russia, Voice of: This is Russia.
- 2335 Egypt, Radio Cairo: The Civilization of Islam.

- 2339 Netherlands, Radio (am): Newslite.
- 2345 Costa Rica, R for Peace Intl: UN Daily News.
- 2352 Costa Rica, R for Peace Intl: Earth and Sky.
- 2356 Egypt, Radio Cairo: Egyptian Songs.

RADIO PROGRAMS, continued from Page 43

- 0940 KTWV (Guam): "Pacific DX Report"
- 1030 Voice of America (as pac): "Communications World"
- 1100 Radio For Peace Intl: "World of Radio"
- 1130 WWCR #3 (Tennessee): "World of Radio"
- 1230 Voice of America (as pac): "Communications World"
- 1245 Voice of Turkey: "DX Corner (biweekly)"
- 1300 WHRI (Angel 2): "DXing with Cumbre"
- 1300 WWCR #1 (Tennessee): "World of Radio"
- 1342 Radio Tashkent: "Radio Tashkent DX Program"
- 1349 Radio Romania Intl: "DX Mailbag"
- 1430 WHRI (Angel 2): "DXing with Cumbre"
- 1455 FEBC (Philippines): "DX Dial"
- 1519 Radio Romania Intl: "DX Mailbag"
- 1730 Voice of America (af/me/south as): "Communications World"
- 1730 WHRI (Angel 1): "DXing with Cumbre"
- 1800 Radio For Peace Intl: "World of Radio"
- 1909 HCJB (eu): "DX Partyline"
- 1915 Voice of Turkey: "DX Corner (biweekly)"
- 1949 Radio Romania Intl: "DX Mailbag"
- 1958 Vatican Radio: "On-the-Air"
- 2015 WRMI (Florida): "Wavescan"
- 2104 Radio Havana Cuba: "DXers Unlimited"
- 2130 Voice of America (me): "Communications World"
- 2131 Radio Exterior de Espana: "Distance Unknown"
- 2149 Radio Romania Intl: "DX Mailbag"
- 2215 Voice of Turkey: "DX Corner (biweekly)"
- 2230 WHRI (Angel 1): "DXing with Cumbre"
- 2230 WRMI (Florida): "Wavescan"
- 2300 Vatican Radio: "On-the-Air"
- 2300 KSDA (Guam): "Wavescan"

PROPAGATION CONDITIONS, UNITED STATES

LOCAL BROADCASTING WITH NVIS

By Jacques d'Avignon
monitor@rac.ca

OPTIMUM WORKING FREQUENCIES (MHz)
For the Period 15 August to 14 September 1997 Flux=83 SSN=21

In the tropical areas of the world, dense vegetation causes such extreme attenuation of ground waves that this normal broadcasting mode is basically impossible to use under jungle conditions.

The lateral attenuation of the ground wave has been demonstrated by Hagn and Barker (Ref 1) to be an increasing function of frequency:

$$a(\text{dB/m}) = 0.009 f(\text{MHz}) + 0.1 \quad (1)$$

If we use equation (1) we find that at 3.0 MHz the lateral attenuation due to vegetation would be 127 dB/km; at 10 MHz, along the same path, the attenuation is now up to 190 dB/km! In the same reference, Hagn and Barker cite the losses using NVIS as being only 97 dB for 600 km or 0.16 dB/km along the ionospheric virtual path, when using NVIS at 3.0 MHz. This is a substantial difference! It is obvious why ground wave cannot be used for broadcasting in a jungle or tropical environment.

On the other hand, if the normal HF ionospheric mode was used for local broadcasting, the "local" audience, widely scattered in small pockets around the transmitter site, would be located inside the skip zone of the HF transmitter and, looking at Equation (1) above, it is obvious that it would not be commercially viable to increase the power sufficiently to use ground wave mode. Increasing the power would not insure that you would reach your audience but, because of the absorption, it would definitely warm up the vegetation surrounding the transmitter site! So for tropical broadcasting, we are left with one option: the Near Vertical Incidence Skywave mode of HF propagation we discussed last month.

Some stations in the interior of Australia (Alice Spring is one example), have been broadcasting using this technique to reach their widely scattered audiences. These Australian stations are using this "District" propagation, as they call it, in the "tropical domestic" band that extends from 2.300 to 2.495 MHz. The transmissions, designed to be local in nature, are fulfilling their role very well, but they can also be heard in Eastern North America in the early morning hours at certain times of the year.

The NVIS broadcasting technique is also prevalent in Africa and South America for daily domestic broadcasting use. If you live on the East Coast of North America, check the frequencies in the "tropical bands" on your shortwave receiver in late afternoon and you will hear stations from those regions.

The specific tropical bands are: 2.300 - 2.495 MHz, 3.200 - 3.400 MHz, and 4.750 - 5.060 MHz. In addition, there are the "domestic bands" between 3.900 - 3.950 MHz in Asia and

UTC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TO/FROM US WEST COAST																								
SOUTH AMERICA	20	17	17	14	12	11	11	11	11	10	8	9	10	13	16	18	18	18	19	19	20	20	21	21
WESTERN EUROPE	10	9	8	8	8	8	8	8	8	0	0	0	0	0	12	14	15	15	14	15	14	14	13	11
EASTERN EUROPE (P)	0	0	9	10	12	11	10	0	0	0	0	0	0	0	12	14	15	15	14	13	12	0	0	0
MEDITERRANEAN	12	11	11	11	11	11	10	0	0	0	0	0	0	0	14	16	17	17	17	17	16	15	13	12
MIDDLE EAST (P)	0	11	13	14	13	0	0	0	0	0	0	0	0	0	12	14	15	16	14	0	0	0	0	0
CENTRAL AFRICA	15	14	12	10	9	9	10	0	0	0	0	0	0	0	15	16	17	18	19	19	19	18	17	16
AFRICA	11	11	10	10	9	9	11	11	0	0	0	0	0	0	16	17	18	19	19	16	14	0	0	12
SOUTH EAST ASIA (P)	17	17	17	16	15	0	0	0	0	0	0	9	9	9	10	12	14	14	14	14	0	0	0	16
FAR EAST	16	16	16	15	14	13	11	10	9	9	9	9	9	9	10	10	10	10	10	10	13	16	17	17
AUSTRALIA	22	21	20	20	17	15	13	12	12	11	11	11	11	10	10	12	12	0	0	0	0	19	20	21
TO/FROM US MIDWEST																								
SOUTH AMERICA	17	16	14	12	11	10	10	10	10	9	8	9	11	14	16	16	17	18	18	18	19	19	20	20
WESTERN EUROPE	11	10	10	9	9	9	9	9	9	0	0	0	12	15	16	16	17	16	16	16	16	16	15	13
EASTERN EUROPE	8	8	8	9	11	9	0	0	0	0	0	0	0	13	14	15	15	15	14	14	13	0	0	0
MEDITERRANEAN	12	11	11	11	11	10	9	0	0	0	0	0	0	15	16	17	17	17	17	17	16	14	13	12
MIDDLE EAST (P)	11	11	12	13	11	0	0	0	0	0	0	0	0	13	14	16	17	16	15	14	0	0	0	11
CENTRAL AFRICA	15	14	12	10	9	9	10	0	0	0	0	0	0	16	17	18	19	19	19	19	18	18	17	16
SOUTH AFRICA	12	11	10	10	9	10	10	0	0	0	0	0	0	16	18	18	19	19	19	16	14	13	13	12
SOUTH EAST ASIA (P)	16	16	15	14	0	0	0	0	0	0	0	9	9	10	12	14	14	13	13	0	0	0	0	15
FAR EAST	16	16	15	14	13	12	10	9	9	9	9	9	9	10	11	11	11	11	0	0	13	15	16	16
AUSTRALIA	21	20	19	16	14	12	11	11	11	11	11	11	10	11	13	12	12	0	0	0	14	19	20	21
TO/FROM US EAST COAST																								
SOUTH AMERICA	14	12	10	10	9	9	9	9	9	7	7	10	14	15	15	16	16	16	17	17	18	18	18	16
WESTERN EUROPE	10	9	9	8	8	8	8	8	8	0	9	13	14	15	16	16	16	15	15	15	15	15	14	12
EASTERN EUROPE	9	8	8	9	9	8	0	0	0	0	0	12	14	15	15	15	15	15	15	15	13	11	10	9
MEDITERRANEAN	11	11	10	10	10	9	9	0	0	0	0	14	15	16	16	17	17	17	17	17	15	12	12	11
MIDDLE EAST (P)	11	11	11	10	0	0	0	0	0	0	0	14	16	16	17	17	17	17	16	14	13	12	12	11
CENTRAL AFRICA	15	14	12	11	9	9	11	10	0	0	0	15	18	19	19	19	19	19	19	19	19	19	20	18
SOUTH AFRICA	12	11	10	10	9	10	11	10	0	0	0	16	18	18	19	19	19	19	19	16	14	13	13	13
SOUTH EAST ASIA (P)	15	14	13	0	0	0	0	0	0	0	11	13	15	16	14	14	13	0	0	0	0	0	11	13
FAR EAST	16	15	14	13	0	0	0	0	9	9	9	10	12	12	11	0	0	0	0	0	13	16	16	17
AUSTRALIA	19	17	15	0	0	0	11	10	10	10	10	10	12	12	12	0	0	0	0	0	14	19	19	19

3.950 - 4.000 MHz in Europe. Yes, that is the top of the 75 meter band used by radio amateurs! In Europe it is also a popular broadcast band used by many international broadcasters. So NVIS does work: it is being used commercially for local broadcasting, but there is no guarantee your "local" signal will not be heard half way around the world!

INTERESTING WEB PAGE

For those with access to the Internet, try http://www.ips.gov.au/asfc/usa_hf/ This page is produced by IPS in Australia and is automatically updated hourly. One map shows F2 critical frequencies across the USA, based on data received in real-time (hourly updates) from the USA. These frequencies could be used as proxies

for district/NVIS frequencies.

The HAP (Hourly Area Predictions) maps also found on this page give you the best frequency to communicate with a station for which the specific HAP map was drawn.

Let us know what you would like to see discussed in this page: send your ideas to the Editor or to myself. Have a good summer and don't worry, that static you are hearing will disappear shortly: autumn is around the corner!

(Ref 1). Hagn, G. H. and G.E. Barker, 1970, "Research-Engineering and Support for Tropical Communications," AD-889-169, Final Report, Contract DA-36-039 AMC-00040(E), SRI Project 4240, Stanford Research Institute, Menlo Park, CA.

Are You Suffering from LMS?

If you have been following my writings here and other places, you know I've identified myself as a "DC to Daylight" monitor. If it's out there in the radio frequency spectrum I want to hear it, log it, and enjoy it. Further, as a dedicated amateur radio operator I also have a strong desire to transmit signals everywhere that the FCC allows. (Some folks do not feel burdened by the law and choose to both listen and transmit in other places, but that is clearly another story altogether.)

Anyway, is it any wonder that I sometimes feel a little sad when I see someone, especially a beginner, limiting his or her listening opportunities? Many beginners (and actually quite a few old timers, too) suffer from that all too common radio monitoring disease, LMS.

LMS stands for **Limited Mode Syndrome**. You see it all the time. Somebody purchases a nice new general coverage receiver, but they never switch it out of the AM mode to hear everything else there is to enjoy. Likewise, somebody might work hard, study ceaselessly, and eat all their vegetables in order to acquire an amateur radio license, only to limit their entire ham experience to a few chats on the local 2 meter FM repeater. A scannist might pay extra for a full featured scanning receiver only to program in the local FM public safety stuff and never make use of the AM aircraft bands.

You get the picture, pal? Even modest priced gear can be undervalued when it is not fully utilized. The whole radio spectrum awaits your curiosity, tenacity, and even your participation. So let's take a few minutes to discover some of those modes that are off the beaten track for an average listening session.

■ CW

Okay, let's begin at the beginning. Continuous Wave transmission has been around since the beginning of radio. It has fallen out of favor to some more sophisticated digital modes of communication in many circles, but it still remains on the air in many places. While no longer monitored as a distress signal by the U.S. Coast Guard, CW communications can still be found in the maritime world. Additional Morse signals can be found throughout the utility bands if you dig around.

For amateur radio operators, code proficiency remains at this time the key access to many portions of the HF amateur spectrum.

First, it is required for the higher class licenses that allow the ham access to those frequencies. Secondly, many rare DX stations operate almost exclusively in the CW mode. Finally, the majority of the amateur radio community recognizes CW as a skill, and a growing portion of this same community loves it as an art. Further, you can get by with modest equipment. Folks who are excited about low power operating (QRP) find CW gets the signal through.

Another group of hams who make use of CW are the VHF/UHF "weak signal" crowd. These are folks who try to push the limits of the distances that can be achieved above 30 MHz. (Ironically, this 30 MHz-and-up world is primarily populated with "No Code" technician class operators.) These radio experimenters will even make use of exotic propagation, such as working stations by way of the ionized trails left by meteors and by using the surface of the moon as a passive reflector. So, just because you didn't need to test for the code when you went for your ham license doesn't mean you might not want to get in on the fun of weak signal communication now.

If you aspire to the ultimate in the CW experience, check out the folks working each other in the Extra Class portions of the CW bands. Casual chats in excess of 30 words a minute might make your head spin as a beginner, but it's something to shoot for. If the high speed stuff makes you dizzy, come on down where I hang out. If you ever want to find Uncle Skip on the air, check out the Novice portion of the 40 meter Ham Band (7100-7150 kHz). I love the enthusiasm that I find in the novice bands. It's contagious. It's also a sure cure for LMS.

You scannists out there don't get off the hook, either. Most repeater based operations found in the VHF/UHF bands identify by way of a Morse code signal. Often, copying this automatic ID transmission is the key to figuring out who you might be monitoring. So a bit of code study will help you out, too. Many of the advertisers in the pages of *MT* have code tapes and programs available to help get you on track. You can also monitor regular code practice sessions daily from W1AW on 1818, 3581.5, 7047.5, 14047.5, 18097.5, 21067.5,



An all mode transceiver such as this ICOM IC-821H can get an amateur on all of the modes available to a Technician Class ham.

28067.5 kHz. And don't forget, once you get the code down, you should head to the local Volunteer Examiner testing site and get that ham license with HF privileges.

■ SSB

Single sideband transmissions, both upper and lower, can open up a whole new world to any monitor suffering from LMS. First of all, USB and LSB are the keys to monitoring much of what is worth listening to in the utility portions of the shortwave spectrum. Although a majority of point-to-point communications may be found primarily in the USB mode, don't forget the LSB position. Remember that amateur radio operators can be traditionally found using LSB on 40, 80, and 160 meters. SSB is also used in the VHF/UHF portions of the amateur radio spectrum. Once again, the weak signal crowd is fond of this mode for its long distance capabilities. It is also used for EME (earth-moon-earth, or moonbounce) communications.

Single sideband is a common communication mode on the amateur radio satellites. Some of the more intriguing amateur radio gear from a purely technical standpoint are the dual band, multimode VHF/UHF rigs. With AMSAT Phase III ready to launch, you may want to take a look at what's available. *Satellite Times* will help you keep up with the latest developments.

■ AM and FM Vice Versa

Okay, you're a dedicated shortwave broadcast listener who is trying to figure out why there is an FM position on your general coverage receiver. The place to look for communications in this mode would be the 10 meter

ham band. Between 29.5 and 29.7 MHz you will find FM repeater activity in most states.

And, you scannists who are trying to figure out why you need AM capability, need look no further than the aircraft frequencies between 116 and 136 MHz. AM is the mandated mode for air travel because it doesn't suffer from "capture effect"—the tendency of a stronger signal to override a weaker one, common in FM mode. By using AM, a weaker signal can still get through under a stronger one. The importance of this in an emergency situation should be self-evident.

■ The Digital Modes

Now that hobbyists have figured out how to hook up their home computers to their receivers, the opportunity to translate the various digital modes of transmission has become possible. Many interfaces are currently available, as are any number of dedicated demodulators. Adding these devices to your listening post can open up a whole new world, no matter if you listen to HF or VHF/UHF signals.

■ RTTY

Traditional five level Baudot code has been around for a long time. Only now are more modern signal systems overtaking its use.

One of the things that most often confuses beginners is when your system starts decoding a signal successfully but the screen shows gibberish. Remember, there are a lot of RTTY stations out there using languages with alphabets that don't translate into English. Cyrillic, Arabic, and Chinese come immediately to mind. It's a bigger world than you knew, now that you are a radio hobbyist. Keep an eye on the Utility World and Digital Digest columns, and you'll soon get an idea of what is out there worth monitoring.

■ ASCII

The American Standard Code for Information Interchange is the language that computers use to talk to each other. It is a seven level code that resolves many of the text transmission problems of Baudot. Right now it is mostly used experimentally by Amateur Radio operators in the portions of the ham bands set aside for RTTY.

■ SITOR

Simplex Telegraph Over Radio is a very common, improved coding system in common use today. It is a system that allows for correction of errors in its transmissions by way of intercommunication of the sending and receiving

station. There are two forms of SITOR communication:

SITOR "A" works by sending its signal three characters at a time and then waiting for an acknowledgment signal sent back by the receiving station on a different frequency. Once the sending station is sure that "the mail got through," it proceeds to send its next three character group.

SITOR "B" performs its error correction "on the fly." This is known as Forward Error Correction (FEC) The data is sent in a continuous stream. However, each character is sent twice along with a series of control characters. The receiving station's system performs a series of error tests to assure that the data is accurate. SITOR "B" lends itself best to transmitting news and weather broadcasts.

Amateur radio operators also use their own variations of the SITOR systems of transmission called AMTOR.

■ ARQs and FECs

There are quite a few more exotic RTTY signals out there worth giving a listen to if your equipment is up to it. ARQ stands for AUTOMATIC REQUEST. This is a form of message error correction that involves the receiving station sending signals back to the transmitting station to assure the message was properly received. (SITOR-A would be considered an ARQ mode)

ARQ-M is a system that allows either two or four different data signals to travel along a single carrier. ARQ-E is a single channel system used by the French Military, as is ARQ-E3. Other ARQ systems you will encounter include SWED-ARQ, used by the Swedish Embassies, and DUP-ARQ, used by the Hungarian Embassies. Many other diplomatic services make use of systems known as FEC-A and FEC-3.

Baud rates and frequency shifts are all over the map in these modes. You will need to keep an eye on RTTY loggings in *MT* to get a real handle on the latest trends.

■ ACARS

This is the Aircraft Communications Addressing and Reporting System, a VHF teletype mode that is used to transmit data, telemetry, and messages between commercial aircraft and airports. Most of this communication currently goes on at 131.55 MHz. With a computer or demodulator set up to monitor these communications, you can get some great insights into modern aircraft operations. If you are interested in aero monitoring and haven't set yourself up for ACARS communications yet, you are missing half the fun.

■ Packet Radio

This mode of communication was supposed to take over the whole of amateur radio communication when it first arrived on the ham scene over a decade ago. It didn't exactly do that (I'm still playing with CW, remember?). It did, however, carve out its own niche in the ham hobby, both on the HF and VHF/UHF amateur frequencies.

Many hams use this digital mode for routine communication. But the mode has really taken on its best use among the hams dedicated to public safety activities. Packet radio is used for emergency traffic handling as well as supporting such programs as Skywarn. Experiments are also going on with hams linking packet equipment to GPS receivers to create tracking devices by way of the APRS (amateur packet radio) system. This mode still has a lot of new excitement still coming around the bend.

You get the idea, my friend? This whole exercise was just meant to show you a bit about what is out there. We didn't even have space to check out television (both slow and fast scan), amplitude compandered single sideband, spread spectrum — I could go on and no doubt will in some future column. Meanwhile, have fun! Try a new mode this month. It's a sure cure for LMS.

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Lower ZWI

Much has been written (here and elsewhere) about the 160–190 kHz “Lower” (low frequency experimenters) band. Few, however, have actually *seen* a lower station—or the operator behind the controls. This month, we’ll take a field trip to Lower station ZWI (178.6 kHz) run by Howard “Mort” Mortimer (WB2ZWI) of Baldwinsville, New York.

A little background is in order. During the spring of ’91, I was in diligent search of loggings for use in my first *Below 500 kHz* column. Having taken a break from the hobby for several years, my direct contacts for this information were rather limited. By coincidence (or maybe not) Mort was also seeking LF information—for his newly acquired Palomar Engineers LF transmitter.

He’d spotted my name in an old issue of the *Lowdown*, and since I lived nearby, he sent me a letter with his questions. Mort’s timing couldn’t have been better. I was able to give him the information he needed, and he was able to supply me with numerous loggings for my first column. We’ve maintained a special friendship ever since that first meeting. Now, let’s get started on the field trip.

■ Arrival, 0945

My visit to ZWI began with a stop for breakfast at the B’ville Diner, a 50’s-era restaurant with a well-deserved reputation for good food. There, I met Mort and fellow longwave enthusiast Gordon Hullin, K2ZBU. The three of us chatted for a long time about radio (what else!) and what I could expect to see during my visit to Baldwinsville. With breakfast finished, it was now time to head for station ZWI.

For kicks, I switched on my Sangean portable as we approached Mort’s house. There was no mistaking it—a *pounding* signal on 179 kHz repeatedly sent the call sign of the beacon. I knew I was in the right place.

■ ZWI—A Look Inside

The transmitter for ZWI sits on a shelf in the corner of Mort’s basement and normally runs 24 hours a day. An ammeter connected to the transmitter jumps in perfect step with the Morse ID being transmitted.

The antenna for ZWI is a single sloping wire that is secured to a tree beside Mort’s house. It was once much higher, but a storm wiped out the original installation and the antenna had to be moved to this lower elevation—at least for the time being.

Despite its simplicity, ZWI has been heard by several listeners across upstate New York, and even one in Minnesota. The Minnesota reception could be verified because the listener reported the exact ID format of the beacon, which had not been published anywhere.

As far as I know, ZWI is the first lower to receive coverage in a daily newspaper. A few years ago, his station was featured in the *Ham Radio* column of the *Herald-American* newspaper of Syracuse, New York. In this, and many other ways, Mort deserves credit for promoting low frequency radio. At hamfests, he even sports a sign that announces his beacon’s frequency, and he is always happy to tell a newcomer about low frequency radio.

Just seeing ZWI would have been a worthwhile trip, but I was also treated to a visit to Gordon’s station. An entire story could be written about this visit, as well. In short, it was like taking a step back into history.

Gordon’s equipment consists of meticulously restored equipment, from WWII right through the 1960’s. Old timers will recognize some of these classic model numbers seen during my visit: RBL-5, SP-600, Mackay 128AY, R-388 and BC-348. Gordon points out that all of this gear is as clean on the inside as it is on the outside.



FIGURE 1. Mort points to the transmitter used at his Lower station in near Syracuse, NY (ZWI/178.6 kHz). His station has been heard as far away as Minnesota.

It was a day to remember. Mort and Gordon certainly are doing their share to promote VLF radio in the Syracuse area.

■ Summer Loggings

Let’s be honest. August is not known for its stellar LF conditions. However, if the static is not too heavy, some surprising DX can be still be found. Try listening in the early mornings, before static levels build up. This is also a perfect time to pack your portable gear and go on a DXpedition. To get you started, Table 1 lists some of the most commonly logged beacons in North America. As always, feel free to send your loggings, questions, or comments to me at P.O. Box 98, Brasstown, NC 28902.

■ New VLF Tape

In response to many questions about what can be heard below 500 kHz, I’ve just completed an inexpensive cassette titled *VLF RADIO!—The Sounds of Longwave*. The tape plays actual recordings of beacons, European broadcasters, Lowfers, GWEN, WWVB, Omega, Natural Radio, and more. A narration explains each sound and offers tips for improved reception. Tapes are available for \$11.95 (postpaid) from: Kevin Carey, P.O. Box 56, West Bloomfield, NY 14585.

SELECTED BEACON LOGGINGS

FREQ.	ID	LOCATION
194	TUK	Nantucket, MA
198	DIW	Dixon, NC
206	GLS	Galveston, TX
216	CLB	Wilmington, NC
236	GNI	Grand Isle, LA
245	YZE	Gore Bay, ONT
246	DFI	Defiance, OH
248	UL	Montreal, QUE
257	SQT	Melbourne, FL
263	YGK	Kingston, ONT
305	RO	Roswell, NM
329	CH	Charleston, SC
332	HK	Hickory Hills, IL
344	CL	Cleveland, OH
344	FCH	Fresno, CA
346	YXL	Sioux Lookout, ONT
356	YZD	Downsview, ONT
362	SB	Sudbury, ONT
363	RNB	Millville, NJ
366	YMW	Maniwaki, QUE
379	BRA	Asheville, NC
379	GKQ	Newari, NJ
382	LQ	Boston, MA
388	NXX	Willow Grove, PA
413	YHD	Dryden, ONT
417	IY	Charles City, IA
428	COG	Orange, VA
429	IKY	Springfield, KY
432	IZN	Lincolnton, NC
512	HMY	Lexington, OK

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Domestic DX and the Internet

Some would argue that the Internet has been one of the worst things to happen to the radio hobbies. It's stiff competition — it attracts technically-minded young people, it's good experience towards some of the most lucrative professions that exist today, and it doesn't require those "ugly" antennas that parents and neighbors abhor.

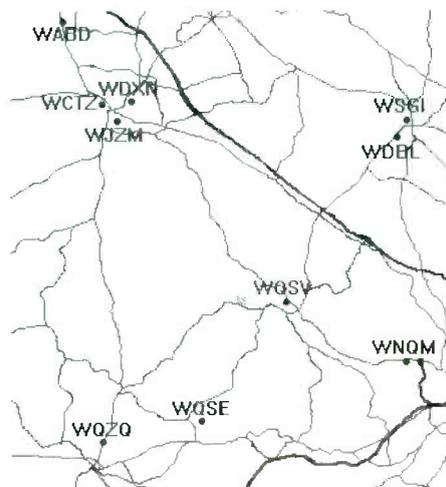
But the 'Net is also a valuable resource for the radio hobbyist, regardless of what bands you DX. A fantastic variety of information is available at the click of a mouse. While I couldn't possibly cover every relevant site in this column, this month I will cover a few of the more interesting and informative sites for the domestic-band DXer.

The obvious starting point is the FCC, at www.fcc.gov. Look under Bureaus, Mass Media. This site contains just about every official FCC document relevant to broadcasting. It includes the Public Notices of applications for new stations and changes to existing stations. There's a search area to find information on specific stations, and you can download the engineering databases which contain technical information on all U.S. broadcasting stations. (However, you'll need to be fairly handy at programming to use them.) A similar site exists for Canada's regulatory agency; look at www.crtc.gc.ca/eng/news/whatsnew.htm.

Radio hobbyists of all kinds should certainly have a bookmark for www.anarc.org. ANARC is an "umbrella" organization for radio hobby clubs in North America, and has membership information and Web page links for all of its member clubs. If you want to know if there's a club for your specialty, this is the place to look.

Of course, don't forget to stop by *MT*'s own pages on www.grove.net! You'll find more club information, last-minute news, as well as the Grove catalog of available equipment for the DXer. Another good general page is www.inforamp.net/~funk. Operated by Werner Funkenhauser of the Ontario DX Club, this site contains the WHAMLOG files of AM broadcast stations — along with links to a wide variety of other sites relevant to the domestic DXer.

Database search pages exist in several places. www.radiostation.com is probably the most popular. But Werner Funkenhauser's



www.jagunet.com/~kodis/station.html links to the U.S. Government's "Tiger" mapping site. This allows you to make maps like this one, showing the tower sites of several AM stations northwest of Nashville.

page also links to www.jagunet.com/~kodis/station.html. This site allows you to find all stations within a given distance of a particular location (handy if you're looking at buying a new house and don't want a 50 kW powerhouse in your back yard!), and plot them on a map.

A less useful but more entertaining feature is available if your browser can display QuickTime™ movies. WNEW-FM (102.7) New York has a Web page at www.wnew.com. Under their homepage at [/qtvr/wnew7681.mov](http://qtvr/wnew7681.mov) is a "pannable" picture of the WNEW studios. By dragging the mouse around, you can look around the studio and see the various equipment (and people) involved in keeping a major-market radio station on the air.

■ New and Old

Many DXers are also history buffs. If that includes you, be sure to take a look at Jeff Miller's Collection on members.aol.com/jeff560/jeff.html. Jeff has accumulated a fascinating set of articles on

the early days of AM, FM, and TV broadcasting, both in the country as a whole and in his native West Virginia. This page is a definite must-read for the fan of radio history. Another good collection of historical items is on www.aa.net/~rfs; these pages cover the history of broadcasting in San Francisco. There's also information on NBC's West Coast operations in the 1930s and 1940s.

If your interest is not in old stations, but old receivers, then you want to look at the Radio History Society. At www.radiohistory.org, this site is full of pictures of old radios. It also contains information on trading and restoring these collectors' items, a entire hobby in itself.

Some readers prefer real, physical, paper-and-cardboard books. The Grove Software & Books Catalog lists a variety of excellent historical titles. Take a look on the 'Net at www.grove.net/hmpgcat.html or write for a copy.

■ Afraid of heights?

If you aren't, here's an opportunity for you! Last month, you read about the assignment of DTV channels and the FCC accepting applications for digital television licenses. Shortly after I wrote that, an item appeared in several local newspapers highlighting the shortage of qualified tower crews.

All TV stations will be required to install a second transmitter and, in most cases, a second antenna for digital broadcasting. Many stations will be able to use their current tower for the new equipment. But in many other cases, the existing tower isn't strong enough and a new tower (or extensive reinforcement of the existing tower) will be necessary.

The problem is, only three companies in North America make tall towers! And there are fewer than 20 crews qualified to work more than 1000 feet (300 meters) above ground. Current calculations indicate it will be simply impossible for



Welcome to the Radio History Society



The Radio History Society, at www.radiohistory.org, has a fascinating Web site for those interested in collecting old radios.

the people available to do all the work necessary.

Bits and Pieces

• Jack Little in the Toledo, Ohio, area is hearing a new and rather strange FM station.

“Jack and Jill Radio” operates on 107.1 MHz. This very low power station serves to promote the day-care center of the same name. It can be heard only at the corner of Jackman Road and Elanor Avenue in Toledo. Other similar stations have been heard advertising homes for sale. And here in Nashville, on Music Row, I’ve heard one advertising the latest releases of various country stars.

• The first application for regular operation in the expanded band has been filed, by a Texas station wanting to move to 1700 kHz. I expect more to be filed soon. Remember that WJDM and KXBT are authorized under a special law applicable to a very limited number of stations. No DTV applications have yet been filed, but I expect to see some very soon.

• KNOB-540, which has been authorized to move to 1650, has not yet completed that move. The frequency change is now expected in August or September. However, the co-owned 540 station in Tijuana, Mexico, (XETIN) has now gone to classical music in English, using the slogan “X-Bach.”

Another Spanish-language station in California, KOFY-1050 San Mateo/San Francisco, is also switching to an English-language format. KOFY will become an all-sports station.

The sporadic-E season is now winding down, but the AM band should be getting quieter, and better for DX. Have you heard anything interesting? Pass along your DX to P.O. Box 98, Brasstown NC 28901, or via the Internet to 72777.3143@compuserve.com. Good luck!

CALL LETTER CHANGES

The following stations have changed call signs:

Old call	New call	Location
KOSG-1450	KNHD	Camden, AR
KMJI-1380	KTKZ	Sacramento, CA
KXOA-1470	KQPT	Sacramento, CA
KHTX-1460	KDON	Salinas, CA
KWNK-670	KVCA	Simi Valley, CA
KPAG-1400	KWUF	Pagosa Springs, CO
WWNN-980	WHSR	Pompano Beach, FL
WRBD-1470	WWNN	Pompano Beach, FL
WTK-1600	WNML	Warner Robins, GA
WSCR-820	WYPA	Chicago, IL
WEJM-950	WDBI	Chicago, IL
WJJD-1160	WSCR	Chicago, IL
WXKN-680	WNAI	Newburg, KY
WTAC-600	WSNL	Flint, MI
WCUZ-1230	WTKG	Grand Rapids, MI
WZQR-1350	WTZK	Black Mountain, NC
WRAQ-1240	WSQL	Brevard, NC
WLVM-880	WTZY	Fairview, NC
WYCM-1080	WWDR	Murfreesboro, NC
WUSS-1490	WGYM	Atlantic City, NJ
KORK-920	KBAD	Las Vegas, NV
WPGY-1520	WINW	Canton, OH
WCOL-1230	WFII	Columbus, OH
KRPT-850	KJON	Anadarko, OK
KWSA-1070	KRAM	West Klamath, OR
WNZT-1580	WVZN	Columbia, PA
WDSY-1080	WPGR	Pittsburgh, PA
KNTS-1470	KBBA	Abilene, TX
KWTR-1530	KNEZ	Georgetown, TX
KTOL-1280	KLDY	Lacey, WA

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Pirate Loggings Explosion!

The volume of North American pirate activity has been enormous during the past month. We've rarely seen such concentrated broadcasting on shortwave from unlicensed broadcasters. Our readers heard the activity, so our coverage this month is dominated by the huge number of pirate transmissions that have blanketed 43 meters. We thank the dozens of reporters who enjoyed the frenzy of pirate transmissions from 52 different stations!

■ Metallica Retiring Already?

In the July *MT* we broke the news of Dr. Tornado's superpowered 15,000 watt pirate transmitter. During the past month he often took to the airwaves every day, using the pop oldie "Secret Agent Man" as a theme song. But, *MT* readers Shawn Axelrod of Winnipeg, Manitoba, Rich/Talea Jurens of Katy, Texas, and Bill McClintock of Minneapolis, Minnesota, were startled by his announcement on June 7 that Metallica's transmitter would be dismantled. Dr. Tornado previously said that his homebrew 10 kW rig used four CX500's in its final, driven by a Kenwood TS-450 as an exciter.

Pirates have sometimes announced their retirement prematurely, as we see from **Radio Free Speech** in our loggings. Such seems the case with Dr. Tornado, as Metallica continues to be heard, and has even announced a maildrop. Broadcasts from Metallica have caused world-wide interest in North American pirate programming.

■ Radio Free London

Even though it's summertime, Europirate stations sometimes put an audible signal into the east coast of North America. Ross Comeau of Andover, Massachusetts, sends in an example. He heard **Radio Free London** on 6275 kHz for an hour at 0200 UTC. This part of the 49 meter band is a good place to find European pirates; they also commonly use 3900-4000 kHz in what is the 80 meter ham band on this side of the Atlantic.

■ Micropirates

We have two FM micropirate logs to report. Harold Frogde of Midland, Michigan, says that **Tower Boy Network** is using 88.3 MHz in his area with an album rock format, sometimes spiced with blues, rag, and oldies. *The Cleve-*

land Free Times ran a cover story on **Grid Radio**, which uses 96.9 MHz to transmit dance music from their gay dance club in downtown Cleveland. I hear them nightly east of West 117th Street.

■ What We Are Hearing

Your pirate loggings are always welcome via PO Box 98, Brasstown, NC 28902, or via the e-mail address at the top of the column. All frequencies are in kHz, with times in UTC.

North American pirate stations listed here use the following addresses: PO Box 1, Belfast, NY 14711; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 28413, Providence, RI 02908; PO Box 146, Stoneham, MA 02180; and PO Box 11522, Huntsville, AL 35814, Postfach 220342, D-42373 Wuppertal, Germany; and PO Box 3103, Napier, New Zealand. For return postage, enclose three 32¢ stamps in the envelope to USA addresses. \$2 US or two International Reply Coupons go to foreign maildrops.

Summer is still here, so the 39 meter pirate band supports activity during evening hours until 0500 UTC or later; the times in our loggings confirm this.

Anteater Radio- 6955 at 0230. The rock shows from this one sometimes are said to come from Duluth, MN. Addr: Belfast. (Terry Hartsell, Muskegon, MI; Kevin Nauta, Grand Rapids, MI; Michael Prindle, New Suffolk, NY; Basil Shelley, Blythe, CA; Frogde; Jurens; McIntock)

Attention 69- 6955 at 0130. Programming on this new one is sufficiently obscene that we can't really describe it in this family publication. Addr: None. (Frogde; Jurens)

Big Johnson Radio- 6955 at 0245. Rock music and suggestive novelty tunes are regular features on this pirate. Addr: Providence. (William Hassig, Mt. Prospect, IL; Jurens; McIntock)

Black Rock Radio- 6957 at 0300. This rock music station claims to come from the high desert, and it's best heard on the west coast. Sometimes they insert animal noises in the shows. Addr: Blue Ridge Summit. (Randy Ruger, North Hollywood, CA)

Cherokee Radio- 6955 at 0330. Although they use the slogan of "Native American Broadcasting," the program content is mainly rock music. Note their new maildrop! Addr: Blue Ridge Summit. (Lee Silvi, Mentor, OH; Jurens; Shelley)

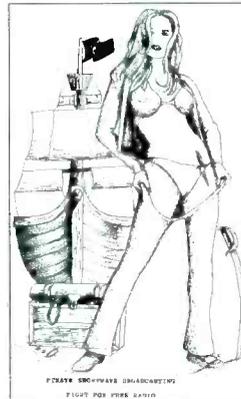
DC Radio- 6955 at 0045. The Morse code message on this one is always, "Don't Vote Republican." Addr: None. (Harald Kuhl, Giessen,

Germany; Kathy McIntyre, Richmond, VA; Jose Campos, Annapolis, MD; Silvi)

FBI Radio- 6955 at 0230. As we see here this month, the women at "Females Broadcasting Interference" are sending out nice new QSL's. Addr: Huntsville. (Jurens; Prindle; Silvi; direct from the station)

Free Hope Experience- 6955 at 0000. Major Spook's diverse programming often promotes pirate radio. Sometimes he transmits "FHX" Morse code identifications during broadcasts. Addr: Blue Ridge Summit. (Joel Rose, Brecksville, OH; Barry Williams, Enterprise, AL; Comeau; Jurens; Nauta; Silvi)

He Man Radio- 6955 at 2300. He Man is back, broadcasting his masculine point of view in Upper Sideband, the "manliest of all modes." Addr: Blue Ridge Summit. (Silvi)



FBI Radio: Obviously not the Federal Bureau of Investigation

KGDR- 6955 at 0230. They remember Jerry Garcia, and they transmit Grateful Dead music. Addr: Providence. (Hassig; Jurens; McIntock)

KIRK- 6955 at 0130. Don't be confused with the elaborate sound effects on this one that include the ID's of a dozen pirates. If you listen carefully, you can hear their Voice of the Ozarks slogan. Addr: None. (Frogde; Hartsell; Silvi)

KIWI- 7475 at 0700. Graham Barclay's New Zealand pirate, which relays several other stations regularly, has announced that they will cease broadcasting on shortwave after the summer. Say it ain't so! Addr: Napier. (Robert Ross, London, Ontario; Jurens; Ruger; Silvi; Williams)

KMCR- Magic Mike and Wanda at Magic Carpet Radio have added Cajun music to their rock programming. Here's another one that puts out good signals on the West Coast. Addr: Blue Ridge Summit. (Ruger; Shelley)

KRAP- 6955 at 0100. If it weren't for Metallica, Fred Flintstone's potent signal would be considered a powerhouse. His rock comes through with fine audio on a strong AM carrier. Addr: Blue Ridge Summit. (Gregory Majewski, Montville, CT; David Krause, Eastlake, OH; Paul Jablonowski, Greenfield, WI; Kim Campbell, Piedmont, SC; Chris Leagus, Bangor, ME; Jeff Ryan, Yardley, PA; Neil Wolfish, Toronto, Ontario; Chris Lobdell, Stoneham, MA; Axelrod; Frogde; Hassig; Jurens; Nauta; Prindle; Silvi; Williams)

Lounge Lizard Radio- 6955 at 1800. Allegedly coming from a motel in Steubenville, OH, their unusual format consists of syrupy night club lounge music. Addr: Providence. (Frogde; Jurens; Nauta; Ryan; Silvi; Williams)

Mystery Radio- 6955 at 0200. The haunting instrumental rock on this one is highly distinctive. Addr: Stoneham. (John Sedlacek, Omaha, NE; Scott Krauss, Cleveland, OH; Frogde; Jurens; Prindle; Shelley; Williams)

Partial India Radio- 6955 at 1400. Harold Krishna and Sanjay have a highly amusing parody of the Indian international broadcaster All India Radio, but North American DXers are the target of some of the humor. Addr: Stoneham. (Comeau; Jurrens; Lobdell; Prindle; Ryan; Silvi; Williams; Wolfish)

Radio Atlantica- 6955 at 0200. Dr. Fish Head inserts his chit-chat in a playlist that includes rock and country music. Addr: None. (John Arendt, Oswego, IL; Axelrod; Frodge; Hassig; Kuhl; Silvi)

Radio Azteca- 955 at 0100. Bram Stoker's comedy makes fun of everybody and everything in DXing. If you send in a report, he'll probably tell jokes about you! Addr: Belfast. (Dick Pearce, Brattleboro, VT; Tony Benbenek, East Hampton, NY; Axelrod; Frodge; Hartsell; Jurrens; McLintock; Silvi; Wolfish)

Radio Communication International- 6950 at 0200. This German Europirate, along with Titanic, has arrangements with North American pirate transmitters for relays. Addr: Wuppertal. (Frodge; Jurrens; McLintock; Silvi)

Radio Dead Man- 6955 at 0100. If you hear Halloween-style shrieking at other seasons of the year, odds are good that you've run across this pirate. Addr: None. (Frodge)

Radio Eclipse- 6955 at 0400. Lately they have transmitted a number of announced tests, usually with a rock music format. Addr: None. (Axelrod; Comeau; Hartsell; Hassig; Jurrens; Kuhl; Majewski; McLintock; Silvi; Williams)

Radio Free Speech- 6975 at 2330. Bill O. Rights announced his retirement over the air. *The ACE* featured the retirement on its cover. Well, Bill is back with his usual comedy and free speech advocacy. Addr: Belfast. (Frodge; Hartsell; Silvi)

Radio Fusion Radio- 6955 at 0200. From the College of Knowledge, this one broadcasts rap music. Addr: Providence. (Frodge)

Radio Garbanzo- 6951 at 0115. Fearless Fred creates some of the bluntest, hardest hitting comedy that you'll ever hear. Addr: Belfast. (Ryan)

Radio KAOS- 6955 at 0030. Joe Mama really hasn't retired, but he has been heard transmitting short comedy and public service announcements. Addr: Belfast. (Hartsell; Nauta)

Radio Mouser Worldwide- 6955 at 2130. Dr. Selsyn is only occasionally active, but he emerged with an on-air QSO relationship with Dr. Tornado of Metallica. This caused Mouser to resume some broadcasting. Addr: New Jersey maildrop defunct. (Faron Fawcette, Cleveland, OH; Arendt; Axelrod; Jurrens; Majewski)

Radio Metallica Worldwide- 6955, multiple afternoons and evenings- *Monitoring Times* has been deluged with scores of Metallica loggings from all over the world! Addr: Blue Ridge Summit (Horacio Nigro, Uruguay; Vashek Korinek, South Africa; Ranier Brandt, Germany; Peter Greene, Eastlake, OH; Tony Shelton, Garland, TX; Brian Berkes, Cherry Hill, NJ; Mark Gregory, Auburn, NY; Steven Lord, Cambridge, MA; Steve Beste, Brewton, AL; Sue Wilden, Columbus, IN; Tim Woods, Indianapolis, IN; Kevin Graniero, Madison, WI; David Strickland, Franklinton, NC; Jeff Nicklaw, Asheville, NC; John Cosimano, Washington, DC; Curt Tresenriter, Sterling, IL; Joel Gosse, St. Paul, MN; Gigi Lytle, Lubbock, TX; Richard Weil, St. Paul, MN; Deane Johnson, Everett, MA; Arendt; Axelrod; Benbenek; Campbell; Comeau; Fawcette; Frodge; Hassig; Jablonowski; Jurrens; Kuhl; Leakus; Lobdell; Majewski; McLintock; Nauta; Prindle; Rose; Ross; Ruger; Ryan; Sedlacek; Shelley; Silvi; Wolfish;

Zeller)

Radio Tellus- 6955 at 0200. Their rock music shows have become one of the most consistent occupants of the pirate bands. Look for their announcer's trademark "Oh Yeah!" exclamations. Addr: Providence. (Comeau; Frodge; Gosse; Hartsell; Jurrens; Nauta; Prindle; Sedlacek; Silvi)

Radio Titanic International- 6955 at 0000. A current program from this Europirate is a commemoration of the only voyage of the Titanic, complete with ominous mood music. Addr: Wuppertal. (Majewski; Prindle; Silvi)

Radio Two- 6950 at 0130. This versions of the numbered stations plays rock and pop oldies music. Addr: Providence. (Frodge; Prindle; Ryan; Silvi; Williams; Wolfish)

Radio USA- 6950 at 0130. Mr. Blue Sky and Joe King have been on the air for a decade and a half with punk rock and comedy productions. The two best known veteran pirates, USA and Laryngitis, often produce some of the best programming heard on shortwave radio. Addr: Belfast. (Hartsell; Pearce; Ryan; Silvi)

Solid Rock Radio- 6955 at 0130. Soul music is the staple on Dr. Love's station, but he branches out into other music styles and comedy shows. Addr: Belfast. (Arendt; Hartsell)

Solid State Radio- 6955 at 0100. Don't confuse this newcomer with Solid Rock Radio. The "State" station has been playing rock music so far on their 200 watt AM transmitter. Addr: Providence. (Ryan; Silvi)

The Crooked Man- 6955 at 2015. The deranged stream-of-consciousness narrative from the Crooked Man allegedly was caused by a tragic fall on his head from the Hindenberg Zeppelin. Addr: Washington address defunct. (Frodge)

Up Your Radio Shortwave- 6975 at 2300. Woody B. Serious puts a lot of effort into his comedy productions, all of which make fun of conservatives and Republicans. Addr: Blue Ridge Summit. (Hartsell; Silvi)

Voice of Bizarro World- 6955 at 0300. Xhem still has everything backwards on this station, which makes him different from everybody else. Addr: Huntsville. (Jurrens)

Voice of Green Acres- 6955 at 0045. The shows on this self-professed "worst pirate" in America consist almost entirely of repeated renditions of the Green Acres television show theme. Don't confuse them with **Green Acres Radio**, a similar station. Addr: None. (Arendt; Frodge; Jurrens; Silvi; Williams)

Voice of Juliet- 6955 at 1300. Their female announcer usually plays music by female singers. Her commentary on gender issues is not always from a feminist perspective. Addr: Merlin. (Axelrod; Comeau; Hassig; Jurrens; Majewski; Nauta; Silvi; Williams)

Voice of Laryngitis- Cowboy Stanley Huxley and Genghis Huxley created some of the funniest pirate shows ever. Somebody has brought the best of their 1980's shows back for a welcome replay, sponsored as usual by Friendly Freddie's Budget Burials, where death is cheap. Addr: Belfast; ignore announced Battle Creek. (Hassig; Jurrens; McLintock; Silvi)

Voice of the Daleks- 6955 at 0130. The Dalek Commander's vessel has blown up on a previous show, but the damage must not have been too severe, since the station is still on the air. Addr: Belfast. (Jurrens)

VOXXX- 6955 at 0200. Adult comedy is their format, but they still aren't communicating with listeners. Addr: None. (Hartsell; Nicklaw)

WARR- 6955 at 0200. Captain Nobeard's rock

music and marijuana advocacy comes with a good signal that is heard nationwide. His maildrop reports that some mail is now getting through, but no QSL's had materialized by MT's press time. Addr: Belfast. (Kuhl; Prindle; Silvi)

WBIG- 6955 at 0130. Big Mike says that his station is the BIG pirate, and that's partly because Mike is a good sized human being. Addr: Belfast. (Comeau; Frodge; Hartsell; Nauta; Ryan; direct from the station)

WLIS- 6955 at 0000. Jack Boggan, shortwave broadcast interval signals, and Ian McFarland on the QSL's are all station trademarks. Addr: Blue Ridge Summit. (Jurrens)

WLWLIS- 6955 at 2000. The station that loves **WLIS** creates its own interval signals, none of which you will hear on regular broadcasters. Addr: Providence. (Jurrens; Rose; Ryan; Silvi; Williams)

WMFQ- 6955 at 1700. A chorus of male announcers gives their identification between rock songs. Their slogan asks, "Where's My QSL." Addr: Providence. (Jurrens; Ryan; Silvi; Williams)

WMPR- 6955 at 0100. Their distinctive style of techno-pop music is easy to spot. Call letter identifications are always by their male announcer, followed by the "6955" frequency by a female announcer. Addr: None. (Axelrod; Benbenek; Comeau; Hartsell; Jurrens; Lobdell; Majewski; Nauta; Prindle; Silvi; Williams; Wolfish)

WPOT- 6955 at 2230. The apparently new station using these classic pirate call letters is a strange one, with the announcer singing over instrumental space music. It's sort of a cross between **WPIG** and the **Voice of the Daleks**. Addr: Belfast. (George Zeller, Cleveland, OH; Frodge; Gosse; Jurrens)

WPRS- 6955 at 1700. Willy B. Quiet is not on as much as he was a couple of years ago, but his relay of an old radio broadcast was fairly widely heard. Addr: Providence. (Jurrens; McLintock; Silvi)

WRCC- 6955 at 0200. P. J. Sparx, host at Radio Free East Coast, has been producing varied programming lately including rock music, comedy bits, and in-studio conversations about issues. Addr: Belfast. (Axelrod; Hartsell; Jurrens; Krauss; Kuhl; Nauta; Prindle; Raven; Rose; Ryan; Silvi; Williams; Wolfish)

WSRR- 6955 at 0100. Solid Rock Radio now uses these call letters. Note that they have established a maildrop address. Addr: Belfast. (Hartsell; Jurrens; McLintock; Pearce; Prindle; Silvi)



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"The World of Ham Radio"

A Gem of a CD

Have you ever stumbled onto something truly valuable? Remember the surprise, the thrill? You can experience that same feeling when you examine a copy of the CD ROM software by AMSOFT called "The World of Ham Radio"! This is one of the best bargains I have laid my hands on in a long time.

This CD has been around for a few years, and I have seen it for sale at several hamfests. Several years ago I looked at it and felt the CD provided a decent call book with some nice software.

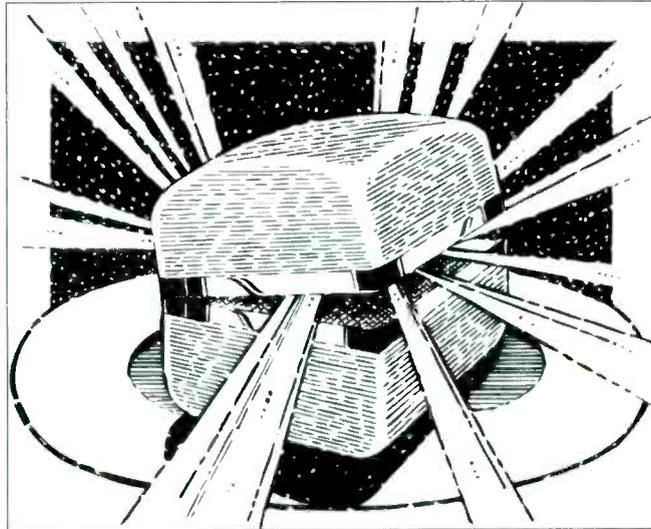
The latest copy, however, knocked me over! I held a copy of it for several weeks before giving it the once over, but after I started I couldn't stop. Programs that I had on separate disks were available in one location with an excellent menu, and moreover, they would run directly from the CD. For many years I have collected shareware at a price of 2 to 6 bucks a disk, finding many I liked, but a lot more that were just ho-hum. If I were to add up the cash laid out to come up with a handful of decent programs I am sure it would be several hundred dollars.

"The World of Ham Radio" is a collection of excellent software; in fact, almost all of the programs I have chosen over the years as being the best are on this CD, plus a lot more, to boot. All of this and a call book, too! Looking up a call is a snap in AMSOFT's "World of Ham Radio." But, let me give you a brief tour of what else is on this CD.

When you type CDVIEW, a listing of many different subjects is presented to you. Choose "Antennas," for example, and you will find 26 different antenna programs that will provide full information on a host of antennas, from simple long wires to yagi and complex loop antennas.

"Basic programs" are a wide range of simple programs written in BASIC which will run directly from the CD. Examples of the Basic listings vary from antennas to z calculations.

Twenty-six different programs deal with



Morse code — from learning programs to programs that will allow you to send Morse from your computer keyboard as well as copy code via the computer and shack receiver.

A variety of engineering programs are included, among which are a simple-to-use CAD program for drawing schematics, a program to lay out PC boards, and tools for designing specific circuits.

Eight different logging programs give you anything you want for contest logging, general logging, and certificate hunting.

One program I particularly like is a training manual for the oscilloscope. As you go through the Oscope manual the computer shows demonstrations of what will appear on the screen of your oscilloscope under different testing situations. Last Christmas a good friend wanted more info on using an oscilloscope and we spent several weekends going over the use of this instrument in my shack. If we had had this program, I am sure my friend would have learned a lot more a lot faster.

Equipment modifications also are included on the "World of Ham Radio" CD. I examined all of the mods available on the CD and am anxious to try several, especially one for a scanner I have. Not every piece of equipment is covered, but there is a lot!

Eight propagation programs allow the

user to determine the best time and frequency to work various parts of the world.

Included are 36 packet programs from very simple to very elaborate terminal programs, information on using packet, and circuits for various packet projects. If you ever wanted to try RTTY, 10 programs on this CD will let you get your feet wet in this interesting mode with minimum outlay.

A very interesting listing for satellite communications provides info on operating and tracking programs, again from simple to fairly complex. There are several programs for SSTV and WEFAX

that I am just now beginning to explore.

As always, there is a "Miscellaneous" listing containing 89 programs which I have only begun to explore. There is also a question and answer section that deals with many subjects. Scanner buffs and SWLs will find a lot of good information on this CD: frequency lists, data bases, modifications, and more.

In short, "The World of Ham Radio" gives you hundreds, if not thousands of dollars worth of information on ham radio, and all at a price of \$29.95! If you have a CD drive on your computer, grab a copy ASAP. If you don't have a drive, consider putting one on your machine just so you can use this super CD.

"The World of Ham Radio" is available from AMSOFT, P.O. Box 666, New Cumberland, PA 17070 or order by calling 1-717-938-8249.

■ The Web

I have recently been asked why I am not active on the Web. To be honest, I have little interest in the Internet, partly because my time is quite limited due to my involvement in so many other projects. But I still welcome contacts; just drop me a letter via "MT" or to my home address at 6347 Chapmans Road, Allentown, PA 18106. Good hamming!

Note on advertisement below: As of 4/26/94 it became unlawful to market cellular-capable receivers in the U.S. Atlantic Ham Radio assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.

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Radio Artwork From Your PC

Many of the projects I describe in this column call for breadboard construction. Others are designed to be assembled with point-to-point wiring on a scrap piece of PC board. Some readers have indicated a desire to obtain an etching pattern for a PC breadboard, because they want the project to look neat and professional. This month I am responding to those requests by providing some breadboard patterns I developed for my personal use. You will be able to make circuit boards from these patterns while using ordinary materials that are available by mail.

■ Creating the Artwork

Figure 1 contains three breadboard patterns for the workbench enthusiast. Two are identical in layout, but one is smaller than the other. A third pattern is provided for those who work with ICs. Two 16-pin IC sites allow the use of standard DIP ICs from 4 to 16 pins. This pattern must be maintained to scale, as provided here. Otherwise, the ICs will not fit into the allocated spots. The other two breadboard patterns may be enlarged or reduced in size with a copy machine to provide the size you prefer.

Patterns such as those in figure 1 can be developed easily with a computer. If you do not have CAD software for drawing schematic diagrams and creating PC-board patterns, you can accomplish the same end result by using Paintbrush in Windows. I use Windows 3.1 in my system. Windows 95 should be satisfactory for this purpose also.

The patterns illustrated in this article were developed while using Boardmaker software, which is a European CAD program.¹ At least two U.S. programs are suitable for this application (PCboards and SMARTWORK).

■ Etching the Boards

One of the better etching products to appear on the market in recent years is Press-n-Peel PnP Blue film produced by Techniks, Inc. It is available from All Electronics in 8-1/2 x 11 inch five-sheet packets.² The figure 1 patterns are transferred to the PnP Blue film with a standard laser copy machine. The pattern on the PnP Blue is then transferred to a piece of clean PC board with a household iron set for silk or cotton.

Approximately one minute of moderate pressure with the iron (keep the iron moving slowly to ensure a complete pattern transfer) is required. Allow the work to cool, then carefully peel the PnP Blue from the PC board. A black etch-resist coating will remain on the board for those copper areas that are protected from the etching solution. Ironing the pattern onto the board causes a mirror-

image reversal, and hence the backward-reading labels in figure 1.

If there should be spots on your PC board where the PnP Blue did not transfer (dirty copper surface or insufficient heat), you may protect those areas with India ink, or with an etch-resist pen.

Ferric chloride etching solution is available in pint bottles at Radio Shack stores.

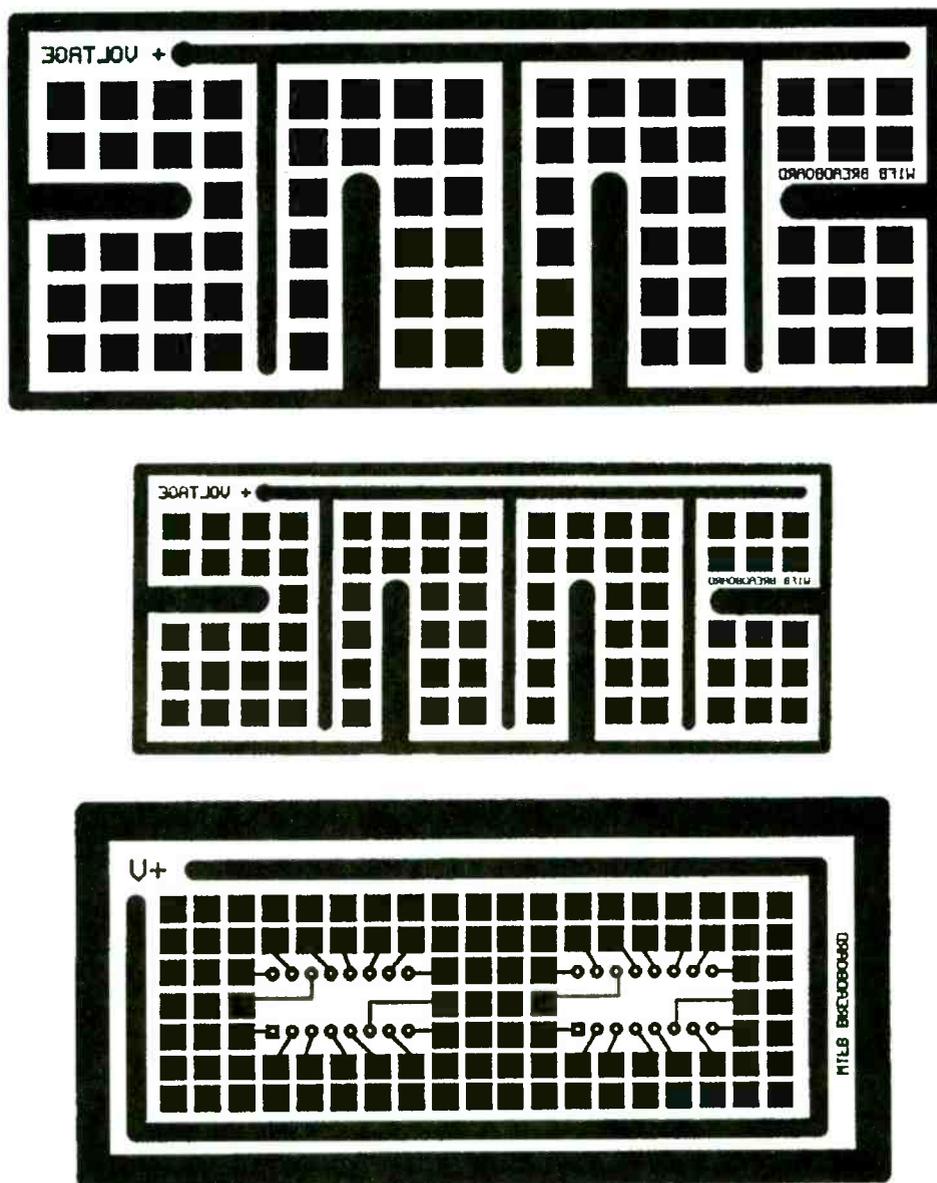


FIGURE 1 — Scale etching patterns for two general-purpose breadboards and one that contains sites for two ICs.

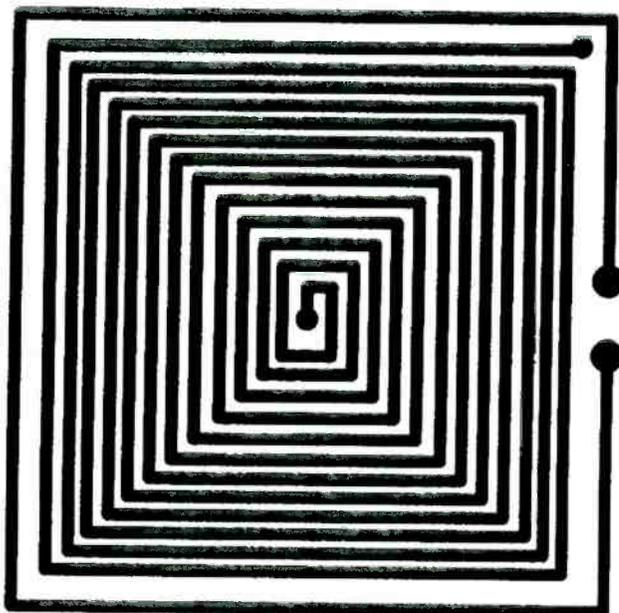


FIGURE 2 — Scale etching pattern for a PC-board coil that has 4.2 microhenries of inductance and a Q of 100.

Alternatively, you can purchase (see reference 2) ferric chloride powder and mix your own etching solution with water. The liquid etchant should be preheated to approximately 100-110 degrees F before the work is placed in it. I do this in a pyrex dish in the microwave oven. **Caution:** Avoid contact with the etchant and do not breathe the fumes. Ammonium persulfate powder may also be mixed with water to provide an etchant.

Agitate the PC board every 30 to 60 seconds during the etching period to hasten the removal of unwanted copper. Most PC boards will etch in 30 minutes or less. The etching time depends upon the thickness of the copper.

Once etched, the PC board should be cleared of remaining etch-resist material by treating it with paint remover or a similar solvent. It can then be washed with warm water and dried with a paper towel. The board may be tin plated by immersing it in tin-plating solution. Tin-plating powder is available from most suppliers of PC board materials, or in liquid form from Kepro Corp. Tin plating makes soldering easier, while protecting the copper conductors from corrosion.

■ A PC-Board Coil

Figure 2 shows a pattern I developed for experimental purposes. It is a flat coil made with etched conductors. The format is similar to that used in the 1930s for loop antennas in some BC band radios. The greater the number of turns the higher the coil inductance, and vice-versa. The figure 2 coil has an inductance of 4.2 microhenries. The measured Q

(on phenolic PC board stock) is 100. The coil can be tapped to lower the inductance (using a rotary switch) in circuits that require a variable inductor. A single-turn loop is on the outer perimeter of the board for use as a coupling link.

This inexpensive approach to coil fabrication lends itself to the construction of compact, low-profile equipment. The inductance can be reduced by placing a brass or aluminum plate on the back side of the PC board. A sliding brass or aluminum plate would make the coil a variable inductor.

In a like manner, a small sheet of powdered iron (pulverized no. 2 or no. 6 toroid material mixed with a binder)

may be placed on the back side of the PC board to increase the inductance. Those who are mechanically inclined should find it easy to make a variable inductor along the foregoing lines.

■ Some Closing Remarks

Breadboards are suitable for finished product fabrication. They can be used again and again for experimental circuits before the copper conductors lift from the phenolic or glass epoxy base material. Always use the least soldering-iron heat practicable to ensure long life for the breadboards. Double-sided PC board stock may be used if you wish to have a ground-plane surface on the non-etched side of the board.

Commercially made versions of the boards in this article may be available. Check with FAR Circuits.³

The plus voltage and ground buses for the two non-IC breadboards in figure 1 are woven into the overall pattern to enable you to keep the power leads short. These lines can be extended into other areas of the pattern by joining them to the square pads with bus wire.

■ Notes

1 — Tsien (UK) Ltd., 181A Huntingdon Rd., Cambridge CB3 0DJ, England.

2 — All Electronics Corp., 14928 Oxnard St., Van Nuys, CA 91411. Phone: 1-800-826-5432 for catalog or orders.

3 — FAR Circuits, 18N640 Field Court, Dundee, IL 60118. Phone: (847) 836-9148 to order.

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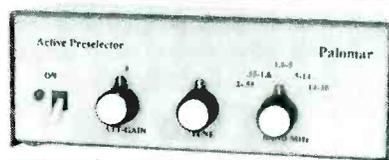


Your longwire may be up in the clear but the wire to the radio picks up noise from light dimmers, TV set, fluorescent lights, etc.

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Separation Anxiety

Welcome aboard! Today we are going to look at a concept that is critical in air traffic control: separation. Keeping aircraft separated is a controller's *prime responsibility*. Separations vary according to conditions, but are discussed in three dimensions or physical planes: vertical, longitudinal, and lateral.

Vertical is the separation of aircraft at different altitudes. **Longitudinal** is the separation of aircraft following one another in trail. **Lateral** is the separation of aircraft at the same altitude, most often to the right or left side. In some respects, given today's use of radar, separation could be thought of as basically either vertical or horizontal. Let's examine these standards of separation as they exist in air traffic control today.

■ Vertical Separation

Vertical separation between instrument flight rules (IFR) aircraft is 1,000 feet up to and including flight level (FL) 290 (twenty-nine thousand). Above flight level 290, vertical separation is 2,000 feet. Therefore, controllers can assign aircraft to fly at 10,000, 11,000, and 12,000 feet up to 29,000 feet. But up where the jets like to travel, the altitudes are at flight levels such as 310, 330, and 350.

To provide 2,000 feet of vertical separation above 29,000 feet, only odd numbered altitudes (flight levels) are used. Aircraft at the higher altitudes flying on courses of 360 to 179 degrees fly at FL 330, 370, 410, etc. Aircraft flying courses of 180 to 359 degrees use FLs 310, 350, 390, etc.

According to the Federal Aviation Regulations, VFR aircraft fly at the given altitude plus 500 feet. Thus, for example, they use 10,500, 11,500, and 12,000 feet. VFR aircraft in terminal control areas are also provided 500 feet of separation.

The 2,000-foot separation minimum above FL 290 is based (among other things) on altimeter accuracy problems at those altitudes. During the last several years, an extensive study on altimeter accuracy has investigated the possibility of reducing the separation to 1,000 feet. The study is still on-going.

■ Longitudinal Separation

In today's environment most aircraft are separated by three nautical miles in terminal areas and five nautical miles when under control of the centers. But again, separation criteria are not always so simple.

1. Wake turbulence separation minima. Wake turbulence is a violent disturbance of the air behind an aircraft, resembling a pair of horizontal tornadoes. The bigger and heavier the aircraft, the more violent the disturbance. For wake turbulence purposes, aircraft are divided into three categories: heavy, large, and small. (An MD11 is a heavy aircraft, a 727 is a large aircraft and a Cessna 421 is a small aircraft.) For aircraft flying directly behind, and less than 1,000 feet below, a preceding aircraft, the following separation minima apply:

- a. Heavy behind a heavy - four nautical miles
 - b. Small or large behind a heavy - five nautical miles
- Near the runway, when the preceding aircraft is over the landing threshold:
1. Small behind a large - four nautical miles
 2. Small behind a heavy - six nautical miles

■ Lateral Separation

Lateral separation exists for nonintersecting flight paths under the following conditions:

- a. When the required distance is maintained between the flight paths.
- b. When reduced route protected airspace is applicable, and the protected airspace of the flight paths do not overlap.
- c. When aircraft are crossing an oceanic boundary and are entering an airspace with a larger lateral minimum than the airspace being exited; and the smaller separation exists at the boundary and flight paths that diverge by 15 degrees or more until the larger minimum is established.

However, lateral separation also exists for intersecting flight paths with constant and same width protected airspace when either aircraft is at or beyond a distance equal to the applicable lateral separation minimum measured perpendicular to the flight path of the other aircraft:

Or, for intersecting flight paths with *constant but different* or with *variable* width protected airspace when either aircraft is at or beyond a distance equal to the sum of the protected airspace of both flight paths measured perpendicular to flight path of other aircraft.

There's more to lateral separation, but I think you get the idea by now.

■ An automatic snitch

Separation also leads us into the next subject to be discussed — the Operational Error Detection Patch (OEDP). Also known as the "snitch gear" or "Sally Snitch," the OEDP "blows the whistle" when a controller has lost the required

minimum separation between two aircraft. In essence, it is the automatic detection of an operational error.

When OEDP first became operational, the number of reported errors increased significantly because the program was capable of detecting 4.9 mile separations when the stated requirement is five miles. Controllers could not discern the one-tenth-of-a-mile loss of separation with the naked eye, so they became conservative, increasing the usual separation to seven miles.

Initially, controllers did not greet the OEDP with a great deal of enthusiasm. But now that they have grown used to it and the system is accommodating slightly increased distanced between aircraft, most everyone agrees that the "snitch gear" has made the system safer — and reduced high "separation anxiety."

■ Major World Air Route Areas

Following is a look at a few of the Major World Air Route Area (MWARA) HF networks that help keep air traffic worldwide on track and collision-free:

North Atlantic (NAT)

(NAT-A): 3016, 5598, 8906, 13306, 17946. Air/Ground transmissions across south central part of North Atlantic - Canarias, Gander, New York, Paramaribo, Piarco, Santa Maria, Shanwick. Bounded by Paramaribo, New York, Reykjavic, and Canarias.

(NAT-B): 2899, 5616, 8864, 13291, 17946.

Air/Ground transmissions across North Atlantic for aircraft that is registered west of 30 degrees west - Gander, Reykjavic, New York, Santa Maria, Shannon (Shanwick)

(NAT-C): 2872, 5649, 8879, 13306, 17946. Air/Ground transmissions for aircraft registered east of 30 degrees west - Gander, Reykjavic (Iceland), Shannon.

(NAT D): 2971, 4675, 8891, 11279, 13291, 17946.

Air/Ground transmissions across furthest northern part of the Atlantic including the north polar region.

(NAT E): 2962, 6628, 8825, 11309. Air/Ground transmissions in Atlantic area between New York and Santa Maria.

(NAT F): 3476, 6622, 8831, 11336, 13291. Air/Ground transmissions in area between Gander and Shanwick.

Caribbean (CAR)

(CAR-A): 2887, 5550, 6577, 8918, 11396, 13297, 17907. Air/Ground transmissions across southern Mexico, Central America, and northwestern Caribbean region of South America - Barranquilla, Boyeros, Guatemala City, Merida, New York, Panama, Piarco, San Andreas Island, San Jose, Tegucigalpa (Toncontin Int'l).

(CAR B): 3455, 5520, 6586, 8846, 11387, 17907. Air/Ground transmissions across north, west, central, and eastern area of Caribbean regions of South America, including north eastern part of South America - Barranquilla, Boyeros, Cayenne, Georgetown, Maiquetia, New York, Panama, Paramaribo, Piarco, San Andreas Is.

Note on advertisement below: As of 4/26/94 it became unlawful to market cellular-capable receivers in the U.S. Bandercom assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.



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Dealer/wholesale distributor inquiries welcome world wide. US based repairshops wanted for complete warranty program. Scanners, Ham Radio, CB, VHF/JHF, Antennas, Amplifiers etc. Customers in 16 countries.

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- Load 40 channels of information including ALPHA NUMERICS into one of the R8500's memory banks in 3 seconds.
- Separate volume level, resume scan delay and maximum monitor delay plus 40 character information field for each scan channel.
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Visit our Internet Web Page or Phone/FAX us for program features, new product releases and pricing schedule. DELTACOMM is available for ICOM R9000, R7100, R7000, R71, R72, IC-735 (features vary with type of radio). Also check out our DELTATONE 2.0 repeater programmer.

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Brave New World of Scanning

The world of federal scanning has taken on an entirely new face over the past month, and those of us that are heavily involved in it are very excited about our "new baby." The first event that occurred is the inauguration of the FedCom mailer on the Internet available through the Grove Web Site. This has brought out the most accurate and timely federal frequency monitoring information that I have seen in the past thirty years—and that's when I got started monitoring the feds.

If you have been following my column, you are aware of the WorldWide Utility Net (WUN) that I brought to your attention in June. FedCom is the same idea, but it is along the lines of federal monitoring instead of utility monitoring, although sometimes the frequency intercepts overlap. To subscribe to the FedCom list, send e-mail to "majordomo@grove.net." In the body of the mail type "subscribe fedcom" or "fedcom digest." Nothing else is necessary. If you are going through AOL, you will have to type something in the subject line or else the mail will not go through. See you on the web!

The second major event is the introduction of the "TrunkTracker" radios.

Over the past few months I have pretty well hashed out the question of where the feds have gone. In many areas of the country, we are hearing less and less on the federal channels. For example, I received an e-mail from someone in law enforcement in a major sheriff's department in Florida. He confirmed our suspicions that the feds have moved up to 800 MHz on the commercial SMR's. (Specialized Mobile Radio systems—a trunked system operated by Motorola). He stated that in the Tampa and Orlando coverage areas, the U.S. Marshal's Office is the first of many federal agencies that are currently making the move to commercial systems. Look for most of the federal agencies in the Central Florida area to be up on 800 within the next few months.

These SMR's are wide area commercial trunking systems, having as many as 20/30 frequencies available on a particular system. On these systems one will find many many commercial systems, from the local pizza delivery service to the pool cleaner to the building contractor. Recent changes in FCC regulations state that the individual users do not have to be licensed, only the trunk system itself. Good luck now finding a particular user!

With more and more commercial systems

leaving their 150 and 460 MHz commercial allocations and showing up on the 800 MHz systems, the feds will become just another face in the crowd—or will they?

I received an e-mail from someone "in the know" with the Bureau of Alcohol, Tobacco, and Firearms (BATF)—another agency that has "disappeared" in the South Florida area from their normal 165 MHz frequencies. To quote the mail: "A couple of weeks ago I was involved in an operation that included personnel from the ATF and the FBI. As we came up on the residence, my trusty Scout popped up with a frequency of 817.614, which I suppose was close enough to 817.6125, an input for a local SMR. It had to be one of those feds, none of the locals would be using that system. I have *not* heard ATF on their 165-166 MHz frequencies for some time in this area (Toledo, Ohio)."

Well, I guess that answers our question on where to find the feds. Will we have to give up monitoring the assigned federal frequencies? Of course not. Keep them installed in your scanner. But the feds know that people are monitoring their frequencies and they are looking for ways to keep their communications secret.

Why isn't digital encryption all that's required for secrecy? DES works fine, but when a lawbreaker starts hearing digital speech encryption on the input channel for the local DEA or FBI repeater or on a simplex channel, it will not take him long to figure out what is happening. This is what is referred to in the intelligence circles as "traffic analysis." You do not have to know the contents of the message; just the fact that the message is being transmitted tells you a great deal.

Since federal agencies are shifting much of their communications to commercial trunked systems, we are going to have to add to our arsenal of monitoring equipment a "TrunkTracker" or its equivalent. In the past, monitors have sometimes obtained trunked radios at hamfests and attempted to get them set up for their own use — thereby risking a lawsuit from Motorola or worse. But now, the rest of us will be able to use the new, legal, scanners that will follow the trunked systems.

There is already a trunktracker internet mailer on the Grove.net server, and a web site at www.trunktracker.com for posting of trunking information as fast as it is being discovered. FedCom will list similar information relevant to federal communications. The

lists get bigger each day with *your* contributions.

For those of you that do have web access, welcome to our new world. If you do not have a computer, you are going to have to obtain one or the services of one to keep informed on the latest developments in Federal scanning. The hobby is changing by the day. Do not be left behind.

■ What You are Hearing

I received a lot of intercepts over the past month, both on the FedCom site and by private e-mail. Let's get to them.

A contributor in the **Boston, Massachusetts**, area submitted the information that there was an active federal trunking system installed in downtown Boston. The system was installed and then no users showed up on the channels. (Note: The same thing happened with the federal SMR in Miami. The system was unplugged in 1995 but is still there.) The following are the data and control channels:

Pair	Transmit Freq	Receive Freq	Connect Tone
One	408.2000	415.3250	90.00 Hz
Two	408.8000	416.9250	90.00 Hz
Three	406.4000	416.7250	90.00 Hz

The connect tone is not the same as the subaudible tone.

I would imagine that the system is still there and bears monitoring. You never know when the system will become active again.

A reader along the U.S./Canadian border submitted the following regarding Border Patrol and Customs operations in his part of the state. **The Border Patrol in Vermont and Northern New York** as far west as Ogdensburg are dispatched out of Swanton, Vermont. Swanton is known as "640." Swanton covers the border from Ogdensburg to Jackman, Maine. When one goes north of Jackman, the dispatcher at Houlton, Maine, takes over the service. Houlton uses the ID of "620."

Swanton (640) uses five repeater sites. They employ the frequencies of 163.625, 163.675, 163.775, 165.875, and 170.625 MHz. The frequency of 163.625 is the busiest. The input to 163.625 is 162.825 MHz. 170.625 is used in the Derby and Newport areas of Vermont. No Digital scrambling (DES) has ever been heard on any of the BP channels. The Customs frequency of 165.2375 MHz is the only Cus-

toms frequency heard.

While we are discussing Customs, they are converting the New England Sector to Motorola Saber Astro VHF radios. Here are the new **Customs repeater sites in the New England** area (hot off the press):

Location	Output	Input
Madawaska, ME	165.2375	166.4375
Houlton, ME	165.2375	166.4375
Calais, ME	165.2375	166.4375
Jackman, ME	165.2375	166.4375
Bangor, ME	165.2375	166.4375
Litchfield, ME	165.2375	166.4375
Jay Peak, VT	165.2375	166.4375
Boston, MA	165.2375	166.4375

The above are in radio switch position A02.

Blackstrap, ME	165.4875	166.9750
Mt. Ascutney, VT	165.4875	166.9750
Worcester, MA	165.4875	166.9750
Orleans, MA	165.4875	166.9750
Trumbull, CT	165.4875	166.9750

The above are in radio switch position A06

Cadillac Mtn., ME	169.4500	171.0750
Deerfield, NH	169.4500	171.0750
Mt. Greylock, MA	169.4500	171.0750
Providence, RI	169.4500	171.0750

The above are in radio switch position A08.

Here are the latest frequencies used by **Customs air operations**. These frequencies will be in the AM mode and may be encrypted.

Frequency	Use
132.9500	Aircraft—Victor channel
139.7000	Aircraft—Victor channel
165.7375	Bravo-1-X-Ray (See note below)
234.6000	Blue 5
238.4000	Blue 7
254.2000	Blue 4
260.8000	Unknown designator—heavy S. Fla use
282.4250	Blue 1
303.8250	Blue 2
336.6000	Blue 3
350.4500	Air to ground and marine units
353.9000	Blue 3
355.9000	Discrete air to ground
361.8000	Blue 9
381.8000	Blue 6
387.8000	Blue 8

NOTE: The frequency of 165.7375 (FM) is confirmed in heavy use in the Southwest United States for air operations.

A reader in the State of Washington sent in the following: **Seattle** DEA office uses channel 6 (418.950 out/416.200 in) for its main operations. The Seattle FBI office uses 167.3875 out/163.8375 input for its downtown repeater. Countywide, the Seattle FBI uses a repeater located on Squak Mountain on 167.2375 out/163.9875 input. The callsign used is KOD220. The U.S. Marshal's office uses a repeater on 164.600 out/162.7875 input for its operations.

Other intercepts include an unknown using the frequency of 166.6375 MHz with traffic in

the Puget Sound area regarding tag checks and prisoner transport details. The frequency of 150.6250 MHz has been monitored with traffic regarding aviation and surveillance of drug smuggling activities in the Tacoma area. This frequency is interesting because it does not fit the normal federal bandplan. The best guess is that it is a National Guard or reserve unit doing drug interdiction activity. This is the portion of the spectrum where you would find them.

The Postal Inspector has been monitored on 414.750 MHz.

The frequency of 417.825 has been monitored with encrypted traffic. This frequency has been monitored in Hawaii also with the same traffic and also "bumper-beeper" sounds. This is not the area where the tracking devices are found. They are in the 170 MHz area. Customs uses this frequency as a "modem link" in the Southwest. It is probably a local DEA operation.

Lastly, I received some more loggings from the **Asheville, North Carolina**, area.

Frequency	Use
164.7000	Unknown use
166.3500	Great Smoky Mountains repeater input - p/l 173.8 Hz
166.3750	Blue Ridge Parkway repeater input - p/l 141.3 Hz
167.1500	Great Smoky Mountains repeater output
167.1750	Blue Ridge Parkway repeater output
168.1250	Forest Service repeater input - output 171.475
168.7250	Forest Service repeater output - input 172.225
171.4750	Pisgah National Forest. p/l 103.5 Hz
171.8750	Simplex—unknown agency
406.1250	Data bursts—repeater out—digital p/l 100 Hz
409.1250	Unknown agency running license tags - digital p/l 723 Hz
412.7250	Data bursts—digital p/l 100 Hz
413.8250	Input to 409.1250

The data bursts are part of an environmental monitoring system known as IFLAWS (Integrated Flood Observance and Warning System). It is a series of remote data collection points that send rain data over a radio link using x.25 packet format. Voice traffic can also be supported on these channels in an emergency.

In Virginia the IFLAWS project is run by the state using frequencies in the 169-172 MHz region. The VHF frequencies are tied into the state police microwave backbone. They eventually end up at the Emergency Operations Center (EOC) in Richmond, Virginia. There are four frequencies in the UHF range. They are:

412.625—Data from state police to NWS and EOC
406.125—Data to state police from NWS and EOC

412.675—Voice from state police to NWS and EOC
406.175—Voice to state police from NWS and EOC

Data from the collection points to the various counties is on 169.5000.

■ Not your basic cable TV

A reader found this in the *Commerce Business Daily* dated June 11, 1997. "The Department of the Treasury (Internal Revenue Service) requires enclosed surveillance systems configured as transformers for mounting on telephone poles. The transmitters shall have an output of two watts and be frequency agile. They shall have an operating temperature range of -20 to +70 degrees C. They shall be remotely controlled and have both tilt and pan capabilities. The cameras will be color and have low light intensifiers on them." I left off the rest of the specs but you get the message.

This and cameras disguised as Cable TV amplifiers are ver-r-ry common methods of disguising federal video surveillance equipment. Most people —and this includes the people being watched — do not know enough about what wires and transformers belong on the poles across from their house. To the technically trained and observant — which I hope all of my readers are — things like pole transformers that do not connect to the power lines and cable TV amplifiers that are just hanging by themselves should sound an alarm in your head. Closer examination will reveal a window on the unit with a little lens behind it. This is not found on regular transformers and cable amplifiers.

Most of this equipment transmits regular FM NTSC video signals in standard microwave bands (1.7 to 2.3 GHz, 2.3 to 2.5 GHz, 5.3 GHz, and of course 7/8 GHz). No attempt has been made to scramble these signals. If you have the correct microwave receiver (some European satellite receivers cover this range) or a good spectrum analyzer, you too can watch the suspect go in and out of his residence or business. If you saw the documentary on how the feds caught John Gotti, they used one of these devices on a telephone pole down the street from his social club so they could watch his meetings in the street with his people. The video is quite good.

Television stations have occasionally discovered these signals from their remote news trucks on their remote pickup antennas. Many of the remote pickup frequencies are in the 2 and 7 GHz band. A lot of times bored techs will tune up and down the band to "see" what they can find.

One contributor saw one of these cable TV amplifier surveillance units for sale at the Dayton Hamfest but did not buy it ... The equipment is out there.

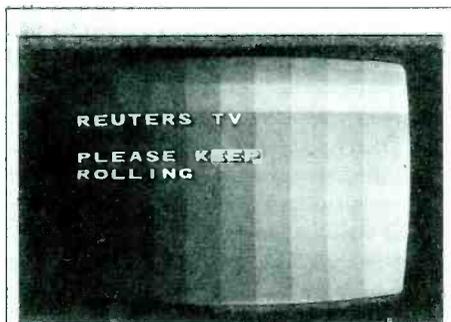
That's it for this month. Let's see you on the FedCom mailer!

The Big Dish Advantage

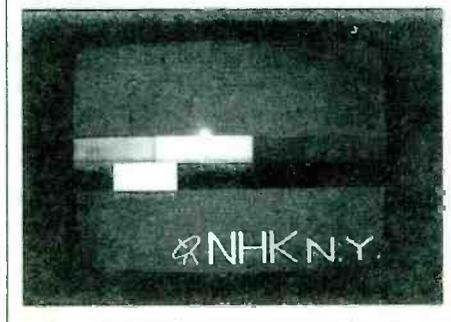
Two years after the wild-fire introduction of direct broadcast satellite (DBS) television, you might have gotten the impression that the big dish universe was history. While it's true that the industry has suffered big losses in subscriber numbers and many manufacturers abandoned big dish satellite TV in favor of the quick money offered by the DBS industry, the technology is very much alive and well.

The reason for the continued success of big dish satellite TV has less to do with home TV viewers and more to do with the television industry as a whole. Those of us still watching big dish satellite are enjoying more and paying less than our friends with the little dishes or on cable. Each year, new audio and video services are launched, and before they end up on your local cable system or the more pricey DBS services, they're seen only on a big dish.

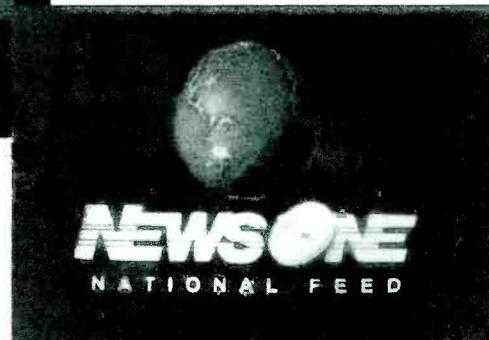
Despite the apparent success of the small dish industry, the really big numbers in television viewing are found in the cable TV industry. While big dish satellite TV claims three million viewers, DBS has four million. Together their seven million viewers are minuscule compared to cable's 65 million subscribers. This is where the real money is.



Reuters TV feeds world news items on C-band as does NHK Tokyo, all in the clear.



CBS (Newspath) and ABC (NewsOne) have national news feeds on C-band as does FOX News. NBC uses Ku-band. All networks have some feeds in the clear. Look to these feeds for dozens of news stories which may not appear on your local affiliates.



Where do you suppose the DBS programmers get their programming? Why, it's down-linked from good old fashioned C-band and re-uplinked to their respective DBS birds. This is why there's more programming available on big dish satellite TV than on any of the DBS satellites. In addition, all the TV networks in North America (the U.S., Canada and Mexico), as well as other nations, use the C and Ku bands to transmit to their affiliates. And, on top of that, many syndication distributors, independent production companies, college sports broadcasters, and governmental agencies use C and Ku to transmit their programs, still in the clear.

■ Networks Galore

Among the biggest users of C and Ku-band technology have been the terrestrial broadcast networks. Whether beaming news and sports back hauls to the network studios or transmitting network programming to affiliates around the country, all networks have used satellite technology to do the job over the last twenty years. They still do.

Viewers in most areas of this country can receive the big broadcast networks ABC, CBS, FOX, NBC, and PBS over the air. Picking up the Warner Bros. Network (WBN) or United Paramount Network (UPN) might be harder. And, unless you live on one of our borders, getting Mexican or Canadian TV is unheard of. You can forget trying to pick up TV from Europe or Asia. Yet, all this programming is available 24 hours a day, in the clear, on a big dish satellite system.

Looking for more variety and specialty programming that you can't find over-the-air or on your local cable system? You can watch The Outdoor Channel, The Computer Televi-

sion Network, Classic Art Showcase, NASA-TV, Arab Network America, America One TV, Network One, at least a dozen shopping channels, and even more religious channels — all on the big dish, all day, in the clear.

■ Sportsman's Paradise

Virtually every major golf tournament, college football and basketball game, NHL hockey game, many college baseball games, professional boxing and wrestling, stock car racing, major tennis tournaments, many professional baseball and football games (despite "universal" scrambling), and soccer from college to pro are found year 'round on C and Ku band satellite TV.

For full coverage of professional baseball and football, you'll have to subscribe to the expensive sports packages (typically \$140 to \$240 per year). Even so, you might be disappointed that your team game is blacked out (unavailable) in your area or that, in the case of baseball, the cable service carries only half the games with the rest being carried by the big networks or independents.

College sports are considerably different, as most big conference teams are carried by their own networks and virtually all in the clear. These networks employ both C and Ku-band with no discernable pattern or rationale. SBS-6, a Ku-band bird, becomes a virtual sports satellite in the fall with as many as 10 individual college football, basketball and hockey games on at once.



Half-hour news programs from France (with English subtitles) as well as BBC and CBC, are transmitted daily on C-band, all in the clear.

■ The Ku Option

Most satellite TV systems are sold and installed with only C-band capability. This is partly because the extra expense and the perception many dealers have of the marginal advantage of Ku-band. In addition, Ku-band reception requires a precise installation with tight dish alignment. Any slop in an installation which could be tolerated on C-band will provide noisy pictures on Ku. Some dealers aren't up to the task. For the real satellite TV DXer, however, Ku-band is a must. Adding Ku-band equipment to the initial installation shouldn't add more than two hundred dollars to the total tab. Retro-fitting an existing C-band installation to include Ku-band could cost more, since the C-band-only feedhorn will not be needed. What will be needed is the extra RG/6 cable to feed the Ku LNB. This, however, is already present on virtually all recent installations.

Since nearly every modern satellite receiver is "Ku-band ready," hooking up and scanning the skies couldn't be easier. Even older receivers can function as Ku-band receivers if they have a video inversion switch, as Ku-band transmissions are sent with the video

signal inverted compared to C-band. Simply adding a high-isolation A-B switch for the two coax feeds and flipping the video inversion switch will allow you to tune most Ku-band birds. Better yet, find an old USCI receiver (G.I. made them in the mid-80's) and operate it as a stand-alone Ku system.

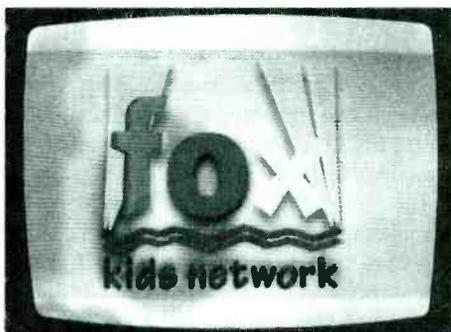


Programming from Canada (CBC), Portugal (RTI), Japan (NHK), Emirates Dubai, Germany (Deutsche Welle), are all on 24 hours a day and all in the clear.

Among the other interesting amenities on Ku-band are SCPC and FM² audio services in addition to the usual subcarriers. There's Chinese programming, TV from Russia, Canada, and at least one PBS channel, again, all in the clear. No special descramblers or fees.

■ But, Wait, There's More

There's C-band, Ku-band, audio services, live sporting events, specialty channels, ethnic oriented programming in native languages, even adult movie channels (eight at last count). With so much in the way of entertainment you'd imagine that big dish satellite TV gear would sell for premium bucks.



Channels you didn't even know existed, such as FOX Kids Network, Classic Arts Showcase, Z music, Computer Television Network are up all day and in the clear.

Not so. Excess equipment from going-out-of-business manufacturers and distributors are selling for rock bottom prices. Brand new in-the-box receivers are selling for as little as \$200. With lots of folks caught up in DBS hysteria, getting a complete used system for \$200 is a snap. Some folks might even pay you to take the big dish away.

With the introduction of General Instrument's 4DTV, big dish owners will be prepared for the next technological big dish revolution: digital transmissions in the Digicipher II mode. You'll be able to add many more years to your viewing pleasure thanks to 4DTV's capability to receive analog, Videocipher II, Digicipher II, and Digicipher II encrypted signals. This is what makes satellite TV of the past the satellite TV of the future. And, if you're interested in news, sports, music, arts,

international programming, adult fare, and wild feeds check out the big dish advantage.

■ Transponder Notes

As you've doubtless heard by now, Mr. Murdoch had a falling out with Mr. Dish and instead of teaming up with Echostar, the Media Baron from Down Under has set his sights on the more friendly Primestar service. Friendly because it is seen not as a threat to cable interests (as DISH was seen) and because the combined force of Murdoch and the Primestar Partners (a consortium of cable giants) will be most threatening to DSS, DISH, and what's left of Alphastar.

There's reason for those services to be concerned. Already suffering financially from the inter-DBS price wars, fighting a protracted war against each other and big cable (fueled by Murdoch's deep pockets) may prove debilitating.

In the "Where-Are-They-Now?" Dept: Following the loss of Telstar 401 last January and Spacenet 2 falling into disuse several months ago, it's not been easy tracking down the whereabouts of a number of the missing inhabitants. South Carolina Public Television was on the Ku side of 401 and is rumored to be on Orion in a Digicipher II format. The VOA SCPC signals on Spacenet 2 have reportedly gone digital on T402.

Only Radio Martí remains in analog SCPC on T402. BBC breakfast news is still seen occasionally on G9, 1 at 3:00 am ET. BBC World News has been seen at Noon ET on various satellites. It's on every day at 11:00 am ET on CBC's Newsworld (Anik E2, 6) with Canadian commercials inserted.

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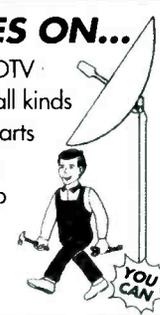
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WiNRADiO's RF Spectrum Scope

Noted science fiction author Ray Bradbury wrote a classic short story many years ago called, *Something Wicked This Way Comes*. Drats! I wanted to use that title because do I ever have something "wicked" for you! Only there's nothing sinister about mine; it's just a ray of brilliance.

Have you ever lusted for a spectrum analyzer (SA)? I have. But at price tags of \$5000 to \$60,000, it never got beyond the salivating stage ... nor do you get that much of an SA for five kilobucks, either. But that's commercial stuff. There are some interesting alternatives to spectrum analyzers available to hobbyists at hobbyist prices. One of which I'm aware dates back to the 70's: a "roll your own" series of kits from Science Workshop called the "Poor Man's Spectrum Analyzer." For about \$300 (and you supplied your own oscilloscope), you could concoct a kludge that indeed monitored the RF spectrum with a visual display. I haven't heard anything out of Science Workshop in recent times, though.

Al Helfrick (K2BLA), and A & A Engineering took the concept a lot farther with their "450 MHz Spectrum Analyzer," as featured in the Nov-1985 issue of *QST* magazine. It's still available today as a kit, less cabinet, hardware, and oscilloscope, for under \$300.

More recently, Grove Enterprises introduced ready-to-go spectral viewing to the hobbyist with their SDU-100 Spectrum Display Unit (not currently being manufactured). Priced at under \$500 and virtually "turn-key" operable, the SDU-100 is useful with selected receivers, including the Icom R7000, R9000, and R7100, but you have to supply the receiver and a monochrome monitor, or purchase a separate monitor.

Icom, of course, includes a spectral display monitor in their high-end R9000 and in some of their high end ham transceivers.

The point is that viewing more than a few kHz of RF spectrum at a time has always been an expensive proposition. Most of us just resort to the "armstrong spectral tuner" (use your arm and hand to spin the tuning dials and flip the bandswitches of a receiver). None of these hobby-SA's are computer-based.

The paradigm is about to shift — indeed, something wicked this way comes! Enter

Rosetta Laboratories, WiNRADiO (see *MT* Sept & Oct-1996), and their latest upgrade to the WiNRADiO software (v2.04 at this writing), where an RF Spectrum Scope has been included at no added cost. If you already own a WiNRADiO, you can download the latest software for free at the Web sites given below.

Version 2.04 offers refinements and added features to the regular user interface and control program: but the bombshell whopper is the RF Spectrum Scope, basically a spectrum analyzer feature previously found only on very expensive radios! See Fig-1 where I set up a quick spectrum scan in 5 kHz steps between 158-159 MHz. Fig-2 is a subsequent sweep in 2 kHz steps of a narrower part of that spectrum, 157.9-158.3 MHz. The large signal at 158.100 MHz is (what else?) a pager. Voice signals appear in Fig-1 at 158.52 MHz and in Fig-2 at 157.94, 158.03, and 158.26 MHz. The three-peak blip in Fig-1 at 158.8 MHz is probably a pair of voice signals on adjacent channels.

receiver scans the band. Any signal within that window produces a response in the trace.

Different trace colors distinguish the maximum, minimum, previous, and current sweeps. This is especially wicked for identifying 2-way radios that key and unkey all the time, in contrast to broadcast and continuous carrier signals. Pagers are wide, multi-peaked displays where 2-way voice signals appear as narrower "blips."

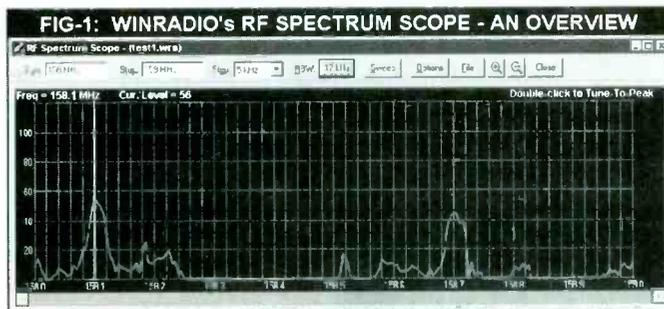
WiNRADiO's RF Spectrum Scope can be set for a single sweep or continuous sweeping with the receiver muted or blaring, as you choose. Sweeps are set in one of two ways: start freq-stop freq (end to end), or center frequency and bandwidth. Sweeps can be as narrow as a few kHz to a maximum of 100 MHz. Wicked!

Utterly delightful, the spectrum screen can be saved to a very small file and redisplayed later for analysis and tuning, or be captured as a graphic image (photograph). Hundreds of sweeps can be saved in a very small amount of disk space. The ones pictured here require around 1250 bytes.

The RF Spectrum Scope has a Zoom-In / Zoom-Out feature to make the spectral display appear with more or less horizontal detail. The "Scope" shows frequency and relative S-Meter numbers (0 to 100) of the trace at any point touched (moused) by the cursor.

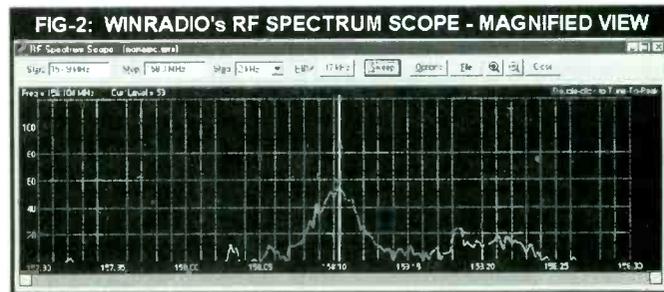
Great boogly woogly! What else can be said? The RF Spectrum Scope feature of WiNRADiO really works, and it's included in the under-\$600 total price of the radio (computer not included, of course). Not only does it work, but also you can do some fairly serious fingerprinting and identification of signals in the spectral display with a little experience under your belt.

In short, WiNRADiO's RF Spectrum Scope



One of the wickedest things about the new RF Spectrum Scope is the capability to position the cursor on any "blip" or spot in the trace and instantly, WiNRADiO tunes to that frequency! Bzzzaaaap! That quick! My WiNRADiO receiver is tuned to 158.100 MHz in Fig-1 and 158.104 MHz in Fig-2.

The RF Spectrum Scope has ten selectable spectrum scan steps: 1, 2, 5, 10, 12.5, 20, 25, 30, 50, and 100 kHz; two resolution bandwidths, 6 and 17 kHz; and a slew of options shown in Fig-3. Resolution bandwidth is the width of the frequency "window" with which the



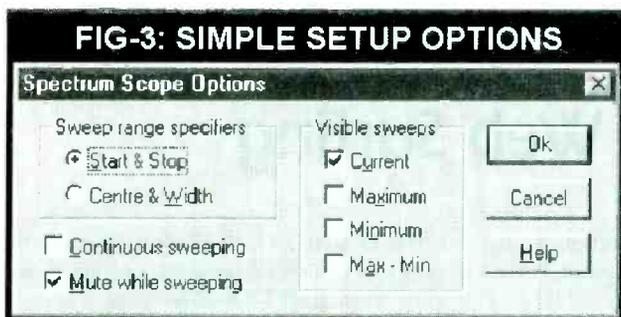


FIG-3: SIMPLE SETUP OPTIONS

is likely the best yet amateur and hobbyist approach to spectrum analysis. And, it's free. (Huh?) Well, the alternatives require a six- or seven figure budget for a "real" SA, or assume that you already have a four-figure receiver and plenty of cash for the peripherals. Of course, if you don't have a computer, then you can't use WinRADiO. If you have a PC-386/ higher, but no DC-to-daylight receiver, then something under \$600 gets both a quality 500 kHz-1.3 GHz receiver and a very useful spectrum scope. If you have an earlier WinRADiO, then you can get the highly enhanced software upgrade for free! How else you can come close to spectrum viewing for under \$600 — short of a benevolent uncle, maybe?

By the way, it is not widely known, but WinRADiO can work under MS-DOS in 8-bit slots of 286 and higher PC's, so if you're mired in computational dark ages, you might still be able to play computer controlled radio. The best operating environments, however, include 16-bit slots in 386 PC's or higher, operating under Windows 3.1x, Windows 95, or Windows NT 3.5/up.

■ What's New in WinRADiO V2.04

Version 2.04 of the WinRADiO software has significant improvements over the original, including:

1. Above described RF Spectrum Scope
2. Step size resolution now 100 Hz, adjustable over a range of 100 Hz to 10 MHz

3. Extra scanning Pause mode in Scanner Setup
4. Enhanced range scanning (stored variables now include mode and squelch settings)
5. Memory group numbers are now shown in Memory viewer
6. Squelch is now joined with scanning sensitivity (but can be separated in General Options)

7. Signal Strength values (0-100) now shown in the bar-graph Signal Strength display
8. Long file names are now supported for Windows 95 and NT
9. "Always On Top" feature
10. "Hide Title Bar" feature
11. Drivers for Win3.1x, Win95, and Win NT 3.50/up are now supplied as part of the install program
12. I/O address setup was added to the Windows Control Panel for easier setup

These new functions are self-explanatory, but the WinRADiO on-line help is excellent.

■ More Information

The latest information and software updates for WinRADiO are available at the US Web site at <http://www.winradio.com> and at the Australia site: <http://www.winradio.net.au>. These sites also contain programming information (both 16 and 32 bit) for those who want to write their own software for the WinRADiO receiver (the information supplied in the manual is superseded). If you don't have a WinRADiO, you can still download the v2.04 software and run it in a demo mode.

■ Please Note

Please note my new e-mail address and 24-hr direct connection to the Internet. Also note that my BBS closed for good on May 31,

1997. It is being replaced by bigger and better Web and FTP sites.

E-mail: bcheek@san.rr.com
 WWW: <http://ourworld.compuserve.com/homepages/bcheek>
 FTP: <ftp://ftp.cts.com/pub/bcheek> or <ftp://204.210.20.47>
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FIG-4: IMPROVED WINRADiO

Radio Rafting and Web Surfing

Wow! You people have been keeping my E-mail and mailman busy with web sites and subjects that are interesting, and potentially quite useful. We'll take a look at these a bit later.

First I want to share with you a new communication mode decoding program, **Radioraft**. This decoder is capable of ten ARQ modes, eight FEC modes and more. The price for the "Lite" version, which only includes six of the most popular modes, is free and immediately downloadable from the Internet. Sound good? Read on.

Radio Rafting Basics

The modes which Radioraft decodes are shown in Figure 1, which is a pull down menu from the program's main screen. Version 2.0 decodes various forms of Baudot, ARQ, FEC, Packet, SITOR, Autospec, Spread, and Morse. Its computer requirements are modest by today's standards. Its minimum requirements are a 386 with one comms (serial) port and a VGA card. The program runs under DOS 3.2 or newer, not Windows.

You can build and use the audio-to-computer interface which is described in Radioraft's Help file. If you have an interface which works with Hamcomm or JVFAX it will work with Radioraft. I used an interface I built quite a number of years ago, which is designed around the ancient (and cheap) 741 operational amplifier. Audio from the receiver is connected to the input. The output of the interface connects to the computer's serial, or comms port. You can use either comms port 1

or 2. Although the author is working on the use of other ports for the next version, Ports 3 and 4 are not supported in version 2.0.

The program originates in France. But the comprehensive Help file is available in a number of languages, including, of course, English.

Starting Down the Decoding River

The Internet file, RAFT201.EXE, is about 250K bytes long and downloads in a few minutes using a 28.8 bps modem. Running this self-extracting file eventually produces a subdirectory RADIORAF containing the main program and instructions. A sub-subdirectory is also created called MASTER.

When you first run the program you will be asked a number of setup questions. All but one can be changed from within the program. The one that cannot be changed from the program asks if you have a coded number which allows you to use the full version, not the limited feature LITE version. This full version unlock number is given to the user by the author once a fee is paid. Installation could not be simpler or easier. The total disk space required by the program is small at less than 500K.

Floating a Raft

The input signal level indicator is located on the top right hand side of the screen. It appears as horizontal lines. The length of the right line indicates the quality of the input signal. The left line shows the error rate of the signal. In both cases, the longer the lines the

better. I found this to be a little tricky to set up. I suggest you spend some time with a strong, easily copied RTTY weather station in order to determine the best settings. This depends a lot on your interface, so experiment. It will be a small amount of time well spent.

Tuning your signal to the audio frequency that the program is "listening" for is easily done using the Frequency Meter, which is displayed when key F8 is pressed. This is shown as the third line down in Figure 2. A wide bar will appear representing the input signal's frequency. Tune your receiver so that the wide bar is positioned at the + mark on this line and you will be set to start decoding.

The operation of the program can be controlled by either the keyboard or the mouse, interchangeable at any time. Figure 2 shows the main screen. A meteo (weather) RTTY station decode is shown. The middle line at the top of the screen, starting at the left with the word File, is the command line. Going from right to left, we first have a very complete Help file. Next we have the Setting menu which contains lots of important selections.

After you select the type of interface you want to use, a second very important menu appears. This is the screen in which you choose the audio input parameters, including the center frequency to which the incoming signal must be tuned. One choice is Signal Tracking, designed to move the input of the decoder to the frequency of the input. We'll talk more about how well this feature performs later. The comm port is also designated from this menu.

Options menu is next with a double click option of "auto-shift-reverse" select. When selected, the program will attempt to automatically determine which is the mark and which is the space tone.

Auto Everything

Again looking at Figure 2, the next two control menus are pretty nifty. These control the setting for mode and speed via pull down menus. It's all here for the taking. But notice, the word "scan" appears in the front of these labels. If we now click on the "scan" in front of the mode, both the mode and the scan speed go into automatic mode trying to obtain a valid match to the input signal. This is Radioraft's automatic decoding mode which lets the computer identify the type of input signal coding.

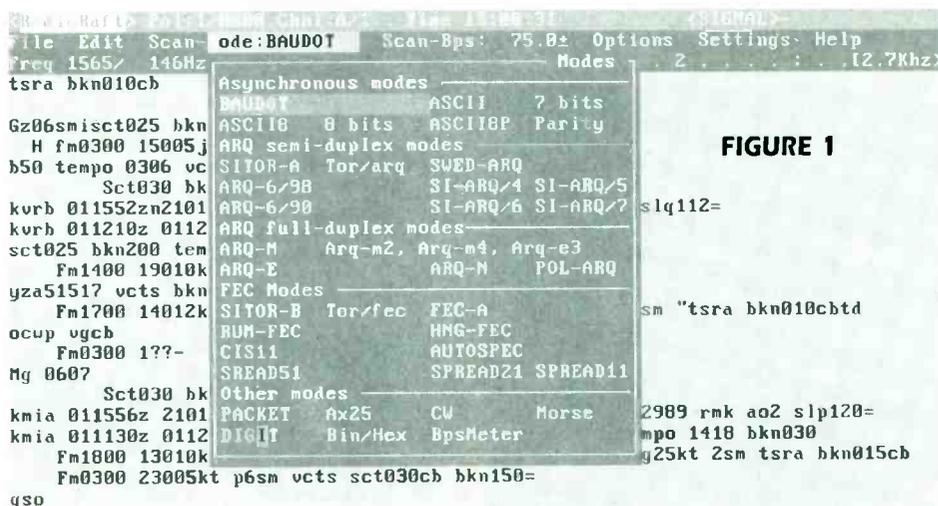


FIGURE 1

```

RadioRaft v1.0 07/0000 Chnl A/1 Time 13:00:13
File Edit can Mode:BAUDOT Scan-Bps: 75.0 Options Settings Help
Freq 1564.1675MHz <0.31> 1 2 12.7KHz
tsra bkn010ch

Gz06smisc025 hkn060 prob40 2303 2sm tsra bkn020ch
H fm0300 15005j
b50 tempo 0306 vcts hkn025ch becng 0607
Sct030 bkn250=
kurb 011552zn21011kn023 hkn090 ovc200 29/23 a2906 ruk slq112=
kurb 011210z 011212 19007k
sct025 hkn200 tempo 1214 hkn025
Fm1400 19010kt p6sm
yza51517 vcts hkn015ch
Fm1700 14012kt p6sm sct030 tempo 1723 urb20g10kt 1sm "tsra bkn010chtd
ocwp vgcb
Fm0300 1??-
Mg 0607
Sct030 bkn250=
kmia 011556z 21010kt 10sm sct034 sct150 ovc250 29/22 a2989 rnk ao2 slp120=
kmia 011130z 011212 12006kt p6sm vcsb sct030 hkn150 tempo 1418 bkn030
Fm1800 13010kt p6sm sct030 hkn100 tempo 2103 urb15g25kt 2sm tsra bkn015ch
Fm0300 23005kt p6sm vcts sct030cb hkn150=
qso

```

FIGURE 2

When the program has grabbed onto a match, three things will occur. The various mode types and speeds will stop rolling by and only one of each will be constantly displayed. The top left "<RadioRaft>" symbol will change to scrolling decoded data. And finally, this data will appear in the center part of the screen.

Once the data is coming through cleanly, a second click on "scan" stabilizes the process and returns the decoder to the manual mode. If you click on the "scan" in front of the speed (bps - bits per second) the mode will remain in the manual mode while the speed automatically looks for a match: a thoughtful operating touch.

■ Does It Work?

The answer to this question comes in parts. Life is never simple. I like the whole feel of the program. It's very easy to use without ever looking at instructions. We have only covered a number of key features: Radioraft has many more.

In high to medium signal strength conditions, using my homebuilt decoder, Radioraft performed well — *once the proper signal level was found*. Figure 2 is live copy, with a fair amount of signal fading.

However, my decoder/interface system did not like weak signals in its automatic mode. It could not make up its mind. I manually tried each combination of mode and speed and had better results.

Using the Signal Tracking feature mentioned above did not seem to produce the proper results. You could see the program hunt for the input signal when it was not at the + mark on the Frequency Meter. Two <> symbols automatically move along the bar until they surround the input signal bar, a nice bit of programming. But the process takes awhile, and I found that the signal had to be very, very strong before it would decode anything using

Signal Tracking. Nice idea; more work needed.

■ Don't Abandon the Raft!

I believe that the weak signal problem flies more with the ultra simple interface and less with the program. Radioraft LITE is a lot of program for free, and the full version is a real bargain at \$28. Radioraft is available from: Francois Guillet, 17 rue Michel Delalande, F-44800 St-Herblain, France. His E-mail is: F6FLT@TheOffice.net. Check out his Web site and download the LITE version from Web site: <http://ourworld.compuserve.com/homepages/F6FLT/>. Tell him you saw it in *MT's* Computers & Radios column.

■ Bits & Bytes

- The computer industry is a very interesting one. Where else could a company that has lost over \$25 million be bought for \$400 million? That was just the case with the WebTV company, which was a loser until Bill Gates decided he needed a TV media/Internet provider arm to Microsoft. The Sony and Magnavox Web TV boxes continue to fall in price. Currently they are both at \$250 ... and falling. The public has not yet embraced the Internet in the living room concept. Perhaps it is the price? Where's the magic dollar number? Place your bets. But remember, home DSS systems did not sell big until they hit the \$199 level! Stay tuned... I mean, stay connected.
- The year 2000 brings with it the problem of having a two digit date that cannot be used arithmetically. You can't do much with "00." I spoke with an inventor recently who told me vast sums of money are being spent by the financial community to find a solution. Some government agencies are warning of "major shutdown problems." The clock is ticking...
- Maryanne Kehoe sent us an article titled, "Thousands of neglected ... outdated sites litter the Internet." Welcome to media blitz

and hype. Few of us check the validity of information anymore. If a person on TV or radio says it's so, it must be. And if we see it written on the Internet that proves... that proves... nothing.

■ More Mining Gold

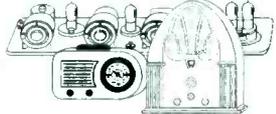
First, let me set the record straight. I wrongly reported the World Utility News site in a previous column. This excellent site is at <http://www.gem.net/~berri/wun>. My thanks to Rick Baker for this corrected info.

Lisa Herder tells me that she has thrown away her phone book and CD roms of phone numbers. Instead she uses <http://www.bigyellow.com> to find anybody in the USA. It works. She found me.

Another orbit prediction and space site was sent in by KF4CYB. Try www.ghg.net/tbraithw/mirtop.html.

Thanks to everyone who E-mailed and wrote to me. I'll pass on any interesting sites or stories that you send. Let me know of any topics that you would like to see us cover and we'll give them a try. Keep those web sites coming. Till next time, I wish you smooth sailing in cool, calm waters.

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Culture and The Arts

In summer, the lively arts seem to get...well...livelier! Outdoor venues, that were unusable in colder weather, join with the year-round indoor *places des arts* to provide a virtual cornucopia of options. In Europe, music and arts festivals like the Proms in England, the Edinburgh International in Scotland, and the Salzburg Festival in Austria are held across the continent. You can travel there (vicariously, of course) through the magic of your shortwave radio! International broadcasters provide regular coverage of these events—everything from a front row seat to performances in a few occasions to regular reports from the festivals.

Much of this coverage is broadcast direct from the home country via regular programs devoted exclusively to the arts. Stations know that one of the prime motivations for listeners tuning in to their broadcasts is the opportunity to learn something about the culture of the nation in question, so a significant portion of nearly every station's schedule is devoted one way or another to coverage of the arts in the country originating the broadcast.

Here is a list of some well-produced arts programs on shortwave. While the term "culture" can be interpreted in a more expansive sense to also include the history and traditions of a people or place, we are concentrating here on programs which report on or otherwise highlight major national, regional, and international cultural and artistic events and performers. Smaller stations that might not offer specialized arts programs often provide coverage through daily magazine style programs that report on a range of domestic topics, including the arts.

Please consult *MT's* Shortwave Guide for frequencies and transmission target areas of the broadcasts listed, as well as for the broadcast times, frequencies, and target areas of stations from countries of interest not listed in this article. For example, Radio Austria International and Swiss Radio International do not feature programs specifically dedicated to coverage of the arts. Nonetheless, the program *Report from Austria* in the case of the former, and *Newsnet* and *Rendezvous with Switzerland* in the case of the latter, regularly provide at a minimum topical coverage of cultural current events within each nation.

Please remember that dates and times are in UTC. An * denotes that a program broadcast

time will likely move one hour later UTC when clocks are shifted to standard time in the fall. Programs and times were checked for correctness at press time, but stations may have made changes in the interim.

■ All India Radio

In India, the cinema is king. Motion pictures are a passion with the Indian public and the orientation of AIR's cultural programming reflects this fact.

Film Story offers a detailed, descriptive summary of a current popular movie. It can be heard on the third Sunday of each month at 1350, 1830, and 2120; also on the third Monday of each month at 2330. *Indian Cinema* is a monthly report on the Indian motion picture industry broadcast on the second Monday of the month at 0005 and the second Saturday of the month at 1030, 1425, 1910, and 2215.

■ BBC World Service

Meridian is the BBC's flagship program devoted to coverage of the arts. *Meridian* takes a wider view than most shortwave arts programs, regularly extending itself beyond the British Isles to provide a more global perspective on artistic events, personalities, and topics. The program is presented four times weekly in four different forms. *Meridian Feature* examines, in documentary form, a topic drawn from the arts. *Meridian Live* takes a weekly look at the arts around the world. *Meridian On Screen* discusses and reports on the international cinema. And *Meridian Books* covers the international literary scene. The broadcast schedule is somewhat convoluted:

Meridian Feature: Americas/Europe stream Saturdays at 0630 and 2130 and Mondays at 0230; Africa stream Saturdays at 1930 and Tuesdays at 1030; Asia stream Sunday at 0630 and Monday at 0915 and 1530 (to South Asia only) and 1130 (to East Asia only).

Meridian Live: Americas/Europe stream Tuesdays at 2130 and Wednesdays at 0230 and 0730; Africa stream Tuesday at 2130; Asia stream Wednesdays at 0915 (to South Asia only), 1130 (to East Asia only) and Thursdays at 0630.

Meridian On Screen: Americas/Europe stream Tuesdays at 0230 and 1030 and Wednesdays at 2130; Africa stream Mondays at 1930 and Wednesdays at 1030; Asia stream Tuesdays at 0915, Wednesdays at 0630 and 1530

(all to South Asia only), Tuesdays at 1130 (to East Asia only) and Thursdays at 1930.

Meridian Books: Americas/Europe stream Thursdays at 0230, 0630 and 2130; Africa stream Thursdays at 1030 and 2130; Asia stream Fridays at 0915 and 1530 (both to South Asia only), 1130 (to East Asia only) and Saturdays at 0630.

Apart from changing feature programs and series on the arts that the BBC broadcasts from time to time, *Spotlight* is a regular program that listens in to conversations among theatre directors, writers, actors, and critics about works which matter to them and why. *Spotlight* is a five minute program airing Fridays at 1740 and Saturdays at 0155 in the Americas/Europe stream, Thursdays at 0925 in the Africa stream, and Fridays at 1525 in the Asia stream.

Live and taped broadcasts from the *103rd Henry Wood Promenade Concerts*, which began in July, continue into August. Via the Americas/Europe stream, tune in Sundays at 1401 and Mondays at 0815. The Africa stream carries the concerts each Sunday at 1401 and Mondays at 2115. Listeners can hear these concerts via the Asia stream Sundays at 1401 and 2115 and Mondays at 0815.

■ Channel Africa

Artist of the Week profiles a prominent African artist and may be heard each Thursday at 0438. *Arts Profile* features interviews with South African performers and is broadcast on Saturdays at 1637.

■ Deutsche Welle

Cultural events in Germany are highlighted every week (except the first week of the month), in *Arts on the Air* which goes out on Sundays at 0915, 1115, 1615, 1915, and 2015 and Mondays at 0115, 0315, and 0515.

■ HCJB

On Line, a production of HCJB's European arm, is a magazine style program that examines European popular culture. It is broadcast at 0730 and 1000 on Fridays and 0200 on Saturdays.

■ Polish Radio Warsaw

Focus presents the arts in Poland and is broadcast Thursdays at 2000*, Fridays at 1730*, and Saturdays at 1230*.

■ Radio Australia

At the time this article was submitted for deadline, much was still unknown about the full extent of schedule changes made necessary by deep cuts to this station's budget. Speculation has centered around increased reliance by *Radio Australia* on the ABC domestic network for programming and abandonment of the existing 24 hour English service in favor of an 18 hour schedule. Consequently, information presented here may have changed drastically by the time you read this.

Arts Australia, a cultural current events magazine hosted by Sian Perry, airs Tuesdays at 0031, 0931, 1431 and 2131 (2031 when clocks are shifted in October).

■ Radio Budapest

Hungary's broadcaster presents a bi-monthly *Cultural Review*, which surveys Hungarian cultural current events. The problem with Radio Budapest is that it shifts its programming schedules almost on a monthly basis. At deadline, *Cultural Review* was scheduled on the first and third Mondays of the month during the 2100 transmission and the first and third Tuesdays of the month in the 0230 broadcast. (Radio Budapest does, however, offer a monthly program guide free of charge that arrives within the first few days of each month and has an Internet site that has timely information about its programming. Mailing address: H-1800 Brody Sandor u. 5-7, Budapest. e-mail site: <ANGOLI@kaf.radio.hu>. Internet: <www.eunet.hu/radio>.)

■ Radio Canada International



Arts in Canada, which takes listeners to various Canadian cultural events and provides interviews with a wide range of Canadian artists, is broadcast Sundays at 2008* and Mondays at 0108*.

■ Radio Exterior de Espana (Spanish National Radio)

Arts in Spain, which reports on national and regional cultural events, goes out at 2240* on Fridays and at 0039, 0139, and 0539 on Saturdays. *Entertainment in Spain* reports on Spanish theatre, cinema, and music every Monday at 2040* and Tuesday at 0039, 0139, and 0539.

■ Radio France Internationale

Arts in France is a weekly cultural report airing Mondays at about 1237, 1437, and 1637 and Tuesdays at approximately 1715. *Film Reel* concentrates on the unique and proud French cinema and is broadcast Sundays at approximately 1715, Thursdays at about 1447,

and Fridays at about 1637.

■ Radio Netherlands

Mirror Images is an award winning and lively mix of interviews, reports, music, and readings with regular contributions from arts correspondents from around Europe and the world. David Swatling hosts this program which transmits Tuesdays at 0753, 0953, 1153*, 1353, 1753, and 1953, and Wednesdays at 0053, 0253, and 0453.

■ Radio Prague

The Arts is a weekly report on Czech cultural events and is broadcast on Wednesdays at approximately 0340, 0710*, 0910*, 1040*, 1310*, 1610*, 1710*, 2010*, 2140, and 2240; Thursdays at approximately 0010, 0110, and 0310.

■ Radio Romania International

Programs devoted to Romanian cultural and artistic life are heard twice a week.

Cultural Survey airs on Fridays during the second half hour of the 0645, 1430, 1900, 2100, and 2300 transmissions and Saturdays in the 0200 and 0400 broadcasts.

World of Culture goes out on Saturdays during the 0530, 0645, 1430, 1730, 1900, 2100, and 2300 blocks and Sundays in the 0200 and 0400 broadcasts.

■ Radio Slovakia International

Cultural Happenings looks at cultural events in Slovakia on Mondays at 0840, 1640*, and 1840* and Tuesdays at 0110.

■ Radio Singapore International

The visual and performing arts in Singapore are the focus of *Arts Arena* which goes out each Monday and Thursday at 1115, Saturday at 1250, and Sunday at 1340.

■ Radio Sweden

Spectrum highlights the arts in Sweden twice monthly on the first and third Saturdays of each month at 1130*, 1230*, 1330*, 1730, 1930*, 2030*, and 2130*; and the first and third Sundays of the month at 0130, 0230, and 0330.

■ Radio Ukraine International

Every Friday at 1210* and 2110* and Saturday at 0010* and 0310*, Radio Ukraine International presents *Roots*, a 45 minute magazine variety program devoted to culture and the arts in the Ukraine.

■ Radio Vlaanderen International

Around the Arts is a brief, but twice weekly,

report on the arts scene in Belgium. It is broadcast each Monday and Thursday at approximately 0643*, 0913*, and 1313* and each Wednesday and Friday at approximately 1813*, 2113*, and 2343*.

■ Voice of America

Critic's Choice is a weekly program looking at the performing arts in the USA. It goes out each Sunday at 1010 and 1310 to East Asia only and at 1710 to East and South Asia and Europe, North Africa, and the Middle East.

■ Voice of Russia

Russian culture and that of its constituent nationalities are consistently on display in several Voice of Russia feature programs, which generally air during the second half hour of each hour's transmission. The focus of these programs is rather wide, however, so every installment or report within them may not necessarily address itself to the arts or an artistic event or performer. Check the following programs:

Kaleidoscope on Sundays at 1432*, Mondays at 1032* and 1732*, Tuesdays at 0232* and 1332*, Thursdays at 0832* and 1332*, Fridays at 0332*, and Saturdays at 2032*.

This is Russia is a program that examines many features of Russian life, including the arts. It may be heard on Sundays at 0532*, 1132*, 1732*, and 2132*; Mondays at 0532* and 1632*; Tuesdays at 0032*, 0632*, 1232*, and 1932*; Wednesdays at 0532*, 0932*, and 1632*; Thursdays at 0032*, 0632*, 1232*, and 1932*; Fridays at 0532* and 0932*; and Saturdays at 0032*, 0632*, 1832*, and 2332*.

VOR also carries a daily feature block of changeable programming which often will include a program or documentary on the arts. These features are carried Monday through Friday at 1532* and 1832*, and Tuesday through Saturday at 0332* and 1032*.

■ Voice of Turkey

Cultural current events in Turkey are highlighted every Friday at 2215* and Saturday at 0315* on *Turkish Album*. The 20 minute program features reports on cultural happenings around Turkey interspersed with contemporary and traditional Turkish music.

■ Music Update

A few schedules have changed since the May feature article on music programming: *Deutsche Welle* has dropped the program *Jazz!* and replaced *Hallo Africa* with *Good Morning Africa*, retiming it for Monday to Friday at 0432 and 0632. *HCJB* has added a broadcast time for *Musica del Ecuador* (2100 Mondays) and retimed the Friday 0800 broadcast to 0830 and the Saturday 0830 broadcast to 0900.

Getting on Track

Welcome to the first *Tracking the Trunks* column, dedicated to sharing tips and hints, trunk frequencies, and trunking system subfleet IDs. Initially we will of course focus on the first scanner of this type—the new Uniden BC-235XLT Trunk Tracker—though other models will follow.

If you have one of these new radios, you have no doubt have experienced the same exhilaration we have in once again being able to follow public safety communications. The BC-235 is a great radio and unarguably the biggest technology development in scanning in over two decades. A big “thank you” to Uniden and the entire ‘235 development team for making scanning fun again.

Now let’s dive right into some tips provided by early TrunkTracker users via the Grove *Trunkcom* internet newsgroup.

Restoring Talk Group Lockouts

Walter Wallenborn passes along the following tip on how to remove a talk group from the lock out list on your ‘235 so you can listen to them again.

1. Press and hold the <L/O> button until it beeps.
2. Scroll through the list with the <Limit> (down arrow) and the <Hold> (up arrow) buttons.
3. When you get to one you want to listen to, press <L/O> to put it back in the scan list in both scan and search.
4. Press <Search> button to get out of the review mode.

Frequency Programming Hint

Bill Cherepy in Grayson, Georgia, passes along this tip for programming frequencies into the ‘235. “If the system you listen to is like my county and always uses the same three or four frequencies as the data channel, do what I did. I programmed those frequencies in the first channels in the bank. That way, when you go to trunking mode it finds the control channel quicker than if it has to scan through 15 or so frequencies.”

Monitoring Phone Patches on the Trunk

“If your county uses a dedicated frequency for phone patches you can enter it in the 20th position of the bank for the system you’re monitoring,” says Gordon Edwards in Lawrenceville, Georgia. He continues, “Then, while monitoring and after pressing <PRI> to make the trunk activity indicators display, you can watch for the indicator on the far right of the display to light up. When it does, you



know a phone patch is taking place, so you can exit trunk mode to go monitor the patch. In conventional mode I locked out all the channels except the phone patch frequency so all I need to do is hit <Trunk>, then <Scan> to monitor the trunked phonepatch.”

Fancy Keystrokes on the 235

Les Butler has discovered that the ‘235 appears to use some of the same keyboard commands to clear the radio as other Uniden models.

- <SVC, 2, 9> brings up the trunk mode with ct____ hold. It loads bank 8 and 9 with 800 freqs. If you turn off the squelch you get 22222 in the display.
- <2.9.E> makes all the display digits light up.
- <2.9.Hold> loads all 300 freqs from 144.0 to 149.98 MHz. <2.9, Search> will also get the same results.
- <2.9. Delay> comes up with 000 0F. Up and Down arrows changes values in the display and it looks like memory addresses... 000 0F, 001 00, 002 00, 003 0F, 004 00, 005 00, 006 0F, and so on. The list goes on until you cycle back to the beginning.

Johnson City Frequency Update

While talking with a Grove customer on our tech line, he passed on a frequency update for the Johnson City, Tennessee TRS. It seems the frequency list in the Uniden *National Public Safety Trunked System Frequency Guide* does not list all the system frequencies needed to make the TrunkTracker work properly. The complete list of frequencies for Johnson City should read:

856-860-0875, 856-860.2375, 856-860.4625 MHz

Why decimal numbers instead of hex?

Another Grove customer, calling our technical support line, asked me, “why does the 235 displays decimal subfleet numbers instead of the hex numbers that Motorola uses?” Greg Knox, developer of the Trunk Tracker, explains:

“Trunktracker displays Motorola talk group IDs as decimal values. It was not possible to make a seven segment LCD character to gracefully handle the alphanumeric that would be required for a hex display.

“If you want to convert the decimal value displayed by the scanner to its equivalent Motorola talkgroup value, divide the decimal value by 16 and convert the result to a 3-place (leading zeroes may be required) hexadecimal result. Some examples:

Trunktracker Subfleet ID	Motorola Hex ID
16	001
32	002
48	003
496	01F
1040	041
2416	097
11536	2D1
12880	325
65520	FFF

“Note that this assumes that the decimal value is an integral multiple of 16. This should be the case for a Type II group ID. If you’ve got a system with lots of even and odd IDs, then you probably need to set your fleet map up as a Type I or Hybrid System.

“If you want to go in the other direction and convert the Motorola hex value to the Trunktracker value, do this: Convert the hex value to decimal and then multiply the result by 16. Don’t add any leading zeroes here. Some examples:”

Motorola hex decimal	Trunktracker multiply
003	3 x 16 = 48
07D	125 x 16 = 2000
097	151 x 16 = 2416
AB9	2745 x 16 = 43920
FFF	4095 x 16 = 65520

Thanks to Greg and all the nice folks mentioned this month for checking in with Trunk Tracker information. There are a number of places new users can go to find and to share information. As he did this month, Rich Barnett will continue trunking coverage in “Scanning Report,” since it’s one of the most significant developments in scanning. However, he has a much broader beat to cover. “Tracking the Trunks” will be your dedicated source for tips and system profiles, especially for those of you without internet access.

If you are on the ‘Net, you should join the free internet newsgroup *Trunkcom*. All you have to do is send a message to majordomo@grove.net. In the body of the text type: *subscribe trunkcom*

You can also get the latest trunk system information and IDs on the internet’s worldwide web at URL: <http://www.trunktracker.com>.

If you have discovered new trunking frequencies or subfleet IDs with your BC-235, we would like to feature them in *MT*. You can send the information or your trunk tracker questions to: *Tracking the Trunks*, P.O. Box 98, Brasstown, NC 28902-0098, or e-mail trunktracker@grove.net.

A Window on the Spectrum



A quick note about the popular WiNRADiO. That's the radio that comes on a card and plugs into your computer, where everything is operated off the screen. WiNRADiO now comes with a full-fledged spectrum analyzer. You can actually see any signal presence on any span of frequencies between 500 kHz and 1.3 GHz. Double click the mouse on any signal spike and the receiver immediately tunes to that frequency! A storage feature allows recall of signal traces.

The entire WiNRADiO, which works best with Windows 3.1, 386 or higher, 1 Meg RAM, 1 Meg hard disk space, VGA monitor, or windows 95 requiring 486 or Pentium, 4 Megs RAM and an SVGA monitor, retails for \$589.95. If you don't own WiNRADiO, Grove Enterprises has it for \$499.95 (call 800-438-8155).



If WiNRADiO is already a part of your radio arsenal, you can download the new software for free from <http://www.winradio.com> or <http://www.winradio.net.au>. Refer to the Experimenter's Workshop column on page 82 for more on what this spectrum analyzer feature can do for you.

Return of the Drake

The R.L. Drake Company was, at one time, the radio hobbyist's

dream company. After the end of World War II, their radios became legend. Time passed, however, and the company quietly bowed out of the ham and shortwave market to concentrate on other radio communications equipment and satellite TV.

A few years ago, Drake reentered the shortwave receiver market. Apparently encouraged despite the decline of ham radio, it has now reentered the amateur market as well. The TR270 FM Transceiver is the only desktop FM transceiver on the market dedicated specifically to two meter operation.



According to the manufacturer, the TR270 is actually two radios. The first permits full two meter transceiver capability (142-150 MHz), while the second permits independent dual band reception (136-174 and 420-470 MHz.) This broad range lets users listen in on public service, marine, weather, and amateur bands. Advanced features include a quality dynamic microphone, an external DC input for mobile or emergency power operation, DTMF and CTCSS tone encoding, external audio-in jack for copying shortwave fax/data transmissions, external speaker jack, headphone jack and transmit time-out timer.

For more information on the TR270, call R.L. Drake at 513-746-4556 or visit their web site at <http://www.rldrake.com>.

Stubby Nubs

Years ago, when I was selling radio gear at DX Radio Supply, we'd get lots of orders for a small stubby ham antenna that was called the "Miracle Baby." It was odd. The antenna was advertised

as only an inch and we said up front that reception was poor. Despite the warning, for quite a while, we couldn't keep the things on the shelf. We couldn't figure out why anyone would want them!

Then someone told us. People buy them to use at the race tracks. They want antennas that don't drag in signals from everywhere. They consider distant signals interference and want only to hear the signals from the nearby drivers. Now we understood!

I no longer sell radio gear, but Grove does, and now stocks a "nub" antenna that does the same job at a very affordable price — \$9.95. This tiny 2-1/2 inch flex antenna concentrates your listening to the track. There's no distraction from unrelated communications. This antenna is designed for "close in" UHF communications — just like the pit crew and drivers. Says Grove, "It's the sure way to get the racer's edge!"

Grove also sells the Nub as a cheap, efficient antenna for any type of frequency counter or near-field receiver (whose stock antennas can run as much as \$35). Put your scanner antenna (that pulls in all the signals to be found in the surrounding three counties) on your frequency counter, and you may as well throw it away!

The Nub antenna is just \$9.95 plus \$5.50 UPS shipping. You can order by calling 800-438-8155, by visiting the www.grove.net web site, or by writing to Grove Enterprises at Box 98, Brasstown, NC 28902.



Compact Active Shortwave Antenna

The H800 Skymatch active antenna is a two-foot, compact powerhouse that performs like a 100 foot antenna. What's more, it

receives signals from 10 kHz through 50 MHz — that's VLF, medium wave, shortwave, and even VHF low band all rolled into one! (Not surprising, considering its manufacturer is LF Engineering — a longtime provider of accessories for longwave monitoring).

The antenna operates either from 120 VAC or optional 9 volt batteries for portable or emergency use.

The wide dynamic range of this active antenna resists the strong-signal-overload problems common in active antennas, while its high sensitivity enhances weak signals. It mounts inconspicuously outside or inside (although that's not recommended because of electrical noise pickup).



The Skymatch includes the integrated active antenna, 50 feet of coax lead-in, control box, and AC adaptor, and is available from Grove Enterprises for \$99.95 plus \$8 UPS shipping. You'll also need a kit to adapt the RCA female plug on the control box to your radio with a piece of coax in between. \$8.45 will get you the adapters plus 3 foot cable from Grove (please specify the antenna connector on your radio), or you can homebrew your own.

— RB

Access to the Airwaves

Allan Weiner is a name known to most radio hobbyists. He seems to be a man possessed with an idea: to put pirate radio stations on the air. That's an oversimplification, but regardless, you either see him as a hero, crazy, or (if you're with the FCC), an enemy of the government.

After all, this man has done things that others have only dreamed about. He's put radio

stations on the air from his parents' home. He's purchased rusting old boats, parked them in international waters, and put radio stations on them. He's had run-ins with the authorities (the FCC seized the *M/V Sarah* in 1987 during a commando raid) that would curl the hair of lesser people. He's reached the pinnacle of his profession, working at the networks in New York City.

Weiner lives, breathes, and eats radio. And he refuses to stop. Ever since his childhood, Weiner has been a radio genius and freak. The movie *Pump Up the Volume* appeared to be loosely based on his early teenage adventures. He's gone on to put radio station after radio station on the air, often disregarding official rules in the belief that the airwaves are free.

Access to the Airwaves is the title of Weiner's life story. At times a bit self-indulgent, it is the story of a decent ex-hippie, who still clings to the idealism of the 1960s. It's an

interesting book that I'm willing to guess contains parts that you'll recognize from your own radio life, or wish you did. In any case, it's a good read and recommended reading for anyone who enjoys hobby radio.

You can get a copy of *Access to the Airwaves* by Allan Weiner as told to Anita Louise McCormick from Universal Radio. The price is \$17.95 plus \$2.00 book rate or \$3.00 UPS shipping. Their phone number is 800-431-3939 or you can write to them at 6830 Americana Pkwy, Reynoldsburg, OH 43068. Mention *MT* when you call.

Happy 17th, Dr. Bruce

Bruce Elving has put out the 17th edition of *FM Atlas*. Elving's unique work lists

10,000 FM stations and translators across the United States, Canada, and Mexico and plots their location on 109 pages of maps. Station directories are arranged by geography and frequency. The book gives program formats, stereo and technical data, SCS subcarrier information, plus station coverages.

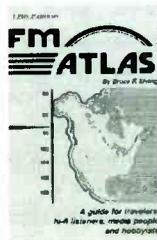
Articles include the new Telecom Act and how the listener and broadcaster might be affected, monophonic talk radio, RADAR Report on FM listening, digital audio broadcasting, a CBC "power grab" in Canada, and FM "microbroadcasters."

There are several sources for this 224-page book. Grove En-

terprises carries it for \$14.95 plus \$2.50 bookrate shipping. Or, if you enjoy FM broadcasting and DXing, you can send Dr. Elving \$16.95 plus \$1.55 shipping for the *FM Atlas* and enclose another \$4.50 for a sample copy of his monthly updater/newsletter, *FMedia!*. The address is P.O. Box 336, Esko, MN 55733-0336.

GMRS Repeater Guide

There are some 3400 repeaters licensed to the General Mobile Radio Service (GMRS) nationwide. Now 50 years old, the GMRS hosts private individuals, families, user cooperatives, and volunteer service teams comprised of more than



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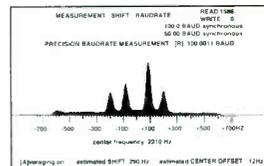
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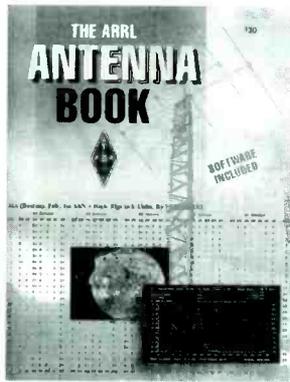
The new guide offers excellent question-and-answer sections about GMRS, then continues with an exhaustive, state-by-state list of repeaters, showing channels in use, coverage, control operator addresses and phone numbers, and area of coverage: everything you need as a licensed GMRS to access these repeaters as you travel across the country.

The *GMRS National Repeater Guide* 10th Edition is \$25 from the Personal Radio Steering Group, PO Box 2851, Ann Arbor, MI 48106; ph. 313-662-4533.

— BG

The ARRL Antenna Book

Few publications rate—or deserve—the accolades given the *Antenna Book* published by the American Radio Relay League



(ARRL). Of course, after decades of revisions, it ought to be good! And it is; this latest 18th Edition (1997) is packed with solid, accurate information of use to the experimenter and professional alike. It would be reasonable to expect that every serious antenna lab in the world has a copy.

More than 700 pages present material on nearly any imaginable antenna topic, from LF through microwave, terrestrial to

satellite, mobile and base, portable and fixed, enormous and compact. If it responds to an RF field, it's probably in the handbook!

Chapters evolve logically from fundamentals and earth effects on through site planning. From there the ptome exhaustively and expertly treats beams, wires, direction finding, repeater antennas, space communications, transmission lines, transmatches ("tuners"), and signal propagation.

As always, the *Antenna Book*, edited by R. Dean Straw, N6BV, is lavishly illustrated with photos, line drawings, charts, and graphs. It is accompanied by a PC program disk to aid in design of many antennas described within its covers. For anyone interested in building or understanding antennas, this book is a must! It's available from Grove Enterprises for \$29.95 plus \$6 shipping.

— BG

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Hwy 64 West, Brasstown, NC 28902 Press releases may be faxed to 704-837-2216 or e-mailed to mteditor@grove.net.

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Drake's Affordable New SW2 Tabletop

With the introduction of the new SW2, the folks at the R.L. Drake Company are reaching for a very interesting spot on the price/performance curve of shortwave tabletop receivers: a model that delivers solid performance for less than \$500.

■ Many features for price, plus intuitive ergonomics

There's a lot to like about the SW2. It is a relatively small receiver, only 10-7/8 inches wide by 4-3/8 inches high by 7-5/8 inches deep, including front knobs and rear panel connector. On the front panel is a forward-firing speaker, a knob for RF gain and another for volume. At top right is a bright yellow, green and red display with a bar-graph signal strength meter, a XXXXX.X frequency read-out, and indicators for AM, SYNC, LSB, USB, POWER, MEM and METER. There is also a numerical display that shows either the memory preset that is being used, or the shortwave or ham meter band to which the receiver is tuned.

Just below the display to the right is a large plastic tuning knob with knurled edges and a handy "speed" dimple. To the left, a group of 18 buttons helps to control the SW2. They include UP and DOWN slewing buttons, a 3 x 3 over 1 telephone-style keypad, a button for turning the receiver on and off, a CLEAR button, a MEM button, an AM SYNC button, a button for toggling between upper and lower sideband, and a button for dimming the display. In all, no gripes about ergonomics—the layout is intuitive and easy to use.

The headphone jack, curiously, is located on the left hand side of the case and, bowing to the fading era of 1/4-inch headphone jacks, the connection is a mini-plug, such as used on Walkmans and other personal listening devices. On the back panel of the SW2 are an SO-239 connector for hooking up and coax-fed antenna, a pair of screw terminals for a wire antenna and a ground connection, a jack for an external speaker and a power input. Power, alas, is supplied by an external "wall wart" transformer. While these are not the norm in tabletop receiver design, external power supplies are increasingly being used even in tabletop receivers, as this allows the radio to be exempted from UL approval (only the outboard AC adaptor has to be approved).



*Receiver sensitivity is good, excellent or superb across the radio spectrum covered. Image rejection is good, and dynamic range measured at 20 kHz is superb. This is truly an excellent showing for a relatively inexpensive tabletop receiver, and better than some costly "supersets" we've tested at *Passport to World Band Radio*.*

The SW2 offers frequency coverage from 100 kHz to 30 MHz with AM, synchronous selectable sideband, and upper (USB) and lower (LSB) sideband. The SW2 includes 100 independent, programmable memories that store frequency, mode and detector mode—these memories do not require battery backup power to maintain stored information. In addition, memories 1 through 32 have been preprogrammed at the factory with stations ranging from the BBC to the Voice of Vietnam to Radio Denmark—a beside-the-point feature for experienced listeners, but an aid in getting started for newbies.

While the SW2 offers synchronous selectable sideband to increase long-term program listening pleasure, as well as single-sideband for receiving ham and utility signals, there are none of the sophisticated controls, such as passband tuning and a notch filter, that dedicated DXers have come to cherish for squeezing the last erg out of a faint signal.

The SW2 is straightforward to operate. To enter a frequency, such as 5070 for WWCR, simply press the keys 5 - 0 - 7 - 0, wait a moment, then the frequency automatically pops up. Or, if you're impatient, either of the slewing buttons can be used as an ENTER key at the end of the sequence. Once entered, the frequency can also be changed in 5 kHz steps with the UP or DOWN slewing buttons, or in relatively coarse 50 Hz steps using the tuning knob.

Sometimes when using the tuning knob, a faint rasping (r-r-r-r-r-r) or chugging sound can be heard in the background, but it is never so loud that it seriously interferes with hearing signals—a big improvement over the cheaper Drake SW1.

To access a memory channel (preset), simply press the MEM button, then the SW2 will automatically tune to the memory channel

last accessed. If you want a different memory channel, you can get there easily by using either the tuning knob or the slewing buttons.

Storing information in a memory channel is equally easy. Press and hold the MEM button for at least two seconds, whereupon the SW2 is put in the memory-store mode. Now, select the memory channel you want to use with the keypad, then press MEM again. That's it.

If you are unsure of which memory channel you want to use, you can scroll through the memory channels using the slewing buttons or the tuning knob until you find the one you want.

■ Pleasant audio, generally superior lab results

The SW2 has pleasant audio quality, and our laboratory measurements confirm that most measurements of distortion are excellent-to-superb. This is important not only for enjoyable listening to programs hour-after-hour, but also to maximize intelligibility with DX catches.

The SW2 acquits itself well in other measurements of receiver performance. To begin with, receiver sensitivity is good, excellent or superb across the radio spectrum covered. Image rejection is good, and dynamic range measured at 20 kHz is superb. This is truly an excellent showing for a relatively inexpensive tabletop receiver, and better than some costly "supersets" we've tested at *Passport to World Band Radio*.

■ Two flaws, one serious

Unfortunately, the SW2 contains two flaws, one serious. The lesser is that the receiver's synthesizer is not as clean as it could be. While this is not readily apparent to the ear except

when, for example, listening to a weak signal adjacent to a powerful signal, the "dirty" synthesizer makes some precise measurements of receiver performance nearly impossible to perform. For example, we couldn't measure dynamic range at 5 kHz spacing because of synthesizer noise.

The other, far more serious, flaw, is sub-standard selectivity, or adjacent-channel rejection. To begin with, the bandwidth is not selectable independent of mode. This means that only the wider of the two voice bandwidths can be used for AM-mode listening—unless you have the fingers of a safecracker, and use the single-sideband "ECSS" mode to manually tune for zero-beat.

The AM bandwidth is nominally 6 kHz, but actually measures 7 kHz at 6 dB and 15 kHz at -60 dB. This not only is relatively wide for world band reception, but its shape factor is only so-so by today's standards.

This means, among other things, that stations can be heard in the clear 5 kHz off their center frequency. As a result, if you are listening to a station on one frequency, and there is another one 5 kHz away, you are going to hear more interference from it than you should, and that's going to diminish your listening pleasure. Synchronous selectable sideband helps rescue the day, but only if the other sideband is well and truly free from adjacent-channel interference.

In addition, the 2.3 kHz (nominal) sideband filter measures 2.7 kHz at -6 dB, with circuit leakage to 15 kHz. It's not a level of performance that will warm the hearts of utility DXers, hams or SWLs using ECSS tuning.

■ Overall: Ferrari with VW engine

In short, the SW2 very much needs at least a couple of well-chosen, leakage-free voice bandwidths, selectable independent of mode, to realize its full potential.

In designing the SW2, the engineers at Drake have come close very close to achieving the goal of creating a worthy performer for less than \$500. But with the present bandwidth arrangement, this receiver falls well short of what it should be.

■ Sony SWL booklet finally available

Several readers have contacted me to ask why the new Sony world band radio booklet, "Tune Into the World" (item C8159, 3/97), mentioned in the May column, was not available from the usual Sony order number. Turns out that some communications lines were crossed, but now the booklet can be obtained, free, from the Sony Customer Information Center at (800) 222-7669.

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.

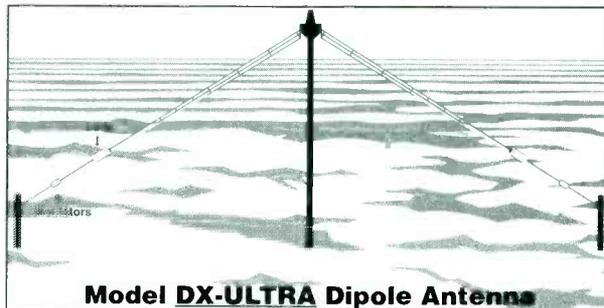
The Drake SW2 Shortwave Receiver is available from Grove Enterprises (800-438-8155) for \$489.95 plus \$14 UPS shipping in the U.S.

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Radio Shack PRO-64 Portable Scanner

Radio Shack's new PRO-64 is a triple conversion, 400 channel portable scanner made in Japan by General Research Electronics. Frequency coverage is similar to the 1994 vintage PRO-62 it replaces, but the PRO-64 includes several new firmware features, including multiple search banks and the ability to be programmed via a personal computer.

The PRO-64 tunes 29 - 54, 108 - 174, 380 - 512, and 806 - 960 MHz, excluding the cellular telephone bands. AM or NFM modes can be selected on any frequency, though AM is the default mode used in the civilian aircraft band.

■ Twice the Memory and Full Featured Scanning

The PRO-64's 400 memory channels are divided into 10 banks. Memory backup is specified to be just one stingy hour during power loss, but our PRO-64's memories remained intact after 22 hours without power. You can program the same frequency into different memory channels, but the display will alert you to the duplication. A 2 second rescan delay may be selected for individual channels.

A brief keystroke sequence sorts the channels within a selected bank in ascending or descending frequency order. This doesn't affect the scan rate, which we measured at about 25 channels/sec — as fast as a PRO-2006.

Empty channels (those programmed with 0.0), are automatically skipped during memory scan, so no time is wasted.

There are 10 priority channels and they are independent of the 400 conventional channels. We found the priority feature worked well, without chopping up nonpriority signals harshly. Priority sampling can be used during searches, too, as in the early Electra/Bearcat models.

Frequencies can be stored in any of 40 Monitor channels and later transferred individually or *en masse* to conventional memory. A simple keystroke sequence zeroes all locked out channels in any bank you choose.

■ Rich Search Repertoire

The PRO-64 provides several ways to search for signals, including Direct, Band, Bank, and Auto searching. Direct search, using the up and down arrow keys, searches from the display frequency in the direction of your choosing. You can also enter a search window size from 1 to 10 MHz to bound the direct search, a new feature for GRE.

There are 10 pairs of user programmable limits for bank searches, and you can link banks in various combinations. There are 14 Band search banks preprogrammed with factory-set limits, e.g., 50 - 54, 144 - 148 MHz, etc., but the Band limits cannot be altered.

The crowning jewel is the Auto store, which searches between one pair of programmable frequency limits and silently stores active frequencies into one or more memory banks of your choice. Duplicate frequencies are not stored.

You can lock out up to 200 frequencies during searches, and review each one later, unlocking frequencies if you like.

Pressing the WX key starts a scan of 11 NOAA weather channels.



Photo by Pam Parnass, N9HRZ

■ Powering the PRO-64

The PRO-64 is furnished with the familiar battery tray which holds 6 AA cells. It's the same tray used by the PRO-43, PRO-62, PRO-60, and other GRE-made portables. In a departure from the past, the PRO-64 does not support charging of AA cells while they are inside the scanner. It has no Charge jack, but does have an external 9 VDC power jack with a 1.3 mm inner diameter/3.4 mm outer diameter.

Options include Radio Shack's AC adapter (#273-1665), DC adapter (270-1560), and a monolithic NiCd pack (#23-288). The only way to charge a battery inside the scanner is to buy Radio Shack's optional NiCd pack and recharge it using either the AC or DC adapter. A 22 ohm 1/4 watt resistor inside the PRO-64 limits charge current to about 410 mA if the adapter furnishes 9 VDC.

Battery current consumption has increased 8% over the PRO-62 we reviewed in February 1995 *MT* (see current consumption chart). The well written owner's manual does not mention a battery saver feature and our measurements showed the PRO-64 consumed a constant 95 mA while squelched.

■ Other Features

The owner's manual mentions that the PRO-64 can be programmed using a personal computer, but the optional data interface kit was not available at review time.

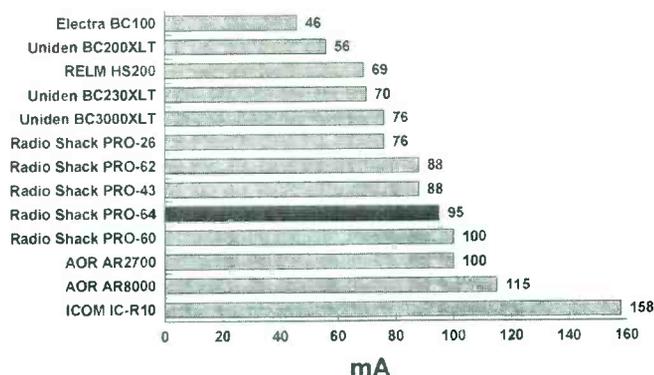
The LCD display on our scanner had sharp contrast, but only when the radio was tilted at the proper angle instead of looking straight at the display at a right angle. Pressing the Light key illuminated the display for 5 seconds, but it was too dim.

Keystrokes are confirmed by a beep tone, but the tone can be disabled by pressing the 2 and Enter keys during power up.

■ Performance

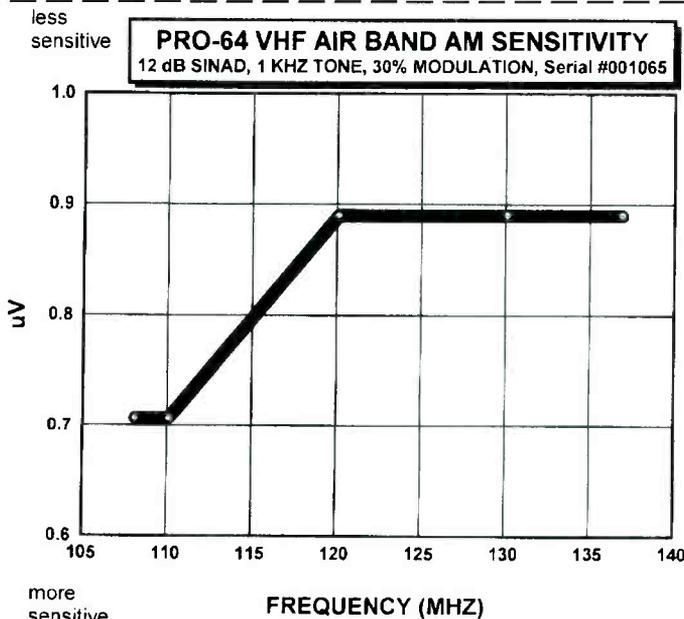
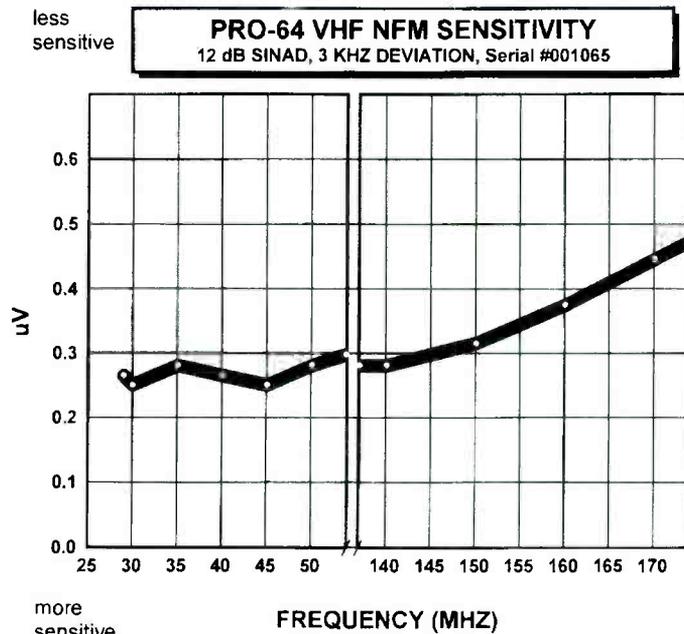
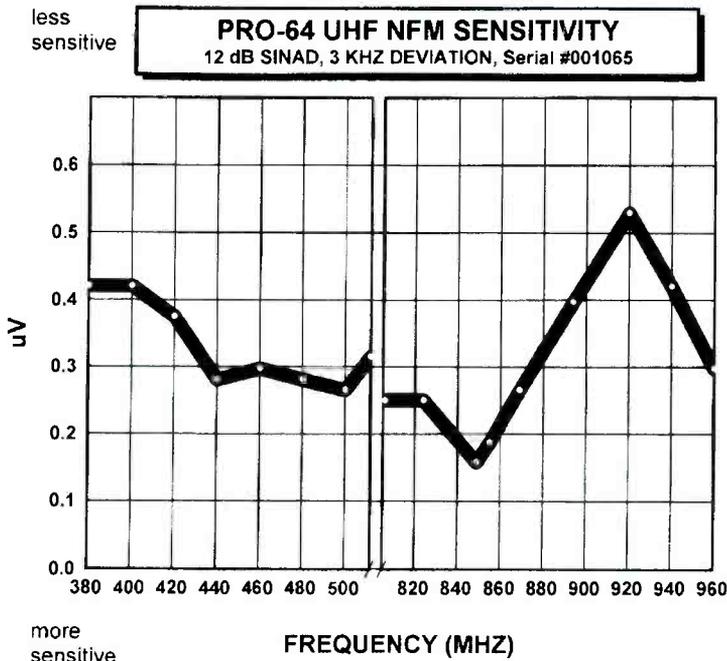
Our PRO-64 had better audio quality than our stock PRO-43. Its small speaker produced clean audio unless the volume control was cranked up. The squelch was well behaved, with the proper amount of hysteresis and short

Portable Scanner Current Consumption
Measured While Scanning



Note: One sample of each model tested.

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“tail.”

Bench and field tests show our PRO-64 to have little intermod and adequate sensitivity (see graphs).

When fitted with a 12 inch Austin Condor antenna, we enjoyed monitoring the simplex mobile-to-mobile chatter on 151.625 and 464.5

MHz as well as in-store communications in the 467 MHz band. We observed a little intermod when using an outdoor Antenna Specialists AV801 antenna in a rural/suburban setting, but detected no image interference in the 160 - 162 MHz range which would prove troublesome for railfans.

We parked 2000 feet away from a cellular telephone tower and searched the 855 - 869 MHz range to ascertain whether our PRO-64 would experience interference from cellular phones. Our PRO-64 was clean in the 800 MHz range, but we heard cellular phone signals both in the civilian air band and from 48.25 to 54 MHz, even when we removed the antenna.

Later, we measured the PRO-64's cellular rejection at about 64 dB in the air band and 48 dB in the VHF-low band. The signal-to-display frequency relationship on the VHF-low band was:

$$\text{Actual transmitter frequency} = 772.5 + (2 * \text{display frequency})$$

For example, we could hear a 870.0 MHz signal when the PRO-64 was programmed with 48.75 MHz, though the 12 dB SINAD sensitivity was only 75 uV.

TABLE 1: Measurements, Radio Shack PRO-64 Portable Scanner S/N 001065

Frequency coverage (MHz):

- 29 - 54 (5 kHz steps)
- 108 - 136.975 (25 kHz steps)
- 137 - 174 (5 kHz steps)
- 380 - 512 (12.5 kHz steps)
- 806 - 824 (12.5 kHz steps)
- 849 - 869 (12.5 kHz steps)
- 894 - 960 (12.5 kHz steps)

Sensitivity: see graphs

FM modulation acceptance: 9.7 kHz

Image rejection: 30.5 dB at 155 MHz.

Audio output power, measured at earphone jack: 171 mW @ 10% distortion

Memory scan speed: 25 channels/sec.

Search speed, 5 kHz step: 50 steps/sec.

Search speed, 12.5 kHz step: 50 steps/sec.

Current consumption at 9.0 VDC:

off - less than 10 uA

manual - 95 mA

scan - 95 mA

full volume - 169 mA

No battery saver action observed

Low battery warning at 5.8 VDC or less

Intermediate Frequencies:

- 257.5, 21.4, and 0.455 MHz

In Closing

The PRO-64 is a good performer with a rich set of features and is a major improvement over the PRO-62. Drawbacks include short memory retention time rating, dim display backlight, and inability to charge AA NiCd cells while in the radio.

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Using a Counterpoise to Aim High

A counterpoise, according to the *IEEE Standard Definitions of Terms for Antennas*, is “a system of conductors, elevated above and insulated from the ground, forming a lower system of conductors of an antenna.” A counterpoise, by virtue of being close to the earth, gives a relatively low-impedance, capacitively-coupled path to earth. This is particularly useful when the antenna is used above dry or rocky earth, which provides a poor RF ground.

A counterpoise can be as simple as a single wire stretched below an antenna, insulated from ground and connected to nothing (fig. 1).

What does it do for an antenna?

If we put a counterpoise under a vertical antenna it usually makes the antenna more efficient. That means that it radiates or captures more of the available signal. A counterpoise will also sometimes lower the vertical antenna’s vertical radiation/reception patterning. This is often desirable because a lower vertical radiation/reception pattern leads to greater responsiveness to DX signals.

But vertical antennas for the HF bands are

so tall as to be difficult or impossible for most of us to erect, especially on the lower end of that band. So homebrew antennas which use a counterpoise are most frequently horizontal antennas.

A horizontal dipole mounted 1/10 to 1/4 wave above a counterpoise directs most of its responsiveness upwards. Just as low-angle vertical radiation/reception patterning is best for DX HF signals, a high-angle vertical radiation/reception pattern is best for receiving signals from closer HF stations. The high angle of responsiveness of such an antenna leads to the name “near vertical incidence skywave” (NVIS) antenna. See page 63 in this issue and in July for Jacques d’Avignon’s discussion of how NVIS can be applied as a means of short-range HF broadcasting.

It is interesting to note that most of our homebrew horizontal HF antennas are of this upwards-directed, NVIS variety. Even when we want to concentrate on DX reception we often build a NVIS antenna. Why? Because it is so difficult to mount a horizontal antenna the halfwave distance above the ground necessary to obtain good low-angle vertical radiation/reception patterning.

To mount a horizontal antenna a half wavelength in the air you would have to elevate it well over 100 feet at 4 MHz, and over 60 feet at 8 MHz. At 16 MHz it is only 30 feet, but even that is still too high for many of us to hoist our antennas. So, whether we like it or not, our horizontal HF antennas are usually NVIS antennas with the consequent small amount of low-angle vertical radiation/reception patterning, and large amount of high-angle patterning. Such an antenna is excellent for relatively close-in reception. Although it is definitely not a DX antenna, it does have some relatively low-angle patterning, and it will still pull in a bit of DX.

Let’s Make a “Straight Up” Beam

1. Consult fig. 1 frequently in constructing this antenna.
2. This antenna consists of an ordinary halfwave dipole with a counterpoise directly below it. Obtain the total length of either of these elements from the formulas below.

$$\text{Length (feet)} = 468 / \text{frequency in MHz}$$

$$\text{Length (meters)} = 142 / \text{frequency in MHz}$$

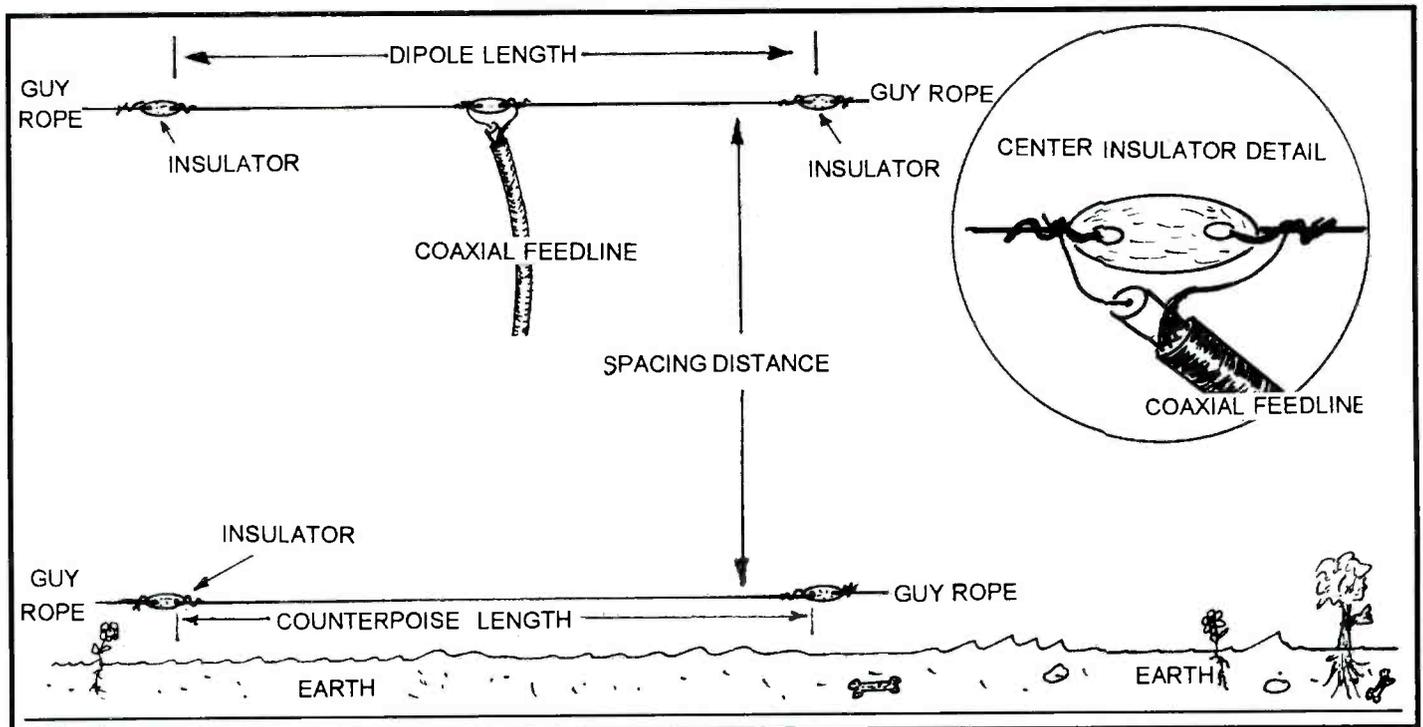


FIGURE 1. A dipole antenna with a counterpoise.

For example, at 10 MHz the total antenna length is 46.8 feet

3. Use just about any kind of wire that's strong enough to last. Cut one wire to the formula length plus enough extra wire to wrap through four of your insulator holes. Cut a second formula length plus enough extra wire for two insulator holes; this second wire will be the counterpoise.
4. For both wires make sure the wire ends are clean for soldering, and insert the ends into insulators as in fig. 1. Solder the wires in place. The counterpoise is now complete.
5. Cut the dipole element in half and attach its center insulator in the same fashion as the end insulators. Then attach a length of low-impedance (50 ohm, 75 ohm) coaxial cable at the antenna center insulator. The center coax conductor attaches to one wire and the coax shield to the other. Seal the coax end against weather with coax sealant.
6. Stretch the counterpoise directly beneath where the dipole element will be. It should be close to the ground, but not close enough to accidentally touch the ground or vegetation.
7. Stretch the dipole anywhere from 1/10 to 1/4 wavelength directly above the counterpoise. The closer spacing should be best for the closest stations.

In air a full wavelength (feet) = 984/frequency in MHz

In air a full wavelength (meters) = 300/frequency in MHz

8. To protect against lightning-induced damage, remember to disconnect and ground the antenna lead-in when the antenna is not in use. Never use an outside antenna during weather likely to produce lightning.

Because its nulls are rather shallow a dipole mounted this close to the ground is relatively nondirectional. You should get good all-around reception of stations up to perhaps 1000 miles away. And, despite its predominately high-angle patterning, you'll copy some DX signals, too.

RADIO RIDDLES

Last Month:

We discussed that "the groundplane antenna has a quarterwave vertical element, and two or more quarterwave radials. As you know, the radials extend outward symmetrically from the base of the vertical element as spokes extend from the hub of a wheel." Then I asked, "When this antenna is transmitting what does the radiation from the radials con-

tribute to the signal strength as received by a distant receiving antenna?" Your hint was to remember the canceling effect of currents which flow in opposite directions within the same wire.

Let's imagine that we look at a groundplane antenna from a distance. Let's also imagine that we can see the current as it leaves the feedpoint and moves out along the radials. The radials are perpendicular to the vertical element. We would "see" current flowing from the feedpoint toward the right on the right hand radial, and from the feedpoint toward the left on the left hand radial.

Because the radials are close together their fields would appear to come essentially from a single source when viewed from a distant receiving antenna. Remember that radio waves and light waves are both electromagnetic waves, and that they act similarly. Thus, this failure of the distant receiving antenna to sense the waves separately is similar to you being unable to visually distinguish between two distant lines which you view from a great distance.

Because these fields essentially overlap, their effect will combine, and the receiving antenna will "see" only this combined field. Because the currents inducing these fields flowed in opposite directions on the two radials the fields will be of opposite polarity, and will cancel each other. The combined result would be no signal at all!

Thus the radials contribute no signal strength at the distant receiving antenna; the vertical element is the sole source of received signal strength. Note, however, that this discussion has described the classic groundplane with radials perpendicular to the vertical element. If we use drooping elements the cancellation is less than perfect.

As the amount of drooping is increased, the radials increasingly contribute to the received signal at the distant antenna until, when drooped straight down, they contribute equally with the top vertical element. As a matter of fact, the antenna is then no longer a groundplane antenna, but a vertical dipole! Oh well!

This Month:

Consider the counterpoise beam described above. Imagine that we swing the counterpoise up in the air parallel to the dipole such that its height was the same as the dipole. Space the dipole and counterpoise 1/4 wavelength apart.

By the way, the counterpoise has a new name when used in this new position; so does the antenna. What are those names, and how have we changed the antenna's performance

by our change in the counterpoise's position?

You'll find an answer for this month's riddle, and much more, in next month's issue of *Monitoring Times*. Til then Peace, DX, and 73.

Note on advertisement below: As of 4/26/94 it became unlawful to market cellular-capable receivers in the US. Radio Progressive assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.

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North American SW Assoc: Bill Oliver, 45 Wildflower Lane, Levittown, PA 19057, (215) 945-0543 <mailto:naswa1@aol.com>. Worldwide; Shortwave broadcast only. The NASWA Journal. Regional meetings.

Ontario DX Association: Joe Robinson, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada; Internet

70400.2660@compuserve.com; (416) 293-8919 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

Pacific NW/BC DX Club: Bruce Portzer, 6546 19th Ave NE, Seattle, WA 98115. Pacific NW and BC Canada. DXing all bands. \$9 US, \$10 Canada. PNBCDXC Newsletter. Irregular meetings.

Palm Beach County Scanner Group (PBCSG): Brian Cathcart, 4050 Edgewood Drive, Coconut Creek, FL 33066-1835; scannerdude@juno.com

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. <http://http://arrowweb.com/RMM> Meets irregularly.

Regional Communications Network (RCN): Jay Delgado, Box 83-M, Carlstadt, NJ 07072-0083. A hobbyist group dedicated to information and resources on rf-telecommunications technology and broadcasting worldwide. #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, Burns Lake, BC, Canada, V0J 1E0; (250) 694-3760, djabs@awinc.com. Canada and worldwide. www2.awinc.com/users/djabs/ MW and SW DXing. Meets Thursdays. Free helpful info; Canadians send three 45-cent stamps, all others send a dollar bill or two IRCs.

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.

August 1-3	Austin, TX	South Texas Section Conv / Joe Makeever, W5HS, 512-345-0800
August 2	Mt. Shasta, CA	Mount Shasta ARC / Rich Zanni, KJ6RA, 916-926-1237
August 2	St Romuald, Can	Hamfest of St Romuald, Canada / Francois Berube, VA2RC, 418-523-4476
August 2	Ellijay, GA	Ellijay ARS / Dot Beam, K4PPS, 706-276-6660
August 2	Watkinsville, GA	Athens Radio Club / Rodney Couch, KE4ANM, 706-353-2773
August 2	Carlinville, IL	Macoupin County ARC / Tim Jones, KA9VIV, 217-627-2355
August 2	Quincy, IL	Western Illinois ARC / Jim Funk, N9JF, 217-336-4191
August 2	Houghton, MI	Copper Country RAA / 1997 Upper Peninsula Amateur Radio Convention / Roland Burgan, KB8XI, 906-482-2403 / Location: City of Houghton's Dee Stadium, located on the downtown waterfront. 9Am.
August 2	Oscoda, MI	ICARE / Ray Knuth, KB8ZYU, 517-739-2896 or 517-739-3129
August 2	Springfield, MO	Missouri State Convention / Karen Thorpe, N0TDW, 417-889-6775
August 2	Weedsport, NY	Auburn ARA / Joe Kahler, WA2NGX, 315-364-5135
August 2	High Point, NC	High Point ARC / Mark McMahan, KB4MFP, 910-887-3039
August 2	Columbus, OH	The Voice of Aladdin ARC / Jim Morton, KB8KPJ, 614-846-7790
August 2-3	Eureka, CA	Humboldt ARC / Wayne Carlson, KF6AAP, 707-668-4396
August 2-3	Jacksonville, FL	ARRL National Convention / Larry Filzen, WB4CGD, 904-272-0726
August 2-3	Spokane, WA	Eastern Washington Section Conv / Ronald R. Kimm, W7OPR, 509-924-2959
August 3	Livermore, CA	Livermore ARK / Noel Anklam, K6CQZK, 510-447-3857
August 3	Pevotone, IL	Hamfesters Radio Club / Dave Brasel, NF9N, 708-448-0580
August 3	Angola, IN	Land of Lakes Hamfest / Sharon Brown, WD9DSP, 219-475-5897
August 3	Amana, IA	Cedar Valley ARC / Wayne Kosloski, KI0FE, 319-393-4224
August 3	Port Huron, MI	E Michigan ARC / Robert Herbert, KB8WMW, 810-364-7874, 810-982-1561
August 3	Randolph, OH	Portage ARC / Joanne Solak, KJ3O, 330-274-8240
August 3	Apollo, PA	Skyview Radio Society / Bob Livrone, N3WAV, 412-339-9607
August 3	Berryville, VA	Shenandoah Valley ARC / Irvin Barb, W4DHU, 540-955-1745
August 3	Marshfield, WI	Marshfield Area ARS / Guy Boucher, KF9XX, 715-384-4323
August 9	Valparaiso, IN	Porter County ARC / Rich Ard, N9QLQ, 219-762-0484
August 9	Dryden, NY	Tompkins County ARC / Ross Boyer, N2ISU, 607-844-4302
August 9	Lewistown, PA	Juniata Valley ARC / Richard Yingling, WB3COB, 717-242-1882
August 9	Tacoma, WA	Radio Club of Tacoma / Alan Hughes, KB7SVU, 206-840-4947
August 9	Huntington, WV	Tri-State ARA / Georgia Overby, KA8QME, 304-522-1811
August 9	Baraboo, WI	Yellow Thunder ARC / Bill Hommel, KA9QFJ, 608-356-8571
August 9-10	Shreveport, LA	Shreveport ARA / Dana Wicks, KJ5SU, 318-865-9430
August 10	Stickney, IL	DuPage ARC / Ed Weinstein, WD9AYR, 630-985-9256
August 10	Frankfort, KY	Bluegrass ARS / Central Kentucky ARRL Hamfest / Bill DeVore, N4DIT, 606-273-8345 / Location: Western Hills High School, Exit 53 off I-64. Admission \$6.
August 10	Jackson, MI	Michigan State Convention / Terry Osborn, K8SMC, 517-784-2398
August 10	St. Cloud, MN	St. Cloud ARC / Charlie Grafit, N0SDL, 320-251-8008
August 10	Redmond, OR	Central Oregon DX Club / Bill Sawders, K7ZM, 541-389-6258
August 16	Madison, WI	4th Annual Madison Area Get-Together for DXers and Radio Enthusiasts / Tim Noonan, 608-271-0458, E-mail: dxeerak@aol.com
August 16	Fair Oaks, CA	River City AR Comm Society / Lewis Tuttle, AC6QP, 916-771-2336
August 16	Warsaw, IN	Hoosier Lakes RC / Loren Melton, WB9OST, 219-858-9374
August 16	Oakland, NJ	Ramapo Mountain ARC / Ken Hansen, KB2SSE, 201-962-4632
August 16	Roanoke, VA	Roanoke Valley ARC / Ben Vlug, AD4UR, 540-890-6782
August 16	Longview, WA	Lower Columbia ARA / 6th Annual Ham Radio, Computer, & Electronic Equipment Swap Meet / Bob Morehouse, KB7ADO, 360-425-6076 / Location: Cowiitz Co. Fairgrounds. Talk-in 147.26+, pl 114.8. 9am - 3pm, admission \$3.
August 16-17	Huntsville, AL	Alabama Section Convention / Don Tunstall, W4NO, 205-534-7175
August 16-17	York, PA	York, Keystone, Hilltop Clubs / Robert Moore, N3KDS, 717-252-1694
August 17	Goleta, CA	Santa Barbara ARC / Rhona Anderson, KE6FKA, 805-969-9178
August 17	Golden, CO	Colorado State Convention / Guy Reed, W5GR, 303-674-5389
August 17	Georgetown, DE	Sussex ARA & DELMARVA / Thomas McDugall, N3JRB, 302-856-2938
August 17	Lafayette, IN	Tippacanoe ARA / James Canarecci, WA9TGO, 317-474-6570
August 17	Salina, KS	Central Kansas ARC / Ron Tremblay, WA0PSF, 913-827-8149
August 17	Cambridge, MA	MIT RS & Harvard Wireless / Steve Finberg, W1GSL, 617-253-3776
August 17	Broadway, OH	Union County ARC / Gene Moore, N8YRF, 513-246-5943
August 17	Paulding, OH	Paulding County AR Group / Jerry Rhodes, KB8MAF, 419-399-4507
August 17	Warren, OH	Warren ARA / Al Van Slyke, N8IKX, 330-889-3378
August 22-23	New Orleans, LA	New Orleans International DX Conv / Silvano Amenta, KB5GL, 504-454-6184
August 22-24	Bismarck, ND	Dakota Division Convention / Tim Rasset, N0SDB, 701-663-6620
August 23	Grand Junction, CO	Western Colorado ARC / Bruce Chambers, KB0SNF, 970-434-7439
August 23	Gardner, MA	Mohawk ARC / John Dould, WF1L, 508-249-5905
August 23	Bridgewater, NJ	Somerset County ARS / SCARS Hamfest / Pat Reagan, N2CQM, 908-873-3394 / Location: Somerset County 4th Center, Milltown Twp. Talk-in 448.175-PL 141.3, 147.135+ PL 151.4
August 23	Chaffee, NY	Pioneer Radio Operators Society / Michael Wrona, KB2TDN, 716-675-2071
August 23	Weston, WV	West Virginia State Convention / Dave Ramezan, KA8ZXP, 304-462-7560
August 23	Rhineland, WI	Rhineland & Northwoods ARES / Mary Berger, NS9Q, 715-362-9296
August 23-24	Woodland Park, CO	Mountain ARC / Don Chamberlain, AA0NW, 719-687-3692
August 23-24	Albuquerque, NM	Duke City Hamfest / Richie Allen, KC5NZR, 505-242-0208
August 24	Enfield, CT	VHF-UHF Conference Swap 'n Sell / Mark Casey, N1LZC, 413-566-2445
August 24	Danville, IL	Vermilion County ARA / Gary S. Denison, KA9SKS, 217-759-7389
August 24	Woodstock, IL	Tri-County Radio Group / Bob Grosse, N9KXG, E-mail: tcrg@hotmail.com
August 24	Adams, MA	Northern Berkshire ARC / Joel Miller, N1WCF, 413-442-2609
August 24	Corunna, MI	Bay, Genessee Co., Lapeer, Shiawassee, Mid-Mich Wireless / Jan LaBrenz, N8NSE, 517-893-3475
August 24	St. Charles, MO	St. Charles ARC / Scott Schultz, AA0ZS, 314-928-7267
August 24	Mullica Hill, NJ	Gloucester County ARC / John Lloyd, KA2EZN, 609-358-1285
August 24	Yonkers, NY	Yonkers ARC / John Costa, WB2AUL, 914-969-6548
August 30	Alamogordo, NM	Alamogordo ARC / Bill Leehan, N5SUM, 505-437-9781
August 30	Hayward, WI	Namekagon Valley Wireless Assn. / Mary Lindberg, KB9LFF, 715-378-2368
August 30-31	Shelby, NC	Shelby ARC / June Melvin, WA4JNJ, 704-739-2583
August 31	Dubuque, IA	G River, IA Antique, Tri-State Computer / Jerry Ehlers, NONLU, 319-583-1060

Send announcements of events or club information to: Editor, Monitoring Times, P.O. Box 98, Brassstown, NC 28902-0098. Fax 704-837-2216; e-mail mtditor@grove.net. See MT's homepage on www.grove.net for complete event and club listings.

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Known for their luxury, high-performance receivers, Japan Radio company (JRC) has just released a high quality, double conversion receiver at a low, competitive price! The new NRD-345 offers wide frequency coverage (100 kHz-30 MHz), multimode reception (AM, synch. AM, SSB), sharp selectivity (2/4 kHz), high sensitivity (0.3 microvolts), wide dynamic range (100 dB), strong audio (1 watt), dual VFOs, scannable memory (100 channels) with channel lockout, computer control (RS232C), dual clock timer (12/24 hour), precision tuning (5/100 Hz., 1/10 kHz steps), and adjustable noise blanker.

Additional features include selectable AGC timing, 20 dB attenuator, adjustable tone control, backlit S meter, large backlit LCD display, and dual-voltage (12 VDC / 120 VAC) power supply. See specifications below.

Frequency Range: 100 kHz-30 MHz
Keypad Entry: Yes
Tuning Steps: 5/100 Hz; 1/10 kHz
Display: Backlit LCD
Recommended use: General purpose SW and utilities
Receiving modes: AM, AM synch, USB, LSB
Memory: 100 channels
Scan: Yes
Clock: 12/24 hr. clock/timer
Audio Output Power 1 Watt
Record Audio Output: Yes
Signal Strength Indicator: LCD bargraph
Computer Interface: RS-232C
Conversion Scheme: Double up-conversion
Sensitivity: 0.3 uv
Selectable Attenuator 20 dB
IF Selectivity: (-6/-60 dB) 4/10 kHz wide, 2/6 kHz narrow
Image Rejection -70dB
Selectable AGC: Off/fast/slow
Dynamic Range: 100 dB
Noise Blanker/Limiter: Adjustable
Tone Control: Yes
Antenna Connector: SO-239 and 600 ohm
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THOSE PESKY "D" CONNECTORS

In my *May Closing Comments*, I tried to flaunt my (imaginary) exhaustive knowledge by incorrectly identifying all RS-232C computer connectors as type DB. Fortunately for my readers, Minor Cross of Corvallis, Oregon, *really* knew the answer. It seems that the second letter denotes the pin count: DA (15 pins), DB (25 pins), DC (37 pins), DD (50 pins), and DE (9 pins). Thanks, Minor.

Q. *Some time ago I remember seeing add-on commercial blockers for TVs. How do they work and where can I get one? (John Wallace, Sr., Syracuse, NY)*

A. Succinctly, they don't work and you can't get one. There are no standard signals sent by networks that could alert any sort of detector that a commercial break is next, or when it is over. That is why you don't see such a device advertised; if they worked, everyone would want one!

The only standard cue is that there is usually a "dip to black," the screen goes dark just before and just after the commercial break;

but that is just unused time, and is not a reliable cue for an electronic device.

Q. *Can the Grove (GRE) 800 MHz converter be used on a Bearcat 20/20 scanner? (Chris Fox, Stevens Point, WI)*

A. The 800 MHz down-converter simply shifts the entire block of 800-900 MHz signals it receives 400 MHz lower in frequency; thus, 806-900 MHz becomes receivable as 406-500 MHz on the host scanner. If your scanner receives only a portion of that 400-500 MHz range, then the amount of 800-900 MHz band receivable is proportionately reduced.

When using such a converter, no other frequency ranges are receivable, only the down-converted 800 MHz band, and tuning step increments will be whatever the host scanner uses in its 400-500 MHz range.

Q. *I recently moved to a large farm; if you had unlimited space for an SWL antenna, what would be your dream system? (A.J. Marhofke)*

A. Assuming I had unlimited space, but not

unlimited cash, I'd be perfectly satisfied with a rather conservative outlay of both wire and money. A couple of Beverage antennas running east/west and north/south would start. For VLF, where signals are sparse and weak, I'd like an active antenna. A 25 ft. vertical for general purpose listening would finish the installation. You might try a rotatable loop for nulling interference and for direction finding.

Keep in mind that atmospheric noise is the limiting factor below roughly 50 MHz; once you have enough antenna to overcome your receiver's own internally-generated circuit noise, a larger antenna will only bring in more noise along with the signal, the same as simply turning up the volume control on a smaller antenna.

For maximizing signal strengths, go for directivity, not size, and stay away from nearby electrical wiring and large, metallic structures.

Q. *I hear medevac helicopters on 155.220 MHz, the same frequency as school buses in my area; how come? (Robert Compton, Mertztown, PA)*

A. Even though they are aircraft, air ambu-

Bob's Tip of the Month

Simple Mediumwave Broadcaster Overload Cure

Many shortwave listeners using outside antennas are plagued by interference from strong, local AM broadcasters in the 540-1700 kHz medium wave band. The problem is especially compounded by the use of a long, random-wire antenna. *MT* reader Jim Weber of Colton, California, has a simple fix.

Jim simply inserts a 365 pF variable capacitor in line (series) with the antenna. Simply stated, the capacitor is adjusted to provide low impedance to high frequency signals while presenting higher impedance to lower

frequency signals; thus it is adjusted to reduce medium wave signals while allowing shortwave signals to come through full strength.

For convenience, Jim mounted his tuning capacitor in a plastic (not metal) box since both the rotor and stator are "hot" (ungrounded). If a metal box is preferred, the capacitor must be insulated from the box. A knob on the shaft makes tuning that much easier.

If your junkbox doesn't yield an air variable tuning capacitor, flea-market AM/FM radios are readily available for a few dollars and offer abundant parts—including their tuning capacitors.

BC-3000XLT Keyboard Trick

One of the most popular topics in this column is simple keyboard tricks for scanners, and the highly-successful BC-3000XLT is no exception. This latest contribution comes from reader Johnny DeVito of Belmont, Mas-

sachusetts, who discovered the meaning of "On Dir" which is displayed briefly when the SCAN key is held down while switching the power on (see *MT*, April 1995 for a complete list).

By pressing the SFT (shift) key followed by the LIMIT/down arrow key, the direction of scan, from lowest to highest channel, now reverses to scanning from highest to lowest channel, as indicated by the small arrow that appears over the frequency display.

To restore the normal lower to upper direction, simply press the SFT key followed by the HOLD/up arrow key.

Not only does this simple keyboard routine reverse the memory channel scan order, but also the frequency autosort direction. This should be of help in manually following Motorola trunking communications which step from higher to lower frequencies as they switch through their frequency pool.

Thanks, Johnny, for your interesting contribution. Other readers who make similar discoveries are invited to share these with fellow hobbyists.

lances may be licensed to communicate with ground medical personnel. School buses are assignable as well under Part 90.43, Special Emergency Medical Services, of the FCC Rules and Regulations.

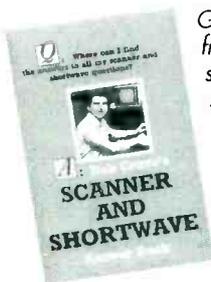
Q. *I have several pieces of equipment powered by AC wall adaptors. Can I plug them all into a switched power strip and possibly reduce their failure from remaining plugged into AC wall sockets all the time? Will the surge of switching them on with the power strip harm any of the equipment?* (Gary Otteson)

A. Keeping them switched off while not in use is a good idea; many "wall warts" meet minimal design criteria and are vulnerable to failure from overheating. No, switching on an AC adaptor will not cause a power surge harmful to your equipment; the internal filter capacitors do a good job absorbing that brief voltage spike.

Q. *Are there any fixes to improve the audio on the BC-235XLT?* (Chris Fix, Stevens Point, WI)

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, or e-mail to bgrove@grove.net. (Please include your name and address.) The current "Ask Bob" is now online at our WWW site: www.grove.net

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A. Nothing published, but any audio circuit can be altered. Audio quality is a matter of personal preference, and each generation of a manufacturer's scanners sound different from the previous one.

For the electronically adept, bass can be increased by increasing the amount of series capacitance in the audio amplifier (between stages, between the amplifier and speaker); or by reducing the treble by placing a bypass capacitor from any audio point to ground. Conversely, treble can be increased at the expense of bass—making series capacitances smaller, and reducing the value of bypass capacitors between the audio circuit and ground.

Q. *The Radio Shack discone is advertised to cover 25-1300 MHz; is it credible over this range?* (Kim Ballweg, W. Seattle, WA)

A. No. Even a paper clip will pick up *some* signals on virtually *any* frequency range. The best-designed discones are good over roughly an 8:1 frequency range, top to bottom frequency. That would mean that the Radio Shack discone, even if ideally designed (it's not), should be most effective from 25-200 MHz, or else from 162-1300 MHz using their top and bottom frequency claims.

Note that even Radio Shack's own ad recommends their discone be used for transmitting only in the amateur 144-1296 MHz bands, but if it were suitable down to 25 MHz, they would have added the amateur 50-54, 28-29.7, and even the CB 27 MHz bands.

Discones are highly overrated; they were designed during World War II to communicate with military aircraft in the 118-136 and 225-400 MHz bands—a wide frequency coverage requiring constant-impedance antennas for matching their transmitters. But discones have no gain, and their upward angle of radiation ("takeoff angle") on some frequencies is great for working airplanes from the ground, but may not be suitable for ground wave coverage.

Some of the better commercial discones like the Diamond and ICOM units add a vertical element to help enhance lower frequencies; but not Radio Shack. Our tests show that all scanner discones are poor performers below about 100 MHz, thus providing an 8:1 frequency coverage of roughly 100-800 MHz or higher since we aren't really interested in impedance matching for receiving purposes. Those with the vertical element provide an additional peak around 50 MHz to help with low band reception.

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RAMSEY SR-I shortwave receiver, like new in

cabinet. \$25.00. Howard (716) 838-2406.

YAESU FRG7, \$200. Quantum MW antenna, \$125. Sangean 606, \$100. All excellent, prices firm, includes shipping. Pete (205) 773-5505.

FOR SALE: McIntosh MR-78, "Simply the Best" FM tuner ever made, (MT July 93 p. 49), excellent, \$1090; Pioneer TX-9500II, \$175; TX-9100, \$125; **WANT:** AOR AR-7030; (412) 243-1569.

WANTED: Mint Sony ICF-SW1, kit not necessary; Mint Zenith Y600L leather T/O, need not be working. Jeff Wayne, 61 Allendale Dr. North Haven, CT 06473, (203) 281-6038, wayne4@snet.net.

DRAKE R8 w/Alpha Delta Sloper, \$525. Sony 2010 w/Gilfer case and stand, \$225. Both mint, w/original boxes and manuals. Call David (717) 385-4241 evenings.

McKAY-DYMEK DR22 - 50kHz to 30MHz - \$290.00. MFJ-1278B, MFJ-1289 has res. enhancer - \$150.00 for both. MFJ-959B anttuner-preamp - \$25.00. (718) 205-4588.

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WANTED: Square four blade socket power connectors or power cords for old type Bearcat III or IV scanners. Gary Jones, PO Box 467, Buckeye Lake, OH 43008.

(Letters, continued from Page 4)

the best. You may hear 'CB' with the tuning capacitor all the way open and ship traffic with it closed. You will need lots of patience with this set, just like fishing, but when you land one it's always a prize. The secrets are to have the best phones you can, to be listening at the right time, to have a good antenna and to tune slowly.' — Good advice for whatever you're monitoring!"

Please don't write Ken requesting copies of these circuits and mods. He doesn't have the facilities to reproduce them, and you can do the same research he did through your public library.

In the adventurous spirit of the hobby, we hope you'll take the articles you find in *MT* and add to them through your own experimentation and experience. As David Mobley of Springfield, Oregon, says: "I wanted to take a minute to say how much I use the magazine for reference, even months down the road." (Or years, in the case of a great number of our readers.) Let us add to your collection with a slightly more complicated receiver construction project in this issue: a new and improved "Ocean Hopper" shortwave radio. Give this old favorite a try and add your own improvements!

Please note the addition of a brand new column — *Tracking the Trunks* — dedicated to those of you just embarking on this latest twist in scanning trunked systems. We are hoping readers without internet access will find it especially helpful. Let us hear from you (whether you've been hoarding *MTs* for months or for years) about what you find most or least useful to your hobby in the pages of *Monitoring Times*.

— Rachel Baughn
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By Bob Grove,
Publisher

Sweeping Frequency Ban Proposal Could End Scanning!

PRESS STOP! *This editorial is a last-minute substitution in order to provide our readers with the latest federal effort to place massive restrictions on the receiving equipment Americans are permitted to buy.*

Steps to restrict Americans' access to the airwaves began fifteen years ago: On November 8, 1982, President Reagan issue Executive Order 12356, classifying as "Confidential" the Government Master File (GMF) of radio frequency assignments. At that time, Bernie Wunder, Assistant Secretary for the Committee of Communications and Information, developed a classification guide for members of the Interdepartment Radio Advisory Committee (IRAC).

In an attempt at moderation, on April 20, 1995, President Clinton, outlining the dangers of over-classification, issued Executive Order 12958 to begin declassification, and so far there are some 100,000 declassified frequencies now available from the GMF.

But we have just received a copy of a legislative proposal which, if passed, could well lead to the elimination of scanners, as well as the scanning receiver portions of commercial and amateur radio transceivers. Not surprisingly, the new sanctions come from the office of Edward Markey (D-MA), the privileged member of last February's Congressional Subcommittee on Telecommunications hearings who, upon being shown that his previous lawmaking efforts were defective, forewarned that we would "see scanner sales drop precipitously." And now he's making that promise good.

What is surprising is that, in spite of Markey's record of flawed rulemaking efforts, Congress has once again entrusted him with more rulemaking. Predictably, his new proposals are ill-considered, sweeping, and reactionary, as if to punish the radio communications industry.

The Bill, HR1964, begins by reforming the Internet, a section which, by itself, is already generating considerable ire from the telecommunications industry, but it is the scanner portion of the Bill which we shall address

here. Markey proposes to ban all of the frequencies allocated to the newly-defined Commercial Mobile Radio Services (CMRS) on future scanners. Let's take a look at the list of frequencies to be cut:

30.76-31.24, 33.14-33.16, 33.40, 35.02-35.14, 35.18, 35.20-35.66, 35.7-35.72, 35.88-35.98, 42.96-43.00, 43.20-43.66, 137-138, 148-150.050, 151.625-151.955, 152.030-152.240, 152.480-152.840, 154.570-154.600, 154.625, 157.200-157.400, 157.740-158.100, 158.460-159.700, 161.800-162.000, 216-222, 399.900-400.050, 4540-455, 457.525-457.600, 459-460, 460.650-462.1875, 462.750-462.925, 463.200-465, 465.650-467.1875, 467.750-467.925, 468.200-470 (and similar chunks of the 470-512 MHz band), 806-821, 824-866, 869-902, 929-932, 940-941, 1525-1559, 1610-1660.5, and 1850-1990 MHz.

That's over 363 megahertz—nearly 20% of the entire VHF/UHF scanner spectrum from 30-2000 MHz! Pretty scary. And that's just the beginning.

As it is, HR1964 would remove access not only to the mobile radiotelephone services (which was its superficial intent), but also weather satellites, Military Affiliate Radio System (MARS), Civil Air Patrol (CAP), many Experimental/Developmental frequencies needed for scientific and commercial purposes, low power industrial, itinerant, and many others as well.

It is the intent of some that the censoring not stop at this. We have learned from a high-placed government official that law enforcement representatives are requesting the elimination of public safety frequencies from scanners.

There *is* some good news: At this writing, it would appear that there are many more rational (or at least, more cautious) members of Congress—there is no hearing scheduled for the Bill, and it has no cosponsors! Of course, this could change with time, and with lobbying; on its surface Section 104 of HR1964 appears innocuous—even reasonable. It is important that you write your Congressman or Congresswoman and express your opposition to what is, in fact, an outrageous proposal before someone takes it seriously.

BT

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