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MONITORING TIMES

A Publication Of
Grove Enterprises

Inside This Issue:

- ★ DXing the Teeny Tiny AMs
- ★ Rebel Radio: Guerilla Communications
- ★ Magne Reviews SW Radios for Your Car

And Much More!

The Ultimate DX...

The Search For Extraterrestrial Life

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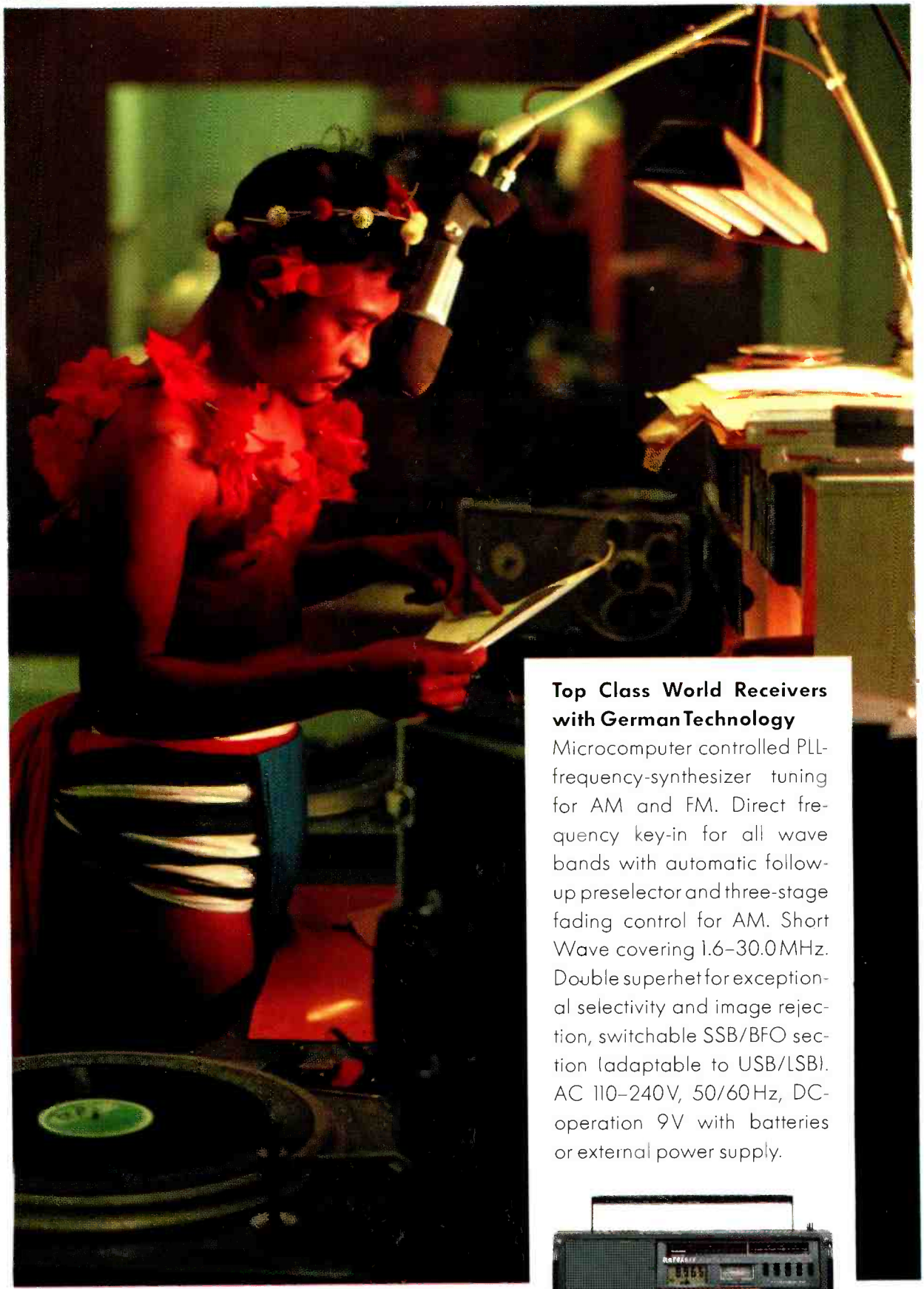

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Published by:
Grove Enterprises, Inc.
Publisher:
Bob Grove, WA4PYQ
Editor:
Larry Miller
Production Manager
Rachel Baughn
Subscriptions:
Mitzi Barrett
Advertising and Dealerships
Judy Grove

From the Publisher:

Monitoring Times Comes of Age

It's hard to believe that more than five years have passed since *Monitoring Times* inaugurated the world's first total-spectrum magazine. It was November 1982 when our eight-page bimonthly tabloid on newspulp began an industry.

New subscriptions and subscription renewals have continued to climb each month; October's figures, the most recent available, show new subscriptions at a healthy 5% per month, with renewals among our old friends at a staggering 83%!

Now *Monitoring Times* has reached a new quality plateau. While our "down home" style remains unchanged, we continue to strive for a more professional presentation. In the coming months you will see more color, quality and an increase in page count as well.

We are returning to the expanded frequency section and have added a new west coast monitor to improve the accuracy of the list. Several exciting articles and new product announcements and reviews are scheduled in the near future.

Most important of all, however, is that we will continue to be the most timely monitoring magazine available. Late breaking news will not be delayed by the new look, and your favorite columnists will still provide you with the best, most authoritative information found anywhere.

As always, we look forward to your comments, suggestions and criticisms; after all, *MT* continues to be *your* magazine!

Bob Grove

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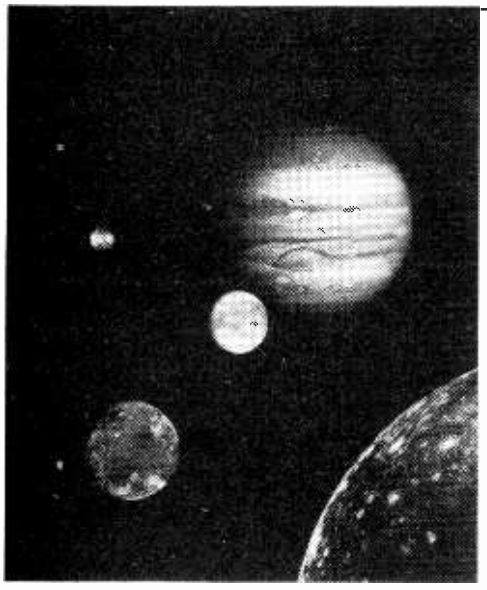
Inside this Issue

On the Cover: KUSW transmitter site outside Salt Lake City, Utah, courtesy KUSW; Satellite dish courtesy NASA.



(Photo courtesy NASA)

The Ultimate DX

by Jock Elliott

In your mind's eye you can almost see it. The scene: a pool room on the edge of the galaxy. You're the new kid in town, standing there with a receiver tucked under your arm. Facing you, across a few million light years of smooth green felt, is the Cosmic Hustler, casually applying caulk to the end of an antenna.

He looks you up and down, clearly unimpressed with what he sees. Then he speaks, "So you came to shoot a little DX, eh kid?"

So it is with SETI--the Search for ExtraTerrestrial Intelligence. It's the cosmos issuing a challenge to you to take a crack at finding what might be out there. It's the ultimate DX--listening for signs of intelligent life in the universe.

For the winner, the potential rewards are extraordinary. There is no doubt that the first individual or team to discover an intelligent signal from a non-terrestrial civilization will be the most famous DXer of all time, earning a permanent place in the history books, uncountable riches, and yes -- maybe even the front cover of *Monitoring Times*.

But even for those who are not first, there are substantial rewards as well: the intellectual challenge of devising the best search strategies, computer programs, and receiving hardware. There's the thrill of learning about the universe and the potential for discovering something new in the heavens (when the first pulsars were found, researchers thought perhaps they had discovered intelligent signals from "out there"). Even after the first extraterrestrial signal is detected, there will be the challenge of figuring out what it means.

Even more exciting for the readers of *Monitoring Times*, you don't have to be NASA or The Planetary Society to get in on the ultimate DX. Though big budgets and sophisticated staffs are certainly great advantages, experts I talked with were positive, even encouraging, about the contribution that amateur searchers can make to SETI.

Thomas McDonough, coordinator of SETI for The Planetary Society and author of *The Search for Extraterrestrial Intelligence*, says, "It wouldn't surprise me at all if an amateur made the first discovery of an extraterrestrial signal."

Later in this article you will find out how you can participate in SETI. But first: Is there life out there?

Kent Cullers, associate research scientist at NASA's Ames Research Center in California, is the leader of a team devising software techniques for finding intelligent signals buried in interstellar noise. "Our detractors say that SETI is like the cynical definition of a philosopher: a blind man looking for a black cat that isn't there. But, in point of fact, no one knows if the cat is in the room or not."

Figuring the Odds

But why does anyone think there might be another civilization out in space whose signals we might hear?

The short answer is that, because our civilization arose on small blue planet circling a yellow sun, we presume that other civilizations might arise under similar circumstances elsewhere in the universe.

Frank Drake, now Dean of the University of California at Santa Cruz, developed an equation for calculating the number of planets in our galaxy that are likely to have intelligent life. For our purposes, this equation is best expressed as a series of questions:

- How many stars are there in our Milky Way galaxy?
- How many of these stars have planets?
- How many of these planets are suitable for life?
- How many of these planets actually develop life?
- How many of those develop intelligent life?
- How many of those with intelligent life develop civilizations with technology capable of interstellar communication?
- How long did these civilizations last?

Scientists attempting to solve this equation agree that there are vast uncertainties in the answer to each question. As a result, scientific esti-

mates of the number of worlds with technological civilizations in our galaxy range from a few thousands to millions.

So what's so hard about finding them? After all, we can read 1-watt signals transmitted by the spacecraft Pioneer out beyond the orbit of Pluto!

A Monster Band Scan

The reason we can hear the signals from Pioneer is we know Pioneer is out there, and we know when, where, and at what frequency to listen. We don't know any of those things about another civilization. And there are substantial problems involving distances, frequencies, and signal strength.

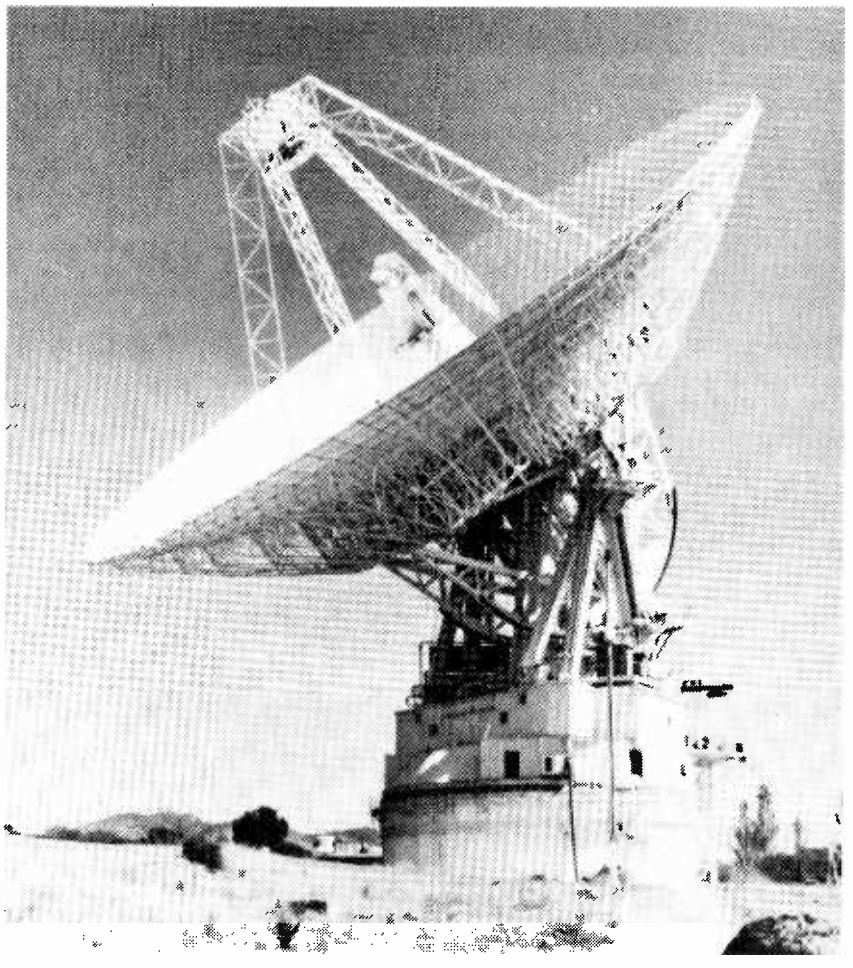
The nearest star is 4.3 light years away. According to Cullers, at that distance, even with a full-scale SETI search program using current technology and proposed funding, we would have a hard time detecting the radio, TV, and radar signals emitted by our own planet. If an alien civilization set up a 1 gigawatt beacon, we might detect it as far away as 100 light years. If we used the 1,000 foot Arecibo dish to look for signals from an antenna of similar size, we might be able to detect signals of similiar size, we might be able to detect signals originating 4,000-5,000 light years away.

To get around some of these problems, professional SETI programs have developed various search strategies. For example, Project META, a SETI program at Harvard University funded by the Planetary Society and film director Steven Spielberg, is searching for very narrow band signals at so-called "magic frequencies." In addition, Project META is looking for a very special kind of signal, a "non-drifting carrier."

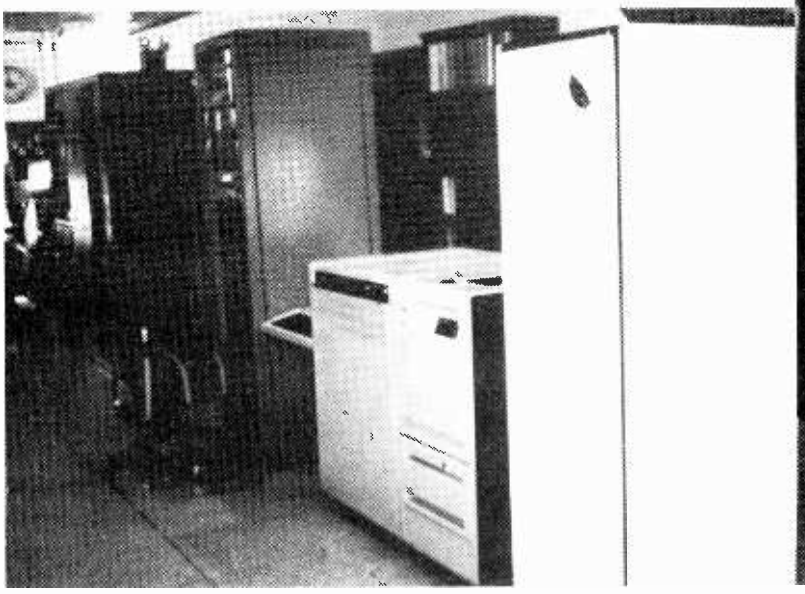
What is remarkable about looking for a non-drifting carrier from outer space is that it presumes that an alien civilization might set up some sort of a radio beacon that is not on the surface of a rotating planet. Otherwise the signal would suffer from Doppler drift -- the same effect that makes the sound of a race car appear to drop in pitch as it speeds past the listener. If the beacon were on the surface of a planet, it would drift past us, kind of like the light on a lighthouse.

In addition, the 8,000,000 simultaneous receiving channels of Project META will also be drifted (on purpose) to adjust for the rotation of the listening platform, planet Earth.

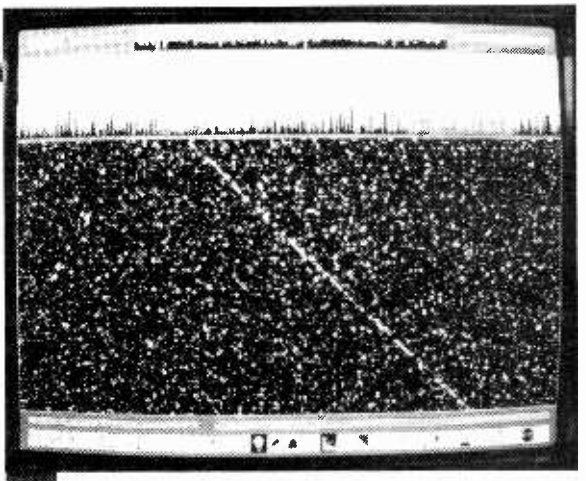
The reason for all of this is that Project META is trying to search as much of the sky as possible with great sensitivity while reducing the number of "false alarm" signals that its computers detect. So far, Project META has completed a search of the entire sky at 1420 MHz (the so-called "hydrogen line" where background noise is particularly low) and is now beginning a full sky search at 2840



64m dish located at Madrid, Spain, which is part of NASA's Deep Space Network of satellite tracking antennas.



Prototype multichannel spectrum analyzer (MCSA) designed and developed for NASA's SETI Program under the auspices of Drs. Allen Peterson and Ivan Linscott at Stanford University.



Pioneer 10 carrier captured by MCSA prototype on a 26m antenna. *Top Window: Power in 144 channels 540 Hz wide. Middle Window: Power in 1152 bins of one 540 Hz channel. Bottom Window: 100 successive spectra in 200 adjacent 1/2 Hz bins. Frequency drift largely due to earth rotation doppler drift. Pioneer 10 distance: 3.3 billion miles. Total carrier power: 1 watt.*

MHz, another of the "magic frequencies" where scientists think a really intelligent civilization might try to advertise its presence to others.

Cullers, Ivan Linscott, and others at NASA are making preparations for a SETI search that will employ another set of strategies that scientists hope will produce results. The NASA SETI project will search the 1,000 nearest stars at 1-3 gigahertz and the entire sky at 1-10 gigahertz.

The NASA team will be looking for non-drifting carriers, drifting carriers, and pulsed signals. But even if the NASA project were entirely funded today (which it isn't), the search would not be ready to begin until 1992. Furthermore, because NASA does not at present have the proper antennas, 1,000-1,400 megahertz will be the last portion of the spectrum to be searched and that probably not get under way until about ten years from now.

The bottom line is, because of the kind of strategies being employed by the professional SETI search teams, the field is wide open for amateurs who want to look for signals that are different from what the pros are trying to detect -- particularly in the 1-2.4 gigahertz range.

Amateurs Aim for the Stars

To illustrate the point, Kent Cullers says, "If another civilization sent a space probe in our direction and was communicating with it using single-sideband, our current professional search strategies would never detect it, no matter what the frequency. But an amateur, using a different strategy, might. We think 1-1.4 gigahertz could be a productive frequency range because interstellar noise is relatively low there."

The least complicated search a *Monitoring Times* reader might undertake would be to rig up an antenna in the 1-1.4 gigahertz range so that it is pointed at the sky. Hook it to a suitable receiver, such as a Kenwood R-7000 with a filter in the 1-2 kHz range, and listen for intelligent signals from space.

Although people are better than computers for detecting a variety of signal types, they are not as fast, and their error rate is higher.

Most people, however, do not have the time or the patience for this kind of searching. So the next step is to let a computer do the listening for you. Again, the R-7000 can be a plus as it can be controlled by computer, allowing frequencies and modes to be automatically changed as needed while the search is in progress.

In addition, if the incoming signals are passed through a digitizer capable of handling data at about 10kHz, the computer can also perform several valuable functions.

First, it can perform a mathematical trick called a "fast Fourier transform," which breaks the digitizer information into many small slices of smaller bandwidth. This has the effect of increasing the sensitivity of your receiver because the sensitivity of your receiver is inversely proportional to the bandwidth. The Fourier transform also makes it easier to detect the strong peaks and weak harmonics that are characteristic of artificially created signals.

Second, in analyzing the signal, the computer can also be taught to find and reject certain kinds of local interference that may plague you in your area.

In addition, your computer can be programmed to set off and alarm or turn on a printer or a recorder if it detects a signal that has all the properties for which you are searching.

Pulling in the Signal

The most critical part of your SETI installation will be the antenna. There are several approaches you can take. You can go out an buy the largest satellite dish you can find. You can beg or borrow an unused dish from some individual or organization. This is precisely what Bob Stephens has done with his amateur SETI effort in the Yukon; he is using some old radar dishes. You can also build your own dish out of very inexpensive materials such as scrap lumber and chicken wire.

But as you are planning for a dish antenna, keep two key factors in mind: the equipment needed to accurately move a large dish is capable of looking at only a fixed band in the sky. Remember, too, that the larger the dish, the more sensitive it is, but it also sees a narrower portion of the sky.

There are, however, alternatives to a full-scale dish antenna. For example, an antenna that is parabolic in only one direction is easy to construct and easy to adjust for searching the whole sky -- just change the declination and let the rotation of the earth do the rest for you.

John Potter Shields, in his book *The Amateur Radio Astronomer's Handbook*, gives instructions for constructing quad and helical antennas that could be used for SETI. One of the advantages of helical antennas is that they are extremely broadbanded. An antenna constructed for 1.2 gigahertz will also work pretty well at 1 and 1.4 gigahertz.

Cullers says, "As the coordinator of amateur SETI efforts for NASA, I find there is always someone who is interested in doing his or her own SETI effort. But I also find that they are sporadic. An individual will often spend a long time getting the rig together and then, after a few nights of listening to the noise, will give up and use the rig for something else, like moon bounce work."

Perhaps you are that "right kind" of person, the one who has the patience, persistence, and intelligence to put it all together, to search in the fight place, at the right time, with the right strategy.

So listen -- the Cosmic Hustler is calling. "How 'bout it, kid? Wanna shoot a little interstellar DX? Wanna go for the Big One? The secrets of another civilization? A place in the history books? Whadya say?"

■

Additional sources of information

NONFICTION:

The Search for Extraterrestrial Intelligence, Thomas R. McDonough, John Wiley & Sons, Inc. 1987

The Amateur Radio Astronomer's Handbook, John Potter Shields, Crown Publishers, 1986.

Cosmos, Carl Sagan, 1980

FICTION:

Contact, Carl Sagan, 1987.

The Listeners, James E. Gunn, 1972.

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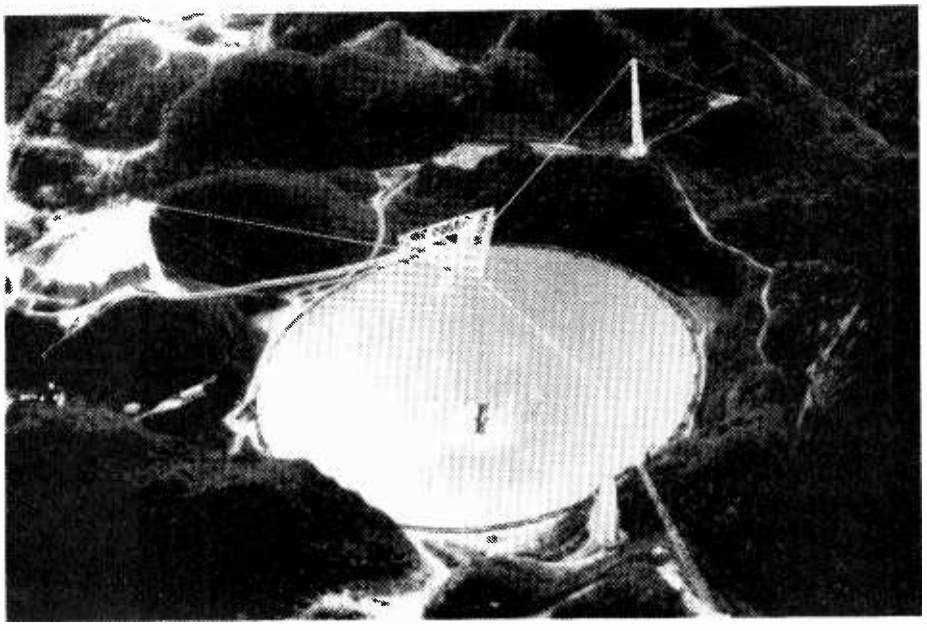


Aerial view of the world's largest (305m) radio telescope at Arecibo, Puerto Rico; operated by NAIC (National Astronomy and Ionosphere Center) at Cornell under contract to the National Science Foundation.

DXing Europe

There's more of a challenge than you think!

by John A. Kirkpatrick, Jr.

Think of European shortwave radio broadcasting and you'll automatically think big. It's here in Europe that many of the world's most massive international broadcasting operations are located: BBC, Radio Netherlands, the Voice of Germany, Swiss Radio International, Radio France International. For the listener, these stations offer some of the finest in shortwave programming. For the DXer, the challenge is very similar to shooting fish in a barrel.

At first glance, that all might seem true. But if you take the time to do some poking around -- turn over a few rocks here and there -- you'll find that there are indeed a few DX challenges left on the continent. So fire up your R-Umpteen Hundred Receiver and let's go DXing!

Albania

The programs of Radio Tirana may be a joke and their signals no harder to catch than those of the BBC, but there's more than one way to skin an Albanian DX cat. There's one other shortwave station on the air from this xenophobic little country and it's called Radio Gjirokaster.

Gjirokaster is a relay of the Albanian home service and it offers listeners lots of good, local folk music. It's been around for many years and remains active and not all that difficult to pick up. The 50 kilowatt transmitter signs on at 0300 UTC on 5057 kHz, though it will occasionally appear on its long-standing alternate frequency, 5020.

Radio Tirana will sometimes QSL reception reports on Gjirokaster, but you may have to have several goes at it before you're successful.

Bulgaria

Here's one you've probably never even heard of! Like Albania, Bulgaria offers a home service relay on shortwave. It's from a 15 kilowatt transmitter in Stolnik which is used only for this purpose, or at least not for Radio Sofia's foreign service. The frequency it uses, 5057 kHz, is a real

oddball, and that in itself helps to identify the station. The Stolnik transmitter signs on at 0300 UTC. Programming is strictly in Bulgarian.

Only one or two QSLs are known to have ever been issued for this shortwave outlet as Radio Sofia apparently has a policy of not issuing confirmations for this shortwave outlet. If you can get one, however, you've pulled off a real QSL coup!

West Berlin

RIAS (Radio in the American Sector) in West Berlin is a station which, while perhaps not regularly logged -- and that's being rather generous -- has at least made it into the consciousness of most DXers. The station has a certain appeal: its name, the throw-backs to the cold war and its isolation within the communist world. Too, under most DX rules, West Berlin qualifies as a separate radio country.

It's a lot tougher to hear than Deutsche Welle or Radio Berlin International, even though it employs a whopping 100 kw. The problem is clearly not signal strength then, but interference from other stations on the channel.

Still, catching RIAS is not impossible. It's a matter of waiting for the right conditions and a "time window" when the other stations are off the air. Programs are all in German.

Greece

Greek home service programming can be heard over a transmitter at Thessaloniki, which was originally used as a Voice of America relay station. Radiofonikos Stathmos Makedonias broadcasts in Greek over two 35 kilowatt transmitters. Check 9935 kHz from 1000 to 2215 sign off (Sunday sign on is at 0600 UTC). The same schedule, except for a half hour break at 1730 UTC, is used on 11595 kHz.

Separate QSLs can be obtained from this station. Try a report to Georgikis Sholis 129, Thessaloniki, Greece.

Hungary

Home service broadcasts from Hungary are only aired over the regular Radio Budapest facilities. Still, hearing the Radio Kossuth programs is a step or two more difficult than tuning in Radio Budapest. And it's possible to get a separate QSL for these home service relays.

Radio Kossuth is, actually, the home service First Program, and airs from 0500 to 2100 UTC on 6025 kHz. Unfortunately, however, Hungary's second and third radio networks are not relayed over shortwave. Reception reports for Radio Kossuth can be sent in care of Radio Budapest.

Sicily

The Italian island of Sicily is often considered a separate radio country and so it attracts the more attention from DXers than it otherwise would. Here again, the shortwave outlet is used strictly for relaying a home service network, in this case, Radio Uno, the RAI first program. This is carried on 6060 and 9515 kHz from 0500 to 2230 UTC, all in Italian. The 50 kilowatt transmitters are located at Caltanissetta.

Hearing this one is probably easier than obtaining an acceptable QSL for RAI will, more often than not, ignore your request that the card contain some mention of Caltanissetta, Sicily or Radio Uno. If you hear and report this one, be prepared to do several follow-ups.

Also from Italy is the religious station, Adventist World Radio Europe. It owns a 10 kilowatt transmitter at Forli. After operations lasting more than a year, the station ran into problems with its frequency usage and the Italian government. There have been continuing problems

Europe is not only inhabited by monstrous, easy-to-hear government stations. For the true-blue DX hound seeking an often-overlooked challenge, it's an opportunity to do some real detective work.

with AWR Forli, so watch *MT*'s "Radio Roundup" column for news of developments on this station.

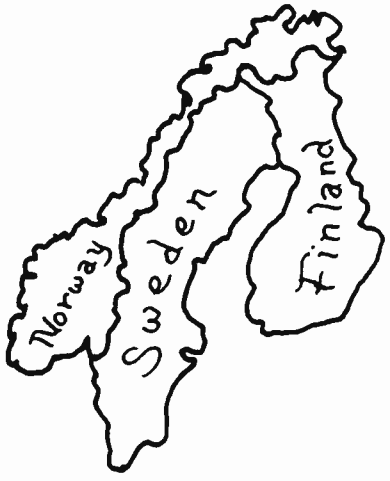
Malta

Radio Mediterranean on the island of Malta is a good target for these winter months when darkness comes earlier and opens up the 49 meter band sooner. Even with the 250 kilowatts of the Voice of Germany's Cyclops transmitter available, Radio Mediterranean is no snap logging.

Check 6110 kHz for its English language transmission from 2230 to 2330 UTC. The station also airs Arabic from 1800 to 1900 and French at 2130 to 2230 UTC. Radio Mediterranean welcomes reception reports to P.O. Box 2, Valletta, Malta.

Portugal

One step down in power and "hearability" from Radio Portugal is Radio Renascencia -- Emissora Catolica Portuguesa -- which has a 100 kilowatt transmitter at Muge, Portugal, at its disposal. The station is on the air in Portuguese only and with a rather limited schedule: 0945 to 1230 on Sundays only on 9575 kHz; 1800 to 2000 on 9680 kHz (from 1400 UTC on Saturdays and Sundays) and at 0015 to 0130 UTC on 9600 kHz. QSLs are issued from Rua Capelo 5, 1294 Lisbon.



Sweden

Swedish Radio's home service programs can be tuned in via a continuing single sideband experiment on shortwave, operated by the Swedish Telecommunications Authority. This 100 kilowatt transmitter is located in Varberg and also carries part of Radio Sweden's foreign service in English (at 2330 to 0000 and 0200 to 0300 UTC on 11950 kHz).

Swedish language broadcasts are best heard in North America during the 1600 to 1800 UTC transmission on 15435 kHz. A special QSL card is sent from Swedish Telecom Radio, S-123, 86 Farsta, Sweden.

Switzerland

Besides Swiss Radio International and the monthly broadcasts of the International Committee of the Red Cross, Switzerland offers one other DX target of interest. The United Nations airs a ten minute program in Russian on 7443 at 1830 UTC. What makes this tough is that it's only heard when the UN General Assembly is in session!

Another frequency is 14500 kHz which *Passport to World Band Radio* lists as active on Wednesdays at 1830 UTC in Russian. This latter broadcast has been heard by US DXers in the past. Both frequencies are in upper sideband with 15 kilowatts of power.

So there it is. Proof positive that Europe is not only inhabited by monstrous, easy-to-hear government stations. For the true-blue DX hound seeking an often overlooked challenge, it's an opportunity to do some real detective work. ■

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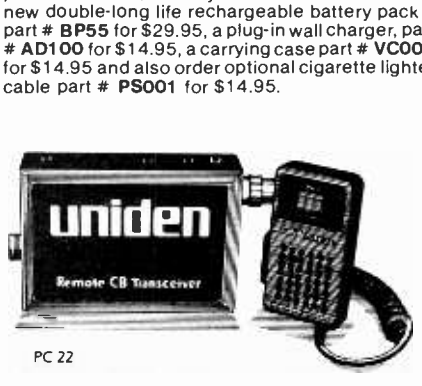

PC 22

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The new Fox scanner frequency directories will help you find all the action your scanner can listen to. These new listings include police, fire, ambulances & rescue squads, local government, private police agencies, hospitals, emergency medical channels, news media, forestry radio service, railroads, weather stations, radio common carriers, AT&T mobile telephone, utility companies, general mobile radio service, marine radio service, taxi cab companies, tow truck companies, trucking companies, business repeaters, business radio (simplex) federal government, funeral directors, veterinarians, buses, aircraft, space satellites, amateur radio, broadcasters and more. Fox frequency listings feature call letter cross reference as well as alphabetical listing by licensee name, police codes and signals. All Fox directories are $14.95 each plus $3.00 shipping. State of Alaska–**RL019-1**; Baltimore, MD/Washington, DC–**RL024-1**; Chicago, IL–**RL014-1**; Cleveland, OH–**RL017-1**; Columbus, OH–**RL003-2**; Dallas/Ft. Worth, TX–**RL013-1**; Denver/Colorado Springs, CO–**RL027-1**; Detroit, MI/ Windsor, ON–**RL008-2**; Fort Wayne, IN /Lima, OH– **RL001-1**; Houston, TX–**RL023-1**; Indianapolis, IN–**RL022-1**; Kansas City, MO/ KS–**RL011-2**; Los Angeles, CA–**RL016-1**; Louisville/Lexington, KY–**RL007-1**; Milwaukee, WI/Waukegan, IL–**RL021-1**; Minneapolis/St. Paul, MN–**RL010-2**; Nevada/E. Central CA–**RL028-1**; Oklahoma City/Lawton, OK–**RL005-2**; Pittsburgh, PA/Wheeling, WV–**RL029-1**; Rochester/ Syracuse, NY–**RL020-1**; Tampa/St. Petersburg, FL–**RL004-2**; Toledo, OH–**RL002-3**. A regional directory which covers police, fire ambulance & rescue squads, local government, forestry, marine radio, mobile phone, aircraft and NOAA weather is available for $19.95 each. **RD001-1** covers AL, AR, FL, GA. LA, MS, NC, PR, SC. TN & VI. For an area not shown above call Fox at 800-543-7892 or in Ohio 800-621-2513.

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The new *Regency* Informant scanners cover virtually all the standard police, fire, emergency and weather frequencies. These special scanners are preprogrammed by state in the units memory. Just pick a state and a category. The Informant does the rest. All Informant radios have a feature called *Turbo Scan*™ to scan up to 40 channels per second. The **INF1-RA** is ideal for truckers and is only $249.95. The new **INF2-RA** is a deluxe model and has ham radio, a weather alert and other exciting features built in for only $324.95. For base station use, the **INF5-RA** is only $199.95 and for those who can afford the best, the **INF3-RA** at $249.95, is a state-of-the-art, receiver that spells out what service you're listining to such as Military, Airphone, Paging, State Police, Coast Guard or Press.

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11-Band, 55 Channel • Handheld/Portable Search • Lockout • Priority • Bank Select Sidelit liquid crystal display • EAROM Memory Direct Channel Access Feature • Scan delay

Bands: 29-54, 118-136, 144-174, 406-420, 440-512 MHz.

The new handheld *Regency* HX1500 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 55 channels at the same time including the AM aircraft band. The LCD display is even sidelit for night use. Includes belt clip, flexible antenna and earphone. Operates on 8 1.2 Volt rechargeable Ni-cad batteries (not included). Be sure to order batteries and battery charger from the accessory list in this ad.

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9-Band, 16 Channel • Priority • Scan Delay Search • Limit • Hold • Lockout • AC/DC

Frequency range: 30-50, 118-174, 406-512 MHz.

Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA ni-cad batteries and flexible antenna. Order your scanner now.

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Bearcat® 800XLT-RA

List price $499.95/**CE price $289.95/SPECIAL**

12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC

Bands: 29-54, 118-174, 406-512, 806-912 MHz.

The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9¼" x 4½" x 12⅛."

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SUPERPOWER KUSW RADIO WORLDWIDE

The Nation's Newest SW Broadcaster

Back at the early part of this decade, the idea of opening a commercial shortwave station in the US was almost unthinkable -- and just about illegal. Then came Joe Costello's pioneering WRNO Worldwide.

Suddenly, a crack in the dam appeared and it seemed for a while that everyone with a typewriter and enough money to buy stamps to mail out press releases was going to put a station on the air. The more grandiose the plan, the better. Most, mercifully, got no further than the press release stage.

Still, the idea of casting one's voice and thoughts about the four corners of the globe is a powerful lure. That accepted, there remained only one thing left to resolve: profitability.

Of the stations that did go on the air, only two were fundamentally non-religious in nature. The first was Costello's "Rock of the World," WRNO, and the second, the World Service of the Christian Science Monitor. At this point in the game, the profitability of Costello's operation remains suspect, seemingly relying on revenue generated by the sale of air time to religious organizations, and WCSN, although quite strong in the programming department, remains unproven in the commercial area.

One religious station that got on the air during this period and that had big plans for secular programming, has since virtually dried up and went away. KCBI, in Dallas, Texas, is now heard on weekends only. The going, it appears, is undoubtedly tough.

Courting the International Market

Why then, would anyone in their right mind -- after having had sufficient time to watch the performance of these other shortwave pioneers -- want to put a station on the air?

We posed that question to Ralph Carlson, who has just launched KUSW Radio Worldwide from Salt Lake City Utah.

"The *Wall Street Journal*," replies Carlson, "recently reported that shortwave receiver sales are up 50 percent over last year." That same article said that the shortwave audience is expected to grow from 4 percent to about 20 percent of the population within 15 years.

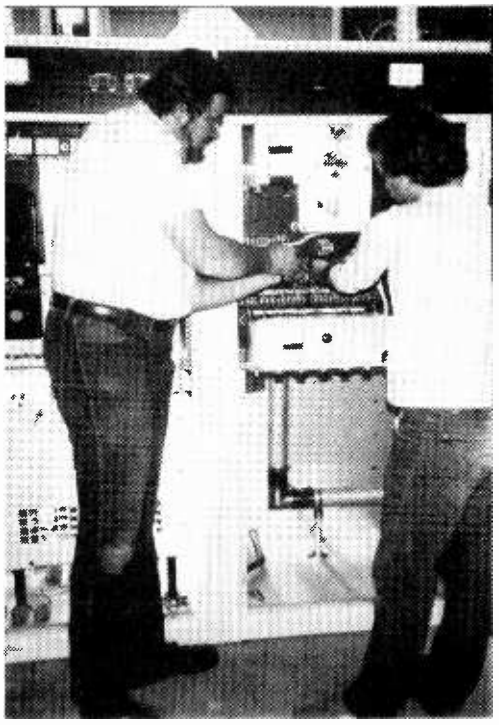
Carlson is quick to point out that this is no slouch audience either. "Studies show that the typical shortwave listener is male and has a median age of 34. He spends 12 to 15 hours a week listening to shortwave. Almost a third of the group has college degrees; another third hold advanced degrees. We are confident that there are many firms interested in advertising and promoting to this market."

Alan D. Hague, Executive Vice-President of KUSW Worldwide Radio, agrees, saying that the reception given the station by major advertising agencies and corporations has been very encouraging. "Many national products are international in scope," says Hague, "with all parts of the world wanting the most advanced things the others have."

Hague points out a number of examples: McDonald's in Paris, Coca-Cola in China and the demand for blue jeans throughout the world.

"Instead of advertising to just your local town, city, borough or even region, with shortwave you can reach people in other countries -- people just like you with wants and needs to improve their lives," says Eri C. Meyer, President of Interconsult, an international management consulting firm. "Despite the penchant by most businesses to shy away from conducting business on an international scale, those that do make the decision to participate reap a significant reward. Many derive 30 percent of their revenues from international business."

In order to reach this market, Carlson has programmed KUSW shortwave with American contemporary classics, "including a blend of music reflective of American musical tastes." News features



will include current international, national and local western US news. All will be geared to maintain the interest of the international listener.

Special Attractions

KUSW also has access to a network of computerized weather data. Special emphasis will be placed on weather advisories and changes throughout the world.

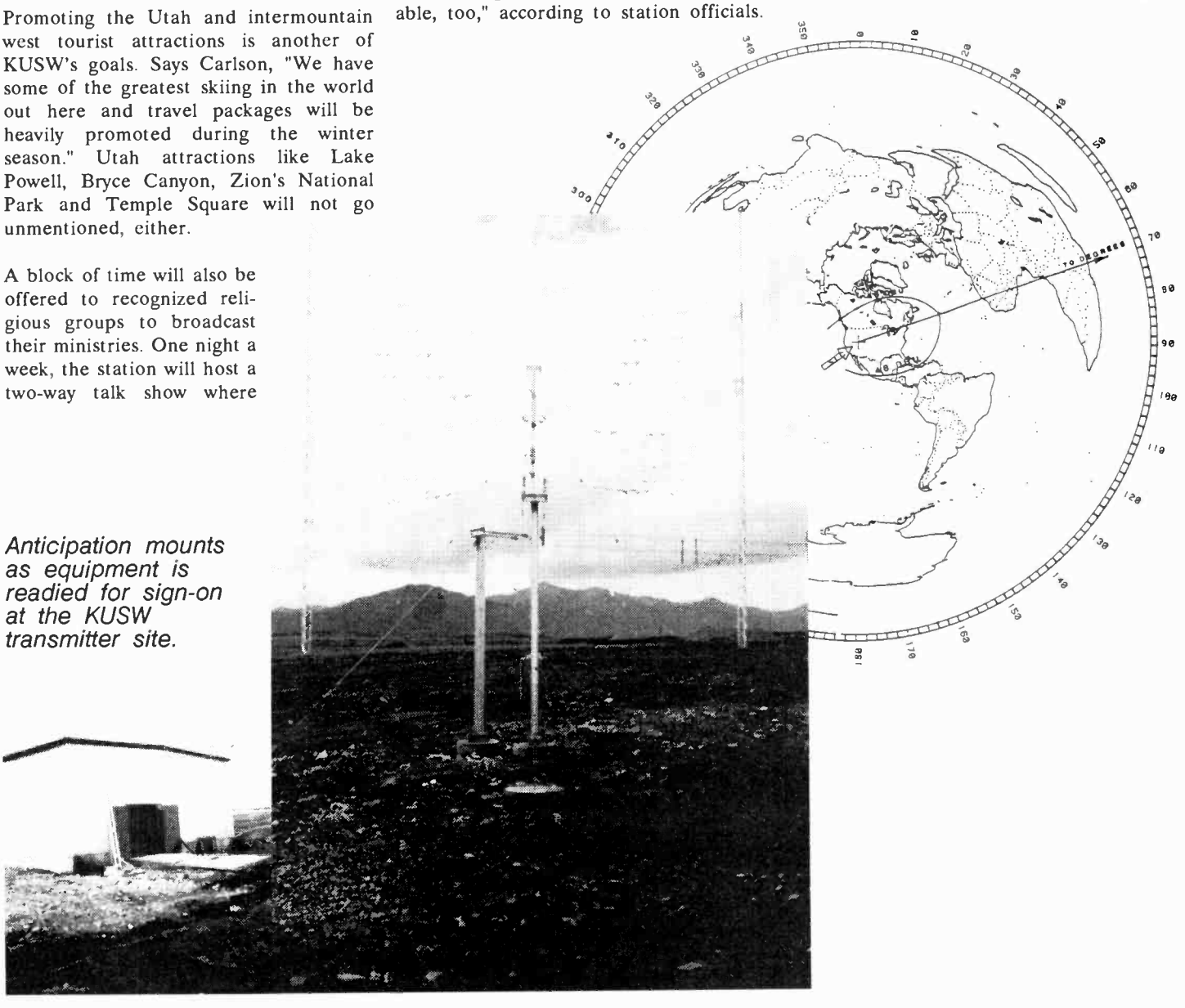
Promoting the Utah and intermountain west tourist attractions is another of KUSW's goals. Says Carlson, "We have some of the greatest skiing in the world out here and travel packages will be heavily promoted during the winter season." Utah attractions like Lake Powell, Bryce Canyon, Zion's National Park and Temple Square will not go unmentioned, either.

A block of time will also be offered to recognized religious groups to broadcast their ministries. One night a week, the station will host a two-way talk show where questions about world events and the station's programming will be fielded.

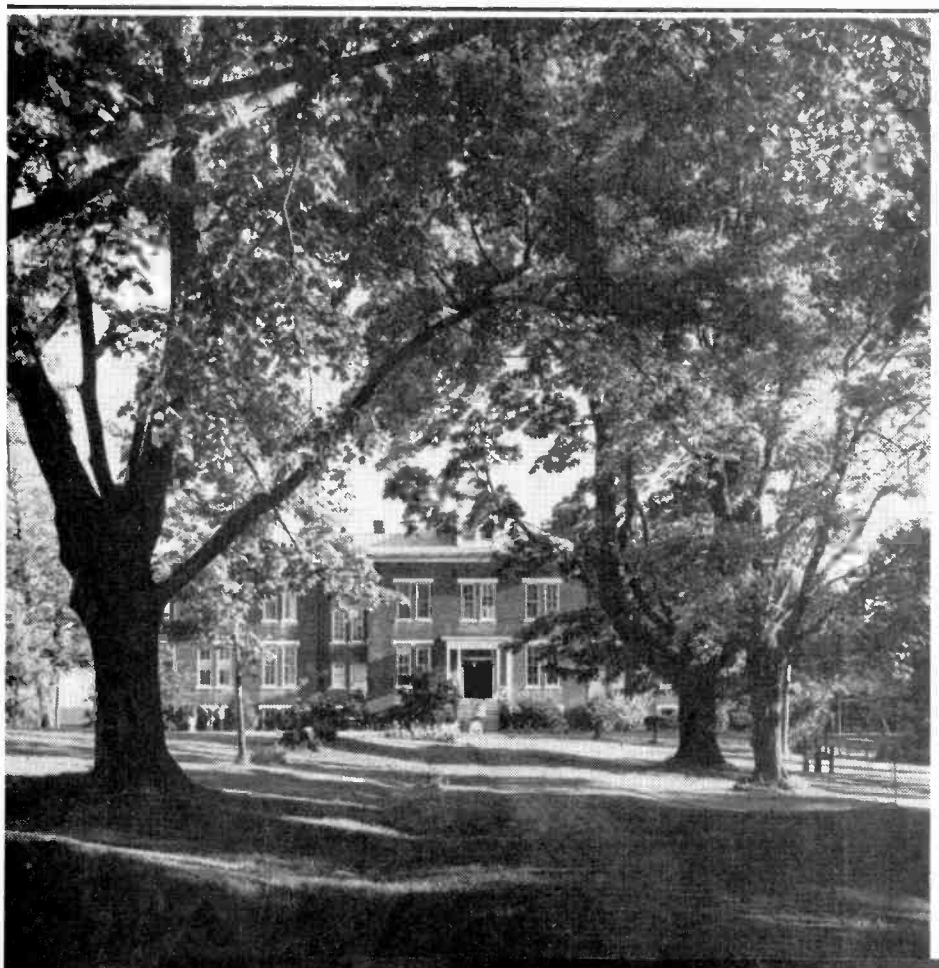
"We see shortwave broadcasting, especially on an international level, as an exciting new arena," says Carlson. "Up to now, most of the stations have been either government or religious operations. Our programming will be mostly music, but will be designed to attract the international audience."

"Advertising on KUSW is quite affordable, too," according to station officials. Assuming that the published rate card is for a 60 second commercial, an advertiser can get on KUSW for as little as 40 dollars.

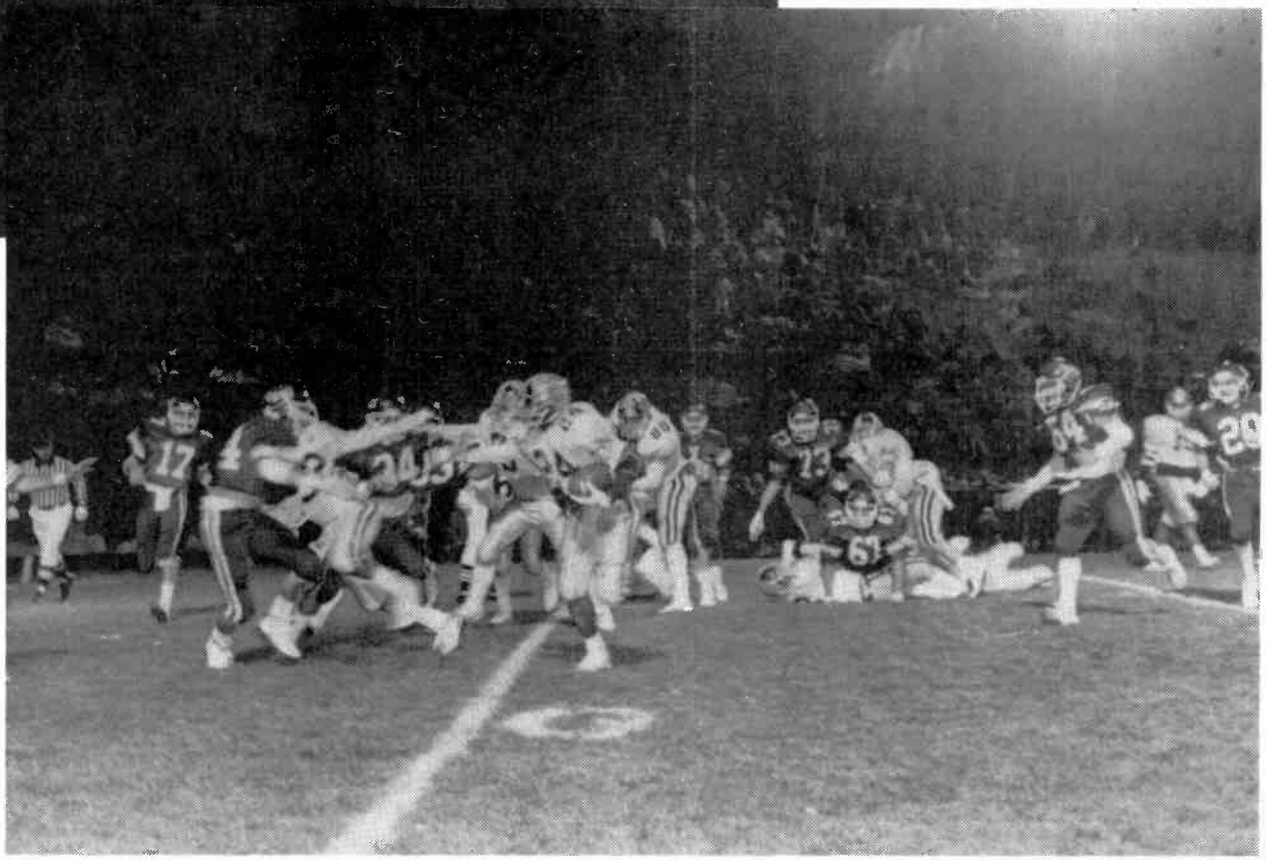
For more information on KUSW Radio Worldwide, write to the station at P.O. Box 7040, Salt Lake City, Utah 84107. KUSW is on the air from 11:00 AM to 11:00 PM Mountain Time. The latest frequency schedule can be found in the *Radio Roundup* section of this issue. All broadcasts are in English. ■



Anticipation mounts as equipment is readied for sign-on at the KUSW transmitter site.



Frankly, teeny tiny AMs are best monitored while traveling. Look for likely spots like real estate signs and colleges, which occasionally augment local coverage of the university station or sporting events. You're not going to hear a half loafer unless you're practically sitting under the antenna!



DXing the

Teeny Tiny AMs

by Peter Kenworth III

"Half a loaf is better than none," goes the old saying. Apparently, there are people who feel that the adage applies to broadcasting, specifically to a class of stations sometimes known as "half loafers." Power-wise, half loafers are about as far away from a WGN or a Voice of America as you can get. These stations are even dwarfed by run-of-the-mill one kilowatt local AMers. *Less than 1 kw?*

Believe it or not, half loafers are real, honest-to-goodness radio stations that use only one half of a watt of power! Technically called 100 milliwatt or .5 mile AM stations, they have found a variety of uses throughout the United States.

Sitting Under the Antenna

Obviously, range is not one of these station's strong points. The truth be known, claims of half mile coverage are somewhat generous, their actual coverage area being calculated in the low thousands of feet. As with all radio, though, distance depends on variables such as ground conductivity, frequency, height of the antenna and so on. Still, even given the best of circumstances, you're not going to hear a half loafer unless you're practically sitting under the antenna.

Despite this obvious and rather severe limitation, there are thousands of such stations in operation, on the air every day. And they broadcast a variety of programming and can add an extra dimension of excitement to your DXing -- if you know where and how to look.

No License Needed

Because 100 milliwatters are nothing more than teeny, tiny AMs, they don't need a license from the Federal Communications Commission. They can operate on any frequency within the AM broadcasting band so long as care is taken to avoid interference with a licensed broadcaster.

In a way, that last part is kind of funny. It's really not likely that a station running 100 milliwatts is going to cause anyone much interference. Failure by a half loaf operator to pick a clear channel simply means that the station won't be heard. So it's more a matter of self-preservation than anything else.

Despite this, the operators of half loafers (not to be confused with "low-fers," who operate low powered transmitters on the low frequencies; See the December 1987 *Monitoring Times*) are continually finding new ways to use these flea-powered stations.

A College Favorite

One of the most popular uses of 100 milliwatt stations is to augment the coverage of college and university "carrier current" stations. Some on-campus areas may not be wired into the carrier current system or the system may have natural weak spots in its coverage. Half loafers can be used to fill these gaps and even get the signal out to off-campus housing.

At least one college station uses a .5 mile AM transmitter as part of its play-by-play coverage of sporting events. In this case, the fieldhouse is too far away from the college's main transmitter and the steel construction of the building where the games are played prevents reception of normal radio signals. So, a half loafer sits in the broadcast booth along with the play-by-play team and broadcasts the action within the building. Those in the crowd with portable radios can, in this way, tune in the action.

A Sales Tool

A more familiar use of 100 milliwatt AMers is as a sales tool for the real estate industry.

How's that? Well, suppose you had a house listed for sale. And suppose you wanted to increase exposure to the house during times when no one

The half loaf "salesperson" is on the job 24 hours a day, never complains, doesn't sleep, and needs no pay! You may have a little trouble getting a QSL from a real estate sign, however!

was available to show the property and other "off" hours. Maybe, too, someone driving by the place finds it interesting -- but not so interesting as to stop by the real estate office and ask for details.

A half loafer, attached to a continuous loop tape extolling the virtues of the property (accompanied by a sign pointing out its existence and the frequency it is operating on), is like putting a salesperson on the job twenty-four hours a day. And the half loaf salesperson never complains, doesn't sleep, and needs no pay!

All a potential buyer would have to do is pull his or her car off to the side of the road, turn on the car radio, tune in the specified frequency, and listen. Realtors are also using half watters to give directions through housing developments.

Half Watt Religion

Churches, too, are making use of this kind of transmitter. With the advent of the half loafer, drive-in churches have become a reality. No longer do you have to go through the strain of dressing up on Sunday morning, getting out of the car and walking through the doors of the church. Now, communion with the Creator can be as comfortable as an hour in your '72 Chrysler Imperial, egg McMuffin and chocolate shake perched in lap.

This same kind of facility is also being used to help train future broadcasters. Schools such as Florida's Columbia School of Broadcasting use .5 mile AMs instead of, or in addition to, a regular in-house "intercom" system. It gives students more of an "on air" feel and faculty members can tune in the "air" product whenever they wish.

Pretend Radio

People who make a hobby out of playing pretend radio announcer sometimes use half loafers for their own amusement and that of a few imagined nearby listeners. One hundred milliwatt stations sometimes appeal to "pirate" broadcasters, too. Popularity of half loafers in this area is limited, however, because of the the tiny coverage area possible and, perhaps, because strictly speaking, using .5 mile AM makes them legal.

DXers interested in tuning in these stations face a unique set of handicaps. To our knowledge, there is no publication listing the locations of these stations. And, frankly, the most successful monitoring of half loafers is done while traveling. It's something

you have to listen and watch for -- look for signs and likely spots like colleges and so forth. And it requires constant checking of the AM dial while you are traveling. With a coverage are measured in thousands of feet, you are quickly into and out of the range of the signal.

I Heard Your Real Estate Sign...

QSLing .5 mile AMers is not an easy trick either. The people who operate these stations -- real estate agents, for example -- will no doubt spend some time scratching their heads when your reception report lands on their desk. Be sure to explain the nature of your hobby in some detail (but don't use a lot of hobby jargon like UTC that might confuse them), be pleasant, and include return postage. It might even be helpful to make up a QSL card for them, so that all they have to do is fill it out and pop it in the mail.

One final note: don't confuse half loafers with Traveler's Information Stations or Highway Advisory Radio. Both use a whole lot more power -- all of ten watts -- and TIS's and HAR's can be heard for two or three miles. Leave the sissy stuff for the beginners!

Tuning in the half loafers is a different kind of DXing that's lots of fun. It adds interest to a simple road trip, makes you sharpen your visual and audio skills, and might even lead to some of the most unusual QSLs to populate a communication enthusiast's album!

■

Support your MT advertisers - They subsidize your subscription!

Rebel

Listening to the shortwave radio bands can be as tame as tuning in a "Letterbox" program on WYFR. It can be as puzzling as one of those Spanish language numbers stations. It can be as exciting as an S-O-S call from a ship in the Persian Gulf. And it can occupy just about any interest level in between those examples. If a shortwave monitor is avid enough, patient enough and lucky enough, he or she can hear just about anything going on in the world today. Sometimes those things can be quite extraordinary.

Back in July 1984, *Monitoring Times* carried a story about a ham radio operator who had tuned in on a rather lengthy gab session between a station in Cuba and another in Nicaragua. Both were using 14280 kHz -- a frequency smack in the middle of the twenty meter ham band! The communication covered the ammunition needed by the Nicaraguans, types of weapons and troop replacements. Later on, a third station, based in the Miami area, joined the other two stations. The ham, who was listening to all this, notified an FCC monitoring station where, it turned out, the FCC men were aready glued to the frequency.

In this instance, the communications apparently involved agents of the Cuban and Nicaraguan governments. It is a perfect example of the kind of riveting listening you can turn up on the high frequencies - whether by the purest chance or with the help of knowing something about when and where to look, coupled with decent equipment, good reception conditions and a sufficient number of attempts. There are, after all, several thousand frequencies and this kind of action can take place around the clock -- even as you are reading this.

ON THE LOOKOUT--A U.S. crew member looks out of the side door of a CH-47 Chinook troop transporting helicopter while flying over Honduras in a Jan 1986 exercise. U.S. helicopter crews have been used to ferry Honduran troops to the Honduran-Nicaraguan border to repel alleged Sandinista incursions into Honduras. (USAF photo)

Radio !

by Dr. John Simpson

We can improve your odds, at least fractionally, by giving you some idea -- however general it might be - of where and when to listen for this kind of very offbeat transmission.

To Get You Started...

The most recent case of non-broadcast rebel radio activity occurred late last summer and, at this writing, is still going strong. The case in question is a numbers transmission being made by representatives of the URNG - Unidad Revolucionaria Nacional Guatemalteca - that combines Guatemalan revolutionary and resistance effort.

This transmission can be tuned in from its sign on at 0100 or a minute or two later on a frequency of 9966. The announcer opens with a preliminary number group and 1 to 10 counts in Spanish. This is followed by Spanish numbers in five digit groups, with every five or six sets interspersed with the number of the next line of text. The last two or three minutes of this 20 or 30 minute transmission are sometimes given over to political talks and occasionally there are mentions of the names of military districts and\or rebel company numbers. The transmission, even more rarely, will end with an identification for "La Voz de URNG".

It is reported that this transmitter is also occasionally used for two-way communications between rebel camps. Signals normally are fairly good and listeners in most North American locations should not have a great deal of trouble tuning in these single sideband transmissions. This station, so far, appears to be about three-fourths utility and one quarter broadcaster!

Listeners who carefully and consistently monitor the area between 6.500 and 7.000 may, on occasion, tune in two-way Spanish language transmissions by other Central American guerrillas, in particular those of the Farabundo Marti National Liberation Front in and around El Salvador.

Normally such communications are made on VHF but they occasionally also show on shortwave when more extended coverage is needed. Such transmissions have appeared in this range in the past, in between the clandestine broadcasters Radio Venceremos, Radio Farabundo Marti and the various music jammers and unidentified voices which chase each other around the ether at night.

Staking Out the 20 Meter Band

Our first example isn't the only instance of rebel activity in or near the twenty meter ham band. Others have operated within the band and up to several hundred kilohertz above. Tom Kneitel in his book *Embassy and Espionage Communications* (available for $10.95 plus 1.95 UPS from Imprime) notes that the Black September terrorist group has made use of 14290. They aren't the only ones.

The Palestine Liberation organization (PLO) is reported to operate a regular network of stations on 14395 lower sideband between 1915 and 2015 UTC. It is difficult to visualize what sort of communications such a net might be used for. The net's existence is no secret so it's doubtful that any really secret information is passed back and forth. Still, it's worth a try to hear this.

There is also rebel shortwave radio activity reported in Surinam. According to an August 1987 report, the Bushnegroe rebels led by Ronnie Brunswijk, a former sergeant in the Surinamese army, are conducting business on shortwave. An American mercenary named "Dr. John" has set up a communications post at a jungle camp inside Surinam.

The radio station is used daily to communicate with rebel supporters in other parts of Latin America and its call is reported to be "Romeo Foxtrot Sierra." The usual operator calls himself "Pancho." Romeo Foxtrot Sierra normally uses 14.700 but sometimes uses 7.400 instead. The transmissions are scheduled at 1200 and 0000 UTC. If the station is in operation, it would seem likely that said transmissions could be heard, particularly by shortwave listeners in the southern US. Presumably the communications are in the sideband mode.

Far-Out Freedom Fighters

On a somewhat more distant front, the Karen people of far west Burma have been involved in a struggle for an independent Karen State (called Kawthulay). They have had a clandestine radio station of their own (currently off the air) and have probably had two-way shortwave tactical communications, though there are no reports of anyone ever having monitored such transmissions.

Rebel radio springs up in reaction to political unrest; For example, places where road repair is performed by the U.S. National Guard (shown here in Honduras), are prime locations for dissident voices!

The Karen are a bit unusual from the standpoint that they have a ham radio station operating from Karen-held territory within Burma. The ham station - call letters 1Z9A - quite openly makes contacts with other hams and has been heard in the US, using for instance, 14226 in the 20 meter band. The station issues a QSL card and has even been pictured in the occasional magazine, *including Soldier of Fortune.*

It's fairly safe to make the guess that there are additional such non-broadcast activities by rebel or terrorist groups taking place on the various shortwave bands. In fact, it may be that among the numerous unidentified utility stations reported to *Monitoring Times*, there lurk transmissions of this kind. Determined shortwave monitors, if they look and listen hard enough and keep their thinking caps on at the same time, might be able to tune in on other rebel activities.

Even if the language or code in use can't be understood that doesn't change the excitement of knowing that the voices in our headphones are living slices of the secret, often violent world of rebel radio. And knowing that makes the hunt worthwhile. Good luck! ■

Grove's Indoor SWL Antenna

Our "Hidden Antenna System" is your key to exciting short wave reception without an outside antenna!

Here's the apartment dweller's dream—a high performance, amplified indoor antenna system.

This 66-inch, thin profile, flexible wire antenna can be tucked in a corner, hung behind a drape—just about anywhere out of sight. And when connected to the powerful PRE-3 signal booster, you have instant total spectrum coverage from 100 kHz to over 1000 MHz!

Yes, global short wave reception will be at your fingertips, and you can operate two radios at one time!

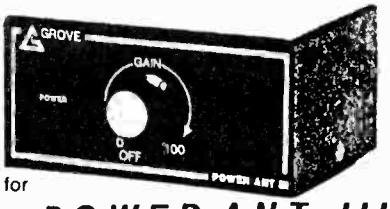
Full instructions included.

The Grove PRE-3 Power Ant has taken all the best from its successful predecessors and combined them into one powerful signal booster.

Equipped with a high gain, low noise, solid state amplifier stage, the PRE-3's front panel control allows custom selection of up to 30 dB of amplification!

What you need to order:

ANT-6 Hidden Antenna	**$8.95** (free shipping)
PRE-3 Power Ant III	**$39** (plus $1.50 UPS, $3 U.S. Parcel Post, $4 Canada)
ACC-20 AC adaptor	**$9.95** (free shipping with PRE-3)
ACC-60 receiver cable	**$7.50** (you specify connector or receiver model; one for each receiver)



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The addition of the Grove Minituner to the ANT 6/PRE-3 combo will allow signal peaking to perfection as well as eliminate intermodulation and image interference on your general coverage receiver.

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TUN-3 Minituner	**$49** (plus $1.50 UPS, $3 U.S. Parcel Post, $4 Canada)
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ADP-2 F/PL-259 adaptor	**$5.00** (free shipping)

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15 DAY RETURN POLICY FULL REFUND

All equipment manufactured by Grove is warranted against manufacturing defects for a period of one year under normal use by the purchaser, providing that no modifications or field repairs have been attempted.

Late-Breaking News:

Jeff White checks in with some sad news. Because of continuing problems with the government of the Dominican Republic, ***Radio Discovery has ceased operation.*** It is not expected to return to the air. The once super-popular White has been off the shortwave bands now for a couple of years. Wouldn't it be great if he could get his own show again?

Another passing, though much more of a mixed bag emotionally, is that of ***John Beck from IICJB's DX Party Line Show.*** Beck has been promoted to director of the station's English Service. Beck is one of the nicest people in the SW business and he will be missed. Kiwi Brent Allred will take over DXPL duties.

The long-awaited changes in KYOI, Saipan will begin taking shape this month. The Christian Science Monitor, which purchased the station from financially beleaguered Larry Berger some time ago, has completed installation of a satellite system whereby programs from the flagship station, WCSN, will be transmitted to the Pacific station for broadcast. Some of the Japanese language/soft rock format will remain for the time being.

Goodbye AFRTS!

Big News: Inside sources say that the popular Armed Forces Radio and TV Service (AFRTS) will be leaving the air sometime this year, possibly as soon as the end of this month. Broadcasts will be transferred to satellite, leaving shortwave listeners without their "all-news" and sports station. The loss will be felt most keenly by US-based international travelers and expatriates who relied on AFRTS for the latest news from home.

Officials at the Voice of America (VOA) are certainly not mourning AFRTS. They're jumping for joy. Although it's often denied in government circles, AFRTS was far more popular among foreign listeners than the Voice. Also, AFRTS was relayed via VOA transmitters which means that once AFRTS is gone, more air time will be available for VOA programs. And no one at the Voice is complaining about that, either.

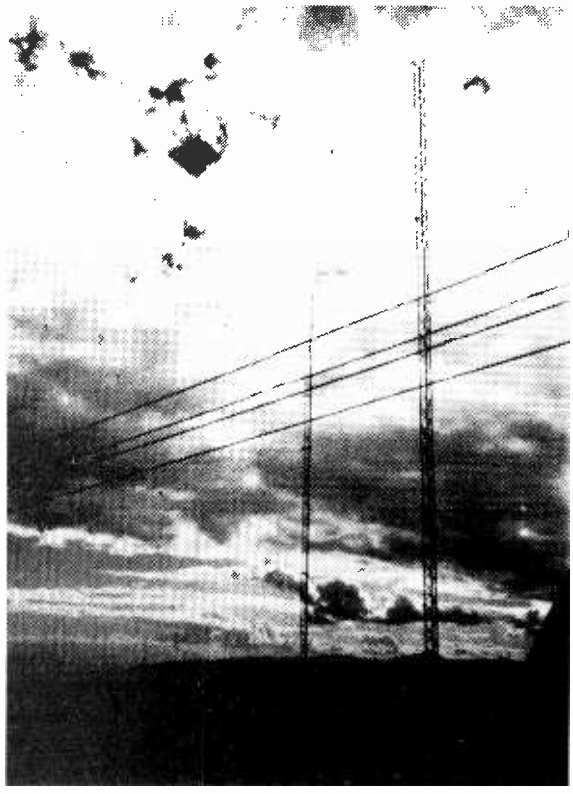
Beijing Blasting!

You may have heard about the powerful new signal Radio Beijing has been putting into the east coast. If not, take a few minutes to tune your radio to 9770 and 11715 kHz from 0000 UTC on through the evening. The first English transmission is at 0000 and all are easily heard. But where are these powerful signals coming from? Certainly not China. And no relay was announced. This was a first class mystery.

It is known that Beijing had been searching for a relay. For a time, things got pretty hot 'n heavy with WRNO in New Orleans. But that fizzled out. So who could it be? Glenn Hauser speculated that the signals were coming from West Africa, perhaps Gabon's Africa Number One. But we disagreed. The characteristics of the transmitter didn't fit, including signal strength and audio quality. So we did what any good shortwave reporter does: picked up the phone and called trans-Atlantic. It took a dozen or so calls to find the source of those grade-A signals: Spain and Mali. Hope that the information was worth the cost. By the way, Bob, wait 'till you see our phone bill this month!

KUSW Is On (We Think)

KUSW, Ralph Carlson's new station from Salt Lake City, Utah should be on the air by the time you get this. We say "should be" because the station had a few problems getting up. Nonetheless, here is the final frequency schedule for them, courtesy of the world's greatest engineering consultant, George Jacobs:



0000-0230 11680 kHz
0230-0600 9755 kHz
0600-1030 6135 kHz 1600-1830 15225 kHz
1830-2200 17715 kHz

Be sure to read *MT*'s profile of KUSW in this issue of the new and improved *Monitoring Times*.

Going for the Gold

Ernie Behr of Ontario, who can seemingly hear any station, anywhere, says he, too, is getting the Burmese Army Station on clear-channel 6570 until about 1330 UTC.

Ed LaCrosse, quoted on Radio Canada International, says Radio Kiribati is once again audible on 14802 kHz at 1925 to 2000 UTC.

The Argentine Antarctic station, Radio Archangel San Gabriel, is "easy" to hear in North America around 2330 UTC. The frequency, which varies, is 15474 kHz.

Who are all of these people calling to say that they're hearing "Radio Chile" in English at 0650 to 0656 UTC on 7205 kHz? One of them is K. D. Kammler, recently back in California after a Navy-sponsored stint in Iceland.

2nd Book for HCJB's MacHarg

Ken MacHarg, host of HCJB's popular *Saludos Amigos* program, has published his second book. It's a non-technical introduction to the hobby titled, appropriately enough, *Introducing International Radio*. It's a super little 33 page booklet complete with a general introduction, advice on selecting a receiver, mini station profiles, an ingenious UTC-local time conversion chart, and even a frequency list.

It's written in the same, friendly, informal style that makes Ken's show so popular and it's perfect for introducing friends and family to this fascinating hobby. The price is a very affordable $3.95. Make your check or money order to: Global Village Press, and send it to P.O. Box 1345, Jeffersonville, Indiana 47131. Just for fun, when you write to Ken, tell him you heard about his book on Radio Pyongyang, North Korea.

New Antennas from Eavesdropper

Antenna Supermarket, the people who have been hand-making the durable Eavesdropper trap dipole, have introduced a new version of the popular antenna. The original Eavesdropper (now called Eavesdropper-F) came with low-loss twin lead feedline for connecting the antenna to your receiver. In most applications, that's still the best deal. However, if you have to bring the feedline into your house over metal siding or other metal obstructions, you'll probably want to order the new Eavesdropper-C, which features coaxial cable. Both versions are the same price.

Sloper-style antennas have been getting more popular in recent months and if you've been thinking about getting one of these antennas for its pulling power in the Tropical Bands, you might want to consider the new Eavesdropper *Sloper*. It's also hand made but unlike the competing Alpha Delta version, it's $20.00 cheaper. The Alpha Delta Sloper retails for $69.95 while the Antenna Supermarket version goes for $49.95. Both are available from a number of *Monitoring Times* advertisers.

Worth the Effort

We've had no luck at this one, but you may want to keep trying for Radio Caroline, the British off-shore pirate station. It is once again, according to Radio Netherlands, testing on 5955 kHz immediately before that station's sign-on at 1130 UTC on the same frequency.

By the way, we owe a belated congratulations to RN program host Jonathan Marks. He recently became a daddy for the first time. Marks, we are certain, will be doing a lot more late night DXing...

There's a new Peruvian station on the air. Look for Radio Quinto on 5700 kHz past 0400 UTC. That from Don Moore on Radio Canada.

Arthur Cushen reports in the ASWLC bulletin that the BBC is testing a new relay to Fiji from 1745 to 2000 UTC on 9740 kHz.

Speaking of BBC relays, the 100 kw Lesotho transmitter has moved to 3255 kHz from 0400 to 0545 and 1515 to 2030 UTC. 6195 kHz remains in use from 0545 to 0815 and again from 0900 to 1515 UTC. On weekends, look for an additional broadcast on 6190 kHz from 0815 to 0900 UTC. (RNMN)

Radio Afghanistan has been noted in Europe on 4760 kHz at 1930 UTC. The transmission is presumed to come from a transmitter in the Soviet Union.

Listeners on the west coast of North America might strain their ears looking for a relay of Swiss Radio International on 6825 kHz at 1315 UTC. It could be coming out of Kunming, China, says RCI.

Finally, we're happy to point out two interesting items about the frequency list in *Monitoring Times*. First, we've added a monitor on the west coast and that should provide helpful to readers there. Second, you'll be happy to know that we'll be returning to the expanded frequency section, beginning, we expect, next month.

In the meantime, take a second to flip the page and look at what everyone has been hearing over the past thirty days. Perhaps we'll see your name in the logbook next month. And with that, we present to you, the vivacious Gayle Van Horn...

-- Kannon Shanmugan

BROADCAST LOGGINGS

0000 UTC on 9580
Norway: Radio Norway. Travelogue feature and news. Rod Pearson - St. Augustine, FL)

0006 UTC on 9735
Paraguay: Radio Nacional. Spanish. Ballads hosted by two men with loads of talk and laughter. Nacional promos.

0007 UTC on 15474
Antarctica: (tentative) LRA36-R. National. Spanish. Male announcer with talk, then "fanfare" introduces music. Quick fade out amid QRM. (Rod Pearson - St. Augustine, FL)

0015 UTC on 11880
Spain: Spanish Foreign Radio. Report on Columbus Day, Spain's national holiday. (Bob Fraser - Cohasset, MA) Thanks for the logs, Bob! - ed.

0020 UTC on 6025
Dominican Republic: R. Amanecer. Spanish. Hymn on piano and lady with religious text.

0045 UTC on 15155
Ecuador: HCJB. "Stories of Great Christians" program. Parallel on 9875 and 11775; both poor. (Bob Fraser - Cohasset, MA)

0045 UTC on 4790
Peru: (tentative) R. Atlantida. Spanish. Speech by man. Weak signal. (Bob Fraser - Cohasset, MA)

0050 UTC on 4945
Colombia: Caracol Neiva. Spanish. "Caracol" network ID and male with newscast. Local time check for Neiva.

0055 UTC on 4920
Ecuador: R. Quito. Spanish. Spanish "easy listening" and US rock. "La voz de capital" ID and into interview.

0100 UTC on 9575
Italy: RAI. News about Italy in the Persian Gulf. (Bob Fraser - Cohasset, MA)

0125 UTC on 5055
Ecuador: R. Catolica. Spanish. Religious format including music and sermon. Station ID with QTH.

0200 UTC on 3250
Honduras: R. Luz y Vida. Spanish. Canned station ID as "esta es Radio Luz y Vida" with QTH and frequency. Then into religious music.

0208 UTC on 3475
Clandestine: R. Venceremos. Spanish. Lengthy speech from male. Signal abruptly off for five minutes then reappeared on 3467 as speech continues/ This station is notorious for moving around!

0210 UTC on 5040
Venezuela: Radio Maturin. Spanish. Local choral and "campesino" music. Quick ID with time check, talk and more vocal music.

0215 UTC on 3381
Ecuador: R. Iris. Spanish. Local chat and announcements about the city of Esmeraldas. Local greetings and music.

0220 UTC on 3380
Guatemala: R. Chortis. Spanish. Very nice marimba music with vocals. Male and female chat.

0220 UTC on 9690
Argentina: RAE. Spanish. Station ID with schedule. Travelogue feature on Argentina and folk music. Rod Peason - St. Augustine, FL)

0225 UTC on 4495.1
Peru: (tentative) R. Contumaza. Spanish. Male announcer presents Peruvian huaynos. No ID heard amid QRM.

0235 UTC on 4775
Peru: R. Tarma. Spanish. Announcements and talk from male announcer. Station ID with local time check. Another Peruvian almost buried in the noise!

0250 UTC on 4810.2
Peru: (tentative) R. San Martin. Spanish. Snappy Latin vocals and talk. Thought I heard a "la voz de..." in which case it was Galapagos Islands but was so weak I can't claim it or Peru. (Rod Pearson - St. Augustine, FL)

0310 UTC on 9475
Egypt: Radio Cairo. Usual horrendous audio quality but discernable Egyptian music. Story on Egyptian history. (Joe Walker, Plano, TX)

0345 UTC on 6015
Zanzibar: (tentative) R.T.Z. Swahili? Several Arabic style pieces of music with male in unknown language. Covered at 0400 with Deutsche Welle sign on in Arabic.

0345 UTC on 4910
Zambia: ZBS Vernacular. Fish Eagle interval signal and into national anthem. Sign-on announcement at 0350. Very weak with RTTY interference.

0400 UTC on 4863
Mozambique: Radio Mozambique. Portuguese. Station ID at the top of the hour and into international news.

0405 UTC on 4975
Peru: Radio Del Pacifico. Spanish. Canned station ID and into religious program. (Rod Pearson - St. Augustine, FL)

0420 UTC on 4952.7
Angola: Radio Nacional. Portuguese. Lady and man trade news items. Afro music followed by more chat.

0515 UTC on 4985
Brasil: R. Central. Portuguese. Several Central promotions. Musical variety covering pops, easy listening, and soul selections.

0525 UTC on 5047
Togo: R. Togo. French. Chime melody interval signal with 0529 national anthem. "Ici Lome" sign on with ID and children's chorus.

0525 UTC on 4830
Gabon: Africa #1. French. French African pop/rock with international newscast at 0530.

0535 UTC on 5020
Niger: LV de Sahel. Male with Qu'ran recitations and into native African rhythms of flutes and drums.

0540 UTC on 6153
Angola: ER de Benguela. Portuguese. Very weak signal with much talk on Angola.

0640 UTC on 7105
Monaco: TWR. Religious program with sermons, prayers and into ID.

0750 UTC on 5955
Peru: R. Huancayo. Spanish/ "Radio Huancayo" ID into Peruvian flute music.

0815 UTC on 6090
Brasil: R. Bandeirantes. Portuguese. Local Sao Paulo ads with time checks and Brasilian pops.

0815 UTC on 9705
Brasil: Radio Nacional. Portuguese. ID from male with station jingles and "fanfare" to introduce features and easy listening style music.

0825 UTC on 3958
Falkland Islands: FIBS. Easy listening instrumentals and local time check.

0835 UTC on 4885
Brasil: R. Club do Para. Portuguese. Usual lively morning DJ with Brasilian pops, jingles and singing ads.

0903 UTC on 4850
Venezuela: Radio Capital. Spanish. "Radio Capital" ID with canned

station promotions (including location, address and schedule) and into US pop/rock music.

0908 UTC on 4875

Brasil: R. Nacional Boa Vista. Brasilian ballads with canned Nacional promotions.

0918 UTC on 4850

Venezuela: R. Valera. Spanish. Venezuelan folk music on harps. Valera ID with location.

0920 UTC on 6000

Brasil: R. Gualba. Portuguese. Brasilian instrumentals into "Radio Gualba" ID at 0925. Phone chat with announcer.

0930 UTC on 4780

Venezuela: LV de Carabobo. Spanish. Numerous Latin rhythms with loud station promotional announcement.

0940 UTC on 4975

Bolivia: R. Illimani. Spanish. Male and lady announcer with morning show.

1025 UTC on 4995

Peru: R. Andina. Spanish. Nice Peruvian huaynos. A few breaks for IDs and talk.

1030 UTC on 4865

Bolivia: R. 16 de Marzo. Spanish. "Morning Show" program format with local talk about Bolivia. Into Bolivian guitar ballads.

1030 UTC on 5030

Peru: R. Los Andes. Spanish. Great selection of Peruvian huaynos. Quick IDs; back into music.

1045 UTC on 4950

Peru: R. Madre de Dios. Spanish. "Easy listening" music followed by a full station ID that included location, schedules and call letters.

1102 UTC on 5025

Peru: R. Quillabamba. Spanish. Lady sings mournful ballad. Break for talk and ID with more ballads.

1110 UTC on 5770

China: VO Strait-PLA Fuzhou. Chinese. Lively conversation with two males. Actually sounded like a radio drama. Quite weak but audible.

1113 UTC on 6095

China: CPBS-2 Nanchang. Chinese. Chinese/Asian music with female announcer.

1120 UTC on 15365

France: Radio France International. Int'l newscast and "Focus on France" program (Rod Pearson - St. Augustine, FL)

1125 UTC on 3325

Guatemala: R. Maya de Barillas. Spanish. Religious choral music. Lady with brief talk, time check and ID. Organ music introduces sermon.

1140 UTC on 3905

Papua New Guinea: R. New Ireland. Pidgin. Lady with local and national news. Several pop songs. More discussion about local events until 1215.

1140 UTC on 6120

Canada: Radio Japan. "Panorama" report on hand-made pottery. (Bob Fraser - Cohasset, MA)

1146 UTC on 6130

Laos: (tentative) Lao National Radio, Vientiane. Lao. Children singing, instrumentals, and bells at 1200. (Sheryl Pasziewicz - Manitowac, WI) Thanks for your logs, Sheryl!

1150 UTC on 3215

Indonesia: RRI Menado. Indonesian. Female announcer with talk. Pops music and instrumentals. Weak signal. Newscast at 1200.

1200 UTC on 15320

Austria: R. Austria Int'l. "Coffeetable" program including pop/rock music. Great signal. (Bob Fraser - Cohasset, MA)

1205 UTC on 5965

Malaysia (tentative) RTM Malaysia. Malay? Male and female announcers here for several days now with what sounds like a newscast. No WRM but very weak. (Rod Pearson - St. Augustine, FL)

1245 UTC on 9580

Australia: R. Australia. "Monitor" report of high technology used in French Polynesia. (Bob Fraser - Cohasset, MA)

1257 UTC on 15165

Denmark: R. Denmark. Sign on routine with station ID and schedule. Newscast at 1300.

1305 UTC on 9610

Australia: ABC Waneroo. Male with feature on New South Wales. Station ID and into "easy listening" music.

1335 UTC on 15590

Belgium: BRT. "Brussels Calling" program and cultural report.

1705 UTC on 6195

Bangladesh: R. Bangladesh. International news to 1710 with sign on five minutes later. Also heard English news at 1530 on parallel 4878 (Bruce MacGibbon - Gresham, OR)

1950 UTC on 9645

Vatican City: Vatican Radio/ Religious news items from Vatican City and USA. (Joe Walker - Plano, TX)

2045 UTC on 17775

USA: KVOH. "Globecast" - religious answers to day-to-day problems. (Bob Fraser - Cohasset, MA)

2145 UTC on 9700

Bulgaria: R. Sofia. Report on new methods of food growing. Heard parallel on 7115 (Bob Fraser - Cohasset, MA)

2220 UTC on 4760

Liberia: ELWA. Religious programming until 2330 sign off. Very weak signal.

2300 UTC on 9560

Turkey: Voice of Turkey. Press Review on the early election law controversy. (Bob Fraser - Cohasset, MA)

2325 UTC on 11705

Sweden: R. Sweden Int'l, Program "Sweden Calling Dxers."

2326 UTC on 4975

Colombia: Ondas del Orteguaza. Spanish. Station IDs with local time check, ballads and echo effects. (Sheryl Pasziewicz - Manitowoc, WI)

2330 UTC on 5047

Togo: R. Togo. French. French pop and easy listening music. Chime interval signal. ID and closing announcements. National anthem and sign off at 0000 UTC. (Rod Pearson - St. Augustine, FL)

2345 UTC on 4835

Mali: RTV du Mali. French. French African pops and native African music. Sign-off with ID an national anthem at 0000 UTC.

You don't have to be one of the world's top ten DXers to be in the Monitoring Times logbook. Whether you're a regular BBC listener or a person who can't enjoy a station unless it's half buried in static, your loggings belong here! Let other readers know what you've been enjoying. Send your loggings to Gayle Van Horn at 160 Lester Drive, Orange Park, FL 32073.

■

Federal authorities jammed Cuban walkie-talkies during the hostage crisis admitted Justice Department spokesman Patrick Korten. Inmates appropriated the hand-held radios from prison guards during the takeover and used the system for private communications.

To prevent continued unauthorized use of the radio system, technicians transmitted jamming tones on the frequency, effectively drowning out the low powered radios. *(Clipping from Robert Eisner, Germantown, MD)*

Signs of the Times: Uniden and Regency are going into trunking. It may be just a coincidence, but Regency and Uniden, leading scanner manufacturers, have both announced that they are combining efforts with other companies to market trunking radio systems. These announcements follow their intent to discontinue cellular coverage on their scanners (see editorial, December, 1987 issue).

Regency has formed Budgetel Mobile Systems after having acquired PMTS Systems, Inc., and will home base in Indianapolis, Indiana. Uniden is joining forces with AmeriCom Corp. and has just acquired a large parcel of land in Dallas, Texas, where they intend to build a 240,000 square foot facility.

In spite of appearances, a management spokesman maintained that manufacturing will remain in Indianapolis and only administration will be moving.

The Association of North American Radio Clubs (ANARC) is undergoing some changes. Following a near collapse in its activities and suspension of its newsletter, Robert Horvitz has agreed to assume the duties of Executive Secretary, finishing out the unexpired term of Don Hosmer.

MT readers will remember Horvitz's leadership during the Congressional ECPA hearings when he represented ANARC and recreational monitors. MT congratulates Mr. Horvitz on his selection and looks forward to the revitalization of ANARC and the newsletter.

Are you interested in computer bulletin boards? ***The National SWL Echo Conference is now on line.*** You can exchange shortwave and scanner frequencies and information anywhere in the country with no access charges (other than the long distance call).

If your home computer is equipped with a 1200 baud modem, you may call: East Coast (202-833-1889); Midwest (414-738-1219); or West Coast (408-251-4926; 415-659-6169). *Thanks, Kurt Barnhart of Milpitas, California, for this item.*

"We the People" Award Correction: Last month we incorrectly stated that the ending date for the "We The People" award certificate was December 31, 1987; in fact, that should have been *1988*! The extra year to work or monitor hams across the nation should come as welcome news to certificate hunters.

Additional information including an application form are available from the American Radio Relay League (ARRL), We The People Award, 225 Main Street, Newington, CT 06111. Be sure to enclose a self-addressed, stamped envelope. *(Thanks, Rick Zolla, N6NKN)*

While progress may be beneficial, ***the Germantown, Maryland, police department is suffering from growing pains.*** Bordering Washington, DC, and serving a population of some 750,000 persons over 535 square miles, 1000 police officers are linked by a microwave system to interconnect their 450 MHz band repeater system which unites 5 district officer and headquarters.

According to Captain Robert Hill, it is the microwave system which has broken down the communications reliability. Recent newspaper reports relate the woes, described as "static and whistling noises." Often, the foot patrolman will not know whether his call has been received and base stations may not hear emergency backup calls from patrolmen.

As of this writing, no serious consequences have resulted from the interrupted communications, but public safety officers fear that it is merely a matter of time before someone's life is on the line and communications will be ineffectual.

In an unrelated article, the Washington/Baltimore area cellular telephone industry is booming. While mobile telephones have been around for nearly half a century now, cellular convenience has captured the public's imagination--and pocketbook.

Utilizing small antennas, small radios and even small handsets, reliable range has improved dramatically. Add to this the fact that costs have dropped from $3000 to around $1000 in just three or four years and you will see why two of the largest local firms boast an increase of from 24,000 to 60,000 subscribers in one year.

One particularly dominant cellular common carrier is Cellular One, taken over by Southwestern Bell very recently. While Cellular One would not reveal their revenue, their closest rival, Bell Atlantic Mobile Systems (BAMS), claims a growth of 60% last year with a projected income of $90 million. *(Above two clippings forwarded to MT by Robert Eisner, Germantown, MD)*

In a recent report released by investigators, it appears that ***routine microwave tower transmissions have knocked down five Army UH-60 Black Hawk helicopters at a loss of 22 servicemen.*** The problem is compounded by the fact that Soviets can deploy a microwave weapon to exploit this vulnerability.

The problem was pinpointed when Black Hawk pilots reported loss of control as they flew near microwave radio towers. In the fatal accidents, the choppers suddenly lurched out of control and nosed down to the ground.

Last year, the Army grounded all UH-60s after one crashed in Alabama after nearing the antenna of a high-powered CB transmitter, killing all three servicemen aboard the aircraft.

While the Army is officially denying the aircraft's vulnerability, the U.S. Navy prohibits their pilots from flying their version of the Black Hawk anywhere within several miles of a radio tower (the actual distance is classified).

This is one of the more severe instances in which electromagnetic interference (EMI) has proved to be a hazard to unrelated operations. EMI from computers and microprocessor controlled electronic circuits is responsible for much radio interference encountered by shortwave receivers, scanners and TV sets.

In the case of the 838 Black Hawk helicopters--$6 billion worth--the future is uncertain. *(Article sent in by George Primavera, Cherry Hill, NJ)*

In a more amusing side of EMI, apparently ***President Reagan's hotline raises garage doors all over Northern Frederick, Maryland!*** It seems that Ft. Detrick, Maryland, home of the U.S. Army's east coast communications complex, loaned their facilities to another agency. When the transmitters went on, the radio-controlled garage doors went up!

After some twenty area residents complained after the peculiar incident, officials shut down the transmitters which are also used to communicate with diplomatic and military installations around the globe. *(Item from Robert Eisner, Germantown, MD)*

Looking for FCC frequency files? Although Grove Enterprises has discontinued carrying FCC microfiche and microfiche readers, the fiche sets will continue to be available (at greater cost) from the National Technical Information Service (NTIS), U.S. Department of Commerce, Springfield, VA 22161 (phone 703-487-4650).

Current prices for sets include: Callsign Index #PB87-902501/HBN, 76 sheets, $38; State Index #PB87-902401/HBN, 78 sheets, $39; Licensee Names #PB87-902302/HBN, 114 sheets, $38; and Master Frequency Database #PB87-919301/HBN, 1126 sheets, $563.

Did you ever wonder what a shipment of 5000 books looked like? The accompanying photo loudly proclaims, ***"The new edition of Communications Satellites has arrived!"*** Although we expected a large delivery, when an oversized 18-wheeler arrived at the Grove Enterprises office building, we recoiled in horror at the task awaiting us.

The trailer was unable to get to our building, so a pickup shuttle was necessary. Even after the unloading and unloading (accomplished single-handedly by Bob Grove!) the enormous delivery still had to be carried upstairs (accomplished reluctantly by Bob's son Bill and friend!). ■

Canadian Government Agencies

The communication loggings section is your chance to appear in print; loggings mostly likely to be chosen for publication are those which are particularly comprehensive, or from a geographical region not covered in previous issues, and which are logically and legibly presented.

This month, however, we diverge by presenting an excerpt from the fourth edition of Bob Grove's Shortwave Directory, which will be available in February. Should you be out and about in Canada in this frosty season, here is a profile of Canadian government frequencies.

Royal Canadian Mounted Police

(Mostly RTTY, some SSB; gradually being phased out)

kHz	Province
2788	Alberta NWT
4765	NWT
4776.5	NWT Alberta Nfld
4785	Yukon NWT BC Alta Man Ont PQ NS WashDC
4798.5	BC Manitoba
4812.5	Sask
5445	Alta Sask Man Ont PQ
6792	Paris
7780	Yukon NWT BC Alt Sask Man Ont PQ NB NS Nfld Paris
9105	NWT Alta Ont NB NS Nfld Paris
9200	Paris
10390	Paris
14620	Yukon,NWT,Alta, Man,Ont,PQ,NB,NS,Nfld
14817.5	Paris
19130	"
19360	"
21785	"
21807.5	"
24110	"

Ministry of Natural Resources

SSB

4460	Northwest Region
4520	
4535	Northcentral Region
4580	
4880	Other Regions
5170	
5240	
5540	Air to Ground
9172	Air to Ground, Long Range

Quebec Dept of Natural Resources

3368.5 4982

Dept of Fisheries

2752 4462 4510

Canada Energy, Mines & Resources

SSB

4441	NWT
4474	Yukon NWT BC Alta Sask Man Ont PQ Nfld
4982	Yukon BC Ont PQ NB NS Nfld
5341.5	NWT PQ
7347.5	NWT BC Alta Sask Man Ont PQ Nfld

Environment Canada

SSB

2221.5	Atmospheric, PQ
2727.5	Atmospheric, PQ NWT
2319.4	Pacific Coast
2508	NWT,PQ
2598.5	Pacific coast
2617.5	Yukon,NWT,Pacific coast
2846.5	Pacific coast
3191.5	Atlantic Coast
4554	Yukon,BC,Nfld
4861.5	Atmospheric, PQ
4982	NS
5124	Pacific coast
5811.5	Atmospheric, PQ NWT
9813	Atlantic Coast
12126.5	NWT,Pacific coast
27655	Nationwide

Quebec Hydro

SSB	RTTY
4625.5	4496.5
4883.5	4625.5
5346.5	5013.5
5347.5	6771.5
6771.5	
7306.5	

Department of Communications (DOC)

SSB	RTTY	
Ontario & NS	(Hermes Electronics)	
7555.5	Ontario/NS	
8046.5	3174.5	9392.5
9391	3214	11623
13714	3253.5	11636
13717.5	3278	13714
19572.5	4081.5	13717.5
20529.5	4084	14645
22834.5	4573.5	14733.5
23068.5	5107.5	19572.5
25149	5181	20529.5
	5276.5	22834.5
	7555.5	23068.5
	7558.5	25147.5
	8046.5	25150.5
	9389.5	

Yukon Radiotelephone

(NorthwesTel Inc.)

	USB			
Ch.	Base	Mobile	Call	Location
1	5222.5	5009	CFY79	Ft. Nelson
3	5396	5856	CHB615	Hay River
4	5215	4950	CFY82	Whitehorse

Alma Radio CGD206 (Quebec)

Bush radiotelephone

Ch.	Freq.
1	3166
2	7465
3	5390 (pri)
4	5430 (sec)

Ministry of Transport

Point to Point

SSB

1792	ONT PQ NB NS NFLD
4885	YUKON NWT BC ALTA SASK

RTTY

2221.5	PQ
2292	Man PQ
2727.5	PQ,NWT
3273	NWT
4861.5	PQ
4886.5	YUKON,BC

4927.5	PQ,NFLD
5380	NWT,NFLD
5795	NWT
5811.5	PQ,NWT
5885	NWT,LABRADOR
7484	NFLD,REYKJAVIK
7630	PQ,NFLD
7675	NWT,LABRADOR
7742	NWT
7825	NFLD,PQ
8135	NFLD,SHANNON IRELAND
8151.5	NWT
9265	NWT,LABRADOR
10290	NWT
11055	NFLD,REYKJAVIK
11077.5	NFLD,SHANNON IRELAND
11470	PQ,NFLD
11505	LABRADOR,NFLD
11695	NWT,LABRADOR
13595	NFLD,PQ
13700	PQ,NFLD
16356	NFLD,SHANNON IRELAND

Marine

SSB

1792	ONT PQ NB NS NFLD
2104.9	NWT BC NB NS PEI NFLD
2201.5	BC

RTTY

4171	BC
4173.5/4353	BC,NS
4174.5/4354	BC,NS
4769	NFLD,REYKJAVIK
4990	PQ,NFLD (Air-Nav)
6259.5/6497.5	BC,NS
6260.5/6498.5	BC,NS
8340.5	BC
8355.5/8716.5	BC,NS
8356/8717	BC,NS
12501	BC
12510.5/13090.5	BC,NS
12511.5/13091.5	BC,NS
16675.5/17212.5	BC,NS
16676/17213	BC,NS
22207.5/22576.5	BC,NS
22221/22590	BC,NS

Ships

2119.4	Atlantic,Gt Lakes
2206/2583.4	East Coast
2207.4/2583.4	East Coast
2237	East Coast
2340/2458	Pacific Coast

2670	Great Lakes, ships to contact US Coast Guard

Aviation

RTTY

2221.5	PQ
4861.5	PQ
5115.5	PQ

Maintenance and Operations

RTTY

2377.5	BC
5115.5	NWT,MAN,ONT,PQ
5352.5	BC
7318	BC
11019.5	BC
16051.5	BC

James R. Hay

141 St. John's Blvd
Point Claire, PQ, Canada H9S 4Z2

Amateur Maritime Nets

Amateur radio operators aren't the sort of people who sit still. They're found all over the world, on trains, planes and boats. When hams do go to sea, many take their rigs with them. Whether it be yuppie hams aboard their yacht Buffy, or tough, grizzled hams doing time on a Greek freighter loaded with yams, they know the value of their radios.

Because of this, a number of maritime "nets" have formed and are being operated for and by these seagoing hams. This month we will have a look at some of them. Remember that all frequencies are in kiloHertz and all times are in UTC.

0100 Gulf Coast Hurricane Net, Gulf Coast USA 3935
0100 Pac-Ind Ocean Net, Pacific and Indian Oceans, daily, 21407
0100/
0200 Maritime Mobile Service Net, Pacific Ocean 14313
0200 Ariz Traffic Net, Ariz/Baja 3992
0200 Cal-Hawaii Net, California, Hawaii, Pacific Ocean 14305
0200/
0100 Hawaii PM Net, Hawaii, Monday-Friday 7290
0220 John's Weather Net, South Pacific/Norfolk Island, Daily, 14315
0300/
0200 Seafarer's Net, Pacific and West Coast 14313
0300 Traveler's Net, Australia and Indian Ocean, 14106
0330 East Coast Maritime Mobile CW Net, East Coast, 14040
0400 Canadian DDD Net, Pacific Ocean, Daily, 14115
0400 Pacific CW Traffic Net, Pacific Ocean, Monday, Wednesday and Fridays, 14075
0500 UK/New Zealand/African Net, Pacific and Indian Ocean, 21200
0500 USA/Australian Traffic Net, Pacific Ocean, 14280
0530 Swedish Maritime Net, Pacific Ocean, 14303
0530 Pacific Maritime Net, Pacific Ocean, 14314
0630 Pitcairn Net, South Pacific Ocean, Mondays, 14180
0630 South African Maritime Net, Atlantic and Indian Oceans, Daily, 14320/105
0700 International Maritime Mobile Net, Atlantic, Mediterranean and Caribbean, 14313
0700 Pacific Island Net, Pacific Ocean, 14265
0700 Guam Area Net, Western Pacific Ocean, 14310
0715 Bay of Islands Net, Australia, New Zealand and South Pacific, Daily, 3820
0800 Australia Traffic Net, Australia and South Pacific, 7280
0800/
0830 Pacific Inter-Island Net, South Pacific, 14315
0800 United Kingdom Maritime Mobile Net, Atlantic, Mediterranean, Caribbean, 14303
0900 Mediterranean Maritime Mobile Net, Mediterranean Sea, Daily, 14313
0900 Canary Island Net, Atlantic Ocean, 708
1000 Pacific Gunkholers Net, South Pacific Ocean, 1433
1000 German Maritime Mobile Net, Caribbean Ocean, Daily, 3815
1030 Barbados Cruising Net, Atlantic Ocean and Caribbean Sea, 14266
1100/
1000 Maritime Weather Net, Atlantic Canada, Monday-Saturday, 3770
1100 Caribbean Maritime Mobile Net, Carribean Sea, Daily, (Listen on 7230), 7082.5
1100 Intercon Net, North, South and Central America, Daily, 14313
1100 Carribus Traffic Net, Eastern/Central Caribbean, Daily, 14283
1130 South African Maritime Mobile Net, South Atlantic and Indian Oceans, Daily, 14320/105
1130 South Atlantic Roundtable, South Atlantic and Indian Oceans, daily, 21325
1200 Maritime Mobile CW Net, Eastern/Central United States, 14040
1200 YL Emergency Net, United States, 14332
1200 South East Asia Net, S.E. Asia, Indonesia, Australia, Daily, 14320
1245/
1145 Waterway Net, U.S. East Coast and Caribbean, Daily, 7268
1300 Trans-Atlantic Maritime Mobile Net, North Atlantic, Mediterranean, Caribbean, 21400
1400 Florida Coast Net, Florida, 7292
1400 Sonrisa Net, Baja, California. Daily, 3963
1500 Alaska Net, Alaska, 7193
1545 Marquesas Net, South Pacific Ocean, 14340
1600/
1500 Baja California Maritime Net, Baja, CA 7238.5
1600/
1700 Coast Guard Maritime Mobile Net, Atlantic and Caribbean USA, Monday-Friday 14313

This list of maritime nets was provided courtesy of Radio School, and is not necessarily complete. Should any readers know of other maritime nets in operation, I would appreciate hearing about them. For example, it is known that both the United States Power Squadrons and the Canadian Power and Sail Squadrons operate a net but details such as time and frequency are not known.

When listening to these nets, keep in mind that the "Q" signals you hear are probably not going to be the same maritime mobile Q signals you're used to. To facilitate message handling during a net, a special set of "Q" signals was developed, this being the set commencing with QN. These signals and their meanings are given below. Signals (or meanings) preceded by a plus sign are used only by the net control station.

+QNA Answer in prearranged order
+QNB Act as relay between XX and XXQNC All net stations.
+QNA Answer in prearranged order
+QNB Act as relay between xx and xx
QNC All net stations. Copy. I have a message for all net stations
+QND Net is directed controlled by control station)
+QNE Entire net stand by
QNF Net is free (not controlled)
QNG Take over as net contrl station
QNI +Net stations report in. I am reporting into the net (give traffic list or QRU)
QNJ Can you copy me? Can you copy xx?
+QNK Transmit messages for xx to xx
QNL Your net frequency is low
+QNM You are interfering with the net. Stand by
QNM Net control station is xx What station is net control?
QNO Station is leaving the net
QNP Unable to copy you. Unable to copy xx
+QNQ Move frequency to xx and wait for xx to finish handling traffic. Then send him traffic for xx
QNR Answer xx and receive traffic
QNS +Following stations are in the net (followed by list) Request list of stations in the net.
QNT Request permission to leave the net for xx minutes
+QNU The net has traffic for you. Stand by
+QNV Establish contact with xx on this frequency. If successful, move to xx and send him traffic for xx
QNW How do I route messages for xx?
QNX You are excused from the net
QNY Shift to another frequency (or kHz) to clear traffic with xx
QNZ Zero beat your signal with mine

These signals were developed by the American Radio Relay League (ARRL) and are for use in amateur CW (code) nets only.

Amateur stations on board a vessel will normally, on voice, suffix their callsign with the words, "maritime mobile." When using code, the call sign is followed by /MM.

In Canada, some hams have gone to the lengths of licensing a station on board their yachts. Ham rigs set up on board commercial or government ships are separately licensed and they are given callsigns commencing with VEO.

The amateur maritime nets can provide considerable interesting monitoring. Sailors on long ocean voyages, for instance, pass messages to friends and loved ones at home. For them it's often the only way to keep in touch with the civilized world.

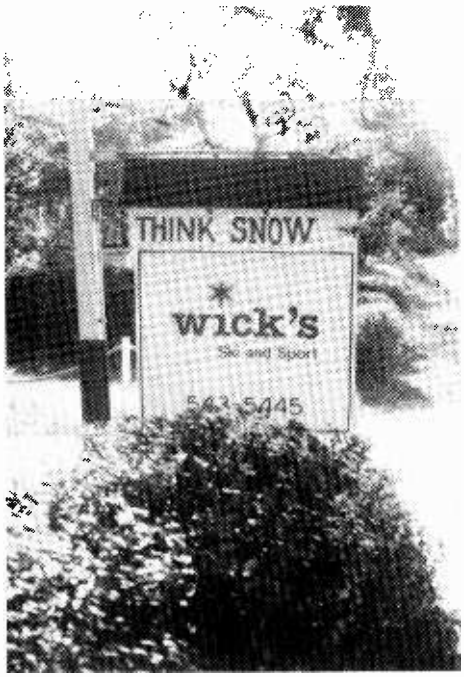
Participation in maritime mobile nets is also a service. When a sailor doesn't check into the net, others will listen for him at other times and attempt to contact him to assure that all is well.

While this isn't to imply that the nets provide a safety service on the level of the various coastal marine stations, some message handling is accomplished. In the end too, it's a pleasant way to pass time on those long ocean voyages! ■

Bob Kay

104 Bonsal Avenue
Glenolden, PA 19036

Scanner Ski Patrol



When skiers just think about snow, their pulse rate quickens.

The cold weather brings to them an uncertain urgency. They feel it in their bones. They are restless; waiting for something. During the day, it draws them away from their work and toward the window. They stare longingly at the gathering grey, not knowing what it is they seek from the barren, lifeless landscape.

It is not until the first snowfall that these tortured creatures are released from their bonds, thus beginning one of the most remarkable migrations known to man. By the thousands they head for the mountains, using every form of transportation available -- cars, planes, horses. And in the process, the species -- known as snow skiers -- transform the rural communities to which they flock into into bustling metropolis' within a matter of hours.

The communications buff quickly recognizes this phenomenon as an opportunity to monitor a variety of radio transmissions. Having equipment at the ready and knowing when the action will take place is simply a matter of listening to the weather forecast. A winter storm warning is a skier's "call to arms."

Tracking the migration and its resulting mayhem will require every piece of communications gear you have available -- not to mention a hearty supply of wits. Even your local AM station is an ally in the search. Here you'll be able to catch the latest "ski reports." Learn the basic language of the slopes and use them to determine the best time to tune in the snow sliders.

Talk of the Trade

"Artificial surface" means man-made snow. "Fresh powder" is newly fallen snow and "packed base" is hard packed snow. Ideally, skiers look for three to five inches of fresh powder on a four to six inch base. An absence of snow, however, doesn't mean that nearby ski areas are closed. Providing the temperature is below 18 degrees, snow-making machines can produce several inches overnight.

The best way to check on snow making activities is to call the resort. Some of them even have a toll-free number with continually updated reports on conditions at their resort.

Making the Pilgrimage

Enthusiasts who do not live within scanner range of a ski area can still catch all of the action by planning a weekend "Snow Ski Scanner Trip." The costs will vary from $70.00 to $100.00 per night. Package deals may be less and meals will be extra. Equipment rentals, should you be so inclined, run between $25.00 and $35.00 per day. Lessons are available. Average cost: $10.00 per hour.

While planning a trip, remember that travel conditions can deteriorate rapidly in a snow storm. A scanner programmed with police and plow frequencies will quickly provide the current road conditions.

Where to Tune

For safety reasons, lift operators at the base of the mountain maintain contact with the operators at the top. An antenna on the control operator's booth is a sure give-away that the lift operation can be monitored. If more than one lift is being used, separate frequencies may be designated for each one.

Ski patrols are staffed by experienced skiers that have been trained in first aid. At least one member of the team will probably be a certified paramedic. Communications with the base station, usually located within the main lodge, are accomplished by using hand-held units.

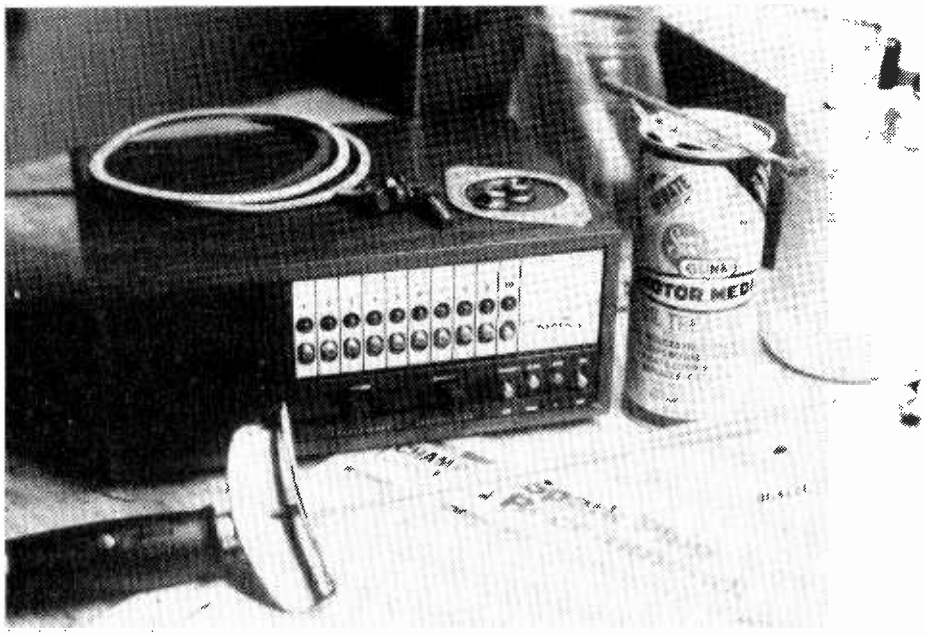
During the peak of the season, hospitals in the vicinity of the ski area will also have increased staff coverage. In Pennsylvania, one such hospital has their own scanner by which they monitor the ski patrol. When they hear the patrol responding to an accident, the emergency room doctor and x-ray technician go on standby.

Broken bones and sprained ankles are considered routine cases. Direct communications between the hospital, ski patrol and medivac units are reserved for more serious injuries. Medivac frequencies can be provided by the ski patrol or by visiting the sponsoring hospital.

Lodge Operations

Ski lodges are nothing more than hotels located on mountains. Experienced scanner owners already know that maintenance and security frequencies can be very interesting. To hear lodge operations, scan frequencies between 154 and 156 MHz and from 461 to 464 MHz. Failure to monitor these frequencies can mean a great deal of missed action!

Lounge lizards use radio, too; Lodge entertainment is another area that lends itself to monitoring. If the entertainers are using wireless microphones, your scanner will bring their entire performance right into the privacy of your room. These microphones are authorized on a number of frequencies, including the 88 to 108 MHz FM band. More professional units operate in the 174 to 216 MHz range. Still others can be found in the 72 to 76 and 455 MHz bands.



Although surrounded by some unusual neighbors, this old, but working Regency scanner was found in a local repair garage.

can be found in the to 76 and 455 MHz bands.

Painting the Town Red

Tuning in the nearby towns will also make for interesting listening. Communications systems will undoubtedly be overworked as police try to maintain some sort of order in a town that, to them, seems to be bursting at the seams.

Really good monitors know the tricks of the trade that allow them to zoom in on the action in a minimum of time. For example, the best way to find local frequencies in town is a trip to the local auto repair garage. Most such businesses utilize a scanner to keep track of police calls and possible tow jobs. Asking a garage owner for a frequency list will usually result in a few minutes of "scanner talk." Don't forget to mention *Monitoring Times*.

While you're at the resort itself, be sure to do some exploring. Find the highest point and use the elevation to check out the neighboring hills and mountains for antenna towers. It you happen to spot one, consider searching on your scanner for other repeater operated services. Be careful, however, not to confuse television or microwave transmitters with a repeater antenna.

And Don't Forget the Feds

A few years ago, a very large drug raid was made near the ski resorts of Pennsylvania. The drug smugglers had been using the remote mountain top location as an air drop for shipments bound for New York. So just for fun, program a random sampling of federal frequencies into your scanner. You may be surprised at what you hear.

If lodge and federal monitoring hasn't taken up your entire day, then try catching some low-band skip. The increased sunspot activity combined with the elevation of the location, will almost certainly guarantee success.

A Word to the Wise

Leaving valuable radio gear in a lodge room is inviting trouble. Room keys are available to a number of employees at the resort. If there is a safe for valuable items, ask for permission to store your radio gear there. Remember, most facilities will not assume responsibility for items stolen from your room!

Locking your gear in the car is not recommended either. When the equipment is brought back into a warm room from subfreezing temperatures, condensation may collect on and ruin delicate circuits. Waiting at least thirty minutes before using the gear will give the moisture time to dissipate.

For the non-skier, pre-arranged lodge reservations will offer a warm and comfortable "monitoring station." For the communications buff familiar with skiing, a hand held scanner on the slopes will provide the perfect way to both hear and see the excitement. Think snow!

■

Correction

In our December issue, we incorrectly printed in our photo caption that "runway 27" meant a heading of 27 degrees; in fact, it means 270 degrees.

Dave Jones

430 Garnor Drive
Suffield, OH 44260

A Profile of Beale Air Force Base

Beale Air Force Base is located near Marysville, California, and is home to the 9th Strategic Reconnaissance Wing (SRW). Beale is also a Strategic Air Command (SAC) host base as well as home to the 14th Air Division, 7th Missile Warning Squadron and 1883rd Communication Squadron.

Other less publicized operations, such as launches of SR-71, TR-1 and U-2 "Spy" planes begin at the base as well. The SR-71 can fly at Mach-3 plus. That's in excess of twenty one hundred miles per hour and not all that bad for a twenty year old design. The cruising altitude is classified; however, reports place it in the 60,000 feet range. The TR-1 is essentially an upgraded version of the U2 but both have high altitude cruising ranges as well.

Listening Range

The radio coverage of these high altitude aircraft is generally large. The estimated radio range for the SR-71, for example, is approximately 300 nautical miles at 10 nmi. The high altitude cruising ranges of the TR-1 and U-2 also ensure large radio coverage areas.

Table one lists the channel assignments utilized in northern California. Channels nine and eleven are nationwide assignments for SAC aircraft and the SAC Command Post (CP) primary and secondary channels respectively. The SAC CP channels are quite active as UHF military frequencies are concerned.

The reconnaissance aircraft require additional aircraft and personnel in support of operations. Airborne support comes from planes such as the KC-135 which provides in-flight refueling and chase aircraft such as the T-38. Ground support varies from aircraft maintenance to refueling and crash and rescue crews. All require communications to ensure a smooth running operation. Table two lists these frequencies. All are confirmed.

Table One

CH	Frequency	Notes
1	228.400	"Information November" - Ground Control
2	276.150	Tower
3	327.500	Departure
4	296.700	Departure
5	281.400	Air Intercept Control Channel (AICC)
6	316.100	AICC
7	340.900	Tower/Ground Aircraft
8	259.100	
9	311.000	SAC Primary SAC Primary CP; "Liberty Control"
10	255.400	Tower/Ground Aircraft
11	321.000	SAC Alternate CP; "Liberty Control"
12	285.600	Approach/Departure
13	269.600	Primary Approach
14	383.100	Approach (Practice flights)
15	243.500	
16	320.100	
17	235.600	
18	372.200	Plane-to-Dispatch
19	239.800	
20	273.500	ATIS-Weather

One ground support operation that is very interesting to watch is when the U2/TR-1 aircraft practice "touch and go's" (the process of practicing landings by approaching the runway, typically touching it with the aircraft wheels, and then applying the throttle and take off procedures).

The U2/TR-1 do not actually touch the landing strip as the engines on these aircraft must be stalled at one meter above the runway. High output Ford Mustangs, dressed in Air Force blue, wait for the aircraft to approach the runway. Once it appears, the Mustangs start accelerating down the runway, roof mounted lights flashing away.

The personnel in the Mustangs are in constant contact with the aircraft pilot, notifying him of the plane's height above the ground. While I've been able to observe this activity, I have not been able to monitor it; I assume that the communications operations were low powered.

Drill, Drill, Drill

The Air Force constantly drills their personnel. Security exercises are held quite regularly and most make for exciting listening. One such exercise involved "hostages" and was so realistic as to sound quite authentic.

The first indication of the hostage situation was an announcement over SAC security frequency 148.500. Security units reported that a UH-1 helicopter had landed near the end of the flight line, approaching at an

Table Two

124.500	Departure; AM mode
126.200	Tower; AM mode (common to all military towers)
134.100	Radar Approach; AM mode (common to all military towers)
138.165	Office of Special Investigation
138.175	OSI
138.325	Paging
148.050	Commander's Net (DES capable)
148.095	9th SRW Command Center; Medical Services
148.185	Fire, Crash/Rescue
148.245	Aircraft Maintenance
148.455	Aircraft Maintenance
148.500	SAC Security (perimeter and flight line)
149.050	Beale Police (Control input to 149.550 base only)
149.150	Aircraft Maintenance
149.225	SAC Security (Control input to 148.500, base only)
149.550	Beale Police (normal law enforcement functions)
150.195	Civil Engineers
150.225	Communication Center
150.315	Aircraft Refueling
150.345	Motor Pool 413.450 SAC Paging - Crew Alerts

Frequencies including 148.035, 149.525, 150.200, 150.255, 164.500, and 388.850 are listed on the government microfiche but have not been confirmed.

extremely low altitude. The "terrorists" then disembarked from the helicopter and split up. One group approached a VIP aircraft and the other headed for the surveillance aircraft hangers.

The next message, in which the terrorists announced that they had taken the VIP hostage, was monitored on 321.000 (SAC alternate CP). Security then notified the base commanders and the command net on 148.050R came alive. The Commander's Net even went DES (Digital Encrypted Standard -- digital scrambling of the transmission). The exercise continued for several hours as if a real situation had existed. Various aspects and functions of base personnel and utilization of frequencies was readily seen during the exercise.

The Strategic Air Command also maintains an HF (2 to 30 MHz) radio communications network between SAC bases and SAC headquarters at Offut Air Force Base, Nebraska. A secure digital system has been implemented at most SAC locations named ACDIN -- Strategic Air Command Digital Information System.

ACDIN is capable of communicating top secret information between these bases and in the event of war, provide a highly secure, fast means of staying in touch. Some SAC aircraft are also equipped for HF operations and confirmed frequencies are desired for future columns.

Table Three

Alpha	SAC Security
Aspen	KC-135 Tankers
Beale	Beale Police; also Base Commanders
Control	SAC Security; also various operations bases.
CP	Base Command Post
Foxtrot	Base Command Net Operator (no numerics)
Horn Control	Base UHF CP (no numerics)
Liberty Control	Base UHF CP (no numerics)
Numeric	Surveillance Aircraft -- straight numerics)
Police	Beale Police
Rambo	Flight Line Ramp Units

Crash and Rescue Unit Numbers

1,2 and 4	Single nozzle Aircraft Pumper Engines
3	Dual nozzle AC pumper Engines
5 and 11	Pick up Trucks
7	Structure Engine
9 and 7	Chemical/Foam Tanker
Wildfire	Field/Brush Units

Table three lists designators utilized by Beale AFB operations and unit numbers for fire apparatus. A unit number is implied after each designator. Security units use "Control X," where "X" is the unit number during operations and "Alpha X" in time of exercises. Beale police identify with either "Beal X" or "Police X" with no apparent call sign differentiation. SAC security units have Motorola MX-300R hand-held units for communications.

■

UTILITY INTRIGUE

Don Schimmel

516 Kingsley Road SW
Vienna, VA 22180

Joe Topinka of Illinois, sent in an item he copied on 7740 kHz, USB, at 2245 to 2251 UTC. The transmission was by an English speaking female who sent number groups. There was a pause after each third number. Joe wonders what this was.

The answer is what is commonly designated 3/2F traffic. It's also been referred to as "dictionary code" traffic and the term applies to a code where words are indicated by page number/word number in a pre-selected dictionary held by all the correspondents. Sometimes numbers (an additive) were added to the true page/word numbers as a means of making determination of the particular dictionary more difficult.

LOGGINGS

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
3476	120114	CW/? DE MOA (uniden) 5L grps, ltrs A-Z plus Spanish Nyeh (MW)
4606	120120	CW/No calls/Fig grps of varying lengths. Frequent BT's, hand sent.
4611	150252	CW/No calls/5L grps, at end of 100 grps sends -100- B (pase) -101- and back into text.
6247	182307	CW/WSA DE DEL, ABA DE DEL (al uniden) believed to be day freq for activity hrd at night on 3073, 3463.6 & 3422 kHz.
6274	182258	CW/Uniden stn calling WVR then moves down approx 1 kHz & resumes calling, moves down another 1 kHz $ continues calling. Contact not made.
6348	090225	CW/No calls/Portuguese language text which contains preparation by Portugal of military contingent for Mozambique.
6991	182248	CW/No calls/5L grps, ten grps per line foll by pause then next 10 grps.
13420	071848	CW/No calls/Portuguese Navy tfc, LISBOA in heading of msg.
14603.1	071451	RTTY 50-425/Y7K30 (MFA Berlin, East Germany/running RY's
14615	062230	CW/CLP5 DE CLP1 (MFA Havana clg Cuban Embassy Algiers)
14720.5	062227	RTTY 50-425/TNL (Brazzaville, Congo) running RY's.

Looking at Radio

I've received a number of requests asking me to visually look at a portion of the spectrum to see what transmissions are active. Most recently, Fred Chesson of Connecticut raised this question.

My suggestion is to write to Science Workshop, Box 310, Bethpage, New York 11714 and ask for the brochure that describes the "poor man's" spectrum analyzer. It looks like inexpensive equipment plus a scope will provide an adequate means of checking desired frequency locations. While it won't duplicate the results obtained with more costly units, nevertheless, it appears to be a practical option.

Publications

The supplement to the *Aero/Marine Beacon Guide* by Ken Stryker and Joe Woodlock is now available. It contains some 800 beacons that have come on the air since publication of the original guide.

QSL's for airline flight transmissions monitored by Patrick O'Connor, NH.

KENYA 134

THIS WILL VERIFY YOUR RECEPTION OF KENYA AIRWAYS FLIGHT 134, 14 JUNE 1987 AT 2044 UTC ON A FREQUENCY OF 11300 KHZ USB.

POWER: 400 Hz AIRCRAFT TYPE: A 310 - 300

REGISTRY #: 5Y BEN POSITION: AMRAD N0545 E03454
REMARKS:

Capt. Chief Pilot
[signature & title]

ANTILLEAN 982

THIS WILL VERIFY YOUR RECEPTION OF ALM-ANTILLEAN FLIGHT 982, 28 JUNE 1987 AT 1532 GMT ON A FREQUENCY OF 8846 KHZ USB.

POWER: Approx 100 WATT AIRCRAFT TYPE: MD-80

REGISTRY #: PJ-SEF POSITION: ENROUTE FROM JFK to ST. MAARTENNA.
REMARKS: WAYPOINT: "GINNY" N2700.0 W066 45.0 AIRWAY A23

P.S. Will write you in the future as I am also interested in buying an ICOM IC-R7HA.

S. A. HENDRIK FLT. TECHN AND NAVIGATION DEPT.
[signature & title]

The updater costs $4.00 postpaid and can be obtained from Ken Stryker, 2856-G Touhy Avenue, Chicago, IL 60645.

What's On

Bill Frantz of Georgia sends in a list of some intriguing utility catches from his logbook.

5320 USB 1845 UTC
NOAA ship WTDO (Oregon II) with COMSTA New Orleans. Went to RTTY after establishing contact.

8718.9 USB 1400 UTC
USS Hoist & USS Grapple with COMSERVRON 8. Towing operations.

6509.5 USB 1830 UTC
NOAA ships WTED (Chapman) $ WTDO (Oregon II). Equipment checks and parts requirements.

6715 LSB 1230 UTC
CROWN with Air Force 2 and Andrews AFB.

11.249 USB 1530 UTC
SAM 1683 with Andrews Air Force base. Phone patches from three senators on board.

11.249 USB 1425 UTC
SAM 1683 with Andrew Air Force base and phone patch with US Embassy, Costa Rica.

6730 USB 1330 UTC
Air Force 2 with Andrews Air Force base.

11.249 LSB 1600 UTC
SAM 1681 with Andrews Air Force base.

6910 USB 1550 UTC
T4T, G31, C2C, F3D, etc. with other stations. Is this the National Guard?

6522 USB 1600 UTC
WIX, Lakin, West Virginia, with check-ins from river boats.

6812 USB 1730 UTC
Air Force 2 and CROWN with Andrews Air Force base.

6835 USB 1530 UTC
0G, 0T, 2Y, etc. with control station 7Q.

6898 USB 1300 UTC
Daydreamer, Real World, Oak Hill, etc. Number transmission and information on satellite tracking equipment.

9025 USB 1535 UTC
"Pennsylvania Air Guard 509, ground radio check on 9027." Interestingly, they were on 9025. Tried a few times on the wrong frequency then finally found the correct one, 9027.

A Word of Explanation

Due to space restrictions in the October 1987 Utility Intrigue column, part of the special interest material for the 13387.8 kHz item was omitted. The missing portion indicated that station ADL was heard calling KNY44. This latter callsign is assigned to an as yet unidentified Embassy in Washington, DC. It is the strong station heard on this frequency. My references do not show a listing for this callsign.

In an effort to have more space for column text in the future, I am going to reduce routine log entries. Hopefully, this will enable me to provide expanded comments. ■

Larry Van Horn

160 Lester Drive
Orange Park, FL 32073

Sky-Tracking the Transpolar Ski-Trek

A combination of space resources may be put to use in support of a joint Canadian-Soviet polar expedition next month. Currently under discussion is project Nordski Comm, a plan whereby the polar expedition team will be tracked by a fleet of international satellites. The team's position will then be reported back to them by UOSAT Oscar 11's digitalker experiment.

The expedition will depart from Cape Arktichesky in the USSR in February, ski across the North Pole, and arrive at the Cape of Columbia near Ellesmere Island, Canada, some 90 to 100 days later. Leonid Labutin, UA3CR, is the chief radio operator for the project.

Labutin will work from a support camp while the SkiTrek Expeditionary Team will carry two Emergency Locator Transmitters (ELT). The ELTs emit specially coded beacons in the 406 MHz range that are picked up by satellites in the SARSAT/COSPAS program. By analyzing the Doppler shift of the transponded signals, personnel at mission control can pinpoint the location of the ELT within a few miles or better.

From there, the information is automatically relayed by telex to the University of Surrey in England where the information is encoded into software that programs the UO-11 digitalker aboard the satellite. Then, several times per orbit, digitalker will announce, in plain English, the team's exact location. All the SkiTrek members need do is tune in 145.825 MHz on their miniature VHF transceivers to know their exact location.

Founded by the United States, Soviet Union, Canada and France, the system now includes the participation of more than a dozen nations. There are about six SARSAT/COSPAC-equipped satellites in operation today. SARSAT stands for Search and Rescue Satellite Aided Tracking System. COSPAC is a Russian abbreviation for Space System for Search of Vehicles in Distress. Officials credit the system with saving more than one thousand lives to date.

Phase 3C Could Fly in March

Arianespace should already have put into orbit mission V-20 by the time this column reaches print. If indeed it and the launch of January's mission V-21 are successful, AMSAT's Phase 3C could see space as early as next month. It is scheduled to be aboard mission V-22.

New Shuttle Schedule

- June 02 1988 Tracking and data relay satellite. TDRSS-C launch.
- September 08 1988 Defense Department mission. Expected to be geosynchronous orbit missile warning spacecraft or two DSCS communications satellites.
- December 01 1988 Defense Department mission. Expected launch of an advanced version of the KH-11 reconnaisance satellite.
- February 02 1989 Tracking and data relay satellite.
- April 27 1989 Launch of the Astro-1 ultraviolet telescopes
- August 24 1989 Department of Defense mission.
- October 09 1989 Launch of the Galileo spacraft. Destination: Jupiter.
- November 09 1989 Launch of a NAVSTAR spacecraft and the SDI infrared background signature survey experiment using the SPAS pallet.

As a reminder, be sure to get your input in for the May space shuttle monitoring article. Information on this article and project NASA appeared in the December, 1987 issue of *Monitoring Times*.

Satellite Beeper?

GEOSTAR Corporation has awarded a $100 million contract to General Electric Astro Space Division for the construction of two commercial positioning service satellites. GEOSTAR plans to launch the two spacecraft into geostationary orbit somewhere in 1991 or 1992.

The new system will be able to monitor the location of and transmit short messages from more than 25 million vehicles and persons per hour. The contract includes options for a third and fourth spacecraft. Each satellite will have two transponders and two uplink/downlink communications packages.

Uplink (center frequency) will be 1618/5175 MHZ and downlink (center frequency) will be 2492/5125 MHz. Each satellite will have a useable bandwidth of 32 MH. Three digital positions are already reserved for the company: 70/100/130 degrees west. Can the Dick Tracy wrist radio be far behind?

Computer Bulletin Boards

A lot of *Monitoring Times* readers use computers to communicate these days and space-related bulletin board systems are on the increase. The following list supplied by Jeff Wallach and the Dallas Remote Imaging Group (Datalink RBBS) should get you started in exploring the world of space and satellites.

- Datalink RBBS, Dallas, TX: Ham radio, satellite tracking, NASA files, ASA, NOAA and weather stats. (1200 baud) 214-394-7438.
- US Naval Observatory, Washington, DC: 202-653-1079.
- Remote Northstar NASA, Greenbelt, MD: Get Away Special (GAS) information. 301-344-9156.
- TBBS The Star Board, Denver, CO: (300/1200 baud, 24 hours) 303-455-3113.
- RCP/M Astronomy, Titusville, FL: Astronomy/-science. CFAS, AAVSO, ISRG, IAPP, SERAL, and 'CANDL (300/1200 baud, 24 hours, pay system) 305-268-8576.
- Spacenet RBBS (L5 Society), Malpitas, CA: Primarily for L5 Society members. (300/1200 baud, 24 hours, pay system) 408-262-7177.
- Austin Party Board, Austin, TX: Carries the University of Texas Star Date program. (300/1200 baud, 24 hours) 512-442-1116.
- AMSAT Info Line, Corpus Christi, TX: (300 baud, 24 hours) 512-852-8194.
- Kalamazoo RCP/M, Kalamazoo, MI: North Star horizon system. Interests: Earth sciences, astronomy, geology, oceanography, and meteorology. (300/1200 baud) 616-342-4062.
- NASA Activities, Houston, TX: Provides detailed information about upcoming shuttle activities. (1200 baud/Available for about one week prior to shuttle launches) 713-280-8711.
- Net-works Apple Astronomy, Houston, TX: Very good system. (300/1200 baud, 24 hours) 713-526-5671.

L5 Society Boards

- L5 Pittsburgh, PA: 412-366-6099.
- L5 Silicon Valley, Mountain View, CA: (weekdays 6 - 10 PST, Sun 12 - 7 PM PST).
- L5 Minnesota, Minneapolis: NASA and ESA press releases. (300/1200 baud) 612-920-L5MN.
- L5 Minnesota, Unknown: 612-927-9743.
- L5 San Diego (FORA), CA: 619-459-2542.
- L5 Kansas City, MO: 913-788-3224.

■

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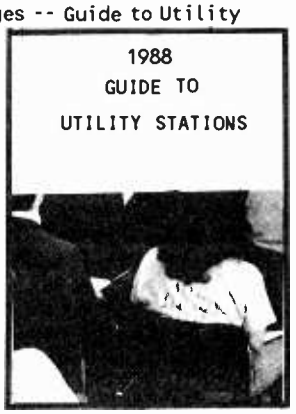

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1988 PASSPORT TO WORLD BAND RADIO

It's the ultimate shortwave frequency guide and more. Complete schedules for every broadcast station on the air from 2 to 25+ MHz, arranged in frequency order. From favorites like the BBC and Deutsche Welle to exotic catches like the Yanggang Provincial Station in Hyesan, North Korea, Radio Kabul, Afghanistan, exotic South Sea destnations like Tahiti and more. Plus a dozen articles by some of the top names in the business tell you how to get the most out of your radio. And it's all topped off by award winning Larry Magne's authoritative receiver reviews. Is the Kenwood R-5000 as hot as everyone says it is? Should you spend $300+ dollars on the "revolutionary" Sony '2010? Thousands of shortwave listeners won't buy until they've checked with Magne. You shouldn't either. Passport to World Band Radio is like getting three books in one. At the price of only one! $14.95 plus $2.16 (2 lbs) UPS shipping.

LATIN AMERICAN DXing

Almost 300 pages of frequencies and station profiles. Highly recommended for anyone serious about chasing down south DX. In English (with Spanish translation). Just $18.95 plus $2.16 (2 lbs) UPS.

1988 WORLD RADIO TV HANDBOOK

An indispensible guide to the broadcast bands! Over 300 pages, arranged by country, of stations around the world. Mini-profiles include station names, addresses, personnel, schedules, languages, targets, transmitter power, and more. New 42nd annual edition just $19.95 plus $2.16 (2 lbs) UPS shipping. Expected ship date: late Jan. '88.

FAMOUS RAND McNALLY MAP PACK

Keep track of your shortwave listening and the world with 8 folded Rand McNally maps. Includes the world, US, Canada, Mexico, Europe, South America, Africa, West Indies/Caribbean. Average size 42 x 28 in full color. $22.50 plus $2.16 (2 lbs) UPS.

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Let 25 of the world's leading experts on radio monitoring introduce you to the exciting world of shortwave listening. Each takes you through a different aspect of the hobby -- from getting started to choosing the right receiver to the fundementals of propagation and DXing, QSLing and more. By some of the biggest names in the business: Magne, Berg, Jensen, Helms, Dexter. A real doorstopper at 500+ large format pages. The encyclopaedia of shortwave. Imprime price: $21.95 plus $2.39 (3 lbs) UPS.

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Getting the "Smarts"

If you're a newcomer to RTTY listening, you may find that many FSK (Frequency Shift Keyed) tones on the shortwave bands do not produce any print on your computer or teletype. At best, that's left you scratching your head.

There are several things that can cause this problem. First, you may be copying the wrong speed. Second, the RTTY may be reversed and third, you may be copying RTTY that's encrypted or in FEC/TOR or TDM. You can do something about the speed. There are ways to handle the inverted RTTY and FEC/TOR.

You cannot, however, decode encrypted RTTY. If you can, it probably means that you are in possession of stolen military equipment and stolen classified documents. Uncle Sam doesn't like that. If he catches you, he will tie you up and throw away the knot.

RTTY and Dead Frogs

On some of the older teletype machines, the only way to change speed was to change a gear on the motor. To change speed in models with DC motors, the operator would have to turn a screw while looking through a special tuning fork.

The tuning fork had an aperture mounted on the prongs and when the fork vibrated, the opening would open and close, creating a stroboscopic affect for the viewer. A wheel mounted on the TTY motor had dashed lines painted on it and when the motor was running at the correct speed, the lines would "freeze." All in all, it was a tedious job that led many operators to seek some rather unusual diversions.

In central Korea where I maintained two of this type machine during the late 1960s; tuning forks used for this purpose were abundant. One operator, a resident of the state of North Carolina, used to sharpen the ends, mount them on a stick, and use them to spear frogs.

Pressing the Panic Button

Thanks to the advent of computers, RTTY sites are no longer littered with tuning

RTTY LOGGINGS

Time	Frequency	Mode	Shift	WPM	Remarks
2350	10.1390	LSB	685 N	67	RYs
0006	10.2364	LSB	85 R	100	United States Information Agency
0015	10.2351	LSB	85 R	100	United States Information Agency
0157	10.5378	RTTY	555 N	100	CFH Halifax Nova Scotia Weather
0240	6.3318	LSB	525 N	100	5 digit numbers. Not weather
0253	6.2559	RTTY	165 R	67	Numbers 1/2/3/&/ 4
0515	8.7110	RTTY	155 N	FEC	KSFO High Seas Weather
0520	4.1732	RTTY	170 N	67	Russian (marine)
0535	8.3491	RTTY	170 N	67	Russian (marine) off at 0545
0540	8.3546	RTTY	170 N	67	Russian (marine)
0550	3/1914	RTTY	75 R	100	FDM AP news AFRTN" military circuits
0615	7.8237	----	25	---	FSK clock at 10 Hz
0615	7.8233		87+37		Twinplex FSK? Slow speed data multiplexed with the 10 Hz clock
1937	16.6968	RTTY	170 N	67	Russian
1945	16.6694	USB	170 N	ARQ L	Traffic from a Greek ship
1955	16.3513	RTTY	385 N	67	United States Information Agency.
	16.3493	RTTY	385 R	67	were grouped together, but not an
	16.3483	RTTY	385 N	67	FDM type. Each RTTY channel was
	16.3473	RTTY	385 N	67	a separate carrier. Beam heading
	16.3463	RTTY	385 N	67	was 135 degrees
	16.3453	RTTY	385 N	67	
	13.7397	RTTY	45 N	--	FDM RTTY FSK test signal.

Mode indicates the receiver's mode. The FSK shift was measured with homebrew TU which has precession tuning capabilities and is accurate +- 5 Hz

forks (or dead frogs). Press a few buttons and the system will change RTTY speed, reversing or changing the shift frequency. As a result, modern machines can copy just about any type of RTTY that you might encounter on the shortwave bands.

So make sure, when you're purchasing an RTTY unit, to get a "smart" one. Models like the Kantronics UTU or the AEK PK-232 have microprocessors and tone decoding circuitry built into them. "Dumb" TUs have only filters and a TTL or current loop output. If you buy one of these "dumb" models, you'll need a computer with RTTY software to display the characters.

To the Market

The best RTTY SWL software package on the market is available only for the Commodore 64 computer. "SWL Text" is manufactured by AEA. It comes in a plug-in cartridge which boots up immediately and turns the '64 into a devoted RTTY machine.

SWL Text can also store the copied characters in a 32k buffer which can, in turn, be transferred to the printer or disk drive. Other features include timing analysis and bit inversion or transportation analysis and the ability to copy Russian and Chinese RTTY/Morse signals using Cyrillic and Katakana characters, respectively.

Buyer Beware

No matter what the model, most RTTY boxes, smart or dumb, have one thing in common: the audio filtering and methods used to decode the tones into a digital signal is less than adequate for shortwave listening. One SWL who purchased a $900 "smart box" ended up having to buy a $1200 "TU" (which he uses to feed the smart box) because the smart box simply didn't have a good enough filter or discriminater for shortwave. If manufacturers can develop a high tech, all-mode radio modem, they should be able to develop better filtering.

In the next RTTY column, I'll explain the use of poles and where the manufacturers of RTTY should put them. We'll also take a look at a type of filter that's been around for quite a few years plus digital processing and the impact it will have on RTTY.

■

Is it later than you think?

Check your subscription label for the last month of issue -- it may be time to renew! The handy renewal form is on page 80.

Ike Kerschner

R.D. 1, Box 181-A
Kunkletown, PA 18058

The Novice VHF/UHF Bands

In March 1987 the FCC opened up a new world to novice class operators in the United States by permitting operation on the 222 and 1270 MHz bands. Novices are allowed all modes of operation on the new bands. At 222 MHz, they are allowed 25 watts of power and 5 on 1270. Both power levels are more than adequate on HF/UHF.

What all this means is that the novice will be able to experiment with exotic modes such as Packet, RTTY, TV, and ASCI as well as the more conventional SSB, CW, FM, and AM. In addition, novices will find it easier to move into the mainstream of amateur radio. They are able to communicate more easily with a large number of amateurs in the local community.

222 MHz (1-1/4 meters) is a VHF band with similar characteristics to the ever popular 2 meters. Average range of contacts will be 30 to 40 miles. Well equipped stations at a good high location can stretch this to as much as 150 miles.

Various propagation phenomena will, at times, make contacts over a thousand or more miles possible. Naturally, when such conditions exist, there is a lot of excitement among VHF operators with everyone clamoring to add a new grid or state to his work total. Under such conditions even the low power operator has a chance to work "DX."

Activity

Although there is some SSB and CW activity on 222 MHz, FM is the major mode on the band. SSB and CW will provide the longest range communications. The increased activity on this band may foment more interest in these modes.

Packet is also popular on 222, so the novice should have plenty of opportunity to become familiar with this mode.

FM and Repeaters

FM is the most popular to use on 220 simply because it's easy. Range is better than AM, though not as great as SSB. Another advantage to FM is its ability to eliminate noise; for the most part, FM communication is noise free. FM has another advantage called "capture effect" which means that the receiver will hear only the strongest signal, eliminating QRM from other stations. All of this makes FM ideal for local communications. An average fixed station should have no trouble communicating with similarly equipped stations 30 or 40 miles away.

Range on FM can be extended considerably on 220 through a repeater. Repeaters are devices that will receive a signal and retransmit it on a different frequency (usually within the same band). Repeaters are normally located at the highest location in the area and will extend normal communication range by many miles. Some repeaters easily talk over a 100 miles or more. The high location makes repeater operation ideal for mobile use because the repeater looks down on the coverage area and shadow effects are greatly reduced.

Cross Linking and Autopatches

The novice amateur on 222 MHz can gain greater access to a large segment to his local community through cross linking. Cross linking is a process whereby a repeater, on say 2 or 6 meters, will accept input from 222 Hz. In some cases it is only necessary to dial in the correct frequency on the 222 rig and talk. On other machines you will need to dial in an access code on a touch tone pad to open the link up.

For example, one repeater in this area cross links 220 to a 2 meter repeater and a 10 meter FM remote base (10 meter transceiver on 29.6 MHz.). Another repeater owner intends to link 222 into a HF rig so novices can get a a taste of DXing on the HF bands.

Another device popular on repeaters is the autopatch. An autopatch is a cross link to a standard telephone permitting the amateur to use the telephone from his station be it mobile, handheld or fixed. Remember, it is illegal to use amateur radio for business. Calling the office for messages is forbidden. In fact, anytime you contact a commercial enterprise on an autopatch you may be in violation (don't call work to report in).

A novice can legally use systems like this as long as he transmits on 222 MHz. To find out what cross linking is available in your area obtain a copy of the ARRL "Repeater Directory," or contact your local amateur club. There is usually a nominal membership fee required for most of these exotic machines.

Operating practice and courtesy

Consider a repeater as a party line telephone; use it sparingly and keep comments short. All most all repeaters have a time out clock on them and if you keep talking too long the machine will shut off and you will be talking to yourself. On the average, the time out will be 90 seconds or less. If you contact someone on the repeater that you can work simplex (simplex is using the same frequency for transmitting as receiving similar to HF practice) by all means move to a simplex channel so others can use the machine (repeaters are often called machines).

When you hear someone say "break" let him in at once. Unlike CB, the words "break"; "break, break"; and "break, break, break" are emergency procedure signals in ham radio. Emergency traffic takes precedence over all other communication!

Gear for 222

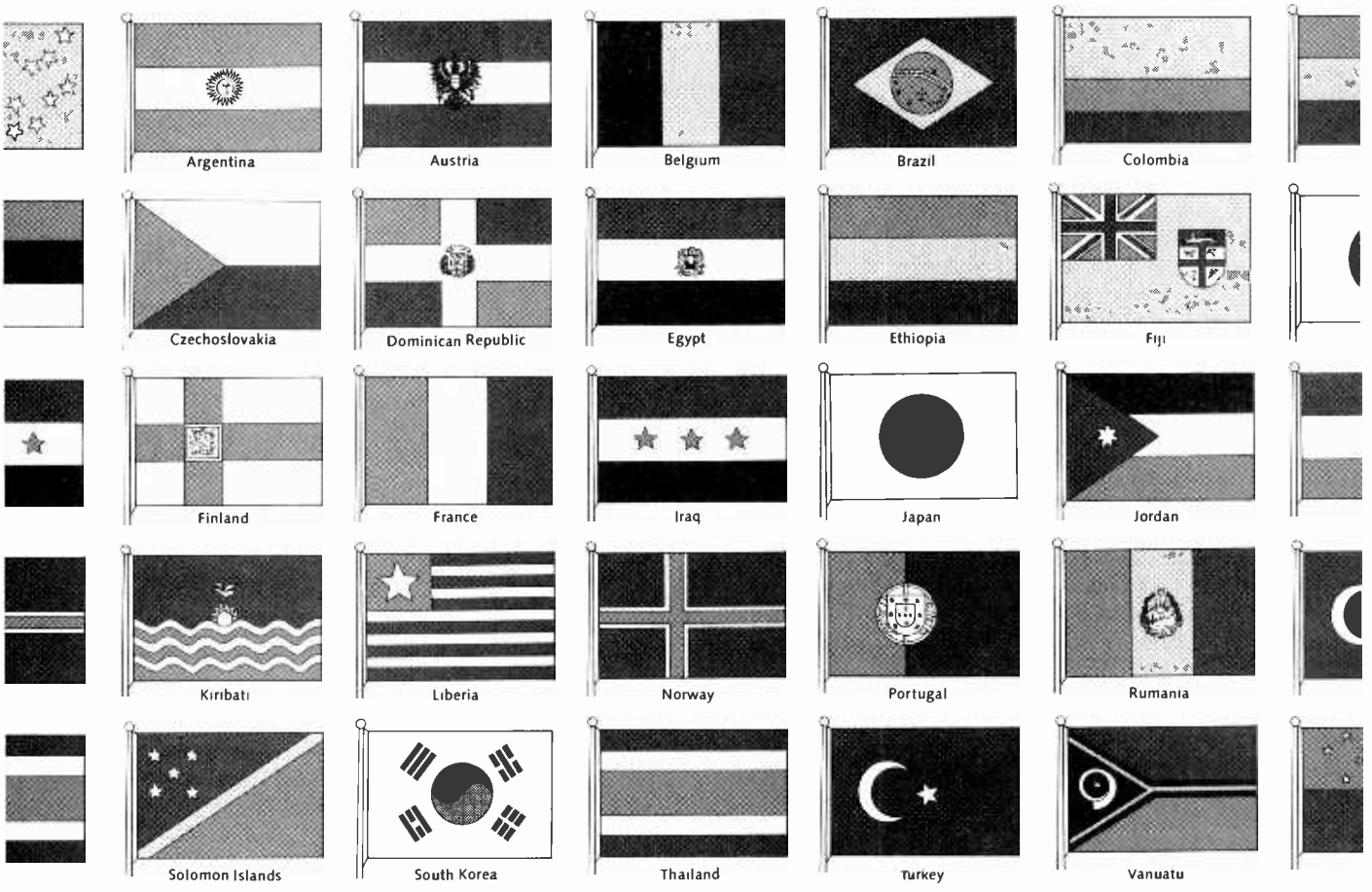
Almost all major manufacturers make equipment for 220. Everything from handheld to large multi-mode fixed rigs are available. Check your local ham dealer or the ads in any amateur magazine. There is little used gear available for this band and whatever you do find will probably cost nearly as much as new gear.

1270 MHz

A UHF band that has not been exploited to any great extent by the amateur community, due to lack of equipment availability. ICOM has recently introduced a line of equipment for 1270 and hopefully activity will soon pickup on this band. FM is the primary voice communication mode on 1270; some SSB and CW is used for moon bounce and DX work, and TV is growing.

Range on 1270 is on the order of 20 to 25 miles. The propagation anomalies that permit long distance communications on VHF have little effect on 1270 so range tends to remain constant. There are times when signals hundreds of miles away can be worked, but they are rare.

■



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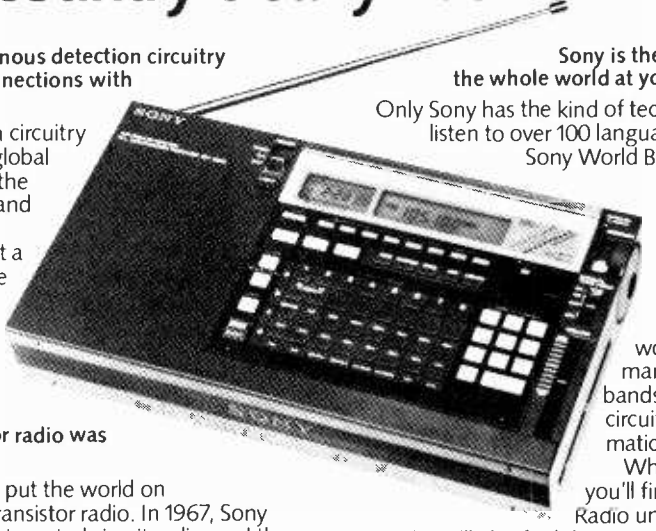

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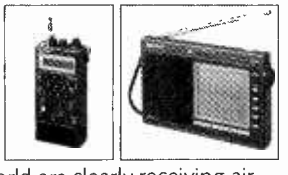

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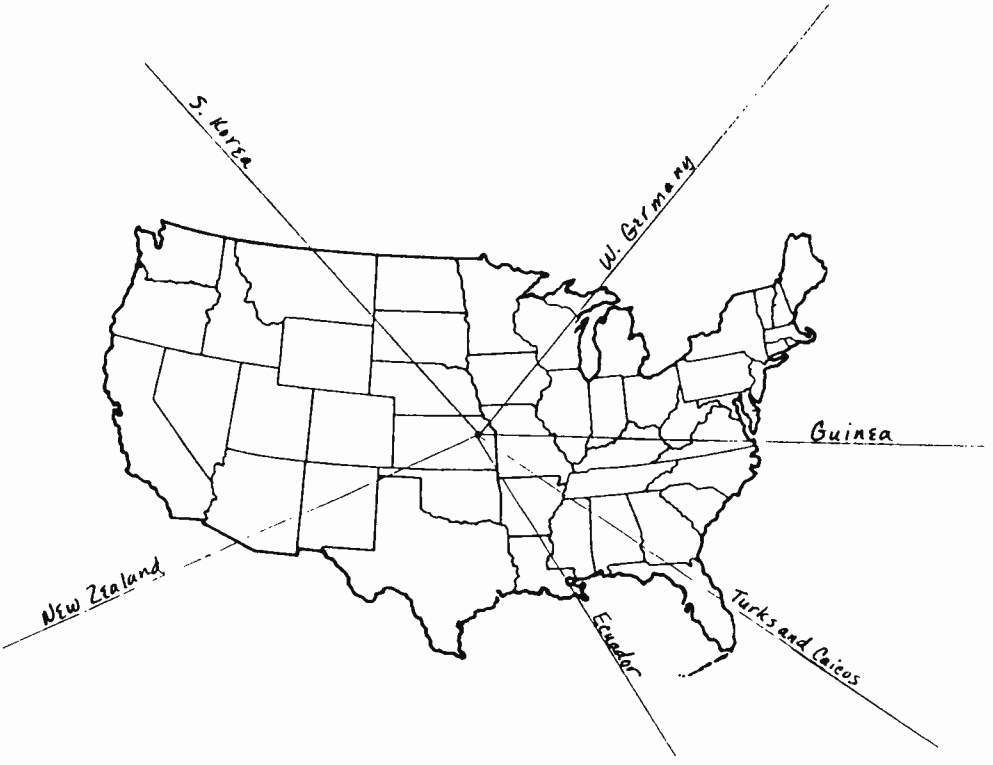
The Impossible Dream?

It's always a pleasure to read about some DXer doing the impossible. For example, it's often said that it's impossible for New England DXers to hear Australian AM stations. But in last month's column, you read about Ray Moore of Walpole, Massachusetts, and others who heard the Australian "print handicapped" stations on 1620 and 1629 kHz this fall. Ray has also been picking up strong carriers which occasionally produce audio on 738 and 774 kHz. The bearing on these is 270 degrees -- just right for Australians.

Jim Hall of Pittsburgh reports hearing definite TP signals on 702, 747, 756, 837, 1206, and 1503 kHz. In the few times I've been able to listen, I've heard the 756 signal plus a tentative 819 kHz. These and other impossible DX frequencies do bear close scrutiny in the hour or so up to local sunrise and perhaps fifteen minutes after. So the next time you hear the word *impossible* in reference to DX, just substitute the word "difficult." And thanks to Gene Martin of Denver, Colorado, who hears impossible DX quite often in the wee hours of the morning -- and who calls others to insist that they, too, get up and listen!



Don't think "impossible" DX -- Just substitute the word "difficult" and you may be amazed and delighted at what you can pick up!

Listening is More Difficult?

We all know that with the many thousands of stations now on the air, DXing is much more difficult than it was in earlier times. Right? Wrong.

Ludwell Sibley, of Flemington, New Jersey, believes differently. In the August, 1987 issue of "*The Old Timer's Bulletin*," (The official journal of the Antique Wireless Association, Inc.), Sibley make this flat statement: "Today's DXing is a whole lot *easier* [emphasis mine] than in earlier times... The major difference is in the performance of the stations themselves."

Sibley first makes the point that radio transmitters are much more powerful and antennas more efficient than those of fifty years ago. "In 1926," says Sibley, "there were only one 40 kW station in North America (WJZ); two 20 kilowatters KOA and KGO), four 10 kW installations (WBAP, KDKA, WLIB, WWAE), and 26 more at 5 kW. The rest ran low power. Of the 657 total stations, about half (330) used 100 watts or less. Apart from the six 'local' channels...the median power today is nearly 1000 watts."

Average modulation levels are higher, too, up to 125%, as compared to 50% modulation on peaks. Audio levels are tightly controlled now, by multiband compressor-limiter processors. "The resulting total improvement in DX 'reach' is hard to estimate: 10 decibels... 15 ... maybe more." Also, audio distortion has been greatly reduced. "We can only guess at how much DX intelligibility was lost to 'mushy' modulation."

We face new levels of QRM from appliances which didn't exist in the '20s, of course, but back then, the stations themselves caused problems. "Today's DXer is spared the chorus of heterodyne howls that used to plague reception. Some of these came from the neighbor down the block with his oscillating regenerative receiver. More serious were the built-in heterodynes from stations assigned to the same nominal frequency."

Loose Tolerance

"As of the late Twenties, the frequency tolerance for transmitters had been tightened to plus or minus 500 Hz. But this loose tolerance still let stations unwittingly destroy each other's reception. One can only imagine the effect of trying to catch some rare DX station in the presence of three or four heterodyne tones, each fading in and out; each wobbling up and down in frequency with the modulation. The universal use of crystal control finally removed this misery, but today's 20-Hz frequency tolerance wasn't in full effect until 1944."

Sibley doesn't mention the broad-band spark gap transmitter of the early '20s, said to wipe out a good portion of the spectrum when on the air.

Of course, the days of a DXer being able to sit on almost any given channel on a Monday morning and listening to stations sign off at local sunset, sequentially from east to west, no longer exists. Again, Sibley is firm in his conviction that DX nowadays is easier.

"We also have many more stations per channel today, both from sixty years' growth of broadcasting and from the FCC's policy of permitting new nighttime stations on the former 'clear' channels. We have adjacent-channel sideband interference from wide-spread use of high-frequency audio boosts, a recent development. But these are minor problems compared to the many factors that have made DXing easier. So we might well remember, in examining someone's long-forgotten DX log or trying out his hand-built receiver, that distant reception was a lot harder in the old days.

If you'd like to get an idea of exactly what it was like to DX in the "good old days," try this: Wire in a 25-dB pad between the antenna and the receiver. That will give you signal levels comparable to 1926. In order to simulate the heterodynes, fire up three or four signal generators on the same frequency.

Sibley admits that it was his father, not he, who was the '20s DXer. He also points out that whatever the receiver his Dad had to use, it certainly was not blessed with digital readout but rather was calibrated simply from "0" to "100."

"Such calibration as could be ascribed to an old-time receiver was subject to the swaying of the antenna, setting of the regeneration control, changes in humidity, etc." Sibley later found evidence confirming that a modern broadcast antenna is more efficient than an early flat-top strung between two towers: "...The January, 1936 issue of the I.R.E. Proceedings (A.B. Chamberlain and W.B. Lodge, "The Broadcast Antenna") reports a typical radiated field of 90 mV/m for one kilowatt at one mile... By contrast, a typical post-1940 installation puts out about 200 mV/m under the same conditions. The difference works out to about seven dB."

Old TV

WDTDA has been running excerpts from early bulletins in a column entitled, "TV DX Thirty Years Ago." It makes for fascinating reading. How about this news from 1957? "WBUF-17 went dark; trying to sell their $2 million plant while WKBW-7 in Buffalo will start in December. Other new stations include: CFCL-2 (Ontario, Canada), CKBL-9 (Quebec, Canada), WTOL-11 (Toledo, Ohio), KUAT-6 (Tucson, Arizona) and WJRT-12 (Flint, Michigan). WABD-5 (New York City) now WNEW; WABT-13 (Birmingham, Alabama) now WAPI. WTRI-35 (Albany, New York) to 13 and WKTV-13 (Utica, New York) to 2."

The "Tech Notes" column includes some pertinent recommendations as to the care of TV antennas: Take down, inspect, clean and repair every year. Replace it every two or three years depending on environmental conditions in the area.

Replace all broken/bend elements, bolts, clamps, and insulators. Use an electric drill, saw, or in extreme cases, torch, to remove dead rivets. Don't remove too much! Clean the area with Brillo soap pads. Use sandpaper only on the pitted areas. Carefully clean where lead is attached to working elements. Use special plastic spray to matching terminals only -- to use on the entire antenna would lessen chances for weak DX.

Coat all bolts with motor oil. Paint saddle clamps if rusty. All of this should improve performance for the life of the antenna. (I might add from experience: get another pair of hands to help you take the antenna down. And--not from experience--*stay away from all electrical lines.*)

From the Mailbag

David White of Cherryville, Maine, says that the crystal set he built in 1981 picks up stations in the Antilles and "New York stations all day long this time of year." That's super, David -- but not super-het! (Yuk, yuk.) And Chuck Oliver, of Spring, Texas, recalls trying to separate the three stations in Houston with a cat's whisker. He also mentioned his first battery-powered set, which he had in 1927-28. Let me know about your experiences with the old crystal sets.

Anita McCormack of Huntington, West Virginia, has been a regular correspondent and now she's putting together a book for AM DXers. She'd like to have more photos of program hosts, though, and if you can part with a snapshot of yourself -- if you're a program host -- send it to me and I'll pass it along to Anita. Be sure to identify yourself and the name of your program.

That's it for this edition of "Making Waves." Keep those cards and letters coming and 73! ■

Dr. John Santosuosso

P.O.Box 1116
Highland City, FL 33846

The Black Cockerel

Last month we reported on the Angolan clandestine, Voice of the Black Cockerel. The Cockerel is sponsored by the National Union for the Total Independence of Angola UNITA). Now, readers with the capability of receiving and decoding teletype can tune in to another UNITA service on shortwave, this one the KWACHA News Press service.

The KWACHA News Press Service transmits to southern Africa on 10900 kHz at 0600 UTC, eastern Africa on 15524 at 1500 UTC, Europe on 18333 kHz at 1200 UTC and North America on 7310 kHz at 2300 UTC. Let us know if you log any of the "clandestine" RTTY signals.

The Mail Bag

From Indiana, William Dragoo sends an article from the Muncie *Star*. Do you remember Bruce Quinn? Although legally blind, Bruce was able to put pirate Jolly Roger Radio on the air in the early 1980s. The station had quite a following on the campus of Indiana University and even the FCC engineer who shut it down was sympathetic.

With the encouragement of that engineer, now retired, Quinn is trying to establish himself in legal radio. He is hoping that the FCC assigns an FM frequency to Nashville, Indiana, near Bloomington, and then to obtain a construction permit for a station there. Quinn taught himself to make the necessary frequency searches in order to find a clear channel.

Robert Fraser of Massachusetts sent an item from the Patriot *Ledger*. Boat pirate Radio NewYork International may have been busted, but land-based piracy on New York's Long Island still flourishes. Super Q on 91.5 MHz claims to be the island's most powerful pirate with 250 watts. "Frank," the 28 year old operator, has $15,000 worth of equipment in his station. His friend "Scott" runs another pirate, Rox 103, from his bedroom, an arrangement he declares is most convenient. He can even lie down on the job. Another friend, "Johnny," has a station with an equipment value of $25,000 in his garage.

Once, this gang of pirates got together and did a broadcast from the top floor of a hotel in Darien, Connecticut. A future goal may be to move to Florida and bring their transmitters with them.

With folks such as this around, one can be assured there will always be one more pirate to log. No doubt David Thomas would have been proud. Remember him? His pirate WUMS broadcast for over fifty years, a record which may never be broken.

Cuba, Florida and Hurricanes

It may be nothing more than coincidence, but last fall, as hurricane Floyd was making its way across Florida, the signals of clandestines Radio Caiman on 9960 and La Voz del CID on 9940 suffered drastic deterioration. In fact, after a sharp drop as 0112, Caiman disappeared entirely.

Meanwhile, we have been advised that CID (Cuba Independiente y Democratica) is again engaged in broadcasting activities in Florida. Unfortunately, there are no additional details available at this time. One widely respected DXer does suggest keeping an eye on CID's old 5106 frequency.

AM Activity

From Pennsylvania, John Demmitt reports heavy Cuban activity on the AM band during the fall as the Radio Progresso and Radio Rebelde networks joined together for a special program feed. About twenty frequencies carried the program with 710 kHz having the strongest signal. Demmitt suggests careful monitoring of 1040 kHz, as that frequency could provide some real DXcitement in the future.

Speaking of 1040, the winter months are a great time to log the Radio Moscow weekend relay on this frequency. Most recently, it was heard for about a half hour before its sign off at 6:00 pm EST. Obviously, the purpose of this relay is not to provide those in the southeastern United States with another way of hearing Radio Moscow World Service. So, as we said, keep tuned to 1040 kHz. And now, here's Havana Moon...

Shooting the Moon

Now here's something really interesting. Tune to the frequency of 6818 kHz at 0500 UTC and guess what you'll hear? You just many catch a *live* transmission of English numbers. The format is a group of three followed by a group of two. And guess who else uses 6818? Air Force Two.

Pager Intrigue

KPG of a well known California firm, sends information in regards to my previous column on voice pager intrigue. I knew I would get mail on that one!

KPG states -- very kind words -- that I should stop looking for hidden messages in everything. I'll point out -- in very kind words -- that "looking" for hidden messages and other things that go bump in the night is my avocation as well as vocation. Your comments are valued.

I might add, however, that the 5-digit group overheard on my female companion's pager was anything but routine. But you and the other readers would have to know the full story to understand. And a strange story it is. In fact, the entire story is still miles down the road. And it could just be that the "sleaze factor" in this saga would read ten on a scale of ten. Can't say any more at this time. His story will, however, be published.

KPG says that the five digit number group(s) were most likely extension numbers in a large PBX or Centrex system. Many large hospitals and business users, according to this west coast writer, use pagers in an effort to reduce costs by passing information to their employees on their pagers, which allows them to do a function without having to call in continuously.

KPG continues: "...I think by now, I have

heard every type of pager message possible. In several cases I had to track down the source of the page for several reasons and almost all of them *were not* illegal users [emphasis mine -- HM].

"As for pager use by the illegal drug industry, my educated guess based upon dealing with this type of customer for many years is that the drug dealer now only uses digital display paging for message transactions, due to the security of the transmissions. Many suppliers use these pagers to pass messages with return telephone numbers so their 'customers' can place orders.

"...The two most popular digital formats are Golay and POCSAC. The Golay code was created by Motorola and is very common. If you can bear to listen to the digital transmission, you can differentiate Golay from POCSAC since the Golay format sends the address information (the pager's cap code or address) at 6000 baud and the text at 300 baud. In comparison, POCSAC, the British Post Office Standard, is sent at 512 baud only. The POCSAC format is the international standard and most RCC's and BOC's are moving towards this format. It is VERY difficult to decode this information without special equipment nor would it make much sense."

KPG concludes, "Keep up the good work as many of us do enjoy reading *MT*."

Thanks for the information! Letters such as the above are always welcome. And speaking of pagers, I just looked at my latest pager bill and feel faint. Aaaaaawwwwk! Maybe a tecate will help!

Numbers and Floyd

Could it be that Hurricane Floyd played some minor -- or perhaps major -- role in the apparent cessation of 3090 kHz "numbers activity?

German Numbers -- Two letter phonetic sign on:

Frequency	Time	Identifier
3230 kHz	1700 UTC	"PL"
3230	1800	"PL"
3230	2000	"VL, VI. KR"
3230	2100	"YS, PL"
3230	2200	"AM"
3230	2300	"PJ"
3260	1800	"PL"
3260	1900	"EL"
3260	2000	"VL, VI, YS"
3260	2100	"YS, PG, AM, CT, EL"
3260	2200	"AM, ER, ST, IT"
3260	2300	"PJ"

More German "numbers" frequencies, time and identifiers next issue.

Thanks to Simon J. Mason of Humberside, England, for the above. Thanks for purchasing *Uno, Dos, Cuatro*.

German Frequencies:
4540, 4590, 4820, 4890, 5015, 5180*, 5285, 5735, 5770, 6850**, 7405*, 7530, 8065, 8170, 9325, 9450*, 10180, 10740 and 11107 kHz.

* *Often active with 5-digit Spanish numbers transmissions.*
** *Maintain close watch.*

Six Eight Four Zero

A Juno Beach, Florida monitor reports 4-digit English activity during the early afternoon on 6840 kHz!

Games People Play

Last issue I hinted -- very strongly -- that new and revealing Spanish numbers information was forthcoming. I -- very definitely -- am in possession of this coveted information. There is, however, indication of disinformation. The validity of this information can't at this time be easily determined! Stay tuned for further details!

The "giver" of this information or disinformation is, well, a young lady. Her pager also -- at times -- sounds off with "numbers groups" sent from a touch tone phone.

Maintain Watch

The frequency range of 6800 through 6840 kHz continues to yield all sorts of strange intercepts. Reports are urgently solicited.

Buena suerte Amigos,
Havana Moon

frequency SECTION

MT Monitoring Team

Joe Hanlon, PA

Rich Foerster, NE

Greg Jordan, NC

LEGEND:

- The first four digits of an entry are the broadcast start time in UTC.
- The second four digits represent the end time.
- In the space between the end time and the station name is the broadcast schedule.

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

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

- The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "V" for a frequency that varies.
- Frequencies in bold are most likely to be heard regularly in North America.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

0000 UTC [7:00 PM EST/4:00 PM PST]

0000-0025		Kol Israel.....	7462.5 9435 9845
0000-0030		BBC, England.....	5975, 6005 6120, 6175 7325, 9410 9515, 9590 9915, 11955
0000-0030		Radio Canada International..	5960, 9755
0000-0030		Radio Korea, South.....	15575
0000-0030	M	Radio Norway Internation....	9580, 9605
0000-0045		Radio New Zealand Intl.....	17705
0000-0045		WYFR, Florida.....	9660, 9680
0000-0100		All India Radio, New Delhi..	6035, 9595 11715
0000-0100		Armed Forces Radio and TV...	6030, 15345
0000-0100		AFAN, McMurdo, Antarctica...	6012
0000-0100		AFRTS Far East Net, Tokyo...	3910
0000-0100		CBC Northern Quebec.....	6195, 9625
0000-0100		CFCX, Montreal, Canada.....	6005
0000-0100		CFRX, Toronto, Canada.....	6070
0000-0100		CFVP, Calgary, Canada.....	6030
0000-0100		CHNX, Halifax, Canada.....	6130
0000-0100		CKFX, Vancouver, Canada.....	6080
0000-0100		CKZN, Newfoundland, Canada..	6160
0000-0100		CKZU, British Columbia.....	6130
0000-0100		Falkland Islands (FIBS).....	3958 USB
0000-0100		Guyana Broadcasting Corp-2..	5950
0000-0100	A-S	KCBI, Dallas, Texas.....	11735
0000-0100	TEN	KUSW, Salt Lake City, Utah.	11680
0000-0100	T-A	KVOH, California.....	9495
0000-0100		Radio Australia.....	15320, 15240 17795
0000-0100		Radio Beijing,China.....	9665, 9770 11715
0000-0100		Radio Havana Cuba.....	6140
0000-0100		Radio Moscow.....	5915, 5940 6000, 6045 7115, 7150 7215, 7310 11770, 12050 13665
0000-0100		Radio Moscow World Service	15130
0000-0100		Radio Sofia Bulgaria.....	6070, 11720
0000-0100		Radio Thailand, Bangkok.....	9655, 11905
0000-0100		R. Peace & Progress, USSR...	4895, 5915 5940, 5980 6020, 7100 7115
0000-0100		Singapore B'casting Corp....	5010, 11940
0000-0100		Spanish Foreign Radio, Spain	6125, 9630
0000-0100		Sri Lanka B'casting Corp....	4940, 6005
0000-0100		VL8K, Katherine, Australia..	5025
0000-0100		VLQ9, Brisbane, Australia...	9660
0000-0100		VLW9, Perth, Australia.....	9610
0000-0100		Voice of America.....	5970, 5995 6130, 9455 9650, 9775 9815, 11580 11695, 11740 15205, 17740
0000-0100		WHRI, Indiana.....	7400
0000-0100		WRNO Worldwide.....	7355
0030-0055		BRT, Belgium.....	5910, 9925
0030-0100		BBC, England.....	5975, 6005 6120, 6175 7325, 9515 9590
0030-0100		HCJB, Ecuador.....	9720, 11775 11910, 15155
0030-0100		Radio Belize.....	3285
0030-0100		Radio Kiev, Ukrain SSR.....	6200, 7165 11790, 11860 13645
0030-0100	S,M	Radio Canada International	5960, 9755
0045-0100		Radio Berlin International..	6080 9730
0050-0100		Vatican Radio.....	6150, 7315 9605, 11780

0100 UTC [8:00 PM EST/5:00 PM PST]

0100-0115		Vatican Radio.....	6150, 7315 9605, 11780
0100-0120		RAI, Italy.....	9575
0100-0124		Kol Israel.....	7462.5 9435 9845
0100-0130		Radio Berlin International..	6080, 9730
0100-0130		Radio Canada International	5960, 9535 9755
0100-0150		Deutsche Welle, West Germany	6040, 6085 6145, 9545 9565, 11795
0100-0200		Armed Forces Radio and TV...	6030, 15345
0100-0200		AFRTS Far East Net, Tokyo...	3910
0100-0200		BBC, England.....	5975, 6005 6120, 6175 7325, 9515 9590
0100-0200		CBC Northern Quebec Srvc....	6195, 9625
0100-0200		CFCX, Montreal, Canada.....	6005
0100-0200		CFRX, Toronto, Canada.....	6070
0100-0200		CFVP, Calgary, Canada.....	6030
0100-0200		CHNX, Halifax, Canada.....	6130
0100-0200		CKFX, Vancouver, Canada.....	6080
0100-0200		Falkland Islands (FIBS).....	3958 USB
0100-0200		HCJB, Ecuador.....	9720, 11775 11910, 15155
0100-0200	T-A	KVOH, California.....	9495
0100-0200		Radio Australia.....	15320, 15395

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			17795
0100-0200		Radio Baghdad, Iraq.....	6110, 11810
0100-0200		Radio Havana Cuba.....	6140
0100-0200		Radio Moscow.....	5915, 5940
			6000, 6045
			7115, 7150
			7215, 7310
0100-0200		Radio Moscow World Service	15130, 17880
0100-0200		Radio Prague, Czechoslovakia	5930, 6055
			7345, 9540
			9740
0100-0200		R. Peace & Progress, USSR...	4895, 5915
			5940, 5980
0100-0200		Spanish Foreign Radio, Spain	6125, 9630
0100-0200		Sri Lanka B'casting Corp....	4940, 6005
0100-0200		Voice of America.....	5995, 6130
			7205, 9455
			9650, 9740
			9775, 9815
			11580, 11740
			15205
0100-0200		WHRI, Indiana.....	7400
0100-0200		WRNO Worldwide.....	7355
0100-0200		WYFR, Florida.....	5950, 9680
0130-0140		Voice of Greece.....	7430, 9395
			9420
0130-0200		Radio Austria International.	9550

0200 UTC [9:00 PM EST/6:00 PM PST]

0200-0210		Radio France Int'l.....	5950, 6055
			9715, 9790
0200-0215	S	Radio Austria International.	9550
0200-0230		BBC, England.....	5975, 6005
			6120, 6175
			7125, 7325
			9410, 9515
			9845, 9590
			9915
0200-0230		Kol Israel.....	7465, 9435
			9845
0200-0230		KUSW, Utah, USA.....	11680
0200-0230	T-S	Radio Budapest, Hungary.....	6025, 9835
0200-0230		Radio For Peace, Costa Rica.	7375
0200-0230		Swiss Radio International...	5965, 6135
			9725, 9885
			12035
0200-0250		Deutsche Welle, W. Germany..	7285
0200-0256		Radio RSA, South Africa.....	9580, 9615
			11730
0200-0300		Armed Forces Radio and TV...	6030
0200-0300		CBC Northern Quebec, Canada.	6195, 9625
0200-0300		HCJB, Ecuador.....	6230, 9720
			11775
0200-0300	A,S	KCBI, Texaxs, USA.....	11735
0200-0300		KVOH, California, USA	9495
0200-0300		Radio Australia.....	15345, 17795
0200-0300		Radio Baghdad, Iraq.....	6110
0200-0300		Radio Bras, Brazil.....	11745v
0200-0300		Radio Bucharest, Romania....	5990, 6155
			9570
0200-0300		Radio Cairo, Egypt.....	9475, 9675
0200-0300		Radio Canada International..	5960, 9755
0200-0300		Radio Havana Cuba.....	6140
0200-0300		Radio Moscow, U.S.S.R.....	5915, 5940
			6000, 6045
			6070, 7115
			7150, 7215
			7310
0200-0300		Radio Polonia, Poland.....	7270
0200-0300		RAE, Argentina.....	9690, 11710
0200-0300		Voice of America.....	5995, 6130
			7205, 9650
			9740, 9815
			11830, 15205
0200-0300		Voice of Free China, Taiwan.	5985, 9555
0200-0300		WHRI, Indiana.....	7400
0200-0300		WRNO Worldwide.....	7355
0200-0300		WYFR, Florida, USA	5950, 9680
0215-0300		Radio Berlin International..	6080, 9730
0230-0300		BBC, London, England.....	5975, 6005
			6120, 6175
			7124, 7325
			9410, 9515
			9915
0230-0300		KUSW, Utah, USA.....	9735
0230-0300	T-A	Radio Portugal.....	6060, 9635
			9680, 9705
0230-0300		Radio Netherlands.....	6020, 6165
			9590, 9895
0230-0300		Radio Sweden International..	9695
0230-0300		Radio Tirana, Albania.....	7065, 9760

0300 UTC [10:00 PM EST/7:00 PM PST]

0300-0310		CBC Northern Quebec Service.	6195, 9625
0300-0325		Radio Netherland.....	6020, 6165
			9590, 9895
0300-0330		BBC, England.....	5975, 6005
			6120, 6155
			6175, 6195
			7185, 7325
			9515, 9600
			9915
0300-0330		Radio Budapest, Hungary.....	6025, 9835
0300-0330		Radio Cairo, Egypt.....	9475, 9675
0300-0330		Radio Kiev, Ukrain SSR.....	6200, 7165
			11790, 11860
			13645
0300-0345		Radio Berlin Int'l.....	6080, 9560
0300-0350		Deutsche Welle, West Germany	6010, 6045
			9545, 9700
0300-0355		Radio Beijing, China.....	9770, 11715
			11980
0300-0400		Armed Forces Radio and TV...	6030. 11730
0300-0400		CFCX, Montreal, Canada.....	6005
0300-0400		CFRX, Toronto, Canada.....	6070
0300-0400		CFVP, Calgary, Canada.....	6030
0300-0400		CHNX, Halifax, Canada.....	6130
0300-0400		CKFX, Vancouver, Canada.....	6080
0300-0400		HCJB, Ecuador.....	6230, 9720
			11775
0300-0400	T-A	KVOH, California.....	9495
0300-0400		Radio Australia, Melbourne.	15160, 15320
			15395, 17795
0300-0400		Radio Cultural, Guatemala..	3300
0300-0400	T	Radio Earth (WHRI).....	7400
0300-0400		Radio Havana Cuba.....	6140
0300-0400		Radio Japan.....	5960
0300-0400		Radio Moscow.....	5915, 5940
			6000, 6045
			6070, 7115
			7150, 7310
0300-0400		Radio New Zealand Int'l....	15150, 17705
0300-0400		Radio Prague, Czechoslovakia	5930, 6055
			7345, 9540
0300-0400		Radio RSA, South Africa.....	4990, 7295
			9580, 11900
0300-0400		Radio Tirana Albania.....	7065, 9760

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0300-0400	South Africa Bcasting Corp..	3215
0300-0400	Trans World Radio, Bonaire..	9535
0300-0400	Voice of America.....	5995, 6035 7200, 7280 9525, 9575 9740, 11835
0300-0400	Voice of Free China, Taiwan.	5985, 9555
0300-0400 W-M	WHRI, Indiana.....	7400
0300-0400	WRNO Worldwide.....	7355
0300-0400	WYFR, Florida, USA.....	9860
0313-0400	Radio France International..	6055, 7135 7175, 9550 9790, 9800 11995
0330-0400	BBC, England.....	5975, 6005 6120, 6155 6175, 6195 7185 9410 9600, 9915
0330-0400	Radio Tanzania.....	9684
0340-0350 T-S	Voice of Greece.....	7430, 9395 9420
0350-0400	RAI, Italy.....	9710
0352-0358	Radio Yerevan, Armenian SSR	11790, 11860 13645, 15180

0400 UTC [11:00 PM EST/8:00 PM PST]

0400-0413	Radio Budapest, Hungary.....	9835
0400-0425	Radio Netherlands.....	9850
0400-0430	BBC, London, England.....	3955, 5975 6005, 6120 6175, 6180 6195, 7105 7185, 7260 9410, 9600
0400-0430	Radio Budapest, Hungary.....	5990, 9570
0400-0430	Radio RSA, South Africa.....	4990, 7295 9580, 11900
0400-0430	Radio Tanzania.....	9684
0400-0430	Swiss Radio International...	6135 9725 9885, 12035
0400-0430	Trans World Radio, Bonaire..	9535
0400-0500	Armed Forces Radio and TV...	6030, 11730
0400-0500	CBC Northern Quebec Service.	6195
0400-0500	CFCX, Montreal, Canada.....	6005
0400-0500	CFRX, Toronto, Canada.....	6070
0400-0500	CFVP, Calgary, Canada.....	6030
0400-0500	CHNX, Halifax, Canada.....	6130
0400-0500	CKFX, Vancouver, Canada.....	6080
0400-0500	HCJB, Ecuador.....	6230, 9720 11775
0400-0500	Radio Australia, Melbourne.	15160, 15240 15320, 15395 17795
0400-0500	Radio Havana Cuba.....	5965, 6035 6140
0400-0500	Radio Moscow World Service.	5940, 6000 7150, 7165 7310, 9490
0400-0500	Radio New Zealand.....	15150, 17705
0400-0500	Radio Sofia Bulgaria.....	7115
0400-0500	RAE, Argentina.....	9690, 11710
0400-0500	Voice of America.....	5995, 6035 7200, 7280 9525, 9575 11835
0400-0500	Voice of Turkey.....	9445
0400-0500	WHRI, Indiana.....	7400
0400-0500	WRNO Worldwide.....	6185
0400-0415	RAI, Italy.....	9710
0425-0440	RAI, Italy.....	7275
0430-0500	BBC, London, England.....	3955, 5975 6005, 6180 6195, 7185 9510, 9600
0430-0500	Deutsche Welle, W. Germany..	6065, 7225
0430-0500	Radio Austria International.	6000
0430-0500	RAdio Berlin Int'l.....	6080, 9560
0440-0455	Radio France International..	6055, 6175 7135, 7175 9790, 9800

0500 UTC [12:00 PM EST/9:00 PM PST]

0500-0510	CBC Northern Quebec Service	6195, 9625
0500-0515	Deutsche Welle, W. Germany..	6065, 7105
0500-0515	Radio Berlin Int'l.....	6080
0500-0530	BBC, London.....	5975, 6005 6155, 6180 6195, 7105 7185, 9510 9580, 9600
0500-0530 S,M	Trans World Radio, Bonaire..	9535
0500-0550	Deutsche Welle.....	5960, 6120 6130
0500-0600	Armed Forces Radio & TV.....	6030, 11730
0500-0600	CFCX, Montreal, Canada.....	6005
0500-0600	CFRX, Toronto, Canada.....	6070
0500-0600	CFVP, Calgary, Canada.....	6030
0500-0600	CHNX, Halifax, Canada.....	6130
0500-0600	CKFX, Vancouver, Canada.....	6080
0500-0600	HCJB, Quito, Ecuador.....	6230, 9720 11775
0500-0600	Radio Australia, Melbourne.	15160, 15240 17795
0500-0600	Radio Havana Cuba.....	5965, 6140
0500-0600	Radio Japan, Tokyo.....	15235, 17810
0500-0600	Radio Moscow.....	5915, 5940 6105, 7150 7165, 7310
0500-0600	Radio New Zealand Int'l....	15150
0500-0600	Spanish Foreign Radio.....	6125
0500-0600	Voice of America.....	5995, 6035 7200, 7280 9540
0500-0600	WHRI, Indiana.....	7400
0500-0600 S	WRNO Worldwide.....	6185
0500-0600	WYFR, Florida, USA.....	5950
0530-0600	Radio Netherlands.....	6165, 9715

0600 UTC [1:00 AM EST/10:00 PM PST]

0600-0615	Ghana Broadcasting Corp.....	3366, 4915
0600-0620	Radio Vaticana.....	6185
0600-0630	Radio Netherlands.....	6165, 9715
0600-0700	Armed Forces Radio and TV...	6030
0600-0700	BBC, London.....	5975, 6180 6195, 7105 7150, 7185 9410, 9600 9640
0600-0700	CBC Northern Quebec Service.	6195
0600-0700	CFCX, Montreal, Canada.....	6005
0600-0700	CFRX, Toronto, Canada.....	6070
0600-0700	CFVP, Calgary, Canada.....	6030
0600-0700	CKFX, Vancouver, Canada.....	6080
0600-0700	CHNX, Halifax, Canada.....	6130

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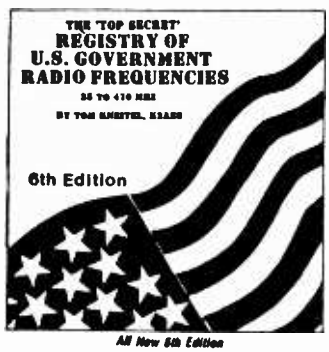

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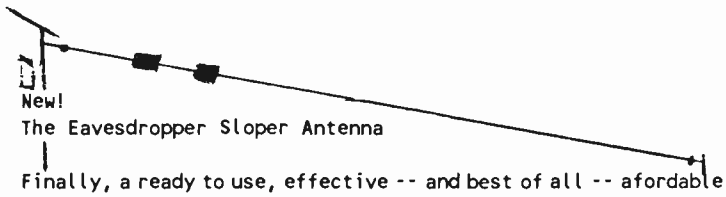

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frequency SECTION

0600-0700	HCJB, Quito, Ecuador.....	6230, 9720 11775
0600-0700	Radio Australia, Melbourne.	11945, 15240 17795
0600-0700	Radio Havana Cuba.....	9525
0600-0700	Radio Moscow.....	5915, 5940 6105, 6130 7165, 7310
0600-0700	Voice of America.....	5995, 6035 6080, 6125 7200, 7280 9530, 9540 9550
0600-0700	Voice of Nicaragua.....	6100
0600-0700	WHRI, Indiana.....	6100, 7400
0600-0700	WYFR, Florida, USA.....	5950, 6065 7355
0615-0700	Deutsche Welle, West Germany	9700

0700 UTC [2:00 AM EST/11:00 AM PST]

0700-0730	BBC, London.....	5975, 7150 9410, 9600 9640, 15400
0700-0730	Radio Australia.....	9655, 11720
0700-0745	Radio Berlin Int'l.....	5965
0700-0800	CFRX, Ontario, Canada.....	6070
0700-0800	HCJB.....	6130, 9845 11835
0700-0800	Radio Havana Cuba.....	9525
0700-0800	Radio Moscow.....	7290
0700-0800	Trans World R. Monte Carlo	7105
0700-0800	WCSN, Boston, Mass.....	7365
0700-0800	WHRI, Indiana.....	6100, 7400
0700-0800	WYFR, Florida.....	6065
0730-0800	Radio Finland, Helsinki.....	6120
0730-0800	Radio Netherlands.....	9630, 9715
0730-0800	Swiss Radio International...	6165, 9535 9560, 9885

0800 UTC [3:00 AM EST/12:00 PM PST]

0800-0825	Radio Netherlands.....	9630, 9715
0800-0830	BRT, Belgium.....	5910
0800-0830	HCJB, Quito, Ecuador.....	6130, 6205 11835
0800-0900	ABC, Brisbane, Australia....	9660
0800-0900	BBC, London.....	5975, 7150 9410, 9600 9640, 11860 15400
0800-0900	CFRX, Canada.....	6070
0800-0900	Radio Australia.....	5995, 9580 9655, 11720
0800-0900	Radio Korea, South.....	7550, 13670
0800-0900	Radio Moscow.....	7310
0830-0900	HCJB, Quito, Ecuador.....	6130
0800-0900	WCSN, Boston, MA.....	7365
0800-0900	WHRI, Indiana.....	7355

0900 UTC [4:00 AM EST/1:00 AM PST]

0900-0930	Radio Australia.....	9580, 9655 9710, 11720
0900-1000	ABC, Perth, Australia.....	9610
0900-1000	BBC, London, England.....	7180, 9410 12095, 15070
0900-1000	AFRTS.....	6030, 9530
0900-1000	CFRX, Canada.....	6070
0900-1000	CKZU, British Columbia.....	6160
0900-1000	Deutsche Welle.....	6160
0900-1000	HCJB, Quito, Ecuador.....	6130, 11925
0900-1000	KTWR, Guam.....	11805
0900-1000	WHRI, Indiana.....	7355
0900-1000	WYFR, Florida.....	6175
0930-1000	Radio Australia.....	9580, 9655 9760
0930-1000	Radio Beijing, China.....	9700, 11755

1000 UTC [5:00 AM EST/2:00 AM PST]

1000-1025	Radio Beijing, China.....	9700, 11755
1000-1030	Radio Australia.....	9580, 9655 9770
1000-1030	Swiss Radio International..	9560, 9885 17830
1000-1100	ABC, Perth, Australia.....	9610
1000-1100	AFRTS.....	6030, 6125 9530
1000-1100	BBC, London.....	9410, 11705 12095, 15070
1000-1100	CFRX, Toronto, Canada.....	6070
1000-1100	CHNX, Nova Scotia, Canada...	6130
1000-1100	KTWR, Guam.....	11805
1000-1100	Radio Moscow.....	6000, 13790 15405, 15225 15475, 15595
1000-1100	Voice of America.....	5975, 5985 6160, 9590 15225
1000-1100	WHRI, Indiana.....	7355
1030-1100	Radio Australia.....	9580, 9770

1100 UTC [6:00 AM EST/3:00 AM PST]

1100-1130	HCJB, Ecuador.....	11740
1100-1130	Radio Australia.....	5995, 6060 6080, 7215 9580
1100-1130	Voice of America.....	5975, 5985 6160, 9590
1100-1155	Radio Beijing, China.....	9665
1100-1200	ABC, Perth, Australia.....	9610
1100-1200	AFRTS.....	6030, 6126 9700, 15430
1100-1200	BBC, London.....	5965, 6195 11775, 15070 17790
1100-1200	CFCX, Montreal, Canada.....	6005
1100-1200	CFRX, Toronto, Canada.....	6070
1100-1200	CFVP, Calgary, Canada.....	6030
1100-1200	CHNX, Halifax, Canada.....	6130
1100-1200	CKFX, Vancouver, Canada.....	6080
1100-1200	KYOI, Saipan.....	11900
1100-1200	Radio Japan General Service.	6120
1100-1200	Radio Moscow.....	6000, 13790 15225, 15475
1100-1200	Radio RSA, South Africa....	21590
1100-1200	WHRI, Indiana, USA.....	5995, 11790
1100-1200	WYFR, Florida.....	5950
1115-1200	TWR, Bonaire.....	11815
1130-1200	HCJB, Quito, Ecuador.....	11740
1130-1200	Radio Australia.....	5995, 6060 6080, 7215 9580, 9710

frequency SECTION

		9770, 21480
1130-1200	Radio Netherlands.....	15560, 17605

1200 UTC [7:00 AM EST/4:00 AM PST]

1200-1225	Radio Netherland.....	15560, 17605
1200-1230	HCBJ, Ecuador.....	6075
1200-1230	Radio Australia.....	5995, 6060
		6080, 7205
		7215, 9580
		9710, 9770
1200-1230	Radio Finland, Helsinki....	11945, 15400
1200-1230	Radio Tashkent, USSR.....	7275, 9540
		9600
1200-1242	Trans World Radio Bonaire..	11815
1200-1300	ABC, Wanneroo, Australia....	9610
1200-1300	AFRTS.....	6030, 6125
		15430
1200-1300	BBC, London.....	5965, 6195
		11775, 12095
		15070, 15420
		17705, 17790
		21710, 21470
1200-1300	CFCX, Montreal, Canada.....	6005
1200-1300	CFRX, Toronto, Canada.....	6070
1200-1300	CFVP, Calgary, Canada.....	6030
1200-1300	CHNX, Halifax, Canada.....	6130
1200-1300	CKFX, Vancouver, Canada.....	6080
1200-1300	HCJB, Quito, Ecuador.....	11740, 15115
		17890
1200-1300	KYOI, Saipan.....	11900
1200-1300	Radio Moscow.....	6000, 9635
		13790, 15140
		15150, 15225
		15230, 15420
		15460, 15475
		15490, 15540
		15595, 17655
		17820
1200-1300	Radio RSA, South Africa....	21590
1200-1300	Voice of America, Wash.....	11715
1200-1300	WHRI, Indiana.....	5995, 11790
1200-1300	WYFR, USA.....	5950, 6185
1200-1256	Radio Beijing.....	7355, 9635
		9665, 11715
1230-1300	Radio Australia, Melbourne..	5995, 6060
		6080, 7205
		7215, 9580
		9770
1230-1300	Radio Austria International	15320
1230-1300	Radio Bangladesh.....	15525
1245-1300	Radio Berlin Int, E.Germany	15240
1245-1255	Radio France International.	15155, 15365
		17720, 21645

1300 UTC [8:00 AM EST/5:00 AM PST]

1300-1330	BBC, London.....	5965, 6195
		9510, 11760
		11775, 12095
		15070, 15105
		15420, 17705
		17790, 18080
		21470, 21710
1300-1330	Radio Australia.....	5995, 6060
		6080, 9580
1300-1330	Radio Berlin Int, E.Germany	15240
1300-1330 S	Radio Norway International.	15310
1300-1330	Swiss Radio International..	12030
1300-1337 A-S	TWR, Bonaire.....	11815
1330-1355 S	Radio Finland.....	11945, 15400
1300-1400	ABC Waneroo, Australia.....	9610
1300-1400	AFRTS.....	6125, 15330
		15430
1300-1400	CFCX, Montreal, Canada.....	6005
1300-1400	CFRX, Toronto, Canada.....	6070
1300-1400	CFVP, Calgary, Canada.....	6030
1300-1400	CHNX, Halifax, Canada.....	6130
1300-1400	CKFX, Vancouver, Canada.....	6080
1300-1400	CKZU, Vancouver, Canada.....	6160
1300-1400	HCJB, Quito, Ecuador.....	11740, 15115
		17890
1300-1400	KYOI, Saipan.....	11900
1300-1400	Radio Canada Int'l.....	9625, 11855
		15535, 17820
1300-1400	Radio Moscow.....	9820, 13790
		15225, 15475
		15540, 15595
		17655, 21725
1300-1400	Radio RSA, South Africa....	9750, 15125
		17810, 21590
1300-1400	Voice of America.....	9760
1300-1400	WHRI, Indianapolis.....	9455, 11790
1300-1400	WYFR, USA.....	5950, 13695
		15170
1330-1400	BBC, London.....	12095, 15070
		15105, 17705
		17790, 21710
1330-1355 M-A	BRT, Belgium.....	15590
1330-1400	Radio Australia.....	6060, 9580
1330-1400	Radio Berlin International.	17880, 21465
		21540
1330-1400	Swiss Radio International..	11955, 15135
		15570, 17830
		21695
1330-1400	U.A.E. Radio.....	15435, 17865
		21605

1400 UTC [9:00 AM EST/6:00 AM PST]

1400-1415	Radio Berlin International	17880, 21465
1400-1430	Radio Australia.....	7205, 9580
1400-1430	Radio Finland.....	11945, 15400
1400-1430 S	Radio Norway International.	15310, 15315
1400-1430	Radio Sweden International.	15345
1400-1500	ABC Perth, Australia.....	9610
1400-1500	AFRTS.....	15330
1400-1500	BBC, London.....	12095, 15070
		17790
1400-1500	CBC Northern Quebec Service.	9625, 11720
1400-1500	CFCX, Montreal, Canada.....	6005
1400-1500	CFRX, Toronto, Canada.....	6070
1400-1500	CFVP, Calgary, Canada.....	6030
1400-1500	CHNX, Halifax, Canada.....	6130
1400-1500	CKFX, Vancouver, Canada.....	6080
1400-1500	HCJB, Quito, Ecuador.....	11740, 15115
		17890
1400-1500	KYOI, Saipan.....	11900
1400-1500 S	Radio Canada International.	9625, 11720
		11955, 15440
		17820
1400-1500	Radio Korea, South.....	9750
1400-1500	Radio Moscow.....	11840, 13790
		15225, 15475
		15540, 15595
1400-1500	Radio RSA, South Africa....	21590
1400-1500	Voice of America, Wash DC...	9760
1400-1500	WHRI, Indiana.....	9455, 11790

frequency SECTION

1400-1500		WYFR, USA.....	6175
1430-1500		KTWR, Guam.....	9870
1430-1500	S	Radio Finland.....	11945, 15400
1430-1500		Radio Netherland.....	11735, 13770 15560

1500 UTC [10:00 AM EST/7:00 AM PST]

1500-1530		HCJB, Quito, Ecuador.....	11740, 15115 17890
1500-1530		Radio Finland, Helsinki....	15185
1500-1530		Radio Netherland.....	11735, 13770 15560
1500-1556		Radio RSA, South Africa....	15125, 17810 21590
1500-1600		ABC Perth, Australia.....	9610
1500-1600		AFRTS.....	9700, 15330 15430
1500-1600		BBC, London.....	12095, 15070 15400, 15420 17705, 17885 21710
1500-1600	A,S	BBC, London.....	9515, 15260
1500-1600		CBC Northern Quebec Service.	9625, 11720
1500-1600		CFCX, Montreal, Canada.....	6005
1500-1600		CFRX, Toronto, Canada.....	6070
1500-1600		CFVP, Calgary, Canada.....	6030
1500-1600		CKFX, Vancouver, Canada.....	6080
1500-1600		CHNX, Halifax, Canada.....	6130
1500-1600		KTWR, Guam.....	9870
1500-1600		KYOI, Saipan.....	11900
1500-1600		Radio Australia.....	9580
1500-1600	S	Radio Canada International.	9625, 11720 11955, 15440 17820
1500-1600		Radio Japan General Service	21700
1500-1600		Radio Moscow.....	11670, 11840 13790, 15475 15585
1500-1600		Voice of America.....	15205
1500-1600		Voice of Ethiopia.....	9560
1500-1600		WHRI, Indiana.....	15105, 21700
1500-1600		WYFR, Florida.....	5950, 6175 13695, 15170
1515-1600		Radio Berlin International	15240
1530-1600		Radio Yugoslavia.....	15240
1530-1600		Swiss Radio International..	9885, 15430 17830, 21695
1540-1548	M-F	Voice of Greece.....	15630
1545-1600		Radio Canada International.	11915, 11935 15135, 15325 17820

1600 UTC [11:00 PM EST/8:00 AM PST]

1600-1630	S	Radio Norway International.	15310
1600-1640		UAE Radio Dubai.....	15320
1600-1700		AFRTS.....	15330, 15430
1600-1700		BBC, London.....	9515, 12095 15070, 15260 15400, 17705 17885
1600-1700		CBC Northern Quebec Svc.....	9625, 11720
1600-1700		CFCX, Montreal, Canada.....	6005
1600-1700		CHNX, Halifax, Canada.....	6130
1600-1700		CFRX, Toronto, Canada.....	6070
1600-1700		CFVP, Calgary, Canada.....	6030
1600-1700		CKFX, Vancouver, Canada.....	6080
1600-1700		Radio Beijing, China.....	11715, 15130
1600-1700		Radio Canada International.	9625, 11720 11955, 15440 17820
1600-1700		Radio Canada Int'l,Montreal	11935, 15135 15325
1600-1700		Radio France International.	11670, 11705 11995, 15315
1600-1700		Radio Moscow.....	11840
1600-1700		Voice of America.....	15205, 15410 15445, 15580 15600, 17785 17800, 17870
1600-1700		WCSN, Boston, MA.....	15280
1600-1700		WHRI, Indiana.....	15105, 21700
1600-1700		WRNO Worldwide.....	15420
1600-1700		WYFR, Florida.....	11830, 13695 15440, 15170 17613, 17750
1630-1700		Radio Netherland.....	15570

1700 UTC [12:00 PM EST/9:00 AM PST]

1700-1730		Radio Netherlands.....	15570
1700-1745		BBC, England.....	9410, 9515 12095, 15070 15260, 15400 17885
1700-1800		AFRTS.....	15330, 15430
1700-1800		CBC Montreal.....	9625, 11720
1700-1800		CFCX, Montreal, Canada.....	6005
1700-1800		CFRX, Toronto, Canada.....	6070
1700-1800		CFVP, Calgary, Canada.....	6030
1700-1800		CHNX, Halifax, Canada.....	6130
1700-1800		CKFX, Vancouver, Canada.....	6080
1700-1800		CKZU, Vancouver, Canada.....	6160
1700-1800	S	KCBI, Texas.....	11735
1700-1800		Radio Moscow.....	9565, 9760 11760, 21485
11840			
1700-1800		Voice of America.....	15410, 15445 15580, 15600 17785, 17800 17870
1700-1800		WCSN, Massachusetts.....	15280
1700-1800		WHRI, Indiana.....	15105
1700-1800		WINB, Pennsylvania.....	15295
1700-1800	S-F	WMLK, Pennsylvania.....	9455
1700-1800		WRNO Worldwide.....	15420
1700-1800		WYFR, Florida.....	11580, 13695 17613
1745-1800		BBC, London.....	9410, 12095 15070, 15400 17885

1800 UTC [1:00 PM EST/10:00 AM PST]

1800-1830		Radio Canada International	15260, 17820
1800-1830		Swiss Radio International...	9535
1800-1900		AFRTS.....	15330, 15430
1800-1900		BBC, London.....	9410, 12095 15070, 15400
1800-1900		CBC, N. Quebec Service.....	9625, 11720
1800-1900		CFCX, Montreal, Canada.....	6005
1800-1900		CFRX, Toronto, Canada.....	6070
1800-1900		CFVP, Calgary, Canada.....	6030
1800-1900		CKFX, Vancouver, Canada.....	6080
1800-1900		CKZU, Vancouver.....	6160
1800-1900	A,S	KCBI, Texas.....	11735

frequency SECTION

1800-1900		Radio Moscow.....	9565, 11840
1800-1900		Radio Kuwait.....	11665
1800-1900		Voice of America.....	9700, 9760
			11760, 15410
			15445, 15580
			15600, 17785
			17800, 17870
			21485
1800-1900		WCSN, Boston, Mass.....	21515
1800-1900		WHRI, Indiana.....	13760
1800-1900		WINB, Pennsylvania.....	15295
1800-1900	S-F	WMLK, Bethel, PA.....	9455
1800-1900		WRNO Worldwide.....	15420
1800-1900		WYFR.....	11580, 13695
			15170, 17613
1830-1900	A,S	Radio Canada International	15260, 17820
1830-1900		Radio Netherlands.....	15180, 17605
			21685
1830-1900		Spanish Foreign Radio.....	15375
1830-1900		Radio Havana Cuba.....	9670
1830-1900		Radio Tirana Albania.....	9480

1900 UTC [2:00 PM EST/11:00 AM PST]

1900-1925		Radio Netherland.....	17605, 21685
1900-1930		Radio Norway International.	9590
1900-1930		Spanish Foreign Radio.....	15375
1900-2000		AFRTS.....	15330
1900-2000		BBC, London.....	9410
1900-2000		CBC Northern Quebec Serv....	9625. 11720
1900-2000		CFCX, Montreal, Canada.....	6005
1900-2000		CFRX, Toronto, Canada.....	6070
1900-2000		CFVP, Calgary, Canada.....	6030
1900-2000		CKFX, Vancouver, Canada.....	6080
1900-2000		CKZU, Vancouver, Canada.....	6160
1900-2000		HCJB, Ecuador.....	15270, 17790
1900-2000	S	KCBI, Texas.....	11735
1900-2000		Radio Havana Cuba.....	9670, 11795
1900-2000		Radio Kuwait.....	11665
1900-2000		Radio Moscow.....	9565, 11840
1900-2000		Voice of America.....	9700, 11760
			15410, 15445
			15580, 17785
			17800, 17870
1900-2000		WCSN, Boston, Mass.....	21515
1900-2000		WHRI, Indiana.....	17830
1900-2000		WMLK, Bethel, PA.....	9455
1900-2000		WRNO Worldwide.....	15420
1900-2000		WYFR, Okeechobee, Florida..	11830, 13695
			15170, 15566
1930-2000		Radio Bucharest, Romania....	9690, 11940
1930-2000	M-F	Radio Canada International.	11945, 15325
			17875
1940-2000		Vatican Radio.....	9645
1945-2000		Radio Berlin International	15170

2000 UTC [3:00 PM EST/12:00 PM PST]

2000-2010		Vatican Radio.....	9645
2000-2030		Kol Israel.....	7462.5,9010
			9435
2000-2025		Radio Bucharest, Romania...	9690
2000-2030		Radio Sofia Bulgaria.....	7155
2000-2100		AFRTS.....	9700, 15330
			15430
2000-2100		BBC, London.....	6175, 7325
			9410, 9580
			11820, 12095
			15260, 15400
2000-2100		CBC Northern Quebec Svc.....	9625, 11720
2000-2100		CFCX, Montreal, Canada.....	6005
2000-2100		CFRX, Toronto, Canada.....	6070
2000-2100		CFVP, Calgary, Canada.....	6030
2000-2100		CHNX, Halifax, Canada.....	6130
2000-2100		CKFX, Vancouver, Canada.....	6080
2000-2100		CKZV, Canada.....	6160
2000-2100	M-A	Equatorial Guinea.....	9552.5
2000-2100	A,S	KCBI, Texas.....	11735
2000-2100	M-F	KVOH, California.....	17775
2000-2100		Radio Kuwait.....	11665
2000-2100		Radio Moscow.....	7115, 7150
			9565, 11840
2000-2100		Voice of America.....	6045, 9700
			9760, 11760
			15410, 15445
			15580, 17800
			17785, 17870
			21485
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2000-2100		WHRI, Indiana.....	13760, 17830
2000-2100		WRNO, Worldwide.....	15420
2000-2100		WYFR, Okeechobee, Florida..	9455, 17613
			13695, 15170
			15566, 17845
2005-2100		Radio Damascus Syria.....	11625, 12085
2015-2100		Radio Cairo, Egypt.....	9670
2030-2100		Radio Beijing, China.....	9745, 11790
2030-2100		Radio Korea, South.....	7550
2030-2100		Radio Netherland.....	9540, 9715
			9895, 11740

2100 UTC [4:00 PM EST/1:00 PM PST]

2100-2115		Radio Cairo, Egypt.....	9670
2100-2125	S-F	CBC Northern Quebec Service.	9625, 11720
2100-2125	M-A	Radio Austria Int'l.....	7205
2100-2125		Radio Netherland.....	9540, 9715
			9895, 11740
2100-2130		Radio Beijing, China.....	9745, 11790
2100-2130		Radio Bucharest, Romania....	7195, 5990
2100-2130		Radio Budapest, Hungary.....	9835
2100-2130		Radio Canada Int'l.....	5995, 11945
			15325
2100-2130		Radio Korea, South.....	7550
2100-2130		Swiss Radio Int'l.....	9885, 12035
			15570
2100-2140		Radio Havana Cuba.....	11705, 15230
			15340
2100-2150		Voice of Turkey.....	7215
2100-2156		Radio RSA.....	7295, 9580
			11900
2100-2200		AFRTS.....	15330, 15345
			15430
2100-2200		BBC, London.....	6005, 6175
			6180, 6195
			7325, 9410
			15260
2100-2200		CFCX, Montreal, Canada.....	6005
2100-2200		CFRX, Toronto, Canada.....	6070
2100-2200		CFVP, Calgary, Canada.....	6030
2100-2200		CHNX, Halifax, Canada.....	6130
2100-2200		CKFX, Vancouver, Canada.....	6080
2100-2200	M-A	Equatorial Guinea.....	9552.5
2100-2200		KVOH, California.....	17775
2100-2200		Radio Baghdad, Iraq.....	7295
2100-2200		Radio Moscow.....	7150, 7195
			7310, 11840
			21485

frequency SECTION

Your QSL Card Belongs Here!

If you've received a QSL card from a shortwave broadcaster -- or have one in your collection -- that you'd like to share with other *Monitoring Times* readers, send it to us. Each month, we'll print some of them in the frequency section. High quality copies are acceptable but we prefer the original card for best reproduction. And, of course, we'll take special care of your card and return it to you promptly.

Send your card(s) to Rachel Baughn, QSL editor, P.O. Box 98, Brasstown, NC 28902.

2100-2200		Voice of America.....	6045, 9700
			11760, 15220
			15410, 15445
			15580, 17785
			17800, 17870
			17880
2100-2200		WCSN, Boston, Mass.....	9495
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			13695, 15170
			17613, 17845
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2125-2150	S	Radio Austria Int'l.....	7205
2130-2200	S-F	CBC Northern Quebec Service	9625, 11720
2130-2200		HCJB, Quito, Ecuador.....	11790, 15270
			17790
2130-2200		Radio Canada International.	5995, 11880
			15150, 17820
2130-2200	A-S	Radio Canada International	11945, 15325
2130-2200		Radio Moscow.....	5915, 5945
			7150, 7105
			7310, 11840
2130-2200		Radio Sofia, Bulgaria.....	6070, 7115
			7155
2145-2200		Radio Berlin International	6125

2200 UTC [5:00 PM EST/2:00 PM PST]

2200-2225		BRT, Belgium.....	5910, 6035
2200-2225		Radio Finland.....	6120, 9670
2205-2225		Vatican Radio.....	6015, 9615
			11830
2200-2225		RAI, Italy.....	9710
2200-2230		CBC Northern Quebec Service	9625, 11720
2200-2230		KGEI, California.....	15280
2200-2230		Radio Berlin Int'l.....	6125
2200-2230	S	Radio Norway Int'l, Oslo....	9525, 9605
2200-2300		AFRTS.....	6030, 15345
			15430
2200-2300		BBC, London.....	3955, 5975
			6005, 6175
			6195, 6180
			7325, 9410
			9515, 9915
			15260
2200-2300		CFCX, Montreal, Canada.....	6005
2200-2300		CFRX, Toronto, Canada.....	6070
2200-2300		CFVP, Calgary, Canada.....	6030
2200-2300		CHNX, Halifax, Canada.....	6130
2200-2300		CKFX, Vancouver, Canada.....	6080
2200-2300		CKZU, Vancouver.....	6160
2200-2300		KVOH, California.....	17775
2200-2300		Radio Australia.....	15160, 15240
			15320, 15395
			17795
2200-2300	M-F	Radio Canada International	9760, 11945
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			6045, 6170
			6200, 7115
			7195, 7310
			9710
2200-2300		RAE Argentina.....	9690, 11710
2200-2300		Voice of America.....	11760, 15290
2200-2300		Voice of Free China, Taiwan	7355, 9955
			11805
2200-2300		WCSN, Boston, Mass.....	9495
2200-2300		WHRI, Indiana.....	9770, 17613
			17830
2200-2300		WRNO, Louisiana.....	13760
2200-2300		WYFR, Florida.....	13695, 15170
			17845
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			9620
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			11610
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2230-2300		Swiss Radio Int'l.....	6190
2230-2300		WRNO Worldwide.....	9495
2245-2300		GBC1 Ghana.....	4915

2300 UTC [6:00 PM EST/3:00 PM PST]

2300-2330		BBC, London.....	3955, 5975
			6005, 6120
			6175, 6180
			6195, 7325
			9410, 9590
			9915, 9515
			11955
2300-2330		Radio Canada International..	9755, 11730
2300-2330		Radio Sofia, Bulgaria.....	11720
2300-2330		Radio Sweden International..	6045, 9695
2300-2330		Radio Vilnius.....	6200, 7165
			13645, 11790
2300-2345		Radio Berlin International..	6165
2300-0000		AFRTS.....	6030, 15345
2300-0000	A,S	CBC Northern Quebec Service	11720
2300-0000		CFCX, Montreal, Canada.....	6005
2300-0000		CFRX, Toronto, Canada.....	6070
2300-0000		CFVP, Calgary, Canada.....	6030
2300-0000		CHNX, Halifax, Canada.....	6130
2300-0000		CKFX, Vancouver, Canada.....	6080
2300-0000		CKZU, Vancouver.....	6160
2300-0000		KVOH, California.....	17775
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2300-0000		Radio Moscow, U.S.S.R.....	5915, 5940
			6045, 7115
			7215, 7310
			15425
2300-0000		Voice of Turkey.....	9445
2300-0000		WHRI, Indiana.....	9770, 11770
2300-0000		WRNO, Louisiana.....	9495
2300-0000		WYFR, Florida.....	9660, 9680
2330-0000		BBC, London.....	5975, 6005
			6120, 6175
			7325, 9515
			9590, 9915
			11955
2330-0000		Radio Korea (South).....	15575
2335-2345		Voice of Greece.....	9395

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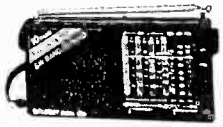

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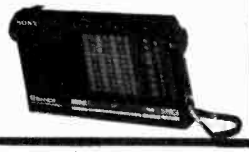

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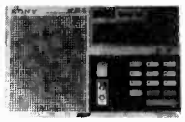

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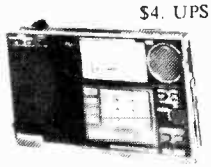

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CIRCLE 55 ON READER SERVICE CARD

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Lawrence Magne

Editor-in-Chief
Passport to World Band Radio

Automobile Shortwave Converters

Recently, reader Bob Skaggs of Santa Fe wrote to inquire as to why manufacturers aren't making in-dash shortwave radios for cars. After all, if you drive long distances listening to local radio can get pretty tiresome. The likes of the BBC World Service can be like a breath of fresh air.

Actually, to some extent they already do. In Europe, various manufacturers incorporate the 6 MHz (49 meter) and even 7 MHz (41 meter) bands in selected models of car radios. That's because these bands -- also sometimes called the "European bands" -- are widely used for regional coverage of domestic stations, especially in Germany.

Additionally, since 1986 Philips has been advertising its 90AC 739 car radio in Holland. This digital-readout model, which mounts under your dashboard, includes not only the usual AM and FM, but also shortwave from 3.9-22 MHz and a compact-disc player. That's the good news. The bad news is that Philips' North American subsidiary, Magnavox, has no plans to carry this model. If you want to lay your hands on one, you'll have to find an excuse to travel abroad.

Declining Shortwave Market

However, outside Germany, where shortwave has always been fairly popular, shortwave listening in Europe has been on the decline until recently. Historically, this market has just been too specialized to warrant a mass-market producer like, say, Delco to produce a special automobile radio covering shortwave.

Although the shortwave listening market in North America is growing steadily -- it's now probably around 3-4% of the population -- it's hardly comparable to either the AM or FM markets. Too, if history is any guide, new audio concepts tend to appear first in homes, and only much later in automobiles. With hi-fi, for example, as late as 1974 only 13 percent of cars in the US were equipped with stereo FM, even though stereo was commonplace in homes. Now, well over 80 percent of US cars are equipped with stereo FM. It takes time for a home audio market to translate into a mobile audio market.

Ignition Noise

There's a special problem concerning listening to shortwave in a moving car: the "tap-tap-tap" of ignition noise which, at a minimum, can degrade reception of weaker shortwave signals. Conventional noise blankers, found on more costly receivers, act only when the strength of the received station is lower than that of the pulse interference.

What this means is that these blankers don't work very well. In principle, a blanker with its own separate wideband RF circuitry could create properly phased blanking independent of the received signal level. But these circuits would be relatively costly.

How much of a problem ignition noise will be depends on your car's ignition design and where its antenna is located, among other things. In some cases, this noise can be quite intrusive. In others, it's only a minor annoyance. The best way to find out is to listen to a shortwave portable with its antenna out the window while the engine is running -- both at idle and revved up.

Of course, diesel engines, which use compression instead of a spark to generate fuel ignition, produce no ignition noise whatsoever. Still, modern automobiles are like little homes on wheels, complete with noisy wiper motors, fuel-metering microprocessors and the like that may generate at least some electrical noise. And cars cuddled around you on the expressway don't help matters, either.

The Temporary Solution: Shortwave Converters

If shortwave -- or world band -- radio listening continues to grow as it has over the past few years, shortwave coverage will almost certainly will be included on at least some car radios. However, you don't have to wait until then to hear the world in your car. MFJ, Becker, Blaupunkt and other manufacturers already offer simple shortwave converters that allow your existing radio to receive at least the stronger signals.

According to MFJ's ad on page 38 of the just-released *1988 Passport to World Band Radio*, two mobile shortwave converters are available: the four-band MFJ-304 for $79.95, and the more sensible eight-band MFJ-308 for $99.95. MFJ and Becker both indicate that although these are not major sellers, they are being sought out by active listeners.

Mixed Results

Shortwave converters make use of your car's AM radio circuitry and antenna, plus the special circuitry in the converter itself. As we shall see, this interactive mixture has some disadvantages. But one advantage, besides price, is that it effectively provides double conversion. Double conversion is helpful in keeping "dih-dah" and other unwanted sounds from making listening unpleasant.

Another plus is that they're small and easily hidden. Since they don't have to be operated except when you wish to change bands -- tuning is done using your existing radio's regular tuning or slewing controls -- an ideal place for mounting is in the glove compartment.

We've tested the $200 German-made Becker "Reims" converter with both Panasonic and Becker models of AM/FM radios. Shortwave performance, overall, is only so-so -- especially with the less-well-shielded Panasonic -- and there's no semblance of a frequency readout to let you know where you're tuned. You're likely to get comparable results with the MFJ models.

However, reception is at least acceptable enough for you to be able to enjoy the major worldwide broadcasters, such as the BBC or Radio Canada International. The main problem in metropolitan areas, aside from ignition noise, is "breakthrough" of local AM stations. This is because a shortwave converter makes use of the car radio's AM circuitry, which tends to allow powerful local AM stations to "break through", and thus interfere with shortwave stations.

Selectivity is mediocre, too. These converters use old-fashioned circuitry that simply is not up to the rigors of today's crowded shortwave bands. But, again, for casual listening it's usually adequate. And when you do find a powerful station "in the clear", the broad selectivity becomes a virtue, inasmuch as it allows you to enjoy full wideband audio.

Interface Alignment

Sensitivity varies in concert with numerous variables. As a converter is interactive with your car radio's AM stage, the performance of that car radio is a factor. Additionally, with the Becker "Reims", there are numerous circuits that can be aligned after installation to provide a small degree of enhanced performance. In practice, installers appear to forego these cumbersome alignment steps and simply wire the converter to the radio. So, if you're looking for the best results, be prepared to pay a competent electronics technician to perform this time-consuming chore.

Neither MFJ model has provisions for such alignment; you simply connect the converter to the car's existing antenna and radio. This is a simpler approach and keeps converter and installation costs to a minimum. However, you do forfeit the possibility of the sort of precise peaking that can be performed on the "Reims".

Digital Car Radios

Another problem with shortwave converters is that if they are connected to a car radio having synthesized tuning, that radio may not tune shortwave precisely enough. This is because most synthesized North American AM-band radios tune in 10 kHz increments that don't necessarily correspond to channel locations on shortwave.

Fortunately, MFJ, at any rate, has devised various means by which this may be resolved should this be a problem for any of their customers. Even better is Becker's approach. They offer two versions of the "Reims" -- one for ordinary analog-tuned radios, another for radios with electronically synthesized tuning.

For now, mobile shortwave listening specialty antennas simply aren't available. What this means is that you have to make do with the standard whip located on a fender (an antenna built into the windshield won't do). In principle, an active whip antenna that attenuates below, say, 2 MHz would go a long way towards reducing "breakthrough" from local AM stations while, at the same time, improving reception of the weaker shortwave stations.

Becker offers a costly active all-band whip antenna as an accessory, but it has no circuitry to attenuate AM stations. Additionally, its capture area is miniscule because it's so short. We tested this model and found it does nothing of substance either to improve or to degrade reception of shortwave signals as compared to an ordinary passive whip antenna.

In short, for the time being shortwave listening and driving do go together, even if only to a limited extent. If you wish to purchase a shortwave converter, one hedge is to try it on a returnable basis. MFJ (800/647-1800) advertises a 30-day refund if you're not satisfied, provided you make your purchase directly from the factory. Becker (215/545-2434) doesn't appear to offer this option, but you might be able to negotiate this with a local dealer.

■

You can hear Larry Magne's equipment reviews the first Saturday night each month over Radio Canada International's "SWL Digest" at 8:10 PM Eastern Time on 5960 and 9755 kHz. Larry's "What's New in Equipment" is also featured over "SWL Digest" various other Saturdays throughout the month. Additionally, Passport's Don Jensen and Tony Jones can be heard the third Saturday night each month.

In the US, RDI White Papers are carried by various dealers, including Electronic Equipment Bank, Imprime and Universal Shortwave. A free catalogue of the latest editions of all available RDI White Papers, which cover -- warts and all -- the most advanced communications receivers, portables and antennas, may be obtained by sending a self-addressed stamped envelope to Publications Information, Radio Database International, Box 300, Penn's Park PA 18943 USA.

New Scanners Still Have Images and Intermod

by Bob Grove

Although scanners may be offering more functional perks, their basic weaknesses--poor dynamic range and first order image response--are still prevalent. Even the new Bearcat BC580XLT/600XLT and Regency TS-2 Turboscan have, in spite of their obvious triumphs, these shortcomings.

The BC600XLT offers miniaturization and plug-in accessories, but strong local signals will produce false signals which may be heard outside the signal frequencies. The optional preamplifier could well aggravate the problem and should not be used in metropolitan locations, especially with an outdoor base antenna.

Under the dashboard of a vehicle, using a short antenna as originally intended, the BC600XLT is a fine performer and, out in the open, away from big-city signals, the preamp will offer some improvement in weak signal reception.

Image range

Long-time reader Rene Borde of Sunnyvale, California, offers details. In the 29-54 and 118-136 MHz bands, images will be heard 21.7 MHz above the signal frequencies (50.7-75.7 and 139.7-157.1 MHz respectively); at 136-174 and 406-512 MHz, images will be heard 21.7 MHz lower (114.3-152.3 and 384.3-490.3 MHz).

Rene also reports that while images may be hopefully missed when the user programs in discrete frequencies, they will be frequently encountered in the search mode.

Modern-day miracles still have feet of clay

The Regency TS-2 Turboscan offers real improvement in scan and search speeds, but is no more immune to images than its competition, according to users. This susceptibility to first order image interference is overcome in the Realistic PRO-2004 by using up-conversion.

But the Radio Shack product has a problem of its own. Whether the result of insufficient low-noise gain or improper factory alignment, many owners report significantly lower signal sensitivity in the PRO-2004 than with competitive scanners. An external preamp cures that, however.

More on the PRO-2004 and PRO-2011

Those Unlockable Channels

In our October issue we reported on an interesting modification which would add another 100 channels of memory to the fast-selling Realistic PRO2004 scanner. Reader Dan Hughes made another interesting observation: After performing the modification, he found that some channels could not be locked out.

Rich Carlson of Arlington Heights, Illinois, phoned and Bill Cheek of Lemon Grove, California, wrote to say that this is perfectly normal; Radio Shack points out that in each bank the last channel cannot be locked out even before the modification.

So What Does D511 Do?

Next to the microprocessor is a line of holes which will accept several diodes, omitted in the American version. We previously discussed the purpose of some of the diodes, but it was left to Rich Carlson to solve the mystery of D511.

Apparently, D511 disables the 30 kHz increments for the cellular telephone band and the entire 800 MHz band is searched in 12.5 kHz increments. There is no reason to install D511, whether or not the cellular band is restored.

The PRO2011

Similar diodes girdle the microprocessor in the Radio Shack PRO2011 scanner. Rich Carlson decided to venture into those as well. While they produce some profound frequency programming changed, they cannot be used in the American version.

D44 adds 806-960 MHz and D45 adds 66-88 MHz; unfortunately, there is no RF circuitry to track the new tuning ranges, so no signals will be heard. Apparently, the same chip is used in a variety of scanners and diode-programmed for the frequency allocations of different countries.

Cellular Coverage on the new Bearcats

A number of scanner listeners have expressed concern over Uniden's decision to delete cellular coverage from their forthcoming BC200XLT and BC900XLT scanners. There is a bright spot on the horizon. At least one importer has arranged to bring in the scanners with total frequency capability.

Although details are not yet available as to whether cellular coverage will be already installed or whether it will be up to the owner to make the simple modification (as in the Realistic PRO2004), the scanners will be identified as BC205XLT and BC-950XLT.

Shipment of the hand-held BC205XLT is expected no sooner than February, while the BC950XLT, a look-alike of the popular new BC600XLT, but with additional 800 MHz coverage, should arrive a month or two later. Further information on these and other new products will be published in *MT* as soon as it becomes available.

■

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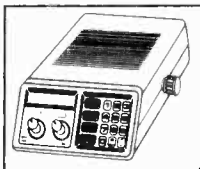

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REGENCY R1075 AC Digital Scanner	94.99	(6.00)
REGENCY MA-257 Cigarette cord for HX1000/1200	16.99	(*)
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REGENCY MA-549 Drop in charger for HX1000/1200	89.99	(5.00)
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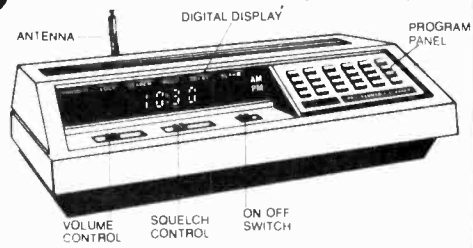

The Regency Z30 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10¾"Wx2-7/8"Hx8-3/8"D.

Sophisticated microprocess-controlled circuitry eliminates the need for crystals, instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only $39.99, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only $29.99, gives you a total of 3 yrs complete warranty.) Z-30 Service Manual $5.00.

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Guide to Utility Stations

Sixth edition by Jorg Klingenfuss (494 pages, 6-1/2" x 9-1/4", perfect bound; cost, $35 from MT advertisers or from Klingenfuss Publications, Hagenloher Str. 14, D-7400 Tuebingen, FRG)

One of the most authoritative publications on HF utilities stations is now expanded and updated even further, including SSB, CW, RTTY, and FAX worldwide. Although the listings are strongly European in emphasis, there is considerable information on North American transmissions as well.

The format of the directory is quite useful, showing basic bandplans and listing specific assignments under them. Data fields include frequency, call sign, location, mode, and schedule information as applicable.

A handy call sign list allows a listener to look up a legal identification he heard to determine the user; several US coastal stations and some US Navy callsigns are included, but the majority are European.

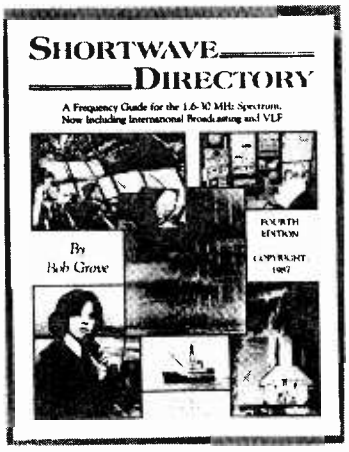
An extensive press services list for RTTY and FAX is given along with languages and schedules, cross referenced by location and schedule. An expansive appendix lists commonly used abbreviations, QSL addresses, telegram formats, maritime and aeronautical frequency allocations, and the Q and Z codes used in CW and RTTY communications.

For armchair travelers of the world's two-way shortwave circuits, Klingenfuss's *Utility Guide* is hard to beat.

Radioteletype Code Manual

Tenth edition by Jorg Klingenfuss (96 pages, 6-1/2" x 9-1/4", perfect bound; approximately $15 from MT advertisers or send DM 25 to Klingenfuss Publications, Hagenloher Str. 14, D-7400 Tuebingen, FRG)

For the consumate RTTY devotee, no publication contains more technical format information on reception than the Klingenfuss RTTY Code Manual. Multilingual circuit identifications, definitions, third shift configurations, TOR formats and protocols, even cryptology--they're all here. Well illustrated and accurate.



Shortwave Directory

Fourth edition by Bob Grove (Over 200 pages, 8-1/2" x 11", perfect bound; $12.95 plus $1.50 shipping from Grove Enterprises, PO Box 98, Brasstown, NC 28902 and other MT advertisers)

Fresh off the laser printer and targeted for distribution by the end of February, this greatly expanded and revised listening companion now contains VLF listings, international broadcasting and an exhaustive RTTY section. This new edition is loaded with photos and illustrations as well as text.

Although worldwide in scope, entries concentrate on those stations heard in North America. World broadcasters are included for the first time, a major section highlighting those English language stations which are of greatest interest to American SWLs.

An extensive radioteletype section reflects thousands of loggings made during late 1987, making this portion of the new Shortwave Directory the most up-to-date RTTY list available anywhere. TOR, TDM and FDM are included. An update facsimile section is also provided for FAX enthusiasts.

Since modern general coverage receivers are capable of tuning down into radio's "basement bands", a considerable number of stations to be heard in the 10-530 kHz range are listed, all recently verified, including identifications of non-directional beacons (NDBs) in the 200-400 kHz band, commonly encountered by listeners.

This excellent frequency directory is conveniently arranged in order of service and agency and contains an exhaustive frequency cross reference, allowing the listener to identify the likely source of an intercepted signal without having to thumb through the categorized sections.

Whether you are a casual listener to the shortwave spectrum or a devoted DXer, the new Shortwave Directory is an incredible storehouse of indispensable information at unusually low cost.

Secrets of 123 Classic Science Tricks & Experiments

by Edi Lanners (192 pages, 5" x 8", perfect bound; $7.95 from TAB Books, Blue Ridge Summit, PA 17214)

Purists may scoff at this book title, wondering "What does this have to do with radio monitoring?" The answer is, of course, "Absolutely nothing!" But who among us does not have a curiosity which extends beyond our listening inquisitiveness? Who, further, is not fascinated by expert sleight of hand?

During the late nineteenth and early twentieth centuries (definitely before television), parlor magic was very popular. Illusions and prestidigitation cast their magic spells over many a youth--and the young at heart.

Lanners has secured many original woodcuts used to illustrate the popular parlor tricks of the day, lending atmosphere to the book which is written in the eloquent editorial style of the day.

Growing crystals on a bean; static electricity dancing paper dolls; suspended and spinning coins; soap bubble carousel; visual illusions; shadow pictures; trick photography. Fun reading on a cold winter's day--or a great token gift to a young-minded friend.

The Radio Observer

(Monthly magazine edited by Robert Sickels; approximately 23 pages, 7" x 8-1/2", offset printed and stapled; $20 per year from Bob's Electronic Service, 7605 Deland Ave., Ft. Pierce, FL 34951)

If your interests include radio astronomy or receiver design, this little monthly is loaded with clever, simple designs and informative articles.

The December 1987 issue (sample copy, $2.50 from the address above) contains an array of useful articles: For example, an excellent step-by-step flow chart on diagnosing and repairing a defective circuit; a table which calculates the gain of a dish antenna at various frequencies; details on designing a noise-cancelling receiver; a news item which seems to disprove the constant of universal gravitation; simple gated audio to enhance reception; and how to construct a high-sensitivity, temperature-independent detector circuit.

Fascinating reading for the inquisitive radio hobbyist.

Radio School Code Training Cassettes

(Six cassette courses, $39.95 each from Gordon West Radio School, 2414 College Drive, Costa Mesa, CA 92626)

Fresh on the heels of Radio Shack's successful Novice Enhancement package, Radio School is now offering the logical next step: A series of code-speed improvement cassettes.

Available in three different six-cassette sets, the choices include a beginner's course for learning the code; a 5-13 word per minute General Class upgrade; and a 13-20 word per minute Extra Class upgrade.

All cassettes are cut in stereo with voice instructions on one channel, enabling deletion of the voice on stereo players. Each cassette is timed to increase the learner's code speed by at least two words per minute.

A final (yellow) cassette is virtually identical to the actual tests which are conducted nationwide by volunteer examiners, exhibiting the same tone and dit-dah ratio adopted by VEC teams across the country.

RF-CAD Electronics Design Program (for IBM)

by Joe Reisert, W1JR, and Gary Field, WA1GRC (Floppy disc for IBM-PC, XT, AT, or compatible; requires 128K RAM and Microsoft BASIC; $39.95 plus $3.50 shipping from Ham Radio Bookstore, Greenville, NH 03048)

While it may seem fashionable for everyone with a home PC to develop a program of his own, most aren't worth the disc space to run them. Not so with this powerful CAD collection which has evolved over several versions and six years.

All long-time hams will recognize the name of RF engineer Joe Reisert who has written about virtually every electronics subject that has a title; his monthly columns in Ham Radio magazine have inspired and tutored the technically inquisitive for many years, and his combined efforts with Gary Field have amassed considerable expertise.

RF-CAD is easy to load and is menu driven. Approximately forty individual design files include tested programs for antennas and feedlines, amplifiers, oscillators, filters, matching networks, microstripline layouts, attenuators, propagation planning, satellite and moon tracking, and receiver noise figure and spurious response prediction.

Although excellent documentation is provided with the package, the programs are not for the faint-hearted and assume a foundational knowledge of electronics terminology.

If you suspect that this is an ambitious CAD undertaking, you're right; and if you suspect that Reisert and Field have done it well, you're right again!

Kenneth Vito Zichi

3018 Moyer Road
Williamston, MI 48895-9566

The ABC's of Propagation

As children, a lot of us thought of radio as a "magic" box. Just by turning a switch, voices and music from across the city, or state, would come drifting into our room. By the time most of us discover shortwave, we've outgrown the idea that supernatural forces were at work in our radios. Still, we remain awestruck at the idea that someone in Australia or South Africa could whisper into a microphone and we could hear it half a world away.

This decidedly non-supernatural method by which radio waves travel from point "A" to point "B" is called *propagation*. It is a concept basic to all radio communications. And despite popular myth, you do not need a Ph.D in physics to understand it.

Radio is a form of "electromagnetic radiation." That is a fancy way of saying that radio waves have both electrical and magnetic properties. If they are energetic enough, they can leave the confines of a conductor and travel freely through the air, a vacuum (like outer space), or other similar media. In this way, radio waves act much like light, which is another form of electromagnetic radiation, albeit higher in frequency than radio. In fact, light provides a very good analogy for explaining how radio waves propagate.

Types of Propagation

Like light, radio waves can propagate (travel) in several different ways. We've sketched out some of the most common types of propagation, how they work and on what band(s) you're likely to encounter them.

GROUND WAVE

The most common and reliable way for radio waves to travel is called "ground wave." This is a form of propagation that is common to *all* radio bands from VLF (Very Low Frequency) to radar. Simply put, when a radio wave travels directly from the transmitting antenna to the receiving antenna without bending, reflecting, or otherwise being diverted, it is traveling by ground wave.

Using the light analogy, imagine a lighthouse shining in the distance. So long as there is nothing between you and the light -- and you are not so far away that the curvature of the earth would place the lighthouse below the horizon -- you can see it. (See figure one, wave A).

You can increase the distance you can see the lighthouse by elevating either yourself (a receiver) or the light (a transmitter), but once these variables are fixed, there is a finite distance at which the light will be visible because of the earth's curvature.

Reception distance is therefore limited when using this form of propagation. However, this limitation is offset by the fact that groundwave reception is very reliable. Some examples of transmissions using ground wave reception are local AM and FM broadcasters, police communications and CB radio.

IONOSPHERIC ("Skip")

Another very common form of propagation is ionospheric propagation, which is also known as "skip" or "skywave." This common phenomenon of long distance communications on frequencies between .5 and 30 MHz is the result of the bending of radio waves in the earth's *ionosphere*.

The ionosphere is several regions of charged oxygen (and other gases) located some 60 and 200 miles above the ground. These layers have a number of unique properties, not the least is their ability to *refract* radio waves that enter it back toward the earth's surface.

To use the light analogy again, it is as if someone placed a huge mirror in the sky, and radio waves, which would ordinarily shoot off into space, are re-directed back to the earth's surface. (See figure one, wave B.)

Actually, this analogy is not quite correct since the ionosphere *refracts* radio waves and a mirror *reflects* light. At any rate, if a radio wave of the right frequency enters the ionosphere, it will be bent back to earth. The result is reception of the signal hundreds of miles away from the

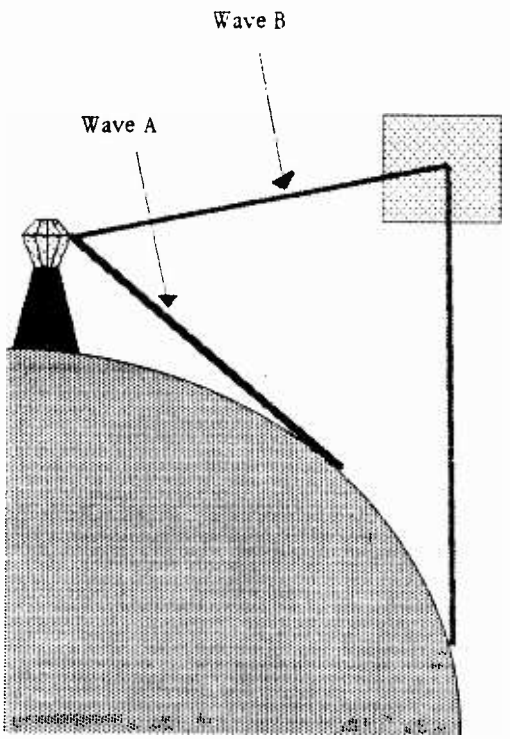


Figure One

Like the light from this lighthouse, radio waves travel only in straight lines. As a result of the curvature of the Earth, they can therefore only travel a finite distance (Wave "A").

Reception past the horizon can take place, but only if the radio waves are refracted or reflected off some surface, akin to someone in space holding amirror to allow you to see the lighthouse, as illustrated by wave "B."

Kenneth Vito Zichi

3018 Moyer Road
Williamston, MI 48895-9566

transmitter and well beyond the range possible by ground wave propagation.

Unfortunately, the ionosphere is also capable of absorbing or blocking reception of radio waves. Depending on the density of the ionosphere at a given time, the angle of the wave entering the ionosphere, and the frequency of the wave, long distance reception will be either enhanced or destroyed.

Too, the gap between where ground wave reception ends and the spot where the skywave signal hits the earth is also an area of non-reception. It is called the *skip zone* and the phenomenon is illustrated in figure two, with "S" denoting the skip zone.

Depending on the time of day and solar conditions (solar radiation is one of the major factors that cause gases in the upper atmosphere to ionize and form the ionosphere), different layers of ionized gas of varying intensity will be formed. Each layer affects radio waves slightly differently.

Lower frequency shortwave signals (eg. 2 through 9 MHz) will be absorbed if they pass through the ionosphere at low angles during the daylight hours. During this part of the day, there are more layers to the ionosphere and these layers are thicker. Thus, during the day, low frequencies do not propagate as well as higher frequencies (eg 11 through 25 MHz). Similarly, at night, the ionosphere is thinner and the low frequency waves are refracted without being absorbed. Then, the higher frequencies pass freely into space.

MULTI HOPS

Radio signals making the journey from transmitter to ionosphere to earth are said to have completed a "one hop" circuit. However, this is not necessarily the end of the trip. That same signal can be reflected from the earth, back up to the ionosphere once again, and down to earth, this time even further from the transmitter. If conditions are just right, a signal can go all the way around the world and double back on itself.

The "multi-hop" circuits do increase distances dramatically, but are less than single hops since they are subject to the uncertainties of the ionosphere more than once.

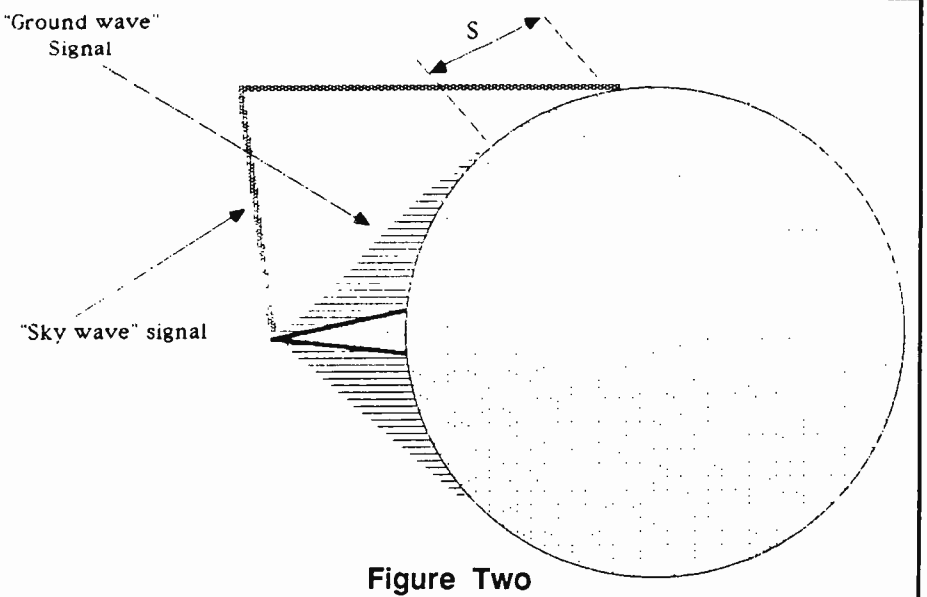


Figure Two

"S" = the "skip zone": the area between ground wave and sky wave propagation where reception of radio signals is difficult at best.
Drawing is not to scale! Actual distances for ground wave reception on the Earth would be about 300 km depending on effective height of transmitter and receiver antennae, not 1/4 of the planet's surface as indicated here!

EXOTIC STUFF

Lastly, there are numerous, less common ways that a radio wave can get from point A to point B.

One of these is called *sporadic E.* If it is sufficiently charged, the "E Layer" of the ionosphere is capable of refracting relatively high frequency radio waves. Occasionally, there will be "pockets" of highly charged particles within the E layer which allows for unusual reception.

This so called "sporadic E reception" is just that: sporadic. It is fairly common around local dusk and can boost reception of FM and TV signals well beyond their intended range. Sporadic E is also most common during the late spring and early summer in temperate latitudes but it is possible at any time of the year.

Moonbounce is a form of reception that's fascinating but rarely used now that man-made satellites populate the skies over planet earth. Pioneered by radio amateurs, it is a form of propagation in which signals are intentionally reflected off the moon's surface and back to earth.

Tropospheric Ducting is most common at relatively high frequencies and affects transmissions heard on FM, TV and scanners. It results when radio waves follow patterns of high and low pressure in the atmosphere (much the way weather patterns do). It allows for reception of signals slightly beyond the range you might otherwise expect.

Lastly, *Meteor Scatter* is probably one of the most unusual forms of propagation. Here, radio waves are bounced off the ionized trails of meteors. Like sporadic E reception, this results from a region of the atmosphere becomming supercharged, and thus refracting higher frequencies than normal back to earth. Reception of VHF signals using metero scatter can be very brief -- lasting in the order of seconds.

In short, there are a plethora of exotic reception techniques, but the ones outlined in the first part of this article are the ones you are most likely to run into, and should aid you in planning your listening to best enjoy the hobby.

■

Sangean ATS-801 Erratic Display Fix

Apparently, Sangean has had complaints regarding their ATS-801 portable receiver. In some instances, the display ceases to function. The cause appears to be a loose connection with two silver oxide button cells which power the microprocessor.

According to a service note from Sangean, the fix is simple: merely pry up gently on the metal plate backing on the battery compartment to establish better contact.

K-Mart Komponents

by Bob Grove

Gone are the days of radio stores where you could buy a 2.5 millihenry RF choke or an aluminum chassis and wrinkle-finish panel for your favorite project. But the resourceful experimenter and home builder can still find sources for unusual items in unexpected places.

Looking for an automatic way to turn your receiver on and off several times a day? Twenty-four-hour programmable timers are now available for about $5 which allow a variety of setable time-on/time-off operations. Great for making recordings of your favorite station while you are away--and use a multiple-outlet wall-plug adaptor to control your tape recorder at the same time!

It is always a good idea to turn off all of your equipment when you are finished with your listening. Most discount department stores now stock low-cost multiple-strip outlets, often containing noise-reduction filters and transient voltage protectors as well. A good investment.

Need a good ground? Try pounding an eight-foot rod into the ground as near to your radio room as possible and connect it to a length of coax shield for flexibility and effectiveness. Your local electric utility company is likely to give you the ground rod and clamp if you explain your purpose. Grounding clamps are also available in the electrical section of some discount houses.

Lamp cord has a number of uses including balanced low impedance transmission line! Don't try using it for your scanner, but for low, medium and shortwave reception, it works fine. It also makes good aerial and ground wire.

Speaking of antenna wire, aluminum clothesline and stranded guy wire both work well for that application and they are usually quite inexpensive. Insulators can be fashioned by drilling holes through small sections of PVC pipe.

Looking for a speaker grill for the panel of that new experimental receiver? Nothing can be more frustrating than trying to hand-drill ten thousand teensy holes in a neat pattern! Try one big hole, covered by a round drain guard from the plumbing supply section.

Speaking of speakers, how about a chassis for that radio? Years ago, breadboards (yes, real boards for cutting real bread) were called into service when the wife wasn't looking. Now we can use aluminum cake pans, readily available in kitchenware. Other aluminum kitchenware may be brought into service for panels and shielding.

An antenna wire is only as good as its support. Nylon rope is one of the best answers and readily available in the hardware department. It doesn't have to be thick, just strong. Tie one end to a rock and throw it over a limb, pulling up the antenna wire after the heavy end drops back to the ground.

Are you always dropping tiny screws on the rug? Naturally, they blend in perfectly with the pattern. Only the vacuum cleaner will find them. Instead, use a heavy glass furniture coaster to hold the microscopic parts--they're bottom-heavy so they won't tip over.

A dab of clear nail polish is handy to cover exposed solder joints or printed labels. Colored nail polish may be used to dab on incandescent panel lamps to code their significance. Clear or colored nail polish is a great way to hold a critical adjustable component in position after calibration.

For that professional finish, don't forget the endless variety of acrylic spray paints waiting for you in hardware. Clear acrylic preserves the natural metal and protects graphs and panel legends; colors are your own choice.

As you can see, the diseased mind of the weekend electronics junkie knows no bounds when it comes to improvising! Next time you lament the passing of the parts houses, take a trip to a local TV shop to salvage carcasses and then, on the way home, don't forget to stop by your favorite discount store and peruse their parts as well.

Looking for an old equipment manual?

One of the most frustrating things about shopping hamfests for used equipment is finding a bargain, but no maintenance manual. Fortunately, there are several sources for obsolete equipment manuals, some of which we've mentioned in previous issues of MT.

A new source (well, new to us) has just been suggested by reader Milan Seifert of Ft. Belvoir, Virginia. He needed a Hallicrafters receiver manual and it was provided by ARDCO Electronics, PO Box 95, Berwyn, IL 60402. Most manuals are in the $8-9 range, including shipping. Give them a try!

ICOM R7000 Remote Control

Johnathan Vail, N1DXG, of Lyndeborough, New Hampshire (603-862-6562), has discovered the secret of ICOM's remote control matrix. He found that he could easily change the MEMORY SCAN function to SELECT MEMORY which he uses far more often.

Accessing the remote option board which had been installed in his R7000, Johnathan unsoldered the cathode end of diode D40,

soldered a small-gauge (#30 insulated, in his case) to the unsoldered lead of the diode, and soldered the other end of the wire to the cathode of diode D32.

A simpler method would be to run the wire from the lifted cathode of D40 through the hole left by the removal of the lead, and connect it to the gray wire (pin 8) of connector P1. Either of these procedures changes the decoding diode matrix.

Johnathan points out that the schematic diagram for the R7000 shows the decoding of the front panel switches; an oscilloscope would suggest other changes for control.

Fast Charge for HX1000/1200

When Regency discontinued their HX1000 and HX1200 programmable hand-held scanners, they also replaced the drop-in charger with one that would work with the new HX1500. A current-limiting resistor in the older scanners prevents rapid charge when attempting to use them with the new MA256 drop-in charger.

Curtis Harbin of Johnson City, Tennessee, has discovered a quick fix. Removing the case of the HX1000 or HX1500, the user will see a small resistor connected to the charge jack. Simply unsolder the red wire from one end of the resistor and resolder it to the other end of the resistor--that's it!

Curtis says that this modification allows the HX1000 or HX1500 to recharge in about one hour and still charge from the wall adaptor as well.

RTTY Filters Revisited

In September's issue of *MT*, Bob answered a question concerning the bandwidth of RTTY filters. He quoted Al Chandler at AEA who said, "The proper filter bandwidth for RTTY is equal to three times the baud rate and then add the shift."

The design specification is probably true for a pre-detection audio filter used in a RTTY tuning unit, but filters that are used in a shortwave receiver I.F. stage operate at radio frequencies and have a different set of design parameters.

A receiver's I.F. filter should limit the bandwidth so that only desired signals pass through the I.F. section. The minimum bandwidth should be slightly greater than the RTTY shift to allow the mark or space frequency to pass through the I.F. without being attenuated by the filter.

A consideration when using audio filters for RTTY or data communications is the response time -- the time it takes a filter to respond to a burst of tone whose frequency is equal to the filter's band pass frequency.

If a filter has a slow response time (like a bell) it will create a ringing effect which can cause problems when receiving RTTY at a higher baud rate. In FSK applications there are no frequency bursts, therefore the response problem is not as severe, but it still exists.

The response time of a filter is determined by the center frequency and bandwidth ("Q"). When the center frequency is increased the response time decreases, therefore an I.F. filter with the same bandwidth of an audio filter can have a faster response time.

I have experimented with different I.F. filters in the past and here is what I recommend for the best RTTY reception.

1) 850 Hz shift, use the standard 2.1 or 1.8 Hz SSB filter or the passband tuning control

2) 425 Hz shift, use a 500 Hz narrow CW filter. Some receivers have passband tuning which can be adjusted to 170 Hz or less using two 500 Hz bandwidth I.F. filters.

3) 170 Hz shift, use a 250 or 300 Hz narrow CW filter (as used by some utility RTTY stations and all amateurs). The passband tuning can narrow the I.F. to 170 Hz or less using two 500 Hz I.F. filters. Some receivers will only accept a single narrow I.F. filter. If you select a 250 Hz or 300 Hz filter, you may have trouble copying 425 Hz RTTY.

I hope this will clear up the question of what RTTY filter to use in shortwave receivers. Contact me if you have any questions and enclose an SASE for a personal reply.

Jack Albert
203 York Place
New Lenox, IL 60451

W. Clem Small, KR6A, CET

Rt 1 Box 64A
Weybridge, VT 05753

The Genius of Heinrich Hertz: A Tribute

Vestal Press has recently reprinted the March, 1938 "Jubilee Souvenir Number" of the old-time magazine called, *Radio Craft*. This issue commemorated what was, back then, the fiftieth anniversary of Heinrich Hertz's work.

Hertz, the Great Pioneer

The work to which I refer is, of course, Hertz's experiments on electromagnetic radiation. And, as you probably know, it was these experiments which established the technology that was later to become the basis for the science of radio communications.

Not only did Hertz demonstrate the existence of radio waves or "electric waves" as he called them, but he designed an impressive array of devices to be used with them. For years, they continued to play a major role in the development of radio communications. Today, many are still in use.

Along with designing such items as the first radio detector, first radio receiver, and the first radio transmitter, Hertz also designed the first communications antennas. As an example, the familiar halfwave dipole is known to old timers in the field of radio as the "Hertz" antenna. The loop antenna is another of Hertz contributions, as are the use of parabolic reflectors for antennas, and the basic concepts behind the dielectric antenna.

At the Beginning

Let's take a look at the simple and very popular halfwave dipole as shown in figure 1A. In that figure, the antenna is horizontally oriented. This antenna will work well with vertical orientation also, as many scanner buffs know from experience. A vertically oriented dipole is shown in figure 1B.

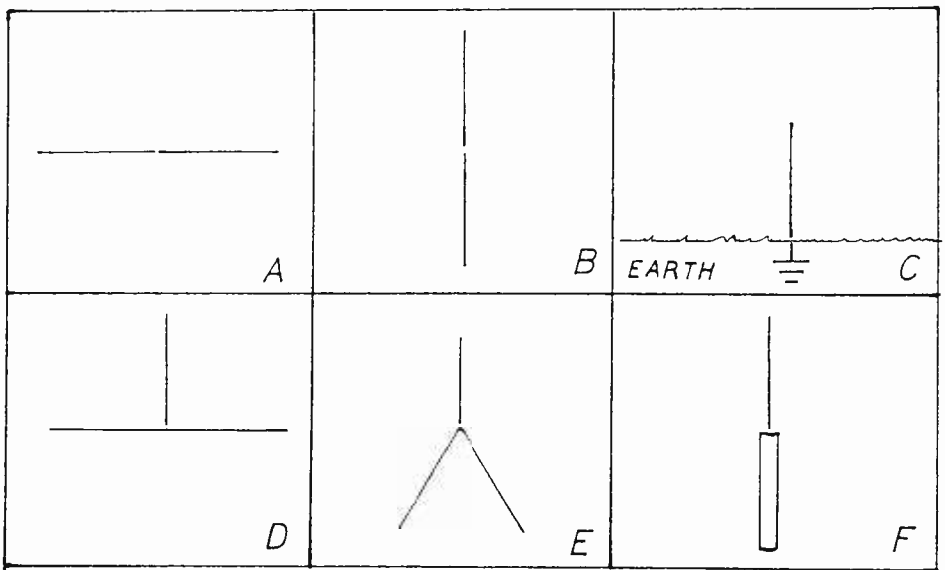


FIG. I. AN ANTENNA DERIVATION SEQUENCE

Marconi Enters the Picture

Look at the antenna configuration in figure 1C. What is that antenna? It is the antenna which Marconi developed from the Hertzian dipole of figure 1A, by rotating it as shown in 1B and then replacing the bottom element with a connection to the earth, or a "ground" as shown in figure 1C.

Ground above Earth

Now let's move on to another type of quarterwave antenna mounted over a groundplane. The "groundplane antenna," shown in figure 1D, is something like a vertical with the lower leg split, and the two split parts of the leg then pulled out horizontally. These "pulled-out split legs" form what is called the "groundplane."

This antenna resembles the Marconi in that it has lost its lower leg, which is replaced by the groundplane, somewhat as the Marconi antenna lost its lower leg, which was replaced by the earth ground. On the other hand, the groundplane antenna is still very much a child of the halfwave dipole as the "split-leg" analysis just given suggests.

Got Something Up Your Sleeve?

One popular configuration of the groundplane is the "drooping radial" groundplane of figure 1E. Look at 1E and mentally picture the radials of the antenna drooped even more so that they are pointed downward. If there were a large number of the radials, drooping them would form a "sleeve" radials around the feedline which enters the antenna from the bottom end. Such a visualization leads us the the sleeve antenna of figure 1F. It's

an antenna familiar to many persons working in VHF-UHF communications.

Now, if we look at the sleeve antenna in figure 1F and the vertical dipole of 1B, we see two antennas with essentially the same configuration and performance. Both are one-half wave length for their total length, both are composed of two quarterwave elements placed end-to-end vertically, and the radiation pattern an gain is essential the same for both antennas. For all intents and purposes, these two are very close to being the same antenna, electrically.

Who Was that Masked Antenna?

We've come almost full circle. The relation of the sleeve antenna to the simple vertical halfwave dipole is clear. To make the circle even more complete, let's rotate the sleeve antenna 90 degrees, and then we see that we have an antenna which is essentially our old friend the Hertzian antenna of figure 1A. Small world, isn't it?

So now, when you come across an antenna design that you haven't met before, pause a few minutes and see if you can catch a glimpse of old Heinrich Hertz peeping at you. It's a good bet you'll find him there taking pleasure in providing radio communications to a lot of lucky people very much like you and me.

RADIO RIDDLES:

Last Month's Radio Riddle: Last month I asked you why the gray line was such an efficient path for radio wave propagation. In the "Shortwave Propagation Handbook," Jacobs and Cohen tell us that the "D" layer of the ionosphere is essentially absent at the gray line. Recall that the presence of this "D" layer or "D" region of the ionosphere makes skip communications difficult by absorbing energy from radio waves as they pass through it. Jacobs and Cohen go on to say that "The 'D' region is rapidly disappearing on the sunset side of the gray line, while it has yet to build up in the areas experiencing sunrise." So the gray line is a very special path through the ionosphere where the signal -reducing effect of the of the "D" layer is removed.

This Month's Radio Riddle: History records a lot of interesting names for antennas. Some examples are haystack antenna, rocking horse antenna (to eat the haystack, I quess), pocket antenna, cheese antenna, and for the hypochondriacs among us, pillbox and hypodermic antennas. In this month's column there are no clues to what sorts of antennas the first five of these might be, but if you are observant, you may be able to find a clue for the identity of the hypodermic antenna. What is a hypodermic antenna, anyway? ■

Terry Staudt, LPE, W0WUZ
716 N. Roosevelt
Loveland, CO 80537

Clean-up Day

New Year's Day has once again come and gone -- along with most of my resolutions. Still, it might be a good time to clear out my desk and brain of acquired trivia.

Talk to Me

When I receive a letter from someone needing help "yesterday," it's usually accompanied by the gripe, "You have an unlisted phone number." And a lot of times when I call the grip-ee back to explain, I find, ironically, that so does he.

The thing is, everyone in this game has an unlisted phone number. Otherwise, we're on the phone with luminaries ten hours a day. (A luminary is one lighted from without by God's grace, or within by strong drink, sometimes both.)

If you do need to talk to me, be sure to include *your* phone number in your letter. Do so with the realization that when I do call, it will be *collect*. The simple fact of the matter is that your subscription price doesn't pay my phone bill. Nor does Bob Grove. Sorry.

Usually, I can solve your problem in about five minutes. But please, restrict your questions to radio. I don't have the faintest idea why there's a diagonal violet bar on your TV screen. Fair enough?

On the DX 300

One very shy *Monitoring Times* reader sent me some very good information on how to improve the infamous Radio Shack DX-300. I've fooled around with a few of these radios and they really do sound like feeding time at the zoo.

If you're using a wire antenna attached to the A1 terminal, it seems that this bypasses the front end coils and makes for monstrous overload. Even if you're using the coax connector, it's more or less connected to the A1 terminal, varying by production run.

The cure is simple. Snip the thin brown wire from the A1 solder lug and wrap it loosely around the jumper or capacitor going to the center of the coax jack.

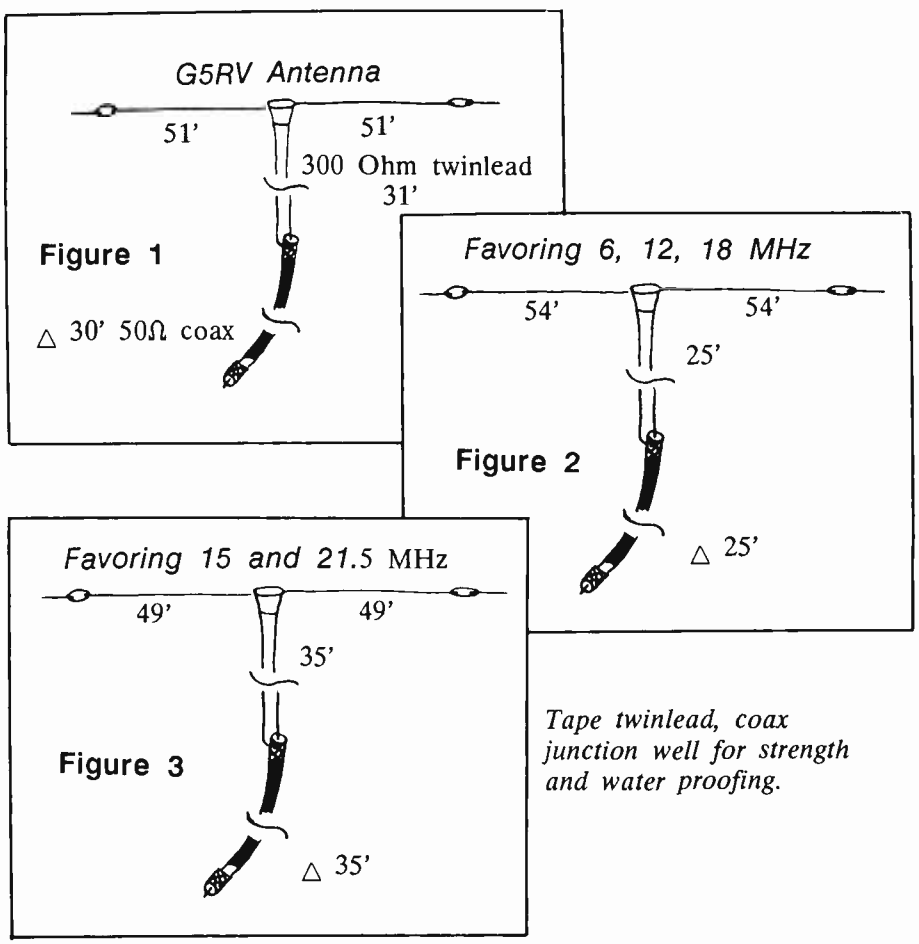
Another source of overloading is improper biasing of the RF amplifier. R 203 (100 K) going to gate 1 should have the low side grounded, not connected to the source. Evidently, the engineer was thinking FETs at lunch.

Popcorn Pilot Lights

If you're going through pilot lights like popcorn, the reason is there's 14.5 volts on them. On the terminal block, just behind the "S" meter, remove the yellow wire and put a 22 Ohm resistor in series with it.

The other information in the reader's letter I more or less take on faith.

Separate the two gray cables going to the front RF board (inner front side) and route the center cable up and curving to the read-out box. Route the inner cable between the two coil "cans" on the front of the RF board. Tape the cables in place after you've reduced the synthesizer whine as low



Tape twinlead, coax junction well for strength and water proofing.

as possible while listening to the lower end of band three.

You might also want to disconnect the black wire on the side of the display box, which routes to the center of the RF board. It seems that this is a redundant ground and it may be responsible for picking up garbage to the front end.

There were a few other tips in the letter, like disabling the AGC to the last RF. While it is sound practice, I'm just not comfortable in doing it without a schematic. In another place, it's suggested that the AGC voltage on gate 2 can go as high as 5 volts. That is catastrophic. I will, however, take a flyer and suggest that you connect a 4.7 K resistor from the stiff, bright blue wire going to R 202 (33 K) to ground. This will drop the AGC voltage to a more realistic (no pun intended) value. There is a superb biasing scheme on page 56 of the October, 1987 *Monitoring Times*.

A Neat Antenna

G5RV, a ham in England, did some very fancy calculating about ten years ago and came up with a gain antenna (on 20, 15, and 10) for 80 meters. It doesn't require any monkey business and is rather inexpensive. The antenna can be adjusted for short-wave listeners to favor 6, 12 and 18 MHz *or* have gain on 15 and 21.5 MHz.

Figure one is the original design for hams. Figures two and three are for shortwave listeners. Don't use foam filled or foil wrapped twin lead. It isn't suitable for this application.

If you have a Grove Mini Tuner or equivalent, this puppy can really shine. Erect it as high as possible. If you're not technically inclined, at least one *MT* advertiser is now offering a fully-constructed 1/2 G5RV for sale.

That's it for this month. Thanks for all of the great letters, Dr. Rolly Johnson in particular.

I hope to have some flashes of insight in 1988 that will put a good spin on the enjoyment of your radio hobby. And, as usual, I'll keep my micro cassette recorder by the bed so as to assure that none slip away.

As always, enjoy. Questions? Don't forget a self addressed, stamped envelope.

■

A License Free Low Frequency Transmitter

by Ken Cornell, ARS W2IMB

Describing a transmitter before the receiver may sound a lot like putting the cart ahead of the horse. In this case, however, it's not that bad at all. Many of the receivers available today already have low frequency coverage, often as low as 150 kHz. Others have low frequency converters that make reception of the 160 to 190 kHz band possible.

What you probably *don't* have is a low frequency transmitter. And what you quite possibly don't know, is that you don't need a license to operate one. Sound good? Wait -- there's more.

Inexpensive Xmitter

As many monitors are well aware, communications equipment can cost a hefty buck. That's not the case when it comes to a lowfer transmitter. This one can be built, from scratch, for under $25.00, not including the power supply. Power supply circuitry can be found in innumerable books and publications.

Over the seventeen years I've been experimenting on the low frequency bands, I've constructed countless tube and solid state circuits. This transmitter, however, is one of the simplest, most fool-proof I've ever had the pleasure to construct.

The transmitter exciter is shown in figure one. It uses two I.C.s. The oscillator uses crystals in the 5120 to 6080 kHz range. (It's a CD4011BCN.) This is followed by a CD4024BCN that divides the crystal frequency by 32, producing an output between 160 and 190 kHz.

Easy-to-Get Parts

The final amplifier uses the relatively new high-powered FETs known as VMOSs and HEXFETs. These devices are extremely easy to drive and require only a gate bias resistor, several bypass capacitors and a tank antenna coil in the circuitry. They are also readily available and cost less than $2.00 each. See figure two for the circuit.

Seasoned experimenters can use their favorite construction methods but for the novice, I recommend that parts be assembled on perforated boards that have holes spaced at .100" x .100". Parts are mounted on top of the boards and the wiring underneath. I also suggest that sockets be used for the solid state devices as they can be easily damaged in soldering. Since we are dealing with LF, simple point-to-point wiring will suffice.

A cheeseboard measuring 8" x 5.5" x .75" thick was used as a baseboard on which to attach the assemblies. The perf boards were mounted on the cheese board with short stand offs. Three binding posts were mounted at the edge of the board for the power supply connections and grounding. See figure three for the transmitter layout.

The Tank/Antenna Coil

The most difficult and time consuming part of the project is the tank/antenna coil. Use a twelve inch length of 1 1/4 inch PVC pipe (1-5/8" o.d.) for the coil form. A PVC pipe cap is used to mount the coil vertically to the cheeseboard.

Fit one end of the pipe into the pipe cap and just clear of the cap flange, drill two small holes side by side to hold the start of the winding. From these holes, measure 10.5 inches to the other end and drill two more small holes side by side to secure the other end of the winding.

Next, measure 1 3/8" from the start and make a mark on the form for the final amplifier drain tap (100 turns). From the other end, place four marks, spaced 1/4" apart for the antenna taps. The winding will consist of a 10 1/2" length of close wound #28 enameled copper magnet wire. This is about 730 turns or 330 feet.

Gumming and Gluing

Keep a supply of gummed tape strips

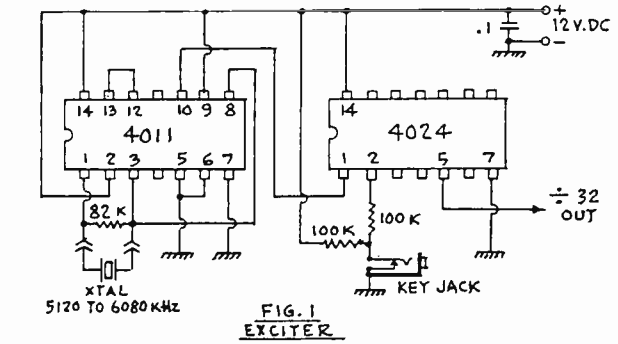


FIG. 1
EXCITER

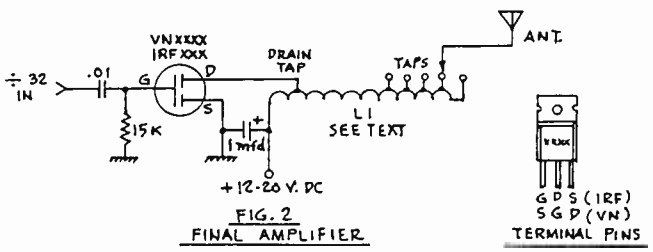
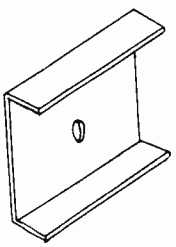


FIG. 2
FINAL AMPLIFIER

All resistors can be 1/4 watt. Capacitors should have a 50 volt minimum rating. A standard transistor socket can be used for the final amplifier.

For continuous use, I suggest that a heat sink be used on the VMOS or HEXFET amplifier. Cut a several square inch rectangle out of sheet copper or aluminum and form into a channel shape as shown. Drill a hole in same and bolt to the back side of the drain tab.



handy to secure the winding when interrupted. Also, after every inch or so of winding, add some Duco cement to secure the wire. Let it dry before continuing. To make a tap, form a loop and then tightly twist them for two or three turns. Use long nose pliers and press the base of the twisted wires to align them for continuation of winding. After the coil is finished, the loop can be cut and the wires twisted tighter and then soldered.

When wiring up the various assemblies, test each device stage by stage. First, check out the 4011 crystal oscillator. Tune your receiver in CW mode to the crystal fundamental frequency. Clip about three feet of wire to pin #10 on the 4011 to act as an antenna. Apply 12 volts.

You should be able to hear the beat note in the receiver. Next, clip the short antenna wire on to pin #5 on the 4024 and tune to the crystal frequency divided by 32 that falls into the 160 to 190 kHz band, and again, you should hear the beat note. If you hear no signal, recheck your wiring and solder connections.

To test the final amplifier (and the whole transmitter) I suggest that you use the dummy antenna described in figure four. It consists simply of a noninductive 27 ohm resistor in series with a 365 pf variable capacitor. Connect the dummy antenna to the antenna coil using the full winding. Apply about 12 to 15 volts to the amplifier, tune the receiver to the frequency and note the "S" meter. Now set the variable capacitor to about 1/3rd mesh and try the antenna tap for maximum reading on the "S" meter. (You may need a short antenna on the transmitter for an effective reading.) When this point is found, retune the capacitor for maximum strength.

It should be noted that all antennas have a capacity to their ground system and the dummy's capacitor will duplicate this capacity. See figure five where the capacity, "Cx", which is the antenna's capacity to ground, is illustrated.

Final Tune Up

The final tune up will require the transmitter to be connected to its operational antenna. This will require a means for "fine tuning" the tank/antenna coil. Changes in weather and moving the operational frequency will require retuning. I use a ferrite rod that can be moved up or down within the coil field at the top and then clamped in the desired position. As the ferrite rod penetrates the coil field, it increases the coil's inductance. Another scheme is to use a variable capacitor connected between the antenna and ground.

Set-Up

Before selecting your operating frequency, a thorough study of the band should be made to locate the quietest one for you location. This should be done over a period of time. Take notes for accuracy and ease of reference.

The transmitting antenna should command considerable attention. First, it must be vertical. The FCC limits the length to 15 meters (49.2 feet). But even a much shorter vertical antenna will out-perform a 15 meter horizontal. The antenna will, in any case, carry high RF voltage, so excellent insulation from all supports is most important. Keep the antenna clear from trees and structures that could absorb RF radiated energy.

The ideal location for the transmitter would be to locate it in a weathertight housing at the base of the vertical antenna. Since we're dealing with low power, providing power and keying by cable from the operating position would be no problem.

Remember that the FCC limits the power input to the final amplifier to one watt. Therefore, after tuning up the transmitter, the drain voltage and current should be metered and set at one watt. Section 15.113 states that a certification label to this effect be placed on home-built devices and it must read:

I have constructed this device for my own use. I have tested it and certify that it complies to applicable regulations of the FFC Rules, Part 15. A copy of my measurements is in my possession and is available for inspection.

Signed _____

Date _____

■

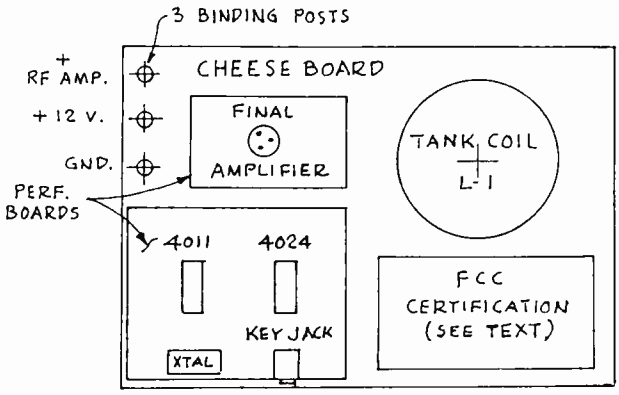


FIG. 3
TRANSMITTER LAYOUT
1/2 SIZE

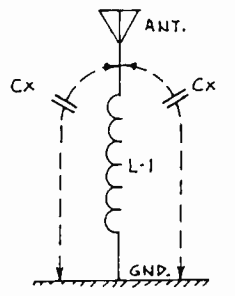


FIG.
ANTENNA CAPACITY
TO GROUND

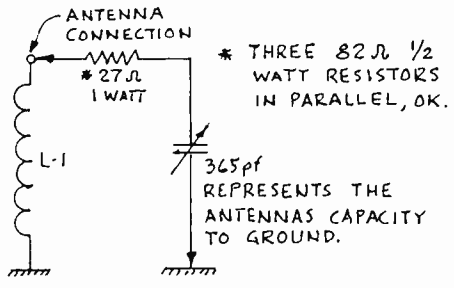


FIG. 4
DUMMY ANTENNA

ASK BOB

Bob Grove

Q. My Grove Skywire is superb on shortwave, but longwave and mediumwave signals are not as strong. How come? (Darryl Holland, Tottenville, NY)

A. The lower the frequency, the longer the dipole for efficient matching to the receiver. The Skywire, like other dipoles on the market, is optimized for the shortwave bands. To radically improve its reception at shortwave and longwave, simply unscrew the shell of the antenna connector at the radio and pull the plug away slightly, disconnecting the shield of the coaxial cable but leaving the center pin inserted. Now the coax line becomes an integral section of the antenna, effectively increasing its length.

Q. What is a good list of low frequency beacons identified by beacons and call signs? (Billy Estes, Irmo, SC)

A. Particularly good is the *Aero/Marine Beacon Guide* by Ken Stryker and Joe Woodlock, available for $10 including postage from Stryker at 6350 N. Hoyne Ave., Chicago, IL 60659.

A list of the more-commonly-heard low frequency beacons and military/commercial signals as well is included in the new *Shortwave Frequency Directory* by Bob Grove ($12.95 plus $1.50 shipping from Grove Enterprises, PO Box 98, Brasstown, NC 28902 and other *MT* advertisers).

Finally, listeners interested in low frequency monitoring should be aware of the Lowdown Club of America and their monthly publication, *The Lowdown*. Membership is $18 per year and $1 brings a sample of their excellent newsletter: Longwave Club of America, 45 Wildflower Rd., Levittown, PA 19057.

Q. Is it possible to tune in on the Blue Angels and Thunderbirds aerobatic teams when they are performing? (Mort Arditti, L.A., CA)

A. It sure is--if you have a wide-frequency-coverage scanner. For the Blue Angels try 142.0, 143.0, 143.6, 241.4, 251.6, 275.35, and 384.4 MHz; for the Thunderbirds check 120.45, 126.2, 141.85, and 413.025 MHz.

Q. Are low band (30-50 MHz) military communications conducted in AM or FM mode? (Buster Coles, Charleston, WV)

A. VHF and UHF military radio communications are wideband FM from 30-80 MHz; AM from 108-144 MHz (except for some military bases operating narrowband FM in the 138-144 MHz band); narrowband FM from 144-150.8, 162-174 and 406-420 MHz; and AM from 225-400 MHz (except for satellite communications which may be FM or SSB and heard downlinking in the 240-270 MHz range).

Q. Is there a way to increase the scan speed of a Realistic PRO2021 scanner? (Ken Cohen, Columbia, MD)

A. Yes. The procedure is described on page 55 of our May 1987 issue. A reprint is available for $2 for any article just so long as the reader can cite an issue date.

Q. Is there any way to adapt my low/high/UHF programmable scanner so that it will receive the 800 MHz band? (Ken Cohen, Columbia, MD)

A. There is no simple way that any scanner can be internally modified to receive 800 MHz if not originally designed to do so. External converters are occasionally advertised which can be added to scanners, allowing them to receive a small portion of this band.

Q. For my apartment, can I use the cable TV lead as an antenna for shortwave listening? How about a rooftop TV antenna?

A. If the cable TV distribution system is properly designed, you should get lousy shortwave reception! MATV (master antenna television) systems are designed to pass only those frequency ranges assigned to local TV stations--and occasionally FM broadcasting as well.

Your rooftop TV antenna is a possibility, but not because of the antenna itself which works poorly at shortwave frequencies. The ribbon twin-lead acts like a random-wire antenna when both conductors are connected to the shortwave receiver's antenna post. Don't connect one lead to the antenna and the other to ground or you may lose signals strengths. Experiment for the best combination.

Don't use it simultaneously with a TV set turned on, however; the noise generated by the TV set will be deafening! It would be better not to have the TV set connected to the same line as the shortwave receiver; its high-pass filtering could severely attenuate shortwave signals.

Q. How can I find scanner frequencies used in my area? (Robert Lautmann, Carrollton, TX)

A. Occasionally, when specific listings are requested and accompanied by a self-addressed, stamped envelope, I will attempt to find one or two listings by conducting a search of our microfiche data files. Where massive lists are sought, I recommend that you purchase the Police Call Directory, available from your local Radio Shack store.

Custom sorts are available from Norm Schrein (see *MT*'s Library Shelf, December 1987).

Questions sent to MT are answered in this column as space permits. If you prefer an answer by return mail, you must include a self-addressed, stamped envelope.

SCAN (the catalogs) *and* SEARCH (the aisles)

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HAND-HELD PROGRAMMABLE SCANNER

Regency steps ahead once again with the most powerful hand-held programmable scanner on the market. Just look at these features: • 55 memory channels, • Direct channel access; • Rapid scan and search; • 29-60 MHz FM, 118-136 MHz FM, 406-420 MHz FM, and 440-520 MHz FM frequency range; • Channel one priority; • 0.7 uV average sensitivity; • ±7.5 kHz selectivity; • 2 second scan delay, 4 second search delay; • Individual channel lockout.

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This fine unit's non-volatile memory never needs battery backup. Unit requires eight standard AA cells or Nicad rechargeables.

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$394 Retail Value

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Includes carrying case!

$3 UPS

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From Bearcat— The BC 100XL!

The **BC-100XL**—now with aircraft! Yes, the all-time popular Bearcat 100 hand-held programmable scanner now has aircraft reception as well. Includes 16 channel memory, illuminated LCD display for night viewing, search, rapid scan (15 channels per second), direct channel access, lockout, delay, low battery indicator, priority, and keyboard lock.

Frequency coverage is 30-50, 118-174, 406-512 MHz. Accessories included: Rubber ducky antenna (with BNC base), AC adaptor/charger, NICAD batteries, earphone, and carrying case.

Handsome new black case with white chrome accents.

Dimensions: 7½"H x 2⅞"W x 1⅜"D; Weight: 2 lbs., 10 oz.

Order SCN 16

Retail ~~$349.95~~

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SCN-11

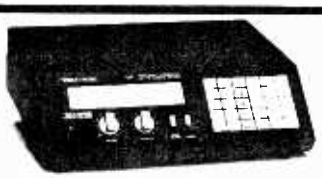
The BC800XLT

Offered at Grove discount prices!

Wide frequency coverage: 29-54, 118-136 (AM), 136-174, 406-512, and 806-912 MHz FM with 40 channels of memory in two banks.

Rapid scan (15 channels per second), powerful 1.5 watt audio amplifier, two telescoping antennas (one for 800 MHz range), 0.7 microvolt average sensitivity, -55 dB selectivity @ ± 25 kHz, instant weather reception, brilliant fluorescent display, AC/DC operation, direct channel access, individual channel delay, priority channel one, fully synthesized keyboard entry.

Dimensions: 12½"W x 4½"H x 9¼"D; *Weight: 7 lbs., 2 oz.*



Realistic® PRO-2004

You can walk into your chain retail store and pay $400 for this new luxury scanner, or you can order it from Grove for only $389.

The PRO-2004 provides continuous frequency coverage between 25-520 and 760-1300 MHz in your choice of mode—AM, narrowband FM or wideband FM. With no crystals needed, this exceptional unit delivers a wide range of frequencies not found on most scanners—including public service, broadcast FM, military bands and CB!

Search mode finds new channels, with an incredible 300 channels available for storing the ones you like. Rapid 16-channel-per-second scan and search complements this scanner's high sensitivity and excellent selectivity, providing for maximum distance reception, even in crowded band conditions. BNC antenna connector for efficient signal transfer. Built-in speaker and telescoping antenna are included. Jacks provided for external antenna, headphone, external speaker, tape recorder and DC adaptor.

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Call for availability

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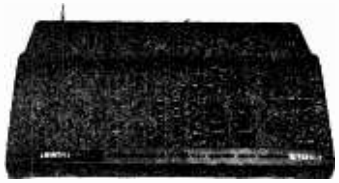
Bearcat BC210XLT



Following in the footsteps of the immensely popular BC210XW and BC20/20, this new Bearcat programmable scanner combines the capabilities of both. Two 20-channel memory banks provide a total of 40 memory channels, and instant weather coverage is available at the press of a button.

Frequency coverage is 29-54, 118-174 and 406-512 MHz to provide instant access to all major land mobile, maritime and aircraft bands—low, high and UHF. A whip antenna is included for indoor use and an external antenna jack allows use of an outdoor antenna as well.

Excellent sensitivity (average 0.5 microvolts) and selectivity (-55 dB at ± 25 kHz); powerful audio (1.8 watts at 10% THD); and a brilliant fluorescent display combine with internal memory backup, direct channel access, selectable scan delay, individual channel lockout, search with hold, priority, fast speed (15 channels per second), and automatic squelch.

The BC210 XLT can be operated from 120 VAC or from a 12 volt source (DC cord and mobile mounting bracket available).

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$5 UPS; $10 U.S. Mail P.P.; $15 Canada Air P.P.)

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Do you use your dial? Don't you wish everyone did?

On page 53 of the Nov '87 *Monitoring Times*, a Helpful Hint from Rene Borde of Sunnyvale, CA, shows a Worldwide Timetable listing countries and the number of hours difference between their local time and Eastern Standard Time. This list is very familiar to me from a March 1986 update of a brochure titled "AT&T International Dialing." You can get your own current brochure and other international telephone booklets free from AT&T by dialing their International Information Center at 1-800-874-4000, open 24 hours. One problem -- it takes at least a month to get the literature.

The list of countries is also a lesson in politics because of the many countries not on the list. The U.S. Naval Base at Guantanamo Bay, Cuba, is dialable, but Cuba itself is not -- you must go through an operator. The USSR is not listed because you could only dial the USSR directly for a short time around the 1984 Summer Olympics. Maybe this will change under Gorbachev. Countries like China, French Guiana, and many African countries have only been dialable a short time.

Most non-dialable countries, including the USSR, can be reached through an operator; however, a few countries do not even appear on the non-dial list. Included (excluded?) here are Albania, North Korea, and Viet Nam, and perhaps a few others. I believe Albania has chosen to be isolated since World War II. North Korea is also a "hermit kingdom." However, I believe our government has chosen not to have direct relations with North Korea and Viet Nam.

On the other hand, it's still possible to direct-dial Nicaragua and Iran. Primary responsibility for U.S. international telecommunications policy lies with the State Department. The FCC, the Commerce Department, and the U.S. Trade Representative also have some input.

A few years ago I tried to call Viet Nam. The operator said, "I'm sorry, sir, I have no routing code for that location." I persisted and was referred to a supervisor at an international operations center. I told her Viet Nam was listed in the Paris phone book as a place you could call. She told me I'd just have to fly to Paris if I wanted to call Viet Nam!

Yours for better communications,

Bruce Morrow
Keeseville, NY

Concerning the Shroud... Has MT gone astray?

Yes... There are quite literally myriads of very interesting articles that are written all about fascinating subject matter, and I am sure that they do have their place, but it is not in *Monitoring Times*...There are many other publications pertaining to these items.

This magazine should be reserved strictly for the pure in heart...communications and its kindred subjects, and that is all. I have surveyed many of our readers and the preponderance of opinion [is] let communications only reign supreme in this magazine...

There is plenty of interesting and informative material on all of the phases and aspects of this hobby to keep the readers awaiting the next issue without superfluous and extraneous material on other subjects, to be sure, so let's keep *MT* pure.

Sol Hoffman
Los Angeles, CA

Yes... This letter is in reference to your Shroud of Turin article. I vote you do not carry such articles, just have radio articles. I can (and have) read such articles in other magazines.

Thanks for a great publication, but let's keep it "strictly on listening."

Karl Heil
Blue Mounds, WI

Yes... I thought I'd give some feedback about *MT* doing articles on information that doesn't have a darn thing to do with monitoring. I'll be brief. I don't like it.

With a great number of magazines already devoted to other topics such as the Shroud of Turin and God only knows what else, the information is already available, and can be called upon when needed. I think that most SWL's are indeed fortunate that a magazine as good as *MT* is available to us. One reason for that is just as the name implies - *Monitoring Times*. That's why I like your publication so much because of the many interesting articles on all types of monitoring, and the information on how to get more out of the hobby. I hope this letter doesn't sound too harsh, because it wasn't meant to be; I just hope you and the gang at *MT* will, as stated in the magazine, "stay on the straight and narrow," and continue to publish the outstanding magazine that *MT* is.

Jim Michael
St. Clair Shores, MI

No... It is my pleasure to respond to your insert (*MT* Dec 87) asking if articles of unusual interest, not strictly in the listening realm, should appear in *Monitoring Times*.

Why not? There will always be purists and those who are concerned with only a particular facet of the monitoring scene, and some may be inclined to object to anything that deviates. Not all *MT* articles quicken my pulse but I read each issue thoroughly, for there is information on every page; a lot of information. And an article such as "Dating the Shroud of Turin," though a deviation, is certainly informative and interesting. Such is not going to taint the pages of *MT* nor deprive anyone of the normal minitoring coverage.

It is not as though an insidious attempt is being made to bend minds to a biased religious or partisan political viewpoint. A dash of the unusual is welcome in these quarters. Bring it on.

Darlington Fadeley
Lowellville, OH

No... [I would like to] encourage you to write more "From the Publisher" in the same tone as your piece "Cellular Censorship: The Rumor is True." It was easy to read, easy to understand, drove directly to the point and dealt with both the issue and the action required by the reader. Thank you!

The second is to answer your query in the box on page 61 of the December issue of *MT*. I favor more articles such as the Shroud of Turin. It was extremely

interesting and to me dealt with a remote but related facet of your readership's "electronic attraction" in that sophisticated electronics made the work that was done on a truly intriguing mystery possible. I enjoyed the article though I wish we could have had a conclusion! But now there is the possibility of a follow-up article.

Tom Hagerman N0DST
Branson, MO

Incorrect I.D.

You do a great publication, but someone is decades away on aircraft identification. *MT* December 1987 page 22, the aircraft identified as a B-17 is really a U.S. Navy P-2V anti-submarine patrol plane, of Squadron VP-67. Unique among aircraft, note the two large four-bladed prop engines (one on each wing) plus one powerful turbine jet engine also underslung on each wing.

It was this model aircraft that held the non-refueled in flight distance record of almost 12,000 miles for many years. That aircraft was named the "Truculent Turtle" and now is in the Navy's Aircraft Museum in Pensacola, Florida, a visit worth everyone's time. Well done on *Times*.

Gerard Barry
(former US Naval aviator)
Naples, FL

My "Dream Cruise"

My guest cruise on the USS Edson DD964 was a dream come true.

I was permitted, even at flank speed (25 knots) to "drive" the destroyer, keeping her on course by reading the gyrocompass.

It has .50 cal. machine guns, torpedoes, and the deadly 5 in. guns.

One of the sailors (I got to know quite a few of them) gave me a "used" 10-foot underway flag! A real U.S. flag carried on the mast of the Edson. It seems that the signal bridge changes the underway flags and battle ensigns every couple of months.

The only parts of the ship which, unfortunately, I was not allowed access to, were the CIC (Combat Information Center), and the radio room, because of sensitive encrypting machines being used.

We were on maneuvers with four frigates, one CG cutter and an attack submarine. The frigates were Miller, Valdez, Perry, and Estocin; the sub, Helena, and the cutter Gallatin.

On occasion, when their underway comms were piped through the bridge, I heard "radio checks," between us, Miller and Valdez.

I never got seasick, ate all standard Navy dinners, slept in the Commodore's stateroom and was welcome at all times in the Officers Stateroom.

I will never forget my experiences, and I owe it all to my shortwave radio!

Andrew Gordon
W. Hartford, CT

[Andrew Gordon authored "U.S. Navy Communications" in our October 1987 issue...Bob]

Let's Hear it for Havana

Now that Havana Moon is back, how about giving him his own column? I enjoy reading both Santosuosso's column and Havana's and I think they should be given separate pages.

Which brings me to a complaint I have about *Monitoring Times*. In the last several issues, there has been entirely too much said about International Broadcasting and Ham Radio, and not enough about specialty columns.

Granted, there are few publications on International SWL, but there is no reason for *Monitoring Times* to go overboard and try to fill that gap. As for ham radio, I'm a Ham, Technician Class,KB6DQG. I can be found pounding the brass on many amateur frequencies throughout the HF spectrum, and in voice on 2, 6, and 10 meters. If I wanted to read about Ham Radio, I'd subscribe to *73, Ham Radio, QST,* or some other ham publication. I don't need to read about it in *Monitoring Times*! Come on guys, bring back the spirit of *Monitoring Times* past, let's have more specialty columns, something for everyone. Dig into the first one or two years, and see how *Monitoring Times* has changed.

Bill Edwards of Texas wrote about setting up an RDF network, which is an excellent idea, but there are many problems involved, not insurmountable, but extremely difficult to overcome. If such a network were to be set up, a conference would have to be held, with people from across the US attending. You'd then need experts of RDFing to explain how all the bearings could be correlated to give a meaningful overall picture to someone at a central information collection point, and many other problems I don't wish to contemplate! But, as Bob sez, "Any interest out there?"

I'd like to hear from fans of Dr. John and Havana. Please write me at my "QTH"(!) 6470 Green Valley Road, Placerville, CA 95667.

Michael McCloskey
Placerville, CA

Getting Started

I had always wanted to hear an "underground/clandestine" station. With the help of Database International's *Passport to World Band Radio*, I have discovered two of them:

9940 La Voz Del Cid -- which comes in very nicely. Wonder what their power is?

9960 Radio Caiman -- not as strong.

There's one on 7430 that seems to be religious -- with *boring* speakers. But I like there music.

The verification card from the Voyager Crew (round the world plane) is my prize. Also have one from the ham station in Jonestown, Guiana, where Prophet Jones and others committed suicide or murdered each other.

James Hughes
Mt Pleasant, MI

Helpful Hint

I thought your readers would like a helpful hint on how to keep track of all their wiring and antenna lead-ins.

A few years ago I raised dwarf parrots; I used bird bands to keep track of the family tree of my birds. Each band has its own number and is made of light

aluminum and, depending on the size you buy, clamps very nicely around RG antenna cable and electric cords. I just keep a file of what number goes with what.

Kevin K. Chedville
Port Sulphur, LA

Author, Author!

I have two suggestions for future *MT* articles: (1) How can urban dwellers like me cut through high level noise to enjoy scanner and shortwave listening? (2) What are the influences of weather systems on monitoring shortwave and scanner ranges?

Frank Lagana
Brooklyn, NY

[Excellent topics, Frank; how about it, writers?]

The Shrinking Frequency Section

I want to register my complaint about the new format of the Frequency Section of *Monitoring Tiomes*. It is not much help in its present format. The listed freqs are the ones everyone hears. I use the old ones and they are getting a little worn.

I logged many of the ones listed in light print and used it on a regular basis. If it's out there you may not hear it one day, but by being patient one eve there it will be.

I read *MT* from cover to cover but use the Freq Section every day. To cut from seven pages down to four is unforgivable. It appears as if you are trying to save space. The column should be expanded and include a lot of foreign language stations as well.

Last night between 1600 and 1625 I logged eight stations that were in the old format and eliminated in the new. I use a Kenwood R-1000, a Grove Skywire, a random long wire, and an antenna that works best on the tropical bands.

In any event *MT* is the best of its kind.

Bob Zirkelbach
Pleasant Hill, CA

[Yours is the consensus of opinion, Bob, and MT will gradually build its Frequency Section back to its former girth...Bob]

I ♥ my Monitoring Times Fan Club

I read with some amusement in October's *MT* about some folks who get concerned before th 10th of the currentmonth as to the whereabouts of their copy. I should be that lucky. The average arrival date for me is 25th-28th of the current month! I am sure that Canada Post has a lot to do with this but if I could get mine by the 10th of the month, I'd be delighted.

I also note that another correspondent says that there is too much "simple" stuff and not everyone is a beginner. This is true but a lot of people are beginners of one grade or another. What you have now in a good balance that helps and informs everyone to some degree. The novice will skip the technical and the expert will skip the elementary. No problem, keep your balance, it's good for all of us.

Al Rayment
Nelson, BC, Canada

INFORMATION PLEASE

Would like to purchase FCC State Index microfiche cards for the states of West Virginia and Ohio. Doug Shinn, WB8SCD, 113 Henry St., Ravenswood, WV 26164 (304) 273-5691

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Kenneth Kinsey
Winder, GA

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