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- **Bonus Book: Monitoring The Forgotten Americans**
- **The Golden Years of Radio**



- **Selected English Language Broadcasts: Winter 1987**
- **The Rarest DX Country That Almost Was**
- **Deep Sea Ship Communications**
- **The SOS That Nobody Heard!**



ICOM HF Receiver

IC-R71A



The World Class World Receiver

ICOM introduces the IC-R71A 100KHz to 30MHz superior-grade general coverage HF receiver with innovative features including keyboard frequency entry and wireless remote control (optional).

This easy-to-use and versatile receiver is ideal for anyone wanting to listen in to worldwide communications. With 32 programmable memory channels, SSB/AM/RTTY/CW/FM (opt.), dual VFO's, scanning, selectable AGC and noise blanker, the IC-R71A's versatility is unmatched by any other commercial grade unit in its price range.



Keyboard Entry. ICOM introduces a unique feature to shortwave receivers...direct keyboard entry for simplified operation. Precise frequencies can be easily selected by pushing the digit keys in sequence of frequency. The frequency will be automatically entered without changing the main tuning control.

Superior Receiver Performance. Passband tuning, wide dynamic range (100dB), a deep IF notch filter, adjustable AGC (Automatic Gain Control) and a noise blanker provide easy-to-adjust clear reception even in the presence of strong interference or high noise levels. A preamplifier allows improved reception of weak signals.

32 Tunable Memories. Thirty-two tunable memories, more than any other general coverage receiver on the market, offer instant recall of your favorite frequencies. Each memory stores frequency, VFO and operating mode, and is

backed by an internal lithium memory battery.

Options. FM, RC-11 wireless remote controller, synthesized voice frequency readout, IC-CK70 DC adapter for 12 volt operation, MB-12 mobile mounting bracket, two CW filters, FL32-500Hz and FL63-250Hz, and high-grade 455KHz crystal filter, FL44A.



First in Communications

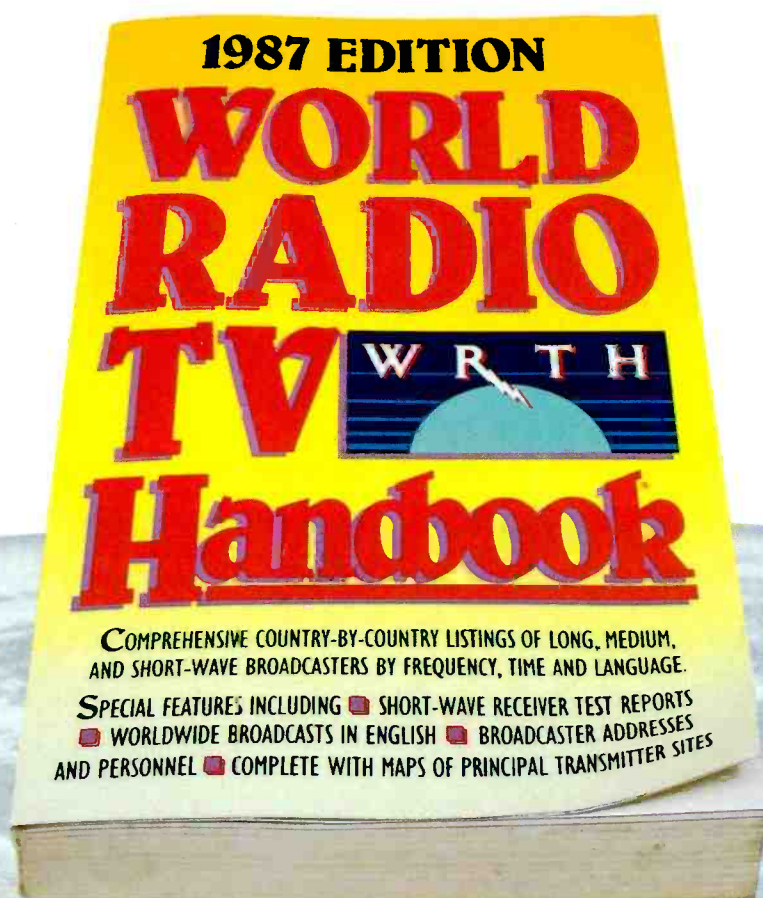
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All listed specifications are approximate and subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. R71A1084

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Although this new receiver is highly sophisticated, all controls are user-friendly. Favorite frequencies, such as BBC, VOA, WWV plus local AM stations, are easily stored in a 25 memory bank for recall at the touch of a button. Memories not only store the frequencies, but the modes and the tuning rates. The tuning knob allows you to change tuning speed automatically — in 100 Hz, 500 Hz, 1kHz or 5kHz steps.

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- Keyboard or tuning knob frequency entry.
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Audic output is 2 watts at 10% distortion.

Striking high-tech appearance finished in black.

Durable, high quality epoxy-glass circuit boards.

Dimensions (HWD) 3½" x 9½" x 7". Weight 5 lbs. 5 oz.

115 VAC adapter included, also 13.8 VDC capability.

Suggested Price \$699.

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POPULAR COMMUNICATIONS

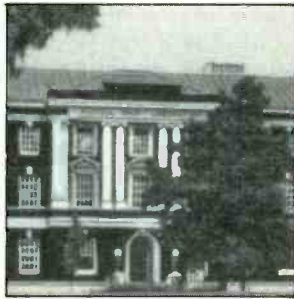
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SCAN Magazine

JANUARY 1987

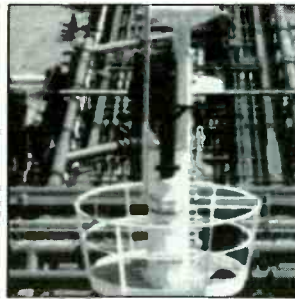
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AN EDITORIAL

Our Prediction Page

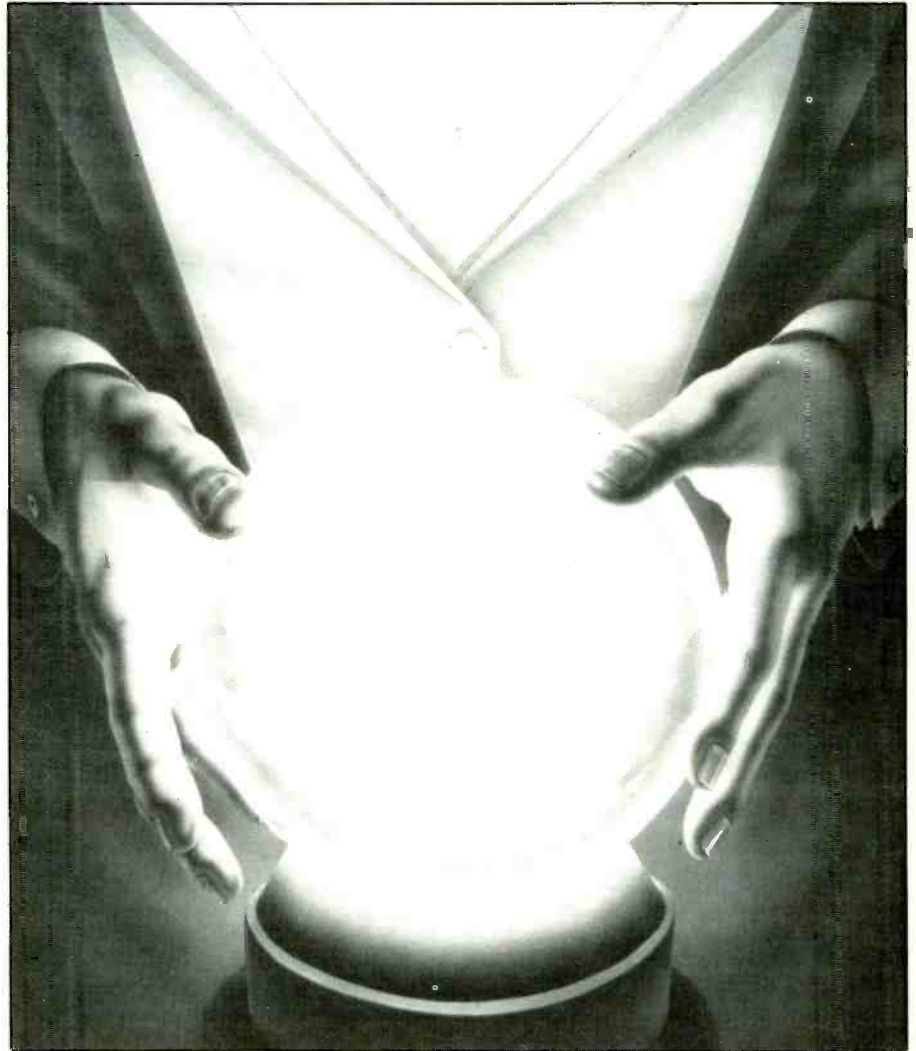
Who am I to fly in the face of tradition? How dare I not take the opportunity a January issue offers to present predictions for the coming year? Yup—we've never done it before. Hope the crystal ball has the right channel plugged in!

By the time you read this, the Electronic Communications Privacy Act will probably have been signed into law despite many efforts from within the hobby to oppose the legislation. Some scanner manufacturers will be discontinuing models that cover the 800 MHz Cellular Mobile Telephone (CMT) band; the band being made off limits in the aftermath of the Privacy Act. Several dealers have told me that the 800 MHz scanners they have in inventory may well be the last ones they'll have since several manufacturers are designing new-generation scanners that won't receive 800 MHz frequencies. If you think that you might ever want to tune the 800 MHz band, better check with dealers to see what they still have in stock. Apparently these units are being snapped up pretty fast by scanner enthusiasts. Could well be collectors' items in a few months.

Of course, if you owned a mobile telephone nobody could fault you for tuning across the band to see which channels were in use before you began transmitting. Wouldn't want to walk all over someone else's mobilephone call, would you? It's only good communications practice in use throughout the spectrum in many radio services. I predict that those who want to monitor mobilephone calls will figure out several novel ways to continue to pursue their interests long after 800 MHz scanners have become history. If you can't beat 'em, join 'em!

As I sit staring into the crystal, I think I can see manufacturers of scanners and communications receivers all deciding upon standardizing the antenna connections on their equipment. As I work with my own gear I find that I have to keep a supply of assorted connectors—PL-259, BNC, "Motorola," etc.—and converting adapters required to patch everything together. I certainly hope that I'm getting a good, clear picture on my monitor screen because it would be a boon to communications hobbyists if everything fit together as it came from the carton. Oh well, maybe it's all just wishful thinking.

In the halls of government, I'm getting a picture of a method of preventing classified documents from being stolen from government offices. I foresee the development of a metallic coating in a spray can that will be used to thwart the problem. Any document, when sprayed on its reverse with the metallic film, could be picked up by airport-type



metal-detectors to be positioned at strategic doorways throughout Federal buildings. Folks with sticky fingers would think twice before trying to sneak such documents past those electronic sentries. This system will be backed up by specially trained dogs who can sniff out the sprayed documents, just the way they sniff out smuggled drugs.

Wait—I see large transmitters and mighty antennas. It's the Voice of America coming into focus, and the transmitters I see are of ancient WWII vintage. The VOA, despite its mission to transmit information about the United States to the peoples of the world, seems to be one of the Federal activities most vulnerable to Washington's budget crunching.

I predict that, sooner or later, the VOA will announce that it will accept tax-deduct-

able contributions from industry in a manner similar to the way its done by TV's Public Broadcasting System (PBS). Major corporations doing worldwide business, such as Coca-Cola, IBM, as well as airlines and hotel chains, will be offered the opportunity to endow individual programs in exchange for low-key "institutional" mentions of their name and tax benefits. This will bring sorely-needed financing into the VOA without the need to dip into public funds, it will promote American industry overseas, and also provide tax relief to corporations feeling the pinch of new tax laws. Everybody wins!

Extending that prediction, I think that the NOAA's 162 MHz weather broadcast stations will begin to pay their own way with 30-second commercials. Great opportunities there for snowblowers, rock salt, rain-

wear, beachwear, cameras, film, swimming pools, sunglasses, tanning lotions, boats, and many other products. My own local NOAA weather station has already started announcing the names of the on-the-air weather reporters, and they've begun running contests for their listeners. While they're still a few notches away from spinning David Lee Roth, Rush, and Madonna discs, the inclusion of a single 30-second commercial during every repeat of their broadcast tape loop wouldn't be too much of an intrusion on their service to the community. I think it will happen as the Federal budget squeeze catches up with these broadcasts. Of course, commercial AM/FM/TV broadcasters will howl in outrage at what they will feel is government competition with their own services.

Radio Interview

Be sure to listen to the special DX/SWL-oriented Ray Briem Show that will be broadcast over the ABC Talk Radio Network on the morning of Saturday, January 10th. Ray has done this program in previous years and it's always been very informative and popular, permitting DX fans to call-in and talk "live" with DXperts in various areas of the hobby.

This year, Ray's guests include Stew MacKenzie, Dr. Bruce Elving, Bob Grove, and even yours truly. The overall program is 3 a.m. to 8 a.m. Eastern Standard Time (0800 to 1300 UTC), although some stations in the Network will not carry the entire five-hour program.

Some of the key stations in the ABC Talk Radio Network include: KABC, Los Angeles, CA (790 kHz); WABC, New York City, NY (770 kHz); WPRO, Providence, RI (630 kHz); WTKN, Pittsburgh, PA (970 kHz); WERC Birmingham, AL (960 kHz); KPRC, Houston, TX (950 kHz); KTAR, Phoenix, AZ (620 kHz); KFBK, Sacramento, CA (1530 kHz); KXL, Portland, OR (750 kHz); and (on tape delay) KGU, Honolulu, HI (760 kHz). There are other stations (including FM) in the ABC Talk Radio Network, so check your local area. If your nearest station doesn't carry the entire program, you may be able to tune it in on one of the key stations listed above.

The call-in number (a toll call) is 213-879-8255. The main local number in Los Angeles is 213-520-8255. In all cases, if it's busy, keep trying. If it rings, just let it ring (no matter how long) until they answer, which will be just before it's your turn to go on the air. As we go to press, I am tentatively scheduled for the 6 a.m. to 7 a.m. (1100 to 1200 UTC) time slot. Hope to hear from some of my friends.

Then I predict that time/frequency station WWV will get the message from the VOA and NOAA, and will follow suit with one or two brief commercials each hour wedged tastefully into their format. The National Bureau of Standards, which operates WWV/WWVH/WWVB has had its budget substantially whittled away by Congress. The agency could develop some non-governmental sources of income.

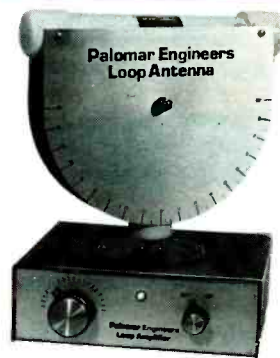
What with so many expensive wrist-watches being made overseas by companies such as Seiko, Rolex, Tudor, Tourneau, Piaget, etc., it seems to me that the NBS family of stations would be a great place to offer worldwide commercial information on precision watches made in this country. Moreover, these stations could also be a medium for a wide assortment of American-made scientific, laboratory and research devices and equipment to be exposed to a worldwide audience.

I further predict that if WWV doesn't kick off the idea, eventually Seiko will lead the way with commercial announcements over Japan's time station, JJY.

If all of this comes to pass, please remember that you read it first in POP'COMM. If, after a five year wait, none of it comes to pass, I sincerely hope that you tell everybody that you read all of this drivel in the copy of the *National Enquirer* you used for housebreaking Fido.

Hope 1987 is a good one for you!

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SALE

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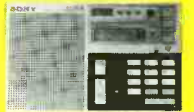
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SALE



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ICOM R-7000

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- CK-70: DC kit for VDC operation
- CR-64: High stability oscillator
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- EX310: Voice synthesizer
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 - Free extended 6 month warranty.
- | | |
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| R71 HP (XFS) Super 2.1 KHz filter | add \$300 |



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MAILBAG LETTERS TO THE EDITOR

The most interesting questions we receive will be answered here in each issue. Address your questions to: Tom Kneitel, Editor, Popular Communications magazine, 76 North Broadway, Hicksville, NY 11801.

Protect Communications? No Way!

The Senate should avoid repeating the mistake made by the House when it unanimously passed the Electronic Communications Privacy Act. Purportedly a benign updating of the 1968 Federal wiretap law designed to guarantee privacy in the electronic age, the bill actually promotes the cellular telephone industry at the expense of the public good.

True enough, obsolete language in the existing wiretap law fails to address digital, video and other new forms of communications. The proposed law would fix that. But it would also declare certain communications legally private regardless of the electronic medium used to transport them. The mere act of receiving radio signals, except for certain enumerated services like commercial broadcasts, would become a Federal crime.

To disregard the medium is to ignore the essence of the privacy issue. Some media, such as wire, are inherently private. That is, they are hard to get at except by physical intrusion into a residence or from a telephone pole. Other media, notably radio signals, are inherently accessible to the public. Commercial radio and television broadcasts, cellular car telephone transmissions and other "two-way" radio communications enter our homes and pass through our bodies. Cellular phone calls, in fact, can be received by most TV sets on UHF channels 80 through 83.

If radio is public by the laws of physics, how can a law of Congress say that cellular communications and other forms of radio are private? The unhappy answer is that the proposed law appears to be a product of technological ignorance or wishful thinking. A similar edict applied to print media would declare newspapers, or portions of them, to be as private as first-class mail. The result is plainly absurd and contrary to decades of reasonable legislative and judicial precedent.

In contrast, present Federal law prescribes a sensible policy for oral communications, protecting only those "uttered by a person exhibiting an expectation that such communication is not subject to interception under circumstances justifying such expectation." To illustrate, a quiet chat in one's parlor would likely be protected. Substitute for the parlor a crowded restaurant or the stage of a packed auditorium, and the expectation of privacy is no longer justified. The law would not grant it.

Congress should apply this same logic to electronic communications. The broadcasting of an unencrypted radio telephone call, or anything else, is an inherently public act, whether so intended or not. Thus, it violates the "justifiable expectation" doctrine, and warrants no Federal protection.

Protection or no, people will not be stopped from receiving radio signals. Even Representative Robert W. Kastenmeier, Democrat of Wisconsin, who championed the bill in the House, confesses that its radio provisions are essentially unenforceable. They will have no deterrent effect, and they will not increase the privacy of cellular phone calls or other broadcasts. Worse, the act would lull the public into a false presumption of privacy.

On further examination, it appears that the legislation is really more a sham than an honest, if puerile, attempt by Congress to deal with new technology. Its sponsors say they aim to protect all electronic communications equally. Yet the bill creates at least four categories of phone calls, with varying penalties for interception. Cellular radio calls are guarded by threat of imprisonment, but there is no interdiction whatsoever against eavesdropping on "cordless" phones of the sort carried around the apartment or backyard.

So, Congress is about to give the cellular telephone industry ammunition for advertising and bamboozling, promising privacy that does not actually exist. Cellular service companies thereby hope to avoid losing revenue from customers who might use the service less if they understood its vulnerability.

If Congress were serious about privacy in the communications age, it would scrap the Electronic Communications Privacy Act and begin anew. Legislators and the public must first grasp the true properties of new technologies. Are those properties inadequate or unsavory? If so, relief will come only from research and more technology not wishful legislation.

Robert N. Jesse
Baltimore, MD

All we can add is, "Amen."—Editor

Noisy Scanner

I've had a scanner installed in my car for over a year now and until recently it was performing well. Last week my problems began, namely in the form of severe radio noise while the engine is running. Also, at the same time this commenced the vehicle became hard to start and it runs "rough." Not only do I have a car problem, but now the scanner is also on the fritz. Where do I begin? I have a '79 Olds Cutlass Cruiser Brougham.

Mack Meyers
Wichita, KS

Although I'm not much of a car repair

specialist, I'd say that it's worth seeing if the cable between the distributor and the ignition coil has come loose at one end or the other or has dirt in its contact points. I don't think that the scanner itself is at fault, but a problem with this cable could well cause all of the annoyances you listed, including the noisy scanner.—Editor

DXing Ma Bell

I enjoyed the story you ran a while back on "telephone loop numbers" and how lots of people try to see who they can come up with by probing "loop" numbers. I have a different telephone hobby. First I dial "800" and then follow it up with random combinations of 7 digits. This connects me (at absolutely no cost) to all sorts of fascinating people and places. I've hooked up with airlines, oil companies, government agencies, hotels, bookies, etc., etc. You'd be surprised at some of those who have these "free call" numbers and don't expect to get calls on them except from a certain very select and limited number of clients. It's like calling "CQ" on the Ham bands, except that I didn't have to take a test or buy a Ham rig!

"Touch-Tone Tony"
Terra Alta, WV

If you can get them to QSL, then maybe you really have something there, Tony!
—Editor

'At Is The Answer

I have occasionally run across the term "ATIS" in reference to communications, yet I haven't been able to locate any definition of its meaning. Please explain.

Stanley R. Teasdale
Chelan, WA

At larger airports, ATIS is a recorded VHF (and/or UHF) aero band one-way broadcast containing the latest information for arriving/departing aircraft. This broadcast (which is frequently updated) might contain weather, wind, and runway conditions/usage, frequency data, etc. In this case, the letters are the initials for Airport Terminal Information Service. But don't go away yet, ATIS also has another meaning. The letters also stand for Automatic Transmitter Identification System. This ATIS is a component that is intended to be built into transmitters so that every time they are keyed they automatically send out a short data burst containing a coded identification number permanently programmed in by the equipment's manufacturer. The FCC is considering new regulations that would call for such ATIS devices to be built into all communications transmitters. This, in an effort to discourage operation on unauthorized frequencies and other rule violations. There is still some question if this would be a viable project that couldn't be easily defeated. Take yer pick!—Editor

OFFICIAL NEWS COLUMN OF THE SCANNER ASSOCIATION OF NORTH AMERICA

**Electronic Communications
Privacy Act Is Law!**

We thought that it couldn't happen, but it did. A ridiculous new law has been foisted upon us. Just tuning the radio spectrum now can make you a criminal. Of course, your chances of being caught are close to nil. But just the very concept of restricting radio receivers sends chills up our spines . . . what country are we living in anyway? Even the way the law was passed raises some interesting questions about how our government works. In the closing hours of Congress, when there was little time to carefully review anything, the privacy act legislation was tacked onto the drug enforcement legislation package. Now we all know how every politician has been trying to prove they are tough on drugs—especially before elections—so the drug enforcement package was sure to pass. The net result is that you and I with our scanners were thrown in the same basket as cocaine dealers. *Outrageous!* But that's exactly what has happened.

While we should not minimize the damage that has been done to our traditional American right of free access to the airwaves, and especially the precedent that it may set for future restrictions, we were able to make some significant changes in the Electronic Communications Privacy Act before it passed. One key reason why we were able to have some significant changes made was the effort many of you made in communicating with your U.S. Senators and Representatives by letters, phone calls and telegrams. If you were one of those who did take action, give yourself a big pat on the back. Your efforts did pay off! We also owe our thanks to groups like the Association of North American Radio Clubs and the Neighborhood Crime Prevention Coordinating Committee. Both organizations expended a great deal of resources in time and money to help shape this legislation to a more favorable conclusion. In fact, it is frightening to think about where we would be today without your efforts and the actions of these groups.

As the deadline for this column is upon us, we still do not have the final details of the legislation, which is about to be signed by President Reagan. Next month we will have complete details for you, but for now rest assured that most—if not all—of your current monitoring activities will not be effected. We plan to have a full update and some advice on how to operate under the Electronic Communications Privacy Act next month.

Something You Can Do To Help . . .

Without question we would have lost the battle if it had not been for the Neighborhood Crime Prevention Coordinating Committee (NCPCC). This non-profit organization has been a primary mover behind the "Neighborhood Watch" concept that has been so successful in reducing neighborhood crime. Most importantly, from the viewpoint of a scanner enthusiast, is the fact that this organization has always promoted the usefulness of ordinary citizens listening in on local police communications. This has not always been a popular idea with some police and sheriffs' departments. But over the years, as NCPCC carefully documented the many benefits of informed citizens in aiding their local police, opinions changed. Today, both the International Association of Chiefs of Police and the National Sheriffs' Associations are on record as endorsing the use of scanners. When the framers of the Electronic Communications Privacy Act (ECPA) wanted to ban the use of receivers for anything but broadcast, they were shocked and dismayed that law enforcement agencies did not support their proposal! Therefore, early on, public safety communications were excluded from the proposed ECPA.

The NCPCC operates without any government subsidy; all of its funds come from public donations. Over the years it has produced a number of public service TV spots with personalities such as Jamie Farr (from *M*A*S*H*) and Lonnie Anderson donating their talents. Each of these announcements includes prominent use of scanner radios as part of crime prevention efforts. We think that it is time for the scanner radio community to step forward and help support this organization which desperately needs funding to continue

its work. If each of us sent in just \$5.00, NCPCC would have the resources to launch another major TV campaign about the use of scanners in crime prevention. Therefore, SCAN is establishing a fund drive for NCPCC to demonstrate our support for their efforts. This organization is classified by the Internal Revenue Service as 501(c)3—which means that your donation qualified as tax deductible on your income tax.

Here's how to do your part . . . simply send a check or money order made out to the Neighborhood Crime Prevention Coordinating Committee (or to "NCPCC"). *Please do not make out your check to SCAN or POP'COMM and do not send cash.* Mail your donation to NCPCC Fund, c/o SCAN, P.O. Box 414, Western Springs, IL 60558. It takes a lot of money these days to produce and distribute a TV commercial, even when the airtime is donated by the stations. We want to provide NCPCC with \$20,000 to continue their work in 1987 . . . so please send as much as you can. In return, NCPCC has a handsome membership card which is recognized by law enforcement agencies nationwide and will be sent to you as acknowledgement for your donation. NCPCC was there when we needed them, why not do your part to support them?

800 MHz Scanners In Short Supply

As mentioned in the All Ohio Scanner Club newsletter, scanners covering the 800 MHz band are likely to be very scarce in the foreseeable future. Manufacturers understandably curtailed or cancelled production, not wanting to be stuck with merchandise that can't be sold. So, if you want one of these units and find a dealer with one in stock, better snap it up! Even after the ECPA regulations are clarified, it could take many months before 800 MHz units are again in full production.

Incidentally, the All Ohio Scanners Club is an excellent organization to get to know if you live in Ohio or adjoining states. For information you can write them at their new address: All Ohio Scanners Club, P.O. Box 148, Vandalia, OH 45377.

**Washington Legal Foundation Petitions
FCC To Require Cellular Phone Warnings**

The Washington, D.C. based Washington Legal Foundation, a national public interest law firm, has filed a 13-page formal petition for a ruling that would require manufacturers of cellular phones to put warning labels on the phones stating that the communications are not private. The Foundation noted that the ECPA may give users of cellular phones a false sense of security when, in fact, the calls can be intercepted by many VCRs and TV sets as well as scanners. The Foundation also noted that the FCC already requires warning labels on cordless phones. It will be interesting to see how the FCC and the cellular phone industry react to this proposal!

Auto Transmitter ID In Our Future?

Every few years it seems that the idea of ATIS (Automatic Transmitter Identification Systems) becomes a subject at the FCC. During the CB boom years the subject was hotly debated as the FCC struggled to control illegal operation. The next time the subject was brought up was when proposals for a new type of CB service were made for the 900 MHz region. Now faced with severe budget cuts, the FCC has again raised the issue with an official Notice of Inquiry. The proposal would require that transmitters in all services be outfitted with automatic identification devices to transmit ID codes issued or registered at the FCC.

The type of code used is left open for discussion, but it might very well be a computer compatible ASCII code. Whatever the merits of requiring ATIS, it may make scanner listening with a decoder quite interesting. Imagine having a display which would tell you who was transmitting even if they didn't identify themselves by voice. The FCC sounds serious about their proposal this time around, and technology has made it far easier and less expensive than it would have been a few years ago . . . so don't be surprised if it actually happens. We'll keep you posted.

It Started In Tangiers

A Look At Trans World Radio

BY GERRY L. DEXTER

Like the late Clarence W. Jones who founded HCJB, Dr. Paul Freed had long felt the call to go into missionary radio broadcasting. Not in the service of an already established missionary radio group, but with a new organization that he could guide with his own hands.

By the late 1940s this desire had been teamed with determination. Unfortunately, Dr. Freed faced the same problem most of us face—money. Insufficient amounts of it. So, in order to raise enough money to at least start himself toward the goal, Freed formed a company to build houses and house trailers. All the profits from this business went into a fund for the future radio effort.

By 1952, Freed had enough money to get started, at least on paper, so Trans World Radio was born under the name "International Evangelism." An actual broadcasting station was still some distance away.

Freed's initial plans had been to broadcast the Christian religion to the Arab world, but that was not to be, at least not in the beginning. Instead, a number of factors combined to spotlight Spain as the initial target area of the new broadcasts.

At that time Tangiers, on the north coast of Morocco, was an open, international city. Freed felt that Tangiers would be an ideal site for broadcasts to Spain and so began what looked like a long trek through governmental bureaucracy—a license to broadcast was the prize at the end of the trail.

But, along the way, Freed met a man named Southworth who had already heard about Freed's plans and, it so happened, already had a license to put a station on the air from Tangiers. Southworth was, in fact, in the process of building the station. Southworth offered to supply the station to Freed through a lease arrangement. So Trans World Radio's first station, WTAN, The Voice of Tangier, went on the air over Southworth's "Radio International" facilities overlooking the Straits of Gibraltar. That was in 1954, using an initial power of only 2.5 kW, although a 10-kilowatt unit was added shortly afterwards.

One might think that the success in getting on the air and the development of programs for Spain as well as the quick expansion into programming in Romanian and Serbo-Croat would have had TWR off to a great start.

But, in another parallel to HCJB, the initial success was followed by a slump. What few funds had been accumulated were soon

Verification Card

WTAN *The Voice of Tangier*

BRITISH P. O. BOX 219 - TANGIER MOROCCO - NORTH AFRICA

Many thanks for your Reception Report of *February 4, 1956*
 THE VOICE OF TANGIER, under the direction of International Evangelism, Inc. Greensboro, N.C., U.S.A., is a missionary radio station, dedicated exclusively to the broadcasting of the Gospel of our Lord and Saviour Jesus Christ and is maintained by free-will contributions.
 Station WTAN broadcasts on short waves with power of 10,000 watts (10 kw) and 2,500 watts (2.5 kw) equipped with directional antennae into at least five specific areas of Europe, North Africa and the Middle East.
 THE VOICE OF TANGIER is on the air daily. Detailed schedule of programmes, showing assigned frequencies, is found on the inside of this folder.

Broadcasts are in the following languages:

English	Czech	Russian	Italian
French	Polish	Hungarian	Albanian
German	Yiddish	Yugoslavian	Greek
Spanish	Esthonian	Bulgarian	Armenian
Portuguese	Lithuanian	Roumanian	Hebrew
Norwegian	Slovakian	Ukrainian	

Station announcements: In English - This is WTAN, The Voice of Tangier; in French - Ici La Voix Evangelique de Tanger; in Spanish - Esta es La Voz Evangelica en Tanger.

Rev. Ralph Freed
Field Director

QSL card from The Voice of Tangier, 1956.

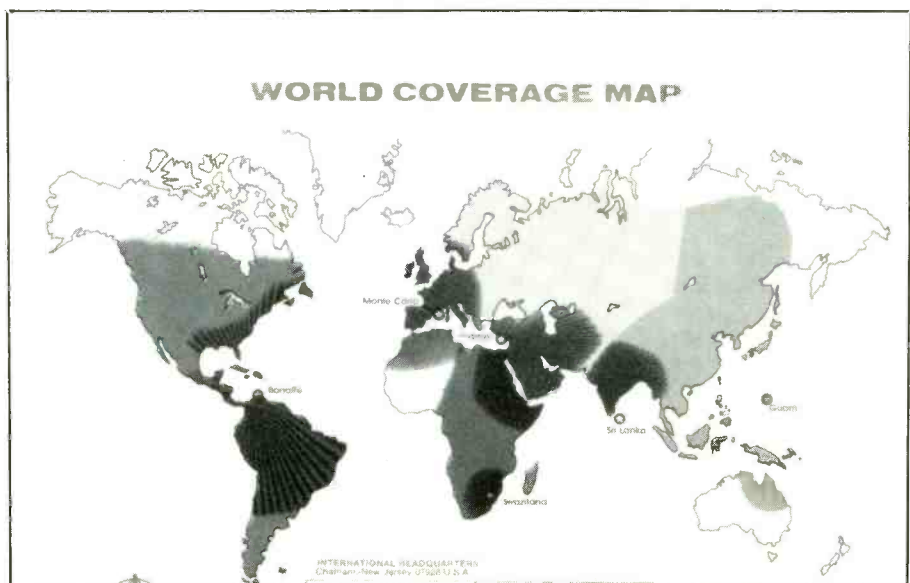
depleted. Freed's parents, who had given up their plans for semi-retirement in order to go to Tangiers and run the station there, were within days of giving it all up when an American church decided to take financial responsibility for their personal support.

Things began to improve financially and, by 1956, a second 10-kW transmitter had been added, along with a more effective antenna system. By the end of the first five

years of its operation, Trans World Radio had a staff of 26 operating in Tangiers.

Meantime, Freed had discovered Monte Carlo, found the place fascinating and began thinking about the possibility of headquartering TWR there, perhaps even putting up a second TWR outlet in Monaco, this international playground of the very rich.

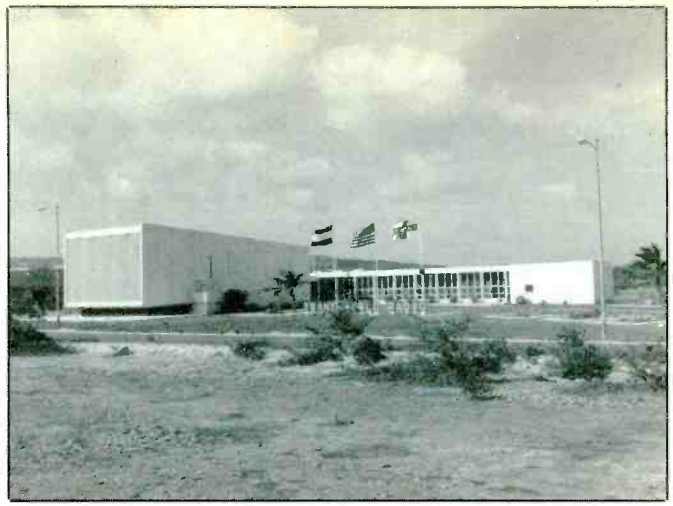
International politics forced a decision. In 1959, Morocco gained its independence



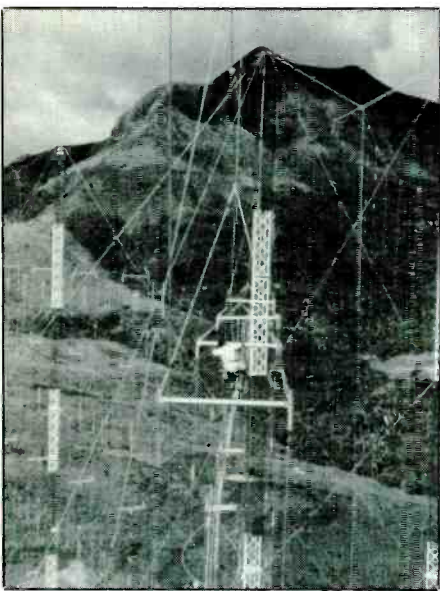
Trans World Radio's various stations cover most of the world.



TWR Swaziland. A view of control board and taped programs being fed to transmitters across the hall.



TWR's installation on Bonaire, Netherlands Antilles.



Part of the antenna system at KTGW/KTWR on Guam.

from France and the new Moroccan government not only shut down Tangiers' former "open city" status but announced that all broadcasting from Tangiers would be nationalized. So, the rather leisurely pace at which Monaco was being approached suddenly took on a new urgency. The Voice of Tangier had only nine months to live!

Eventually, a franchising agreement was reached with the government of Monaco. Under the agreement, Radio Monte Carlo would own the facilities of the proposed new Trans World Radio there and then lease the facilities back to TWR. The new TWR station would be housed in a huge stone building located on Mt. Agel, 2500 feet above the city of Monte Carlo. Trans World Radio's use of the building for a missionary radio station represented a great change from its originally intended use. The building had been built by the Germans during World War II and was meant to house a Nazi propaganda broadcaster but the war ended before it could be put on the air.

On December 31, 1959, the Voice of Tangier aired its last broadcast. And Trans World Radio's programs were no longer heard on shortwave or mediumwave.

In Monaco the activity was at a furious pace. Some 90 tons of antenna towers were hauled up the mountain. In all, there were 21 towers that would support giant curtain antennas aimed at the Mideast, Britain, Scandinavia, Russia, Spain and Eastern Europe. The antennas would be fed by a 100-kilowatt transmitter. This was a four-fold increase in power over the Tangiers site but it was also just one transmitter compared to the three in use at Tangiers. That meant cutting out some programming. There are only 24 hours in a day, even in Monte Carlo.

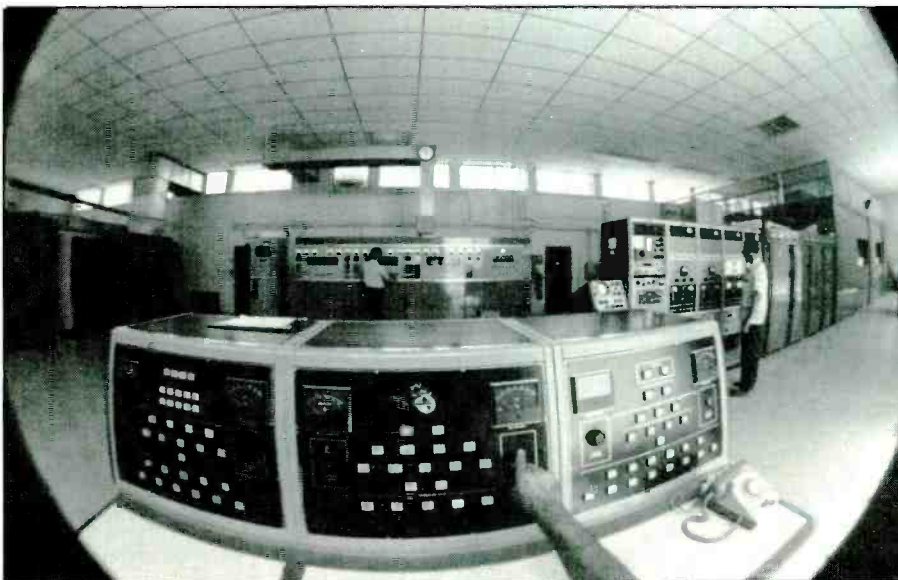
Some nine months after the Voice of Tangier left the air Trans World Radio signed on from Monaco.

Money became a problem again as the TWR group scrambled and prayed for the \$83,000 payments which had to be made to Radio Monte Carlo at specific intervals. On one occasion the last few thousand dollars arrived within hours of the deadline. On another, Freed was actually in the bank director's office—a few thousand short—when the banker took a phone call with the news that the necessary amount had arrived at the last second.

On a third occasion there was no last minute telephone reprieve. The banker checked over the figures a second time, this time basing his calculations on new exchange rates, and found the difference in TWR's favor was just enough to cover the missing amount!

TWR's first year of Monte Carlo operation brought in 18,000 letters and, like a snowball gaining size and speed as it rolls downhill, Trans World Radio began to grow in size and services.

Studios in Tangiers were kept in use and provided Spanish language programming. A network of monitors was set up throughout Europe to provide the station with signal reports on a daily basis, identify interference and recommend frequency changes. A recording studio was opened in Oslo, Nor-



The transmitting center at Bonaire.



A partial view of the TWR building in Monte Carlo with antennas.



Trans World Radio's staff at Monte Carlo.

way. The Gospel Recording Society was created to produce programs for Israel and the Arab world. In 1966 TWR began airing its programs over Radio Monte Carlo's 400-kilowatt mediumwave transmitter during hours in which the station would otherwise have been silent.

By the early 1960s, Freed was looking at maps again. He wanted to expand in new directions and felt that a station located in the Caribbean would be just the thing to cover parts of the Western Hemisphere.

Negotiations began with the government of Curacao in the Netherlands Antilles. An agreement to put up a TWR station there

was even signed. Then someone wondered about the close proximity of the planned site to Curacao's international airport. Tall towers and airports can be a deadly combination.

The two parties tore up the agreement and TWR looked next door, to the salt flats of Bonaire island. The Bonaire government welcomed the idea. So much so that it agreed to prepare the land, build roads, provide landscaping and landfill at the proposed site just outside the capital, Kralendijk.

So, on October 1, 1964, Bonaire's Trans World Radio station came on the air with a half-million watts on 800 kHz—easily receiveable in the U.S. at night. The next year

a 300-kW shortwave transmitter went on and a second such unit was added later. The snowball was picking up speed.

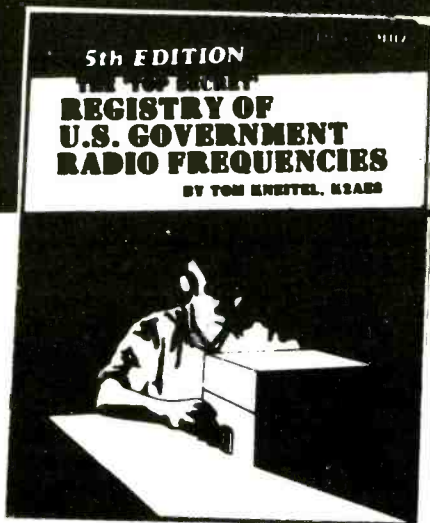
Ten years later, Trans World Radio went back to Africa, though to a place almost at the other end of the continent from where it all began. The Kingdom of Swaziland was to be TWR's new African base. A 50-kW mediumwave, four 25-kW and one 100-kW shortwave units were installed at Mpangela Range to serve northeast and southern Africa.

Just two years after Swaziland went on the air, Trans World Radio landed on another island—Guam, in the South Pacific. A 10-kilowatt mediumwave station, KTWG, began broadcasting in 1976 followed, a year later, by two 100-kW shortwave outlets

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Trans World Radio Shortwave Frequencies

3200 - S	9475 - M	11705 - M
3240 - S	9495 - M	11715 - M
3275 - S	9515 - G	11725 - M
4760 - S	9535 - G	11735 - G
4775 - S	9550 - S	11760 - M, S
4790 - S	9585 - G	11765 - G
5055 - S	9590 - G, M	11815 - B
5955 - M	9600 - M	11840 - G
5965 - S	9610 - M	11845 - S
6070 - S	9640 - M, S	11875 - B
6105 - S	9665 - M, B	11895 - B
6145 - B	9670 - M	11900 - M
6200 - M	9710 - S	11920 - G
6220 - M	9720 - G	11930 - M
7105 - G	9725 - S	11945 - G
7115 - G	9755 - M, G	11955 - M
7125 - G	9770 - M	15240 - G
7160 - M	9775 - M	15355 - B
7205 - M	9820 - G	15420 - G
7235 - M	9870 - G	15440 - B
7240 - G	9830 - S	17705 - G
7275 - M	9870 - G	17770 - G
7295 - S	11965 - M	17795 - G

S = Swaziland, M = Monaco,
B = Bonaire, G = Guam.

CIRCLE 76 ON READER SERVICE CARD

Trans World Radio

International Headquarters:

P.O. Box 89
Chatham, NJ 07928

Bonaire:

Trans World Radio
Bonaire,
Netherlands Antilles

Swaziland:

Trans World Radio
P.O. Box 64
Manzini, Swaziland

Monaco:

Trans World Radio
5 rue de la Poste
Monte Carlo, Monaco

Guam:

KTWR
Box 3518
Agana, Guam 96910

operating as KTWR. There are now four 100-kW units at Nimitz Hill on Guam, beamed to China, eastern Russia, southeast Asia, Japan, Indonesia and northern Australia.

Still the snowball rolled and, a year later, TWR put a 400-kW mediumwave outlet on the air from Puttalam, Sri Lanka (on 882 kHz), beaming programs to India, Pakistan, Bangladesh, Burma, Tibet and Afghanistan.

Throughout the years, the building of broadcast training centers accelerated. The one in Hilversum, Holland provides instruction in broadcast techniques to the many independent producers who provide programming for TWR. Other studios and offices sprouted in places like Buenos Aires, Belwyn (Australia), San Paulo, London, Beausoleil (France), Wetzlar (West Germany), Hong Kong, New Delhi, Nairobi, Barcelona, Maracay (Venezuela) and Montevideo. World headquarters were established in Chatham, New Jersey. The various stations, studios and office sites around the world now total 29! TWR's combined wattage has surpassed 5 million watts!

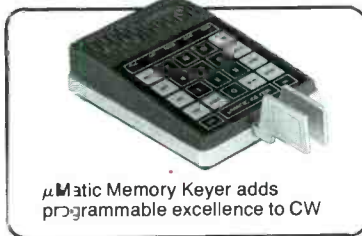
Trans World Radio verifies correct reception reports with attractive QSL cards. You can write directly to the individual stations since each has a staff on hand to answer mail.

It has been more than 30 years since the first broadcasts went out over the Voice of Tangier. What might have been a disaster for Trans World Radio in North Africa instead contributed to the creation of one of the world's most powerful and widespread religious broadcasting organizations. It makes you wonder if the snowball has yet reached the bottom of the hill.

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Two Policemen Rescue Three From Burning House

Policemen put their lives on the line every day, but two officers in Fullerton, California went far beyond the call of duty in helping three people escape from a burning house.

Officer Scott Camery, 27, and Officer Robert Richardson, 30, were credited with saving the lives of three people when fire swept their two-story home. Both officers are members of the Fullerton Police Department.

SCAN PUBLIC SERVICE AWARD

While on patrol shortly after midnight, Camery noticed that flames were visible on the roof of a house. He then radioed the Fullerton Fire Department for help.

Camery and Richardson sounded their squad car sirens to wake up the occupants in the burning building. That didn't seem to work, so the two officers kicked down the door of the building and rescued 12-year-old Adam Christenbery, who was sleeping on a living room couch.

According to an account of the incident in the *Orange County Register*, the commotion woke up Cheryl Parker, 26, and Robert Ybarra, 18, who were sleeping upstairs.



Officer Scott Camery of the Fullerton, CA Police Department is one of this month's award winners.



Fellow Officer Robert Richardson shares the award this month for heroic and life-saving actions.

They tried to go down the stairs, but the heat and smoke kept them upstairs.

Thomas Thompson, an inspector with the Fullerton Fire Department, said that the two officers were finally able to help the two people escape from an upstairs window with the aid of an unidentified neighbor.

Parker suffered a bruised foot while climbing down a ladder to safety, and the other two occupants of the building were uninjured, according to the *Register*. The blaze was reportedly started by an electrical short that ignited the paneling in the bedroom.

For their heroic rescue, Officers Camery

and Richardson will receive the SCAN Public Service Award. The award includes a \$100 cash prize and a special commendation plaque. Darrin Kosky of Placentia, California will also receive a plaque for making the nomination.

Congratulations to all of you!

Send all SCAN Public Service Award nominations to SCAN Public Service Award, P.O. Box 414, Western Springs, IL 60558. Please send a letter along with background information, such as newspaper clipping.

SCAN

Best Equipped

As you can plainly see, E.J. Berryman of Lincoln, Nebraska is not short on equipment! He has arranged an interesting mix of scanners, receivers and accessories on a 60-inch steel pedestal desk.

E.J., who goes by the monitor callsign of WDX0EYN, uses four scanners: Bearcat 220; Bearcat 300; Regency TMR8-H/L; and Hy-Gain Pro-Scan. A Japan Radio Corp. NRD-515 and Yaesu FRG-7700 are used for shortwave listening.

Accessories include Yaesu's FRV-7700 UHF adaptor and FRA-7700 antenna, along with a McKay Dymek DA-7 medium-wave antenna, MFJ-959 antenna tuner, Autek Research filter, and a Weather Alert weather radio. A Sherwood S7100 AM-FM stereo receiver rounds out this setup.



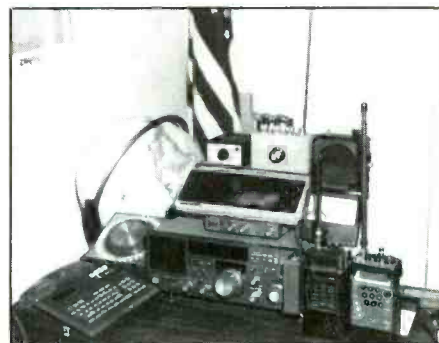
SCAN PHOTO CONTEST WINNERS

Best Appearing

The centerpieces in George W. Finger's radio shack are a Bearcat 250 scanner and a Yaesu FRG-7700 communications receiver. The Watkinsville, Georgia listener uses a descrambler/external speaker combination and EA-14 antenna amplifier with the Bearcat and a Yaesu FRA-7700 antenna tuner with the FRG-7700.

George says that he is able to consistently pick up Atlanta stations, over 70 miles away, by using a Butternut SC-3000 antenna, Grove Electronics scanner beam, and a B&W CS-3G antenna switch.

In his automobile, George has a Bearcat 250 with an M-25 descrambler, VE-18 voice equalizer and EA-14 antenna amplifier, all from Capri. He also has a Bearcat 100 portable scanner and a Sony Air-8, and uses an aluminum case with a Grove ANT-8 portable antenna to take his scanning hobby with him wherever he goes. George says that the aluminum case is modified to accept



portable external power, chargers for radios, headphones and extension cables for the extra antennas.

George describes himself as an "absolutely dedicated scanner enthusiast," and enjoyed a recent trip to New York City with his portable scanner set-up.

Winners in the Photo Contest this month receive the BMI "NiteLogger" tape recorder activator. Plugged into a cassette recorder and a scanner, it gives a complete record of all communications with no "dead time" on the tape. If you would like to enter the contest, just send a sharp black/white print to SCAN Photo Contest, P.O. Box 414, Western Springs, IL 60558.

SCAN



**POP'COMM Book Bonus:
A Comprehensive Directory
for Hearing Federal and Tribal
Communications of the American Indian**

Monitoring The Forgotten Americans

BY TOM KNEITEL, K2AES, Editor

The day was typical of South Dakota in late February, bitter cold and gray. A cutting wind swept down from the northwest. It was the day that a band of Oglala Sioux occupied the trading post and church at Wounded Knee in a bitter confrontation with federal agents that was to last for nine harrowing weeks. The Oglala Sioux said that they were protesting consistent U.S. violations of Indian treaty rights, particularly the Treaty of 1868 between the Sioux and the United States.

Then, American Indians (or, Native Americans, if you prefer) occupied the federally-abandoned Alcatraz penitentiary in San Francisco harbor as a militant protest against perceived injustices.

The Ute Indians went to court and were awarded almost \$32-million as compensation for tribal lands taken from them in Colorado and Utah between 1891 and 1938.

These incidents aren't from the distant past; the siege at Wounded Knee took place in 1873! In 1975, at a peak of unrest amongst the Menominee Indians in Wisconsin, a clandestine broadcast station called *The*

Menominee Warriors' Station, located somewhere near Keshena, turned up on 1580 kHz (only 10 kHz away from a nearby commercial broadcast station) in order to be used as a forum for voicing numerous complaints against Washington.

Even as this is being written, Navajo and Hopi Indians in Arizona are engaged in a very serious territorial dispute, while tribes in New England continue to press their claims to millions of acres of land that they feel were taken from them illegally.

The news media devotes little attention to the plight of Native Americans during these days of headlines about international terrorism, drug smuggling, and the arms race. The Indian has, for the most part, and unfortunately, become much of a forgotten American insofar as the general public's perception of their claims, needs, activities, and status.

There are probably about 2.5 million U.S. citizens who consider themselves Native Americans by virtue of some degree of Indian heritage. While more than half of these people are assimilated into the general

population, the remainder live within territories known as Federal Indian Reservations.

Some of the approximately 250 Reservations consist of a mere few hundred acres, although the Navajo/Hopi Reservation in Arizona, Utah, New Mexico, and Colorado equals the size of West Virginia.

At the present time, Washington recognizes and acknowledges that it has a special relationship and a trust responsibility for 506 federally-recognized Indian entities (tribes, bands, villages, groups, pueblos, etc.) that qualify for special governmental services and benefits.

For better or worse, Indian Reservations were established in the aftermath of decades of brutal warfare as settlers moved west into lands that had been traditional Indian villages and hunting grounds. Treaties were eventually signed, and special tracts of land were set aside for Indian settlements under the general administration of the Bureau of Indian Affairs (BIA), a division of the U.S. Department of The Interior. For the most part, Federal Indian Reservations are self-governing areas that exist almost as separ-



ate mini-states with the United States, having unique status in the eyes of federal and state governments.

The BIA is charged with administering the federal programs directed at those who reside on the Reservations, including education, vocational training, and numerous social welfare programs. The BIA is also the trustee for money earned as a result of the exploitation of the natural resources found on Reservations (oil, gas, uranium, timber, hydroelectric power, etc.).

In addition to these duties, the BIA also operates its own public safety services, including a law-enforcement arm. The tribes themselves also (and often) have their own tribal public safety services within the Reservations. Another federal agency operating on some Reservations is the Department of Health and Human Services (HHS). For the most part, these are the agencies that appear to carry the bulk of the services within the Reservations, with surprisingly little involvement by state and county governments.

When I sought to compile a listing of BIA stations and frequencies, I quickly realized that it would be necessary to add selected listings for vital tribal services, inasmuch as they are as much in evidence as the BIA and HHS communications. What I ended up with was a book-length directory of services that is the only listing of its type ever presented.

On the tribal level, all known public safety (plus a few business/industrial) services are shown. Listings indicated as being for "miscellaneous" purposes are used for either police, fire, highway maintenance, schools, logging, oil or gas exploitation, mining, governmental administration, civil defense, ambulances, or a combination of several of these services.

Where possible, information is given to indicate the name of the tribe(s) that are covered by a station's activities. In the case of BIA stations, the locations given in the of-

ficial records used were frequently abbreviated to the point of being undecipherable. Other locations were specified in terms of locally-known landmarks since they were probably miles from the nearest post office. Under such circumstances, some BIA station locations have defied all attempts at providing better known locations, although I did manage to track a good many of them down.

The structure of the BIA consists of Area Offices and local Field Offices or Agencies. Such designations are shown next to appropriate listings. BIA listings not shown with specifications are Field Office sub-stations, repeaters, relays, schools, and VHF or UHF links. Larger Reservations usually contain remote and mountainous areas that require complex systems in order to achieve reliable communications. Listings that don't specify BIA or HHS are generally those operated by the tribes themselves.

Not all Indian Reservations are recognized as such by the BIA. Furthermore, not all recognized Reservations have BIA or tribal communications within their borders. In such cases, public safety services are routinely provided by state, county, and local agencies that normally serve the areas surrounding the Reservations.

In looking over this directory, some observers will be surprised to note that there are few listings for Texas. That's because there aren't many Reservations there, and no BIA offices. There aren't any formal Reservations in Oklahoma similar to those located in other states. While there are about 160,000 Native Americans from at least nine major tribes in Oklahoma, the BIA considers these people to be mainly assimilated into the general population. There are, however, BIA, HHS, and tribal communications facilities in many areas of Oklahoma having large Indian populations.

While it's true that the national news me-

dia pays scant attention to the Native American, the fact that many live on Reservations doesn't at all mean that their evolution and history came to an end sometime in the 19th century. Indeed, only last September a federal appeals court, in a 5 to 4 decision, upheld the finding of another court that Alexander Haig and other former government officials are permitted to be sued by the Sioux Indians who occupied Wounded Knee in 1973! The Sioux say that military forces illegally intervened in the incident, thus violating the 1878 congressional ban on the military's enforcing of civilian law.

The appeal court ruling obtained by the Sioux seems to weigh heavily upon the possible use of military forces in patrolling the nation's borders in an effort to curtail international drug smuggling. This is only one example of the very active Native American political movement (which some see as controlled by radical factions) as it claims to fight for many pro-Indian causes including land reform, treaty compliance, cultural and religious restoration and redress of numerous grievances.

The Native American culture is a proud one, rich in tradition and colorful in nature. The many events taking place within Indian communities clearly indicate that their present and future is easily as fascinating as their past. This, despite the fact that the national media tends to ignore their plight and current activities.

There's a lighter side, too. Many Reservations openly seek out tourists and visitors, offering tribal pageants and pow-wows as well as crafts shows on a regular basis. Communications relating to all of these activities, plus routine public safety traffic (including those concerned with fish and game management) may be monitored on the channels listed herein.

The Native American may have become the forgotten American, but, no, his activi-



ties didn't stop at the turn of the century. Moreover, his communications have long since surpassed smoke signals. You can tune in on *real* American history just as it is being made—every bit as current as it was during the days of Sitting Bull, Crazy Horse, and Geronimo!

Whether you tune in from where you live, or while you're on vacation, your scanner can put you in touch with a unique people whose roots in North America trace back far more than 50,000 years. That's something to go out of your way to hear!

ALASKA

Anchorage			
BIA Field Office	KWA597	164.25	
HHS	KRS615	164.30	171.2375
Bethel			
HHS		164.30	
Metlakotla (HQ Metlakotla Indian Community)			
BIA Field Station	KWA599	168.55	
Police	KNGV997	155.25	155.37
Maritime	WHH275	156.325	157.025
Power Utility	WRP247-8	153.725	
Business	KNJB400	151.925	
Mount Edgecombe			
BIA	KWA596	164.80	
HHS		164.80	
Tonana			
HHS	KIK731	164.30	

ARIZONA

Statewide: Salt River Project	uses	153.455	153.515	153.62		
153.71	158.19	169.475	171.925	406.075	451.05	451.0875
451.25	451.275	451.475	452.20	453.725	462.75	462.80
462.85	816.1875	820.1875				
Ak Chin (HQ Ak Chin Indian Community)						
Miscellaneous	WNA5634	816.0875	820.8375			
Apache County (Navajo)						
Police	KBB847	154.74				
Ashsya'dn						
BIA	KOJ514	171.75	172.625			
Black Mesa (Navajo)						
BIA	KOP564	164.775	164.80			
		417.675				
Medical Emergency	KZO415	463.00	463.175			
Black Peak						
BIA	KOJ509	171.775				
Black Pncl.						
BIA	KOJ584	171.65	172.525			
Cameron (Navajo)						
Miscellaneous	KML95-6	154.98				
Camp Verde (Apache Visitor Center)						
Miscellaneous	KAD3505	462.625				
Carrizo (Apache)						
Miscellaneous	WZX559	154.055				
Chediski						
BIA	KOJ552	172.675				
BIA	KOJ556	172.675				
Chinle (Navajo)						
BIA Chinle Agency	KOJ572	40.31	165.6875			
BIA Chinle Agency	KOP511	40.01				
HHS	KGU611	164.30				
Police	KVZ589	46.02				
Medical Emergency	KYY851	463.00	463.175			
Miscellaneous	WBH972	155.985				
"	KML96	154.98				
"	KNCG869	154.98	155.04			
"		155.76	155.82			
"	KWL580	46.52				

"	KXR782	155.82				
"	WAU714	155.04				
"	WRA599	154.98				
"	WBC207	451.30				
Telephone Repair						
Chlchnbt.						
BIA	KOP506	40.01	40.31			
HHS	KUU611	165.3125				
Chuck Box						
BIA	KOJ533	172.025	172.675			
		406.475	408.075			
Cibecue (Apache)						
BIA	KOJ538	172.025	172.675			
		406.475	408.075			
Logging	KNHU721	451.60				
Forestry	KVF705	151.175				
Power Utility	WNBK756	452.35				
Miscellaneous	KVF705	153.74				
Coolidge (San Carlos Irrigation District)						
BIA	KOJ510	163.125	171.75			
		172.625	172.725			
BIA	KOJ513	171.75	172.625			
BIA	KOJ517	171.75	172.625			
Cottonwood (Indian School)						
BIA	KOP511	40.01	40.31			
Cave (Indian School)						
BIA	KOP512	40.03	40.33			
Deer Springs						
BIA	KOJ554	172.025	172.675			
Defiance Mountain						
BIA	KOJ560	40.33	164.8625			
		165.6875	169.70	169.725		
		172.425	412.275	419.65		
Dennehotso (Ramah Navajo School)						
BIA	KOP584	40.01	40.31			
Devilshead						
BIA	KOP562	164.8625				
BIA	KOP567	164.80	164.8625			
		165.6875	165.7125			
Dilkon (Navajo)						
BIA Indian School	KOP514	40.01	40.31			
HHS	KUU611	164.30	165.3125			
Police	KGJ798	154.95				
Police	WNBS230	154.89	155.25	155.85		
Power Utilities	KNEB668	153.65	158.16			
Medical Emergencies	KYY853	463.00	463.175			
Miscellaneous	KXR781	155.04	155.82			
Dry Lake						
BIA	KOJ541	171.70	172.425			
Flagstaff						
US Dept. of Justice		164.80	164.8625			
		165.7125				
Fluted Rock						
BIA	KOJ580	171.65	171.525			
Foghat Ridge						
BIA	KOJ555	172.025	172.675			
Fort Apache (Apache)						
BIA	KOD598	406.475	408.075			
BIA	KOJ532	171.70	172.025			
		406.475	408.075			
BIA	KOJ545	172.10	172.70			
Fort Defiance (Navajo)						
BIA Ft. Defiance Agency	KOJ562	172.525				
BIA Ft. Defiance Agency	KOJ570	40.03	40.33	164.8625		
		165.6875	171.65	411.625		
Window Rock University	WNAX497	154.515				
Police	KWJ417-8	46.02				
Police	KWL578	46.02				
Police	WCR277	451.10				
Telephone Repair	WBC209	451.50				
Power Utilities	KNFX922	452.70				
Power Utilities	KNEY213	452.30				
Power Utilities	WSZ863	153.605	158.16	158.265		
Miscellaneous	WAF926	45.44				
Miscellaneous	WCH735	452.70				
Miscellaneous	WSQ940	153.98	155.775			
Fort McDowell						
BIA	KOJ528	414.875				
Fort Yuma (Quechan)						
Police	KOM522	153.86				
Ganado (Navajo)						

Police	WZJ658	154.95				
Fire	KNGB518-9	153.77	154.37			
Schools	KYN391	154.54				
College Police	WQH260	154.615				
Power Utilities	KNBA262	163.65				
Miscellaneous	KXR783	155.82				
Miscellaneous	WAU867	155.04				
Miscellaneous	WSQ941	155.775				
Geronimo (San Carlos Apache)						
Miscellaneous	KUS630	453.725				
Goulding (Navajo)						
Miscellaneous	KBW824	155.76				
Miscellaneous	KDN25	154.98				
Grat Mountain						
BIA	KOJ526	166.875				
Greasewood (Navajo)						
BIA	KOP539	40.01	40.31			
Medical Emergency	KYY855	463.00	463.175			
Hoyden						
BIA	KOJ512	171.75	172.625			
Headgate						
BIA	KOJ508	171.775	172.425			
Hilltop						
BIA	KOJ521	171.70	172.425			
BIA	KOJ594	172.425				
Hotevilla (Hopi)						
BIA	KOJ547	166.975	168.375			
Miscellaneous	KUO215	453.725				
Hunters Point						
BIA	KOP543	40.03	40.33			
Indian Wells (Navajo)						
Police	KXQ699	46.02	154.95			
Police	WBH974	451.10				
Kaibito (Navajo)						
BIA	KOP554	40.03	40.33			
HHS	KUU611	164.30	165.3125			
Medical Emergency	KYY856	463.00	463.175			
Koyenta (Navajo)						
BIA	KOJ574	40.01	40.31			
HHS	KUU611	164.30				
Police	WGC341	452.70				
Police	WGC343	452.70				
Power Utilities	KJS527	153.65	158.16	158.265		
Power Utilities	KNIP381	153.65	158.16	158.265		
Power Utilities	KNIR689	153.65	158.16	158.265		
Power Utilities	KWX220	153.65				
Medical Emergency	KYY857	463.00	463.175			
Miscellaneous	WAH284	45.44				
Miscellaneous	KIL291	153.845	154.98			
Miscellaneous	KXF650	153.845				
Miscellaneous	WSQ934	153.98				
Miscellaneous	KXR784	155.04				
Miscellaneous	KRU990	155.085	155.94			
Miscellaneous	WBH971	155.985				
Miscellaneous	WSB699	453.575				
Keams Canyon (Hopi)						
BIA Hopi Agency	KOJ546	166.975				
BIA Hopi Agency	KOP560	164.80	164.8625			
		165.6875	165.7125			
		168.375				
Miscellaneous (Hopi)	KUP216	453.725				
Miscellaneous (Navajo)	KNDX343	155.085	155.94			
Medical Emerg. (Navajo)	KYY858	463.00	463.175			
Kinliche						
BIA	KOP541	40.03	40.33			
Kinney						
BIA	KOJ557	172.025	172.675			
Kitsilee (Navajo)						
Miscellaneous	KYK326	45.64				
Miscellaneous	WBH968	45.64				
Kitt Peak (Papago)						
BIA	KOJ531	168.375				
HHS	KRS617	168.525				
Leupp (Navajo)						
BIA	KOP527	40.01	40.03	40.31	40.33	
HHS	KUU611	164.30	165.3125			
Police	KBB851	46.02				
Police	WNBS230	155.25	155.85			
Medical Emergency	KYY860	463.00	463.175			
Miscellaneous	KGL609	153.845	154.98	155.82		
Miscellaneous	KYX287	46.52				
Miscellaneous	WXQ950	153.98				
Limestone						
BIA	KOJ537	172.025	172.675			
		406.475	408.075			
BIA	KOJ553	172.025	172.675			
Long Mesa						
BIA	KOJ504	168.325	171.775			
Lower Greasewood (Navajo)						
HHS	KUU611	164.30	165.3125			
Lukochukai (Navajo)						
BIA	KOP569	40.01	40.31			
BIA	KUU611	164.30	165.3125			
HHS	KLR277	44.66	154.935	453.05		
Police		460.225	460.275	460.30	460.50	
Power Utilities	KNEX930	153.575				
Medical Emergency	KYY861	463.00	463.175			
Miscellaneous	KBW823	155.76				
Miscellaneous	KWL581	46.52				
Miscellaneous	WXQ953	153.98	155.775			
Lupton (Navajo)						
Police	KNHE586	154.95	155.475	155.625		
Lw. Mountain						
BIA Indian School	KOP537	40.01	40.31			
Mammoth						
BIA	KOJ515	171.75	172.625			
Many Farms (Navajo)						
BIA	KOP502	40.01	40.31			
BIA	KOP593	164.825	165.6875			
		412.375				
Miscellaneous	WSQ945	153.98</				

BlA	KOJ559	406.475	408.075	Highway Maint.	WGJ955	150.955		Yalepont (Navajo)			
BlA	KOJ577	172.025	172.675	Highway Maint.	WQJ322	156.075		BlA	KOP531	40.31	164.80
BlA	KOJ587	172.425		Miscellaneous	KIL495	453.975		CALIFORNIA			
McEnkopi (Hopi)				Miscellaneous	WCP247	453.975		Big Hill			
Miscellaneous	KNFM559	453.725		Miscellaneous	KA92120	816.6875-820.6875		BlA	KMC501	172.775	
McKays Peak				Sacaton Mountain				BlA			
BlA	KOJ554	406.475	419.475	BlA	KOJ536	169.40	171.75	Blythe (Colorado River Tribe)			
BlA	KOJ551	172.675		BlA	KOJ500	171.75	172.625	Business	KNBK518	464.30	
McNary (Apache)				BlA	KOJ520	166.375	167.025	Covello (Round Valley Reservation)			
Logging	KNHU721	451.60		BlA	KOJ520	171.70	172.425	Fire	WQW839	154.19	
Power Utilities	KCW779	153.41		BlA	KOJ520	166.375	167.025	Forestry	KHQ84	169.475	
Forestry	KUS471	151.175		BlA	KOJ520	171.70	172.425	Miscellaneous	KNAE723	453.60	
Business	KNDV217	461.875	463.40	Medical Emergency	KA34351	463.00-463.175		Havasut Lake (Chemehuevi Tribe)			
Business	KNHM489	464.20		Miscellaneous	WXM591	453.225		Police	KNAR939	155.655	
Business	WFZ499	463.40		San Xavier (San Xavier Reservation)				Hoopa (HQ Hoopa Valley Tribe)			
Business	KWO630	463.40		HHS	KRS614	163.075		BlA	KMC500	171.725	172.775
Miscellaneous	WZJ640	453.275		Sowmill (Navajo)				Police	KZJ970	154.92	
Moenkopi (Hopi)				Police	KWJ416	46.02		Police	WFR354	155.07	
Miscellaneous	KNFL532	453.725		Scottsdale (Salt River-Pima Indian Community)				Police	KZJ40	155.79	
Miscellaneous	KNFM559	453.725		BlA Ft. McDowell Office	KOJ527	408.725	412.275	Forestry	KFV99	169.475	
Mohave Valley (Ft. Mohave)				Miscellaneous	KUV664	453.725		Rescue	WSW465	47.54	
Business	WZV916	154.515		Miscellaneous	WNAQ200	816.2125-820.2125		Medical Emergency	KIG886	463.00-463.175	
Monzntpt				Sebada Lake				Miscellaneous	WFR360	155.895	
BlA	KOJ561	166.875		BlA	KOP547	40.01	40.31	Hrmtsbnc.			
Mount Eldon (Navajo)				Second Mesa (Hopi)				BlA	KMC507	173.7625	
HHS		165.4325		Miscellaneous	KMA867	154.115		Klamath (Resighini Tribe)			
Medical Emergency	KYY862	463.00-463.175		Sells (Papago Tribe; Tohono O'odham Tribe)				BlA	KMC505	171.725	172.775
Mount Lemmon				BlA Papago Agency	KOJ830	163.075		Palm Canyon			
BlA	KOJ511	171.75		Indian Oasis School	KNDZ216	155.235		BlA	KMC506	173.7625	
Mount Turnbull				Shonto (Navajo)				Riverside			
BlA	KOP576	167.025	172.425	HHS	KUU611	164.30	165.3125	BlA	KOP580	406.475	
Na Ah Tee (Navajo)				Medical Emergency	KY868	463.00-463.175		Susanville (Susanville Tribe)			
BlA	KOP565	40.31	164.80	BlA Indian School	KOP903	40.30	40.33	Miscellaneous	KNAH388	37.18	
HHS		165.3125		Springerville (Apache)				COLORADO			
Miscellaneous (Hopi)	KUP214	453.725		Power Utility	WQC863	153.455		Herman Peak			
Telephone Repair	KQH558	451.35		Power Utility	WSZ634	153.545	158.25	BlA	KAC502	171.75	
Medical Emergency	KY863	463.00-463.175		Water	WYA948	463.60		Ignacio (Southern Ute Tribe)			
Power Utility	KNEK938	153.575		Emergency	KNEN709	155.28		BlA Field Office	KAC500	171.75	172.675
Power Utility	KJ5525	153.65		Business	KNDV217	461.875	463.40	HHS	"Ute 102"	171.75	172.675
Navajo County (Navajo/Hopi)				Business	KNBH308	461.80		Police	WAN529	154.71	155.52
Sheriff		39.18	155.07	Supai (HQ Havasupai Tribe)				Ambulance	KNFJ204	155.34	
Miscellaneous		154.025	155.145	BlA	KOJ503	172.425		Pk. Pt.			
		155.085	155.94	Tale Point				BlA	KAC507	171.75	172.675
Navajo Mountain				BlA	KOP531	167.025		Sandyims.			
HHS		165.3125		Teec Nox Pos (Navajo)				BlA	KAC505	171.75	172.675
Nozlini				BlA	KOJ564	40.03		Spring Creek			
BlA	KOP568	40.31		Police	KVV741	44.66		BlA	KAC508	171.75	172.675
Ookridge				Medical Emergency	KY869	463.00-463.175		Towaoc (HQ Mountain Ute Tribe)			
BlA	KOJ582	171.65	172.525	Miscellaneous	KXB765	155.82		BlA Field Office	KAC501	171.75	172.675
Odart				Miscellaneous	WAU686	155.04		Police	WNBE638	154.65	155.415
BlA	KOJ543	172.675		HHS	KUU611	164.30	165.3125	Ambulance	KNFJ206	155.34	
BlA	KOJ558	172.675		Thornton				Miscellaneous	WNAU322	453.425	
Old Summit				BlA	KOJ502	168.325		FLORIDA			
BlA	KOP578	171.70	172.425	Toyeyi (Navajo)				Big Cypress			
Oracle Junction				BlA	KOP542	40.01	40.31	BlA	KIE511	167.125	
BlA	KOJ534	171.75	172.625	Police	KKD382	154.71	154.725	Brighton			
Oraibi (Hopi)				Tsaile (Navajo)				BlA	KIE512	163.025	167.125
Miscellaneous	KMA866	154.115	156.015	BlA	KKD382	154.71	154.725	BlA	KIE514	166.325	167.125
Miscellaneous	WDH805	453.725	453.825	BlA	KOJ561	40.03	40.33	Clewiston (Seminole)			
Page (Navajo)				BlA	KOJ561	40.03	40.33	Industrial	KNGT288	35.84	
Telephone Repair	KYO571	451.50		BlA	KOJ561	40.03	40.33	Hollywood			
Papago Farms (Papago)				BlA	KOJ561	40.03	40.33	BlA Seminole Agency	KIE510	166.325	167.125
BlA	KOJ590	163.075		HHS	KUU611	164.30		Lokeport (Seminole)			
Parker (Colorado River Tribe)				Police	KUL792	155.625		Industrial	KGT288	35.84	
BlA Field Office	KOJ506	171.775	172.425	Police	WNBS230	155.25	155.85	Miscellaneous	KB44592	816.1125-820.1375	
BlA Field Office	KOJ588	171.775	172.425	Medical Emergency	KYY870	463.00-463.175		Tallahassee			
Miscellaneous	KXZ889	453.725		Power Utility	KJ5532	153.65	158.16	Seminole Tribe	KNHP758	461.25	
Peach Springs (HQ Hualopi Tribe)				Power Utility	KJ5533	153.65		IDAHO			
BlA	KOJ501	168.325		Telephone Repair	WBC210	451.30	451.35	Bannock Creek Pumping Station			
BlA	KOJ539	168.325		Miscellaneous	KXR786	155.82		BlA	KOD538	171.775	172.45
Miscellaneous	KNIX626	453.725		Miscellaneous	WAU721	155.04		BlA	KOD536	171.775	172.45
Phoenix				Miscellaneous	WBH970	155.985		BlA	KOD539	171.775	172.45
BlA Phoenix Area Office	KOP575	164.8625	165.6875	Valencia County (Navajo)				Ferry Butte			
BlA Phoenix Area Office	KOP597	406.475		Sheriff	KUL791	155.625		BlA	KOD533	172.45	
Pinol Peak				Valentine				Fort Hall (Shoshone-Bannock)			
BlA	KOJ516	167.025	171.75	BlA Truxton Canon Agcy	KOJ505	168.325		BlA Ft. Hall Agency	KOD535	171.775	172.45
Piney Hill (Navajo)				Vicks Hill				Fire	KNEC660	154.16	
BlA	KOJ581	171.65		BlA	KOJ524	412.225		Gibson			
BlA	KOJ563	172.525		White Cone				BlA	KOD534	171.775	172.45
HHS		164.30		BlA	KOP573	164.80	165.7125	Kamiah (Nez Perce)			
Medical Emergency	KYY864	463.00-463.175		Whiteriver (White Mountain Apache)				Forestry	KOE849	151.145	
Pinon				BlA	KOJ550	172.025	406.475	Forestry	KCZ47	151.325	151.445
BlA	KOP571	164.80	165.7125	Forestry	KUS471	408.075	414.875	Plummer (Coeur d'Alene)			
BlA	KOP583	40.01	40.31	Schools	KJ8904	463.00-463.175		Fire	KZE793	154.16	154.22
HHS	KUU611	164.30	165.3125	Business	KAD0674	462.55		Forestry	WSZ293	159.225	
Police	WQX272	46.02	154.71	Business	WFZ500	463.40		Pocatella (Shoshone-Bannock)			
Pipe Springs				Business	KNDV216	461.825		Police	KNEK634	460.425	
BlA	KOP540	40.03	40.33	Business	WZF502	463.40		Portneuf Reservoir			
Point of Pines				Miscellaneous	WGA713	453.275		BlA	KOD537	171.775	172.45
BlA	KOJ522	171.70	172.425	Miscellaneous	WZX798	153.74		BlA	KOD537	171.775	172.45
Paston (Colorado River Tribe)				Wide Ruins				BlA	KOD535	171.775	172.45
BlA	KOJ517	171.775	172.425	BlA	KOP546	40.01	40.31	BlA Ft. Hall Agency	KOD535	171.775	172.45
BlA	KOJ519	171.775	172.425	Willow Mountain				Fire	KNEC660	154.16	
Miscellaneous	KNEJ854	453.725		BlA	KOJ523	171.40	172.425	Gibson			
Preston Mesa (Navajo)				Window Rock (HQ Navajo Tribe)				BlA	KOD534	171.775	172.45
BlA	KOJ593	40.33	164.80	BlA Navajo Area Office	KOJ565	32.94	40.02	Industrial	KYH945	452.125	
Miscellaneous		172.425	411.65	Police				Worley (Coeur d'Alene)			
BlA	KGJ792	153.845		Police	KGJ797	154.95		Fire	KGW302	154.13	
Quajote Mountain				Police	KJD958	154.95		Fire	WFL436	155.355	
BlA	KOP500	168.375		Police	KNHE585	453.40		School	KNEE266	155.295	
Red Lake				Police	KWQ483	39.18		KANSAS			
BlA	KOP572	164.80	165.7125	Power Utility	KJ5529	158.16	452.20	Lawrence			
BlA Indian School	KOP504	40.03	40.33	Power Utility	KNEK926	158.625	452.30	BlA	KKF560	162.025	
Rocky Ridge				Miscellaneous	KBW826	155.76	155.82	Reserve (Soc & Fox Tribes of Missouri)			
BlA Indian School	KOP523	40.03	40.33	Miscellaneous	KCU254	155.82		Miscellaneous	KNFJ264	158.76	
Roof Butte (Navajo)				Miscellaneous	KDM61	154.98		LOUISIANA			
HHS		165.3125		Miscellaneous	WXQ952	153.98	155.775	Elton (Coushatta Tribe)			
BlA	KOJ586	171.65		Winslow (Navajo)				Miscellaneous	WXB840	154.04	
BlA	KOJ598	40.33	164.8625	BlA	KOP530	40.01		MAINE			
BlA	KOJ598	408.725	411.65	HHS	KUU611	164.30		Indian Township (Indian Township Tribe)			

Old Town (Penobscot Tribe)		
Miscellaneous	KIG639	153.875
Miscellaneous	KNDB480	153.815 155.085
Perry (Passamaquoddy Tribe)		
Miscellaneous	KIL403	153.875
Princeton (Indian Township Tribe)		
Miscellaneous	KNDS847	155.085
Miscellaneous	KNER266	153.875
Fire	KNEF717	154.31
Topsfield (Indian Township Tribe)		
Miscellaneous	KNDS847	153.815 155.085

MICHIGAN

Baraga (Keweenaw Bay Tribe)		
Business	KXZ828	42.96
Buses	WNAC357	43.84
Forestry	KQF65	159.39
Brimley (Bay Mills Indian Commission)		
Police	KKJ246	154.95 155.13 155.865
Heron (Keweenaw Bay Tribe)		
Buses	WNAK357	43.84

MINNESOTA

Ball Club (Minn. Chippewa Tribe)		
Forestry	WRY436	151.19
Bemidji		
BIA	KAC560	172.425 414.825
Bena (Minn. Chippewa Tribe)		
Fire	KNCH627	154.16 154.295
Business	KNAF911	461.10
Big Meadows		
BIA	KAC556	171.725 172.425
Boisfort		
BIA	KAC567	171.725 172.425
Cass Lake (HQ Leech Lake Reserv.- Minn. Chippewa)		
BIA Minnesota Agency	KAC562	171.725 172.425
U.S. Dept. of Justice		171.725 172.425
Housing	WSK287	154.515
Schools	KBZ431	155.34 155.385
Bus Service	KNDY292	47.66
Business	KNAF911	461.10
Fire	KNAK489	154.16 154.295
Forestry	KAG429	151.265 151.415
		159.427 159.465
Police	WAL271	154.755 154.95
Police	KAJ832	155.31 155.475
Fire	KUX465	33.56
Miscellaneous	KNGW930	155.835
Grand Portage (HQ Gr. Portage Reservation)		
BIA	KAC550	171.725 172.425
Ambulance	KZ6336	155.34 155.355
Heritage		
BIA	KAC566	171.725 172.425
Longville (Minn. Chippewa Tribe)		
Fire	KNA0482	154.16 154.295
Marshal		
BIA	KAC568	171.725 172.425
Mount Maude		
BIA	KAC551	171.725 172.425
BIA	KAC553	171.725 172.425
Mount Sophie		
BIA	KAC552	171.725 172.425
Naytahwaush		
BIA	KAC557	172.425 414.825
Nett Lake (HQ Nett Lake Reservation)		
BIA	KAC564	171.725 172.425
BIA	KAC565	172.425 414.825
Northome		
BIA	KAC563	408.525
Ponemah (Red Lake Reservation- Minn. Chippewa)		
BIA	KAC558	171.725 172.425
Ambulance	KNCT744	155.325 155.34
Red Lake (HQ Red Lake Tribal Cncl. Minn. Chippewa)		
BIA Field Office	KAC555	172.425 414.825
Police	KYJ235	154.755 154.86
		155.37
Police	KA34562	154.95 155.475
Emergency	WQJ322	155.22
Ambulance	KNCT744	155.325 155.34
Ridge Tower		
BIA	KAC559	171.725 172.425
Welch (Prairie Island Tribe)		
Bingo	KB65840	154.57
White Earth (Minn. Chippewa Tribe)		
Hospital	WXP443	155.34 163.25
Miscellaneous	WQR601	153.80 155.865

MONTANA

Anton Butte		
BIA	KOD547	166.325
Babb		
BIA	KOC516	36.18
Box Elder (Chippewa Cree)		
Police	WXB760	37.94 39.82 39.86
		39.88
Public Health Center	KNAD278	155.25 155.325
		155.34
Brockton (Ft. Peck Tribe)		
Emergency	KNFF817	155.235
Browning (HQ Blackfeet Tribe)		
BIA Field Office	KOC515	36.18 166.30 166.925
Police	KBQ393	39.74 39.82 39.86
Emergency	KNHC258	47.46
Hospital	KYB948	155.28 155.34
Schools	KNEA866	47.46
Miscellaneous	KNDR601-2	153.815 154.995
Miscellaneous	KNGJ772	155.76
Busby		
BIA	KOD546	36.18
Cody Butte		
BIA	KOD580	36.18

Continental Butte		
BIA	KOD543	166.275
Crow Agency (HQ Crow Tribe)		
BIA Field Office	KOD515	408.725
BIA Field Office	KA9360	36.18
Police	KNIP327	39.56 39.74 39.82
		39.86 39.88
Cut Bank (Blackfeet Tribe)		
BIA	KOC518	36.18
Emergency	KNHC258	47.46
Divide		
BIA	KOC517	36.18 166.925
Dixon (Confed. Salish Kootenai Tribes)		
BIA	KOC595	166.325 166.925
Police	KY1997	39.56 39.74 39.82
		39.88
Ferry Bsn.		
BIA	KOC594	166.325 166.925
Fisher		
BIA	KOC514	36.18
Fisher Butte		
BIA	KOD548	36.18 173.7625
		412.275
Fort Belknap (Ft. Belknap Tribe)		
Emergency	KXV659	155.28 155.385
		452.225
Fort Kipp (Ft. Peck Tribe)		
Police	KBF883	39.74 39.82
Emergency	KNFF815	155.235
Frazer (Ft. Peck Tribe)		
Police	KBF898	39.74 39.82
Emergency	KNFF814	155.235
Harlem (HQ Ft. Belknap Tribe)		
BIA Field Office	KOD540	36.18 166.325
		167.075 167.125
Police	KXC835	39.74
Hays (Ft. Belknap Tribe)		
Miscellaneous	WQJ542	155.94
Heart Butte (Blackfeet Tribe)		
Police	KJF470	39.74 39.82
Hot Springs (Flathead Reservation)		
BIA	KOC590	166.325 166.925
		172.425 172.675
Police	KC4136	39.50 39.56 39.82
Ambulance	WXF589	155.28 155.385
Irvine		
BIA	KOC588	166.325 166.925
Jocko		
BIA	KOC586	166.325 166.925
Kicking Horse		
BIA	KOC584	166.325 166.925
Lame Deer (HQ Northern Cheyenne Tribe)		
BIA Field Office	KOD545	164.425 167.075
		408.725
Police	KY7588	39.74 39.82 39.86
		39.88
Board of Health		
KON358/KMK451		155.28 155.385
Lodge Grass (Crow Tribe)		
Police	KNEN353	39.74 39.82 39.86
		39.98
Health Service	KNAY222	155.28 155.385
Oliver Point		
BIA	KOC587	166.925 172.425
Pablo (Confed. Salish & Kootenai Tribes)		
Police	KMK2109	39.56 39.74 39.82
		39.88
Police	WNAU975	155.685 159.15
Miscellaneous	KMK390	155.28 155.34
Miscellaneous	KOM370	155.115
Pistol Creek		
BIA	KOC593	166.325 166.925
Polson (Flathead Reservation)		
BIA	KOC596	166.325 166.925
BIA	KOC597	172.425 172.675
Poplar (HQ Ft. Peck Tribe)		
BIA Field Office	KOD504	166.325 167.075
Police	KNEQ467	154.995
Emergency	KNFF816	155.235
Pryor (Crow Tribe)		
Police	KNIP327	39.96
Schools	KL5351	155.205
Rocky Boys Reservation (Chippewa Cree Tribe)		
BIA	KOD541	166.275 167.075
		167.125
Police	WXB760	39.74 39.82 39.86
		39.88
Ronan (Flathead Reservation)		
BIA Flathead Agency	KOC583	166.325 166.925
BIA Flathead Agency	KOC599	166.725
Police	KNAB725	39.80 39.82 39.88
Fire	KIC415	154.31
Saint Ignatius (Confed. Salish & Kootenai Tribes)		
BIA Flathead Irrig. Proj.	KOC598	172.425 172.675
Police	KXM777	39.70 39.82 39.88
Fire	KNGP506	154.235
Miscellaneous	KNAG905	154.995
Miscellaneous	KNBZ685	154.055
Saint Mary (Blackfoot Tribe)		
Miscellaneous	KNDR860	154.995
Seville		
BIA	KOC519	36.18
Swift Current		
BIA	KOC518	36.18
Two Medicine		
BIA	KOC519	36.18
Wolf Mountain		
BIA	KOD512	173.7625 412.275
Wolf Point (Ft. Peck Tribe)		
BIA	KOD505	166.325 167.075
BIA	KOD506	166.325
Emergency	KNFF815	155.235
Miscellaneous	KL5380	46.58
Zortman (Ft. Belknap Tribe)		
Emergency	KXV659	155.28 155.325
		155.34 155.385
		452.225

NEBRASKA

Statewide		
U.S. Dept. of Justice		38.98
Macy (Omaha Tribe)		
Industrial	KNCK766	153.335
Miscellaneous	KSQ436	39.90 39.98
Miscellaneous	WSL636	39.82
Pender (Winnebago Tribe)		
Schools	WRG555	155.265
Thurston (Winnebago Tribe)		
Schools	WRG555	155.265
Miscellaneous	KNFL664	39.82 39.90
Winnebago (HQ Winnebago Tribe)		
BIA	KAC585	38.98
Police	KVH326	39.90 39.96
Miscellaneous	KAX297	39.82
Miscellaneous	KNWH310	39.90
Schools	KVF771	47.58
NEVADA		
Cnspr. Mountain		
BIA	KOJ591	172.45
Las Vegas (Paiute Council)		
Police	KNFR822	154.785 155.43
Owyhee (HQ Owyhee Paiute Tribe)		
BIA	KOJ540	171.775 172.45
Sutcliffe (Pyramid Lake Paiute)		
Police	WBC402	154.785
Police	KYJ335-6	155.79
Yerington (Walker River Paiute)		
Water	KNIL976	463.525
Kayenta (Navajo)		
Police	KWV528	46.02
Medical Emergency	KY857	463.00-463.175
Miscellaneous	KIL291	153.845 154.98
		155.76
Miscellaneous	KWV769	46.52
Miscellaneous	KXF650	153.845 155.76
		155.82
Miscellaneous	KXR784	155.04
Miscellaneous	WAH284	45.64
Miscellaneous	WAU715	155.04 155.82
Miscellaneous	WBH971	155.985
Power Utility	KJS527	153.65 158.16
		158.265
Laguna (Laguna Pueblo)		
Police	KNIC237	156.21
Police	KNGX235	158.73
Miscellaneous	KBL755	155.055 453.60
Miscellaneous	KTI771	155.055
Miscellaneous	WIQ81	155.925
Lake Valley		
BIA	KOP520	40.01 40.31
Lamosca (Navajo)		
BIA	KOJ592	40.31 164.775
		411.85 417.95
Police	KUL791	155.625
Magdalena		
BIA	KOP525	40.01 40.31
Mariano Lake		
BIA	KOP521	40.01 40.31
Marley Mountain		
BIA	KKF512	172.675
Mescalero (HQ Mescalero Apache Tribe)		
BIA Field Office	KKF510	171.75 172.675
HHS	KO7571	171.75 172.675
Miscellaneous	KNIK321	155.085 155.805
Miscellaneous	KUY420	155.055 155.925
Miscellaneous	KZJ958-962	155.085
Mount Powell		
BIA	KOP545	171.65 172.575
Mount Taylor		
BIA	KKF535	166.30
HHS		165.3125
Muerfano		
BIA	KOP533	40.01
Nambé (Nambé Pueblo)		
Emergency	KNDN569	462.975
Navajo (Navajo)		
Police	KXV496	154.95
Logging	KFM933	48.68 49.40
Newcomb (Navajo)		
Police	KGJ794	154.74
Nhnzd. School		
BIA	KOP351	40.03 40.33
Ojito		
BIA	KKF501	171.75 411.85
Ojo Encin.		
BIA	KOP549	40.01 40.31
Osborne		
BIA	KKF504	171.75
Pajarito Mountain		
BIA	KKF513-4	171.75 172.675
Picuris (Picuris Pueblo)		
Fire	KNIP403	154.145 154.31
Pojo Aque		
BIA	KKF529	166.30 166.90
		408.775 411.775
Pueblo Pintado (Navajo)		
BIA	KOP526	40.01 40.31
Miscellaneous	KXU303	155.82
Miscellaneous	WAU731	155.04
Puycliffs		
BIA	KKF536	166.30 166.90
Ramah (Navajo)		
BIA	KKF521	40.37
Police	KBK609	155.625
Red Rock School		
BIA Indian School	KOP522	40.03 40.33
Ruidoso (Mescalero Apache)		
Business	KNDU845	463.20
San Felipe (San Felipe Pueblo)		
Miscellaneous	WBV938	155.025
San Ysidro (Zia Tribe)		
Police	KWE578	155.37

Police	KWE579	156.015
Police	WBW945	155.025
Sanostee (Navajo)		
BIA Indian School	KOP524	40.01 40.03 40.31
HHS	KUU611	164.30 165.3125
Emergency Medical	KYY865	463.00-463.175
Santa Clara (Santa Clara Tribe)		
BIA	KKF532	166.30 166.90
Police (8 Northern Pueblos)	KNCE513	154.725
Miscellaneous	KQO296	39.58
Miscellaneous	KCP451-2	39.58
Santo Dominga (Santo Domingo Pueblo)		
Miscellaneous	WBV940	155.025
Santa Fe (Nambé/Pojo Aque/San Idelfonso & Tesque Pueblos)		
BIA N. Pueblo Field Ofc.	KKF531	406.475
BIA N. Pueblo Field Ofc.	KKF534	166.30 166.90
Shiprock (Navajo)		
BIA Shiprock Navajo Agcy	KOJ566	40.03 40.33
		164.8625 165.6875
BIA Shiprock Navajo Agcy	KOP587	412.375
HHS	KUU611	164.30
Police	KBB846	154.74
Telephone Repair	KYQ570	451.30 451.50
Power Utilities	KJ5528	153.65 158.16 158.265
Miscellaneous	WAWJ32	155.82
Miscellaneous	KQU315	155.82
Miscellaneous	KXU304	155.04
Miscellaneous	WBH967	155.985
Miscellaneous	WRH25	154.98
Medical Emergency	KYY866-7	463.00-463.175
Silver		
BIA	KKF517	171.75 172.675
Silver Canyon		
BIA	KKF507	171.75 172.675
Stong		
BIA	KKF528	166.30 411.775
Taos (Taos Pueblo)		
BIA	KKF541	166.30 166.90
		408.775 411.775
HHS	KUP864	171.3375
Tesuque (Tesuque Pueblo)		
Fire	KNBJ611	154.19 154.31
Thoreau (Navajo)		
BIA	KOP538	40.01 40.31
Miscellaneous	KYX286	46.52
Toadlena		
BIA Indian School	KOP552	40.01 40.03 40.31
		40.33

NEW MEXICO

Acoma (Acoma Tribe)		
Police	WDB357	154.71
Police	KOB457	155.61
Miscellaneous	KUE502	155.835
Alamo (HQ Alamo Band of Navajo)		
BIA	KOP528	40.31
Police	KBP670	155.625
Albuquerque		
BIA Area Office	KKF530	166.30 166.90
BIA Area Office	KKF540	166.30 166.90
BIA Area Office	KOP566	164.8625 165.6875
BIA Area Office	KOP582	406.475
Cochiti Pueblo		
Miscellaneous	KNFX726	155.025 156.015
Isleta Pueblo		
Miscellaneous	WBV933	155.025
Miscellaneous	KBF603/644	156.015
San Felipe Pueblo		
Miscellaneous	KBF987	155.025 156.015
Sandia Pueblo		
Miscellaneous	KBF647	155.025 156.015
Santa Ana Pueblo		
Miscellaneous	KBG989	155.025 156.015
Santo Domingo Pueblo		
Miscellaneous	KBF990	155.025 156.015
Zia Pueblo		
Miscellaneous	KBF991	155.025 156.015
Baco		
BIA	KOP535	40.01 40.31
Bclbt. School		
BIA	KOP508	40.03 40.33
Bdspr. School		
BIA	KOP548	40.03 40.33
Bernalillo (Isleta Pueblo)		
Miscellaneous	WBV934	155.025
Black Rock (Zuni Pueblo)		
BIA	KKF520	171.75 172.675
Borrega Pass		
BIA	KOP509	40.01 40.31
Bezza Bluff (Navajo)		
HHS		165.3125
Medical Emergency	KYY903	463.00-463.175
Canon City		
BIA	KOP516	40.01 40.31
Canoncito (Navajo)		
Police	KCE741	155.625
Carizozo Canyon		
BIA	KKF505	171.75 172.675
Cebollita Peak (Acoma Tribe)		
BIA	KKF537	166.30 166.90
Cedar Springs		
BIA	KKF503	171.75 172.675
Cinght. Mountain		
BIA	KKF506	171.75
Clara Peak		
BIA	KKF533	166.30 166.90
Cochiti (Cochiti Pueblo)		
Miscellaneous	KNXF722	155.115
Colgate School		
BIA	KOP532	40.03 40.33
Crown Point (Navajo)		
BIA E. Navajo Agency	KOJ571	40.01 40.31
		164.8625 165.6875
HHS	KUU611	164.30
Police	KBB844	155.625

Palice	WAW712	451.10
Medical Emergency	KYY852	463.00-463-175
Power Utility	KNBA263	153.65
Miscellaneous	KWL579	46.52
Miscellaneous	WAF928	45.64
Miscellaneous	WSQ936	153.98 155.04 155.82
Crystal (Navajo)		
Logging	KAW987	49.40
BIA School	KOP513	40.03 40.33
Dulce (HQ Jicarilla Apache Tribe)		
BIA Field Office	KKF500	171.75 172.675
		411.85
Police	KUJ780	154.755 155.37 155.55
Police	KXM807	154.755
Police	WAS641	155.64
Fire	KGU907	154.31
Miscellaneous	KNDT256	154.965
Miscellaneous	KNDT257	154.965 155.88
Dzlhdtl.		
BIA	KOJ576	40.31
Eagle Creek		
BIA	KKF516	171.75 172.675
Farmington (Navajo)		
BIA Irrigation Project	KOJ589	40.03 40.33
BIA Irrigation Project	KOJ596	40.03 40.33
BIA Irrigation Project	KOJ597	40.03 40.33
Miscellaneous	WSQ944	155.775
Five Canyon		
BIA	KKF508	171.75 172.675
Fort Wingate		
BIA	KOJ568	40.03 40.33 163.125
		167.125 408.575
BIA	KOP596	412.375
Gallup (Navajo)		
BIA (Navajo Area Office)	KOJ575	32.94 40.02 40.03
		163.125 408.725
HHS	KUU611	164.30
Police	KTC842	155.625
Medical Emergency	KFY854	463.00-463.175
Miscellaneous	WCC930	452.70
Miscellaneous	WSQ942	153.98 155.775
Gamercio		
BIA	KOJ577	163.125 167.125
Ganado (Navajo)		
Police	WZJ658	154.95
Grants (Navajo)		
Police	WAF870	451.10
Police (Acoma Tribe)	KOB457	154.845 155.61
Miscellaneous	KYX288	46.52
Miscellaneous	WXQ949	153.98
Harley Mountain		
Huerfano	KKF512/519	171.75
BIA	KOP533	40.31
Isleta (Isleta Pueblo)		
BIA	KKF538	166.30 166.90
Miscellaneous	KTP981	156.015
Miscellaneous	WBV935	155.025
Jemez (Jemez Pueblo)		
Miscellaneous	KNC1548	153.995
Miscellaneous	KBF646	155.025 156.015
Jnsc. School		
BIA	KOP519	40.03 40.33
Tohatchi (Navajo)		
BIA	KOJ583	171.65 172.525
BIA	KOP507	40.01 40.31
BIA	KOP592	412.375
Police	KBB845	155.625
Police	KXR803	46.02
Police	WAE785	451.10
Telephone Repair	KYO572	451.50
Power Utility	KJ5531	153.65 158.16
Power Utility	KNEX934	153.575
Miscellaneous	WXQ948	153.98
Miscellaneous	KBAN820	154.98 155.82
Tohntsa		
BIA	KOJ585	171.65 172.525
Toreon		
BIA	KOP534	40.01 40.31
Tse Bonito (Navajo)		
Fire	KNFN764	154.325
Washington		
BIA	KOJ578	172.525
BIA	KOJ579	171.65 172.575
		172.725
Wingate		
BIA	KOJ569	40.01 40.31
Wofford		
BIA	KKF511	171.75 172.675
Zuni (Zuni Pueblo)		
BIA Field Office	KKF524/526	171.75 172.674
Schools	KB63803	154.60
Emergency	KNCH599	155.235
Medical Emergency	KNJR813	463.00-463.125
Miscellaneous	KNEX607	156.015 155.025
Zuni Top (Zuni Pueblo)		
BIA	KKF522	40.37
BIA	KKF523	171.75

NEW YORK

Hogansburg (St. Regis Mohawk)		
Police	WZN400	156.21 158.21 155.37
Irving (Seneca)		
Miscellaneous	WTK447	45.36
Miscellaneous	KYX214	39.82
Mastic (Poospatuck Tribe)		
Police	KEI863	155.985
Fire	KED284	46.30 46.30 46.46
Salamanca (Seneca Tribe)		
Miscellaneous	KYX214	39.82
Southampton (Shinnecock Tribe)		
Police	KWM630	154.845 155.625
Fire	KUB851	46.46 46.48
Miscellaneous	KBY245	154.98
Miscellaneous	KXD231	453.25

NORTH CAROLINA

Brntt. Knob		
BIA	KIE501	164.625
Cherokee (Qualla Reservation, E. Band of Cherokees)		
BIA Field Office	KIE500	164.675 165.3375
Police	KON342	154.875
Ambulance	KNA0847	155.28 155.34
Ambulance	KWI902	47.62 155.28 155.34
Miscellaneous	KNHP905	45.40 456.825
Miscellaneous	KRP906	158.835
Mount Noble		
BIA	KIE502	164.625 165.3375

NORTH DAKOTA

Statewide		
U.S. Department of Justice		38.98
Belcourt (Turtle Mountain Chippewa Tribe)		
BIA Field Office	KAC590	38.98 164.625
Police	KNGR880	154.785 155.91
Indian Hospital	KGC511	154.34 155.385
Bullhead (Standing Rock Sioux Tribe)		
Miscellaneous	WBF85	158.745
Canon Ball (Standing Rock Sioux Tribe)		
Miscellaneous	WBF87	158.745
Dunseith		
BIA	KAC591	38.98 164.625
Fort Lincoln (United Tribes)		
Training Center	KUQ765	158.82
Fort Totten (Devils Lake Sioux Tribe)		
BIA Field Office	KAC595	38.98 164.625
Police	KVT904-5	155.25
Police	WAA462	155.91
Ambulance	KY4264	155.34 155.40
Fort Yates (HQ Standing Rock Sioux Tribe)		
BIA Field Office	KAC530	38.98
HHS		163.25
Police	KNCG433	154.785 155.91
Indian Hospital	KFE485	155.235 155.34
Miscellaneous	KNGV251	451.225
Miscellaneous	WBS300	153.815
Miscellaneous	KRF332	158.745
Kenel (Standing Rock Sioux Tribe)		
Miscellaneous	WBF82	158.745
Little Eagle (Standing Rock Sioux Tribe)		
Miscellaneous	WBF83	158.745
Mandaree		
BIA	KAC512	38.98 41.14
School	KNIA236	155.22
Police (3 Affil. Tribes)	KNCN242	154.785
Minnewaukan (Devils Lake Sioux Tribe)		
Ambulance	KZ2257	155.205 155.34
School	KQF316	155.205
Mobridge (Standing Rock Sioux Tribe)		
Miscellaneous	WBF81	158.745
New Town (Ft. Berthold Reservation)		
BIA Field Office	KAC510	41.14
Police (3 Affil. Tribes)	KNCN242	154.785
Police (3 Affil. Tribes)	KRL249	155.37 155.43
Police (3 Affil. Tribes)	WCD241	155.505
Indian Health Svc.	KZ2166	155.34 155.385
Parshall (Ft. Berthold Reservation)		
BIA	KAC506	38.98
Police	KLD609	155.37 155.43 155.505
Ambulance	KZ3840	155.34 155.40
Schools	KNCP227	155.205
Shields (Standing Rock Sioux Tribe)		
Miscellaneous	WBF86	158.745
Twin Buttes		
BIA		41.14
Wakpalla (Standing Rock Sioux)		
Miscellaneous	WBF84	158.745
Whitshld.		
BIA	KAC514	38.98 41.14

OKLAHOMA

Ada (Chickasaw Nation of Oklahoma)		
HHS		166.10
Housing	KNJR757	453.75
Anadarko		
HHS		165.3375 166.10
Antlers		
HHS		165.3375
Ardmore (Chickasaw Nation of Oklahoma)		
HHS		165.3375
Housing	KNJR757	453.75
Blair		
HHS		165.3375
Brushy Mountain		
BIA	KKF581	168.30
Bunch (Cherokee Nation of Oklahoma)		
HHS		165.3375
Miscellaneous	KNAR847	453.10
Miscellaneous	KNCY895	453.10
Chillico		
BIA Indian School	KIE530	163.025
Claremore		
HHS		164.30 165.3375
		166.10
Clinton (Cheyenne & Arapahoe Tribes)		
HHS		164.30 165.3375
Ambulance	KNJX384	155.28 155.34
Concho (HQ Cheyenne & Arapahoe Tribes)		
Miscellaneous	KNBS897	453.05
Duncan (Chickasaw Nation of Oklahoma)		
Housing	KNJR757	453.75
Enid		
HHS		165.3375
Eufaula		
HHS		166.10
Hugo		
HHS		166.10
Kiamichi Mountain		
BIA	KKE571	168.30

Lawton (Comanche Tribe)		
HHS	164.30	165.3375
	166.10	
Police	KNHW262	154.71
McAlester		
HHS	165.3375	166.10
Miami		
HHS	166.10	
Muse		
HHS	165.3375	
Muskogee		
HHS	165.3375	166.10
Oilton		
HHS	165.3375	
Okemah (Creek Nation)		
Ambulance	KNID393	155.34
Oklahoma City		
HHS	165.3375	166.10
Pawhuska (HQ Osage Tribe)		
Police	KNN728	155.415
Police	KNJG390	155.415 155.49
		155.67
Police	KXB503	156.21
Hospital	KK0882	155.22 155.34
Miscellaneous	WZU505	155.04 155.76
Miscellaneous	KEY975	453.875
Pawnee		
HHS	164.30	166.10
Ponca City		
HHS	165.3375	166.10
Pateau		
HHS	165.3375	
Preston (Creek Nation)		
Miscellaneous	KAB4155	462.70
Purcell		
HHS	165.3375	
Shownee (Pottawatomie; Shawnee, Sac & Fox Tribes)		
HHS	166.10	
Police (Pottawatomie)	KNEN700	155.49
Srilwell		
HHS	166.10	
Tahlequah (HQ Cherokee Nation of Oklahoma)		
BIA Field Office	KKF580	167.15 168.30
HHS		164.30 166.10
Police	KNDH513	155.49
Ambulance	KNDH514	155.34
Miscellaneous	KNAH393	153.875 154.98
Talihina		
BIA Field Office	KKF570	168.30
HHS		164.30 166.10
Indian Hospital	KAQ416	155.34
Tishomingo		
HHS	165.3375	166.10
Vinito		
HHS	165.3375	
Watonga (Cheyenne & Arapahoe Tribes)		
Ambulance	KNJX384	155.28 155.34
Wekoka		
HHS	165.3375	
Wright		
HHS	165.3375	

OREGON

Statewide (portable)		
BIA	KOC567	166.6125 168.40
Bear Springs		
BIA	KOC566	171.775 172.425
Burns (Burns-Paiute Tribe)		
Police	KA93922	155.475
Chemawo		
BIA	KOD563	172.30
Clear Lake		
BIA	KOC561	171.775 172.425
Deadmon Springs		
BIA	KOD592	172.425
Eagle Butte		
BIA	KOC564	171.775 172.425
Formons Point		
BIA	KOC562	172.425
Green Ridge		
BIA	KOC557	171.775 172.425
Kahneeta Hot Springs (Warm Springs Reservation)		
BIA	KOC565	171.775 172.425
Mission		
BIA	KOD590	171.775 172.425
Pendleton (Umatillo Tribe)		
BIA Field Office	KOD590	172.425
Business	KNJT942	463.25
(Confed. Tribes: Coos, Lwr. Umpqua & Suislaw)		
Police	KNDG253	154.785 158.97
Redmond		
BIA	KOC559	171.775 172.425
Sdwltr. Butte		
BIA	KOC563	171.775 172.425
Shitk. Butte		
BIA	KOC554	171.775 172.425
Simnasha (Warm Springs Reservation)		
Police	WBN958	155.01
Police	KZR513	155.49
Warm Springs (HQ Warm Springs Tribe), Confed. Tribes: Coos, Lower Umpqua & Suislaw)		
BIA Warm Springs Agency	KOC555	171.775 172.425
Police	KXC745-6	155.49
Police	KTC873	155.25
Police	WAM836	155.01
Miscellaneous	KCU824	153.98
Fire	KNBS821	153.755 154.25
Ambulance	KA87196	155.34
Logging	KYJ456	451.225
Logging	KA75880	467.0125
Wasco County (Confed. Tribes: Coos, etc.)		
Miscellaneous	WGP52	158.94

SOUTH DAKOTA

Note: Many BIA & Tribal Police agencies, as well as various state & federal agencies operate in all areas on 39.10, 39.16

39.32, & either 39.24 or 39.28 in addition to or instead of other frequencies. On these frequencies, base station ID's are often by numbers such as "14-7" or "7-7," with their associated mobile units using the same numbers followed by a letter, such as "14-7C" or "7-7L." In the following list we have shown such designations only for BIA & Tribal Police, although other types of agencies may also be monitored using alphanumeric ID's.

Statewide
U.S. Dept. of Justice X-1 thru X-36R & 2-X3 thru 2-X32
38.98 39.10 39.16 39.32 39.24/28
KAC538 164.675

BIA
Aberdeen
BIA Police 3-7 39.10 39.16 39.24 39.32

Allen
BIA KAC521 169.625

Batesland (Oglala Sioux)
School KJA210 155.22

Bridger
BIA KAC541 38.98

Browns Valley (Sisseton-Wahpeton Sioux)
Police 55-7N 39.10 39.16 39.24 39.32

Bullhead (Standing Rock Sioux)
BIA KAC532 38.98
BIA Police 20-7M 39.10 39.16 39.28 39.32

Civil Defense WBM20 158.82

Cherry Creek (Cheyenne River Sioux)
BIA KAC536 38.98

Dupree (Cheyenne River Sioux)
Police 24-7Q 39.10 39.16 39.28 39.32

Civil Defense KRL83 158.82

Eagle Butte (HQ Cheyenne River Sioux)
BIA Field Office KAC535 38.98
BIA Police 24-7D 38.98 39.10 39.16 39.28 39.32

Police 27-7 39.10 39.16 39.28 39.32

Miscellaneous KAG666 39.10 39.16 39.18 39.22 39.32

Miscellaneous KNJ712 154.785
Civil Defense KRL82 158.82
Miscellaneous KAC6732 467.725

Faith (Cheyenne River Sioux)
Police 24-7Y 39.10 39.16 39.28 39.32

Flandreau (HQ Flandreau Santee Sioux)
BIA KK7480 38.98

Fort Thompson (HQ Crow Creek Sioux)
BIA Field Office KAC576 38.98 414.825
BIA Police 14-7A 39.10 39.16 39.28 39.32

Police 14-7 same as 14-7A
Police KNC97 154.785 155.91

Fort Yates (Standing Rock Sioux)
BIA Police 20-7 39.10 39.16 39.28 39.32

Civil Defense KRL89 158.82

Gettysburg (Cheyenne River Sioux)
Police 24-7P 39.10 39.16 39.28 39.32

Goodwill
BIA KAC517 414.825

Greenwood
Police 17-7 39.10 39.16 39.32

Highmore (Crow Creek Sioux)
Business KNIK827 461.875
Housing KAD5676 462.725

Ideal (Rosebud Sioux)
BIA Police 67-7I 39.10 39.16 39.28 39.32

Isabel (Cheyenne River Sioux)
Civil Defense KRL80 158.82

Jova
Civil Defense KRL91 158.82

Kenel (Standing Rock Sioux)
Civil Defense WBM22 158.82

Kyle (Pine Ridge Reservation)
BIA KAC523 169.625
BIA KAC529 169.625 169.775
Police 65-7B 39.10 39.16 39.24 39.32

La Plant (Cheyenne River Sioux)
Civil Defense KRL86 158.82

Lake Andes
BIA KAC584 414.825

Lantry (Cheyenne River Sioux)
Civil Defense KRL84 158.82
Miscellaneous KAC6731 462.725
Miscellaneous KAD2292 462.55

Little Eagle (Standing Rock Sioux)
BIA KAC531 38.98
BIA Police 20-7K 38.98 39.10 39.28 39.32

Civil Defense WBM21 158.82

Loneman
BIA KAC528 169.625
BIA KAC515 169.625 169.775

Lower Brule (HQ Lower Brule Sioux)
BIA Field Office KAC577 38.98 414.825
BIA Police 45-7 38.98 39.10 39.16 39.32

Police KNCG455/KNAU474 155.19 155.91

Lowry
Civil Defense KRL20 158.82

Manderson
BIA KAC522 169.625

Martin (Pine Ridge Reservation)
Police 65-7A 39.10 39.16 39.24 39.32

McIntosh (Standing Rock Sioux)
Police KRW237 39.10 39.16 39.18 39.32
Civil Defense KRL76 158.82

Miscellaneous KAF217 39.10 38.18

McLaughlin (Standing Rock Sioux)
Police KNCG433 154.785 155.91
BIA Police 20-7P 39.10 39.16 39.28 39.32

Civil Defense WBM24 158.82
Miscellaneous WBT646 153.815
Miscellaneous KNFB963 453.925

Mission (Rosebud Sioux)
BIA KAC581 38.98
BIA Police 67-7K 38.98 39.10 39.16 39.28 39.32

Schools KAV260/KNBV350 46.00

Moabridge (Standing Rock Sioux)
BIA KAC533 38.98
Police 24-7B & M 39.10 39.16 39.28 39.32

Civil Defense KRF72 158.82

Morristown (Standing Rock Sioux)
Civil Defense KRL88 158.82

Mound City
Civil Defense KRL92 158.82

Mount Coolidge
BIA KAC526 164.625

O'Kreek (Rosebud Sioux)
BIA Police 67-7O 38.98 39.10 39.16 39.28 39.32

Parmlee (Rosebud Sioux)
Schools KAV261 46.00

Peever (Sisseton-Wahpeton Sioux)
Police 55-7C 39.10 39.16 39.24 39.32

Pickstown
BIA KAC586 38.98 408.525

Pine Ridge (HQ Pine Ridge Reservation; Oglala Sioux)
BIA Field Office KAC520 169.625 169.775
HHS 169.625
Police 65-7 & 65-7J 30.10 39.16 39.24 39.32

Ambulance KEC532 155.34 155.385

Pollock
Civil Defense KRL93 158.82

Porcupine (Oglala Sioux)
BIA KAC516 169.625 169.775
BIA KAC524 169.625
School KJK720 155.22
Miscellaneous KNFM400 155.955 158.745

Porcupine Ridge (Oglala Sioux)
BIA KAC527 38.98 164.625 164.675

Promise
BIA KAC539 38.98

Rapid City
HHS 164.30

Reliance (Lower Brule Sioux)
BIA Police 45-7G 39.10 39.16 39.28 39.32

Ridgeview (Cheyenne River Sioux)
Miscellaneous KAC6730 462.725

Rdscffld.
BIA KAC537 38.98

Rosebud (HQ Rosebud Sioux Tribe)
BIA KAC580 38.98
BIA Police 67-7 38.98 39.10 39.16 39.32

HHS KUU617 164.30
Police KNC9789 154.785 155.91
Schools KBG297 46.00
Miscellaneous KNCJ400 155.085
Miscellaneous KYN986 39.10

Saint Francis (Rosebud Sioux)
BIA Police 67-7S 38.98 39.10 39.16 39.28 39.32

Sisseton (HQ Sisseton-Wahpeton Sioux Tribe)
BIA Field Office KAC519 414.825
BIA Police 55-7T 39.10 39.16 39.24 39.32

Police 55-7 see 55-7T
Hospital KAC4760 462.725
Miscellaneous KQV825/920 155.10 158.925
Miscellaneous KNHU988 453.10

Stephan (Crow Creek Sioux)
Police KNC9787 154.785 155.91
High School KNCJ430 47.46 47.48

Stephan Mission (Crow Creek Sioux)
BIA KAC578 38.98 408.525

Swiftbird
BIA KAC542 38.98

Thunder Hawk
Civil Defense KRL95 158.82

Timber Lake (Cheyenne River Sioux)
Police KRS321 39.10 39.16 39.32
Civil Defense KRL78-9 158.82

Wagner (HQ Yankton Sioux Tribe)
BIA KAC587 414.825
Miscellaneous KNAB903 154.965

Wakpala (Standing Rock Sioux)
BIA Police 20-7W 38.98 39.10 39.16 39.28 39.32

Civil Defense KRL94 158.82

Wanblee (Oglala Sioux)
BIA KAC525 169.625
BIA KAC534 169.625 169.775
Police 65-7C 39.10 39.16 39.24 39.32

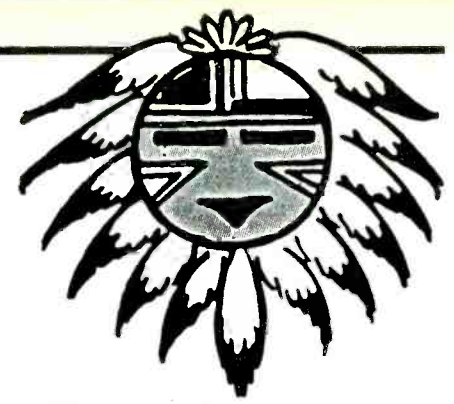
White Horse (Cheyenne River Sioux)
BIA KAC540 38.98
Police 24-7X 39.10 39.16 39.28 39.32

Whitstn.
BIA KAC518 38.98 408.525

TEXAS
Livingston (Alabama-Cauchatta Reservation)
Police KUZ817 154.785

Fire	KNBN648	46.34	46.40
Miscellaneous	KNFL533	154.025	155.025
UTAH			
Altamont (Uintah & Ouray Reservation)			
Fire	WXC629	154.415	
Aneth (Navajo)			
BIA	KOP533	40.03	40.33 41.14
Police	KFR668	154.74	
Bluebell (Uintah & Ouray Reservation)			
Police	KIL462	154.77	155.37
Duchesne (Uintah & Ouray Reservation)			
Police	KIL462	154.77	155.37
Emergency	KNDU703	155.205	
Emergency	KB63379	155.16	
Miscellaneous	KNH728	158.865	
Miscellaneous	KXA490	155.10	
Brigham City			
BIA	KOD530	406.475	408.475
		412.275	
Fort Duchesne (HQ Skull Valley Tribe; Uintah & Ouray)			
BIA Uintah & Ouray Agcy	KOJ595	411.625	
Police (Ute Tribe)	KNAG322	154.725	155.415
Miscellaneous (Ute Tr.)	KNIL283	452.725	
Water Svc. (Ute Tribe)	KKAB870	153.455	
La Mink			
BIA	KOJ599	41.14	416.025
La Point (Ute Tribe)			
Police	KNAG322	154.725	155.415
Little Mountain			
BIA	KOD531	406.475	
Mexican Hat (Navajo)			
Police	KBB849	46.02	
Police	KUL793	155.625	
Miscellaneous	KEW822	154.98	
Miscellaneous	KGL610	153.845	155.76
		155.82	
Miscellaneous	KWQ600	46.52	
Miscellaneous	WXQ981	153.98	
Navajo Mountain (Navajo)			
Power Utility	KNE942	153.575	
BIA School	KOP501	40.33	
Roosevelt (Uintah & Ouray Reservation)			
Hospital	KVT669	155.28	155.34
Miscellaneous	KXA490	155.10	
Tabiona (Uintah & Ouray Reservation)			
Ambulance	WZJ500	155.34	
Miscellaneous	KXA490	155.835	
Vernal (Ute Tribe)			
Emergency	WQQ343	462.975	
Miscellaneous	KNIL283	154.98	452.725
WASHINGTON			
Stotewide (portable)			
BIA	KOC568	166.6125	168.40
Amando Park (Quinault Tribe)			
Fire	KQN956	154.19	
Miscellaneous	WAU774	158.955	
Anthm. Ridge			
BIA	KOC569	163.175	
Auburn (Muckleshoot Tribe)			
Police	KNAA587	154.755	
Bellingham (Lummi Tribe)			
Miscellaneous	KNID283	173.3625	
Boundary Butte			
BIA	KOD569	172.30	172.775
Buoyville			
BIA	KOC577	170.075	
Cape Chapparral			
BIA	KOC533	40.37	40.85
Capital Peak			
BIA	KOC544	166.6375	
Chewelah (Colville Confed.)			
Miscellaneous	KNBF684	154.115	453.40
Cody Butte			
BIA	KOD580	172.30	172.775
Colville (Colville Confed.)			
Logging	WXS601	153.275	154.625
Cook Creek			
BIA	KOC551	166.6375	168.375
Cougar Creek			
BIA	KOC528	40.85	
Coulee Dam (Colville Confed.)			
Fire	KNHR596	154.13	
Crown Point			
BIA	KOC542	166.6375	
Derning (Nooksack Tribe)			
Miscellaneous	WNAL293	460.925	
Miscellaneous	KBZ443	45.40	
Desautel			
BIA	KOD562	172.30	172.775
Eastbound (Lummi Tribe)			
Business	WRS506	462.675	463.425
Elmer City (Colville Confed.)			
Logging	WXS598	153.275	154.825
Everett			
BIA Puget Sound Agency	KOC548	166.6375	168.375
Fort Simcoe			
BIA	KOC531	40.37	40.85
Glacier (Nooksack Tribe)			
Miscellaneous	WNAL293	460.925	
Glenwood			
BIA	KOC523	40.37	40.85
Gold Mountain (Colville Confed.)			
BIA	KOC550	166.6375	
BIA	KOD579	36.18	172.30 172.775
Granger (Yakima Tribe)			
BIA	KOC576	170.075	
Police	KNFB966	155.01	156.09
Miscellaneous	KXF677	154.965	
Great Broken Mountain			
BIA	KOC531	40.85	
Harrah			
BIA	KOC572-3	170.075	
Hoodspout (Skokomish Reservation)			
Fire	KKG526	154.19	

Hoquiam			
BIA Olympic Peninsula Agcy	KOC543	36.18	
BIA Olympic Peninsula Agcy	KOC545	166.6375	168.375
Site "I"			
BIA	KOC579	170.075	
Inchelium (Colville Confed.)			
BIA	KOD572	36.18	172.30
		172.775	
Miscellaneous	KNDB839	39.18	452.25
Johnny Gg. Mountain			
BIA	KOD578	172.30	172.775
Kalispell			
BIA	KOD564	171.70	172.425
Keller (Colville Confed.)			
BIA	KOD582	172.30	172.775
Logging	WXS599	153.275	154.625
Keller Butte (Colville Confed.)			
BIA	KOD577	36.18	172.30
		172.775	
Lacanner (Sauk-Seattle Tribe)			
Police	WRG691	155.07	155.565
La Push (Quileute Tribe)			
Miscellaneous	WBP223	453.875	
Leopold (Menominee Tribe)			
Business	KNIC247	461.225	
Marysville (Sauk-Seattle Tribe)			
Police	WRG690	155.07	155.565
Miscell. (Tulalip Tribe)	WNAH926	453.425	
Miscell. (Tulalip Tribe)	WNAZ784	39.58	
Mill Creek			
BIA	KOC522	40.85	
Mitchell Point			
BIA	KOD568	172.30	172.775
Monumental			
BIA	KOD586	36.18	
Moon Mountain			
BIA	KOD581	36.18	
Moses Mountain			
BIA	KOD574/589	36.18	172.30
		172.775	
Mount Constitution			
BIA	KOC549	166.6375	
Neah Bay (HQ Makah Tribe)			
BIA	KOC546	166.6375	168.375
BIA	KOC548	36.18	
Police	KKC738	155.07	
Medical Emergency	KDT751	463.00	464.175
Neilton (Quinault Tribe)			
BIA	KOC543	36.18	166.6375
Miscellaneous	KXV534	156.015	
Nespelem (HQ Colville Tribe)			
BIA Colville Agency	KOD570	36.18	172.30
		172.775	
Police	WQY303	155.37	
Logging	WXS600	153.275	154.625
Miscellaneous	KNBF684	154.115	
Miscellaneous	KNDB839	39.18	452.25
Miscellaneous	KRL727	155.085	155.775
Oakville (Confed. Tribes of Coos, etc.)			
Police	KNBH432	158.73	
Fire	KDN518	154.19	
Miscellaneous	WNAE543	155.865	
Okonagan (Colville Confed.)			
BIA	KOD573	172.30	172.775
Miscellaneous	WBA633	155.085	
Omak (Colville Confed.)			
Logging	WXS603	153.275	154.625
Omak Mountain (Colville Confed.)			
BIA	KOD573	36.18	
BIA	KOD575	172.30	172.775
Port Angeles (Lower Elwha Tribe)			
Miscellaneous	KNDK580	453.375	
Port Gamble (Klallam Tribe)			
Police	KX4888	158.73	
Quartz Mountain			
BIA	KOD584	36.18	
Queets (Quinault Tribe)			
Miscellaneous	WAU775	158.955	
Satus Peak			
BIA	KOC529	40.37	40.85
		164.575	406.475
Seattle			
HHS		165.3375	
Shelton (Squaxin Tribe)			
Police	KZI349	158.73	
Signal Peak (Yakima Tribe)			
BIA	KOC526-7	40.37	40.85
Snsgr. Mountain			
BIA	KOD588	172.30	
Sopelia			
BIA	KOC532	40.85	
Suquamish (Suquamish Tribe)			
Police	KDT517	158.73	
Tacoma (Puyallup Tribe)			
Police	KFO707	158.73	
Schools	KNIU422	155.28	
Moritime	WHF960	156.45	
Miscellaneous	KFO705	155.115	
Toholah (Quinault Tribe)			
Police	WGC626	159.15	
Miscellaneous	WAU776	158.955	
Toppenish (HQ Yakima Tribe)			
BIA Yakima Agency	KOC525	40.37	40.85 168.375
Miscellaneous	KUZ576-7	155.775	
Miscellaneous	WGT703-4	155.055	155.085
Miscellaneous	KCA528	154.085	
Toppenish Creek (Yakima Tribe)			
BIA	KOC575	170.075	
Tower Mountain			
BIA	KOD565	171.70	172.425
Wapato (Yakima Tribe)			
BIA Wapato Irrig. Distr.	KOC571	170.075	
Police	WQM332	155.01	155.37
Miscellaneous	KXX333	154.115	155.94
Wellpinit (HQ Spokane Tribe)			
BIA Spokane Agency	KOD571	171.70	172.425

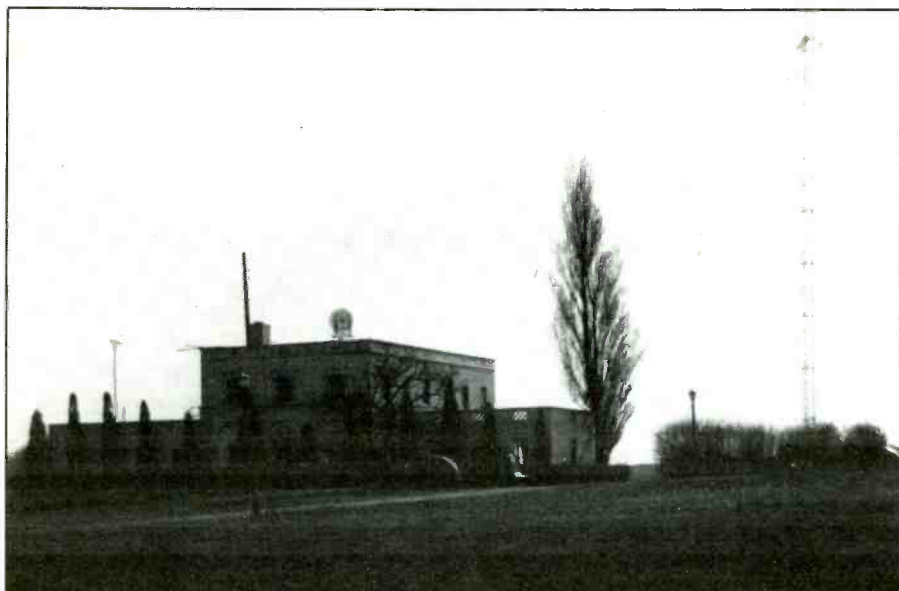


Wellpinit Mountain (Spokane Tribe)			
BIA	KOD569	172.425	
Miscellaneous	WQD439	156.00	158.925
Whitemore			
BIA	KOD576	36.18	172.30
		172.775	
White Swan (Yakima Tribe)			
BIA	KOC524	40.37	40.85
Police	WG1997	155.01	
Miscellaneous	WZU595	155.085	155.775
White Swan Ridge			
BIA	KOD585	172.30	172.775
Whitestone			
BIA	KOD585	36.18	
Wilbur (Colville Confed.)			
Logging	WXS602	153.275	154.625
Yakima (Yakima Tribe)			
BIA	KOC574	170.075	
Miscellaneous	KNBL832	154.085	155.055
Miscellaneous	KJB632	154.085	
Yelm (Nisqually Indian Community)			
Police	KZM840	158.73	
Police	WYC829	155.01	155.37 155.55
Fire	KZJ301	154.43	
WISCONSIN			
Ashland			
BIA	KAC569	414.825	
Battlefield			
BIA	KAC572	172.425	
Bowler (Stockbridge-Munsee Tribe)			
Miscellaneous	WXM865	155.82	
Crandon (Sokoogon Chippewo Tribe)			
Fire	WSZ214	154.19	154.295
Hayward (Courte Oreilles Tribe)			
BIA	KAC573	172.425	
Police	KA75539	155.37	
Fire	KA75534	154.235	154.295
Business	KA47161	33.40	
Housing	KNAO541	154.965	
Miscellaneous	KNBI409	154.025	158.94
Hertel (St. Croix Chippewo)			
Fire	WZC538	154.295	154.415
Kesheno (Menominee Tribe)			
Police	WYN674	154.815	155.37
		155.475	158.91 158.97
Hospital			
Restoration	WXR263	155.28	155.34
Business	KZ3838	155.34	
Business	KNH562	151.895	
La du Flambeau (HQ Lac du Flambeau Tribe)			
Police	KGR340	39.18	39.42 39.46
Schools	KKL853	155.235	
Meller			
BIA	KAC570	172.425	408.525
Odanah (Bad River Tribe)			
Police	WRA293	155.655	
Fire	KB41206	154.235	154.295
		154.40	
Oneida (Oneida Reservation)			
Fire	KNIF845	154.25	154.295
Rat Lake			
BIA	KAC575	172.425	
Squirrel Hill			
BIA	KAC571	172.425	
Washburn			
BIA	KAC574	414.825	
WYOMING			
Black Mountain			
BIA	KOC507	36.18	
Crowheart (Wind River Reservation)			
School	KVN597	155.28	
Fort Washakie (Wind River Reservation; Arapahoe-Shoshone)			
BIA Wind River Agency	KOC500	167.075	
Police	WQU469	154.83	155.31
Hudson (Wind River Reservation)			
Police	KA42104	154.80	154.875
Pavillion (Wind River Reservation)			
School	KVN597	155.28	
Riverton (Wind River Reservation)			
Police	WZT969	155.565	
Police	WZN699	154.80	154.875
		155.565	
Hospital			
Hospital	KYF309	155.28	
Miscellaneous	WBA662	462.525	
Miscellaneous	WRG582	155.055	
Miscellaneous	KEC388	155.025	
Miscellaneous	KNHT418	158.76	
Wind River (Wind River Reservation)			
BIA	KOC506	166.725	
Winkelman Dam			
BIA	KOC505	36.18	166.325
UNITED STATES			
All Areas (portable)			
BIA	KAC538	164.625	

Radio: The Golden Years

Fondly Remembered, Days of Sparks and Vacuum Tubes

BY ALICE BRANNIGAN



The WTAM transmitting site in 1948.

In our June issue we saw a series of photos showing various stages in the construction of the WTAM (Cleveland, Ohio) antenna built in 1938. That brought in a communication from Kirk Sanderson, one of our readers in Cleveland.

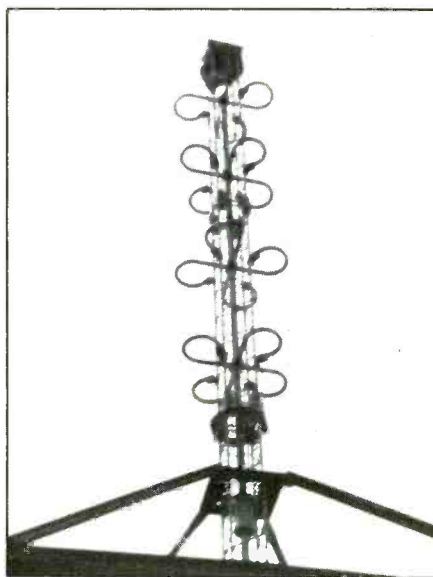
Three years ago, Kirk retired after 43 years in the broadcasting field. This included several years as a Technical Director with NBC-TV. Kirk recalls how, in 1948, he started working for WTAM as an engineer and spent many chilly nights in the WTAM tuning house shown in our June issue pictures. He notes that this same tower is still in use, serving stations WWWE (AM), WZAK (FM) and WBNX (TV Channel 55).

Kirk furnished us with two photos including the WTAM transmitting plant on Snowville Road in Brecksville, OH as it looked in 1948. That was prior to the addition of FM and TV transmitters.

The other photo shows the Western Electric *Clowerleaf* installed at Burlington, IA in 1947. This was for station KBUR-FM (92.9 MHz), the first FM broadcaster in Iowa. This station is no longer in operation. We sincerely thank Mr. Sanderson for sharing this with us.

Mysteries Getting All The More Mysterious!

We have had a few brave souls attempt to solve some of our recent mystery station photos. Close, but no cigar—or as someone once told me, “close only counts in pitching



Iowa's first FM broadcaster, KBUR-FM, used this “Clowerleaf” antenna when it took to the airwaves in 1947.

horseshoes and hand grenades.” The Miami Beach station (1922) has been guessed as being Southern Bell Telephone's coastal station WDR, and also as broadcast station WQAM. Our records show that WDR was not licensed on Miami Beach until many years after our 1922 view. As for WQAM, it was on the air in 1922 but from Miami, not from Miami Beach (so far as any records I can locate).

The 1919 mystery station at Wilmington's DuPont Hotel was guessed as being station WILM. Would that it were so simple! Broadcasting stations weren't even licensed until late in 1921, with only a handful of stations operating that year. Our mystery photo was taken three years before broadcasting came to Wilmington or anywhere else in The Diamond State.

The identity of the Miami station will be revealed in our February issue; Wilmington's station will be identified in the March issue.

Give Me An Ohm Where The Buffalo Roam

Jack M. Thorpe, W8JDG, of Grosse Point Woods, MI (a town I really like) reminded us of a poem about radio that was written in 1934 by famed poet Edgar A. Guest. English-born Guest (born 1881) lived in Detroit for many years and read his poetry over one of the local broadcast stations. His poetry was homely, sentimental, and moralistic doggerel verse that was extremely popular at one time. Collections of his poetry appeared in *A Heap o' Livin'* (1916), *Just Folks* (1917), and *Life's Highway* (1933).

His radio poem was about Amateur Radio Operators. Guest apparently had a program over New York station WJZ in pre-WWII days (when WJZ—now WABC—was part of the Blue Network NBC, prior to the time the ABC Network was started as a split-off from NBC). Presumably, WJZ (or NBC) had received a sufficient number of requests for copies of the poem to print it up and mail it out to listeners. Okay, so *The Vision of Sir Launfal*, by James Russell Lowell, it isn't. Nevertheless, it's a pleasant little rhyme that expresses a sincere and accurate sentiment.

With A Sigh, It Was Gone – But Not Forgotten!

DX'er Carroll Weyrich, of Baltimore, MD, (one of the old Newark News Radio Club gang), was an active listener between 1936 and 1955. The call of the static again summoned, and after twenty-four years away from the dials, in 1979 he went back to DX listening. From his early DX era, Carroll sent us several wonderful memories.

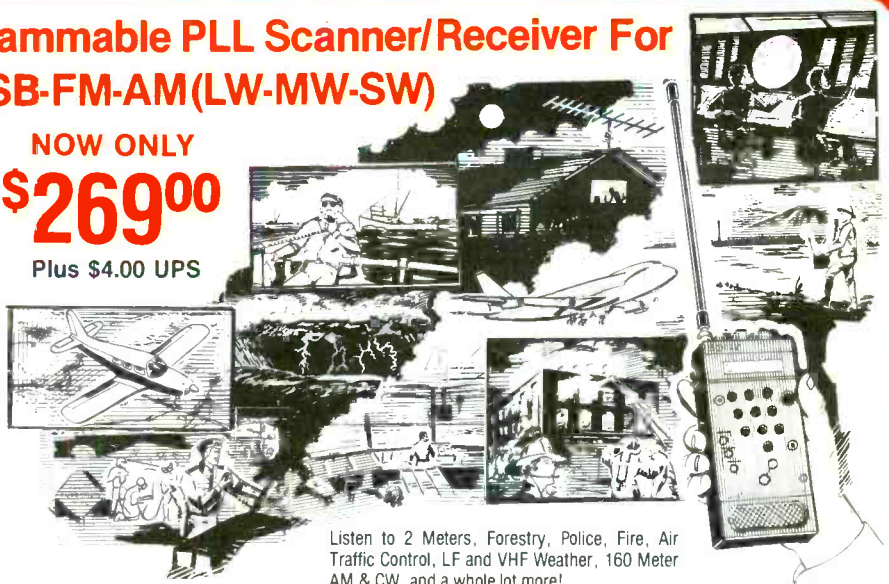
One QSL that was especially eye-catching was dated 1939 and was from *Radio Saigon*, “The Voice of France In The Far East.” Of course, thirty years later, Saigon was no longer part of French Indo-China; it was the main city in South Vietnam, a place

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The Air-8 measures 3 1/8" x 7 1/8" x 2", and weighs just 21 oz. This is truly a sturdy little companion that will give you years of dependable performance wherever you go.

6 Frequency Bands

Band	Frequency range	Tuning interval
PSB	144 - 174 MHz	5 kHz
AIR	108 - 136 MHz	25 kHz
FM	76 - 108 MHz	50 kHz
AM	SW 1601 - 2194 kHz (1603 - 2194 kHz)	1 kHz
	MW 530 - 1600 kHz (531 - 1602 kHz)	10 kHz (9 kHz)
	LW 150 - 529 kHz (150 - 530 kHz)	1 kHz

7 Functions on LCD Display

Indicates the band being received

Frequency being received

The large black dot indicates that the frequency is memorized to the 3 key

The small black dot indicates that the delay function is activated for the 3 key

Indicates that the input frequency is out of range

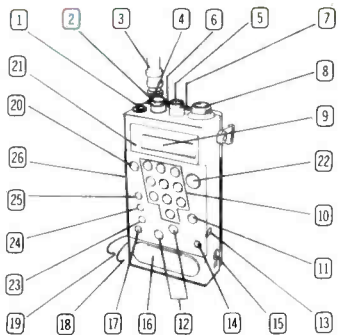
Indicates that the priority function is activated

Indicates that the program function is activated

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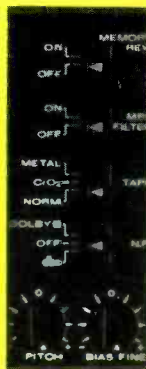
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- 3-Head off-the-tape monitoring while recording
- 4-Way Power
- Direct Telephone Connective Jack
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- 3-Position mic attenuator
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Many features of the PMD 221 such as illuminated VU meter but without off-the-tape monitoring



Direct telephone connective jack on PMD201/PMD221



PMD 420 /430

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CrO ₂ tape	40Hz—14kHz (40Hz—7.5kHz)	35Hz—15kHz
Metal tape	40Hz—15kHz (40Hz—8.5kHz)	35Hz—17kHz
Signal to Noise Ratio, NR off	57dB	51dB
Dolby B NR on	—	60dB
dbx NR on	—	75dB



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There's something about them you've got to admire.
They work for the love of the task, not for hire.
Every one of them's blessed with the heart of a boy!
What's a job to the drudge unto them is a joy.
While we to our regular schedules are keeping,
The amateurs do without eating or sleeping.

They worry their wives—since so short is a day—
They don't get to bed when they should, but they stay
Sending calls on the air; catching calls from afar—
And I think as I hear them how patient they are!

How much better we'd work here if
only we knew it
In that amateur spirit of wanting to do it!

Professionals weary sometimes and they shirk.
Since they're paid to perform they look on it as work.
They begin with reluctance; they're glad when they're
through—
And they measure in money whatever they do;
But the amateur never begrudges a minute;
He goes to the job for the job that is in it.

So here's to the amateurs—brave hearted throng—
Though short be their waves, may their lives all be long.
May the wisdom they gain and the joys which they reap
Make up for the nights when they go without sleep;
And may we—in their spirit and deep understanding
Of work and its joy—keep our amateur standing!

© 1934, Edgar A. Guest



V4 73's

Edgar A. Guest
HOUSEHOLD MUSICAL MEMORIES
NBC—WJZ Tuesdays 7:30 EST

Roses are red; Violets are blue; A poem about radio; So what else is new?



Mac, W3HCW, turned up this wooden sign at a garage sale. We found out what station WPH was.

the dark. He asks if we can help to identify his treasure.

Well, in 1919, the callsign WPH was being used by a ship called the SS S.M. FISCHER. That's not the station in the sign, however, Mac's WPH was located right in his home town of Williamsport and was operated by the Pennsylvania Power and Light Company. This WPH appears in license records of the early 1920s as being operated on 2222 kHz. Records of 1930 and 1931 indicate operation on 3184 kHz. Hope that information helps!

WHAZ Whiz

Bob D'Imperio, Pensacola, FL offers for your approval a photo identified only as "The Operating Room of Radio Station WHAZ." This station, which also operated as 2XAP in the early days of radio, went on the air in 1922. Operated by Rensselaer Polytechnic Institute, Troy, NY it started out on 790 kHz (500 watts), then went on 1300 kHz, then (by WWII) to 1330 kHz with 1 kW. Today, WHAZ still operates on 1330 kHz with 1 kW.

Although it's a long-lost fact, in the early days of broadcasting, WHAZ used the second Monday of each month from midnight to 1:30 a.m. to run a special trans-Atlantic and transcontinental DX test transmission.

RADIO - SAIGON

Boîte Postale 412 — SAIGON (Indochine Française)

Nous avons le plaisir de confirmer votre réception de
We are pleased to verify your reception of RADIO-SAIGON
transmettant sur 11.780 kHz c'est-à-dire 25.46 mètres
broadcasting on i. e. meters
le 19 à 8.44 AM the 12th No 19 39 at 8.44 AM

RADIO SAIGON

LA VOIX DE LA FRANCE EN EXTRÊME-ORIENT
THE VOICE OF FRANCE IN THE FAR EAST

Daily sessions: (gmt time)

11.00 to 11.45 a. m. News and music
3.30 to 4.00 p. m.

Please request your local Radio-Magazines
to Publish our Programme!

6.116 kcs. 49.05 mètres.
11.780 kcs. 25.46 mètres.
1.000 kcs. 300. mètres.

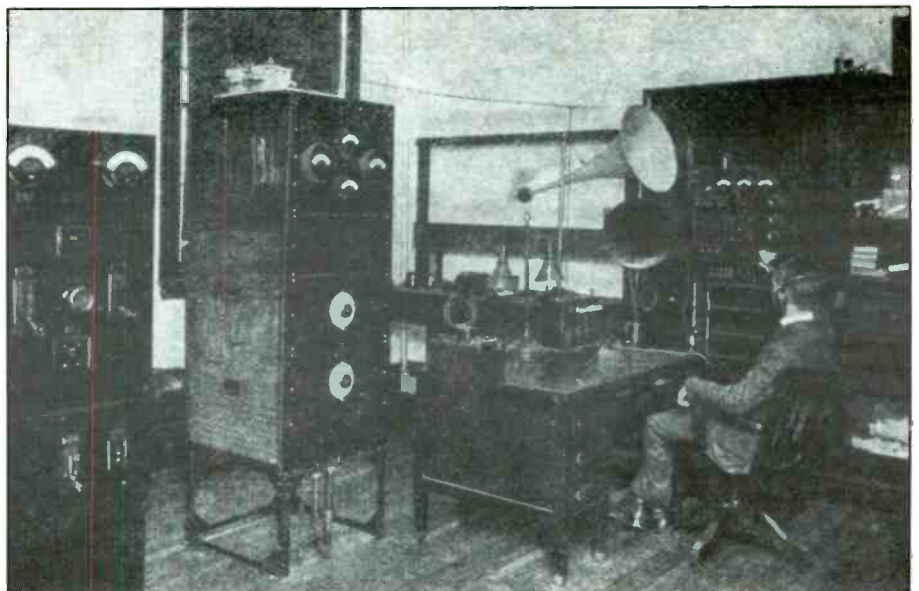
Radio Saigon sent out these QSL's in 1939.

that many Americans remember with a variety of emotions.

In 1939, things were far more tranquil and this station operated on the BCB at 1000 kHz, with shortwave relays on 6116 and 11780 kHz. This station operated from 1100 to 0400 GMT in English and French and even relayed *Paris-Mondial* from France on a daily basis. The station's QSL card has a printed inscription, "Please request your local Radio Magazines to publish our Programme!" So, we're getting around to this only forty-eight years late, but we meant well.

It's A Sign Of The Times

Carl McDaniel, W3HCW, of the QCWA and the Bald Eagle VHF Society in Pennsylvania, couldn't resist buying an old wooden sign at a garage sale in Williamsport, PA. Other than the fact that it's colorful, 12" by 19" in size, old, and relates to "Limited Commercial Radio Station WPH," Mac's in



The operating position at WHAZ "in the beginning."



This view of the WHAZ antennas is probably from the 1940's. It shows the masts mounted atop the Engineering Building at RPI.



KUOA, shown at night from its location at Siloam Springs, Arkansas.

The station's announcement was, "WHAZ, Transcontinental and International Broadcasting Station located at the Oldest College of Science and Engineering in America."

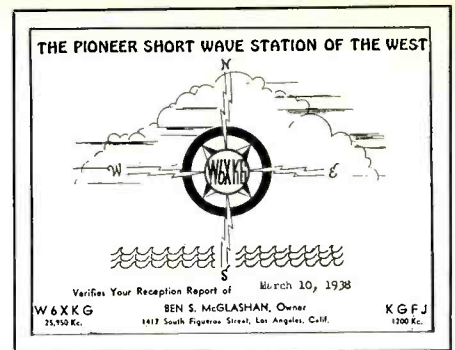
Arkansas Traveler

In 1914, a "Special Land" station was authorized for operation at Fayetteville, AR. By 1916, this station, licensed to the University of Arkansas, was known as 5YM, only to be removed from the airwaves during WWI. After the war, the station returned to the air from the Engineering Hall, running its signal into a 100-foot longwire (and fan-type counterpoise). In December of 1923, the callsign KFMQ was issued to this station for 100 watts on 1140 kHz, shifting to 1000 kHz by February of 1925. This station became known as, "KFMQ, The Voice of the Ozarks" and soon upped its power to 750 watts.

In February of 1926, the callsign KFMQ was changed to KUOA (some said it meant

"Kall University of Arkansas"). By April of 1927, KUOA was ordered by the government to drop down to 500 watts and change its frequency to 1010 kHz; but by early 1928, the station was permitted to increase its power to a full kilowatt. Eventually, KUOA was forced to share time with station KRLA (Little Rock), a rather uncomfortable relationship that ultimately (by 1931) permitted KUOA only four and a half hours per day (the station was normally silent during summers). After a destructive fire in February of 1933, the station was moved off-campus to the Mountain Inn in Fayetteville.

In April of 1933, KUOA was sold and soon thereafter was granted permission to switch to 1260 kHz where it would no longer have to timeshare. In mid-1936, the station was granted permission to move to Siloam Springs, AR and operate with 2.5 kW (Western Electric Model 355-E1 transmitter) into a 450-ft. transmission tower. KUOA's owners, John Brown University, in



W6XKG's very rare 1939 QSL card. This was an early experimental "UHF" shortwave relay broadcast station located in Los Angeles.

1939, received permission to jump to 5 kW, and in March of 1941, the station shifted frequency to 1290 kHz. The station presently operates with 5 kW on 1290 kHz.

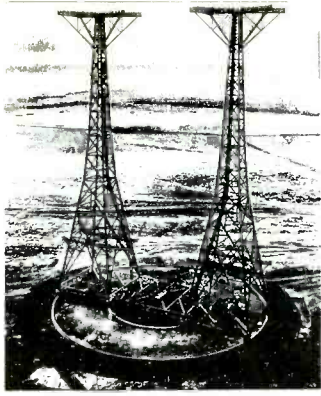
Our 1949 view of KUOA shows its transmitter building at night from its location in Siloam Springs. The handwritten message on the flip side of the card is addressed to someone in Texas and says, "Dear Sally, I'm kind of homesick. Doing actual announcing and control room work here. Good. (Signed) Fred V. Brewer, John Brown University, Siloam Springs, Arkansas."

Los Angeles Shortwave Pioneer

When Los Angeles station KGFJ commenced broadcasting on 7 February, 1927, it had little idea that ten years later it would be operating one of this nation's earliest shortwave broadcasting stations, W6XKG. KGFJ was operating on 1200 kHz with 100 watts, definitely not one of the high-powered heavyweights operating from California's sunny climes. The station was owned by Ben S. McGlashan, of 1417 South Figueroa Street, Los Angeles.

As shortwaves became popular in the 1930s, several major broadcasting stations such as KDKA, WLW, WGN, and others obtained experimental licenses for the purposes of relaying their programs. Oddly enough, little 100-watt KGFJ applied for one of these licenses and was granted authorization to operate experimental shortwave relay broadcast station W6XKG on 25.950 MHz. True, this wasn't one of the prime bands for reaching the world (other, larger broadcasters had channels in the 9, 11, and 15 MHz bands). Also true that *Radio Station Treasury* notes that W6XKG shared time with two other stations, W4XR (relaying WSPA, Spartanburg, SC) and W9XUP (relaying KSTP, St. Paul, MN).

Nevertheless, the gutsy little shortwave station was on the air for a year or two and even sent out a smattering of QSL cards that proclaimed itself as "The Pioneer Shortwave Station of The West." We obtained one of these very rare QSL's dated 10 March, 1938. It is printed with red call letters on a light blue card. The text is printed in



PCJ
HILVERSUM HOLLAND

wish to convey to you their appreciation of your kind communication regarding the experimental transmission on behalf of Philips Radio Works - Eindhoven - Holland, on frequency **9590** kc/sec

Frequency: 15220 kc. Wavelength approx. 19.71 M
9590 kc. Wavelength approx. 31.28 M

Power: Two Philips Tubes
Type T.A. 20/250 in the final stage

Position: Lat. 52°17'32" N Long. 5°14'48" E

Announcements in **NETHERLANDS - ENGLISH - FRENCH - GERMAN - SPANISH and PORTUGUESE.**

P.C.J.'s aerial masts on wheels, which can be directed to every part of the world.

PCJ, the ever-lovin' "Happy Station" in Hilversum, Netherlands, has been one of the best friends DX'ers have ever known. Here's their QSL from 1939.

dark blue ink. This station ran 100 watts, same as its big brother, KGFJ.

Happy Station

If any international broadcast station could lay claim to being a sentimental favorite for all of the world's listeners, certainly, "The Happy Station," otherwise known as PCJ (and presently as Radio Nederland) in Hilversum, Netherlands, would have the inside track on the honor.

This station goes back in history to the earliest days of shortwave when it was the station operated by the Phillips Radio Works at Eindhoven. Always interested in accommodating the radio hobbyist, the station has gone out of its way to produce programming and QSL's that have had enormous appeal to listeners in all nations.

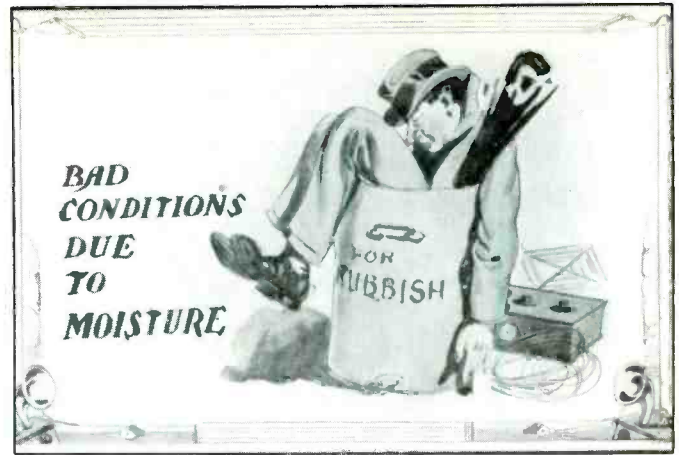
We came across one of PCJ's 1939 QSL's, issued only a few months before the Netherlands was invaded and brutally occupied for five years by Nazi Germany. In 1939, PCJ operated on 9590 and 15220 kHz, although these days the station utilizes more than 35 shortwave frequencies. Interestingly, 9590 kHz is still used by Radio Nederland!

Our black/orange QSL on white card stock shows PCJ's absolutely outrageous answer to the problems of directing signals to a specific target area. Two full-sized steel lattice towers mounted on a gigantic turntable permitted rotating the array towards any desired point of the compass.

A tip of the hat, complete with earmuffs and pompom, to the station at Hilversum, a wonderful old friend whose efforts have brought so much happiness, entertainment, and information to the world's DX'ers.

Canned DX'er

An old radio-joke postcard from the 1920's shows a konked-out DX'er deposited in an ash can, his prized receiver knocked over on the ground beside him. The caption tells of bad conditions due to moisture, and chances are the moisture in this guy's life



The message on this 1924 radio-cartoon postcard is 63 years old but still valid. If you're a DX'er, you've got a good reason to stay home on New Year's Eve instead of mixing "moisture" with driving!

was Prohibition-era 90-proof homebrew "right off the boat" rather than high atmospheric humidity.

So, before I leave you this month with my best wishes for a healthy and prosperous 1987, I'd like to remind you not to experience any bad conditions due to moisture like our ancestor in the cartoon.

The same kind of "moisture" that ad-

versely affected our 1920's DX'er is no less harmful, especially when combined with driving. Play it safe this New Year's Eve; if you're going to sop up "moisture," avoid the possibility of "bad conditions." Stay home and listen to the many special DX programs that are copiously available that night.

Now I can wish you that healthy, prosperous, and safe 1987! **PC**

Historic Ham QSL's

This month it isn't as much historic as it is unusual—a Ham station in Iran operated by an American. But our QSL from EQ4DC is more than 40 years of age, dating from August of 1946!

For many years, Iran was hospitable to all Hams, including foreigners. Back in 1938, the Amateur prefix was listed as EI. A year later it was EP, eventually modified to EQ and EQ. By 1955, the ARRL listed only EQ, but the 1982 ARRL listing showed only EP.

Americans, along with other foreign Hams in Iran were listed in callbooks right up until political unrest resulted in a revolution in which the Shah left the country in 1979.

Presently, Iran is suspicious of and hostile to most foreigners, with Americans high on the suspect list. In 1946,

right at the tail-end of WWII, things were obviously quite different. The operator of EQ4DC was probably a diplomat or a member of the military. He mailed his QSL from Milwaukee almost three months after the date of his 20-meter band CW QSO with an American Ham in Pennsylvania.

The son of the late Shah has recently made announcements to the effect that he would like to establish a new government with himself at the top. His method of communicating with the Iranian public was by means of clandestine radio and TV broadcasts. Looks like he's hip to communications. Could it be that this strange and strife-torn nation, some time in the future, may once again be the operating site for those great old EP (or EQ) stations with Yank accents? For now, I wouldn't suggest asking for a license there!

TEHERAN, IRAN

QSO..... on 8.4.46 at 0228 GMT Ur 14 Mc. R5S8T9

EQ4DC

PC QSL. TNX. **73 R. F. BERGMAN**



Winter 1987

Selected English Language Broadcasts

BY GERRY L. DEXTER

Note: This list of English language broadcasts was accurate at the time of compilation, but stations often make changes in the hours and frequencies of their broadcasts with little advance notice. Hundreds of broadcasts are aired in English on the shortwave broadcast bands every day, many of them directed to an audience in North America. This is a representative sampling and not intended as a complete reference. Some broadcasters air only a part of their program in English during a given hour, or may run the English segment into the following hour. Times are UTC. Numbers in parentheses indicate a starting time in English that many minutes past the hour.

Time	Station/Country	Frequencies
0000	Radio Canada International	5960, 9755
	Radio Baghdad, Iraq	11750
	Kol Israel	5885, 7465, 9435
	Vatican Radio (50)	6015, 9605, 11845
	Radio Tirana, Albania	7065, 9750
	BBC, England	5975, 6005, 6120, 6175, 7325, 9410, 9515, 9590, 9915
	RBI, East Germany	6080, 6125, 9730
	Radio Beijing, China	15445
	RHC, Cuba	6100, 6140
	Radio Moscow	7115, 7175, 7185, 9600, 9720, 9865
	Spanish Foreign Radio	6055, 9630
	BRT, Belgium (30)	9830, 9925
	Radio Portugal	9680
0100	Radio Canada International	9535, 11845, 11940
	DW, West Germany	6040, 6085, 6145, 9545, 9565, 11785
	RAI, Italy	5990, 11800
	Voice of Nicaragua	6015
	Radio Tirana, Albania	7120, 9750
	HCJB, Ecuador	9870, 11910, 15155
	Radio Netherlands	6020, 9895
Voice of Greece (30)	7430, 9395, 9420	
Radio Austria International (30)	9770	
0200	Radio Budapest, Hungary	6025, 6110, 9520, 9835, 11910

Time	Station/Country	Frequencies
	Radio Polonia, Poland	6095, 6135, 7145, 7270, 9525, 11815, 15120
	Radiobras, Brazil	11745
	Kol Israel	5885, 7465, 9435
	Radio Japan	15195, 15420
	Voice of Free China	5985, 9680, 9765, 11740, 11745, 11825
	Radio Kiev, Ukraine SSR	7165, 7175, 7205, 11790, 13605, 15180
	Radio Belize	3285
	Radio Prague, Czechoslovakia	5930, 7345, 9540, 9740, 11990
	RAE, Argentina	9690, 11710
	Swiss Radio International	9725, 9885
	Radio RSA, South Africa	5980, 6010, 9615
	Radio Bucharest, Romania	5990, 6155, 9510, 9570, 11810, 11940
	Radio Cairo, Egypt	9475, 9675
Radio Sweden	9695	
0300	DW, West Germany	9545, 9565, 9640, 9735
	Radio Polonia, Poland	6095, 6135, 7145, 7270, 9525, 11815, 15120
	Radio New Zealand (45)	9620, 11780
	Radio Tirana, Albania	7120, 9750
	Radio Netherlands (30)	6165, 9590
	RBI, East Germany	6080, 9730
	Radio Portugal	9565
	Voice of Turkey	9560
	HRVC, Honduras	4820
	TIFC, Costa Rica	5055
	TWR, Netherlands Antilles	9535
	Radio France International (15,45)	7135, 9535, 9790, 9800
	Voice of Greece (40)	7430, 9420
0400	Radio Botswana	4820, 7255
	Radio Japan	9505
	Voice of Nicaragua	6015
	TGNA, Guatemala	3300
	Swiss Radio International	6135, 9725, 9885

Time	Station/Country	Frequencies	Time	Station/Country	Frequencies
	Radio Baghdad, Iraq	11750			
	Radio France International (15,45)	6055, 6175, 7135, 9535, 9550, 9790, 9800	1200	Radio Canada International	9650, 11855, 11955, 15440, 17820
	Radio Austria International (30)	6155, 9755		Voice of People of Kampuchea	9695, 11938
0500	DW, West Germany	5960, 6120, 6130, 9700		Radio Pyongyang, North Korea	9600, 9715
	Radio Netherlands (30)	6165, 9590		Radio Tirana, Albania (30)	9515, 11960
	Radio Lesotho	4800		HCJB, Ecuador	11740, 15115, 17890
	TWR, Netherlands Antilles	9535		Radio Finland	11945, 15400
	Kol Israel	7465, 9009, 9435, 9860		Radio Tashkent, Uzbek SSR	9600
	RBI, East Germany	9500, 11960		Radio Ulan Bator, Mongolia	12015
	RHC, Cuba	6090, 6100, 6140		KYOI, Saipan	11900
	Radio Nigeria	7255		RAE, Argentina	15345
				All India Radio	11620
0600	Radio Canada International	6140, 7155, 9740, 11775		Radio Austria International (30)	6155, 11915, 11955
	HCJB, Ecuador	6230, 9870, 15155		Radio Bangladesh	15525
	GBC, Ghana	3366, 4915		Radio Sweden (30)	9565, 11940
	CRFX, Canada	6070	1300	Radio Norway (Sunday)	6040, 9590, 15300, 15305, 17775
	BBC, England	5975, 6175, 7150, 9510, 9600		Radio Canada International	9715, 11955
	Swiss Radio International	6165, 9535, 9870		Radio Finland	15400, 17800
0700	Voice of Free China	5985		BRT, Belgium	15590, 17590
	ELWA, Liberia	4760		HCJB, Ecuador	15115
	Radio Bucharest, Romania	11940		Radio Beijing, China	9730, 11660, 11755
	CHNX, Canada	6130		UAE Radio, United Arab Emirates (30)	11955, 17775
	Radio Moscow	7290		Voice of Vietnam (30)	10040, 15010
0800	Solomon Is. Broadcasting Service	5020, 9545	1400	Radio Norway (Sunday)	11860, 15300, 15305
	HCJB, Ecuador	6130, 9745, 9845, 9860		Radio Finland	15400, 17800
	BRT, Belgium	9880		Radio Japan	9695
	KTWR, Guam	11735		Radio Sweden	11785, 15345
	KYOI, Saipan	15190		All India Radio	11810, 15335
	Radio Australia	5995, 9580		HCJB, Ecuador	15115, 17890
	TWR, Monaco	7105		Radio Korea, South Korea	9750, 15575
0900	Radio Australia	9580, 9655		Radio Moscow	9655, 11840
	Radio Afghanistan	4450, 6085, 15255, 17665	1500	HCJB, Ecuador	11740, 15115, 17890
	Radio Korea, South Korea	7275		Radio Veritas, Philippines	9570
	KNLS, Alaska	11850		TWR, Guam	9870
	Radio Japan	9675, 11955		BBC, England	15260, 17775
	Radio Singapore	5010, 11940		Radio Australia	9580
1000	Radio New Zealand (30)	6100, 9620		Voice of Indonesia	11790, 15150
	Radio Norway (Sunday)	9590, 15175, 15185, 15230		Voice of Greece (40)	11645, 15630
	Voice of Vietnam	9840, 12035	1600	Radio Pakistan	11675, 15595, 17660
	BSKSA, Saudi Arabia	11855		Radio Norway (Sunday)	9510, 11925, 17840
	Radio Australia	9580, 9655, 9770		Voice of Vietnam	10040, 15010
	Radio Netherlands	6020, 9650		UAE Radio, United Arab Emirates	11955, 15300, 15320
1100	Radio Pyongyang, North Korea	9750, 9977		BSKSA, Saudi Arabia	11855
	NBC, Papua, New Guinea	4890		Radio France International	11705, 17620, 17795
	Radio Pakistan	15605, 17660	1700	Radio Surinam International (30)	17775
	Radio Finland	11945, 15400		BBC, England	9740, 15070, 15260
	Radio Japan	9675		Radio Norway (Sunday)	9655, 11925, 15310
	SLBC, Sri Lanka	11835		Radio Moscow	9580, 9640, 9705, 9775, 9885,
	Voice of Vietnam	9840, 12035			
	Radio Beijing	9535			
	Radio Korea, South Korea	15575			
	TWR, Netherlands Antilles	11815			
	VOIRI, Iran	15084			

Time	Station/Country	Frequencies	Time	Station/Country	Frequencies
	Radio Moscow	11840, 12030		Radio Yugoslavia	6100, 7240, 9620
1800	Radio Canada International	15260, 17820		HCJB, Ecuador	15270, 17790
	Radio Kuwait	11675		Kol Israel	9435, 9815, 9860, 12080
	BRT, Belgium	15510	2200	Radio Norway (Sunday)	9605, 11930
	Radio Nigeria	15120, 17800		Radio Vilnius, Latvian SSR	7165, 7400, 9800, 11750, 11860, 15100
	RHC, Cuba	11795		Voice of Turkey	9560
	Voice of Greece (40)	11645, 15630		BBC, England	5975, 6120, 6170, 6175, 7325, 9590, 9915
1900	Radio Afghanistan	9665, 11880		Radio Moscow	7400, 9610, 9720, 9820, 9880, 12030, 13665, 15425
	Radio Canada International	11945, 15260, 15325, 17820, 17895		Kol Israel (30)	7410, 9435, 9815, 9860
	Radio Norway (Sunday)	11865, 15310		CBCNQS, Canada	9625, 9755, 11720
	BBC, England	12095, 15070		Swiss Radio International (30)	9590, 9885
	HCJB, Ecuador	15270, 17790		Radio Yugoslavia	6100, 7240, 9620
	VOIRI, Iran (30)	9022, 11930	2300	Radio New Zealand (45)	11780, 15150
2000	Radio Algiers, Algeria	9640, 15215, 17745		Radio Kiev, Ukraine SSR (30)	7205, 9685, 11790, 13605, 15180
	Radio Budapest, Hungary	9835, 11910		RBI, East Germany	6080, 9730
	Radio Moscow	12030, 12050, 15425		Radio Japan	9695, 11705
	Radio Cairo, Egypt	15375		Voice of Turkey	9560
	Voice of Nigeria (30)	11770		Radio Prague, Czechoslovakia	9630
	All India Radio (45)	9910, 11620		Radio Luxembourg	6090
2100	Radio Damascus, Syria	7455, 9950, 12085			
	Radio Netherlands	9540, 9715, 9895			
	Radio Japan	9675, 11815			
	RHC, Cuba	11725, 17885			
	Voice of Nigeria	15120			

PC

EXPERIENCE TOMORROW'S TECHNOLOGY TODAY



Japan Radio's new **NRD-525** receiver offers unparalleled performance coupled with sophisticated features including NOTCH, PBS, RIT, SQUELCH, TONE, KEYPAD & 200 ch. intelligent scanning/sweeping MEMORY. Read-out to 10 Hz. Options: RTTY Demod., VHF/UHF & RS-232. \$1179.00 + ship. Write for full details.

At Universal Shortwave we specialize in quality communications equipment for the serious enthusiast. We are an authorized dealer for all major lines including Kenwood, Icom, Yaesu, JRC, Sony, Hal, and Info-Tech. Contact us for full specifications on these and other exciting communications products.



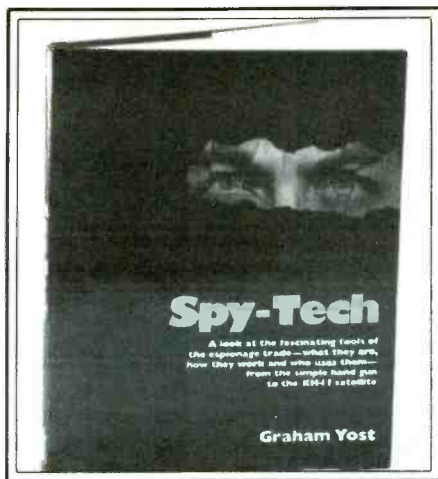
The new **Info-Tech M-6000** is clearly the most powerful RTTY unit available. Simply connect audio from your receiver & a video monitor to SEE a whole new world of shortwave excitement. Copies Morse, Baudot RTTY, ASCII, ARQTOR, FECTOR, Bit-Inversion, Time-Division Multiplex and much more. Write for full info.! \$849.95 + ship.

UNIVERSAL SHORTWAVE RADIO

1280 Aida Drive
Reynoldsburg, Ohio 43068
Phone: 614-866-4267

BOOKS YOU'LL LIKE!

BY R.L. SLATTERY



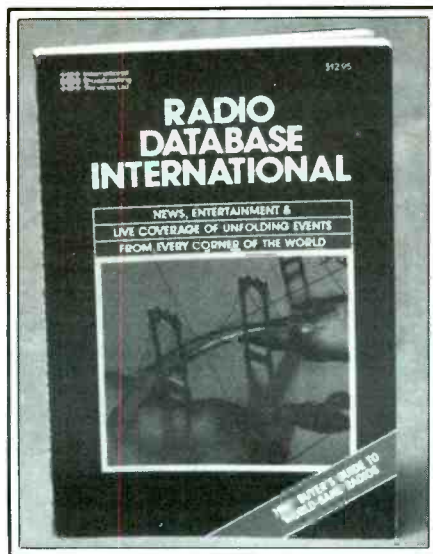
Spy-Tech

The day-to-day activities of a real-life espionage agent (spy) may not be too much like a James Bond movie, but much of the hardware in use is far more innovative and bizarre than could be created by either author Ian Fleming or his Hollywood counterparts! A fascinating book called *Spy-Tech* takes an in-depth look (in words, plus many photos and drawings) at the latest tools of the spy trade. These range in complexity from very basic items all the way to secret surveillance satellites.

Spy-Tech is a 288-page hardcover book that includes specific and highly-detailed information about U2 and SR-71 spy planes, the spy satellites of the West and the East (along with their uses and limitations), telephone surveillance and countersurveillance, bugging and debugging, data surveillance, visual surveillance, secret communications, cryptology, the technology of the National Security Agency, and all sorts of "black bag" and "dirty tricks" devices, techniques and information. An extensive bibliography and index is included.

In reading *Spy-Tech* (probably the most authoritative book yet published on the subject) you'll learn not only how and when espionage agents use the various tools at their disposal, but also how those devices work. Even when dealing with complex subjects such as lasers, satellite photo interpretation, and the ins-and-outs of bugging, the author's explanations are vivid, interesting, and easy to understand. The electronics and communications devices shown and described in *Spy-Tech* are quite sufficient to intrigue any and all who always wondered what's really being used by the CIA, NSA, and Soviet KGB. Author Graham Yost knows his topic well and is adept at putting it into words. You'll like *Spy-Tech*.

Spy-Tech is available at \$17.95 per copy (plus \$1.50 postage/handling) to addresses in USA/Canada/APO/FPO from CRB Research, P.O. Box 56, Commack, NY 11725.



Radio Database International

Under the direction of Larry Magne, the new edition of *Radio Database International* has arrived upon the scene. A look through the masthead of RDI says it all, with input from the likes of DX'perts such as Larry Miller, Don Jensen, George Wood, Graham Mytton and others.

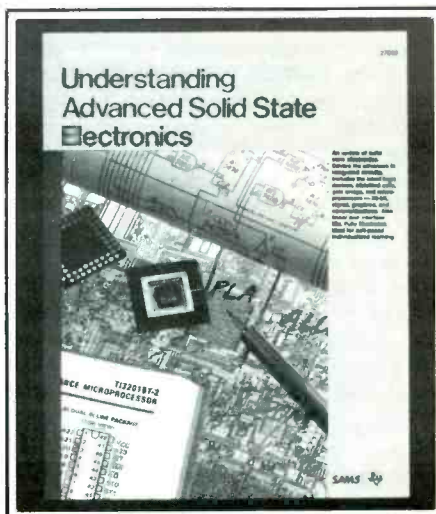
RDI is a 352-page book that gives a frequency-by-frequency graphic exposition of the international shortwave broadcast bands between 2.2 MHz and 22 MHz. Each frequency is listed individually along with the identity of all stations known to be using it at various times around the clock, along with supplemental information about languages employed, seasonal factors, jamming problems noted, transmitter power, and the directions in which the signal is beamed. This, the main portion of the book, is excellent.

In the back of the book, Larry Magne offers his 1987 guide to world-band radios: portable, table-top, and super-duper chrome-plated professional. I found this section of the book to be more useful as an overview of the brands and models on the market than as the "gospel" of which ones range between great or absolutely awful as they are rated therein. I suppose, like movies, cars, sports teams, favorite foods, vacation spots, etc., it's really all a matter of what you're looking for, or how much you're willing to spend, combined with your needs and tastes. In that respect, I have usually found that Magne's tastes and preferences are a considerable distance from my own. He tends to be overly critical of low and medium-priced equipment when I'd consider that the same gear is performing adequately for what it costs and what it presents itself as.

On the other hand, his being overly impressed with equipment carrying a \$5,000

to \$8,000 price tag really isn't giving much information that you might have not already guessed on your own, although his descriptions of the equipment's features are quite thorough. The reader should therefore keep in mind that the highly detailed reviews are done with a definite touch of elitism. I thought several to be somewhat unfair.

RDI is available at \$12.95 per copy from International Broadcasting Services, Ltd., P.O. Box 300, Penn's Park, PA 18943. You'll find it to be a worthwhile addition to your DX efforts.



Understanding Advanced Solid State Electronics

Howard W. Sams & Co. has recently published *Understanding Solid State Electronics*, a 272-page addition to the Sams/Texas Instruments Understanding Series, retailing for \$14.95.

No single invention has influenced the electronics industry more than the integrated circuit. This volume covers all the major benefits of IC technology for the experimenter, serious hobbyist, and electronics technician.

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Topics covered include: Integrated Circuit Technology, Logic Circuits, Logic Cells and Arrays, Microprocessors, Digital Signal Processing, Graphics Processors, Communications Processors, Bit-Slice Systems, Linear Integrated Circuits, and Interface Integrated Circuits. Glossary, Index, and Chapter Review questions and answers are also included.

Don Cannon is an associate professor of electrical engineering at the University of Texas and a staff consultant to the Texas Instruments Information Publishing Center. Sams books are available through bookstores and electronics distributors. **PC**

“Mayday – Whiskey Sierra Delta X-Ray”

The SOS That Nobody Heard

BY PAUL L. SCHMIDT, W9HD
Naval Cryptologic Veterans Association

The telephone in my state room was ringing. I picked it up and heard, “Sparks.”

“Yes, this is the Radio Officer.”

“Sparks, this is the Captain. Call the Coast Guard; the PRINCE WILLIAM SOUND is going down at 20-03N 106-41W.”

“Yes, sir.”

The time was 2:30 a.m., Monday, May 5, 1986. We were on the supertanker NEW YORK, callsign WSDB. We were heading for Petrol Terminal, Panama, known as PTP to the tanker men. PTP is near David, in northwestern Panama, a hundred or more miles north of the Panama Canal. We were carrying nearly two million barrels of North Slope Crude from Valdez, Alaska.

The PRINCE WILLIAM SOUND was 250 miles ahead of us, also carrying a cargo of North Slope Crude bound for PTP when suddenly an expansion joint in the sea water line from the bottom of the ship to the condensers let go and flooded the engine room, quenching the boilers, knocking out the generators and seriously upsetting the trim of the vessel. The rear deck was almost under water. The crew was taking to the life boats.

In the wheel house the Master picked up the microphone of the ship’s 25-watt VHF radio, “Mayday, Mayday. This is the tanker PRINCE WILLIAM SOUND, Whiskey Sierra Delta X-ray, sinking in position 20-03N 106-41W. Immediate assistance is required. We are about to lower lifeboats and abandon ship.”

On board the NEW YORK, 250 miles away, the Second Officer on watch in the wheel house heard the distress call and answered it, and notified the Captain who then called the Radio officer. Another American vessel, the STUYVESANT, WTHF, also heard and responded to the distress call. The STUYVESANT was some 50 miles closer to the distress vessel than the NEW YORK.

On the bridges of all vessels in all the oceans the Captains, Deck Officers and Seamen are listening to Channel 16 VHF, 156.800 MHz. Most of the transceivers are 25-watt units with battery back-up. Many vessels have two transceivers. The normal range of these units is 30 to 50 miles in the daytime, with occasional longer ranges at night.



Paul Schmidt R.E.O. (Radio Electronics Officer), S.S. New York. Schmidt is shown here in the radio room of his last ship, M/V Pride Of Texas.

Had the Radio Officer aboard the PRINCE WILLIAM SOUND had power with which to run his main transmitter on 500 kHz, he may have put out the Auto Alarm signal which would have called me on watch, but evidently his 50-watt emergency radio was not “making the trip.”

Immediately after my telephone call I stepped into my coveralls and shuffled into the radio room. Radio NMC, U.S. Coast Guard, San Francisco stands watch on 500 kHz. He also listens to CW Channel 11 (8368.4 kHz) for ships, and replies on 8574 kHz. I first put a receiver on 500 kHz, and static poured out unmercifully. Then I set up the ship’s 1-kilowatt CW HF transmitter on Channel 11 planning to call NMC later. That transmitter has a three-minute time delay with no exceptions. While waiting, I turned on the quick warm-up 500-watt, 500-kHz transmitter and proceeded to call “NCU,” meaning “Any Coast Guard Unit.”

No answer; only static. Then I decided on the Urgent Signal, “XXX.” I sent XXX CQ and notified the listeners out there that the PRINCE WILLIAM SOUND was in distress and to please answer me . . . static. Nothing but static.

By this time the kilowatt HF had timed out, so I called NMC in San Francisco on CW Channel 11, 8 MHz. No answer. I put a lot of my ship’s business through the ITT (International Telephone and Telegraph) station in San Francisco, KFS, so I shifted to Channel 13, where KFS listens (8370 kHz) and called KFS, but he was taking messages from a passenger ship at the moment. Again, no answer.

About that time the Captain came in the radio room to see how I was doing. I glanced at the clock. We were in the Silent Period (15th to 18th minute and 45th to 48th minute of every hour), so I sent out the Auto Alarm signal on 500 kHz. That is a series of

four-second dashes with one-second spacing between the dashes. It sets off automatic SOS alarms on other ships in the vicinity. I sent about 12 of these long dashes, and then commenced to send an SOS explaining that it was for the PRINCE WILLIAM SOUND, who was sinking, adding, "please acknowledge." I listened. Heard through the static's roar was "HPKQ DE KLC QTC." It was Galveston calling a ship for whom he had a message. Nothing else.

I made yet another attempt at a distress message on 500 kHz, this time sending DODSOS which means, "This is an SOS for another ship" and told my listeners it was for the PRINCE WILLIAM SOUND which was sinking. "Please acknowledge." No answer. Still nothing.

The Captain shook his head and left for a cooler part of the ship. I turned my attention once again to NMC, the Coast Guard in San Francisco. He was talking to the STUYVESANT. NMC was saying to the STUYVESANT, "Go and assist the PRINCE WILLIAM SOUND." This was on 8 MHz CW. The Coast Guard had been notified, not by me but by the STUYVESANT's brand new Satcom (Satellite Communication) equipment. The STUYVESANT has informed the Satellite Disaster Headquarters in New York, who then informed the Coast Guard.

Epilogue

The following afternoon we passed by the PRINCE WILLIAM SOUND. A couple of foreign vessels were still standing by. The

PRINCE WILLIAM SOUND's stern end was awash, but the bow was well out of the water. Overhead a beautiful shiny white Lear jet circle, bearing the Coast Guard logo and the red bow stripe. Overheard on VHF Channel 16: "PRINCE WILLIAM SOUND this is Coast Guard Aircraft 6076. How do you read?"

P.W.S. "Loud and clear."

C.G. 6076. "Are you stable? Can you last through the night?"

P.W.S. "Yes, we've stabilized. I'm certain we will remain stable all night."

C.G. 6076. "Is your diesel generator running now?"

P.W.S. "Yes, sir."

C.G. 6076. "How long will your supply of diesel fuel last?"

P.W.S. "We have enough for about a week."

C.G. 6076. "We plan to helicopter a new crew from Acapulco to relieve you people."

P.W.S. "Fine."

C.G. 6076. "We also plan to bring out pumps this evening before dark. Can you handle them?"

P.W.S. "Surely. Thank you. Anything else?"

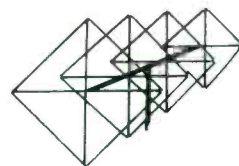
C.G. 6076. "That's all. Good luck."

Now when one of my grandchildren asks me, "Grandpa, did you ever send out an SOS?" I can answer, "Let me tell you about my time on the S.S. NEW YORK . . ."

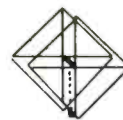
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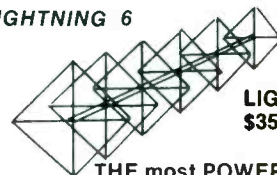


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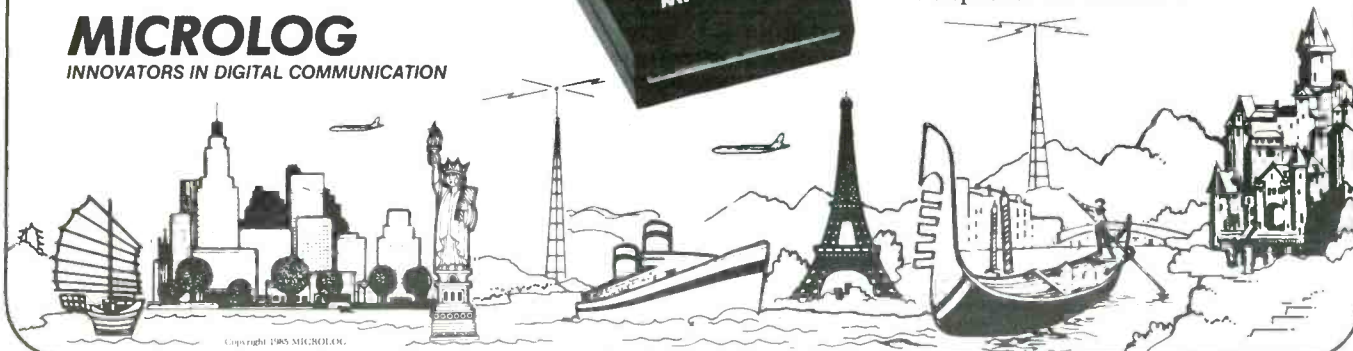
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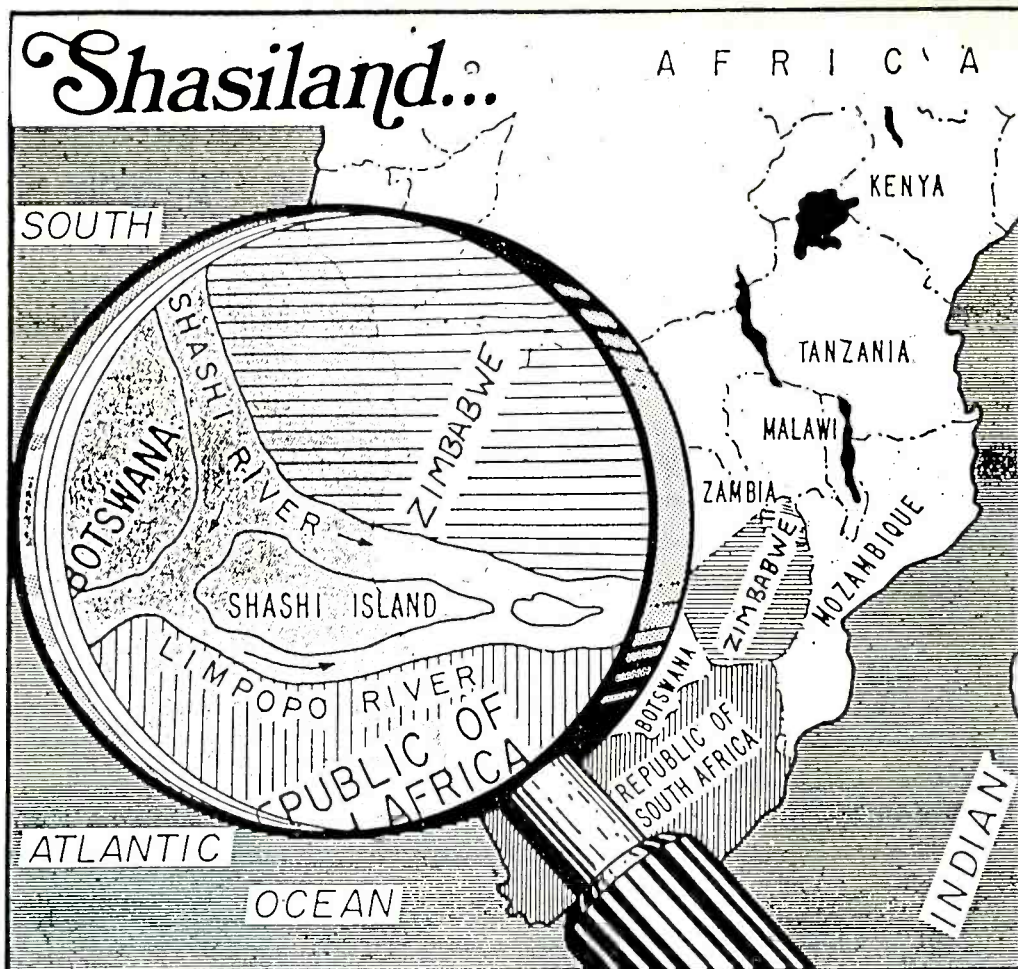
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CIRCLE 40 ON READER SERVICE CARD

37



CARA's Adventures --- --- In Shasiland

The Rarest DX Country That Almost Was!

BY DON JENSEN

A combat patrol comprised of a dozen dusty SADF troopers, deeply tanned and sweatstained, each carrying his 5.56-mm assault rifle at ready, carefully picks its way through the rocks and scrubby brush along the banks of the Limpopo River. Low overhead skims a military chopper, an airborne scout seeking signs of guerrilla activity on South Africa's northern border.

Today, there's a war going on here. Undeclared, but war nonetheless. People are getting killed and nobody's smiling.

It's a far cry from the last little police action hereabouts. It was a warm May morning in 1966, when a truckload of African police constables forded the muddy river and, grinning and almost apologetically, confiscated the half-built radio station on the tiny, almost uninhabited, island.

Almost as a lark, several of the policemen pulled down the wooden sign. It read: "Trespassers will be prosecuted. This island, named Shasiland, is a sovereign, inde-

pendent state, not part of the Union of South Africa, Bechuanaland or Southern Rhodesia, and has been occupied by me since 1st July, 1952." After giving the missionary a receipt for the confiscated gear, the police drove.

If you want to pinpoint any country on earth, from Assam to Zanzibar, ask a DX'er. The hobby has taught the DX'er how to find even the most obscure dot on the globe. But Shasiland? Where's that? You'll only get a shrug and a blank stare in return.

For Shasiland, a tiny would-be country in southern Africa, is almost totally unknown, despite the fact that 18 years ago it came within a hair's-breadth of becoming home to the rarest shortwave DX target in the world!

But for the vagaries of African politics, shortwave listeners would be frantically tuning to hear a one-lunged missionary broadcaster called CARA, operated by a South African religious organization, Christian Action by Radio in Africa.

CARA's adventures in Shasiland are really two tales in one—the story of how this

strange little never-never land nearly came to be, and that of a small missionary society that almost beat overwhelming odds in its attempt to put a Gospel voice on the air in southern Africa nearly two decades ago.

The first tale began years earlier, when a prosperous South African businessman, W.B. Coetzer, who owned a farm on the border of what then was the British protectorate of Bechuanaland (now Botswana), made an interesting discovery. He learned by chance that uninhabited Shasi Island, located at the confluence of the Shasi and Limpopo Rivers, where Bechuanaland, South Africa and Southern Rhodesia (today's Zimbabwe) met, was unclaimed land.

Never one to miss a bet, Coetzer staked his claim. On July 1, 1952, he nailed his sign to a big tree on the 215-acre island, proclaiming it his own, personal, sovereign and independent country.

As far as Coetzer was concerned, Shasiland was his. And no one else seemed to care. All the island had to offer was a jungle of huge twisted trees, monkey ropes, Malela



An aerial photo of Shasiland, the no-man's land that almost became a DXer's dream. Above and right, across the narrow Limpopo River, lies South Africa; the point of land on the Shasi River, left, is Zimbabwe. The tiny nation of Botswana, which eventually claimed Shasiland, is seen in the left foreground.



Missionary volunteers began construction of a transmitter building on Shasiland. It was never completed.

palms, and undergrowth. Its only residents were the hundreds of different kinds of birds that chirped and shrieked cacophonously. For years his claim went unnoticed and unchallenged.

Then CARA entered the picture.

In 1961, five students and a Dutch Reformed Church minister in South Africa formed CARA to bring a Gospel message to Africa by radio. It was a noble but difficult goal. The society soon established recording studios in four southern African counties. It could produce the Gospel programs, but the stumbling block was a lack of transmitting facilities. CARA purchased a half hour per week from a commercial short-wave station in neighboring Mozambique, but it was too little and too expensive on a continuing basis.

CARA needed its own shortwave station, but try as it might, the society was unable to get the necessary license from any nation in southern Africa.

Things looked bleak until a chance meeting between one of the CARA group and a

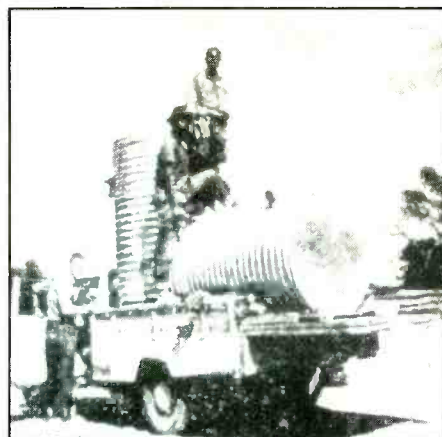
medical missionary, who just happened to be Coetzer's son.

A meeting was quickly arranged, in April 1962, at the Mt. Nelson Hotel in Cape Town. The Rev. Steyn Fourie explained CARA needs. Coetzer listened carefully and then agreed to the proposal to establish a radio station in independent Shasiland. He would issue the license which neighboring nations has refused.

His sign, he noted, had been posted on the island without challenge for 10 years, the time necessary under international law to proclaim it an autonomous state.

It took CARA four more years to raise the funds needed for the radio project. During that period, using the framework of an old transmitter, John Graham, a missionary/engineer, built a 1000-watt shortwave station in the workshop of South Africa's Stellenbosch University.

On May 5, 1966, Graham and his wife, Lorraine, left Cape Town for Shasiland, the transmitter and other vital parts loaded into a 1½-ton truck and a station wagon.



The would-be station's power generator was trucked to the Shasiland site in these makeshift shipping containers made from steel culvert pipes.

After a 1300 mile trip, the Grahams joined another missionary couple, Mr. and Mrs. J. Foster already on the island. A mud-brick transmitter building had been partially constructed. Work was progressing rapidly. It looked as though CARA's long awaited station soon would be on the air.

But 250 miles up the Limpopo, at the protectorate's capital of Gaverone, authorities became concerned at reports of a radio station under construction on the obscure island. The police raid was launched. The whole police action was friendly enough. The constables took the transmitter and issued a receipt, promising to return the equipment should CARA ever obtain permission to establish a legal station.

CARA wasn't interested in raising a fuss. It paid a small fine and the case was soon settled. The society applied to the new Botswana government for a broadcasting license, but after a year of waiting, the answer was a firm "no."

Discouraged, CARA's governing board, in late 1967, dissolved the group, turning its activities and assets over to MEMA, the audio-visual branch of the South African Dutch Reformed Church. Graham headed the MEMA team that produced popular religious programs that were broadcast over Radio Botswana and South Africa's Bantu FM network.

Coetzer indicated he intended to take the question of Shasiland's status to court, but nothing much came of his efforts. The Botswana and South African governments said that Shasiland and other boundary questions would be resolved by negotiations at a later date.

Whether it was or not seems to be one of those petty international questions whose answer is lost in the bureaucratic red tape. In short, if any authority knows, it isn't saying! It's probably a moot point anyway, since real control is in the hands of the South African Defense Force.

Goodbye, Shasiland, and goodbye to the DX listeners' chance to log the rarest country that almost was. **PC**

Deep Sea Ship Communications

The excitement of the high seas awaits you.

BY JERRY V. CODY

Modern maritime operations require effective communication links between ship owners and cargos at sea. Without the ability to contact shore facilities, a ship's master could face disaster alone. Home offices would suffer if questions could not be answered about a ship's cargo or location.

Throughout the year, 24 hours a day, ships ply international trade routes at sea. It would be impossible for the United States to function without crude oil brought in from Alaska, Indonesia, or the Middle East. North Atlantic Treaty Organization (NATO) countries depend on each other for military sealift. Imported technology from Japan would be much more expensive if not for the ships.

Maritime communications also play a very important role in defending the United

States of America. With approximately 75% of the Earth's surface covered by water, hostile forces could approach from the Pacific, Atlantic, or Gulf of Mexico. Only through communication links could the U.S. Navy mobilize its forces to repel such an attack.

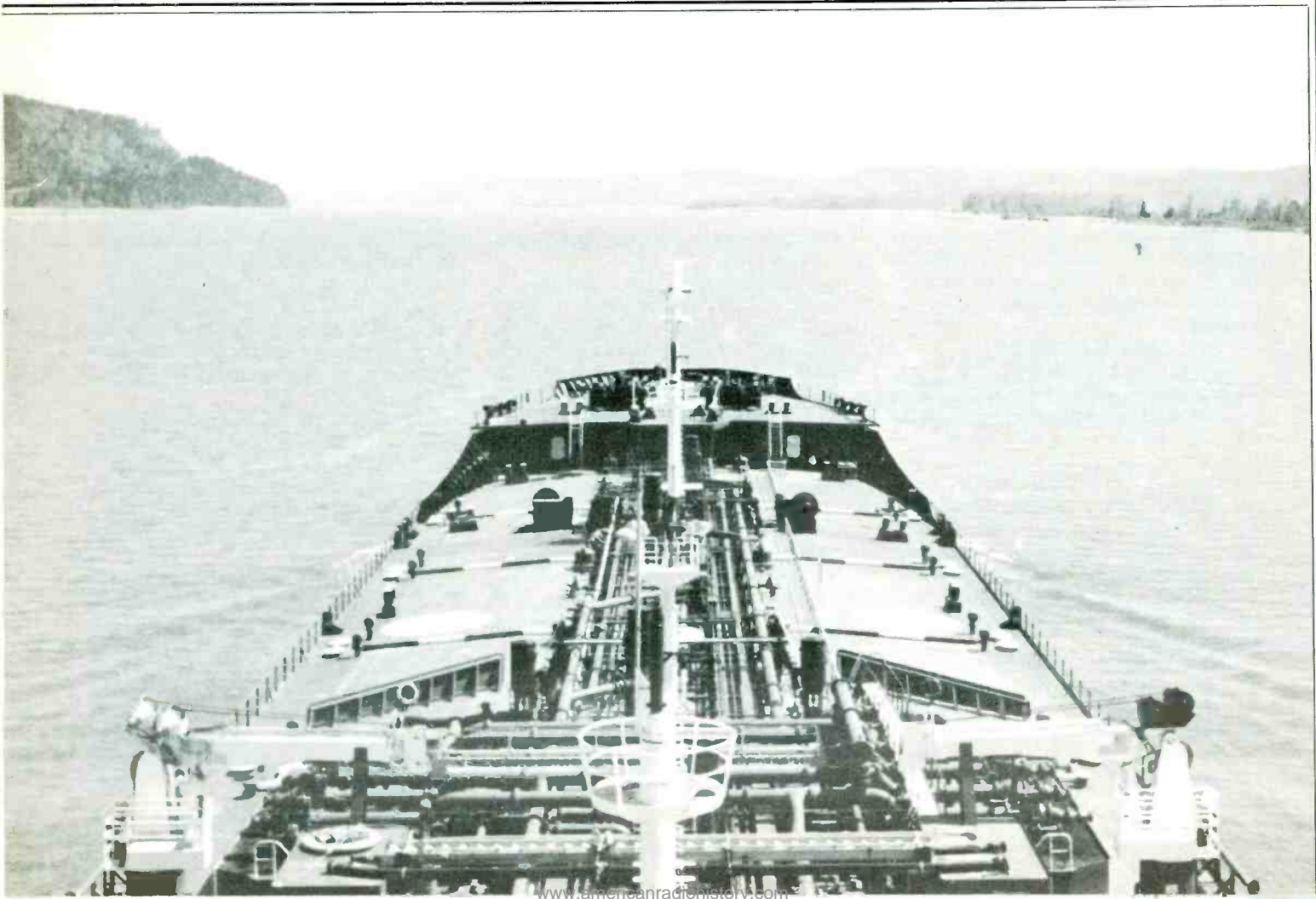
Maritime communications consist of shortwave (mostly upper sideband), very high frequency (VHF), and satellite links. Shortwave is utilized primarily for distances of closer proximity to the continental United States such as Alaska, Hawaii, or the Panama Canal. VHF is utilized by organizations like the Columbia River Pilots in tasks such as navigating big tankers to the Portland Oregon Ship Repair Yard. Satellite communications are employed by home offices to direct ships in distant locations such as the

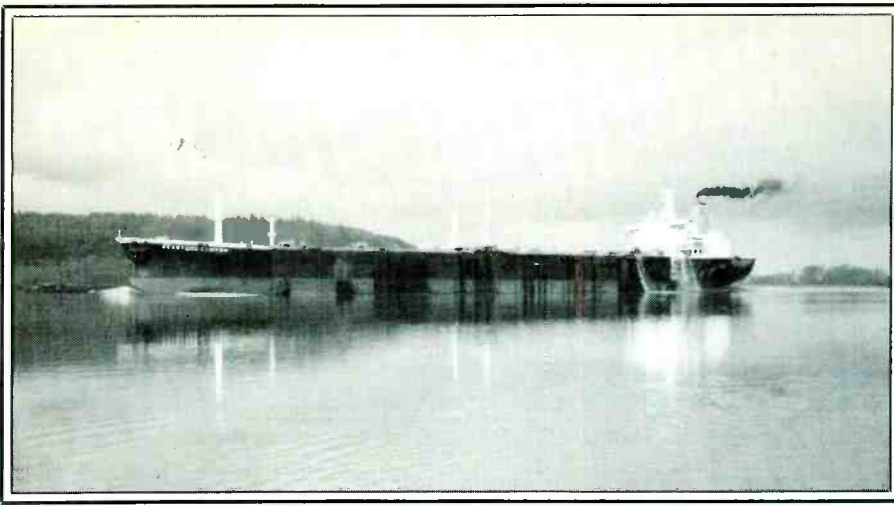
Persian Gulf or Mediterranean Sea. This link provides a clear and fast relay should a ship need to be diverted because of cargo requirements or hostile political events.

Interesting upper sideband shortwave frequencies to monitor include 2182 kHz which is International Distress and:

4125 kHz	8294 kHz
4143.6	12,429.2
6218.6	12,432.3
6221.6	16,587.1
8291.1	16,593.3

The CHEVRON LOUISIANA en route to the Willbridge terminal in Portland. It is owned by Standard Oil of California and carries gasoline and other refined oil products. The white peak in the background is Mount St. Helens.





← The KEYSTONE CANYON on its way to the Portland ship repair yard, while degassing its cargo tanks to prevent the possibility of an explosion.

↓ The USS DAVID RAY attending the annual Rose Festival of Portland - the City of Roses. This is a Spruce Class Destroyer of the US Navy that weighs in at 7800 tons and is used for anti-submarine warfare. The helicopter on board tows a mine-clearing device.

Certain stations may move up or down a few kilohertz to diminish interference.

Ionospheric changes and sunspot activity determine which frequencies are used and when. When the F layer of the ionosphere changes height, certain frequencies are heard better during daytime than at night. The lower frequencies are refracted over greater distances at night and the higher ones not so well. The situation is reversed during hours of daylight. For approximately the past eight years sunspot activity has reduced the usage of marine channels located on 22,124 kHz, 22,127 kHz, 22,133 kHz, and 22,136 kHz. This cycle will change shortly and more activity will be heard on these channels.

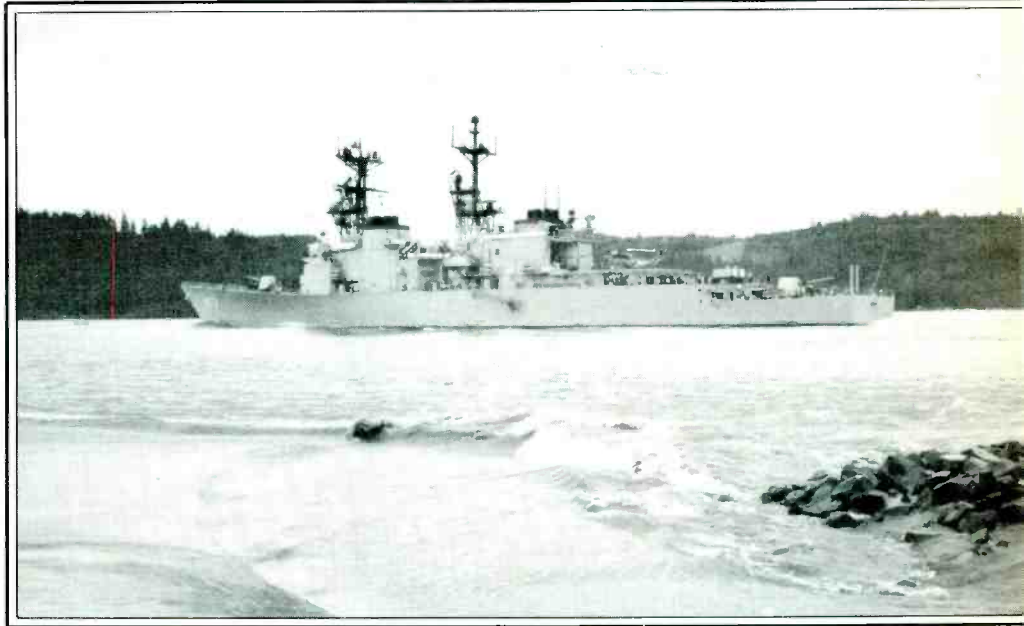
Interesting VHF frequencies to monitor in MHz include:

156.3	156.7	157.1
156.65	156.8	157.175

Other frequencies may be in use from 156.275 MHz through 157.175 MHz depending on locality. VHF travels considerably farther over water than on land, so scanner owners will notice greater range as compared to land service.

An interesting facet of ship communications is the recent development of marine satellite links or "marisat" for short. Headquartered in London, England, the International Maritime Satellite Organization (INMARSAT) has a total of 44 member countries with close to 3800 ships ranging in size from fishing boats to supertankers using the system. Southbury, Connecticut and Santa Paula, California are shore relay stations located domestically, with an additional eleven overseas. People living on the Columbia or Mississippi Rivers will notice ships with marisat by looking for white fiberglass radomes located above the bridge next to the radar masts.

Ships utilizing satellite communication have a definite advantage over shortwave and VHF due to the intercontinental range and non-interference from the ionosphere. Satellites maintain their position in orbit by staying between the Earth's gravitational pull and the centrifugal force of their rotation. Two 720-pound marisat satellites were



The author's equipment, used for deep sea monitoring, includes an R-2000 Trio-Kenwood communications receiver, a Radio Shack Comp-100 scanner and a DX-400 shortwave radio.



GILFER'S Apartment Dweller Shortwave

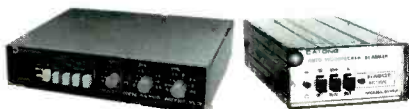
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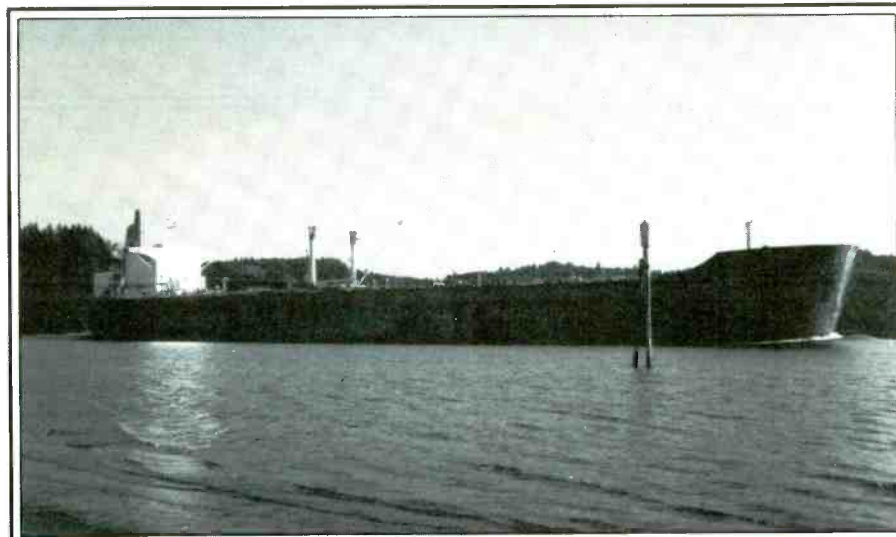


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CIRCLE 50 ON READER SERVICE CARD



The grain ship *MARTHA MARINER* bound for Korea out of Portland, Oregon.



En route to Valdez, Alaska is the *PRINCE WILLIAM SOUND* out of the Portland ship repair yard.

launched in February and June 1976 respectively, with one over the Pacific Ocean and one taking station over the Atlantic. A third marisat was placed over the Indian Ocean, but did not become operational until 1978.

When underway at sea, a ship's satellite antenna under the radome remains locked on to the satellite as long as it is in view. Change from Pacific to Atlantic satellite would occur when a ship transits one side of the Panama Canal to the other. Monitoring satellite communications is possible in VHF and UHF, but fleeting due to the fact they fly over an area. Voice communications are much rarer than on shortwave upper sideband because much of the transmitted information is RTTY or ARQ.

Deep sea communications played a vital role in the rescue of 524 people from a stricken cruise ship on October 4, 1980. The 427-foot Dutch registered MS PRINSENDAM was en route to Japan from Vancouver, British Columbia when fire broke out in the ship's engine room. The ship's master made the decision to abandon the PRINSENDAM when fire fighting efforts proved futile because electrical power and water pressure were knocked out by the rapidly spreading blaze. A MAYDAY was sent out from the ship and was picked up by authorities along with two U.S. flag tankers

and a freighter. Thanks to effective maritime communication there were no deaths when the MS PRINSENDAM sank in over 8,000 feet of Pacific Ocean, 120 miles Southeast of Yakutat, Alaska.

One interesting activity of listening to maritime communique is the collection of QSL's or reception letters confirming the ship-to-shore transmission. Specific information should never be mentioned other than ship name, local time, UTC and equipment used in monitoring the maritime companies. Be sure to include a stamped, self-addressed envelope for United States companies and an International Reply Coupon for foreign companies. Shipping company addresses may be located in books such as *Standard and Poors* business directory or books written specifically for the QSL'er.

Ship communications of the future may bring about some interesting changes. Visual as well as voice transmission to and from shore could add a more personal touch between a ship's master and owner. Handheld radio equipment could provide direct contact with shore facilities thousands of miles away. In the years to come ships will be more automated with an increasing need for information to be monitored from shore. Deep sea ship communications will definitely play an important part in the future of professional maritime transportation. **PC**

"A Ban On Programmables?"

The Federal Communications Commission is considering banning programmable transceivers that feature a keypad for frequency selection. Congress is also looking to restrict the sale of programmable scanner receivers that might tune in to cellular frequencies. Sounds bad, doesn't it? Here are the details.

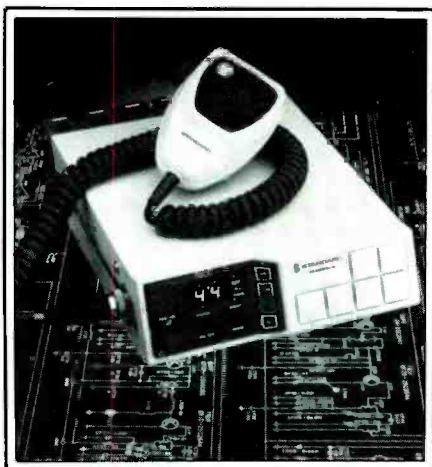
As this is being written, it looks as though the Electronic Communications Privacy Act will go through. A scanner receiver specifically made for picking up cellular telephone calls will then be illegal to own, operate, manufacture, or sell. This restrictive scanner band would only pertain to a scanner receiver developed primarily for cellular telephone eavesdropping. Any scanner that is capable of receiving more than 50 percent of the services outside of the "band list" could continue to be legally sold, manufactured, and listened to. However, it would not be legal to eavesdrop on cellular phone frequencies with this equipment.

The big issue is now with programmable business transceivers that feature instant channel and frequency selection on the front panel. The FCC is concerned that these transceivers could be illegally set on just about any frequency the operator might wish.

There are approximately ten imported transceivers that offer complete channel programmability from their front panel. These sets are available in either 30 to 50 MHz versions (not very common), 150 to 170 MHz versions (very common) and 450 to 470 MHz versions. There are also approximately five manufacturers that provide complete programmability on their handheld front keypad for instant channel selection.

All of these sets may first require a "secret code," or the snip of a single wire, to unlock the frequency selector on the front panel. Once the set is unlocked, it can span a complete band, up to 30 or 40 MHz wide, in 5 kHz increments. This is what has the FCC worried—a set could be programmed to transmit almost anywhere.

"The National Association of Business and Education Radio Users (NABER) agrees that keyboard-entry transceivers might pose too much temptation for the curious operator not to dial in some new frequencies. However, NABER also feels that the manufacturers should work to develop ways to make accessibility to unlocking the keyboard a lot tougher than it is now," comments a NABER representative.



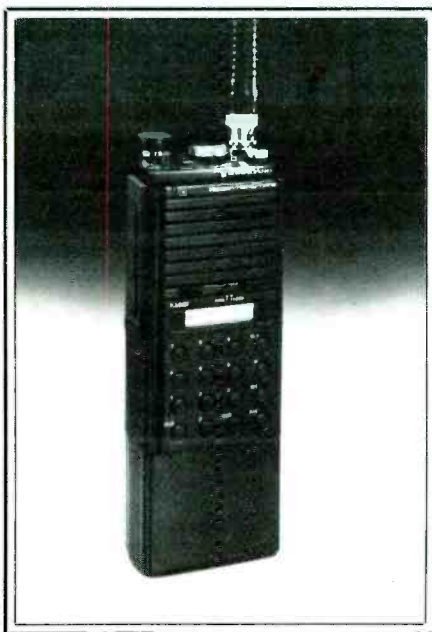
A Standard GX 3000 series programmable business radio.

Land mobile radio sellers of programmable equipment are first to indicate that the problem may be perceived, and not an actual problem. After all, crystal-type radios can easily be re-crystalled by anyone smart enough to open up the cabinet and plug in some new rocks. Manufacturers also indicate that they indeed have put obstacles in front of the casual operator in being able to

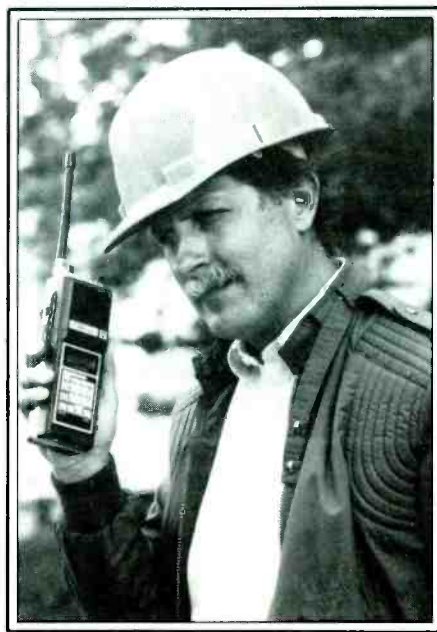
reprogram the radio for transmitting on illegal frequencies. On handhelds, the applicant must know the secret code to unlock the keyboard frequency selection. On mobile units, it takes the knowledge of knowing which wire to cut or which post to ground in order to unlock the keypad for new frequency information for both transmit and receive.

Many user services that operate business radios in their fleet are absolutely dependent on programmability. Take an air ambulance service that might need to communicate with area hospitals on different frequencies, police departments, search and rescue organizations during an air lift mission, and possibly even government agencies. In this type of service, the frequency-agile, programmable transceiver is almost a necessity. This one frequency set might be able to accomplish the communication tasks of five separate high-band radios that would add considerable weight to the rescue vehicle or aircraft.

The Association of Police Communications Officers (APCO) indicated that programmable radios might be available only to public service agencies, but possibly be outlawed to the regular general business radio service. Police departments may operate under special FCC rules that may allow them a multitude of frequencies to use on a



A programmable handheld.



Business use of a multi-channel radio.



An internal programmable business radio.

non-interfering basis for surveillance work. The programmable radio would allow them to pick a quiet frequency, and frequency hop if they should suspect that their prey might be tuning them in with a scanner.

Two of the most popular programmable transceivers are the Regency RH250 and the Fujitsu Ten programmable sets. On the Regency unit, bridge a wire and the keyboard becomes active for both channel as well as frequency selection within the band that the unit operates (generally 20 MHz wide).

On the Fujitsu set, the top comes off, and you simply ground a specific test point; the radio is ready for immediate frequency and channel selection. Both sets will hold anywhere from 10 to 20 frequencies in their memory.

Despite the fact that both manufacturers restrict the information on how to "unlock" the sets for new frequency selection, the information is readily available in the technician's service manuals that are floating around the country in every land mobile radio dealership.

The FCC is studying the possibilities of making it harder for the end-user to program new frequencies in their business radio programmable set. One way would be to limit the FCC type-acceptance of a programmable radio if it might be easily reprogrammed by the end-user. The FCC would then need to come up with guidelines on the steps it would require manufacturers to take in order to limit programming only to authorized technicians. One way might be the use of an extensive NAM programmer that actually burns a program into the memory of a chip. These very expensive set-ups would normally only be found at the better technical shops.

On the other hand, the FCC is trying to get out of regulating the different radio services, and letting them set their own standards (the old deregulation promise). Right now the Commission is soliciting comments on how the industry feels about this situation, and what steps the FCC should take, or not take.

Business radio programmable handhelds with keypad channel entry are easier to re-

program. No wires to cut, nor posts to ground. The operator simply needs to know the magic numbers to unlock the set. One popular business radio keyboard entry handheld set has gone one step further in making it easy to reprogram—simply do a crisscross on the keypad number system, and the set is unlocked; the frequencies are ready for programming. "X" does it all, and the word spreads fast.

Are the end-users really transmitting on any and all frequencies after unlocking their handhelds? Few do. Interference complaints would probably cause the local FCC field office to find them out shortly. There simply aren't any vacant business radio frequencies left in major metropolitan areas, so operating on an unauthorized frequency would certainly cause the legal channel operator to become suspicious. The legal channel operator would make a quick call to the FCC, who would listen in, verify the problem, and then seek out the hapless operators.

Just recently a balloon team, staying in touch from their hot air balloon to a chase vehicle on land, was caught using programmable business radios on unauthorized frequencies. It took the local FCC office all of a day to track them down, and write them up, an ultimately cost them a huge fine. It's just not worth it when obtaining business radio frequencies legally is the most sensible alternative.

Or at least the FCC would want you to think so. If you've ever applied for a business radio license, you know that it's a frustrating experience. I finally gave up after six attempts to try and license an emergency rescue organization that falls under both the special emergency radio service as well as the business radio service. After six attempts to seek a frequency, I just gave it up because of the red tape. Unless the FCC and their volunteer frequency coordinators streamline the licensing process, more and more users may end up pirating their own channels out of sheer FCC licensing frustration. How unfortunate!

If you're thinking of purchasing programmable transceivers in the near future, better do it soon. Their frequency agility may soon be eliminated through pending FCC inquiries into the matter. If you presently operate programmable business radios, stay on the channel you're assigned and avoid the temptation of trying out a different frequency to see if it's more clear. Without the proper license, this is not legal.

Hopefully, the Commission will allow business radio licensing to be as easy as marine radio licensing—filling out an application, and being able to go on the air immediately using temporary ID numbers. Maybe a paid frequency coordinator and a hefty \$200 check is what it will ultimately take to finally get a shared business radio channel. Whatever way you go, surely there is nothing wrong with the new breed of programmable radios, providing you use them on the channels you have been assigned. **PC**

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CIRCLE 38 ON READER SERVICE CARD

BROADCAST TOPIK

BY MARK MANUCY, W3GMG

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

Another year is dawning on us and I hope your holiday season has been filled with rare DX and some stations that you thought would never be heard!

There is one suggestion I would like to pass on regarding last month's column on grounding. At most hardware stores and Radio Shacks there is a small device that can be plugged into a wall socket that will tell you the condition of that socket. There are three small lights on this device that show whether or not the wall socket polarity is correct, and whether or not the socket is properly grounded. This type of device might be easier to use than the neon tester described last month. The neon tester is still needed for "hot" chassis checks and for the other activities that were described last month, however, this wall socket tester is very easy to use and gives an immediate and definitive answer.

I have not finished moving due to other priorities, however, I have done the paper work in my head on how to resolve the third floor shack. I'll say this, for DX'ing with a portable radio and a loop antenna, the third floor sure beats a basement shack! By the way, a big Lazy Boy easy chair helps with the early a.m. hours normally spent with small radios!

How many of my readers have seen or even heard of a one-man radio station? They may be few and far between but how about a one-man TV station? I have heard of a couple. How about a one-man radio and TV station? The other day I found a station from the hills of Pennsylvania that has been operated by a single person on duty for both the TV and FM station. The stations are separate and are both operated separately but are also operated at times with a single operator. Neither station is automated. The TV station has been sold and, by the time you read this, the FM station may have been sold as well so a bit of history has passed us by without most of us realizing it. I hope to get some more information about the way these stations were run before the owner/operator departs—so stay tuned.

How many of you ever listen to The Larry King Show at night? Most everyone has heard of it I'm sure—especially if you're a late night DX'er in the eastern half of the U.S. The show is aired before midnight on the west coast. Well, yours truly was the "guest engineer" on the broadcast of September 19th from Harbor Place in Baltimore. WBAL sponsored Larry in Baltimore that night and therefore provided the facilities to broadcast the show. The guests included Phyllis Diller and the famous manager of the Baltimore Orioles baseball club, Earl Weaver. More about Larry at a later time.



For those of you that are BCB pirate radio seekers there is a book out describing the adventures of Laser 558, the infamous pirate radio ship of Great Britain. The man who did most of the work in putting the station together, Paul Alexander Rusling, has put down on paper his tale of the good ship *Communicator* from the beginning to 1984.

First, I am a person who does not favor this type of operation by any stretch of the imagination. From near the start I find this story to be what would be expected of any Hollywood version of a tongue-in-cheek pirate story. Paul Rusling is an engineer and behaves as such through the story and is one of the saner characters. The engineering point of view is the only sensible part of the whole approach, but what would you expect from a bunch of "pirate-minded" individuals?

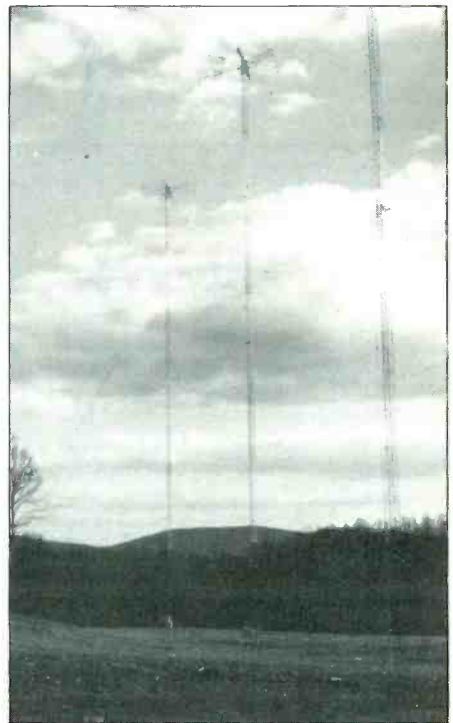
To begin with the whole idea just doesn't seem economically feasible to me and this is the theme I see through the whole book. Radio Caroline, Laser 558, or any operation of this type, has too much to lose at the next storm that comes across the waters to make a venture of this magnitude realistic to me. Paul points this out time and time again. If it's not one thing it's two others, not only with Laser 558 but also with Caroline. Although Caroline was an earlier pirate radio ship of considerable note and although mention is made in several chapters, this book is titled "*The Lid Off Laser 558, The Inside Story of the Concept and Building of the Pirate Radio Station*" from Paul A. Rusling. The ships off the coast of England may be fun to listen to, but it's no picnic putting the operation together and keeping it afloat. For more details, and with lots of pictures, I suggest you order your own copy today. Order direct from Paul. They are available from Pirate Publications for \$13.75 (U.S.). The address is P.O. Box 19, Herne Bay, England.

I do want to mention some of the technical parts of the operation to you before departing the subject. They had two 25-kilowatt transmitters and the original plans were to use either or both. As the program progressed, or maybe digressed, one was cannibalized to keep the other operating. From what I gather the total output power rarely exceeded five kilowatts. A fancy news operation was planned which never got off the ground. Two stations were planned with separate studios, and on and on like this... one has to read the book to appreciate how Paul felt. He does a good job of keeping his inner emotions out of the facts. As a person who has experienced the disappointment of a well planned station going aground, it is interesting to note that Paul's own inner story has been suppressed in order to give the reader a factual account of Laser 558.

Bits and Pieces

Some months back I mentioned the ARI system used by the Blaupunkt Radio people for a traffic bulletin service on the subcarriers of FM stations in the major U.S. markets. Here is a brief description of how the system operates.

In many cities across the country there are traffic reports broadcast over various stations, both AM and FM. To really take ad-



WWV, Charlottesville, VA. Notice large top-loading structures at the top of each tower.

REFERENCE DATA

FM BROADCAST STATION CLASSES & FREQUENCIES

Channel No.	Frequency	For Class	Channel No.	Frequency	For Class
201	88.1 MHz	†	251*	98.1 MHz	B-C
202	88.3 MHz	†	252*	98.3 MHz	A
203	88.5 MHz	†	253*	98.5 MHz	B-C
204	88.7 MHz	†	254*	98.7 MHz	B-C
205	88.9 MHz	†	255*	98.9 MHz	B-C
206	89.1 MHz	†	256*	99.1 MHz	B-C
207	89.3 MHz	†	257*	99.3 MHz	A
208	89.5 MHz	†	258*	99.5 MHz	B-C
209	89.7 MHz	†	259*	99.7 MHz	B-C
210	89.9 MHz	†	260*	99.9 MHz	B-C
211	90.1 MHz	†	261*	100.1 MHz	A
212	90.3 MHz	†	262*	100.3 MHz	B-C
213	90.5 MHz	†	263*	100.5 MHz	B-C
214	90.7 MHz	†	264*	100.7 MHz	B-C
215	90.9 MHz	†	265*	100.9 MHz	A
216	91.1 MHz	†	266*	101.1 MHz	B-C
217	91.3 MHz	†	267*	101.3 MHz	B-C
218	91.5 MHz	†	268*	101.5 MHz	B-C
219	91.7 MHz	†	269*	101.7 MHz	A
220	91.9 MHz	†	270*	101.9 MHz	B-C
221	92.1 MHz	A	271*	102.1 MHz	B-C
222	92.3 MHz	B-C	272*	102.3 MHz	A
223	92.5 MHz	B-C	273*	102.5 MHz	B-C
224	92.7 MHz	A	274*	102.7 MHz	B-C
225	92.9 MHz	B-C	275*	102.9 MHz	B-C
226	93.1 MHz	B-C	276*	103.1 MHz	A
227	93.3 MHz	B-C	277*	103.3 MHz	B-C
228	93.5 MHz	A	278*	103.5 MHz	B-C
229	93.7 MHz	B-C	279*	103.7 MHz	B-C
230	93.9 MHz	B-C	280*	103.9 MHz	A
231	94.1 MHz	B-C	281*	104.1 MHz	B-C
232	94.3 MHz	A	282*	104.3 MHz	B-C
233	94.5 MHz	B-C	283*	104.5 MHz	B-C
234	94.7 MHz	B-C	284*	104.7 MHz	B-C
235	94.9 MHz	B-C	285*	104.9 MHz	A
236	95.1 MHz	B-C	286*	105.1 MHz	B-C
237	95.3 MHz	A	287*	105.3 MHz	B-C
238	95.5 MHz	B-C	288*	105.5 MHz	A
239	95.7 MHz	B-C	289*	105.7 MHz	B-C
240	95.9 MHz	A	290*	105.9 MHz	B-C
241	96.1 MHz	B-C	291*	106.1 MHz	B-C
242	96.3 MHz	B-C	292*	106.3 MHz	A
243	96.5 MHz	B-C	293*	106.5 MHz	B-C
244	96.7 MHz	A	294*	106.7 MHz	B-C
245	96.9 MHz	B-C	295*	106.9 MHz	B-C
246	97.1 MHz	B-C	296*	107.1 MHz	A
247	97.3 MHz	B-C	297*	107.3 MHz	B-C
248	97.5 MHz	B-C	298*	107.5 MHz	B-C
249*	97.7 MHz	A	299*	107.7 MHz	B-C
250	97.9 MHz	B-C	300*	107.9 MHz	B-C

† For classes of noncommercial educational stations and their definition, refer to FCC Rules and Regulations, Paragraph 73.504.
 * In Hawaii, the band 98-108 MHz is allocated for non-broadcast use, and the frequencies 98.1-107.9 MHz will not be assigned in Hawaii for use by FM broadcast stations.

In answer to the many requests for the FM channels and frequencies.

vantage of this feature Blaupunkt came up with an idea to use a subcarrier on an FM station to activate the receiver and cause it to tune itself to the station broadcasting the traffic report. There are several different

models of radios available to do different types of things. The most sophisticated is actually two receivers in one chassis. With this radio one section is tuned to the ARI station and the other section is tuned to whatever

station the listener desires. When the ARI station prepares to broadcast a traffic report they activate a subcarrier on the FM transmitter (57 kHz) which the ARI receiver decodes and causes the receiver to switch to the ARI station for the traffic report. When the report is over, the ARI station broadcasts the commercial, turns the subcarrier off which causes the ARI receiver to retune to the station (AM or FM) that the listener had selected. On the simpler version, the radio must be tuned to the ARI station but the listener may be listening to a cassette or have the volume turned down. When the ARI subcarrier is detected, the receiver turns to the ARI station by raising the volume or de-selecting the cassette.

Some cities have several ARI stations so the user may select the traffic reports he prefers to hear by selecting different ARI stations on that section of the receiver. No traffic information is broadcast on the 57 kHz subcarrier. For more information call Blaupunkt at (800) 323-1943; in Illinois, (312) 865-5200.

Next month I hope to have an update on the NAB antennas that are being built near Washington for the purpose of testing the restricting of sky-wave propagation. This would be useful in reducing interference on local and regional channels and allow more stations to operate on the same frequency. The tests will be conducted on the spectrum around 1700 kHz.

Is AM stereo dying? More manufacturers are dropping their AM stereo receivers. The new 1987 Radio Shack catalog still shows their two AM stereo receivers, one for home and one for the car. The trade magazines rarely mention AM stereo since the hot talk now is the compact disk. Several radio stations are pulling the LP's off the shelf, strongly encouraging the DJ's to play the CD when they have both the album and the CD. I see lots of portable CD players but a portable AM stereo radio is hard to come by. The flood of stations converting to AM stereo has slowed to a trickle; maybe a drop now and again is a better description! However, Kahn has reported a few new stations this month. He seems to be running maybe a couple a month. Not enough to keep AM stereo alive and well. C-Quam's rate is about the same.

The big news is the signing of the Mexican agreement which will allow U.S. broadcasters on Mexican clears to some limited operating at night. Other stations will get regular authorization for full-time broadcasting.

Em 100 K.C.T.N COUNTRY

Call Letter Changes

Location	Old	New			
AM Stations			Jacksonville, AR	KEZQ	KEZQ-FM
Mesa, AZ	KNTS	KJAA	Osceola, AR	KHFO	KWLU
N. Little Rock, AR	KBOX	KEZQ	Merced, CA	New	KBCY
Berkeley, CA	KRE	KBLX	Oceanside, CA	KGMG	KMGM-FM
Oceanside, CA	KNWC	KGMG	Santa Paula, CA	KKBZ-FM	KIEZ
Rocklin, CA	New	KFRP	Berkeley, CA	KBLX	KBLX-FM
San Diego, CA	KGB	KPOP	Port Charlotte, FL	New	WVIJ
San Francisco, CA	KFRC	KMMG	Tallahassee, FL	WBGW	WBGW-FM
Santa Maria, CA	KZON	KTAP	Ocala, FL	WFUZ	WMMZ
Santa Rosa, CA	KQTE	KWFV	Jesup, GA	WAJS	WZKS
Greeley, CO	KGRE	KATR	Kingsland, GA	New	WKBX
Gainesville, FL	WMGI	WDVH	Nashville, GA	WLYZ	WJYF
Lehigh Acres, FL	WGTR	WOOJ	Des Plains, IL	WYEN	WZRC
Tallahassee, FL	WKQE	WBGW	Des Moines, IA	KKXI	KDWZ
Alpharetta, GA	WVNF	WQRZ	Russellville, KY	WZNY	WLTO
Austell, GA	WCKZ	WAOS	Donaldsonville, LA	KSMI-FM	KKAY-FM
Columbus, GA	WEIZ	WDAK	Portland, ME	WWGT	WWGT-FM
Jefferson, GA	WEEG	WBKZ	Sanford, ME	WEBI	WCDQ
Nashville, GA	WNGA	WLYZ	Forest, MS	WQST	WQST-FM
Waimea, HI	New	KJRI	Kansas City, MO	KBKC	KCPW
Westbrook, ME	WMER	WWGT	Las Vegas, NV	KUDO	KEYV
Thurmont, MD	WFCO	WTHU	Hanover, NH	New	WTSL-FM
Mt. Pleasant, MI	New	WPRJ	Nashua, NH	New	WHOB
Brainerd, MN	KQBR	KVBR	Vineland, NJ	WKQV	WVLT
Petal, MS	New	WLJH	Los Alamos, NM	KPZA	KBOM
Pearl, MS	WKKE	WJNT	Albuquerque, NM	KRKE-FM	KZRR
Forest, MS	WJYV	WQST	Buffalo, NY	WNYS-FM	WHTT-FM
Lovelock, NV	KDXA	KLVK	Rotterdam, NY	WERV	WNYQ
Vineland, NJ	WDVL	WFHM	Lake Success, NY	WAPP	WQHT
Seaside Park, NJ	New	WNJO	Glen Falls, NY	WNIQ-FM	WAYI-FM
Albuquerque, NM	KRKE	KZSS	Buffalo, NY	WPHD	WPHD-FM
Alamogordo, NM	KINN	KZZX	Glens Falls, NY	WNIQ-FM	WRXI
Buffalo, NY	WNYS	WHTT	S. Bristol Twp, NY	WYLF	WZSH
Buffalo, NY	WYSL	WPHD	Hertford, NC	New	WELQ
Trumansburg, NY	WJCU	WPIE	Rocky Mount, NC	WFMA	WTRG
Mebane, NC	WMYT	WGLH	Fredericktown, OH	WWMZ	WJMR
Minot, ND	KKOA	KRRZ	Enid, OK	KUAL	KOFM
Medford, OR	KEKA	KFLI	Bend, OR	KJII	KWBX
Hughesville, PA	WKDJ	WTPS	Muncy, PA	WJKR	WTPS-FM
Hilton Head, SC	WHHQ	WHHR	Whitneyville, PA	New	WLIH
Jasper, TN	New	WAPO	Hilton Head, SC	WHHR	WHHR-FM
Highland Park, TX	KVIX	KVIL	Batesburg, SC	WBRL-FM	WKWQ
Colonial Hgts., VA	WPVA	WHUM	Orangeburg, SC	WTCB-FM	WIGL
Williamsburg, VA	WQSF	WMBG	Mc Kenzie, TN	WKTA	WWYN
Petersburg, VA	WSSV	WPLZ	Lake Jackson, TX	KGOL	KZFX
Yakima, WA	KAJR	KZTA	Comanche, TX	New	KZAA
Tumwater, WA	KCIF	KVSN	Ft. Stockton, TX	KPJH	KFST-FM
			Bountiful, UT	KSEJ	KLZX
			Orange, VA	WSNV	WSPV
			Petersburg, VA	WPLZ	WPLZ-FM
			Cape Charles, VA	WWGH	WIAV
			Cheney, WA	KEWC-FM	KEWU-FM
			Holmen, WI	WKDL	WKBH-FM
			Rock Springs, WY	New	KYCS
			Rojo, PR	New	WMIO
Location	Old	New			
FM Stations					
Sylacauga, AL	WMLS-FM	WAWV			
Eloy, AZ	KKAF	KXMK			
Camden, AR	New	KCEZ			

How many of you have heard the new station operating on 530 kHz? This is not a TIS but an authorized operation in Ft. Erie, Ontario, Canada. CJFT, AM 530, operates 24 hours a day with 250 watts. There may be more . . . keep listening!

A recent letter from Paul Brown, typical of the ones I receive from new readers, prompts me to run down his list of questions for the benefit of all newcomers to AM and FM broadcast DX'ing.

1) Do FM stations have QSL cards?

Some do but today most confirmation is done via an individual letter. By including return postage the likelihood of an answer is increased.

2) Do FM stations "skip" like AM and SW? No. AM and SW stations signals bounce off the ionosphere hitting the earth and bouncing skyward again, repeating until the signal is too weak to be heard. FM signals can be "trapped" in a "duct" of atmosphere being given a free ride for hundreds or even a thousand or so miles to be heard

as if it were skip. Normally this DX is very directional (one point to another) and not widespread such as the lower frequencies. TV signals are also affected in the same manner.

3) Why do stations that are clear one minute fade out the next? The atmosphere is changing constantly, therefore the reception of the FM (TV) signal will also change rapidly.

4) Are there any clubs specializing in FM DX'ing? Yes, There are several. Probably

one of the largest and most organized is the Worldwide TV-FM DX Association, P.O. Box 514, Buffalo, NY 14205. They'll be glad to send info to any requesting. Another would be the Association of DX Reporters, 7008 Plymouth Road, Baltimore, MD 21208.

5) *Are there any publications specializing in FM DX'ing?* Yes, for one the WTFDA (above) has a monthly bulletin which runs 50-60 pages and is filled with info only about TV & FM. They have directories showing even low power FM & TV stations.

6) *Could you give me the call letters and address of 100.7 in Gillette, Wyoming, so I can write them?* Yes. KGWY, 110 E. Lakeway, Suite 800, zip 82716. They operate with 100 kW at 565 feet above the terrain.

7) *One last thing. I picked up an Indiana TV station on 87.7 MHz. Do TV stations broadcast on FM?* TV Channel 6 is just below the FM band. The TV sound is FM and is on 87.75 MHz. That is why most FM receivers can hear a TV channel on the bottom of the FM dial, below 88.1.

There are a few ICOM R-70 receivers appearing on the used market for about \$400. Just thought the information might be worth passing on. Check the ads in the back of CQ and QST magazines. It's taken for granted you'd check the back of POP'COMM first! No, mine's not for sale.

Steve Lawrence asks about bumper sticker and air check clubs. I have a short list of people who are interested in this type of activity. There are just about enough names on the list now to make a list and send everyone a copy. If you would like to add your name and address send me a SASE by the end of the month so I can add you to the list. Steve says he's just bought a new R-70 and can't wait until it arrives. If you're disappointed with the BCB reception send me \$2.50 and I'll send you modifications instructions to make the receiver come alive below 1600 kHz.

My copy machine is having a heart attack from all the requests for the Commodore BC/SWL/QSL program requests, but as it recovers I'm getting caught up on the mailouts. Send your request with an SASE.

January and February should continue to be good months for AM DX'ing but remember that this year daylight savings time will start earlier, the first Sunday in April I think, so this will change your operating habits somewhat. Plan to take advantage of the situation. It means many daytime stations will be operating with low power for an extra hour every morning. This will allow you an opportunity to log other stations an hour later or possibly pickup on some of the daytimers using low power. These low power operations seem to be quite a catch as I haven't received a whole lot of mail mentioning low power loggings. Maybe they are not creating the interference the full-timers were afraid they would. DST should not have any effect on FM DX'ing. That still takes the warmer spring weather for the northern states.

Station Updates

Call	Location	Freq	Pwr	Ant
AM				
WSBS	Great Barrington, MA	860	2.2/0	NDA
KAAN	Bethany, MO	870	1/0	NDA
KSWM	Republic, MO	940	5/5	DA-2
KRKX	Milwaukie, OR	1010	4.5/0	NDA
KMAS	Shelton, WA	1030	10/1	NDA
KLIP	Fowler, CA	1210	10/1	DA-D
KGFJ	Los Angeles, CA	1230	1/4	NDA
KPPC	Pasadena, CA	1240	1/4	NDA
WNOG	Naples, FL	1270	5/2.5	DA-2
WGSP	Charlotte, NC	1310	1/1.6	DA-2
KCHS	Truth Or Cons., NM	1400	1/1	NDA
KMPG	Holiister, CA	1520	5/0	DA-D
WVKO	Columbus, OH	1580	1/.25	DA-2
FM				
KHCS-FM	Round Rock, TX	88.1	3	85'
KCSN	Northridge, CA	88.5	.052	2129'
KMUW	Wichita, KS	89.1	100	439'
KZUM	Lincoln, NE	89.3	1.5	174'
KJVH	Longview, WA	89.5	.1	780'
KYDZ	Cody, WY	90.1	10	-459'
KNYD	Broken Arrow, OK	90.5	50	1638'
WKTZ-FM	Jacksonville, FL	90.9	50	462'
WTJU	Charlottesville, VA	91.3	1.1	305'
WJHS	Columbia City, IN	91.5	2.63	219'
WGHN-FM	Grand Haven, MI	92.1	3	247'
WBTR-FM	Carrollton, GA	92.1	.58	635'
WYCA	Hammond, IN	92.3	50	492'
WBKR	Owensboro, KY	92.5	91.4	1049'
KKNG	Oklahoma City, OK	92.5	98	984'
KLSI	Kansas City, MO	93.3	100	1066'
WKQZ	Midland, MI	93.5	1.372	486'
KLFA-FM	King City, CA	93.9	5.4	720'
KSDN-FM	Aberdeen, SD	94.1	100	438'
WQZX	Greenville, AL	94.3	1.75	410'
KICT	Wichita, KS	95.1	98.8	1027'
KQNS-FM	Lindsborg, KS	95.9	1.3	455'
WFTW-FM	Ft. Walton Bch., FL	96.5	100	1047'
WSEY	Sauk City, WI	96.7	1.78	429'
KBAL-FM	San Saba, TX	96.7	1.6	411'
WXTC	Charleston, SC	96.9	100	1770'
WVCX	Tomah, WI	98.9	100	990'
WHFS	Annapolis, MD	99.1	50	492'
KCFS	Sioux Falls, SD	100.1	3	189'
KLKT	Incline Village, NV	100.1	.8	629'
WLRZ	Peru, IL	100.9	1.15	518'
KRDI-FM	Decorah, IA	100.9	3	200'
KFIG-FM	Fresno, CA	101.1	5.4	1421'
KLTE	Oklahoma City, OK	101.9	100	1083'
KSKY	Reno, NV	102.3	1.32	425'
KJYO	Oklahoma City, OK	102.7	100	984'
KPRS	Kansas City, MO	103.3	100	995'
KFTZ	Idaho Falls, ID	103.3	50	590'
WWKZ	New Albany, MS	103.5	100	1004'
KEZT	Ames, IA	104.1	100	1009'
KTOF-FM	Cedar Rapids, IA	104.5	91.4	1039'
KXWT	Burkburnett, TX	104.7	100	1016'
KQQQ-FM	Pullman, WA	104.9	50	1669'
WLAY-FM	Muscle Shoals, AL	105.5	.53	743'
WSWV-FM	Pennington Gap, VA	105.5	3	276'
KVRO	Stillwater, OK	105.5	3	15.1'
KCGL	Centerville, UT	105.5	.339	961'
KWSP	Santa Margarita, CA	106.3	.093	1467'
KJUG	Tulare, CA	106.7	1.2	2550'
KTWN	Texarkana, AR	107.1	1.4	479'
WFXC	Durham, NC	107.1	1.19	505'

Key: D = Daytime, N = Nighttime, DA = Directional Antenna, DA1 = Same Pattern Day & Night, DA2 = Different Pattern Power Day/Night, NDA = Omni Antenna Day and/or Night, * = Special Operation or Critical Hours, N/C = No Change.

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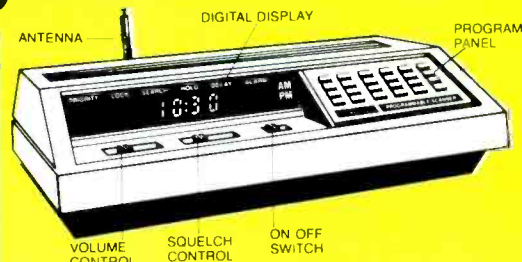
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Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

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ACKNOWLEDGING YOUR REPORT OF RECEPTION

WEAU FM
ON Sept 7th 1952

BY *[Signature]*

A WEAU-FM QSL sent in by Robert Grubbs in Kearny, MO.

March should be good in the southern part of the country as the cool nights warm rapidly in the AM creating the "ducting" which promotes TV & FM DX'ing. A good FM yagi antenna helps for the FM band . . . I've got to get mine back up! Use a rotor unless you're fortunate like Paul Brown who has an eight element yagi on the deck outside his window. He uses an "Armstrong" rotor with his! Here again, though a digital dial makes DX'ing so much easier. I don't think it takes any fun or mystery out of DX'ing. It does remove a great deal of frustration. On my recent trip to Pennsylvania I was riding with a friend and his car

radio was typical. The calibration was awful and I could not find any frequency I was looking for. Remind me if I forget . . . never again will I have an analog dial, except on an antique radio. Their dials were more accurate than the analogs of today anyway! My dad's old Atwater Kent had a knife edge pointer and a fine-line scale that was right on the money. Wonder what he did with that radio?

That about wraps it for this month. Thanks again for writing and for those who haven't the address is P.O. Box 5624, Baltimore, MD 21210. Let's make my postage box rent worthwhile!

PC

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CIRCLE 66 ON READER SERVICE CARD

CLANDESTINE COMMUNIQUE

WHAT'S NEW WITH THE CLANDESTINES

BY GERRY L. DEXTER

Once again, the Inner Sanctum-like creaky door opens and we step inside the secret world of clandestine broadcasting.

This month's main mystery is: What happened to Radio Monimbo? This well-heard anti-Sandinista station, apparently using at least ten kilowatts of power, was widely logged throughout the U.S. during its evening broadcasts on 6230. Unlike many clandestines, Monimbo never changed or even varied a little from its frequency. It began on 6230 and that's where it stayed, even when missionary broadcaster HCJB landed on the same spot and covered Monimbo's nightly 0200 broadcast. But Monimbo has not been heard in at least two months on 6230 or any other frequency so it has apparently been closed down, either by choice or by force. It never announced a sponsoring organization although a Japanese DXer says that it was owned by the son of Joaquin Chamorro who founded the newspaper *Dario Prensa Nicaragua* during the Samosa regime. If you spot this one back on the air please let us know.

Here are five more fairly easy-to-log clandestine stations for those who are just delving into this kind of radio monitoring:

La Voz de Cuba Independiente y Democratica's Radio Camilo Cienfuegos can be heard throughout the daytime hours on 9940 kHz and in the evenings on 6305 and 7380. CID has a very attractive QSL card and reception reports can be sent to any one of several addresses, including 937 15th St. NW, Suite 903-5, Washington, DC 20005 or Apartado Postal 5557, 1000 San Jose, Costa Rica. Programs are all Spanish.

The mysterious Radio Caiman is another anti-Castro station and is currently the strongest clandestine on the shortwave dial (at least in the midwest) putting in powerhouse signals during its evening broadcasts on 7470. We wouldn't be surprised to learn this runs 50 kilowatts. The station never announces any sponsoring organization and despite our research and appeals there is no known address to which to send a reception report. For those who enjoy puzzles, Radio Caiman offers a humdinger!

Still another active anti-Castro outlet is La Voz de Alpha 66, operated by the Alpha 66 group. Its broadcasts are on Monday, Wednesday and Friday evenings at 0200 and

run about half an hour. Frequency is 6666, although lately that has been varying up to 6672. It takes a while but the station does send a QSL card in response to reports. The address is P.O. Box 420007, Miami, FL 33142.

Radio Free Suriname, which once had its own station, or at least used an unidentified transmitter and location, can now be heard via the La Voz del CID transmitters. A broadcast in Hindi and other languages of Suriname can be heard at 0830 and approximately 2240 on active CID frequencies. This began as a weekly broadcast (on Tuesday) but may have expanded by now. Reports are requested to: Box 5517, Rotterdam, The Netherlands.

The Voice of the Nation's Saving (formerly the Voice of the Revolutionary Party for Reunification) is based in North Korea, but claims to be in Seoul, and is operated by the Korean National Democracy Front. Look

for it in Korean between 1000-1400 UTC on 4120 and 4557. It's not known to have ever QSL'd.

CLANDESTINE LOGGINGS: La Voz del CID heard on 6305 at 0815 and 9940 at 0220 in Spanish by Garth Carman in Alberta. And on 6305 at 1018 in Spanish by David Bush in Ohio.

An unidentified and presumed clandestine was found by David Bush on approximately 6650-6700 in Spanish at 0205.

If you are doing any clandestine hunting (and we hope you will if you haven't tried it yet) please forward your loggings or any information on stations and their backers or even potential backers of potential clandestines. Loggings, QSL copies, news clippings and such will be most appreciated and will help sort things out, at least a little, in what is one of the monitoring hobby's most intriguing areas. We look forward to having your input.

PC



Huber Matos, Jr., of Cuba Independiente y Democratica addresses the Congress of the Council for the Liberation of Suriname, a meeting which was covered by Radio Free Suriname.

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

RTTY New Year to you! There's lots of maritime news to report, some of it related to your RTTY monitoring.

The U.S. Navy recently commissioned a nuclear submarine. Named the U.S.S. Chicago (SSN 721), it is the fourth naval vessel to be named after that city. The submarine is to be fitted with Tomahawk cruise missiles, an irony in that early last year the Chicago City Council declared the city a nuclear-weapons-free zone!

Each cruise missile has a range of 1,500 miles and carries a 200-kiloton nuclear warhead. The submarine is 360 feet long and weighs 6,900 tons.

The submarine will never get to visit its namesake, though. Submarines just don't travel through the Great Lakes.

The first U.S.S. Chicago was commissioned in 1889. It was a steel warship that had sails and was powered by steam. It later sank while being towed. The second vessel was launched in 1931 and was seeing duty during the beginning of World War II. It too sank while under tow. The third U.S.S. Chicago served during World War II and in Vietnam. It was decommissioned in 1980.

Some of you express an interest in monitoring RTTY traffic from the Soviet Union's merchant fleet, including the passenger ships, all of which makes up one of the largest fleets in the world. Its international cruise liners can be found at most world ports, but not those in the United States.

This is because of a ban by the Federal government on all such vessels from American waters; the ban stemming from 1980 when the Soviet Union invaded Afghanis-

tan. When that happened, the longshoremen here refused to service the Soviet cruise liners docked at New York City; New Orleans, Louisiana; and Galveston, Texas. The Federal ban came a short time later.

As you log RTTY traffic from such vessels, try to picture what it's like to be aboard them. They have small cabins, plain food and so-so entertainment, according to an article in *The New York Times*. Service, however, is good, fares are low and schedules are adhered to closely. Security against terrorists is tight.

Their passengers are rarely from the Soviet Union due to the cost of world cruises and because they are restricted by their government from travel to foreign ports. Most of the passengers are Western Europeans, mainly from West Germany and Great Britain.

Few Americans will be found aboard the luxury-lacking vessels. Those on board will find Central European-type food and small cabins, many which lack private baths. The entertainment usually features Russian folk singers or dancers.

Speaking of cruise ships, Carnival Cruise Lines has added a seventh one to its proposed fleet of eight "Fun Ships."

Carnival, you may recall, is the owner of such luxury liners as *Tropicale* and *Festivale*. The latest ship, *Jubilee*, is the second of three "SuperLiners" planned for cruises in the Western Caribbean. The first, *Holiday*, is also in service, and the third, *Celebration*, will see its inaugural sailing early this year.

Jubilee and *Celebration* were constructed at the Kockums shipyard at Malmo, Swe-

den (see photos). Each was assembled in 22 different sections which were then welded together on the dock. Both 48,000-gross registered ton vessels carry 1,486 passengers, two to a cabin, and are slightly larger than *Holiday*.

In a cost-cutting move, the U.S. Navy has proposed that its military cargo be carried by foreign ships rather than the higher costing U.S. shipping firms, according to *The Washington Post*.

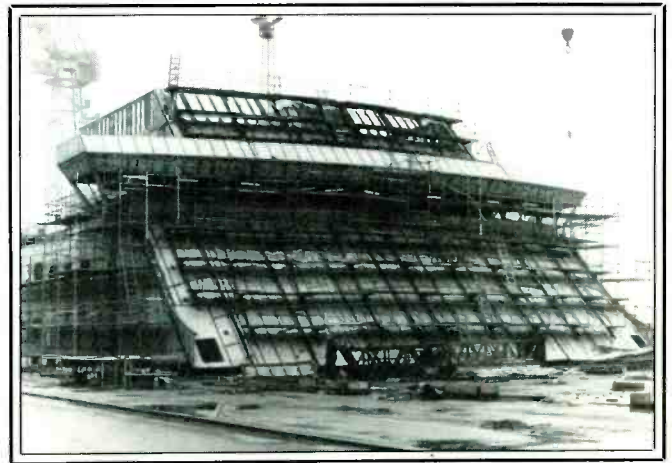
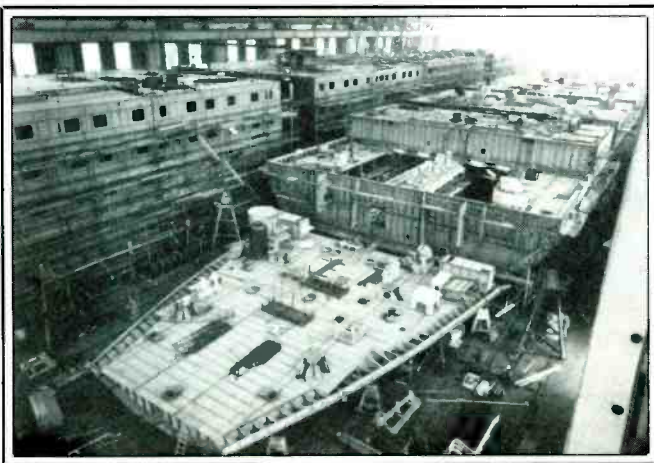
Such U.S. shipping companies such as Sealand, U.S. Lines, Lykes Brothers and American Presidential Lines, which are regularly logged by RTTY buffs, carry a substantial portion of military cargo to overseas military bases. They do so under contract with the Navy's Military Sealift Command.

It cost the Navy \$1.8 billion in 1985 to move cargo on U.S. flag ships. Foreign flag operators can operate up to 30 percent cheaper than U.S. operators, according to industry estimates.

The Navy proposal is being fought vehemently by the U.S. flag operators, which reported heavy losses in revenue last year and contend that allowing foreign flag vessels to carry the cargo will have a devastating effect on the maritime industry here.

"The right to carry government cargo is the only reason anybody has a U.S. flag-ship," the *Post* quoted Albert May, executive vice president of the Council of American Flag Ship Operators.

In a feature story on marine consumer electronics, the *Post* mentioned the use of weather FAX machines which automatically print the radio transmitted weather charts



Carnival Cruise Lines' newest "Fun Ships" *Jubilee* and *Celebration* under construction recently at the Kockums shipyard at Malmo, Sweden (left). The bridge section of *Jubilee* being constructed (right). *Jubilee* was completed last summer and *Celebration* will see its inaugural sailing this spring. (Photos courtesy Carnival Cruise Lines.)

of the National Weather Service. With an average cost of \$3,000, these printers can provide satellite maps of weather conditions, water currents and temperature analysis. Some machines have permanent memory of worldwide weather stations built in and can be programmed to tune to several of them.

A number of readers have wondered about the disappearance of WBR70, Miami Meteo, Florida, and WSY70, New York Meteo, New York, from the HF bands. No matter what the time of day was, or how bad radio reception got, we were always assured of logging RTTY copy from these stations for many, many years.

They went bye-bye last summer as the result of cost-cutting measures by the Reagan Administration. It was just costing too many bucks to maintain their outdated transmitting equipment.

NOAA still provides National Weather Service data to public and private concerns, however. Weather data is sent via satellite, facsimile over HF radio and by landline. But the era of HF RTTY weather broadcasts appears to have come to a saddened end.

Here's an interesting book to add to your library shelves, especially if you're an espionage buff: *Clandestine Operations: The Arms and Techniques of the Resistance, 1941-1944*, by Pierre Lorain, 185 pages, Macmillan Publishing Co., NY, \$24.95.

This book, published in English in 1983 (the original is in French), is a guide to what the Resistance used in occupied France in World War II to spy on the Germans. Included are drawings and descriptions of aircraft bombers, anti-tank weapons, pistols, and sabotage and explosives materials.

Of interest to RTTY buffs, however, are the chapters devoted to clandestine radio transmissions, the transmitting and receiving equipment used by the Resistance, and various cryptographic systems used to transmit messages over radio. Even the familiar one-time pad is discussed. This book is sure to cure the mid-winter blahs many are now suffering.

Time now to turn on the RTTY machine and view the traffic.

RTTY Intercepts (All Times Are UTC)

4215.2: Un-ID w/RURY at 500/66N, hour after hour & more (Fred Hetherington, FL).
 4271: CFH, Canadian Forces R., Halifax NS w/wx at 0444, 850/100R (Jim Hartung, MD).
 4613.5: ELRB, Monrovia Aero, Liberia w/tfc at 0429, 425/66N (Hartung, MD).
 5102.9: Tokyo Meteo, Japan, w/wx at 0930, 850/66R (Hetherington, FL).
 5117.1: STK, Khartoum, Sudan at 0100 w/RURY, 425,66R (Hetherington, FL).
 5117.6: TYE, Cotonou Aero, Benin, w/wx at 0045, 425/66N (Hetherington, FL).
 5150.2: PTT, Havana, Cuba sends tfc using Time Division Multiplex (TDM). No time given (John Biro, MA). We start 1987 w/this new contributor. Let's welcome him-- Ed.
 5460: Nx BC of the VOA, Tangier, Morocco at 0431, 425/66R (Hartung, MD).
 6766.5: ELDY5, the MAASGUSAR, sending Telex thru WCC at 2127, ARQ mode. Appears to be a Yugoslav cargo carrier. Must have changed names recently for my listings show ELDY5 as Liberian-flag cargo carrier IVER SPLIT. Was enroute Miami (Ed.).
 6358.9: PBC36, Dutch Navy, Goeree I., Holland at 0056, 850/100R (Biro, MA). Details of xmsn not given-- Ed.

Abbreviations Used in The RTTY Column

AA	Arabic
ARQ	SITOR mode
BC	Broadcast
EE	English
FEC	Forward Error Correction mode
FF	French
foxes	"Quick brown fox..." test tape
GG	German
ID	Identification/ied
MFA	Ministry of Foreign Affairs
nx	news
PP	Portuguese
RYRY	"RYRY..." test tape
SS	Spanish
tfc	traffic
w/	with
wx	weather

6612.4: "G8B" w.5L msg & tfc in SS to "AOJ" at 0356, 850/66R (Ed.).

6662: ANSA, Rome, Italy nx BC in Italian at 0105, 425/66R (Scott Halligan, MA). Another 1st time contributor here & the 6th one to represent Massachusetts. Still no RTTY monitors in Montana heard from-- Ed.

6736.4: Addis Ababa Aero, Ethiopia w/RURY at 0216, 850/66R (Ed.).

6759: LOR, Puerto Belgrano Naval R., Argentina w/5L tfc + its ID at 0449 at 100N (reception on automatic tuning RTTY decoder). Also heard another day at 170/133N (on my other unit), 0030-1200 when it faded away in the daylight (Ed.).

6775: XTU, ASECNA, Ouagadougou, Bourkina Faso, w/RURY at 0645, 425/66R (Ed.).

6805: SOG280, PAP in Warsaw, Poland w/ID & QRA at 2056, 425/66R (Biro, MA).

6865.4: GYU, RN at Gibraltar, w/RYR RYR + foxes at 0130, 850/66R (Ed.).

6870.3: Pascua Aero; Easter I., w/tfc in SS at 0152, 650/66N (Ed.).

6920.4: Kiev Meteo, USSR w/coded wx at 0340, 850/66R (Ed.).

7442.5: VOA, Monrovia, Liberia w/nx at 2331, 425/100R (Hartung, MD).

7474: TJK, ASECNA, Douala, Cameroon w/RURY at 2335, 425/66N (Hartung, MD).

7650: XINHUA, Beijing, PRC nx BC in EE at 2350, 425/66R (Hetherington, FL).

7690: TUH, ASECNA, Abidjan, Ivory Coast, w/RURY at 0200, 425/66N (Ed.).

7693: 3BT3, Bigara, Mauretania, w/wx at 0400, 950/66R (Hetherington, FL).

7819.5: Kano Meteo, Nigeria w/RURY at 2350, 600/66N (Hetherington, FL).

7820.5: MKK, RAF, London, England w/RYI's at 1000 in TDM mode (Hetherington, FL).

7822.2: French AF, Paris w/ARQ tfc in FF to African FAF bases. Time not stated (Hetherington, FL).

7954.5: DyN nx from Buenos Aires, Argentina w/nx in SS at 0054, 850/100R (Halligan, MA).

8344.5: UPBZ, Soviet cargo ship AKADEMIK FILATOV, w/telegram at 0031 to Leningrad R., 170/66N (Halligan, MA) & TCOI, the ship T. TUNA, in contact with un-ID at 2041 in ARQ (Hartung, MD). The T. TUNA is a Turkish cargo vessel-- Ed.

8346.6: UUGF passing ARQ tfc to UAT, Moscow, USSR. Time not given. (Biro, MA). UUGF is the Soviet passenger ship CHOTA ROUSTAVIELI. This ship also has satellite capabilities-- Ed.

8465: "58JDQ" w/RURY at 2355, 850/100R (Biro, MA). Must be Spanish Navy-- Ed.

8706.5: KFS, San Francisco R., CA w/NWS high seas forecast at 1605 in ARQ (Ed.).

9226: TJK, ASECNA, Douala, Cameroon w/RURY, 425/66N at 2110 (Ed.).

9315: Athens Aero, Greece w/RURY at 2330, 590/66R (Biro, MA).

9846.7: TUH, ASECNA, Abidjan, Ivory Coast, w/RURY at 2125, 425/66N (Daryl Symington, OH).

9994.3: Santa Maria Aero, Azores, w/coded wx at 0027, 850/66N (Ed.).

10360.4: CNA, Taipei, Taiwan w/RURY/QRA at 1320 & EE nx at 1330, 850/66R (Ed.).

10983: XINHUA, Beijing, PRC w/nx in EE at 0708, 425/66N (Albin Magliano, Tahiti).

11096: MKD, RAF, Akrotiri, Cyprus w/RYI's & foxes at 2015, 170/66N (Ed.).

11453.4: Rome Meteo, Italy at 1957 w/coded wx, 850/66N (Ed.).

12175: KCNA, Pyongyang, N. Korea w/nx in FE on a Saturday at 1844, 350/66N (Ed.).

13366.5: 5YD, Nairobi Aero, Kenya w/RURY at 2130, 425/66R (Ed.).

13538: 5L msg of 2100 from MFA, Berlin, GDR, 425/66R (Ed.).

13647.7: CTK, Prague, Czechoslovakia s/off at 1344 after nx BC, 425/66N (Ed.).

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CIRCLE 25 ON READER SERVICE CARD

13728.4: AFP, Paris, w/FF nx at 1402, 350/66N (Ed.).

13791.5: SON279B, PAP, Warsaw, Poland w/FEC nx BC in Polish at 1441. At 1442, QRA from SOK224 & RYRY. At 1500, called Beijing PRC w/ZOK GA TFC & QTC BLIND. Then came msg in Polish from SPR, Szczecin R., Poland to the skipper of SPVR, the POMORZE, a Polish fishing transport vessel. At 1507, s/off in CW (Ed.).

13844.5: KRH51, U.S. Embassy, London, England w/foxes at 1540 & 2258, 850/100N (Ed.).

13977.7: French AF in FF from Paris to FAF unit in N'djamena, Chad; ARQ 2305-2345 (Ed.).

13995: VIA in Monrovia, Liberia w/QRA marker at 2330, 425/100R (D. Symington, OH).

14384.9: NNN0NR0, USN MARS, Rota, Spain w/telegrams to NNN0GKF in USA at 2245, 170/100N (Symington, OH).

14455.4: Foxes w/no ID at 1536, 850/100N (Ed.).

14490: TASS, Moscow, USSR w/EE nx at 1200 & 1700, 425/66R (Ed.).

14497.7: Santa Maria Aero, Azores w/aviation wx BC at 1702, 850/66N (Ed.).

14534.5: GYU, RN in Gibraltar w/RYYR & foxes to MUL + "MUL MUL DE GYU TEST BLIND BLIND BLIND QSY THE F12 TO THE F10 DUE TO QRM R R R R ON THE F12" (Ed.).

14572: BXM62, a PRC embassy, QTH unknown

w/RYY's then to CW & back to RTTY w/a short 4F msg then back to CW for s/off. The RTTY was 500/100R at 1357 (Ed.).

14573: JANA nx in AA from Malta at 1644, 425/66R (Ed.).

14584.8: MKD, RAF at Akrotiri, Cyprus w/RYY's & foxes at 1630, 350/66R (Ed.).

14603.3: PTT, Sofia, Bulgaria w/tfc in Bulgarian at 1619, 730/133R (Ed.).

14605: Berlin, GDR, w/ADN nx in SS at 1218, 425/66N (Ed.).

14619: Y7A59, MFA, Berlin, GDR w/5L msgs to "WAS" (Washington, DC), "HAV" (Havana, Cuba), & "MAN" (Managua, Nicaragua) at 1502, 500/66N (Ed.).

14630.5: ANSA, Rome, Italy, ANSA nx in FF at 1417, 425/66N (Ed.).

14632: TANJUG, Belgrade, Yugoslavia, nx in EE at 1224, 425/66R (Ed.).

14647: 5F msg, 425/100R at 1959, s/off in CW at 2008 (Ed.).

14672.7: MKD, RAF, Akrotiri, Cyprus, at 1459, 170/66R (Ed.).

14676: RY's/CQ DE RCF "FOR CAZ RKM KDN NR 55 FOR FRU RKG NR 54" at 1441, 425/100N. Nr. 54 was a Gr 30 msg in 5L; Nr 55 was a Gr 288 msg in 5F. Off 1447 (Ed.).

14719.7: TASS, Moscow, USSR nx in AA at 1227, 425/66R (Ed.).

14723: TNL, Brazzaville Aero, Congo w/RYYR

at 2016 & 0020, 425/66R (Ed.).

14760: MAP, Rabat, Morocco w/EE nx at 1229, 425/66R (Ed.).

14785: INFOIND, New Delhi, India at 1412 w/test tape: "CZCC ATPSIXFIVE STROKE ONE-FOURSEVENEIGHTFIVE KHZ." Nx in EE at 1435, 425/66N (Ed.).

14794.5: AFP, Paris, France w/nx in AA at 1423, 425/66N (Ed.).

14795.7: AFP, Paris, France, w/nx in FF at 1440, 425/66N (Ed.).

14810.3: SS tfc apparently from PTT, Havana, sent manually at 1728, 500/60N (Ed.).

14831: KUNA, Safat, Kuwait w/EE nx at 1442 in 425/66N (Ed.).

14882.5: IINA, Rome, Italy w/Middle East nx in EE at 1427, 425/66N (Ed.).

14912: Un-ID sending encryption at 1920, 425/100N. Know this to be correct RTTY setting because of "QRU QSL?? TKS CQ QSL" at 1925 (Ed.).

14937.5: SUA, ASECNA, Naimey, Niger w/coded aviation wx at 1830, 600/66N (Ed.).

14940: TASS, Moscow, on a new freq w/FF nx at 1444, 425/66R (Ed.).

15580: TASS, Moscow, USSR w/nx in EE at 1459, 425/66R (Ed.).

15643: KUNA, Safat, Kuwait, EE nx BC at 1503 (Ed.).

15647: Nx in AA from KUNA, Safat, Kuwait, at 1504, 425/66R (Ed.).

15693.5: ANSA, Rome, Italy, nx in EE at 1511, 425/66N (Ed.).

15705: TANJUG, Belgrade, Yugoslavia nx BC in FF, 500/66R at 1518 (Ed.).

15710: TASS, Moscow nx BC in FF at 1522, 425/66R (Ed.).

15780: TASS, Moscow, USSR, nx BC in EE at 1521, 425/66R (Ed.).

15865: TASS, Moscow, USSR nx BC in FF at 1524, 850/66R (Ed.).

15890: TASS, Moscow, USSR, nx BC in PP at 1525, 425/66R (Ed.).

15919.5: CTX, Prague, Czechoslovakia w/nx in EE at 1526, 350/66N. Was under CFH CW marker but unaffected. New freq for CTX (Ed.).

15930: TASS, Moscow, USSR, nx BC in EE at 1528, 425/66R (Ed.).

15950: CXR, Montevideo Naval R., Uruguay at 1418 w/SS tfc to USN's NBA in Panama (NBA was an 16194, then 19616, then 18990). Tfc sent at 850/100R & 850/66R (Ed.).

16107: 5F msg to Washington DC sent at 2029 in ARQ (Ed.).

16397: DIPLO, Paris, France w/nx FF, 425/66N at 1522 (Wolfgang Palmberger, West Germany).

17520: The Cuban embassy at Cotonou, Benin w/nx in SS about Africa to MFA, Havana at 1550, 425/66R (Hetherington, FL). Kneitel's Guide to Embassy & Espionage Communications tentatively lists callsign as CLP15-- Ed.

18030: MINREX, Havana, Cuba w/5F msg & JURIMINREX w/circulars in SS to various Cuban embassies & consulates, 425/66N at 1521 (Ed.).

18382: Tokyo Meteo, Japan, w/coded wx at 0644, 425/66N (Magliano, Tahiti).

18619.9: CLP1, MFA, Havana, Cuba w/SS tfc to its African embassies at 1330, 500/100N (Hetherington, FL).

18810: MFA, Stockholm, Sweden w/nx in Swedish after 1400 to KNY34, its embassy in Washington, DC, 425/100R (Hetherington, FL). Kneitel's book lists Stockholm's callsign as SAM; a QSL from SAM is also shown-- Ed.

19108: An Indonesian diplo station w/tfc to an embassy in Dar es Salaam, Tanzania at 1303, 425/66N (Palmberger, West Germany).

19227.1: DFZG, a Yugoslav embassy somewhere w/RYYR at 1430, followed by tfc in EE & Serbo-Croat & using encryption for classified material. Was 425/100N (Hetherington, FL). Fred, I'm still not fully convinced this is MFA Belgrade. I've seen "DFZG" listed only in American sources, not in any European ones-- Ed.

19390: MFA, Berlin, GDR, 425/66N + 133N at 1429 w/GG nx (Palmberger, West Germany). Kneitel lists callsign here as Y7A76-- Ed.


19438.4: LOR, Puerto Belgrano Naval R., Argentina w/5L msgs & marine warnings in both SS & EE, 1834-1854, 170/100N (Ed.).

20350: NBA, USN, Balboa, Panama calls YAPD & sends RYYR & SGSG. YAPD is possibly a ship of Venezuelan Navy. Was 850/100R at 1928 (Ed.).

20513: BXM51 at 0756 w/VVV, HR ZNN & RYYR, 170/66N (Magliano, Tahiti). Probably a PRC embassy somewhere.

23388.4: LOR, Puerto Belgrano Naval R., w/marine advisories in SS at 1910, 170/100N (Hetherington, FL).

143.625 MHz: MIR, Soviet Space Station sends coded info giving its orbit #, its revolution around Earth for the day, the time in Moscow + other info. RTTY setting of about 134/66 (Biro, MA). A ribbon of RTTY tape & a big box of chads to you for this excellent logging. Now, has anyone logged RTTY tfc from the satellites?-- Ed. **PC**



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CIRCLE 73 ON READER SERVICE CARD

ANTENNAS AND SIGNAL IMPROVING ACCESSORIES

An Easy-up Wideband Vertical For A Small Lot

Don't overlook the vertical as a solution to your small lot limitations. You may be able to erect one just outside the radio room window or some other location very near to the house or garage. When this is done, only a short length of transmission line is needed. Verticals perform well and radio Hams all over the world have been using them successfully for years. In fact, for reception purposes, the matching problem is not nearly as difficult as that encountered by Hams when they must match their transmitter output to the antenna. The vertical has an omnidirectional horizontal sensitivity pattern and good low-angle vertical pick-up, the right combination for shortwave listening.

This is a two-part story of a limited space vertical antenna installation for the frequency range between 1.5 and 20 MHz. The basic vertical is shown on the left of Fig. 1. To its right is a special loading coil that can be used to enhance tropical band operation. The loader will be described next month.

An answer to acceptable multiband reception is to choose a vertical length that is practical and will provide good average performance over the range of bands of interest to you. Over a period of time of experimentation with SWB verticals, our results indicated that a vertical cut to the 25-meter band was a valid compromise. A quarter wavelength at this frequency corresponds to a length of 19' 10", Fig. 2. The mast consists of three sections of PVC piping (2", 1 1/2" and 1" ID) telescoped together as shown in Fig. 2. Such a mast can be lifted over a metal pole set into the ground. Mount this pole straight and, if a permanent installation is desired, it can be set in cement. If the pole is set straight the plastic mast is self-supporting. If desired, two or three rope guys can be used to minimize whipping in the wind. Although not really necessary, they help to keep the pole straight up. The other ends of the guy ropes can be fastened to short stakes or other support points such as trees or buildings. Small stakes can be positioned about 10' from the mast, occupying little space. Even less space is needed if you can bracket the mast to a building.

Three resonant radials complete the basic antenna, setting up a fine 25-meter signal snatcher. As always, I choose to use #16 plastic-covered hook-up wire for both vertical and radials. Wire is bared only where it connects to the two nut/bolt combinations that act as coaxial line terminals, Fig. 3.

Before the mast is erected the vertical wire is fastened to the top of the PVC mast.



Here's Ed, POP'COMM's resident antenna expert!

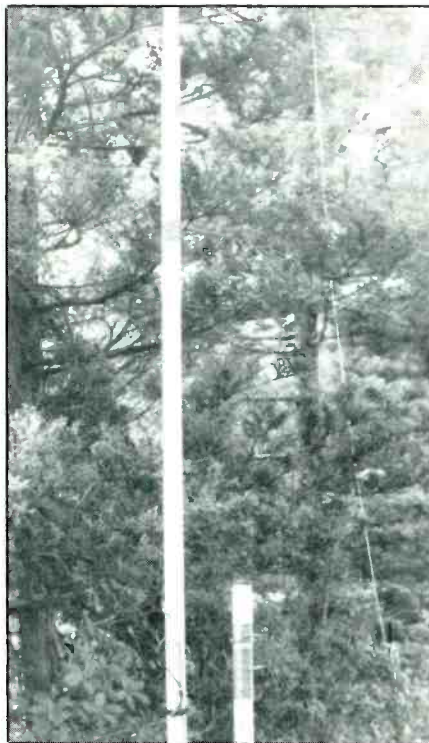


Figure 1: Vertical rising through the trees near to window or radio room. Special tropical band loading coil to the right is described next month.

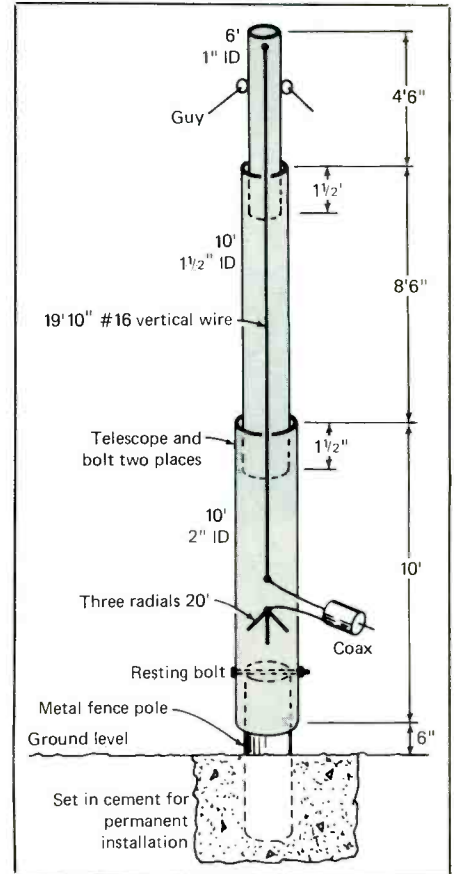


Figure 2: 25-meter vertical.

A solder ring is soldered to the bared opposite end and is held close to the mast by the bolt/nut terminal. The radials are run straight down to the bottom of the mast. At ground level they are fanned out and are buried 1" below the surface. Ideally, they should be fanned straight out with 120° separation, Fig. 4A. However, things do not change too much if you must go out at differing angles. In fact, a serpentine arrangement of the radials can be used in a tight situation, Fig. 4B. Perhaps you can run two straight and a then a third one in an arc to accommodate lot arrangement and proximity to the house.

Additional radials are used to extend the bandwidth of such a vertical simply by improving the match situation. In tests here, good results were obtained by adding two additional 19-meter radials. Also, after some cut and try efforts, a single long radial was cut for 49 meters. By using appropriate curves and serpentes you can usually con-

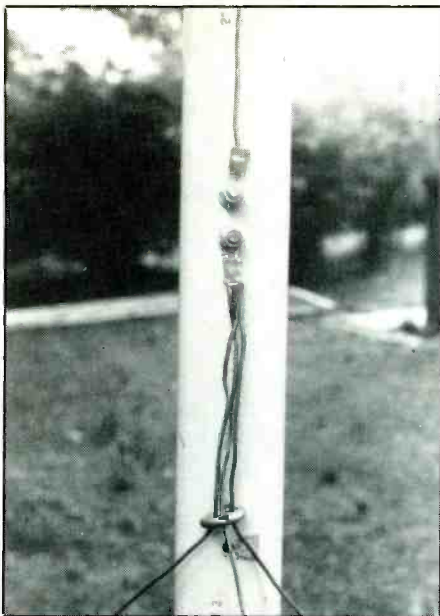


Figure 3: Terminals at base of mast. Three radials are shown.

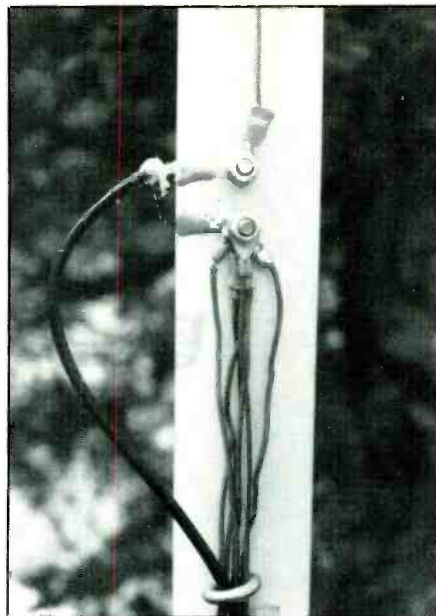


Figure 5: Terminal connections showing addition of three more radials (A) and weather protection (B).

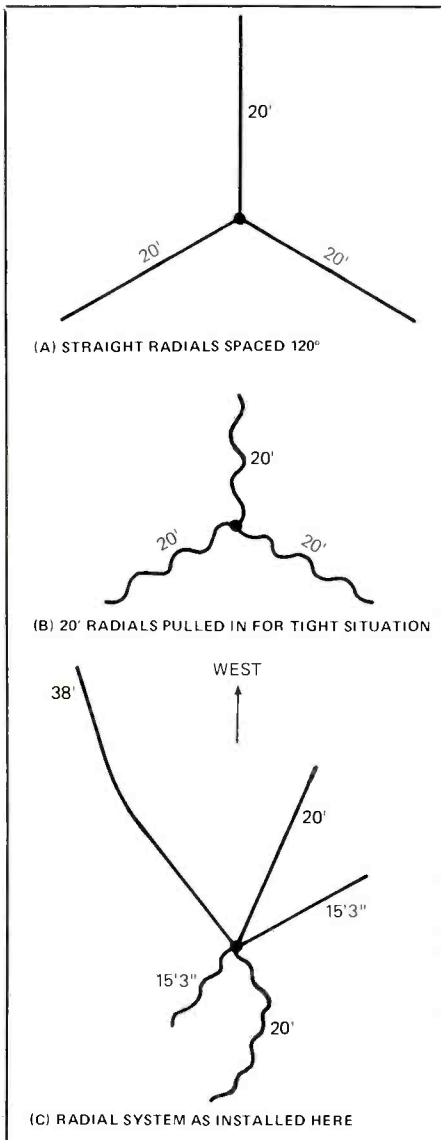
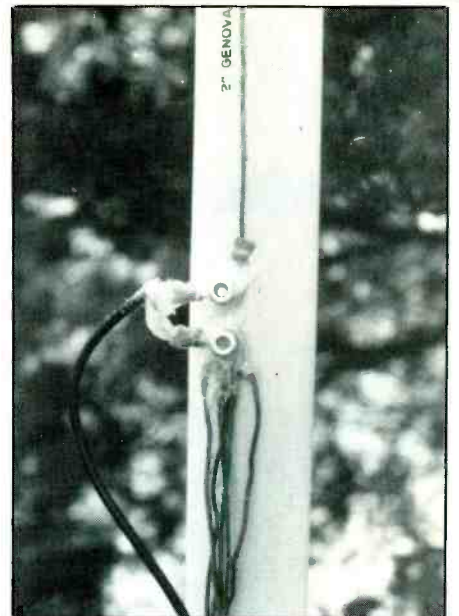


Figure 4: Radial system for vertical.

fine your radial radius to less than 15' if that is necessary. Do the best you can, using just as much space as you have available.

Our own final arrangement is shown in Fig. 4C. Toward the house side I had to compromise the straight-out arrangement for one of the 19- and 25-meter radials. On the west side of the mounting position, reasonably straight radials could be set down except that the long 49-meter radial was in a broad arc. Signal sensitivity seems to be a bit better toward the west and southwest. It may be the proximity of the house and/or the cramped radials that cut back the north-easterly signals an unimportant amount. Fig. 5 shows all the various radials connected to the ground terminal as well as the transmission line. Notice in (A) that silicon sealer has been placed where the inner conductor of the coaxial line leaves the braid to prevent moisture from entering the line. In example (B), all the exposed metallic surfaces except the outside nuts have been covered with sealer to hold off early rusting

and deterioration of the connections. In most of my presentations of antennas, for the purpose of clarity, I do not show weathering precautions. Usually I do not bother because antenna changes around here are frequent.

The vertical antenna installation, in comparison with a number of reference antennas, indicated good performance on all bands 19 through 49 meters. Results were within 1/2 signal strength unit (SINPO). Results were fair on 13, 16 and 60 meters (down no greater than a minus 1 SINPO signal strength unit). Results were fair to poor on the remaining tropical bands. No tests were made on 11 meters. Quite a good performer for a tight space and a simple antenna.

Would you like to go a step further and do some signal peaking on bands 41 through 120 meters with the loading arrangement shown in Fig. 1? Drop in next month. The antenna proper, the radial system and the required mounting space are unchanged with the addition of the useful loading coil.

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DATE	GMT	FREQ	MODE	UR RST	POWER	ANT

KRALLIS COSTAS TO RADIO
6-8 KIQY ST. OP
GR-11844
ATHENS GREECE PSE-TNX-QSL 73 DE *Krallis*

Figure 2: A QSL from Athens, Greece, sent in by Konstantinos Krallis.

of interest to others. I have been monitoring 10,913 kHz which is supposed to be in use by the FBI but I have heard nothing. I was wondering when most of the activity takes place on this frequency. Another thing is that I have heard tones on the Department of Energy 5,750 and 7,700 kHz frequencies but no other activity."

I have checked back through my logs and find I have not logged anything for these three frequencies. Perhaps readers can offer David some information.

Let's get to our intercepts:

**Intercepts
All Times Are UTC**

- 341: Beacon CGN, Chattanooga, TN at 2130 (David Patton, TN).
- 369: Beacon CQX, Camilla, GA, at 0100 (Patton, TN).
- 382: Beacon ALX, Alexander City, AL at 2030 (Patton, TN).
- 400: Beacon UWI, Dalton, GA at 1900 (Patton, TN).
- 2166: PAVX, vessel ABRAHAM CRYNSEN in USB at 2248 to WOO in N.I. (Pat O'Connor, NH).
- 2182: NMF4, USCG at Point Allerton, MA at 0245 in USB to USCG in Boston (O'Connor, NH).
- 2962: Gander Aeradio, Newfoundland, in USB at 0502 to Olympic 412 (Bob Margolis, IL).
- 3397.7: 5F groups in CW at 0402 (Tom Kneitel, NY)
- 4030: Beacon P, unlocated, in CW at 0135 ("Mr.?", MO).
- 4109.5: GBTT, luxury liner QE II at 2328 to WOO in NJ with 'phone patches. Enroute the "Big Apple" (O'Connor, NH).
- 4087.8: WJG, Memphis, TN in USB at 1038 to towboat NOBLE III (Margolis, IL).
- 4125: Tug CAPT. ADAMS to WKT, Master Marine at Bayou La Batre, AL, at 0135. KXV Steuart Transportation at Piney Point, MD to WV4463, the towboat BIG BILL at 0430. KZV864, Collegetown Marine Towing, Part Allen, LA to PACE at 1035. WIX, Indiana & Michigan Electric Co., Lakin, WV to WXE2187, towboat James E. Wright at 1125. WFE, Houston, TX to WX5549, towboat BARRACUDA at 1330. KGW387, Paducah, KY to towboat JOHN S. at 1551. All above in USB. (Margolis, IL). USCG COMSTA Kodiak, AK in USB at 0010 with fishing vessel(?) WAYWARD WIND possibly aground (Brookman, AK).
- 4128.1: NRCB, USCGC EAGLE, a beautiful sailing vessel used for training purposes, heard at 1837 to WOO in NJ. Verified with PFC, letter, mini-poster & fact sheet, plus a medallion commemorating OP SAIL 85 & the 50th anniversary of the vessel's building (O'Connor, NH).
- 4143.6: KZR, Miami Marine Salvage, FL, to WYT9190, towboat GODFATHER at 1021. KSA, Barge Rentals, Galliano, LA to FESTIVALE at 1040. KAZ483, Galliano, LA to NORA JEAN at 1057. KGW346, Philadelphia, PA to towboat VOYAGER II (WYT8666) at 1118. KDL, Hollywood Terminals, Inc., Pasadena, TX to WYR3405, towboat SEA SKIMMER at 1218. WEC, Norfolk, VA to WC4701, SUN CRESCENT at 1446 (Margolis, IL).
- 4236.5: EDF, Aranjuez, Spain in CW at 0242 w/DE EDF QSK 4 MHz tape (Ross, ONT).
- 4286: VHP2, COMSTA Canberra, Australia in CW w/VVV tape at 1009 (Kneitel, NY).
- 4298: PPO, Olinda Radio, Brazil, in CW w/call marker at 0418 (Kneitel, NY).
- 4314: LZW2, Varna Radio, Bulgaria in CW at 0132 w/call marker tape (Kneitel, NY).
- 4722: MVU, W. Drayton (Upvaton AB), England w/RAF weather in USB at 0350 (Homer, PA).

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QSO WITH	DATE	TIME	BAND	RST	MODE	QSL
POP' COMM	1/20/84	8:34	20mhz	5/4	SSB	EXPERIEN RECIBI TNE

N.ECESITO INFORMACION SOBRE LAS REVISTAS

This QSL was received here at POP' COMM from Hernan, OA4BRU, in Lima, Peru.

Abbreviations Used For Intercepts

AM	Amplitude Modulation mode
BC	Broadcast
CW	Morse Code mode
EE	English
GG	German
ID	Identifier/ied/ication
LSB	Lower Sideband mode
OM	Male operator
PP	Portuguese
SS	Spanish
tfc	Traffic
USB	Upper Sideband mode
w/	with
wx	Weather report/forecast
YL	Female operator
4F	4-figure coded groups (i.e. 5739)
5F	5-figure coded groups
5L	5-letter coded groups (i.e. IGRXJ)

- 4780.7: 5F CW groups s/off at 0145 (Kneitel, NY).
- 5400: Marker "pips" at irregular intervals, then scrambled USB at 0240 (Williams, IL).
- 5676: NOJ, Kodiak, AK w/YL up to CG aircraft 1707 in USB at 0428 (Ross, ONT). CG Mobile (AL) Air to CG aircraft 2105 in USB at 1935-- was helping a disabled vessel (Goubeaud, TN).
- 6212.4: WCK, St. Louis, MO w/Mississippi River weather & hydrographic data in USB at 1940 (Goubeaud, TN).
- 6218.6: WPE, Tug Communications, Inc., Jacksonville, FL to tug GAUNTLET at 1353. WRI, Jackson, MS to WD9936, tug GILDA SHURDEN at 1422. All USB (Margolis, IL).
- 6221.6: WYT8215, towboat JOHN C. BYRD to WHM, St. Louis at 2100. WB4121, a 101-year-old towboat, VANGUARD, to WBJ, Rose Barge Line, Clayton, MO at 2118. WIU, International Barge Line, Inc., Madeira, OH to WA4587, towboat ELISH WOODS at 2120. All USB. (Margolis, IL).
- 6227: YL/SS w/5F groups in AM at 0805 (Margolis, IL).
- 6337: EDG2, Aranjuez, Spain in CW at 0335 w/DE EDG2 QSK 6 MHz (Ross, ONT).
- 6427.9: VHP, COMSTA, Canberra, Australia w/VVV in CW at 1107 ("Mr.?", MO).
- 6463.4: VIS, Sydney, NSW, Australia in CW w/VVV at 1117 ("Mr.?", MO).
- 6506.4: DRAP, W. German Navy frigate BRAUNSCHWEIG in USB at 2342 to USS KALAMAZOO re helo evacuation of injured crew member (O'Connor, NH).
- 6509: KVJ, NOAA Pacific Marine Center, Seattle, WA to NOAA vessels MILLER FREEMAN (WTDJ), DISCOVERER (WTEA), & MACARTHUR (WTEJ) w/tfc re new computer pgm, crew details, daily reports (Hall, WA) Time?-- Ed.
- 6521.9: WIX, Lakin, WV to ROBERT JEWELL in USB at 1724 ("Mr.?", MO).
- 6753: Canadian Military bases w/VOLMET (wx) BC's. Stations heard include Trenton, Edmonton, Vancouver, & St. Johns (Patton, TN). Time?-- Ed.
- 6962: Canadian vessel MOONDANCER to several un-ID ships w/lengthy transmission re hydrographic data & sea bed dynamics. Possible barmen fishermen off coast of British Columbia. In USB at 1833 (Hall, WA).
- 8241.5: NLMD, USCG vessel to NMN, USCG, Portsmouth, VA at 0016. NLPM, USCGC CHASE to NMN at 0017. NAAO, icebreaker USCGC GLACIER to NMC, USCG San Francisco at 0412. WYS3261, misc. services vessel GERONIMO to NMN at 0636. GNIE, RN frigate APOLLO to Portsmouth at 0756. Sailing vessel BARRY requesting 'phone patch from Barbados Radio at 1311. NRXD, USCGC EVERGREEN to NMA, USCG Miami at 1418. All USB (Margolis, IL).
- 10255: KWS78, US Embassy, Athens, Greece in CW w/QRA marker at 2021 (O'Connor, NH).
- 10327.3: 5F groups in CW sent by high-speed

- machine at 1328. Using "cut" zero. (Kneitel, NY).
- 11176: US mil aircraft w/ID OMNI-52 to Albrook AFB, Panama in USB at 1805 requesting 'phone patch to "Furious." (Homer, PA).
- 11243: USAF/SAC "Skyking" BC by "Moustache" at 0350 in USB (Patton, TN).
- 11246: Aircraft 046 to "Lobo Base" in USB at 1610. Patched via McDill AFB & asking for maintenance upon arrival (Goubeaud, TN).
- 11267: E2W calling OMT for radio check at 0034 in USB. This is a USN freq. (Homer, PA).
- 11282: French military flight #8806 in USB at 2321 to San Francisco Aeradio w/position & flight status report (O'Connor, NH).
- 11345: Martin Air aircraft Bravo Papa at 0311 in USB to Stockholm Aeradio, Sweden (O'Connor, NH).
- 12209: KWL90, US Embassy, Tokyo in CW at 1125 w/QRA & QSX marker (Margolis, IL).
- 12216: WGY909, FEMA in San Francisco to WGY906, FEMA in Denton, TX, also WGY908 in Denver, CO. USB at 1523 (Margolis, IL).
- 12650: OAEI, a Peruvian vessel w/SS tfc about "logistica.: Poor & fading. In CW at 2230 (Hall, WA).
- 12702: G5BE, Gambian allocated callsign in CW at 2333 w/short SS text (Hall, WA).
- 12790: RUK2, Soviet allocated callsign on top of PWZ33, Brazilian Navy station at 0150 (Hall, WA).
- 12906: DJJ, Manila (Bulacan), Philippines in CW w/CQ marker at 0650 (Hall, WA).
- 1300.8: GTK51, Partishead, England to an oil drilling platform in USB at 2005 (Goubeaud, TN).
- 13270: WSY70, NY Radio VOLMET in USB at 2015 (Goubeaud, TN).
- 13427: AFA3, Andrews AFB, to AF-2 at 2225 in USB. Andrews told AF-2 of poor comms on India Oscar Primary. AF-2 requested switch to LSB, also for Andrews to check "345 Lower" as Pri & "14 Upper" as Sec, "63 Upper" as backup. After all of that, Andrews had to shut downb for power switchover (Williams, IL).
- 15015: AFD14, USAF at Ascension Island (South Atlantic) w/patches for MAC aircraft at 1955 (Williams, IL). MAC 59401 to Albrook AFB in USB at 1825 asking for Charleston wx at ETA at 2115 (Homer, PA).
- 16742.6: EDZ6, Aranjuez, Spain in CW at 1920 w/call marker ("Mr.?", MO).
- 17456: FUJ, Noumea Naval Radio, New Caledonia, in CW at 0000 w/FF tfc (Brookman, AK).



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SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

One of the common complaints of rural scanner listeners is that there is nothing to listen to. Once you've plugged in the frequencies of the local fire department and the police or state police, you might become easily bored. Fat chance, code-breath—you've just touched the tip of the iceberg.

Although there isn't as much radio traffic in rural areas as there is in major cities, you'll find enough to keep your listening fun.

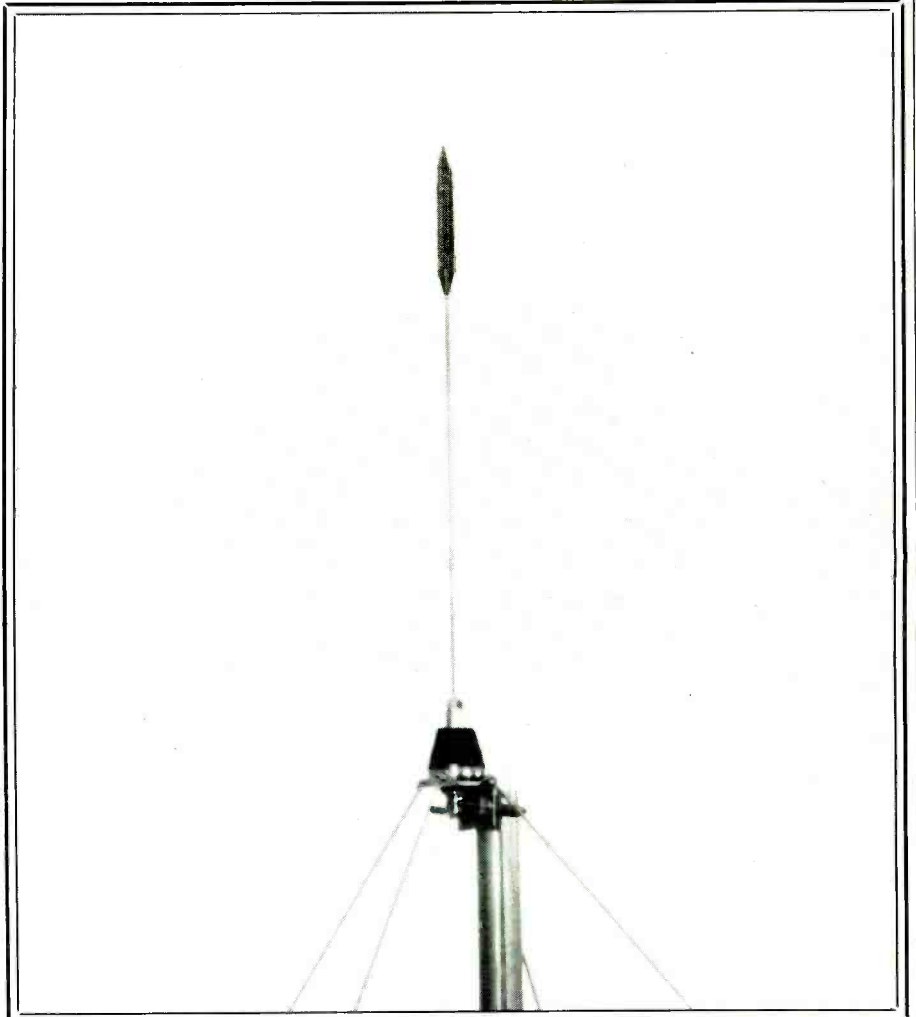
Once you've learned the local channels for police, fire and rescue, you might want to check out the frequencies used in neighboring counties. If a major fire is going on in a neighboring county, it certainly would be of interest. If you're in such a remote area that you don't have a local police department, then you're probably served by county sheriffs or state police. Make sure you know all of their channels. They may have one channel for dispatch, another for record checks, one for car-to-car communications and maybe a surveillance channel. Keep an ear on all the channels if you want to know what's going on. Likewise, the local ambulance may have a channel for ambulance-to-hospital communications in addition to its routine dispatch channel. On the ambulance-to-hospital channel, you'll hear patient reports as the ambulance is rolling into the hospital. In many areas of the nation, 155.340 MHz is used for this purpose.

Perhaps there is a large state institution nearby. States prefer to locate their prisons and mental health facilities in rural areas; they have a lot of land and they get the least amount of resistance from residents in locating the facilities there. If so, radios are most likely used by the facility's guards. Check scanner directory listings for police or local government radio service frequencies that might be in use at such a facility.

During snowstorms and other bad storms, highway maintenance radio channels will come alive as road crews clear highways of snow and debris. In most rural areas, you'll find that state highway crews will use the same frequency within a given county or several surrounding counties. You'll hear what roads are blocked and whether or not you'll be snowed in for a few days.

Forestry conservation radio frequencies also might be active in your area. These frequencies, which might be better classified as an environmental radio service, are used by park rangers, fish and game wardens, environmental authorities, reservoir workers and state park employees.

If logging and forest products are predominant in your area, you should check out frequencies used in the forest products radio service. These frequencies can be



If you live in a rural area, a good all-band base station monitoring antenna, such as this Antenna Specialists MON-38 model, helps pull in signals from farther away.

found on low-band and high-band VHF, as well as UHF.

Farmers are also big users of two-way radio. The larger the farm, the better a reason a farmer has for the use of radio. Farmers can operate in both the special industrial radio service, which is also used in the construction industry, and the business radio service. Many farmers have bought programmable high-band VHF radios and you will probably find them operating on special industrial or business band channels in the 151 MHz band. Other allowable communications in the special industrial radio service include: plowing, soil conditioning, seeding, fertilizing or harvesting for agricultural activities; spraying or dusting of insecticides, herbicides or fungicides; livestock breeding; and the delivery of ice and fuel for heating, lighting and refrigeration.

Farmers cooperatives in many rural towns and villages might be using special industrial or business band frequencies, particularly in the 151 MHz band. The 151 MHz band is popular in rural areas because of the characteristics of VHF high-band channels.

Other frequencies worth monitoring during storms in rural areas include those used by the power company or electric cooperative in the power radio service. You'll hear dispatchers routing equipment and personnel to problem areas, and you might even learn how long it will be until your own power is restored. Because power companies often cover vast areas in rural regions, VHF low-band channels are used most often.

The railroad passes through most rural areas and, in many states, towns sprouted up alongside railroad stops. The railroad is still used to transport goods from our na-

tion's farmers. If you listen in on the various rail channels in the 160 and 161 MHz bands, you'll hear the train coming into town. And if there is ever a derailment, you'll hear that, too. A scanner enthusiast was the only person who heard an engineer's call for help when rail cars fell off a track while crossing a bridge in Iowa last year.

If you live in a rural area with a navigable waterway, such as the Mississippi River, be sure to check out marine radio channels in the 156-157 MHz band. You'll hear barges and some shipping vessels on the river.

If you're so remote that there isn't any direct form of communications with a center of population (such as in Alaska), the special emergency radio service, the same channels used by ambulances and hospitals, can be used for point-to-point communications between the isolated area and a city or village. Where it's not possible to install telephone lines for residents of rural areas, stations in the rural telephone radio service provide service with a method similar to mobile telephones. Users of this service have a phone installed in their home similar to that installed in cars. Their phone calls then go out over the radio to a relay station. Check the VHF high-band mobile telephone channels for these stations.

By searching through frequencies used by Federal government stations, primarily in the 162-174 MHz band, you may stumble across channels used by the Soil Conservation Service, Forest Service, Department of Agriculture, Bureau of Sportfisheries and Wildlife, Bureau of Indian Affairs, Bureau of Land Management and Department of the Interior.

Also, don't rule out the aviation bands. You'll hear civilian airplanes (118-136 MHz) and military aircraft (225-400 MHz) hundreds of miles away, and perhaps some satellites as well.

There's plenty to hear if you live out in the wilderness or in America's heartland. You just have to scratch a bit below the surface and do a little detective work. Use a reputable frequency directory that breaks down frequencies by radio service to help find the channels used in the radio services mentioned above.

Strange, But True

If you monitor the Pittsburgh Fire Department in Pennsylvania and thought you heard Adolf Hitler last year, you did. City officials attempted to track down the person who broadcast ten-second segments of Hitler's rallies over the Fire Department's frequency. A recording of a crowd shouting "Sieg Heil," a Nazi slogan, was heard three times one afternoon.

Clubs

The All Ohio Scanner Club has changed its mailing address. The club, which covers Ohio and the surrounding states of Pennsylvania, West Virginia, Kentucky, Indiana and Michigan, can now be reached at: P.O. Box 2496, Springfield, OH 45501-2496.

The Ohio club has been gaining new

members at a rapid pace not only from their immediate area, but all across the United States and Canada, as well. The club keeps its members up-to-date and informed with news and new product information. It would be worth checking them out.

The Minnesota Radio Hobbyists is a club that was formed a year ago. The club covers public safety, shortwave and longwave utilities, CB, Ham, business band, longwave and shortwave broadcasts as well as AM broadcasts and HF and VHF aviation.

The club's goals are to provide a group for radio hobbyists to learn about radio sys-

tems, to exchange information between members, to help members with antenna installations and to offer tours and other activities.

For more information on Minnesota Radio Hobbyists, write to Daniel McNulty, P.O. Box 18918, Minneapolis, MN 55418.

We'd also like to hear from you here at POP'COMM. We welcome your frequency lists, listening tips, questions, comments and photographs. Write to: Chuck Gysi, N2DUP, Scanner Scene, Popular Communications, 76 North Broadway, Hicksville, NY 11801-2909. **PC**

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LISTENING POST

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

Lotsa news, comments, loggings and stuff in the file this month, so where to begin? You pick something. Japan's relay via Canada? Okay. That was scheduled to start on October first via RCI's 250-kilowatt transmitters at Sackville, New Brunswick. The schedule, which will be in effect by the time you read this, is from 1130 to 1230 UTC on 6120, with the first half hour in English and the last half hour in Japanese. Radio Japan is very anxious to receive reports on these broadcasts and they may be sent to Radio Japan-NHK, Tokyo 150, Japan.

That new Honduran station mentioned in a previous column as Family Radio turns out to be called Sani Radio and it's been putting in pretty good signals during the early evening hours on 4755. Broadcasts are mostly in the Miskito Indian language. The station is operated by the New York-based International Rescue Committee and is funded through the US-AID program. It's located in Puerto Lempira but its mailing address is Apartado 113, La Ceiba, Honduras.

Something you might be on the lookout for during the coming months is somewhat improved reception from the Voice of Vietnam. Inside dope from a POP/COMM reader indicates that a lot of money is being spent on the revamping of Vietnamese shortwave facilities, including those hard-to-hear regional outlets.

KVOH—the coming shortwaver in Rancho Simi, CA operated by High Adventure Ministries in Van Nuys—keeps announcing initial test dates, we keep reporting them, and the dates keep passing with no signals in the air. KVOH has purchased a used 100-kW transmitter from HCJB and that has been shipped to Los Angeles where it will be reassembled and tested. So certainly, KVOH should be on the air by the time you read this. On the other hand, we've said that before! Watch 17775 between 1700 and 2200.

Meantime, High Adventure is seeking \$98,000 so it can purchase the "Morning Star," a ship which H.A.M. would then convert into a floating radio station beaming to Asia.

In the Dominican Republic, Radio Clarin (11700) has been off the air for some months as it undergoes a refurbishing and some antenna improvements, which, when completed, are designed to give the station a better signal into North America. You can probably expect the return of Rudy Espinal to the Clarin airwaves, in addition to former Radio Earth star Jeff White and perhaps a slew of religious programs too.

Radio Yugoslavia has been preparing to put a bigger broadcast punch on the shortwaves for some time now and the last word

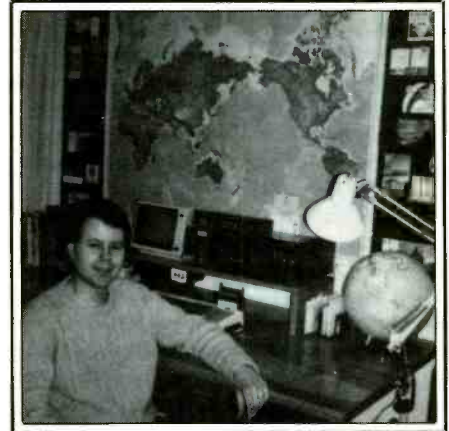
we had was that these 500-kilowatt transmitters were expected to be operational around the first of the year so you might want to scan around for this.

Radio Baghdad has put through some changes on its English language program times and it's now scheduled in English from 0000-0200 (instead of 0300-0500) on 11750.

Most SWLs don't fuss around with the Peruvian stations very much. Most of them are hard to hear. They tend to move around a lot, too. During the fall two Peruvians were putting in exceptionally good signals on 60 meters: Radio Ancash in Huaraz on 4992 and Radio Andina, Huancayo on 4996. And, a strong new Peruvian showed up, Radio Sensacion from Hancabamba on 6792 running to sign-off around 0345.

CLUB NOTES: The Chicago Area DX Club has changed its headquarters address to 237 LaPorte Drive, Addison, IL 60101-3909. If you live in the Chicago area, or anywhere within 150 miles of Chicago, you really ought to get into this group. They are a fun-loving bunch with a monthly bulletin and several picnics, banquets and other activities throughout the year.

The Southern California DXers (SCADS) have released the dates of their coming meetings for the next year and a half. They're set for February 21, June 20, August 15 and October 17, 1987 and February 20, 1988. You can get more information about the group and its meetings by sending a large SASE to Don R. Schmidt, Director, 3809 Rose Ave., Long Beach, CA 90807-4334. And a pox on whoever thought up 9-digit zip-codes!



Guy Atkins of Seattle edits the Cascade Mountain DX Club newsletter SW Monitor.

Listeners in the greater Cincinnati area, including those in southwest Ohio, northern Kentucky and southeast Indiana, are invited to contact Mark Meece, 7917 Third St., West Chester, OH 45069 about forming a regional club for that area.

Guy Atkins of Seattle sends a copy of "SW Monitor," the newsletter of the Cascade Mountain DX Club, and it's a first-rate piece of work! It's a four-page, foldout-style newsletter issued twice monthly unless reports are insufficient. You can subscribe for as many issues as you want at 40 cents each. The address is 3721 27th Place West, #301, Seattle, WA 98199.

Steve Lawrence (not the singer) is trying to locate other SWLs in his area (presumably northeast Iowa, northwest Illinois and

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southwest Wisconsin) so, if that's you, contact Steve at 605 West 17th St., Dubuque, IA 52001.

Into the mailbag now and a note from William Moser of Pittsburgh. Bill bemoans Botswana's QSL policy. You'll be glad to know, if you don't know by now, that Radio Botswana is now verifying correct reception reports. Make them detailed and polite (and a tape recording wouldn't hurt) and send them to Mr. Ted Makgekgenene, Chief Engineer, Radio Botswana, Private bag 0060, Gaborone, Botswana.

Douglass S. Waller of Bay Village, OH wonders about how to identify BBC and VOA relay stations since they aren't announced on the air. Probably the best way is to get ahold of *London Calling*, the BBC monthly program guide, which has a world service schedule with sites indicated. The BBC offers this on a subscription basis but you can get one free copy by asking for it (and asking for a subscription form). Write to Julia Miller-Timmins, *London Calling*, BBC, P.O. Box 76, Bush House, Strand, London WC2B 4PH, England. The VOA's quarterly *Frequency Schedule* lists all VOA sites with times and frequencies and is avail-

able free on request from the Frequency Division, Voice of America, Washington, DC 20457. They don't maintain a mailing list so it's necessary to request a copy each time the broadcast seasons change.

Tom Hartley in Chillicothe, OH is one of a growing number of people who've now received replies from the Voice of Nicaragua. Tom points out that the missive from Managua is a little vague in the QSL wording and wonders if he should count the reply as a QSL. Since everyone is receiving the same form letter and since the letter isn't a "no" to your report we can only assume that the Nicaraguans intend it as a QSL, even though the wording isn't the best.

Benton C. Steck, Jr., of La Porte, IN ran across something calling itself the "Voice of Salvation" at 0300 on 5050 and wonders what it is. The only possibility that comes to mind, Benton, is that you had TIFC in Costa Rica (5055 kHz) carrying some sort of religious program by that name. Anyone have another suggestion?

REMEMBER to forward your loggings—with your last name and state abbreviation after each and some cutting space in between—as well as your comments, questions, shack photos, station photos, copies or duplicate originals of QSLs, news clippings and anything else you think might be of interest to Listening Post readers. We look forward to hearing from you every month! Here's what's on:

SWBC Loggings (All Times Are UTC)

ALBANIA: R. Tirana, EE at 0010 on 7065 (Meece, OH); EE to 0400 s/off & IS on 7300 (Gilbert, CA); 11985 at 1730 w/EE nx (Moser, PA).

ALGERIA: R. Algiers, 17745 in EE w/nx at 2000, r&r mx 2005-2030 (Weiss, IL).

ANTIGUA: Deutsche Welle relay on 6120 w/nx (Moser, PA); 9640 w/EE to NA at 0315 (Neff, OH); 17810 at 2100 w/nx in GG (Loftus, OR).

ARGENTINA: RAE on 9690 at 0110 in EE (Hunt, NC); Ending mailbag pgm at 0444 (Johnston, OH); 0156 w/address & QSL info (Moser, PA); 11710 in EE at 0115 (Gilbert, CA).

ASCENSION ISLAND: BBC Atlantic relay on 7105 at 0400 to Africa (Bush, OH); to Africa at 1550 to 1600 s/off on 17885 & re-start on 17880 at 1600 (Mayo, ME).



The bridge of the "Morning Star" which High Adventure Ministries hopes to turn into a sea-going shortwave station.

AUSTRIA: R. Austria International 9755 at 0445 w/"Shortwave Panorama" (Gilbert, CA); 0430 w/"Report from Austria" (Loftus, OR); 9770 at 0430 in EE (Meece, OH); 0330 in EE (Loftus, OR).

AUSTRALIA: R. Australia, 5995 at 0530 w/Top 40 (Carman, ALB); 6060 w/sports at 1639 (Loftus, OR); 9580 at 1340 (Hunt, NC); 11720 in EE at 0730 (Moser, PA); to 0300 s/off on 15160 in EE, into FF 0300 (Mayo, ME); 15425 at 0130 w/talk (Hunt, NC); 17795 at 0305 (Hunt, NC).

VNG time station at 0649 on 7500 (Carman, ALB). Time station logging info should be submitted to PopComm's Communications Confidential column-- Ed.

BANGLADESH: R. Bangladesh, EE pgm w/ID by YL at 1300 on 15525 (Waller, OH).

BELGIUM: BRT on 15590 at 1315 w/"Belgium Today" (Northrup, MI).

BENIN: ORTB Cotonou on 4870 in FF to 2300 s/off (Waller, OH).

BOTSWANA: R. Botswana on 4820 0350-0400 w/barnyard IS (Moser, PA).

BRAZIL: RadioBras on 11745 at 0148 (Hartley, OH); 0215-0230 in EE w/book reviews (Moser, PA).

R. Nacional Amazonas, 11780 w/QM in PP at 0230 (Carman, ALB); 2330-0000 w/mx, talk, ID's (Neff, OH).

BULGARIA: R. Sofia, 6070 at 0312 in EE (Neff, OH); 9700 at 2030 in EE (Hunt, NC); 15330 at 2327 in EE (Neff, OH).

CAMEROON: R. Yaounde, 4850 at 0505 w/EE greeting & ID (Waller, OH).

R. Goroua, 5010 w/chanting to 2310 s/off (Bush, OH).

CANADA: RCI, 5960 in EE at 0325 (Carman, ALB); 9755 in EE at 0115 (Hartley, OH); 11945 w/EE 2000-2030 (Neff, OH).

CBC Northern Quebec Service, 6195//9625 at 0100 in EE (Linville, ALB).

CHILE: R. (Sistema) Nacional, 15140 nx, ads, ID's at 0030 (Waller, OH); 0131 (Loftus, OR); at 1558 (Moser, PA).

CHINA, PEOPLES REP.: R. Beijing, 9535 at 1136 w/Chinese mx, ID (Loftus, OR); 1205 w/nx (Bush, OH); 9635 at 0226 w/EE (Mayo, ME); 15100//15120//15180//15600 in SS at 0000 (Mayo, ME).

Central People's BC Station, Beijing, 11505 at 0826 in Chinese w/mx & commentary (Loftus, OR).

Fujian Front Station (now known as Voice of The Strait-- Ed.) is standard Chinese w/YL & mx at 1010 on 5770 (Bush, OH).

COSTA RICA: Adventist World Radio's R. Lira at Alajuela w/telet xmsns in EE 2300-0000 on 15400 (Waller, OH).

TIFC on 5055 w/rx pgm in EE at 0345 (Weiss, IL).

CUBA: R. Havana Cuba in EE at 0540 on 5970 (Carman, ALB); 6100 at 0400 in EE (Hobbs, ONT); 11970 in SS at 0230 (Carman, ALB); 9740 at 0118 in EE (Loftus, OR).

CYPRUS: BBC Relay on 11760 at 0718-0723 w/World Service in EE (Moser, PA).

CZECHOSLOVAKIA: R. Prague at 0339 in EE w/NA freq list & address on 5930 (Gilbert, CA); 11840 in EE at 0120 (Hartley, OH); 11705 at 1533 in EE (London, MN).

EAST GERMANY (GDR): R. Berlin International, 0400 on 9560, also 0315 on 9640 (Carman, ALB); SE Asia service in EE at 0552 on 15240 (Linville, ALB).

ECUADOR: HCJB in EE on 6230//9870 at 0220 w/rx pgms (Moser, PA); 0300 on 9870 w/EE nx (Meece, OH); Nx at 0100 on 15155 (Eatock, CA).

EGYPT: R. Cairo, 9475 at 0255 in EE w/mailbox

Abbreviations Used In Listening Post

AA	Arabic
BC	Broadcast/ing
CC	Chinese
EE	English
FF	French
GG	German
ID	Identification
IS	Interval Signal
JJ	Japanese
mx	Music
NA	North America/n
nx	News
OM	Male
pgm	Program
PP	Portuguese
RR	Russian
rx	Religion/iou
SA	South America/n
SS	Spanish
UTC	Coordinated Universal Time (ex-GMT)
v	Frequency varies
w/	With
WX	Weather
YL	Female
//	Parallel frequencies

pgm, request for letters, midnight mx & talk about Alexandria (Gilbert, CA).

ENGLAND: BBC World Service on 9915 at 2230 w/"New Ideas" (Meece, OH); 2300 on 15070 w/"Letter From America" (Eatock, CA); 11775 at 1310 w/"24 Hours" (Neff, OH); 17880 at 1610 w/commentary "Focus on Africa." (London, MN).

FALKLAND ISLANDS: FIBS at 0502-0523 on 3958 w/replay of BBC World Service nx (Moser, PA).

FINLAND: R. Finland International 11945 in EE at 1312 w/nx (Moser, PA); 15400 w/"Airmail" pgm of listeners' letters at 1417 (Johnston, OH); 17785 at 1419 w/discussion to 1424 s/off (Mayo, ME); 22945 at 1308 w/ID, wx, Finnish press review, listener letters (Mayo, ME).

FRANCE: R. France International, 17675 at 1453 w/IS, 1500 s/off in FF (Mayo, ME).

FRENCH GUIANA: RFI relay on 9800 w/EE nx at 0315, into FF 0330 (Meece, OH); EE nx to 0430, into FF (Carman, ALB).

GABON: Africa #1 in FF w/many echo ID's at 0515 on 4830 (Carman, ALB); 9645 w/R. Japan relay at 2303 (Neff, OH); 11940 at 0602 (Hartley, OH); 15200 in FF at 1231 (Moser, PA).

GHANA: GBC at 0600-0615 w/nx in EE on 3366 (Waller, OH); 0600 on 4915 w/nx about Ghana (Moser, PA).

GREECE: V. of Greece on 7395 at 0340 w/nx in EE (Meece, OH); 7430 at 0133 w/EE nx (Mayo, ME); 9420 at 0130 w/nx in EE (Gilbert, CA); 11645 at 1541-1549 in EE (Moser, PA); 15630 w/mx & talk in Greek (Mayo, ME).

GUAM: KTWR in EE w/rx pgm at 1400 on 9870 (Waller, OH).

HAWAII: WWVH time sigs on 10000 at 0311, YL announcer (Meece, OH).

HONDURAS: New, Sani R., HRR1 at Puerto Lempira at 0330-0350 s/off in EE on 4755; heard only in SS since (Waller, OH).

HRVC, La V. Evangelica, 4820 at 0322, tentative logging w/rx pgm (Neff, OH).

HUNGARY: R. Budapest, EE at 0302 w/DX program on 6025//9520//9835//12000 (Moser, PA).

INDIA: AIR, EE at 2100 w/nx on 11620 (Waller, OH).

IRAN: VOIRI in EE at 1140 on 15084, nx 1202, off 1210 (Johnston, OH); EE at 1150 giving address as P.O. Box 3333, Teheran, Announced 19 meters to Far East, 25 meters to S. Asia, 41 meters to Indian subcontinent & 100.7 FM local from 1445-1540 local time (Bush, OH).

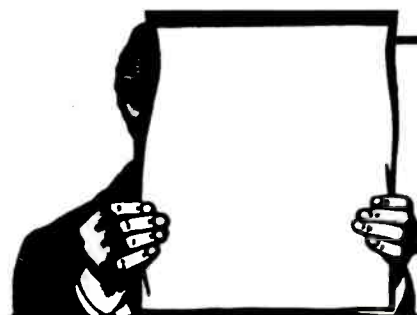
IRAQ: R. Baghdad, 0300 in EE (now 0000-0200-- Ed.) on 9575//11750 (Linville, ALB); 11750 at 0434 (Mayo, ME); in AA from Salah el Deen site on 13700 at 1706, jammed by siren-like transmission. Parallel 13650//15120 around 2145 in EE (Bush, OH); 2145-22 s/off in EE on 15120 (Mayo, ME).

IRELAND: R. Dublin, 6910 at 0100 w/r&t + pop mx, local wx, OM dj & ID as "Radio Dublin" (Hunt, NC).

ISRAEL: Kol Israel, 9435 at 0020 in EE w/"Israel Mosaic" (Gilbert, CA); 9860 at 2130 w/"Spotlight." Announced 9435//12080 but neither heard (Meece, OH).

ITALY: RAI at 0104 w/political commentary on 11800, nx items 0110, mx 0115, EE ends 0119. I'd like to crawl through the airwaves

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& shake their YL announcer awake! (Mayo, ME).

JAPAN: R. Japan, 9645 (via Gabon-- Ed.) at 2300 w/ID, discussion, "Asia Now" (Hunt, NC); 9735//11955 at 0700 w/"Asia Now" (9735 is best) (Loftus, OR); 15195 in EE at 0245 (Hunt, NC); 17825 at 0230 in EE (Mayo, NE).

NSB Radio Tanpa, 9595 at 0730 in JJ (Loftus, OR).

LIBERIA: ELBC, Liberian BC System, nx & ads 0700 on 3255 (Waller, OH).

LITHUANIAN SSR: R. Vilnius, 9750 at 2210 in EE w/mailbag (Meece, OH); 13605 at 2208 w/jazz pgm, into Lithuanian 2230 (Weiss, IL).

LUXEMBOURG: R. Luxembourg, 6090 at 2300 w/nx, wx, American t&r mx (Hunt, NC).

MADAGASCAR: R. Netherlands relay on 9715 at 2110 w/letters pgm in EE (Moser, PA).

MOROCCO: RTM at 1318 w/local mx, lotsa interference on 15335 (Moser, PA).

NEW ZEALAND: R. New Zealand, 11780 at 0400-0430 w/nx & bagpipes (Waller, OH); 0445 w/pop movie themes (Mayo, ME); 15150 at 0130 w/mx (Eatock, CA); 11780 at 0500 w/nx in EE/Maori, wx, mx, ID (London, MN); 0100 w/time pips, still talking about the sinking of Greenpeace's RAINBOW WARRIOR (Mayo, ME).

NETHERLANDS ANTILLES: R. Netherlands relay, 6020 at 1032 w/Pacific & Caribbean service (Bush, OH); 0320 on 6165 in EE (Carman, ALB); 9590, at 0241 w/nx (Moser, PA); 21685 at 1920 in EE, to 1924 s/off (Mayo, ME).

TWR Bonaire, 11815 in EE w/nx & "Unshackled" at 1133-1206 (Neff, OH).

NICARAGUA: V. of Nicaragua, 6015 weak in SS at 1100 (Bush, OH); 0147 in EE (Neff, OH); 0535 in EE (Carman, ALB).

NIGERIA: R. Nigeria, Kaduna 4770 at 0540 in EE w/commentary (Meece, OH); 0600 w/nx from Lagos (Johnston, OH).

N. KOREA: R. Pyongyang, 9750 & 9977 (best) at 1130 in EE, ID 1132 (Waller, OH); 9750 at 1112 w/distortion (Bush, OH).

NORWAY: R. Norway International, 9580 at 0358 w/IS, ID in EE/Norwegian, pgms in Norwegian (Gilbert, CA); 9610 at 0125 testing new 500 kW xmitr to NA, asking for reports, also 11840//15345 (Hunt, NC); 15310 at 1300 w/talk in EE (Hunt, NC); 1414 in EE (Moser, PA).

OMAN: BBC relay at Masirah on 11955 at 0400 w/World Service, weak sigs (Moser, PA).

PAKISTAN: R. Pakistan pn 17659.6 (nominal 17660) at 1600 w/ID & slow speed EE nx (Mayo, ME).

PARAGUAY: R. Nacional in SS at 0030 on 9735, gud w/many ID's (Waller, OH).

POLAND: R. Polonia, heard weakly at 0300 on 7145 (Bush, OH); 7125 at 2230 in EE about E/W relations (Hunt, NC).

PHILIPPINES: FEBC R. International, 15350 at 0800 w/EE ID, rx pgm, s/off at 0900 (Gilbert, CA).

VOA relay on 15425 at 1410 ending nx & into Jazz Hour at 1415; 17820 at 0007 w/nx in Special EE (Mayo, ME).

SINGAPORE: BBC Relay at 1140 in EE on 9740 (Bush, OH); 15280 at 1046 w/mx pgm (Loftus, OR).

SOLOMON ISLANDS: SIBC on 9545 at 0650-0800 w/soccer game between Solomans & Papua New Guinea (Moser, PA); 0713 w/US pops, EE & Pidgin (Loftus, OR).

S. AFRICA (REP. OF): Radio RSA, 6010 w/"Africa Today" pgm (Moser, PA); 11775 at 2120 w/listeners' questions, "Saturday Music RSA" (Hunt, NC); 15240 in GG at 1758 (Bush, OH).

SOUTHWEST AFRICA (NAMIBIA): SWABC, Windhoek at 0300 on 3270/3295, mostly mx with a few brief ID's (Waller, OH).

S. KOREA: R. Korea, 15575 in EE w/nx at 1405, "Seoul Today" to 1433 (un-ID reporter); 15395 in EE at 0658 (Hartley, OH); 9570 at 1450 (Meece, OH).

SPAIN: Spanish Foreign R., 9630 at 0100 in EE (Hobbs, ONT); world nx 0505 (Moser, PA).

SWAZILAND: TWR at 0257 w/EE ID, into an African language on 4760 (Waller, OH).

SWEDEN: R. Sweden International, 9695 w/"Sweden Calling DX'ers" at 2310 (Hunt, NC); 15345 w/SCDX pgm at 1422 (Johnston, OH); 1418 w/interview & "Sunday from Stockholm" (Moser, PA).

SWITZERLAND: Swiss R. International at 0408 on 9725 w/"dateLINE" (Meece, OH); 9885 at 0217 w/nx (Moser, PA); 12035 at 2107 in EE w/nx, sports, into SS 2130 (Neff, OH); 17830 time pips at 1530, ID into "DateLINE," //17570 which was stronger (Mayo, ME).

SYRIA: R. Damascus at 2203 in EE just before s/off on 7455 (Bush, OH); 9950 at 2200 w/nx, ID, mx, off at 2205 (London, MN); 12085 EE to Europe at 2015 (Bush, OH); Nx 2111 (Linville, ALB).

TAHITI: R. Tahiti (tentative) on 15170 w/island mx at 0349 (Linville, ALB); 11825 around 0300, not as gud on 15170. FF to 0315, Tahitian afterwards (Weller, OH).

TAIWAN: V. of Free China, 9680 at 0210 in EE (Carman, ALB); 9685 at 0340 in EE w/"Spotlight" (Meece, OH).

Family R. (WYFR) via Taiwan at 2107 in EE on 15055 w/rx pgm, "Open Forum" & ID (Mayo, ME).

TOGO: RTT, Lome, 5047 at 0529 w/nx, mx, chimes (Moser, PA); 0625 w/nx in FF, into vernaculars 0630 (Waller, OH).

TURKEY: V. of Turkey, 9560 at 2200 in EE (Moser, PA); 0303 in EE (Neff, OH); 15220 tentative at 0430 (Eatock, CA).

UKRAINIAN SSR: R. Kiev, 7160 at 0214 w/trajs in EE (Neff, OH); 7165 at 0317 in EE (Moser, PA); 7175 at 0217 w/mx from the Ukraine. Announced 7175//9640//9800//11790//11875//13605 (Meece, OH).

UNITED ARAB EMIRATES: UAE Radio, Dubai in EE to 0355 s/off on 11940 (wx report said "considerably cooler today with a high of 108" (Waller, OH); 15320//15435 at 1612 w/mailbag, ID, EZ listening mx (London, MN); 9550//15320//17775 gud except 9550 buried under Havana (Mayo, ME).

UNITED STATES: VOA, 5995 in EE w/nx at 0330 (Hobbs, ONT); 9670 at 0440 w/features (Neff, OH); 11680 w/Jazz Hour at 0310 (Carman, ALB); 11860 at 0030 w/Berlin Wall feature (Neff, OH).

WHRI on 7355 w/R. Earth pgm 0330-0400 (Neff, OH); 7400 at 0406 (Meece, OH).

AFRTS on 6030 at 0355 w/ID, various network nxcasts (Neff, OH); 15430 at 1530 w/AP network nx, WWV time check (Hobbs, ONT).

KCBI, 11735 at 1800 w/"Radio Connection" & address for reports (Bush, OH).

WYFR w/VoFC relay on 5985 in Chinese (Carman, ALB); 6065 w/mx, ID, address (Neff, OH); 11805 w/"Open Forum" at 0230 (Carman, ALB); to Europe at 1900 on 21615 (Mayo, ME).

WRNO on 6185 at 0435 w/r&r mx (Neff, OH); 11705 w/pops, at 2230 switched to 9852.5 (Meece, OH); 15420 at 1700 w/nx, 50's r&r (Hobbs, ONT).

WINB in SS at 0130 then commentary on "heavy metal" mx in EE on 15145 (Eatock, CA).

V. of The OAS, 15160 at 0015 in SS w/mx & talk, ID, address in SS/EE, off 0029 (London, MN)

USSR: R. Moscow, 7320 at 0120 in NA service (Meece, OH); 0315 on 9600 (via Havana-- Ed.) (Carman, ALB); 11840 (also via Havana-- Editor) & in EE at 2130 (Carman, ALB); 13665 in EE at 2000 (Carman, ALB); World Service via Chita site on 17860 at 0138 (Mayo, ME).

Vladivostok, 9755 in (presumed) Russian at 0715 (Hartley, OH).

R. Paz y Progreso in (presumed) Russian at 0138 on 11900 (Hartley, OH).

VATICAN: Vatican R., 9645 at 0518 ending in EE, into (presumed) Italian after ID/IS, faded fast (Gilbert, CA).

VENEZUELA: R. Rumbos, 9660 at 1104 w/SS ID, mx (Bush, OH).

VIETNAM: V. of Vietnam, 15010 at 1327 w/open carrier, into EE 1330 (Waller, OH); 1900 s/on in EE w/nx (Mayo, ME).

W. GERMANY (FRG): DW at 0504 w/nx on 6130 (Moser, PA); 6145 at 0122 w/EE nx (Loftus, OR).

ZAMBIA: ZBS, 4910at 0340 w/IS to 0350 (Waller, OH).

Thanks and a deep bow to those who participated this month:

David E. Bush, Sebring, OH; Douglass S. Waller, Bay Village, OH; Frank Eatock, Cupertino, CA; Allen R. Linville, Edmonton, ALB; Mark Meece, West Chester, OH; Tom Hartley, Chillicothe, OH; George R. Neff, Niles, OH; Warren R. Gilbert, Sherman Oaks, CA; Mark A. Northrup, Ann Arbor, MI; Garth Carman, Edmonton, ALB; Doug Johnson, Piqua, OH; Stanley D. Mayo, Yarmouth, ME; K. J. Hobbs, Hamilton, ONT; Billy Hunt, Durham, NC; Michael Loftus, Springfield, OR; William Moser, Pittsburgh, PA; Chris London, Princeton, MN and Vern A. Weiss, Kankakee, IL.

'Til next month, good listening!



PIRATES DEN

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

Here's some background on Irish pirate radio from a man who has been there, "Carl" of Abescon, New Jersey. Carl is from Dublin and he notes there are many stations there operating FM stereo transmitters of up to 50 watts and shortwave outlets on 48 meters running as high as 600 watts. Broadcasts are usually on the air early Sunday mornings.

Carl says the English pirates use anywhere from just a few watts up to 50 or 60 watts and that the laws against illegal broadcasting in England are much stiffer than they are in Ireland where there are a few loopholes. The police, or the "Garda" as they're known, do make raids on pirates occasionally but the bigger stations are able to return to the air in a matter of hours or in a day at the most.

Of the Irish pirates **Radio Dublin** is far and away the longest-running Irish station. It broadcasts on AM with "a few kilowatts" with a sister station, **Dublin 2**, on FM. Both are located in an old house three or four miles from the center of Dublin. The station is also on shortwave (but they've been missing from 6910 of late, I note).

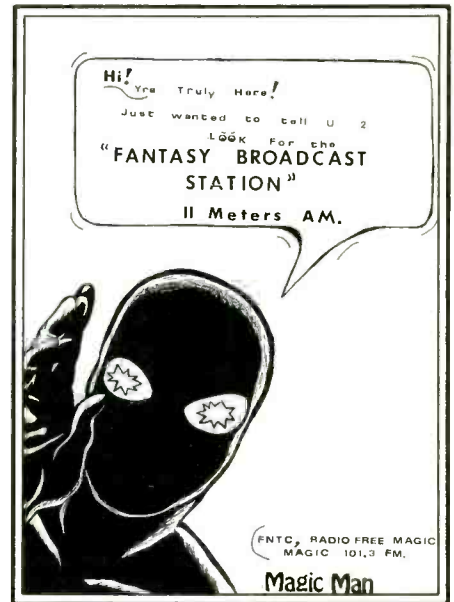
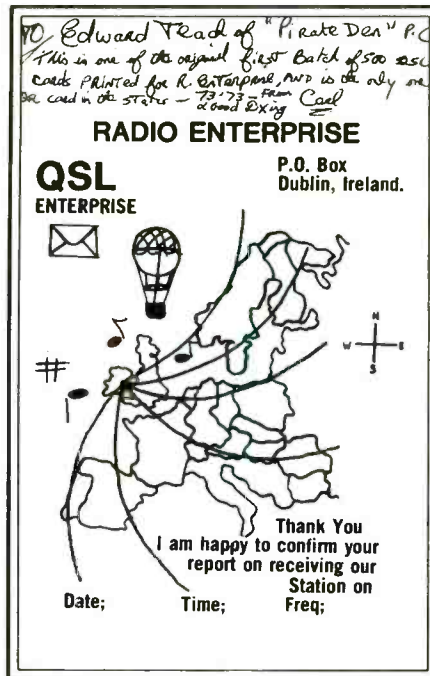
Carl says he ran a station called **Radio Enterprise** from Dublin for a number of years. Radio Enterprise operated with 100 watts on 6317 kHz and received reception reports from all over Western Europe as well as East Germany. No reports were received from the United States, however.

Thanks for the most interesting letter, Carl, and I'm sure all the Pirate's Den readers would like more details when you can provide them.

Speaking of European pirates, William C. Mason II in Forest Knolls, CA writes to say that he used to be a regular listener to **Radio Caroline** back in 1967 when he was stationed in England with the Air Force. Caroline was, according to William, practically the only station the Yanks listened to. The British government ordered Caroline off the air in 1967 and it signed off for good on September 1 of that year.

According to press reports sent in by Dough Rink, a newsman at WDBO in Orlando, FL the Florida Institute of Technology's station WFIT in Melbourne was broken into in early August and equipment valued at some \$10,000 was stolen. The reports note that whoever took the equipment knew what he or she was doing and that it was enough to put together a pirate radio station. Was this robbery, in fact, the genesis for a new pirate station? Anyone in the Florida area noting anything unusual?

Someone sent in some material about the **Fantasy Broadcast Station**, also calling



itself FNTC or Radio Free Magic, which is supposed to appear on 11 meters (the area around 25 MHz). Apparently the station operates on 101.3 MHz FM on a more regular basis. I don't have any information any more specific than this. Let me know if you should run across this one. Is it for real? Where?

KG49 is another station which was supposed to start broadcasting in August. Based on the west coast, KG49 says it was going to use 6250 kHz AM or lower sideband and operate with a 90-watt state-of-the-art transmitter and a half-wave dipole antenna at an elevation of 3,000 feet. Broadcasts were to be on every few weekends and consist of a mixture of rock, comedy and old radio shows. DJs are "240 Gordy" and "Doctor Dipole" who say a mail drop will be announced on the air.

TNFM, the Canadian pirate from Ganges, on Salt Spring Island, British Columbia continues its fairly regular operations. Ken Johnson in Kelowna, BC had them from 0540 to 0630 on 7415. Bruce Jensen in San Leandro, CA noted the station on 7437 from 0440 to an abrupt sign-off at 0508. The programming was mostly rock music and weather reports. Bruce called the station (604-537-4445) and was told the power was 150 watts. Bruce also states that the station was having some technical problems when he heard them.

Radio Mouser International was logged by Phil Bekkala in Laurium, MI from

0154-0208 August 16 on 7490. Alternate slogans were "The Voice of American Free Radio," "7490 Radio Mouser International" and "Radio Mouser Worldwide." Programs were rock music; reports were requested via **POP'COMM**. (That was a bum steer, **POP'COMM** doesn't forward pirate mail.) According to announcements Phil heard, QSL cards are being printed and a mail drop is being arranged. Lara Abshear in Franklin, OH heard the station a day ahead of Phil so Mouser obviously had an active weekend. From various other reports I've seen there still appears to be some doubt as to the exact way this station spells its name so it'll be nice when the QSLs start showing up and we'll know the proper spelling for certain.

Most pirate activity on shortwave is now occurring between 7300 and 7500 kHz during weekend evenings and late afternoons. Among the stations which have been active in this area in recent months are Radio Clandestine, WKUE, Radio Deadman, TNFM, Canadian Club Radio, Radio Mouser, the Voice of Fubar (though the identification of this one is still in doubt), Zeppelin Radio Worldwide, and Radio North Coast International, among others. Tune around enough and you'll eventually pick up one or more of these, to say nothing of the chance of grabbing a new one from time to time.

Be sure to send in whatever pirate information you run across, including your loggings, your QSL news, news clippings, data about stations (attention operators!), copies of QSLs and photos. I'll share them with other Pirate's Den readers and we will all benefit.

See you next month!

PC

INSIDE THE WORLD OF TVRO EARTH STATIONS

User Report

Drake ESR 924i Satellite Receive System

To many readers of *Popular Communications*, the name R.L. Drake Company of Miamisburg, Ohio was known for the many Amateur and communications receivers that the company produced from the middle forties to the early eighties. The Drake Company officially withdrew from most manufacturing and sales of Amateur and communications type gear during 1984 and 1985 and devoted the company's full engineering, sales and manufacturing facilities to the exploding satellite television market. This decision promptly placed the company in the lead of this growing field.

The R. L. Drake Company has undoubtedly produced more total satellite receivers than any manufacturer in this new field. These receivers range from the popular ESR 240, the ESR 324, ESR 524, to the present ESR 924i which we will review in this user's report.

The ESR 924i unit is a fully-integrated system, i.e., the total operating system is contained in one small, well-designed and attractive package measuring 17 inches wide, 14 inches deep, and 3½ inches in height. The cabinet work is attractive and well laid out. All control and programming functions are handled through the use of a handheld infrared control unit which allows the user complete freedom of movement and armchair use and control of satellite selection, transponder selection plus many other functions that the unit is capable of performing. The Drake ESR 924i has accomplished the integration of the total satellite system into one easy-to-use unit.

Features On The ESR 924i

The 924i is a block-type system utilizing the low-noise blocked downconverter unit (LNB) taking the primary 4-GHz frequency to a block of frequencies covering 950 to 1450 MHz. This block of frequencies is carried to the 924i system via a single 75-ohm coax cable from the LNB. This block system allows the use of multiple satellite receivers at various locations in the home. With multiple receivers, the users can select any transponder on their receiver from a single satellite. For example, on Galaxy 1, each receiver location could select any of the 24 transponders on their particular TV set. The features of the ESR 924i are: stereophonic sound, parental lockout, 21-memory programmable antenna positioner, digital LED displays for transponder, satellite and au-



Figure 1: The fully-integrated Drake ESR 924i satellite receive system with full-function infrared handheld control unit.

dio-frequency settings, microprocessor, and 9 preprogrammed priority viewing channels.

The accompanying ESR 924i infrared remote-control unit will control a wide range of functions such as: parental lockout controls, full audio/stereo tuning, bandwidth selection and control, volume control, format selection, skew control, and east/west dish motion controls, plus many more.

Installing The ESR 924i

This is not a high-tech but rather a user report, so we will take you from out of the box to a satellite picture. After the full installation, we did check out most of the important specifications. These all meet or exceed the manufacturer's reported figures and specifications with one exception—the video threshold was slightly lower than I would like to see. However, with a normal size antenna (dish) this is no problem. We intend to look at the picture, not published specifications.

The test antenna was a 1985, 12-foot Paraclype™ mesh unit. This dish has been in constant use and its performance has been proven several times with extensive measurement procedures. In other words, we know what is coming from the antenna and will be able to give a good user evaluation of the receiver system that we are working with.

In any quality home satellite system, we would start with the dish installation, mount the selected antenna actuator system, install

(bury) the multiple lines coming from the satellite dish to the receiver location, etc. In this case, the dish installation was in and the multiple lines were already installed. So, all of the time-consuming and hard labor part of the installation was in place and as mentioned previously, the dish was aimed and properly tracking the Clarke Belt. At this point, I installed a Houston Tracker™ actuator that is compatible with the Drake ESR 924i system. The 924i is designed to accommodate any antenna actuator unit with pulse type sensors. These would be Hall-effect type, reed switch, micro-switch types or other actuator systems that produce an approximate 5-volt TTL level that can be sensed or read by the Drake ESR 924i system in order to control the dish actuator. One word of caution on the actuator or dish mover: Actuators with potentiometer (resistive) sensors are not compatible with this receiver system.

After the mechanical installation and hook up of the actuator system, the Drake LNB (low noise block downconverter) was placed on a new Polarotor 1™ by Chapparal Communications. The Polarotor hook-up is standard on these proven feed systems, and the 924i carries the standard Polarotor 1™ voltages and reads the Polarotor system perfectly.

The complete 924i system was installed at the receiver site and final hookup to the coax, Polarotor 1™ actuator and Sony monitor was accomplished in short order.



Figure 2: Paracclipse™ 3.8 m (12-foot) mesh antenna used in this user report.

The 924i was not plugged in to the AC outlet during this hookup. Most receiver systems carry LNA or, in this case, LNB voltage down the coax to the LNB at all times regardless of the setting of the power switch on the receiver. This is done to insure frequency stability of the LNB, a type of temperature stability, so the LNB is powered up at all times when the system is plugged into the 110 volt AC line.

System Calibration and Set Up

Our first set up procedure was to program in to the systems memory, the most important dish actuator settings, the upper and lower limits setting to prevent the dish from being driven beyond the mechanical limits of the actuator or, on the down side, into the ground which could cause damage.

The ERS 924i has a very good limit system that provides a second memory back-up stop limit in both up and down positions. This made me feel more secure without an actual mechanical limit stop.

Electrical limit stops on antenna actuators have been a favorite subject of mine after a programming glitch caused my dish to wind up and into the air. Luckily the configuration of the mount prevented the dish from falling completely over to the opposite side. On another occasion, a lightning storm caused one of my dishes to drive itself into the ground. The Drake's system should provide an additional safety factor from the above happening to the ESR 924i system.

The actual satellite programming settings were then placed into the system by following the simple directions in the owner's manual. All of this programming was accomplished with the handheld infrared control unit.

The ESR 924i has the various satellite polarity formats permanently programmed into the system so that when you go to the satellite and program that satellite into the

system, it detects the polarity format automatically for each satellite—a good feature. The system can hold a total of 21 satellite locations as well as all audio format and polarization information.

Our next programming chore was to set into the system's memory, the correct audio mode. Most satellite transponders use mono mode at 6.8 subcarrier. The ESR 924i automatically sets this into the system. I took a quick spin to several of my favorite transponders that carry their audio on stereo discrete and a couple that use stereo matrix format. These were entered and checked several times. All areas in the audio provided very good quality audio regardless of format selected.

The entire audio subcarrier section of any transponder can be tuned with the remote control and can be placed in memory if needed; or a simple up/down will tune the entire range from 5.0 to 8.5 MHz.

The Picture and Audio

After twenty minutes of programming the ESR 924i, we directed our attention to the 24-inch Sony Pro-Feel™ studio monitor. The picture quality was excellent.

Further tuning on the satellite produced a set of color test bars which confirmed the high quality of the video picture. A good video monitor is capable of full capture of the entire video signal produced via satellite transmission and produce better overall quality than the average TV set.

The next video test was the use of a Sony 19-inch television set. The TV also produced a high-quality video picture.

A quick and simple hookup to a medium-priced stereo system produced extremely high-quality sound in all stereo modes, matrix and discrete. The 924i system should be considered by any one who loves good music and stereo programming as the satellites are carrying many types of music and audio

services on the subcarriers of most transponders. Refer to any of the satellite TV guides or STV magazines for full audio subcarrier audio services.

Descrambling Compatibility

I was able to do a M/A-Com Videocipher 2 test on the Drake ESR 924i as my descrambler unit is a Videocipher 2 which uses composite video interface. The unit performed very well and quickly locked into the descramble mode and produced the usual high-quality picture. Your satellite dealer can furnish you with the proper information as to the compatible M/A-Com VC-2 unit to use with the Drake ESR 924i and the hookup procedure.

Conclusion

The Drake ESR 924i is a quality fully-integrated satellite TV receiving system with many features which are too numerous to include in this user's report. The owner's manual is very well done, clear, and leads you to the setup of the system with one exception: the installation section of the dish actuator was not as clear as it should be. This information consisted of a loose single sheet of additional illustration data for the ESR 924i. I would think that Drake would mention and recommend first a Drake actuator and then cover some of the popular brands on the market along with names and mode numbers. These should be fully compatible with their system. I would recommend the use of a spike and surge protector device on the 110 volt AC line to the unit. These small devices can sometimes save a receiver from damage from transient voltages coming down the power line. The 924i is Ku-band compatible as it carries a video invert and a channel offset switch on rear of unit. In summary, the 924i is a very good system that should give years of pleasant satellite TV viewing. **PC**



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NEW AND EXCITING TELEPHONE TECHNOLOGY

Telephone Dialers

One of the best innovations to come along in the telephone world has been the automatic dialer. The first dialers were large desk-top devices that worked by inserting a punch card with holes punched out to correspond to the number to be dialed. This was a large, slow, clumsy device by today's standards. Consider that twenty years ago, punched cards were the way to go in computers. Semiconductor memory and Touch-Tone® phones were either still in the lab or very esoteric. These early dialers were rented from the phone company at exorbitant rates, but no hot-shot executive wanted to be without one. Just the thing to sit beside his brand new speaker phone.

The first semiconductor memory dialer to make any impact was the one designed and built by American Telecommunication Corp (ATC). They sold most of them to the Bell system who rented them out with the Bell logo on them. The first ATC dialer could store and dial up to 16 numbers. A pulse and a Touch-Tone® were available. These were snapped up by sales departments, stockbrokers and people who had trouble dialing, either because of poor eyesight or poor mobility. The ATC dialer later came out as a 32-number dialer and models were released with a monitor speaker so dialing could be "on hook" and the phone picked up after the call had gone through.

After the ATC dialers, other companies came out with similar dialers. Western Electric had one of their own and Panasonic had a couple of models. All the companies coming out with new PBXs and Key Systems after divestiture added dialers as a matter of course. Sometimes it was called "speed dialing" but it's all the same thing—a few memory chips storing telephone numbers.

The dialer of choice for the telephone freak has always been the Demon Dialer. This is literally a black box that is connected in series with the phone line. When placed by the phone protector (the point at which the phone line comes into the building), every phone on the line can use the Demon Dialer. The dialer is accessed by flashing the hookswitch on a rotary phone or hitting the # sign (octothorpe) on a Touch-Tone® phone. Some of the Demon Dialers can hold up to 176 numbers. By hitting * and 1 it will redial the last number called. By hitting * and 2 it will redial the last number dialed or, if it is busy, it will hang up and dial again. This automatic redialing is called "Demon Dialing." Just the thing for calling radio stations to win a prize or getting through



Zoom Electronics' Demon Dialer.



The Zelex 910, a 400-number alphanumeric dialer.



Colonial Data Technologies' AP2002, a 200-number alphanumeric dialer and two-line phone.

to the movie house to find out when the feature is playing.

The Demon Dialer people, Zoom Electronics, also make a dialer called the Hot-shot. This dialer will only call one number that is programmed by inserting pegs into the PC board. This is an excellent device for hotlines for such services as airport car rentals. It can also be used to dial a discount long distance carrier if you do not yet have equal access. (Yes, it will wait for the tone and automatically enter the access code.) Another good use for the Hotshot is for emergency phones by pools and in elevators. It can be programmed to dial 911 after the handset is lifted. For this use, a simple phone with no



dial, preferably red in color, and the Hot-shot is all that is needed.

The new thing in dialers is "alphanumeric units." These are dialers with keyboards. To find and dial a number, type in a name, such as CHARLIE and the number is displayed and dialed. The biggest of these devices is the Zelex 910 dialer made by Zelex Corp. It will hold over 400 numbers and with the addition of more memory chips will hold up to 1,000 numbers. This is obviously too many for the average home or small business. The device is designed for "crew calling." Airlines, utilities, railroads, and police departments use these to call out personnel. Often the police department needs to call out extra officers and rather than flick through a Rolodex, it is faster to let a device like the Zelex 910 do the work. Stockbrokers, lawyers and sales departments also find the Zelex useful.

For home and small business use there is also an alphanumeric dialer, the Colonial Data Technologies AP2002. This is a 200-number dialer combined with a two-line telephone and speaker phone. The speaker phone uses the Motorola Speaker phone IC and has very good quality. This phone has a "Line in Use" indicating LED and this means that it will not hang up when used with a 24-volt PBX or on some rural phone lines, where the line voltage can be below the 30 volts, the indicators need to see to turn off the LED and hang up the phone.

For someone on the go who makes lots of calls from public phones, Colonial Data Technologies also has a small handheld alphanumeric dialer that is acoustically coupled to the handset transmitter. This is the AD-2 and it also holds 200 numbers. It will also double as a calculator, alarm clock and timer. Not bad for a device the size of a pocket calculator. **PC**

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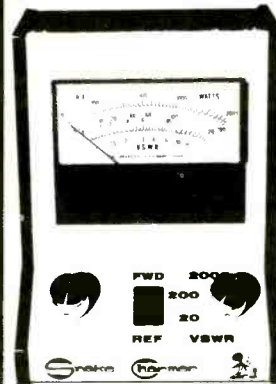
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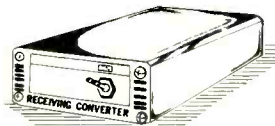
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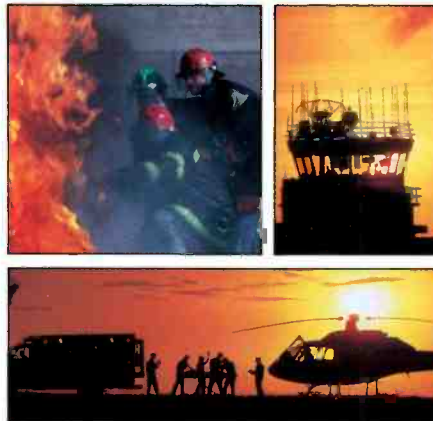


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THE high performance receiver is here from the leader in communications technology—the Kenwood R-5000. This all-band, all mode receiver has superior interference reduction circuits, and has been designed with the highest performance standards in mind. Listen to foreign music, news, and commentary. Tune in local police, fire, aircraft, weather, and other public service channels with the VC-20 VHF converter. All this excitement and more is yours with a Kenwood R-5000 receiver!

- Covers 100 kHz-30 MHz in 30 bands, with additional coverage from 108-174 MHz (with VC-20 converter installed).
- Superior dynamic range. Exclusive Kenwood DynaMix™ system ensures an honest 102 dB dynamic range. (14 MHz, 500 Hz bandwidth, 50 kHz spacing.)



- 100 memory channels. Store mode, frequency, antenna selection.
- Voice synthesizer option.
- Computer control option.
- Extremely stable, dual digital VFOs. Accurate to ± 10 ppm over a wide temperature range.
- Kenwood's superb interference reduction. Optional filters further enhance selectivity. Dual noise blankers built-in.
- Direct keyboard frequency entry.

- Versatile programmable scanning, with center-stop tuning.
- Choice of either high or low impedance antenna connections.
- Kenwood non-volatile operating system. Lithium battery backs up memories; all functions remain intact even after lithium cell expires.
- Power supply built-in. Optional DCK-2 allows DC operation.
- Selectable AGC, RF attenuator, record and headphone jacks, dual 24-hour clocks with timer, muting terminals, 120/220/240 VAC operation.

Optional Accessories:

- VC-20 VHF converter for 108-174 MHz operation
- YK-88A-1 6 kHz AM filter
- YK-88S 2.4 kHz SSB filter
- YK-88SN 1.8 kHz narrow SSB filter
- YK-88C 500 Hz CW filter
- YK-88CN 270 Hz narrow filter
- DCK-2 DC power cable
- HS-5, HS-6, HS-7 headphones
- MB-430 mobile bracket
- SP-430 external speaker
- VS-1 voice synthesizer
- IF-232C/IC-10 computer interface.

More information on the R-5000 and R-2000 is available from Authorized Kenwood Dealers.

R-2000

- 150 kHz-30 MHz in 30 bands
- All modes • Digital VFOs tune in 50 Hz, 500 Hz, or 5 kHz steps
- 10 memory channels
- Programmable scanning
- Dual 24-hour digital clocks, with timer
- 3 built-in IF filters (CW filter optional)
- All mode squelch, noise blanker, RF attenuator, AGC switch, S meter
- 100/120/220/240 VAC operation
- Record, phone jacks
- Muting terminals
- VC-10 optional VHF converter (118-174 MHz)



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