

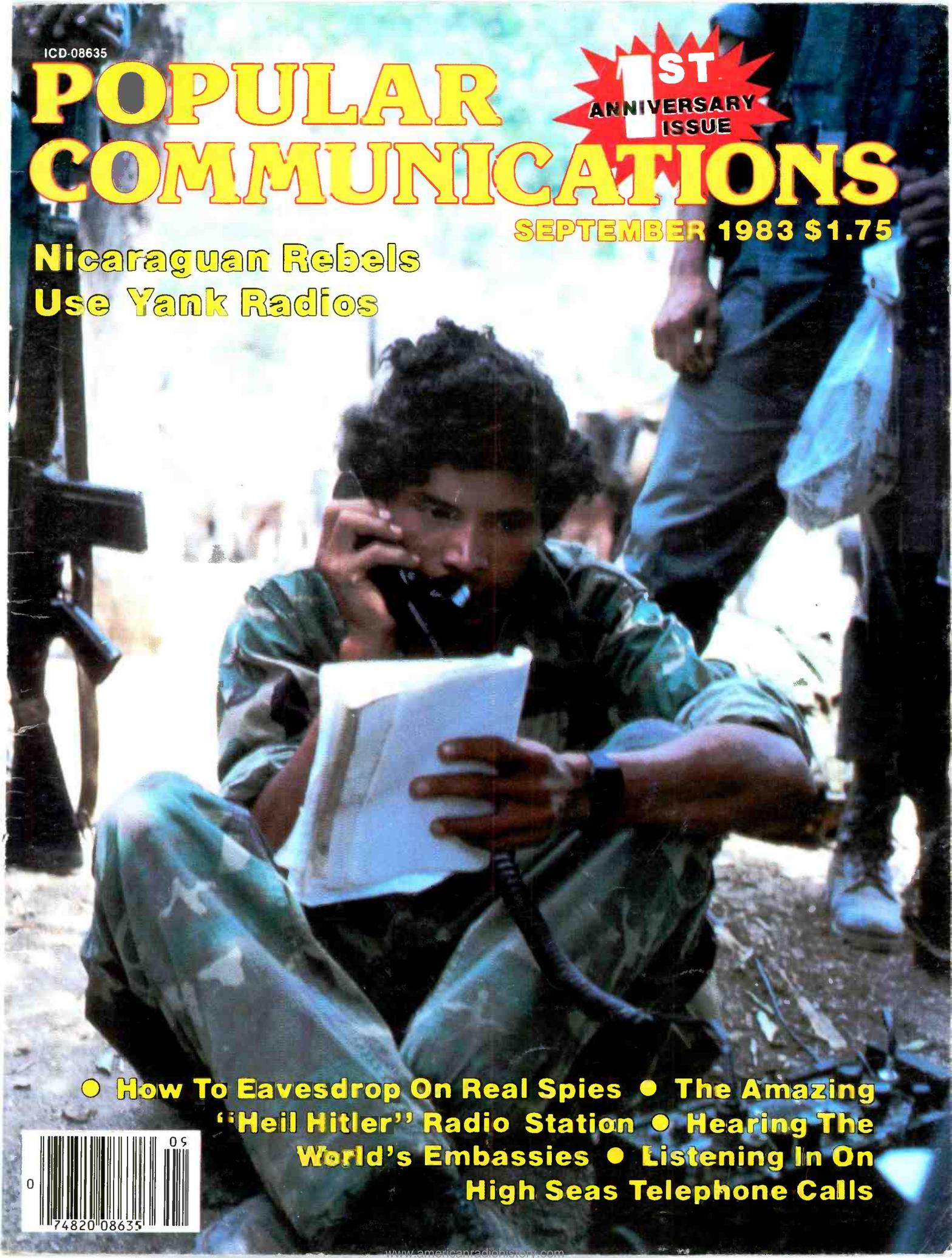
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# POPULAR COMMUNICATIONS

**1<sup>ST</sup>  
ANNIVERSARY  
ISSUE**

SEPTEMBER 1983 \$1.75

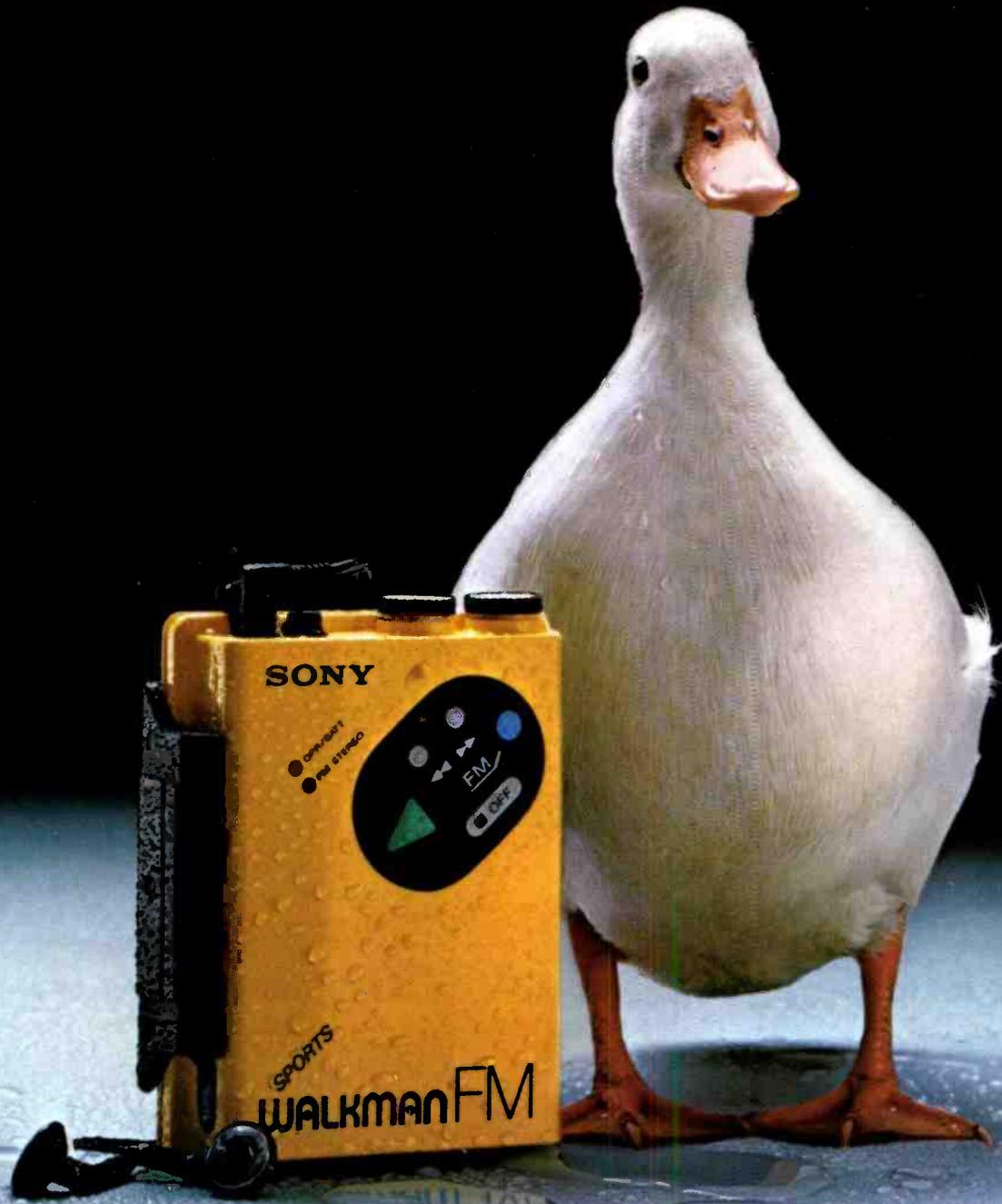
**Nicaraguan Rebels  
Use Yank Radios**



● **How To Eavesdrop On Real Spies** ● **The Amazing  
"Heil Hitler" Radio Station** ● **Hearing The  
World's Embassies** ● **Listening In On  
High Seas Telephone Calls**



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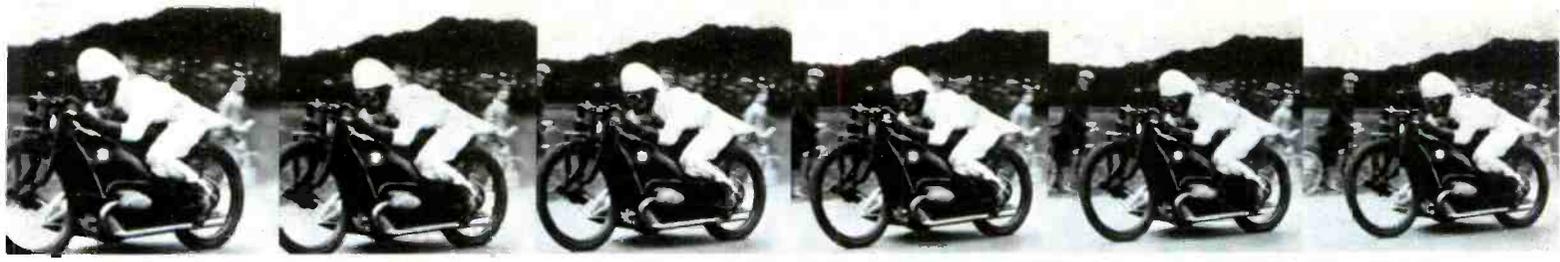
Besides being water-resistant, the Sports Walkman sports other advantages. Such as Sony's ultra-mini MDR earphones that fit comfortably in each ear. And a disc-drive system that protects the Sports Walkman's cassette player from wow and flutter, even when it's jostled.

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CIRCLE 44 ON READER SERVICE CARD



# INTRODUCING THE LATEST HEIR TO 59 YEARS OF GERMAN ENGINEERING.

While the fine lines and sculpted features of most sport bikes spring from the drawing tables of stylists, those of the BMW R65LS had a different birthplace.

The drafting tables of German engineers.

As a result, they are the recipients of the same pragmatic consideration and evolutionary refinement as the legendary engine that powers this 650cc machine.

The shapely sport fairing, for example, provides much more than cosmetic appeal. It helps reduce front-wheel lift by over 30%.

The LS handlebars are low, compact, and help to provide a seating position that "is sporting in a way that Japanese bikes, even with red paint, have not discovered" (Cycle World). (High bars are also available.)

The bike's slender tail,

artful as it too appears, was created in one of the most aesthetically indifferent environments known to man: the massive BMW wind tunnel in Ismaning, Germany.

Even the wheels of the LS possess a beauty that goes far deeper than their gleaming enamel. Each rim section is made of a highly rigid aluminum alloy; each hub and spoke assembly is separately cast from a far more elastic aluminum alloy to provide added flexibility. And then everything—hubs, spokes and rims—is cast as

a single unit. Culminating in an exceedingly resilient "composite" wheel that not only helps

increase handling prowess but decreases unsprung weight.

In the end, the BMW R65LS is one sports bike whose graceful lines do not serve as camouflage for weak engineering. For it is a machine as adept at slicing through the wind and rounding corners as it is at turning heads.

Its price? A lofty \$3,790\*.

But as a motorcycle columnist of *AutoWeek* observed, "a bad motorcycle is worthless; a good motorcycle is worth whatever it costs... By that standard, the R65LS is a bargain."

\*Manufacturer's suggested retail price. \$3,790. Actual price will depend upon dealer. Price excludes state and local taxes, dealer prep, destination and handling charges. © 1982 BMW of North America, Inc. The BMW trademark and logo are registered trademarks of Bayerische Motoren Werke, A.G.

## THE LEGENDARY MOTORCYCLES OF GERMANY.



CIRCLE 151 ON READER SERVICE CARD





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SEPTEMBER 1983

VOL. 2, NO.1



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# BEAMING IN

BY TOM KNEITEL, K2AES

## AN EDITORIAL

### Club Update

**O**f all of the mail received here, one of the more popular and volatile topics concerns DX or SWL clubs. Readers ask for recommendations, or if *this* or *that* club is good or bad or is a ripoff, or if such-and-such club covers some specific area of interest. Readers want to know if we've ever heard of certain clubs, or how to contact a particular club.

POP 'COMM isn't affiliated with any clubs (although I personally belong to several), nor is the magazine a clearing house for any of the many SWL/DX clubs in operation. I do, however, vigorously support the concept of these clubs and I'm always ready to point out to readers those clubs which I believe are especially worthwhile or outstanding within their respective coverage areas. This has not been without its problems.

Last October, I ran a listing of clubs that I thought were tops and, as a result, I found that I received lots of mail asking or even demanding that certain clubs be either added to or removed from my roster! A few issues back I ran an inquiry in the magazine's Mailbag column that asked about clubs; I figured I'd cop out by simply suggesting that those interested in finding out about the various clubs write to The Association of North American Radio Clubs (ANARC) for their current listing of affiliated organizations. Again I received a swamp of mail. This time, the gist of the letters was that I failed to take into account that there are some excellent groups that don't belong to ANARC. On the other hand, some readers felt a couple of the groups affiliated with ANARC were less spectacular than others or maybe were in a state of decline.

All right, so I couldn't give a generalized reply to that letter and get away with it; I'm still getting letters about all of this. Since I like to get mail, I'm going to again stick my neck out and offer a very subjective listing of specific clubs which I feel seem to be especially good—or are displaying a potential for greatness. Astute readers will note that these groups don't conform 100% to those I suggested last October, since the quality of any club is subject to change for the better or for worse, based upon its orientation, membership, and leadership.

Putting together such a listing isn't easy at all since there are many things to be considered. Obviously, saying that certain groups are especially good could give you the impression that any group not on the list is not especially good or, in other words, a clunker. Well, let's face it, some groups are clunkers even though they may have been tops at some point in the past. Other groups are duds and have been so from way back.

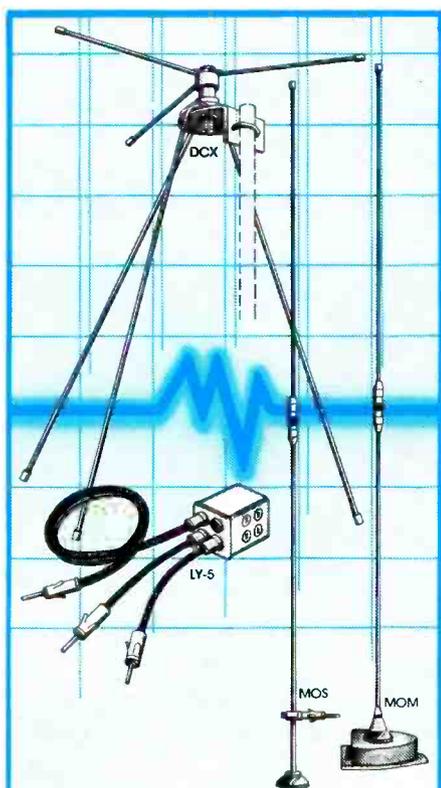
On the other hand, this listing doesn't even attempt to include any of the groups headquartered outside of the U.S.A., even though several are excellent. Perhaps in the future those will be covered separately, but I had to draw the line somewhere for now. Nor have I attempted to list any "average" quality groups, that is to say, those which are dutifully providing solid and adequate (but not outstanding) service. Maybe this is a disservice to those groups; perhaps they'll make it into future listings.

Other organizations specifically excluded from consideration are any of the (usually) excellent "private" or "closed" membership groups which don't have open membership rolls. Membership is purposely kept small and limited, and one can become a member only by invitation after having succeeded in achieving certain exotic accomplishments. These groups are generally composed of "insiders" of one sort or another, and while many persons facetiously call them "snob" groups because of their ultra-exclusivity, those who belong to them find that the organizations are invaluable for their interests. Private or closed membership groups would include both *Numero Uno* and *Fine Tuning* and also the scanner/"utility" monitoring group called simply *The Shortwave League*. There are probably about a dozen such closed-membership groups covering various specialties, even pirate radio! Some of the various groups operate practically undercover in what is essentially an attempt to remain private; some wish to remain inconspicuous to the point where they resent having their group's name or address published. A couple of issues ago, POP 'COMM (not realizing the group's passion for anonymity) mentioned one such group by name and they became more than slightly bent out of shape about it. Since closed-membership groups wish to carefully select their members, there seemed to be no point including them here, regardless of their excellence.

And, lastly, of course I did not and could not consider any of the many groups whose existence has remained outside of my knowledge, regardless of how spectacular they might be. In other words, if your favorite club isn't listed here, stay cool about it.

Now, here is what I *did* consider. I took into account the usefulness of the group's publication or newsletter, the comments received from present and former members, the group's image and reputation, their present or potential clout within their respective fields, and their public relations efforts on behalf of their own organization and the hobby. I've also used my own opinions,

(Continued on page 74)



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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.

### Nuts To Us

I recently purchased a copy of *Popular Communications* for the first time. I found several of the articles both interesting and enjoyable. That was until I reached your departmental section "Free Radio Focus." I am disappointed that a publication . . . would . . . publish articles which exacerbate this type of clandestine activity. The next time I see your publication on bookstore shelves that's where I intend to leave it.

Barry R. Bridge, WB7OWK  
Murray, UT

While not the pinnacle of our coverage goals, pirate radio has made for interesting (and legal) listening since the earliest days of radio and has been covered in both the general media and, from time to time, in other electronics publications. By concealing its existence we will not make it vanish just as by mentioning it we will not cause it to blossom any more than it has already done. Furthermore, we also cover stations which have been forced to shut down. The purpose of any magazine is to please its readers. Inasmuch as you have not been one of our readers and apparently do not expect to become one, your comments become moot as to being of any real value to us in determining the continuing interest in this coverage. Thus far, most of the readers who have written to comment upon the topic have been of a positive nature. —Editor

### Cool Reception

Here's one I'll bet you don't remember. I've got a QSL from a station with the call sign 3YFG. It was located aboard a sailing vessel which crossed the Atlantic in 1958 and was monitored while operating on 14234 kHz, although it wasn't actually a ham station. Curiously, one of the signatures on the QSL appears to be yours! Do I win my bet? Need more clues?

Mark Sapperstein  
Asbury Park, NJ

Sorry, Mark, you don't have to offer any additional clues and you don't win the bet. Sometimes the FCC grants special permission for U.S. hams to contact non-ham ship stations, providing the government which licensed the ship has in turn granted permission for operation on ham frequencies. When I was with United Artists Corp., I arranged with the Norwegian government to authorize our Viking longboat (made for the film *The Vikings*) to use its station (3YFG) to communicate with hams during its trip to the United States. The FCC said okay but because of weather considerations it wasn't

possible to plan the exact date of the sailing until almost the last minute (it was an open vessel). There wasn't enough time to contact ham publications with a sailing date and the only possible way of spreading the word would have been over the ARRL's HQ station, WIAW. Unfortunately, the ARRL felt the trip smacked of being too commercial and flatly refused to use WIAW to publicize the sailing. As a result, only a relatively few hams worked (or even knew about) 3YFG, and even fewer SWLs heard it.

I was in charge of the project and was one of the signers of the QSL card. Your QSL is a rare one, only a few dozen were actually issued; we ended up tossing hundreds of unissued QSLs into the round file. Ten years later, when Thor Heyerdahl's rafts (the ill-fated Ra-1 and the successful Ra-2) sailed across the Atlantic, the Norwegian government granted him a ham license (LI2B) and therefore avoided problems of being considered too "commercial." Other commercial films which had ham radio tie-ins included *The Bedford Incident*, *Kon Tiki*, and *If All The Guys In The World*. All of these had more success with receiving publicity than poor old 3YFG! —Editor

### Earth Shaking Signals?

There was a short news item in the newspaper telling of some of the methods used for earthquake prediction. One thing mentioned was "monitoring radio signals," although they never said which radio signals. Could you find out what they meant? I want to listen.

Harry Kolhage  
San Jose, CA

The whole concept is fairly experimental at this point, but there do seem to be signals generated by the quake itself. In late July of 1976, for 3 to 5 days before the Tangshan (China) quake, unusual radio interference was experienced within 155 miles of Tangshan. On March 31, 1980, unusually high electromagnetic noise was recorded during a 30 minute period before a Magnitude 7 quake in Tokyo. The Tokyo incident had signals covering about 155 miles from the epicenter and they appeared to come from a depth of 300 miles. The emissions were detected between 10 and 1500 Hz and also at 81 kHz. No generally accepted physical mechanism for producing these signals has been found, although several similar cases are also on record. Check out *Nature Magazine* (301:377, 1983) for an interesting report ("Electromagnetic Emissions before Earthquakes," by Chi-Yu King) on this strange and thus far unexplained phenomenon. —Editor

### EW's Increasing Importance

POP'COMM's frequent coverage of EW (electronic warfare) is always worthy of attention. Exactly how much money has been

spent on EW to date, and what are the projects that are currently being funded—to the best of your information.

Charlie Strongfeather  
Glasgow, MT

Air Force programs include the Airborne Self-Protection Jammer (ASPJ), High Speed Anti-Radiation Missile (HARM), Precision Location Strike System (PLSS), and jam Secure Voice, data, and Identification Friend/Foe (IFF) projects. The Navy has their Anti-Submarine Warfare (ASW) programs. The Army's programs include Precision Locating Reporting System (PLRS), and the PLRS/Joint Tactical Information System (JTDIS), as well as Joint Interoperability of Tactical Command and Control Systems (JINTACCS), Ground Mobile Forces Satellite Communications, Single Channel Ground and Airborne VHF System (SINGARD-V), the Joint Tactical Fusion Program (JTFF), plus Joint Tactical Communications (TRI-TAC). In 1980 we spent a billion dollars on EW; the following year almost a billion and a half dollars; last year almost two billion; and this year about two and a half billion dollars. These expenditures are expected to continue to increase faster than the rate at which the overall military budget increases. This data comes from *The Armed Forces Communications and Electronics Association*, and that's about as good as you can get when it comes to such information. —Editor

### Miffed At Moscow

I enjoyed Gerry Dexter's story entitled "Great Shortwave Mysteries" (May issue) and his information on the Soviet over-the-horizon radar known as the "Woodpecker." Frequently this irresponsible signal pops up right in the 20 meter ham band and seeks to destroy communications (as it does wherever it appears). The last time it jammed by QSO I answered in kind. I turned my beam towards Siberia and gave the "Woodpecker" a taste of its own medicine. In fact, I sent 1,000 watts worth of CW pulses back to it, with each pulse keyed as closely as possible to that of the "Woodpecker." My assumption was that if the "Woodpecker" operates by receiving its own pulses back then my signals would give it something to think about. Rather than think about it they moved it to another frequency. A minute after I began transmitting, the "Woodpecker" had flown away!

(please don't run my name)  
Henderson, KY

On the other hand, if they had actually stopped to think about it, they might have thought it was an ICBM on the way over to Moscow! Probably a good thing that they've come up against clowns like you in the past. Why not buy yourself an AEA "Moscow Muffler" which will effectively filter out this annoying signal? We'll all sleep a lot better if you do. —Editor

## Let Kilohertz Put You In The Driver's Seat

I have an RTTY reader which I've found a great new adjunct to my DX'ing. As suggested in the unit's instruction manual, I've been running it from connections made to the speaker of my communications receiver. I thought I'd improvise a bit by modifying this arrangement since I'd like to run the RTTY reader without actually listening to the sound of the RTTY coming through my set's loudspeaker. What I did was to try to run the RTTY reader from the "recorder" output of the receiver since this output would permit me to turn down the volume control to the loudspeaker when copying RTTY. Problem is that the RTTY reader doesn't work from the "recorder" output. Inasmuch as this is putting out whatever is coming through the loudspeaker, why doesn't this work? My receiver is a Yaesu FRG-7700.

Bill Barton  
Boise, ID

*The amount of audio needed to drive an RTTY reader versus the amount of audio drive available at the "recorder" output of most communications receivers is simply too great. It's not the fault of either piece of equipment being lacking in any way, it's that RTTY readers aren't designed to run from "recorder" outputs and, on the flip side, the "recorder" output is set for feeding into a tape recorder and not an RTTY reader. — Editor*

## Skip Scanning

I've taken POP'COMM's advice and started searching out new frequencies on the VHF low band (30 to 50 MHz), especially concentrating on those frequencies mentioned in the November issue as being set aside for U.S. Government communications. Thought you'd be interested to know that during the mornings I've been copying a loud signal on 32.18 MHz, which appears to be a telephone operator placing mobile calls in Kingston, Jamaica. Isn't it unusual that this station is using a frequency reserved for the U.S. Government?

John Balsam, KPA3JK  
Media, PA

*Those frequencies reserved for federal stations relate only to communications within the United States and at locations outside of our borders where our military forces are stationed. Other nations aren't under any restrictions concerning the use of those frequencies for their own purposes, and when the skip rolls in you're likely to hear business and industrial stations from overseas operating there. Interestingly, some of our own military operators don't seem to be aware of this fact. Several times I've noted a military operator on 41.10 MHz (White Sands Missile Range Recovery Net) attempting to kick a Spanish speaking skip station off that frequency by attempting to explain to him that he's "on the wrong frequency."*

*Some interesting low band frequencies to monitor when the skip is in include: 30.05,*

*32.05, 32.82, 34.00, 34.42, 34.50, 40.31, 41.03, 41.14 MHz. Frequency 32.05 MHz often produces a ship with the tactical ID of "Snow White" working other stations using the ID's "674" and "711" as they take innumerable bearings and heading surveys. — Editor.*

## Echoes Of The Shah

There is a frequency of 414.775 MHz, which was assigned to a private individual who was heading up armed Iranian guards in New York City when the Shah of Iran was alive. The Shah is now dead, yet this frequency is still active in the New York City area. It appears to be scrambled with a DVP system. My question is, how does a private security army get itself assigned to a channel reserved for U.S. Government use? Also, on 414.75 MHz, there is a station using DVP scrambling that can be heard throughout Western Massachusetts. Any ideas as to what it might be?

M. W. Y.  
Pittsfield, MA

*I don't really have any answers to either question, M.W., but perhaps one of our readers might wish to offer some thoughts. Anybody wanting to give it a guess can write to M.W. in care of this column. Being that the transmissions on 414.775 MHz are scrambled, there is no way of telling from just listening that the present operations there are in any way connected with those who were using the frequency while guarding the Shah and his family. For whatever it's worth, there are persons working on a method of permitting descrambling of some of the more exotic scrambling systems — going on the premise that anything that can be scrambled can be descrambled. — Editor*

## Amongst The Missing

In your useful and revealing enumeration of Uncle Sam's communications electronics (February issue), you didn't include one called the RS-25 Communications Intelligence Circuit. Wonder if you know about it and could pass along some information on the RS-25.

Jim La Rosa  
Tulsa, OK

*The RS-25 was developed by a private California company at a cost of about \$100-million. It had been designed on a special "cost is no object" basis for the late Shah of Iran in order to permit his intelligence agents to monitor the conversations of his own civilian and military officials. It can secretly monitor and record more than 6,000 telephone conversations simultaneously. The RS-25 has been considered a highly classified device and some say that it was amongst the information diverted to several foreign governments (including the Soviets) by former CIA official Edwin P. Wilson — although at his recent trial (first of several scheduled relating to his activities) the RS-25 was not mentioned. Chances of seeing one on the surplus market are slim. — Editor*

## Locating Pluto

In respect to your November editorial on listening for extra-terrestrial intelligence via an FM stereo receiver, I came across a story in the Salt Lake City Tribune (29 December 1982) that tells of an organization of ham operators called Delta Vee. This group encourages people to build their own SETI (Search for Extra Terrestrial Intelligence) projects and NASA has been encouraging and helping Delta Vee to get its message across. A representative of Delta Vee was quoted as saying, "Everybody has their own idea of what frequency to be on, and really nobody has any idea."

Well, it seems that you were right about hams having the special ability to sort out and identify all of the beeps and screeches in the cosmos. Maybe the 100 MHz "music hole" you described is safe from further research after all. It's nice to have an independent outside confirmation of our abilities. I'm getting ready to fire up my astro-receiver-computer super-whizbang outfit so maybe I can eavesdrop on an intergalactic cordless phone conversation from Pluto. Please advise on how best to orient my antenna towards Pluto.

And thanks for the excellent publication. POP'COMM is now the only electronics related monthly I receive.

Jon Van Allen, WB7OWL  
West Jordan, UT

*I was able to aim my antenna at Pluto by placing it in the general direction of Disneyland. You can't miss him — he's the one with the long drooping ears. And thanks for the kind words about POP'COMM, Jon — glad you like us. In turn, I must say that I've always liked your radiation belts. — Editor*

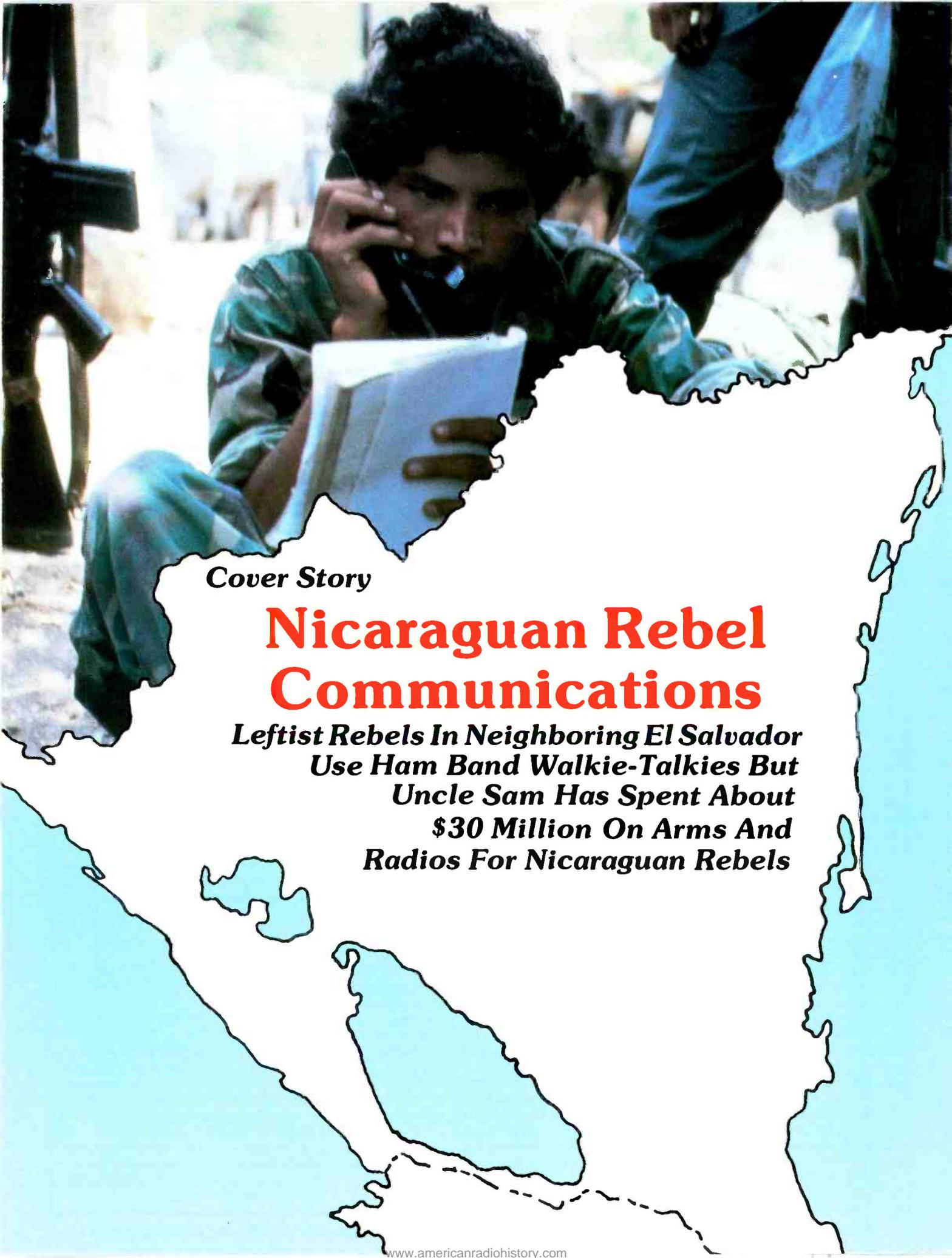
## Adding An Antenna

How can I add an external antenna to a small transistor receiver?

Maurice Levesque  
Ste. Agathe, Quebec

*This shouldn't prove very difficult, providing you can locate the right point to make the connection. Probably the easiest way of doing this consists of running a 20 or 30 foot length of wire to the ungrounded terminal of the antenna tuning capacitor or the antenna tuning coil through a 10 pfd. capacitor. To locate the proper connecting terminal, first find the lead that goes from the existing antenna in the receiver to one section of the tuning capacitor. Then be sure this is not a common "ground" by inspecting the leads that come from it and tracing their paths.*

*Due to the miniaturized construction used in these receivers, it isn't always easy to trace these leads. If that's the case in your receiver, you can try connecting your antenna through the 10 pfd. capacitor to both leads of both sections of the tuning capacitor, leaving it permanently connected to the one that gives you the loudest signal without detuning the receiver. — Editor*



*Cover Story*

# **Nicaraguan Rebel Communications**

***Leftist Rebels In Neighboring El Salvador  
Use Ham Band Walkie-Talkies But  
Uncle Sam Has Spent About  
\$30 Million On Arms And  
Radios For Nicaraguan Rebels***

BY TOM KNEITEL, K2AES

What a difference a few hundred miles can make. In El Salvador, Marxist rebels attempting to overthrow the unpopular Salvadorian government have been able to obtain a modest supply of smuggled-in military weapons, but their uniforms are strictly from the rag-tag school of design. In lieu of military communications gear, the rebels have pressed into service an array of non-military transceivers consisting primarily of 2-meter band walkie-talkies designed for the Amateur Radio Service. The ham radio equipment, in fact, was a clever innovation and serves them well—being less bulky and easier to operate than the type of equipment which they might have been able to obtain from their Russian and Cuban mentors by way of Nicaragua. Nearby Nicaragua has been one of the undercover supply routes which the Salvadorian rebels rely upon.

Nicaragua, which doesn't even share a common border with El Salvador, has its own problems and also its own breed of rebels. There's no doubt that Nicaragua also has an unpopular government. The rebels, however, are armed with Belgian-made FAL automatic rifles and American M60 machine guns. While the rebels uniforms aren't from Gucci, they are a far cry from the rebels outfits in El Salvador. In Nicaragua the rebels are outfitted in clean, new, and well fitting U.S. Army *cammys*. Their communications equipment was never intended for operation on a ham band; it's an assortment of American tactical military equipment primarily consisting of manpack sets with AN/PRC nomenclatures mostly operating with SSB on frequencies below 30 MHz and with FM between 30 and 80 MHz. Our government has spent tens of millions of dollars to outfit, supply, and train the Nicaraguan rebels.

Overtly, the American motives for showing this splendor upon the Nicaraguan rebels has been to stem the flow of materials moving through Nicaragua on the way to the leftist guerrillas in El Salvador. While it seems that this is certainly *part* of their mission, it has become rather apparent that the primary mission is to overthrow the leftist Sandinista government of Nicaragua. The American CIA has shelled out many millions of dollars in this quest, although recent controversies surrounding the pros and cons of the covert mission have endangered the continued smooth flow of dollars, training advisors, and supplies from the United States. As the fighting becomes more a full-blown civil war and less of an attempt to stop supplies from getting through to Salvadorian rebels, Congress has become somewhat cautious about the possible future course of the role of our government in such matters.

The Nicaraguan rebels call themselves the *contras* and their operations are under the direction of the Nicaraguan Democratic Force (FDN). The FDN has about 4,500 troops, and they are supported and supplemented by about 2,000 fierce guerrillas from within the ranks of the Moskito Indians. The revolutionary Sandinista government forces are armed with Russian 82-mm mortars and other weapons. Their communications equipment is strictly of Eastern European design and obtained via Cuban and other Eastern-bloc sources.

Nicaraguan rebel leaders are popularly known under their military nicknames such as Commander Coral, Commander Krill, and Commander Suicide. Commander Suicide was named when he was a sergeant in the so-called Rattlesnake Battalion of the government forces under the earlier regime of Nicaraguan dictator, Anastasio Somoza. Somoza's forces battled the Sandinista rebels until mid-1979, when his feared regime was overthrown by the leftist Sandinistas.

Several monitors have reported hearing what are believed to be communications relating to rebel operations in Nicaragua. It must be assumed that there are communications links between the United States and these rebel forces in addition to the communications between different rebel patrols. Rebel forces have been concentrated in the northern portion of Nicaragua, mostly along the border with Honduras (another Central American nation which has known many border clashes with various forces centered in Nicaragua). One of the problems noted with those who have attempted to monitor the communications of the *contras* is that, even though they are in Spanish, they are coded.

Our cover photo this month was taken by *Newsweek* photojournalist James LeMoyné during a visit to the jungles of Nicaragua at the invitation of FDN leaders. LeMoyné's photo shows Commander Krill in contact with Commander Suicide; both are located in the Nicaraguan combat zone.

With increasing evidence of growing Cuban participation in the Sandinista struggle to fend off the counterrevolutionary *contra* forces, and equally increased determination to remove the Sandinista government from power, it certainly appears that—with or without American overt or covert support—monitors will have an extended period of time in which to try to monitor the very active Nicaraguan communications scene. A reader in Honduras (who does not wish to be identified) reports that 45.44 MHz has been a popular *contra* frequency; transmissions monitored include some using a voice scrambler.

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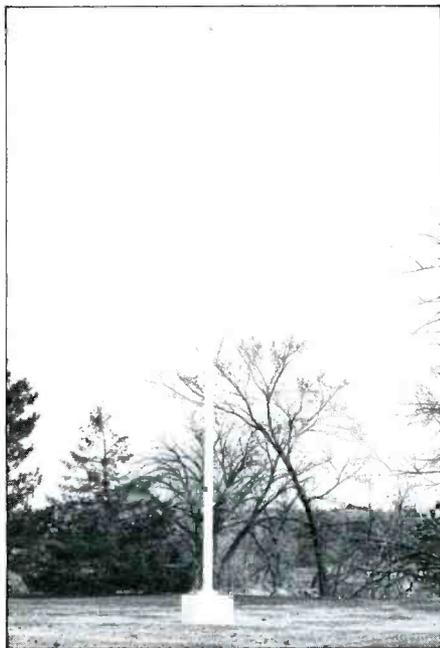
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Just to show you how easily a spy station might be hidden, look at this nice 40 foot flagpole or reasonable facsimile. In actuality, it's a very cleverly designed antenna made by Sabre Communications Corporation (117 Main St., Sioux City, IA 51102). This antenna will handle 2 KW (PEP) between 3.5 and 6 MHz; 8 KW (PEP) between 6 and 30 MHz. It takes three men only 30 minutes to erect this antenna, and it can just as easily be taken down and relocated. It has many military and tactical applications.

As shown in last October's issue of POP'COMM, this steel shuttered building located at a European military installation appears to be a "numbers" station. Photo was taken by a listener who tracked it down with a portable receiver.



**I**t was a gray looking Thursday morning that fateful day in 1957. A cold wind was blowing down from the north which seemed certain to add more snow to the thick white covering already on the ground at Malmstrom Air Force Base in Montana.

Not far from the Air Force Base, a 22-year-old airman sat alone in his house trailer. Warm and cozy, and fortified with a cup of strong coffee, he turned on his Hallicrafters communications receiver and set it to a certain frequency. Nervously he checked his wristwatch and sorted through some papers and books set out before him.

At exactly 0705 local time, the receiver's speaker came to life and he adjusted the bandspread knob to bring in the station with more clarity. Within seconds he picked up a pencil and began writing quickly. He was carefully jotting down the complete contents of the transmission.

Airman Second Class Robert Glenn

Thompson was not an "ordinary" short-wave monitor looking for DX. He sought no QSL cards. He was a Soviet spy and the message he was taking down so carefully consisted of secret and coded instructions sent to him from Moscow.

Was he the only person to hear that transmission on that chilly winter's day? Possibly, but that coded message, like many dozens of similar ones transmitted each and every day, could well have been received by any shortwave listener. The difference was, of course, that the transmission was able to be converted into a meaningful message by Thompson. Anybody else who happened to tune across the frequency would not have been able to make any sense out of it.

### **Done By Numbers**

Because secret instructions are easily and often sent out in a series of four or five digit code groupings, most listeners have come to

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# How To Eavesdrop On Real Spies

## **Tricks And Techniques Used For Espionage Communications – Tried And Proven!**

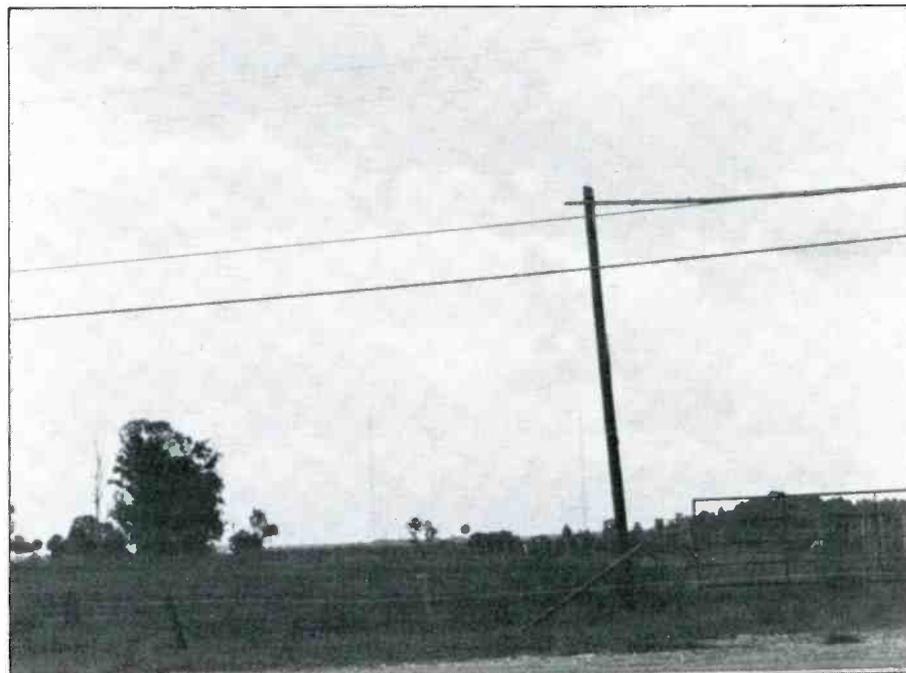
BY DON JENSEN

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*In the background of this photo taken in Kissimmee, Florida about ten years ago are two transmitting towers. The DXer who took this photograph claims that they belong to a station transmitting numbers.*



know them as coming from so-called "numbers stations." Such transmissions have been around for several decades now and seem to have become popularly known after the beginning of the Cold War. Fact is that spy transmissions have had a long and inglorious past and can be traced back to World War I! The history books show that in 1915 the Imperial German government sent Morse signals by spark gap transmitter to other agents in North Africa, instructing them to cause trouble amongst the Berber tribes.

Easily heard by today's listeners, modern espionage broadcasts are usually in voice (in various languages) and are beamed both to and from Communist bloc nations as well as to and from Third World nations. They provide a tantalizing glimpse into the shadowy and eerie world of the cloak and the dagger. It's better than James Bond because it's really happening and not being acted to entertain an audience. In fact, the smaller the audience these broadcasts attract, the happier everyone is!

### Who Was Thompson?

Robert Glenn Thompson's career as a spy seemed to begin in 1956 when, as a young intelligence clerk at Berlin's Tempelhof Airport, he decided that he was annoyed with his commanding officer's nitpicking and complaints. He attempted to defect to the Communists but was rejected by Soviet Intelligence. Later, the Soviets had second thoughts about using Thompson and, threatened with exposure to defect, he eventually became an espionage agent. He took the occasion of a five day furlough to quietly slip behind the Iron Curtain to attend a spy school located on the shores of the Black Sea. There he was given a crash course in

the Russian language, some elementary cryptology, and instructions on the operation of certain communications equipment. He was sent back to his Air Force duties and was told by the Soviets that they would contact him when his services were required.

Eventually he was reassigned by the Air Force to the Strategic Air Command base in Montana. The Soviets were delighted. They gave him \$1,000 and told him to purchase a camera and a shortwave receiver. He was also given a code book and a listing of radio transmission schedules and frequencies. He was told to listen for his own special call sign consisting of the names of two Russian rivers, "Amur ja Lena." He had already been given instructions as to how to use his code book to decipher the "numbers" messages. The only problem was that after he returned to the United States, even though he had copied some of his coded instructions, he developed cold feet and apparently never furnished his benefactors with any additional information.

By 1964, the FBI had caught up with Thompson. He was arrested while running a fuel oil distributorship on Long Island. In 1965 he went to trial in Brooklyn Federal Court and was sentenced to 30 years imprisonment for "13 overt acts of espionage" while he was stationed in Germany.

### The Numbers Technique

From persons such as Thompson and Soviet defectors like Reino Hayhanen, U.S. counterintelligence experts learned valuable information on the numbers type broadcasts, many of which had been heard by federal radio monitors.

Radio hobbyists had also been monitoring the curious transmissions and had been as-

sembling their own unofficial lists of numbers station frequencies, schedules, identifications, transmission contents, etc. This data produced information to the effect that frequencies between 3 and 8 MHz were in especially heavy use, with certain transmitters showing up on the same frequencies on a regular basis night after night, while others appeared only occasionally on offbeat frequencies. One study of 100 transmissions showed that most broadcasts took place between 2300 and 0500 GMT.

Reports from monitors showed that transmissions were noted in Russian, Czech, Polish, German, Spanish, Chinese, English, and other languages, including a gibberish which some have described as an artificial language. One listener, fluent in Eastern European languages, heard a Czech-speaking female announcer add a final "greetings to our friends at the CIA." This strange comment seemed to indicate that those doing the transmitting were well aware that the broadcasts were being analyzed by our governmental agencies.

American shortwave monitors have shown great interest in the Spanish language numbers stations since these have been plentiful on the air for the past 20 years.

*Time* magazine once noted that some of the Spanish "numbers" transmissions "probably originated no farther south than 'Little Havana' in southwestern Miami." And it seems that some of the early operations belonged to anti-Castro exile organizations.

There is some evidence that Cuba itself is responsible for "numbers" broadcasts, particularly those involving sets of five digit numbers.

SWL research also seems to show that powerful transmitters within the U.S. are beaming such signals, not only in Spanish but sometimes in English and German as well. This has led some to conclude that some agency of the federal government is involved. Especially strong signals have been heard in Florida, the Pacific northwest, Ohio, and around the Nation's capital.

Other numbers transmissions, in languages other than Spanish, and particularly those in German, seem to have an origination in central Europe. Whether those transmissions are "ours" or "theirs" is not so clear.

It has been nearly 20 years since we have had the type of clearcut proof that the Thompson case provided informing that Soviets contact agents in this way. In those years, technology has improved greatly, and there is something almost quaintly old-fashioned in the notion that somewhere, secret agents are feverishly copying down long strings of plain text numbers heard on their shortwave set.

Still, sometimes it is the simple approach that is the most economical, foolproof, and easiest to disguise. The question of which "numbers" stations are really spy transmissions remains unanswered.

Authoritative sources have also pointed out that at least some of the mysterious

Federal agents escort Robert Glenn Thompson during his 1965 arraignment on espionage charges. It was charged he received his orders by shortwave. (United Press International photo)





MOVIMIENTO DE RECUPERACION REVOLUCIONARIA	
A	ABCDEFGHIJKLMN OPQRSTUVWXYZ ZYXWVUTSRQPONMLKJIHGFEDCBA
B	ABCDEFGHIJKLMN OPQRSTUVWXYZ YXWVUTSRQPONMLKJIHGFEDCBAZ
C	ABCDEFGHIJKLMN OPQRSTUVWXYZ XWVUTSRQPONMLKJIHGFEDCBAZY
D	ABCDEFGHIJKLMN OPQRSTUVWXYZ WVUTSRQPONMLKJIHGFEDCBAZYX
E	ABCDEFGHIJKLMN OPQRSTUVWXYZ VUTSRQPONMLKJIHGFEDCBAZYXW
F	ABCDEFGHIJKLMN OPQRSTUVWXYZ UTSRQPONMLKJIHGFEDCBAZYXWV
G	ABCDEFGHIJKLMN OPQRSTUVWXYZ TSROPONMLKJIHGFEDCBAZYXWVU
H	ABCDEFGHIJKLMN OPQRSTUVWXYZ SRQPONMLKJIHGFEDCBAZYXWVUT
I	ABCDEFGHIJKLMN OPQRSTUVWXYZ RQPONMLKJIHGFEDCBAZYXWVUTS
J	ABCDEFGHIJKLMN OPQRSTUVWXYZ QPONMLKJIHGFEDCBAZYXXVUTSR
K	ABCDEFGHIJKLMN OPQRSTUVWXYZ PONMLKJIHGFEDCBAZYXWVUTSRQ
L	ABCDEFGHIJKLMN OPQRSTUVWXYZ ONMLKJIHGFEDCBAZYXWVUTSRQP
M	ABCDEFGHIJKLMN OPQRSTUVWXYZ NMLKJIHGFEDCBAZYXWVUTSRQPO

This rather simple code was used in the 1960's by an anti-Castro group. The announcement "Codigo Be" at the start of a radio transmission meant that the message was to be sent in "Code B." Not a difficult code to crack but it served their purposes and suited those who worked with it. A station using a similar code has been recently noted on 8925 KHz after 0440 GMT. (MRR code card courtesy of Tom Kneitel)

cast, a special indicator, often a three or five digit number, tells the spy which page in his gamma booklet to use; other coded introductory information may pinpoint specific agents or groups of agents who are to copy the message which follows.

### The Medium Is The Message

Thompson disclosed how he was instructed to decipher his own instructions from Moscow. For example, if the seventh group in the message was 27406 and the seventh group on the proper page of his gamma pad was 27410, he would subtract the one number from the other and end up with the number "4". The same method would be used with all of the number groups received.

Other techniques, instead of subtraction, call for modular addition, in which the sums exceeding 9 are not "carried over" into the next column.

Thompson arranged his key phrase in the shape of a "T" and numbered the letters starting at the bottom of the shaft, then across from left to right. As shown in the example, "4" would stand for "H." If the number had been "14," it would mean "B." Each set of five numerals would give a single letter of the message. This system required that messages be carefully worded since Thompson was expected to work within the framework of an alphabet containing only 16 dif-

ferent letters, although common letters such as a, i, and u could be assigned any of several code numbers. Nevertheless, by creating an alphabet without the letter o would seem to have given the Russians more work than they really needed when they set about creating a message.

### A Class Act

Actual use of cipher pads and key phrases apparently varies a great deal depending on the status of the agent and the degree of security required. Lesser, unsophisticated, and lower echelon agents such as Thompson were not really expected to work with very complicated systems. Russian defector Lt. Col. Reino Hayhanen, and KGB master spy Rudolf Abel, used far more complex techniques. These involved gammas further complicated by an intricate matrix of numbers and letters. After Rudolf Abel was nabbed by the FBI in 1957, he was swapped for U-2 pilot Francis Gary Powers who had been shot down while spying on the Soviets for the CIA.

As you can see, trying to crack a gamma code is hardly worth your time and effort. Since each cipher is used only once and then destroyed, they are essentially one-time codes and are virtually "fracture proof." One team of expert government analysts tried for years without success to crack

39892 09897 07361 35736 38309	69801 56628 37254 61467 52308
33571 01448 63458 24848 30238	08098 14542 31851 07595 77970
27135 40220 47079 71707 80533	01536 97986 88209 71480 42063
49941 56035 48846 15111 59324	57188 83556 96509 08657 46861
10051 21816 63253 86240 99495	75643 56639 05326 97662 54705
40048 55040 17710 60896 94366	58493 69423 44744 07023 50651
11512 18996 91403 40539 50135	43896 70213 66610 65808 03001
74168 69956 53870 02897 18192	06724 13542 87558 11061 71468
20349 15133 12850 56853 47799	16904 59833 10280 50670 51183
20883 94649 78587 63065 94545	92600 10425 35051 98370 31584
51802 14552 07608 38392 22224	99718 57838 08540 62986 40799
20348 29842 76282 49048 51771	95196 30638 03983 76992 72652
98905 46438 78295 72769 07178	77170 45854 58100 40649 42651
53669 53304 13152 17691 54117	35868 60370 62207 91750 93298
08658 97627 93221 37250 66427	66368 08297 37727 99832 89892
52053 66220 87679 61332 81960	83742 23755 03930 43151 10297
54208 37131 32366 77519 57374	95762 25255 38703 20509 40454
06587 04827 18084 80286 29274	23049 07180 95128 34875 81629
54419 64469 20538 15087 89185	72724 98390 98735 09156 04417
52776 73748 01537 27259 51549	038 23888 63783 92325 29209 10390 038

Typescript copy, originally appearing in the book entitled The Code Breakers, closely resembles the original of onetime or "gamma" pad found on Communist spies captured in Japan in 1961. In use, one side is employed for enciphering (coding), the other for deciphering (decoding).

### Here Are A Few Recently Monitored Numbers Stations

English: 3210 kHz 0215 GMT	German: 11545 kHz 0150 GMT
English: 9370 kHz 0300 GMT	Russian: 4575 kHz 1135 GMT
English: 14727 kHz 2205 GMT	Spanish: 3090 kHz 0530 GMT
German: 4730 kHz 0510 GMT	Spanish: 4040 kHz 0200 GMT
German: 4770 kHz 0515 GMT	Spanish: 4670 kHz 0200 GMT
German: 7405 kHz 0600 GMT	Spanish: 5810 kHz 0200 GMT
German: 7532 kHz 0430 GMT	Spanish: 11533 kHz 1430 GMT
German: 9266 kHz 0100 GMT	Spanish: 19917 kHz 1515 GMT
German: 9626 kHz 0100 GMT	Spanish: 20895 kHz 1700 GMT
German: 9972 kHz 0200 GMT	

**Note:** This is a small random sampling of numbers stations. In any 24-hour period you can probably hear more than a dozen such stations. Spanish stations may vary  $\pm 10$  kHz in frequency. Russian language transmissions also noted at various times on 6430, 8888, 13120, and 14775 kHz.

a page of 207 five digit numbers.

The numbers stations have even given some degree of indigestion to the multi-million dollar computers at the headquarters of our official codebreaking agency, the National Security Agency, at Ft. George Meade, MD, although certainly at least some of the codes have been broken after all of the years of experience and information accumulated. That has in no way taken the bloom from the intrigue we all have of tuning in these mysterious broadcasts. It is possible that you and I will never actually be able to unravel one of the numbers messages; nevertheless, we cannot help but continue to pause when we hear a numbers station and ponder its hidden meanings. Are we hearing the go-ahead for a mercenary invasion of a small nation? Are we witnessing the secret transfer of millions of dollars into a Swiss bank account? Are we tuned in on instructions for where a plane load of illegal drugs is to land? Are we hearing a menu of secret technological or military plans which one nation seeks to obtain through surreptitious means from their agents hidden in another nation?

It's true that we may never know, but there's hardly one of us who hasn't paused to wonder if we've stumbled upon some message that could easily change the world to one degree or another. That's what's so tantalizing!

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CIE Covert Intelligence, Elect. Eavesdropping Man.	\$12.00
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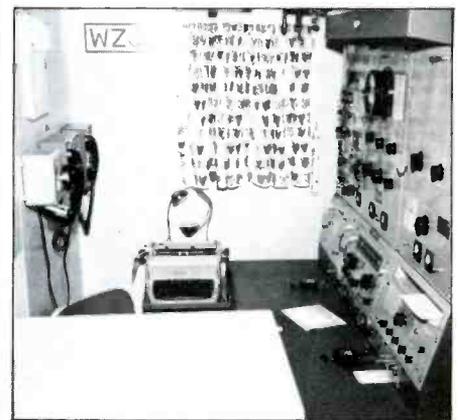
Crews aboard merchant vessels of all kinds regularly use the facilities of high radio telephone stations.

Here's the radio shack aboard the SS American Lancer, a 674 foot freighter built in 1968. Its call sign is WZJB.

*Listening In On*

# High Seas Radiotelephone Calls

*Ships And Aircraft From Throughout The World Calling Home*



BY REX HOLMES, KWA7LN

**I**n the May issue of *POP'COMM* a complete report appeared on how to tune in the VHF maritime channels to hear safety communications, intership conversations, and ship-to-shore telephone calls. Those frequencies constantly buzz with communications from commercial and pleasure craft located along North America's coastlines, inland waterways, and larger lakes.

Ships on the high seas don't rely upon the VHF channels for their communications needs; they can't because not too long after they leave our coastlines they find that their VHF gear is useless for communicating with coastal stations. It's nothing against VHF, except that it isn't intended for long range use on the high seas because it hasn't the ability to cover the distances involved.

Once on the high seas, vessels switch over to other frequencies and transmission modes. The FM used on VHF is replaced by CW, RTTY, SSB, and even satellite communications. While much of the routine navigational and vessel operational information sent from larger vessels is non-voice, high-seas ship-to-shore radiotelephone calls remain, out of necessity, a matter of voice transmission. Likewise, larger pleasure craft and smaller commercial vessels (such as fishing boats) are equipped only with voice equipment for SSB use when out past the range of VHF communications.

Landline telephone calls both to and from

all such vessels are via SSB (upper side-band) and there is a large network of shore or coastal stations throughout the world that handles such traffic. Even aircraft can utilize these stations for placing or accepting personal or business telephone calls.

Each of the shore stations throughout the world is assigned one or more "channel pairs" for such operations—the shore station transmits on one frequency while the mobile (ship or aircraft) station transmits on the other frequency. In addition to the handling of radiotelephone traffic, shore stations may also send out weather broadcasts at certain hours. Many also have regularly scheduled times for the transmission of "Traffic Lists." These consist of an announcement of all call signs representing ships for which the shore station is holding traffic. Ships monitor these lists and respond for their calls when the reading of the Traffic List is completed. They can also initiate their own calls to the shore stations at such time as the desired channel is available.

Calls you can monitor may be to or from passenger liners, cargo ships, tankers, ocean-going tugs, research vessels, yachts, fishing boats, or even naval vessels. Such calls are to or from the officers, crew, or passengers and they range from strictly business to intimately personal.

While some of the shore stations will retransmit the ship transmissions, at times

when they don't it will be necessary to monitor both frequencies in the channel pair in order to hear both sides of the conversation.

For years these stations appealed to monitoring enthusiasts on an equal footing with the overseas point-to-point radiotelephone call stations. Now, with most of those point-to-point telephone stations gone (thanks to satellites), there has been increased interest in the high-seas ship telephone call stations.

Monitors have had varying degrees of success attempting to obtain QSLs from shore stations. Stations KMI, WOO, and WOM are all operated by AT&T and it seems that they are reticent to send out any QSLs, even if a return card is supplied by the listener. Yet, some listeners have been successful nevertheless. My own suggestion to those who would seek to obtain a QSL would be to select a broadcast to report (such as Weather or Traffic List) rather than an actual radiotelephone call. Broadcasts are one-way transmissions not addressed to specific stations and do not raise the question of a listener seeking a confirmation of a personal conversation between a private telephone and someone on a ship or aircraft. It may also be helpful to supply the shore station with a stamped prepared reply card to sign and mail back to you confirming the reception.

Don't forget that any conversations you may overhear between an American flag vessel, an aircraft registered in the U.S., and



Coast Guard and Naval personnel on long cruises use high seas telephone facilities regularly. (Photo courtesy U.S. Coast Guard)

Ocean going yachts and commercial fishing vessels place calls on high seas telephone stations when they are out of range of VHF coastal station.



an American shore station are covered under Section 605 of The Communications Act of 1934, and are therefore within the realm of "secrecy of communications." You are forbidden to divulge the contents of such calls to anyone. This has been the bugaboo with obtaining QSLs from AT&T stations in many instances.

On the other hand, listeners seeking QSLs from ship stations (by means of return prepared QSL card) have generally fared reasonably well. All you have to know is the correct address to write to the vessel!

Ships and aircraft communicating with

American shore stations may be located anywhere in the world. Station KMI works ships in the Arctic, Pacific, southern Atlantic, and Indian Oceans. Station WOO works ships in the Atlantic, southern Pacific, and Indian Oceans. Station WOM communicates with vessels in the Atlantic, mid and southern Pacific, and Indian Oceans. Coverage of WLO is approximately the same as WOM, although WLO is operated by Mobile Marine Radio, Inc., rather than AT&T. By the way, the radiotelephone calls are charged at a rate which relies solely upon the length of the calls and not upon the location

of the ship or aircraft anywhere in the world, or the location of the landline telephone if it is in the U.S., Canada, Mexico, Puerto Rico, or the American Virgin Islands.

Listed here are the stations providing high-seas radiotelephone service in the United States, and the two major high-seas stations in Canada. Frequency pairs are shown with the shore station first, followed by the ship frequency (8784/8260.1 kHz, for example). Frequency pairs above 14 MHz are normally most active during daylight hours at the shore stations; below 14 MHz are most active during nighttime hours at shore stations.

## American Stations

### Station KMI ("San Francisco Radio")

P.O. Box 8  
Inverness, CA 94937

**Frequency pairs:** 4357.4/4063, 4403.9/4109.5, 4407/4112.6, 8728.2/8204.3, 8743.7/8219.8, 8784/8260.1, 13100.8/12330, 13103.9/12333.1, 13107/12336.2, 13187.6/12416.8, 17236/16463.1, 17239.1/16466.2, 17304.2/16531.3, 22636.3/22040.3, 22664.2/22068.2, 22679.7/22083.7, 22704.5/22108.5 kHz

#### Weather Broadcasts

0000 GMT on 4357.4, 8728.2, 8784, 13100.8, 13187.6, 17236.0 kHz

0600 GMT same as 0000 GMT

1300 GMT on 4403.9, 8743.7, 13103.9, 13107, 17239.1, 22636.3 kHz

1500 GMT same as 0000 GMT

1900 GMT same as 1300 GMT

#### Traffic Lists

Every hour on the hour except 0200, 0500, 0800, 1100, 1400, 1700, 2000, and 2300 GMT

Frequencies: 4357.4, 4403.9, 8728.2, 8743.7, 8784.0, 13100.8, 13103.9, 13107, 13187.6, 17236, 17239.1, 22636.3 kHz

### Station WLO ("Mobile Radio")

7700 Rinla Avenue  
Mobile, AL 36619

**Frequency pairs:** 8790.2/8266.3, 8805.7/8281.8, 8808.8/8284.9, 13134.9/12364.1, 13175.2/12404.4, 13178.3/12407.5, 17251.5/16478.6, 17239/16556.1, 17356.9/16584, 22676.6/22080.6, 22689/22093, 22707.6/22111.6 kHz

### Station WOM ("Miami Radio")

1350 N.W. 40th Avenue  
Ft. Lauderdale, FL 33313

**Frequency pairs:** 4363.6/4069.2, 4391.5/4097.1, 4407/4112.6, 4425.6/4131.2, 8722/8198.1, 8731.3/8207.4, 8746.8/8222.9, 8759.2/8235.3, 8793.3/8269.4, 8811.9/8288, 13116.3/12345.5, 13122.5/12351.7, 13125.6/12354.8, 13144.2/12373.4, 13169/13298.2, 13190.7/12419.9, 17232.9/16460, 17257.7/16484.8, 17260.8/16487.9, 17263.9/16491.0, 17279.4/16506.5, 22639.4/22043.4, 22642.5/22046.5, 22661.1/22065.1 kHz

#### Weather Broadcasts

1230 GMT on 4363.6, 8722, 13116.3, 17232.9, 22639.4 kHz

1330 GMT on 4391.5, 8731.3, 13122.5, 17257.7, 22642.5 kHz

2230 GMT on 4407, 8746.8, 13125.6, 17260.8 kHz

2330 GMT on 4425.6, 8793.3, 13144.2, 17263.9 kHz

#### Traffic Lists

0030, 0430, 0830, 1230, 1630, 2030 GMT on 4363.6, 8722, 13116.3, 17232.9, 22639.4 kHz

0130, 0530, 0930, 1330, 1730, 2130 GMT on 4391.5, 8731.3, 13122.5, 17257.7, 22642.5 kHz

0230, 0630, 1030, 1430, 1830, 2230 GMT on 4407, 8746.8, 13125.6, 17260.8 kHz

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LONG LINES DEPARTMENT

32 AVENUE OF THE AMERICAS

NEW YORK 13, N.Y.

G. B. PARKER  
OVERSEAS PLANT SUPERINTENDENT

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TO FILE  
WFO-15

Dear Sir:

This is in reply to your recent letter regarding your reception of a Bell System Radiotelephone Station.

These radiotelephone stations are used to extend the service of the Bell System and its connections to various foreign countries and to ships at sea. They are "Public Service" stations and not "Broadcasting" stations.

We wish to thank you for taking an interest in this matter but in view of the nature of our service, please understand that we cannot, in any way, discuss transmissions that you may have heard over our facilities.

Yours truly,

G. B. PARKER  
Overseas Plant Superintendent

RCB:RCD

This is a typical non-QSL brush off letter of the type sent out for many years by high seas telephone stations, although some listeners have been lucky in receiving verification.



M N M B

THIS WILL CONFIRM YOUR RECEPTION OF

RADIO STATION WOO ON 1110 KCS AT  
1743 GMT ON 26 October 1957

POWER: 200 WATTS. ANTENNA: 100 ft. vertical whip

REMARKS: Spotting WFO, Edward & Richmond

0330, 0730, 1130, 1530, 1930, 2330 GMT on 4425.6, 8793.3, 13144.2, 17263.9 kHz

**Station WOO ("New York Radio")**

P.O. Box 558  
Manahawkin, NJ 08050

**Frequency pairs:** 4385.3/4090.9, 4388.4/4094, 4403.9/4109.5, 4422.5/4128.1, 8470.6/8216.7, 8749.9/8226, 8760.3/8238.4, 8796.4/8272.5, 13107/12336.2, 13128.7/12357.9, 13131.8/12361, 13184.5/12413.7, 17245.3/16472.4, 17291.8/16518.9, 17310.4/16537.5, 17325.9/16553, 22596/22000, 22608.4/22012.4, 22632.9/22027.9, 22704.5/22108.5 kHz

**Weather Broadcasts**

1200, 2000 GMT on 4385.3, 8796.4, 13128.7, 17325.7, 22608.4 kHz

1300, 2100 GMT on 4388.4, 8762.3, 13131.8, 17245.3, 22623.9 kHz

1400, 2200 GMT on 4403.9, 8740.6, 13184.5, 17291.8, 22596 kHz

1500, 2300 GMT on 4422.5, 8749.9, 13107, 17310.4, 22704.5 kHz

**Traffic Lists**

0000, 0400, 0800, 1200, 1600, 2000 GMT on 4385.3, 8796.4, 13128.7, 17325.7, 22608.4 kHz

0100, 0500, 0900, 1300, 1700, 2100 GMT on 4388.4, 8762.3, 17245.3, 22623.9 kHz

0200, 0600, 1000, 1400, 1800, 2200 GMT on 4403.9, 8740.6, 13184.5, 17291.8, 22596 kHz

0300, 0700, 1100, 1500, 1900, 2300 GMT on 4422.5, 8749.9, 13107, 17310.4, 22704.5 kHz

**Canadian Stations**

**Station VAI ("Vancouver Radio")**

Vancouver, British Columbia

**Frequency pairs:** 4385.3/4090.9, 6518.8/6212.4, 8737.5/8213.6, 13119.4/12348.6, 17254.6/16481.7, 22654.9/22058.9 kHz

**Station VCS ("Halifax Radio")**

Halifax, Nova Scotia

**Frequency pairs:** 4394.6/4100.2, 4410.1/4115.7, 6518.8/6212.4, 8787.1/8263.2, 13138/12367.2, 17242.2/16469.3 kHz.

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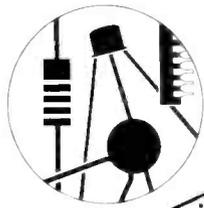
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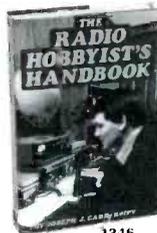


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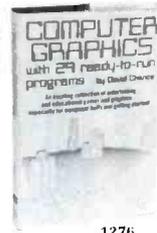
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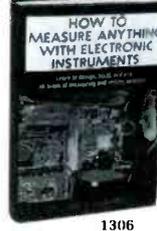
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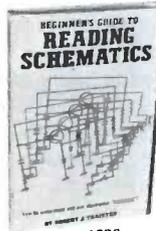
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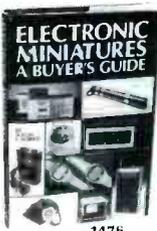
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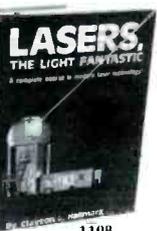
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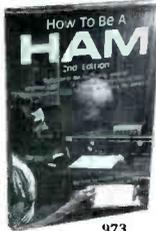
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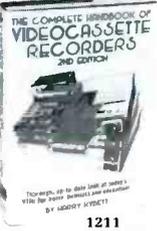
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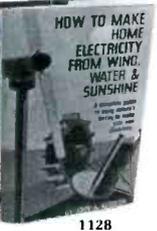
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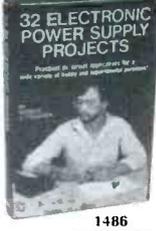
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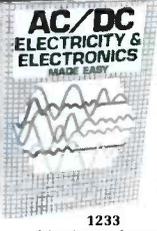
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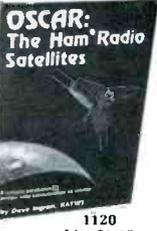
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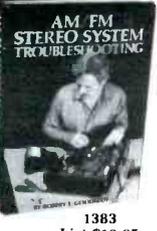
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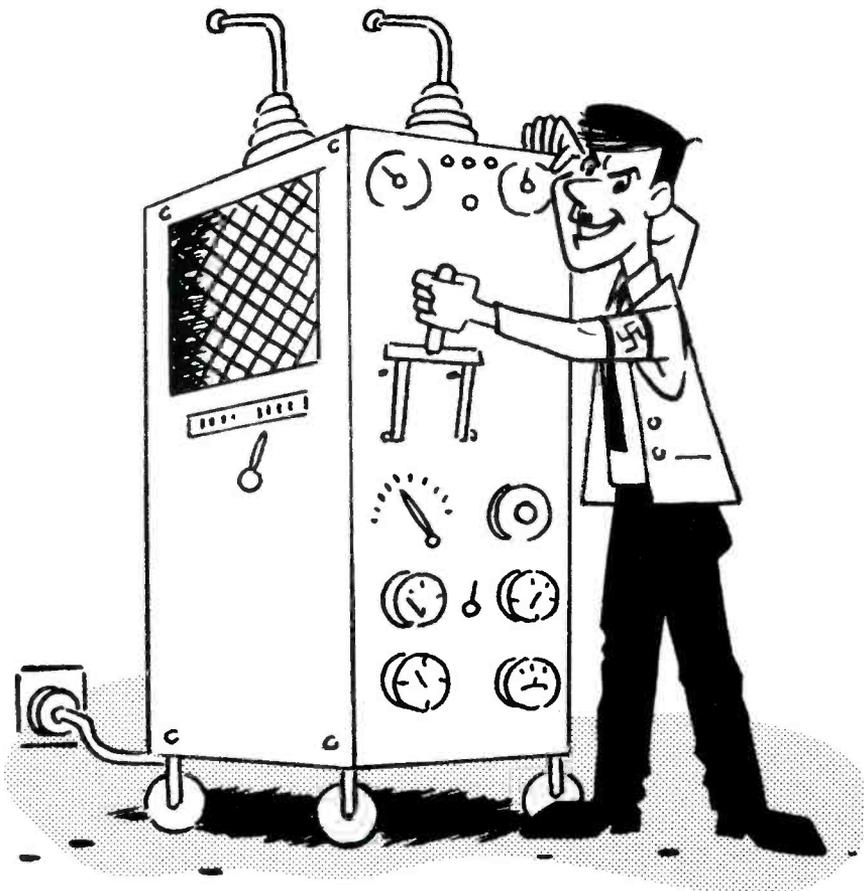
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## The Amazing 17-Day Career Of The “Heil Hitler” Radio Station Was It Operated By A Prankster, A Lunatic Or A Real Spy?

BY TOM KNEITEL, K2AES, EDITOR

In the early days of 1941, while World War II raged in Europe, a mysterious communications station took to the airwaves. It alarmed FCC monitors and federal agents and sent them on a frantic chase to learn its location and seek the identity of its operator.

In actuality, the station was not being operated in a manner that seemed calculated to avoid being monitored. Far from it! It first turned up on April 17th, broke right into an FCC network and attempted to engage the FCC stations in communications. Two days later the station popped up again, but this time on several other frequencies, including 3497.5, 4025, and 6990 kHz—all frequencies in active use by the Army! Identifying himself only as “Fritz,” the operator of the mystery station again tried to make contact with the stations in the networks. He an-

nounced no call sign and liked to freely sprinkle his transmissions with shouts of “Heil Hitler.”

In 1941, with the United States teetering on the brink of war with the Germans, and with rumors of German espionage agents and saboteurs rampant to the point where even American ham operators were forbidden to make contact with overseas stations, this station was cause for serious concern. Blatantly trying to contact station WAR, operated at War Department headquarters in Washington, Fritz was also anxious to talk to all other stations in the Army networks.

Monitors noted that Fritz seemed to have “more than average knowledge” of codes and ciphers, and perhaps justifiably so since he bragged that he was a cryptographer and also a member of an advance unit of the

German Army of Occupation. At first, the military stations were so shocked by his transmissions that they attempted to ignore him. That didn’t deter him from broadcasting his various messages, which he claimed were being relayed from foreign agents. He also liked to play recordings of German military music and speeches made by Der Fuhrer.

In one transmission, he announced that high powered transmitters were being constructed in order to jam military frequencies. Another time he sent out a lengthy message in cipher which, when deciphered by federal monitors, turned out to be in German and related to certain foreign troop movements. Fritz was also attempting to solicit military information from the stations on frequency.

The government was hardly amused, to say the very least. By April 21st, the government had put into effect its plan of attack. Army stations were authorized to reply to Fritz and his so-called “Heil Hitler Radio Station” and engage him in lengthy conversations while the FCC took long range direction finding bearings on the transmitter so that FCC mobile units could be dispatched to his location. Each time Fritz screamed “Heil Hitler” into his microphone, it seemed to cause the hunt to become more intense and additional federal agents (and agencies) to be put on the case.

Army stations did attempt to coax Fritz into revealing his location. However, he was evasive. Upon continued pressing for this information, he said that he was on the *Admiral Scheer* and located “off the coast of Madagascar.” He added that the *Admiral Scheer* “never docked.” The *Admiral Scheer*, in fact, was a heavily armed German pocket battleship which displaced more than 12,000 tons and carried a crew of almost 1,000 men. Built in April of 1933, it was sunk by Allied forces in April of 1945. Monitors didn’t buy Fritz’ story for a minute. They knew that he was within the borders of the United States and somewhere in the midwest.

### Transcripts

Here are some actual quotes from transmissions Fritz made, as shown in transcripts made from off-the-air recordings:

“Staff plans are now coming in, but they are very detailed and too long. Too much trouble to re-encrypt again.”

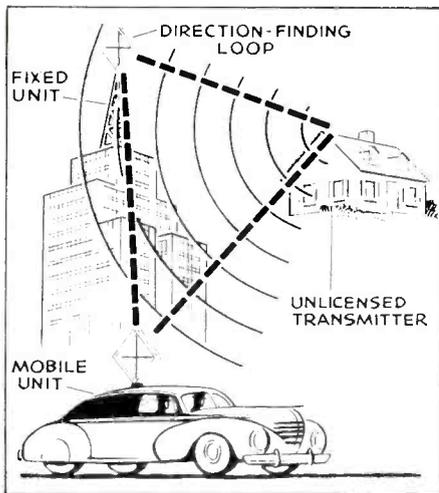
“Tell your cryptographer that this is a columnar position” (Fritz then read a lengthy cipher message).

“I am a cryptographer. You must give me some information in exchange for this stuff. Give me the locations of the following government radio stations: WLXA, WLM, WLH, WLW, WLJ, and WLT.”

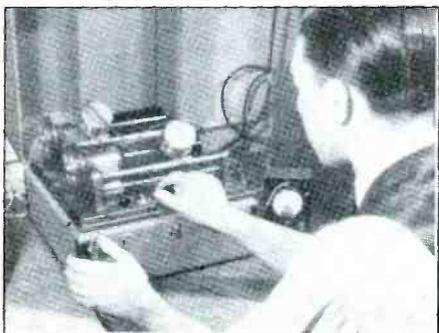
“Your stations are now in the hands of the enemy. Your insolence will not be tolerated by German troops. This station is operated under the control of the German Signal Corps.”

“Name here is Hans vonKreiger. Heil Hitler!”

“I want your codes and ciphers. Give



How mobile and fixed direction-finding units cooperated in locating an illegal transmitter during WWII.



Foreign language broadcasts were recorded and then translated. Records were made of cipher messages, too.



FCC "Police Patrol" agent searches for "Fritz" using a Hallicrafters SX-17 Super Skyriider. These cars were in daily use, trapping "bootleggers" and checking other transmissions. Recordings of broadcast programs were also made and sent to Washington for checking purposes.

them to me or we will jam your frequencies with our transmitters."

"You will be in our concentration camp. I am the cryptographer for this Signal Corps unit."

Although such transmissions today would probably be immediately viewed as the antics of a demented prankster, in the mood the nation was in at that period of time the government regarded all such matters with deadly seriousness. By April 21st, the government's direction finding efforts had pinpointed the general area of Peoria, Illinois. Furthermore, all sorts of important people were now called into the operation to aid the FCC field staff. Some of those personally involved included United States Commissioner William H. Moore, United States District Attorney Howard L. Doyle, United States Marshals Eugene Ahernds and C.T. Cury, as well as Chief of Police Leo F. Kamins of Peoria.

April 22nd found FCC mobile direction finding units cruising the streets of Peoria. The following day they drove up North Sheridan Road and stopped near the home of Charles W. Johnson. At that point, they stood by as the FBI checked out what Mr. Johnson was all about. The final day of the station's operation was April 30th, when a task force of federal agents and local police broke in on Johnson while he was engaged in communications with an Army station. Although he attempted to destroy the transmitter, he wasn't able to do so. He described himself as a senior student in electrical engineering at an area institute. Arrested and held on \$2,000 bond, Johnson was promptly brought before a Grand Jury where he was indicated for violating Sections 301 and 308 of The Communications Act. Thus ended the strange existence of Fritz and the "Heil Hitler Station."

### An Old Story

While many persons today tend to regard unlicensed and undercover radio stations as a relatively recent development in communications, Johnson's activities weren't all that unusual for the period preceding and following our entry into World War II. The FCC had spent several years monitoring and pursuing unauthorized radio stations and transmissions on the theory that at least some of them were the result of German espionage activities. In 1940 alone the FCC tracked down more than 1,000 illegal stations. During the month of June (1941), almost 20 licensed hams were apprehended by the FCC for unauthorized contacts with overseas operators!

Further investigation in the Fritz case revealed that although Peoria's local ham operators were well aware of his activities, little effort was made by hams to track him down on the theory that it might have proven embarrassing should he have turned out to be either a licensed operator or someone who was seeking a ham license. As it turned out, he was neither; and in the aftermath of the incident, Peoria area hams were chided for their reticence in looking for Fritz (QST Mag-

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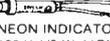
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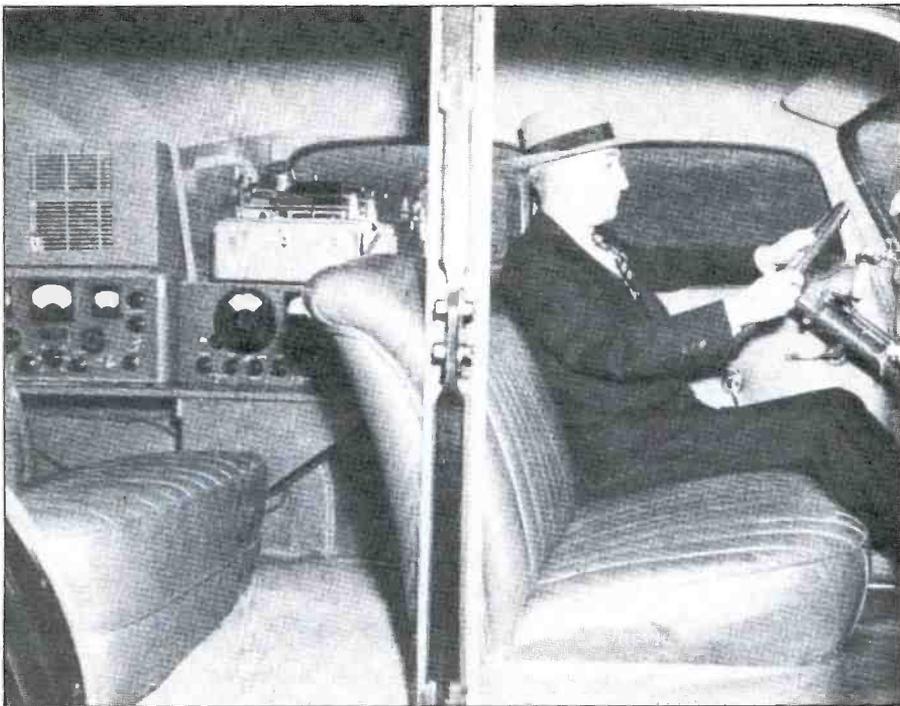
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CIRCLE 17 ON READER SERVICE CARD



One of the FCC mobile units searches for "The Heil Hitler Radio Station."



A federal agent checks out the seized equipment after Fritz was apprehended.



FCC vehicles were equipped with rotating DF loops to search out spy transmitters.

azine, July 1941 issue, page 7). They were duly contrite.

It also came to light that Peoria's Fritz wasn't even very original and was actually copying another earlier Fritz from Massachusetts who had been successful for several years before finally getting caught. (*QST Magazine*, August 1941 issue, page 8!) The original Fritz was caught by hams who rag-chewed with him while the FCC zeroed in his location with direction finders.

By the time Fritz #2 was apprehended in April of 1941, the FCC had increased its field monitoring staff from fewer than 200 to more than 600 engineers and operators. Direction finding units were installed in vehicles and also at fixed listening posts located at 200 mile intervals. There were also 10 long-range DF stations keeping a 24-hour



Army stations engaged "The Heil Hitler Station" in extended communications not only to coax information from "Fritz," but also to make sure it kept transmitting while DF bearings were being taken by the FCC. (Official U.S. Army photo)

vigil on the airwaves, checking out foreign broadcasts and conversations, encoded transmissions, and any activities which sounded suspicious throughout the radio spectrum.

Mobile units working in conjunction with fixed stations would plot signal bearings on maps to ascertain the location of unlicensed stations and other unidentified transmissions. Recordings were also made of many transmissions under investigation.

Even though it had become increasingly difficult for stations to avoid detection for any extended period of time, many persons seemed quite willing to make the try for all sorts of reasons. Some caught by the FCC were actually enemy agents. While many others weren't enemy agents, their activities were either jeopardizing national security or were in violation of pre-war restrictions, or (like Fritz #2) were causing deliberate (or even accidental) interference to vital communications circuits. The fact that illegal radio activity had substantially increased simultaneously with growing war production and preparedness made such surveillance and enforcement necessary. FCC monitors were kept busy with such tasks throughout the entire period of World War II!

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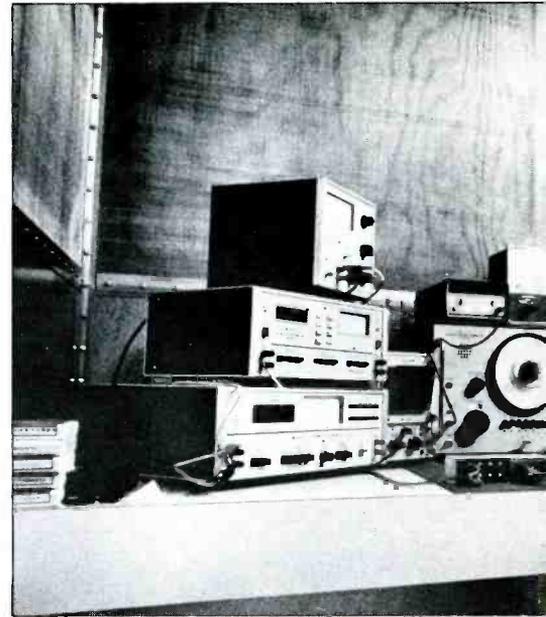
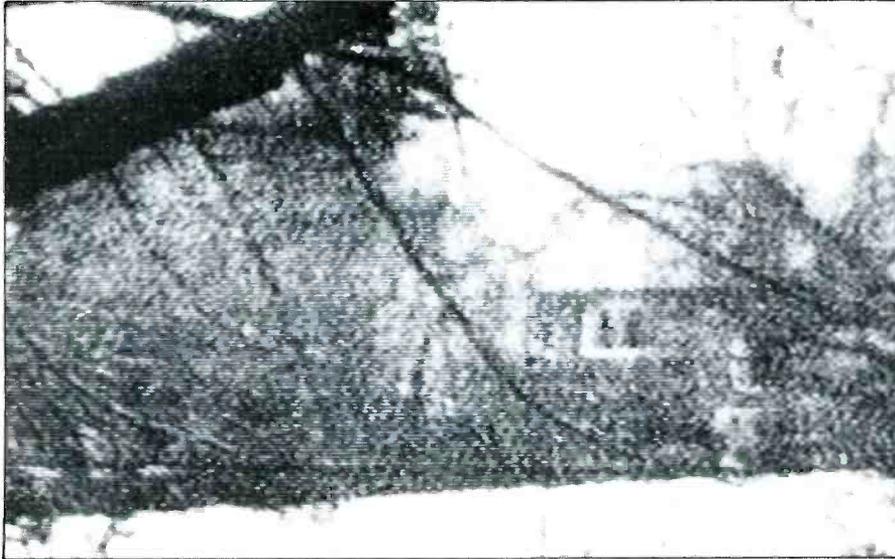
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When the Russians moved into the fancy estate in Glen Cove, New York, they promptly installed shortwave equipment. This photograph of the Russian Glen Cove installation was made from an electronic surveillance system.



# DXing The World's Embassies

BY HARRY L. HELMS, KR2H

**C**urrently, there are six Communist nations known to be operating shortwave radio stations in Washington, DC, for the purpose of transmitting coded messages back to their national capitals. The U.S. government is aware of this situation, however, and has assigned these stations their own call signs.

Such a situation isn't quite as threatening as it might seem. Under international diplomatic law, embassies have the right to communicate with their home governments in codes and cyphers using radio or wire. Not only do foreign governments maintain radio stations in their U.S. embassies, but U.S. embassies scattered throughout the world have their own radio transmitting facilities. Many other nations maintain radio stations at their various embassies throughout the world. It's possible to hear *and even QSL* many of these stations!

## What You'll Hear

Several years ago, there were many more embassy radio stations active than there are today. The bulk of embassy communications today go by cable or, increasingly, by satellite links from the embassy. However, it is believed that most embassies still keep some backup radio communications facilities and test the equipment on a regular basis.

Most embassy communications will be in CW or RTTY. As we've mentioned, the ac-

tual messages will be in codes. However, embassies will identify at the beginning and end of each transmission in ordinary Morse. You can also hear these stations running marker transmissions, using V, CQ, or QRA, before beginning normal operations (much like coastal CW stations).

Sometimes embassies will use call signs allocated to their home countries (this is true for American embassies scattered around the world). Other stations are assigned call signs from their host country's allocation. For example, foreign embassies in Washington are all assigned call signs from the U.S. allocations.

It should be noted that there is *no* requirement for embassies to obtain call signs or register their stations with host governments or international agencies. In fact, it is likely that the vast majority of embassy radio stations do *not* use recognized call signs or make their frequencies public. This is because an embassy building and grounds are given extraterritorial status from the nation in which they are located. This means listeners located in or near cities with large numbers of embassies or consulates (such as Washington, New York, and Ottawa) should be on the alert for all manner of unusual radio signals. (In fact, there is evidence that some of the mysterious "numbers" transmissions may originate from embassies in the Washington area!)

## U.S. Embassies

One of the easiest diplomatic stations to hear is KKN50 in Washington. It's operated by the U.S. State Department Intelligence Service, although it is widely felt that the station has close links with the Central Intelligence Agency. (It may be the State Department is merely "fronting" for the CIA.) KKN50 is widely heard on many frequencies calling U.S. embassies and awaiting traffic. You can find KKN50 on the following frequencies:

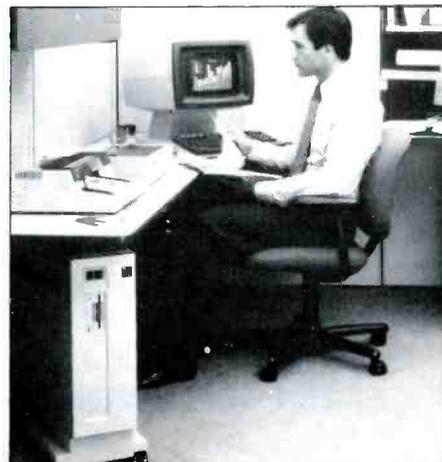
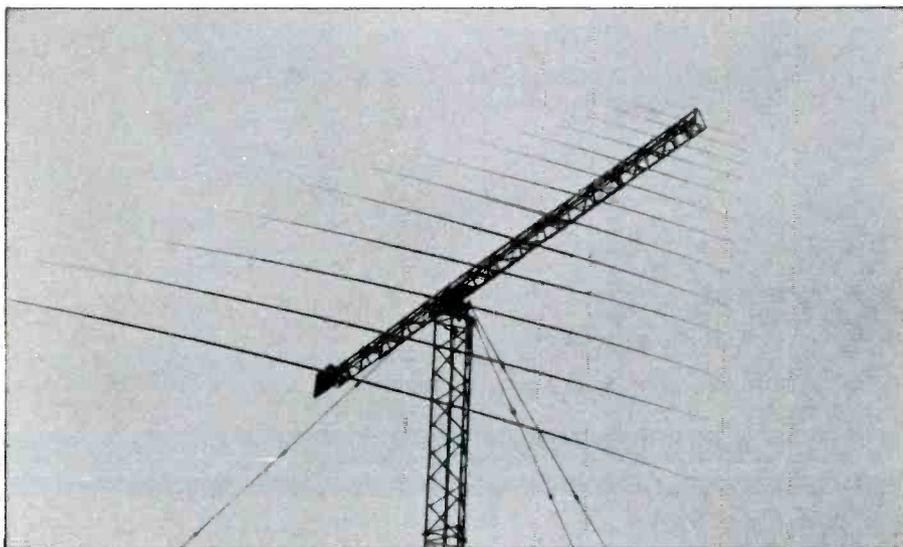
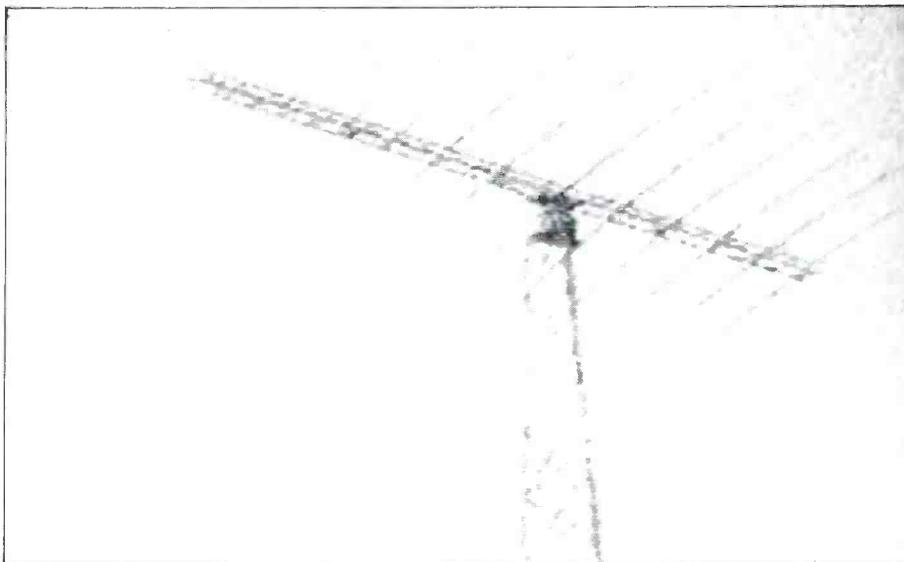
4880	12111.5
6925.4	14880
7470	15492
10637	18525
11095	18700
12022.5	18972

KKN50 is a remarkable verifier of reception reports. Send your report, including a prepared QSL card, to U.S. Department of State, Radio Station KKN50, Office of Radio Communications, Washington, DC 20520. You can also use this address to send reception reports for other U.S. embassy stations.

U.S. embassies overseas are active from time to time and can be heard easily in North America. Here's a list of the more active frequencies, the call sign, and location of each embassy station:



A surveillance system photo of the log periodic type antenna atop a Russian diplomatic installation in New York.



This is the shortwave antenna mounted atop the Russian embassy in New York.

- 4621.5 KRH50, London
- 4886 KKN44, Monrovia, Liberia
- 4910 KWS78, Athens, Greece
- 5110 KKN44, Monrovia, Liberia
- 5426 KRH50, London, England
- 5823 KWL90, Tokyo, Japan
- 7434 KWS78, Athens, Greece
- 7633.9 KKN44, Monrovia, Liberia
- 7645 KWS78, Athens, Greece
- 7662 KWL90, Tokyo, Japan
- 7724 KRH50, London, England
- 9224 KWL90, Tokyo, Japan
- 11142 KRH50, London, England
- 11474 KKN44, Monrovia, Liberia
- 12210 KWL90, Tokyo, Japan
- 14616 KWL90, Tokyo, Japan
- 16458 KRH50, London, England
- 17426 KKN44, Monrovia, Liberia

### Foreign Embassies In Washington

As mentioned before, foreign embassies in Washington use call signs from the normal

U.S. allocations. These stations may QSL certain reports; try addressing your report to the nation's embassy in Washington to the attention of the Chief Radio Operator or the Ambassador. Always include a prepared card. Here is a list of stations by frequency along with call and operating nation:

- 7719 KNY23, Czechoslovakia
- 9040.5 KNY25, Rumania
- 9041.5 KNY26, Hungary
- 10100.5 KNY28, Algeria
- 10642.5 KNY26, Hungary
- 11090 KNY25, Hungary
- 11106 KNY29, Great Britain
- 11303.5 KNY21, Yugoslavia
- 11448 KNY37, East Germany
- 11477.5 KNY21, Yugoslavia
- 13377.5 KNY23, Czechoslovakia
- 13379 KNY26, Hungary
- 13605 KNY27, Switzerland
- 14353 KNY34, Sweden
- 14649 KNY23, Czechoslovakia
- 14875 KNY21, Yugoslavia

- 18250 KNY27, Switzerland
- 18306.5 KNY28, Algeria
- 18808 KNY29, Great Britain
- 19013 KNY24, West Germany
- 19458 KNY20, Poland
- 19458 KNY23, Czechoslovakia

### Other Embassy Stations

Numerous other embassies are scattered throughout the world and are detailed in the next list. Again, most of the transmissions you'll hear will be in CW or RTTY. You can try for QSLs by sending your report to the embassy in the city listed, including a prepared card with your report.

- 4840 OMZ29, East German Embassy, Prague, Czechoslovakia
- 4840 Y7A24, East German Diplomatic Service, Berlin, East Germany
- 4900 OMZ, Czech Diplomatic Service, Prague, Czechoslovakia
- 5125 P6Z, French Diplomatic Service, Paris, France

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|--------|---|---------|--|
| 5204   | OMZ, Czech Diplomatic Service, Prague, Czechoslovakia       | 10150   | SAM35, Swedish Embassy, Belgrade, Yugoslavia         |
| 5744   | RLX, Soviet Embassy, Dublin, Ireland                        | 10150   | SAM36, Swedish Embassy, Budapest, Hungary            |
| 5830   | ONN30, Belgian Diplomatic Service, Brussels, Belgium        | 10150   | SAM39, Swedish Embassy, Prague, Czechoslovakia       |
| 6706   | Y7A24, East German Diplomatic Service, Berlin, East Germany | 10164   | SAM, Swedish Diplomatic Service, Stockholm, Sweden   |
| 7445   | VCS838, Yugoslavian Embassy, Ottawa, Ontario, Canada        | 10164   | SAM38, Swedish Embassy, Moscow, USSR                 |
| 7605   | SAM, Swedish Diplomatic Service, Stockholm, Sweden          | 10400   | HGX31, Hungarian Embassy, Warsaw, Poland             |
| 7650   | ONN38, Swiss Embassy, Brussels, Belgium                     | 10422.5 | OEC57, Austrian Embassy, Pretoria, South Africa      |
| 7698.5 | PCW, Dutch Diplomatic Service, The Hague, Netherlands       | 10422.5 | OEC72, Austrian Embassy, Lisbon, Portugal            |
| 7698.5 | PCW2, Dutch Embassy, Jerusalem, Israel                      | 10736   | OHU21, Finnish Embassy, Paris, France                |
| 7812   | Y7B32, East German Embassy, Belgrade, Yugoslavia            | 10995   | 7RP70, Algerian Embassy, Rome, Italy                 |
| 7880   | OEC44, Austrian Embassy, Tel Aviv, Israel                   | 10996   | 7RV70, Algerian Embassy, Warsaw, Poland              |
| 7894   | OEC61, Austrian Embassy, Rome, Italy                        | 11005   | 7RV50, Algerian Embassy, Islamabad, Pakistan         |
| 7937.5 | HGX39, Hungarian Embassy, New Delhi, India                  | 11030   | CME39, British Embassy, Havana, Cuba                 |
| 8172   | VCS838, Yugoslavian Embassy, Ottawa, Ontario, Canada        | 11125   | 70B452, Libyan Embassy, Aden, Yemen                  |
| 9062   | CME9, East German Embassy, Havana, Cuba                     | 11152   | RXO, Soviet Embassy, Warsaw, Poland                  |
| 9135   | CME396, British Embassy, Havana, Cuba                       | 11508   | CME310, Libyan Embassy, Havana, Cuba                 |
| 9165   | ONN38, Swiss Embassy, Brussels, Belgium                     | 11688   | CYS22, Polish Embassy, Ottawa, Ontario, Canada       |
| 9217   | RLX, Soviet Embassy, Dublin, Ireland                        | 12238.5 | ONN34, Iranian Embassy, Brussels, Belgium            |
| 9481   | CME301, Polish Embassy, Havana, Cuba                        | 13433   | OHU20, Finnish Diplomatic Service, Helsinki, Finland |
| 9910   | ONN30, East German Embassy, Brussels, Belgium               | 13433   | OHU25, Finnish Embassy, Peking, China                |
| 9942   | ONN36, Angolan Embassy, Brussels, Belgium                   | 13937.7 | CLP1, Cuban Diplomatic Service, Havana, Cuba         |
| 10150  | SAM, Swedish Diplomatic Service, Stockholm, Sweden          | 17528   | RLX, Soviet Embassy, Dublin, Ireland                 |
| 10150  | SAM20, Swedish Embassy, Athens, Greece                      |         |  |
| 10150  | SAM25, Swedish Embassy, Lisbon, Portugal                    |         |  |
| 10150  | SAM30, Swedish Embassy, Madrid, Spain                       |         |  |

Good luck in chasing these! And be sure to report any you hear to Communications Confidential!

## May We Recommend . . . .

**The American SWL Club, 16182 Ballad Lane, Huntington Beach, CA 92649.** This club has been operating since 1959. It publishes an excellent 60 page monthly DX publication covering shortwave and broadcast band DX, utility stations, QSL reports, and more. The club co-sponsors three annual DX meetings per year held in southern California. Dues in North America are \$16 per year (includes First Class Mailing of monthly publication). Students (located in North America and 16 years old or younger) can join for \$13 per year. A sample bulletin is available from the club for \$1 (in North America).

**The Longwave Club of America, 45 Wildflower Rd., Levittown, PA 19057.** Here's a club for those rugged enthusiasts interested in knowing what's happening below 540 kHz! Their monthly publication, *The Lowdown*, not only covers listings of stations operating between 10 and 540 kHz, but also has interesting coverage of the 1750 Meter (no license) low power communications band as conducted by Ken Cornell (W2IMB—well known "Lower" authority. Membership includes mailing of the publication by First Class Mail and costs \$10 per year (anywhere in the world).

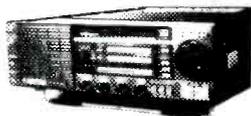
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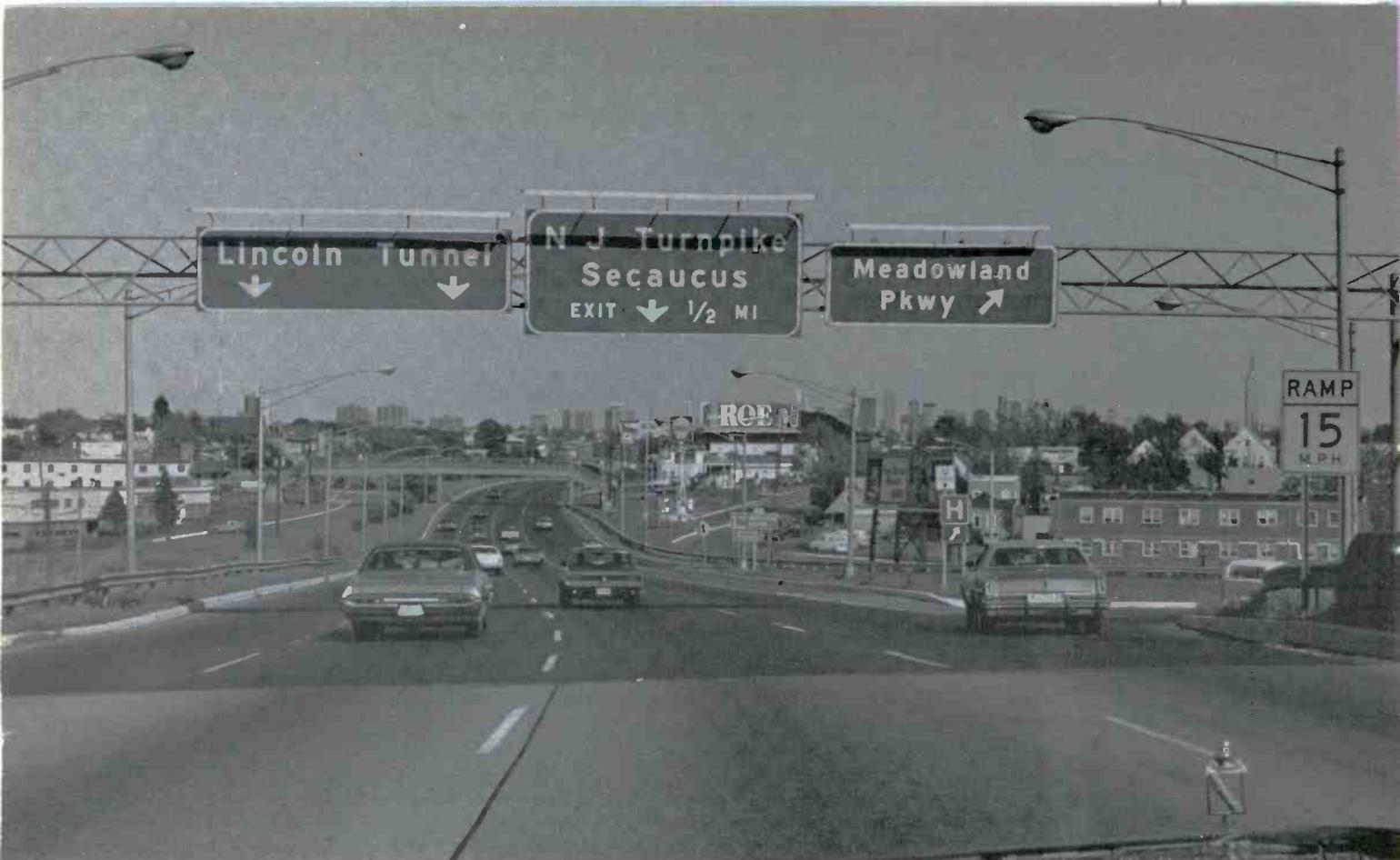
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## POP'COMM Readers Meet The Mini-Broadcasters: DX Challenge

### Reader Response To Our Story On Low Power Broadcasters BY SMOKI WHITFIELD

**I**n the February issue of *POP'COMM* I wrote a story on DXing challenges offered by mini-broadcasters including the Travelers Information Stations (which run low power on 530 and 1610 kHz) and the drive-in theatres (which transmit the sound tracks of their films on 530 kHz). At that time, I stated that I was hoping to gather additional information on these stations in the hope of expanding the trial station roster I presented in the February issue.

Some interesting mail arrived which supplied worthwhile DX information on mini-broadcasters. I promised that I'd share it with my readers, so here are some thoughts sent in by *POP'COMM* readers in addition to the material I had originally presented.

For instance, reader Michael R. Watson, of Sonoma, California, reported that he has long been gathering information on mini-broadcasters in northern California. Mike

says there's a TIS station on 1610 kHz at Redwood National Park (near Crescent City, California), and another one on the same frequency at Yosemite National Park. He says that the Yosemite station appears to have excellent coverage and possibly is running higher than the usual low power (10 watts or thereabouts). Mike also says that a former user of 530 kHz was the Village Drive-In in Santa Rosa. However, after having been in operation for 30 years, the theatre was just recently torn down.

Ken Stryker, the Editor of the "Unidentified Beacons" section of the bulletin of the Longwave Club of America, has himself been compiling a list of TIS stations and he very kindly passed along an excellent list of additions to our roster. Ken would like to exchange information on TIS stations with other listeners in the U.S. and Canada and readers wishing to contact him can write to

Ken at 6350 North Hoyne (Apt. 202), Chicago, IL 60659.

Franklin M. Kern, M.D. (known on the ham bands as W3RK), of Kingston, Pennsylvania, passed along information on low power (1 block range) transmitters used by real estate brokers to gain an edge on competitors. According to the *Wall Street Journal*, the stations send out a continuous repeating broadcast designed to entice house hunters out of their cars and into the model homes. Radio Realty of Minnetonka, Minnesota (a subsidiary of New Pilot Communications Corp.), began making and selling the devices through the Lowen Sign Co., of Hutchinson, Kansas, last November. A sign in front of the home tells motorists which frequency to tune in. The transmitter, with accompanying accessories, is reported to sell for about \$425. One suburban Chicago broker reported that the transmitter is a good tool for getting sellers to list their home with her agency. She said that it was most effective with homes that appear attractive from the street.

Wayne Drexler of St. Petersburg, Florida, offers some interesting data, including station KNFH965 operated by the City of St. Petersburg with 10 watts on 1610 kHz, as well as WY2235 operated by the City of Tampa with 10 watts on 1610 kHz. Wayne tells also of the 28th Street Drive-In and the Mustang Drive-In Theatres (in St. Petersburg) which run 10 watts each on 530 kHz. He says that at times they simulcast their transmissions on 88.0 MHz (FM), and these facilities are also used during daylight hours during the times when a flea market is in operation. Wayne further says that Walt Dis-

ney World at Lake Buena Vista, Florida, runs low power transmitters as follows:

Magic Kingdom 1030 and 1200 kHz  
EPCOT Center 810 and 900 kHz

Wayne has also received the Drive-In Christian Church at South Daytona Beach, Florida on 657 kHz from 7 to 11 a.m. on Sundays. He further says that near Savannah, Georgia he's monitored traffic information on 535 kHz; likewise there's a Metro Traffic Information (for I-75 and I-285) operating on 530 kHz with the call sign WRB948.

Barry Percival of McPherson, Kansas, advises that the Starview Drive-In Theatre in his home town operates on 540 kHz.

Reader "Junior" Dillon, KTX5MW, of San Antonio, Texas, advises that the Texas Department of Transportation has an experimental TIS license for operation on both 530 and 1610 kHz, call sign KF2XDR.

Howard Kemp, Laconia, New Hamp-

shire, sent along a QSL letter which he received from TIS station KFB759, 1610 kHz. This station is operated at Acadia National Park, Bar Harbor, Maine, by the National Park Service.

Another QSL was submitted by Terrance Provance, Zanesville, Ohio. This QSL came from WXT613 (2 watts on 1610 kHz) at the Cincinnati International Airport. The station is 150 miles from Zanesville and proves that DX does exist, and a QSL from a 2 watt broadcaster on these frequencies is really quite an accomplishment. Terrance reports hearing another station, WQF465 from Ohio State University in Columbus on 530 kHz, although he hasn't heard it in a couple of years and doesn't know if it's still active. Terrance says that the National Radio Club recently started a column covering activity in the 1600 to 1800 kHz band, and that includes TIS stations.

Readers with more information on TIS stations, drop me a line!

Acadia National Park, Maine (KFB759)	1610 kHz (2)
Big Bend National Park, Texas	1610 kHz
Biscayne National Park, Florida	530 kHz
Blue Ridge Parkway, NC-VA (KIE768)	530 kHz and 1610 kHz
Bryce Canyon National Park, Utah	1610 kHz (2)
Canaveral National Seashore, Florida	1610 kHz (2)
Cape Hatteras National Seashore, NC	1610 kHz (3)
Carlsbad Caverns National Park, N. Mexico	1610 kHz
Curecanti National Recreation Area, CO	1610 kHz (2)
Custer Battlefield National Monument, MT	1610 kHz
Devils Tower National Monument, WY	1610 kHz
Everglades National Park, FL	1610 kHz
Fort Laramie National Historic Site, WY	1610 kHz
Fort Necessity National Battlefield, PA	1610 kHz
Gettysburg National Military Park, PA	1610 kHz
Glacier National Park, MT	530 kHz
Glen Canyon National Recreation Area, Utah/Arizona	1610 kHz (2)
Golden Spike National Historic Site, Utah	530 kHz
Grand Canyon National Park, Arizona	1610 kHz (2)
Grand Teton National Park, WY	1610 kHz
Great Smoky Mountains National Park, NC-TN	530 kHz and 1610 kHz (9)
Hawaii Volcanoes National Park, Hawaii	1610 kHz
Jefferson National Expansion Memorial National Historic Site, MO	530 kHz
Mammoth Cave National Park, KY	1610 kHz
Manassas National Battlefield Park, VA	530 kHz
Mount Rainier National Park, WA	1610 kHz (3)
North Cascades National Park, WA	1610 kHz
Ozark National Scenic Riverways, MO	1610 kHz (4)
Petrified Forest National Park, AZ	1610 kHz (2)
Point Reyes National Seashore, CA	1610 kHz
Redwood National Park, CA	1610 kHz (3)
Rocky Mountain National Park, CO	530 kHz (2) and 1610 kHz
Sequoia National Park, CA	530 kHz and 1610 kHz
Shenandoah National Park, VA	1610 kHz
Sleeping Bear Dunes National Lakeshore, MI	1610 kHz (3)
Upper Delaware Scenic and Recreational River, NY/PA	1610 kHz (2)
White Sands National Monument, N. Mexico	1610 kHz
Yellowstone National Park, WY-MT-ID	1610 kHz (29)
Yosemite National Park, CA	1610 kHz
Zion National Park, Utah	1610 kHz

TIS radio stations are authorized for the National Park Service in the areas listed above. Nearly all of these are currently in operation. This listing was sent to POPCOMM by the National Park Service. Numbers in parentheses represent the number of such units in service.

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### WXT 613

Travelers Information Radio  
Kenton County Airport Board

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SW of Cincinnati, Ohio, in Boone County, Kentucky.

We confirm your reception of our radio transmission on the 6 day of  
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*John R. Bushelro*  
Chief Engineer

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Yes! You can get actual QSL cards from  
mini-broadcasters. Here's one from a 2 watt  
station at the greater Cincinnati National Air-  
port. (QSL courtesy of Terrance Prouvance)

530 kHz KRN984 Los Angeles International Airport  
530 kHz KUS703 Washington Police Dept. DC (Harbor Div.) 10 watts  
530 kHz KMC476 Cajon Mountain, CA 10 watts  
1610 kHz WXT613 Boone Co., KY (Greater Cincinnati Int'l AP) 2 watts  
1610 kHz Gatlinburg, TN  
1610 kHz Kennedy Space Center  
1610 kHz KMB824 Chicago, IL (Kennedy Expressway) 10 watts  
1610 kHz KMH441 Highland Park, IL (Edens Expressway) 10 watts  
1610 kHz Chicago, IL (Eisenhower Expressway) 10 watts

These TIS station listings were sent in by Ken Stryker, well known DXer who specializes in  
low frequency monitoring.



United States Department of the Interior

NATIONAL PARK SERVICE

Acahula National Park

P.O. Box 177

Bar Harbor, Maine 04609

August 26, 1982

19821

Howard G. Kemp  
140 Court Street  
Laconia, N.H. 03246

Dear Mr. Kemp:

We verify receiving your letter announcing that you had heard the  
radio broadcast identified as KFB 759 on 1610 KCS. August 16, 1982  
from 3:25 pm to 3:29 pm.

We hope this acknowledgment satisfies your request.

Sincerely,

*Robert Rothe*  
Robert Rothe  
Chief Park Naturalist

This brief but adequate letter represents the QSL received from KFB759.

THE MONITORING MAGAZINE

## NEW AND EXCITING TELEPHONE TECHNOLOGY

### Smart Beepers

**U**ntie yourself from the telephone with a smart beeper that will even tell you who is on the line.

It's 5 o'clock, and as you expected, the expressway traffic out of town is moving at a snail's pace. It takes you almost 10 minutes to get into the fast lane, which is moving slightly faster than a crawl.

Your beeper goes off. Not only does it go off once, but a minute later it goes off twice. Now a third time. What can be so important that someone is trying over and over again to get a hold of you? In another 10 minutes you are on the off-ramp, and it's still another 10 minutes until you find a telephone. You call the office, only to find out that everyone has gone home and no one knows why you were beeped.

The next morning you find out that they were shy one bridge tournament partner, and they wanted to know if you wanted to play that evening.

Not only are the older style of beepers insensitive as to whether a beep is urgent or not, they are also inconsiderate as to what you may be doing at the time they go off. Everyone loathes a beeper at church. How about a beeper during grace? How about beepers at the movies—with no phones in sight?

Some solution to this was developed by Motorola several years ago when they came up with a beeper that vibrated. Now that's a little bit smarter. As long as you can feel it go off, you know that someone is trying to get in touch with you.

Voice beepers are another step in the right direction. Not only do they go off, but they also tell you who to call. Some may allow the user himself to make a personal voice page for up to 10 seconds over the airwaves. This may be nice in some cases. It's also disastrous when someone overhears a message intended only for you. Multiple girlfriends, multiple business deals, multiple conflicts of interest are just a few examples of how a voice beeper might overexpose you. There is also the problem of not hearing the message correctly, writing the number down wrong, or misunderstanding what the calling party is saying.

About two years ago, a new type of beeper emerged on the market—a numeric beeper. This handy device allows you to receive not only an alerting beep but also up to 10 numbers on its display. Most of the time, the numbers were a phone number. Ingenious secretaries might also in-code an extra number or two to indicate what type of message goes along with the phone number to call.

This year we see something brand new called the memory alphanumeric pager.



*Digital I and II and PG-50 pagers: Standard Communications pager line now includes Digital I (tone and five numeric character display), Digital II (tone-only), and the PG-50 offering tone, voice, or a 12 character numeric display.*

This little device not only alerts you with a beep that an incoming message follows, but also will spell the message out in both numbers and letters. It will even store the message for later retrieval. This might allow you to receive several phone calls, one after another, and then recall them on your pager the next time you're near a telephone.

The display is the bright LCD—liquid crystal display. These are seen in all degrees of brightness and are back lit for nighttime viewing.

Most of these modern marvels will hold up to 80 or 160 characters.

You may also select, via the front of the beeper, what type of alerting you would like—subtle or a hammer over the head! It might vibrate, beep, hum, stay silent except for emergencies, or do everything at once in an emergency.

These beepers are tied into aggressive companies that operate high powered radio transmitters from mountaintops. This will assure you of seldom missing a beep because you might be in an area where the radio waves won't penetrate. UHF radio signals do the best job of all, bouncing and reflecting into all types of buildings, tunnels, underground garages, and even into air-

plane compartments. (Although their use may be prohibited by commercial carriers.)

New frequencies at 900 MHz may soon open up additional channels for these multifunction memory pagers. Mass production of the pagers with more frequencies may bring down prices dramatically. Pager services will start competing, cost-wise, for more business, and this further will decrease the price of your pager system.

New innovations in telephones may also allow users to signal both numerically as well as alphanumerically to any pager within the system. By next year it might be common to have your pager hold up to 500 characters and actually read a letter sent to you via the keyboard of a telephone. This is now called electronic mail.

The age of electronic communications and electronic message delivery is here. Prices are rapidly dropping as equipment becomes more sophisticated, thanks to the large scale integrated circuit. You may never miss a telephone call again with your new electronic smart memory beeper that won't beep you, but rather scratch your leg when it senses an incoming message. Let's see, two soft scratches for an important message, and a pinch for the message that you forgot your anniversary.

The age of beepers is certainly here. See the latest in technology at your local business radio dealer.



*This tiny pager will store both numbers and letters of an incoming message. The display is liquid crystal for low battery consumption.*



A new broadcasting unit on its way to Afghanistan. Olga Svintsova of the Paris RFK Committee holds the antenna, French engineer Bruno Bucher has the transmitter in a suitcase.



Ludmilla Thone of the New York-based organization "Freedom House" with a Radio Free Kabul transmitter.



One of the Mujahadeen shown with a Radio Free Kabul transmitter.

# "Radio Free Kabul," Mystery Station Voice Of The Mujahadeen And Thorn In Russia's Side! BY GERRY L. DEXTER

It is eight o'clock in the evening in the Hindu Kush mountains of Afghanistan. Inside a cave, deep in this vast range of high peaks, sheer rock walls, and pretzel-like trails, a Mujahadeen freedom fighter leans into a microphone.

If you understood Pushto or Dari, his words would translate into "Here is Radio Free Kabul of the Afghan resistance."

So begins another evening's broadcasting for what is perhaps the world's most unusual radio network—Radio Free Kabul.

Radio Free Kabul came into being as the result of events which took place on Christmas Eve, 1979. On that night, Russian troops were airlifted into the Afghanistan capital. The troops took over the city and ended the short-lived regime of Hafizullah Amin whose political line was a little too independent in nature for the Soviet's taste.

Actually, the Russians had offered to send in their forces several months earlier to help Amin put down Muslim rebellions already in progress in resistance to the coming of Communism to Afghanistan. But Amin declined to offer an invitation.

When the Russians did arrive, Amin was

captured and shot in the Darulaman Palace three days later, along with several other persons.

USSR ground forces poured into the country from Kushkar and Termez between the 29th and 31st of December.

Babrak Karmal was installed as the new Afghan leader. Karmal's announcement of the coup and his appeal to the people for support broadcast over "Radio Afghanistan" was, in fact, a pre-recorded tape made days earlier and aired over USSR transmitters close to the border and falsely identifying as the official Afghan radio. Meantime, the real Radio Afghanistan blithely continued with its regular programs.

Resistance to the invasion sprang up immediately. Radio Afghanistan, next to the U.S. Embassy in Kabul, was the scene of a battle between Russian troops and Afghan soldiers still loyal to Amin.

Some 15,000 to 60,000 freedom fighters (Mujahadeen) continue to fight the occupiers. The number in action at any one time depends to a large extent on the season of the year since many roads are simply impassible in the winter and spring.

Guerrilla wars are practically an inborn part of the Afghan way of life. The Afghans have fought would-be conquerors throughout their history, including three separate times against the British. One such campaign caused Rudyard Kipling to write:

"When you're wounded and left on Afghanistan's plain  
And the women come out to cut up what remains  
Just roll to your rifle and blow out your brains  
And go to your god like a soldier."

Afghan tribesmen have a natural love of independence and a hate of foreigners who would try to rule them. This, coupled with their strong religious faith, makes it hardly surprising that they are doing everything in their power to resist the Soviets.

Radio Free Kabul has been an important part of the resistance effort since its inception. It was born, not in Afghanistan, but in Paris. The idea for a rebel radio service belongs to Bernard-Henri Levy, a French author, and to Russian dissident Vladimir Bukovsky. Both men held discussions with Afghan resistance leaders in Paris where the idea was suggested and eagerly endorsed.

The Paris Human Rights Committee became the guiding light for Radio Free Kabul. An overall governing body made up of five of the six Mujahadeen groups control policy, operations, and program content.

Radio Free Kabul is actually many radio stations. Each station uses a small, portable FM transmitter which has a range of 25 to 50 miles. This FM network concept was the brainchild of Italian film maker Renzo Rossellini. Each transmitter costs between \$2,000 and \$3,600. Transmitters are hidden in caves and other remote areas throughout Afghanistan.

So far, Radio Free Kabul has 11 low power FM transmitters on the air inside Afghanistan, including one inside the Panjsher Valley and another at the entrance to that valley. The most recent addition is near Mazar-i-sharif in Bulkh Province near the Soviet-Afghan border.

Intriguingly for the shortwave listener are elusive reports of a transmitter using a shortwave frequency which is said to have been heard as far as the Soviet border. Unfortunately, no frequency for this transmitter has been located so we don't know where to tune for Radio Free Kabul. Sources close to the people at Radio Free Kabul indicate that an increase in shortwave facilities is in the development stages.

In Afghanistan's capital of Kabul, which Lowell Thomas once called a "brooding city of suspicion" there are faithful listeners to Radio Free Kabul's broadcasts each evening. In the narrow and twisted streets of the bazaars, where one can buy a love potion made of the white ash created by the cremation of a male and female frog, radios switch on at 8 p.m. each evening to hear the resistance radio's broadcasts from a transmitter a short distance outside the city.

Needless to say, the Russians are enraged by Radio Free Kabul. In addition to their natural concern that the station is helping to strengthen the resistance, the Russians also fear that Radio Free Kabul might start beaming programs to the Muslim population living within the Soviet Union itself and thereby create unrest on home territory.

The Russians have, variously, called Radio Free Kabul a "CIA operation," "a Jewish station in Pakistan, run by Israelies and western intelligence groups," and have accused the station of "bringing disrepute on the Afghan people." The Soviet newspaper *Pravda* simply calls them "bandits," a term they apply to all the Mujahadeen.

The Russians have offered a reward of 10,000 afghans (the coin of the realm) to anyone who provides information which results in the location of a Radio Free Kabul transmitter. They have also banned the possession of FM radios by the populace.

But despite the ban, the Afghan population eagerly awaits each night's transmission from Radio Free Kabul. Broadcasts open with the monotonous drumming of a tabla, and an old Russian World War II song called "You Hear The Boots Stomping," followed by station identification in the local Pushto and Dari languages "Here is Radio Free Kabul of the Afghan resistance."



The courtyard of the Radio Free Kabul studio located in a tribal area in Pakistan.



A Radio Free Kabul announcer recording a program.

The evening's programming begins with a newscast, followed by a commentary on a different theme each day. There are also music and prayers along with other features.

The thirty to sixty minute broadcast ends with a segment in Russian prepared by Soviet dissidents like writers Vladimir Bukovsky or Vladimir Maximov. These programs are aimed at Soviet troops in Afghanistan and are intended to subvert morale, also to get the Soviet troops to feel that they should go home.

Russian soldiers, incidentally, were told they were going to Afghanistan to defend the country from American and Chinese domination. The soldiers have no choice but to follow their orders and, once on the scene, really have nowhere to go should they decide to defect. A number have tried it. One wonders if they knew of the Hindus of India who used to pray for deliverance from "the venom of the cobra, the teeth of the tiger, and the vengeance of the Afghan."

At any rate, the rebels are not equipped to handle deserters and they are sent back to their units should they reach Pakistan.

As a result, Radio Free Kabul is very careful not to give the impression that defecting is a viable alternative.

Radio Free Kabul's Russian programs continually point up the similarities between the occupation of Afghanistan and the Nazi occupation of the Soviet Union in World War II, which must strike open nerves among the Russian soldiers.

One of the station's most popular programs is "Letterbox," which answers letters from people in resistance-held areas and from those in refugee camps near Peshawar, Pakistan. Since these letters can't be sent through the mail, they're smuggled into the country by friends and relatives.

Interviews with Mujahadeen leaders are also aired, providing current information on where the resistance effort stands.

According to one rebel commander, Radio Free Kabul is "worth a thousand Kalishnikovs." The Kalishnikov is a Soviet rifle.

Radio Free Kabul has a well-equipped studio in Peshawar, Pakistan, where the daily programs are recorded on cassette tapes and hand-carried to the transmitter sites. Still another studio is said to exist within Afghanistan itself.

The frequencies used by Radio Free Kabul are carefully selected. One transmitter,



Various views of the Radio Free Kabul studios and equipment.

# May We Recommend . . . .

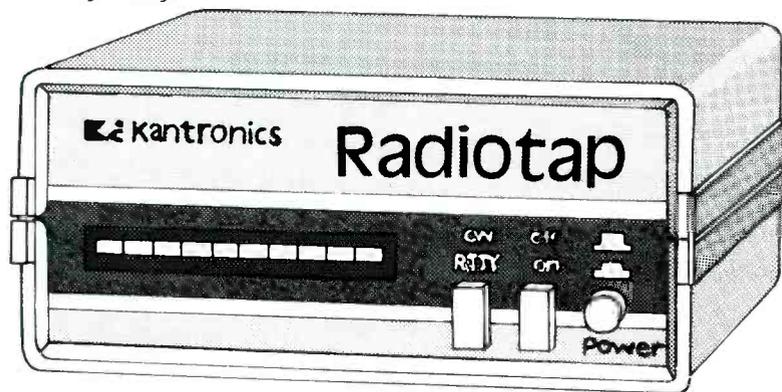
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which beams into Baghran (the site of a major Soviet installation) operates on the same frequency as that used by the Russian military for transmissions from Dushanbe in Tadjhikistan, SSR. Other transmitters use frequencies also employed by the Soviet military and the Afghan government for their communications. The result is that Radio Free Kabul's broadcasts are not easily missed by the occupiers.

However, the transmitters are difficult to locate due to the rugged terrain. There have been a couple of close calls for Radio Free Kabul, though. The transmitter near Kabul was bombed on one occasion but only some minor damage was done to an antenna and that was quickly repaired.

More recently, the transmitter site in Logar Province was encircled by Russian troops. A number of program cassettes were confiscated. One technician's feet froze and had to be amputated later in Pakistan.

Each time a new transmitter is ready, French technicians sympathetic to the Afghan resistance smuggle it into the country where they meet with the Mujahadeen and teach them how to use the equipment. On one occasion, three French-trained Afghan technicians were killed in a Russian attack in the Panjshir Valley. Another engineer was injured.

Eventually, Radio Free Kabul plans to have one station broadcasting exclusively in Russian, producing both live and taped programs prepared by Russian dissidents.

Supports of Radio Free Kabul say a total of \$250,000 is needed to complete the building of the transmitter network. Additional funds are required to maintain the operation.

Part of that cost is for FM radio receivers. FM is not a medium which has any history of use in Afghan broadcasting, so there has never been any reason for an Afghan to want or need an FM radio until now. FM radios costing \$15 to \$20 each are purchased in quantity in Hong Kong and Singapore and smuggled into Afghanistan. The goal is "one Afghan, one radio."

France is not the only center of sympathy and support for the rebel cause and the resistance radio effort. In England, the Thorne Center for Appeals for Freedom has the backing of several members of Parliament, including one Winston S. Churchill.

In the United States, fund raising is handled by "Freedom House," 20 West 40th Street, New York, NY 10018, and "The Committee For a Free Afghanistan," 1237 Pennsylvania Avenue SE, Washington, DC 20003. Another address is "Radio Free Kabul," P.O. Box 9-1983, Pasadena, CA 91103. (Donations, should you wish to make one, can be sent to any of the above addresses. Checks should be marked "for Radio Free Kabul" and are tax deductible.)

Back in the 1920's, the Viceroy of India presented Amanullah Kahn, "Amir of Afghanistan, King of Kabul, Light of the World" with a wireless set. Little did either of them dream at the time that the wireless would, today, play such an important role in the history of that troubled nation.

# SATELLITE VIEW

BY MARK LONG, WA4LXC

## INSIDE THE WORLD OF TVRO EARTH STATIONS

In our June Satellite View column, we mentioned that the Pentagon had recently obtained a pair of earth stations so that the nation's "top brass" could have access to news information via satellite. In this month's column, we have a photo of the Pentagon's rooftop installation courtesy of Potomac Satellite Systems of Arlington, Virginia. One system is dedicated to the reception of CNN news and is a gift to the Department of Defense from Ted Turner. The second system gives the U.S. Air Force TV Center the capability of viewing Soviet TV by accessing the Atlantic-based Gorizont satellite. Both earth stations have horizon-to-horizon tracking capabilities so that each system can access any satellite within view from its Washington D.C. location. The Pentagon's earth station installation consists of a pair of Comtech 3.8 meter parabolic antennas, Harris 80 degree LNAs, and Automation Techniques receivers. The CNN service can be accessed from anywhere in the Pentagon. The second system, which can tune in to international satellite transmissions, can only be seen in certain limited areas within the building.

The Department of Defense has also initiated an ambitious new service that uses satellites to deliver American TV programs via satellite to U.S. servicemen and their families located at U.S. military installations around the world. The satellite edition of the Armed Forces Radio Television Service (AFRTS) is first relayed from its west coast production center to the RCA Satcom IR bird at 139 degrees west longitude, transponder 20. This satellite can be accessed by



AFRTS SATNET Service logo.

military bases in Panama, Puerto Rico, and Guantanamo Bay, Cuba.

To extend the AFRTS service into locations beyond North and Central America, the Intelsat uplink facilities at Andover, Maine intercept Satcom IR's transmissions and relay them across the Atlantic via INTELSAT IV FB at 1 degree west longitude, transponder 5. American military bases in Keflavik, Iceland and even Diego Garcia in the Indian Ocean can now view the service (see chart). Plans call for the addition of a second INTELSAT satellite before the end of the year. This satellite will be stationed over the Pacific Ocean and will provide the AFRTS service to members of the Armed Forces in Korea, the Philippines, and Japan.

Once the Pacific link in the AFRTS "SATNET" program is in place, the service will become the first global TV system, allowing worldwide reception of U.S. television for around 10 hours daily. This is quite

an improvement over the previous AFRTS system, which consisted of shipping video-tapes to overseas military bases. Sometimes there would be delays of a week or longer before tapes of news, sporting events, and entertainment programs would reach their intended destinations. Realizing that the immediacy of certain events required a more direct means of viewing than hand-delivered video cassettes, AFRTS began to relay some programming via INTELSAT to overseas personnel in Europe.

With the initiation of INTELSAT's international lease services program, it became possible for the Department of Defense to use INTELSAT to access a number of locations simultaneously and on a regular basis. The present AFRTS SATNET service began operation during the Christmas holidays of 1982 and is limited to news and sporting events. Entertainment programming is still being sent via video cassettes.

Some entertainment programs do creep in, however, justified as serving certain news functions. *The Tonight Show* is regularly sent via satellite, for example, because Johnny Carson's monologue is considered topical news: *Solid Gold* is another regular, because of their musical review of the top ten songs of the week. A similar rationale is behind the airing of *Entertainment This Week*, a compilation of segments of the independent TV program *Entertainment Tonight*. Most of the rest of the AFRTS programming schedule is a mix of network TV news, PBS news, weekend sporting events, and Turner Broadcasting's CNN. (See program chart).

### Armed Forces Radio Television Service (AFRTS)

#### Weekday Program Schedule

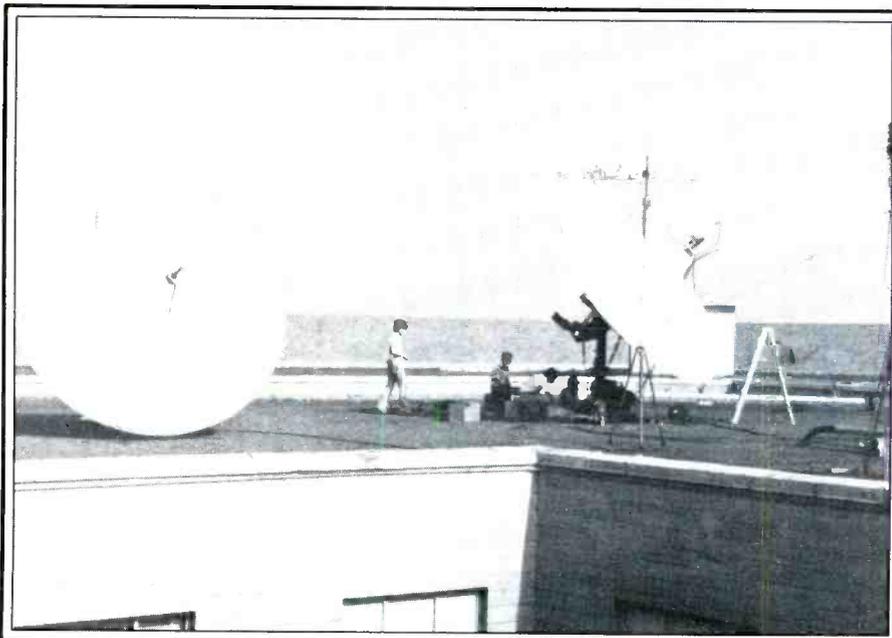
Time	Program
14:00	The Today Show (NBC)
16:00	Cable News Network (CNN)
18:00	varies
19:00	varies
20:00	varies
22:00	Advisory Block
22:15	Armed Forces Digest
22:20	Paul Harvey (ABC)
22:30	ABC World News Tonight
23:00	NBC Nightly News
23:30	CNN News
02:30	MacNeil/Lehrer (PBS)
03:00	CNN Sports
03:30	The Tonight Show
04:30	Nightline (ABC)
05:30	Sign off

#### Weekend Programming

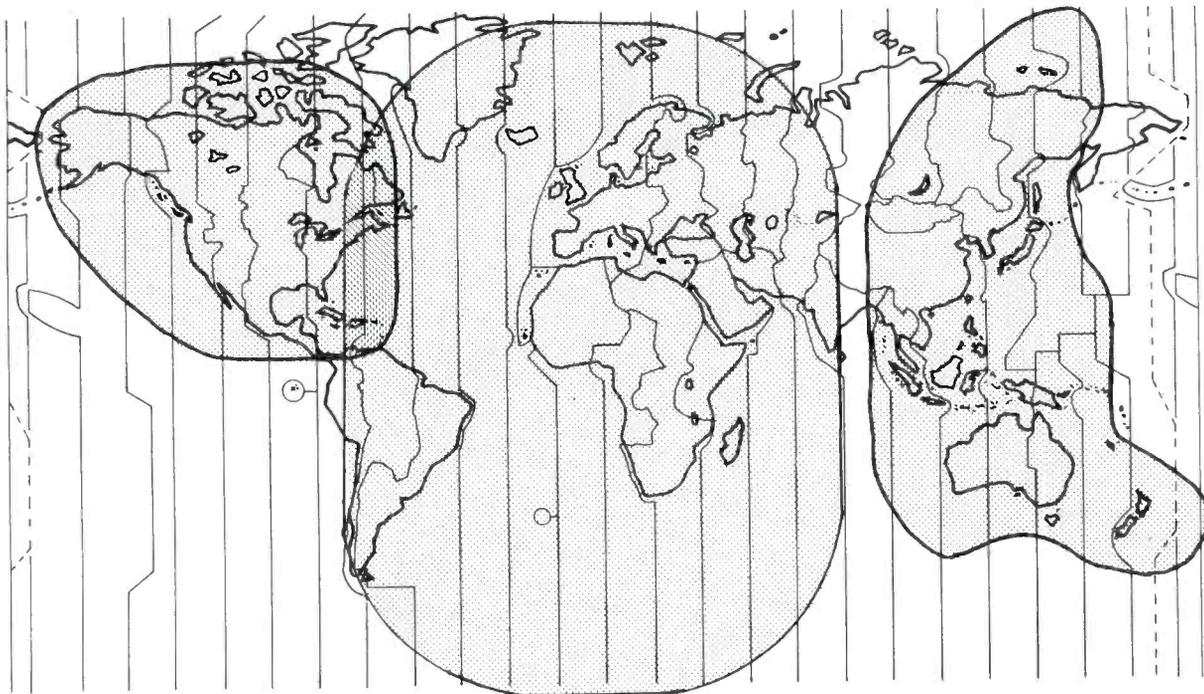
Time	Program
17:00-22:00	Sporting events
22:30	NBC or ABC Evening News
02:30	NBC Monitor (Sundays)

(All times are GMT/UTC)

The Pentagon's rooftop TVRO installation. (Photo courtesy of Potomac Satellite Systems)



## AFRTS 'SATNET' INTERNATIONAL TV SERVICE



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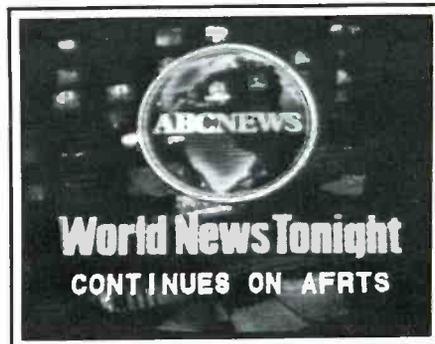
Frequency Range	: 3-30MHz (3 bands; 3-7MHz, 7-14MHz, 14-30MHz)
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RF Attenuator	: 10dB
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Output Impedance	: Low (50-Ohm) & High (1k-Ohm)
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ABC World News Tonight is relayed around the world by AFRTS at the same time we see it here.

News broadcasts are usually sent out as they are released by the networks. There is something reassuring about being able to sit down to the latest edition of the *CBS Evening News* with Dan Rather, even if it is 3:00 a.m. in Diego Garcia! The programs are uncensored and unedited, except for the removal of commercials.

During commercial breaks, AFRTS will insert their logo or occasionally will run public service announcements of their own. Many other programs like *Meet the Press*, *Firing Line*, *Sixty Minutes*, *NBC Monitor*, and *This Week with David Brinkley* are tape delayed. There are also special programs for the military. One series entitled *In Defense of Freedom* carried special segments directed toward the Army, Air Force, Marines, and Coast Guard.

WED 11 MAY 83 4 OF 8  
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**NOT CLEARED FOR PANAMA**

**MACNEIL/LEHRER WILL BE  
 TAPE DELAYED UNTIL  
 0530 UTC. (MORE)**

A program advisory block is run daily to notify member stations of programming changes.

The regular schedule of AFRTS is often interrupted by special events that are beamed live across the planet. The Super Bowl, the World Series, the Miss America contest, and the Academy Awards are all available via AFRTS.

Currently, SATNET carries about 10 hours of programming per day. Eventual plans call for the expansion of AFRTS by 1985 to 92 hours of U.S. TV per week, including a full selection of entertainment programs.

AFRTS has attracted considerable interest among international entrepreneurs within the home satellite TV industry. For the first time, American TV programs are available via satellite at locations around the globe. Whether in Europe, South America,

Africa, Asia, or the South Pacific, American TV is there for the taking. And just what does it take?

The Atlantic-based INTELSAT bird at 1 degree west transmits the SATNET service currently on transponder 5 via a global beam pattern. Using a full transponder and 6.8 MHz audio subcarrier, AFRTS-Atlantic has an estimated beam-center of only around 22-23 dBW dish size, for reception of such a weak signal would be a minimum of six meters, with 7.5 meters actually being necessary in most locations. And that's while using a 75 degree noise temperature LNA! A 25 foot terminal doesn't come cheap, limiting access to Arabian sheiks and the other well-to-do of the world. Still, it's a beginning, and as newer satellites are used to relay AFRTS, the staunch requirements for an operable earth station could come down. Plans for the Pacific Ocean service now call for use of a full transponder on hemispheric beam, which could bring the dish size down to the 5 meter class for reception in that part of the world. We will try to keep you informed as events concerning AFRTS unfold.

We began this month's column with a note on how the Pentagon can watch the *Moscow Evening News* whenever it proves necessary. With the initiation of AFRTS, you can bet that the Kremlin is now accessing that service as well via the Dubna downlink facilities north of Moscow. As you can see from the world chart, the AFRTS foot-

print extends well into the East European portion of the Soviet Union. So now perhaps even Andropov is getting his news updates courtesy of CNN!

If you would like to learn more about satellite television, *The World of Satellite Television* by Mark Long and Jeffrey Keating is available from: Solar Electronics, 156 Drakes Lane, Summertown, Tennessee 38483. The price is \$9.95 plus \$1.00 for shipping and handling. Also available: International Satellite Coordinates Computer Printout. (When ordering please specify your site latitude and longitude.) Price: \$5.00. Dielectric Insert for reception of international satellites; price: \$17.95.



AFRTS logo run instead of the network commercial announcements.

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 <p><b>G.I. AVIATION SUNGLASSES</b>        Shatterproof lenses made to government specifications. Adjustable nose rest and earpieces. Please specify white gold or yellow gold plated frames.  <b>PC4-1070..... \$34.75</b></p>	<p><b>EASY TALK TRANSCIEVERS</b>        Lightweight voice activated/push-to-talk personal radio communicators. The PRC-1 is a waist pack with an attached headset. The PRC-2 is completely housed in the headset. Service area is 1/4 mile or approximately 400 meters. Uses 9 volt alkaline battery. Ideal for security, drug monitoring, surveying, coaching, hunting and all outdoor activities. Weighs only 9 oz.  <b>PC5-1324 PRC-1..... \$59.95</b>  <b>PC5-1325 PRC-2..... \$59.95</b></p> 	<p><b>DOG TAG SET</b>        Two stainless steel tags complete with 24" and 4" chains and silencer kit. Supply the following information: last name, first name, middle initial, social security number, blood type and religion.  <b>PC1-1176..... \$5.95</b></p> 
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CIRCLE 28 ON READER SERVICE CARD

# SCANNER SCENE

BY CHUCK GYSI, N2DUP

## MONITORING THE 30 TO 512 MHz "ACTION" BANDS

**R**epeaters—also known as relay stations or mobile relays—enable radio communications to occur over a much larger area than conventional simplex communications.

Sometimes in our efforts to present technological innovations, we forget to tell about the basics. Thus, this column will discuss what repeaters are, why they are used, who uses them, and how you can tell if a repeater is being used. With the many radio hobbyists I have met over the years, I often find myself trying to explain about repeaters when talking about a particular radio system. Hopefully, this column will help you understand repeaters.

First, let's take a look at the various ways in which radio communications generally occur. The simplest form—simplex—was probably the most common usage until recent years. With a simplex system, the base station and all mobile and portable (walkie-talkie) units operate on the same frequency.

The simplex system generally is fine for local communications and is predominate in rural areas where there are less obstructions to radio signals than in urban areas. Also, there is a lack of repeater service in many rural areas, meaning a simplex system is the only route for radio communications.

Although not generally used anymore, duplex systems employ two radio frequencies to carry out communications. In a duplex system, the base station transmits on one frequency, while the mobiles transmit on another frequency. Thus, the scanner owner will need to listen to both frequencies to hear both sides of the conversation. Examples of duplex systems still in operation include the Los Angeles County Sheriff's Office on the 39 MHz band and the Montgomery County, PA, police radio system. This system prevents patrol cars or other users of the frequency from communicating to each other on the dispatch channel if it is duplex. The units usually have a simplex channel they can switch to communicate with each other, however.

In a true duplex system, the radio operator can transmit and receive at the same time. The best way to describe this kind of system is that it is like your telephone at home—you can listen to the person you are talking to at the same time you are talking. Duplex systems are used primarily in the mobile radio services for mobile telephone service. You've probably listened in on the 152 MHz or 454 MHz band and you are able to hear both sides of the conversation—so can the users of the mobile phones. To prevent interference to the receiver of a mobile phone user while he or she is transmitting at the same time, a device known as a duplexer is employed.

A repeater system, in essence, is a two-

frequency simplex system. The mobile and portable units transmit on one frequency and are retransmitted on another frequency. Thus, a repeater is a combination receiver and transmitter.

Repeaters generally are placed at the highest possible location, such as a mountain top or the top of a tall building. For instance, in the Los Angeles area, major repeater sites are located at peaks such as Mount Lukens and Mount Disappointment; in the New York area—on the Empire State Building, the World Trade Center, the Woolworth Building and a hill in West Orange, NJ; in the Philadelphia area—in the Roxborough section, Wyndmoor and Pine Hill, NJ. The higher the repeater station is located, the better it is able to receive mobile signals from a larger area. The higher site also allows the repeater transmitter's signal to reach in the farther areas.

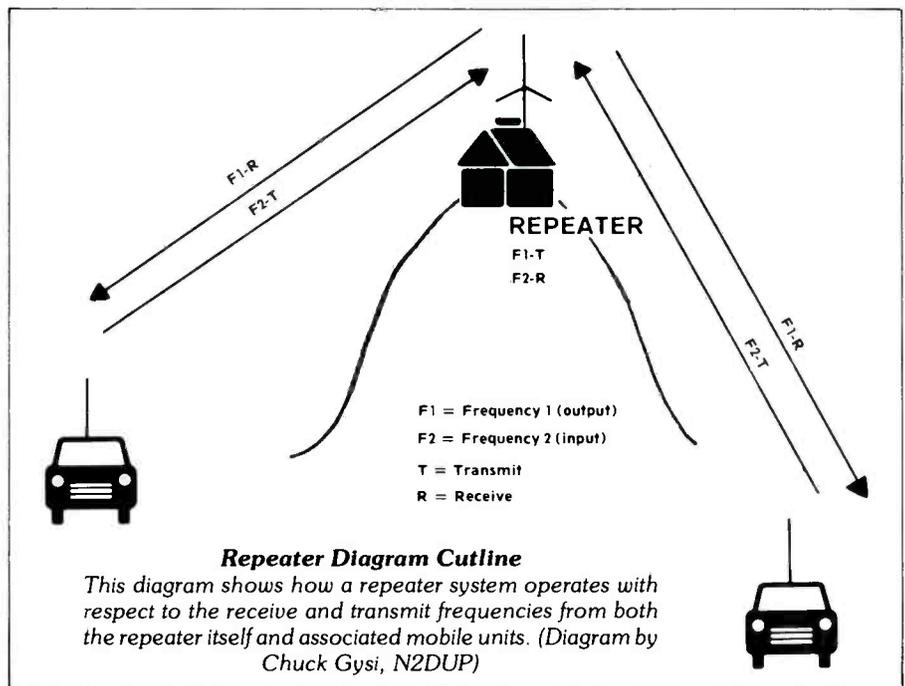
Although the receiver generally is located at the same site of the transmitter, it could be located in a different location or there even could be a series of receivers at various points feeding into the repeater. The satellite receivers usually feed their signals to the transmitter via UHF or microwave radio links or by telephone landlines. By placing another receiver at a farther point, mobiles from farther away and low power portables will be able to be heard better. Satellite receivers generally are used only in wide-area or statewide systems, police systems that cover large areas, mobile telephone service, TV and radio remote broadcast, and amateur radio repeaters. Sometimes all the re-

mote receivers and a series of repeaters are linked, enabling communications anywhere in the coverage area. The FBI and turnpike authorities usually have systems like this.

Repeaters are employed by almost every radio service, although there are restrictions on what frequencies they can operate on in the various services. For instance, business radio users can operate repeaters only on UHF or the 800 MHz band. Low and high-band channels are strictly simplex.

Generally, there are few repeater stations on low band (30-50 MHz) in the continental United States. Some police departments, for instance, may have placed a repeater on the air on low band many years ago and have kept it in operation. One area where repeaters are used a lot on low band is South America, and often during band openings you will hear these stations communicating in Spanish. One South American repeater that can be heard often in the United States is the national park in Caracas, Venezuela, on 39.18 MHz.

On UHF, from 450-470 MHz, the repeater's output frequency is 5 MHz lower than the frequency on which it receives mobiles. For instance, a mobile will transmit on 458.900 MHz. The repeater will hear the signal on that frequency and will retransmit the signal on the output frequency, 453.900 MHz. In the 450-470 MHz band, repeaters usually operate on 450-455 MHz and 460-465 MHz. The associated mobiles operate on 455-460 MHz for the 450-455 MHz band, and on 465-470 MHz for the 460-465 MHz band. There really is no need to lis-



ten to the channel the mobiles are transmitting on, because it is being retransmitted with more power on the repeater's output frequency.

One thing to take note of, however, is that in some UHF and even VHF systems, mobiles and portables may have the capability to "talk around" the repeater. This means the radio is set to transmit on the repeater's output channel, but is not being retransmitted by the repeater because it is not transmitting on the repeater's input channel. Thus, some police departments on a stake-out may switch over to the talkaround channel so their sensitive communications are not retransmitted by the repeater channel for all to hear. Only those within the short range of the portable or mobile units will actually hear the talkaround communications. It also should be noted that there really is no formula for determining repeater input and output frequencies on VHF. Although there are mobile-only channels that are available for public safety agencies to use as repeater inputs, they aren't always used. Thus, a repeater sometimes may wind up retransmitting another repeater's signal if its output is on the other repeater's input frequency.

It should also be noted that on the metropolitan UHF-T bands from 470-512 MHz, the mobiles operate 3 MHz higher than the repeater's output, and on the 800 MHz band, mobiles operate 45 MHz lower than the repeater output.

On the UHF business band from 461-465 Mhz, you will often hear many users using the same repeater station. For instance, you might hear garbage trucks, road service, pizza delivery, a detective agency, and more all using the same channel. How do they do this?

Usually the different users rent repeater time from a radio service company. In some major metropolitan areas, there may be as many as 30 users on one UHF repeater channel. However, they won't hear each other using the repeater because each user is assigned a sub-audible coded tone that each of the mobiles automatically transmit each time the microphone is keyed. While the listener really doesn't hear these tones—called Channel Guard, Private Line and tone squelch by manufacturers—they enable the user's radio to remain silent from any other communications unless someone with the same tone as his or her group is transmitted.

In many areas, on these "community repeaters," you might notice a uniform unit-numbering system. The office or dispatch center of the user may be assigned a number such as 100, 200, or up to say 2900, and the mobile units use numbers such as 101, 102, 2901, etc. The office of a radio user can be connected to the repeater two ways—either by telephone lines or by radio on the repeater's input frequency. When radio is used to connect the office with the repeater, usually a low power base station is used in conjunction with a directional Yagi antenna pointed right at the repeater.

How do you tell if you are hearing a repeater? First, listen to the signal. When the

user lets go of his microphone button to stop transmitting, you will hear the click, but the repeater will probably still be transmitting for a few seconds. Thus, you will hear another "squelch tail" when the repeater stops transmitting. Also, if you hear mobiles all the time with crystal-clear clarity regardless of where the mobiles are, then you are probably hearing the signals through a repeater.

## Torch News

Readers in southern California and those who intend to attend the 1984 Summer Olympic Games in the Los Angeles area should take note. The FCC has granted special permission to ABC-TV and the Los Angeles Olympic Organizing Committee to use frequencies in the 482-488 MHz and 500-506 MHz bands for communications during the Games. While those T bands are unused in southern California, both the committee and ABC-TV sought the special permission because of the number of radios that would

be used during the Games and because of the unavailability of radio frequencies in the Los Angeles area. It also should be noted that the U.S. Olympic Committee was granted permission about two years ago to use the frequencies of 457.525 and 457.600 for coordination of the Games.

## Mailbag

Many readers have written in for the address of Hamtronics Inc., which was mentioned in a previous column. If you send them your name and address, you'll receive a catalog that contains scanner converters and preamps and gear such as repeaters, receivers, exciters, amplifiers, filters, transceivers, and transmitting and receiving converters for hams. They also carry a special space shuttle receiver kit. The items are handy for both hams and scanner enthusiasts. Their address is: Hamtronics Inc., 65 Moul Road, Hilton, NY 14468-9535.

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CIRCLE 80 ON READER SERVICE CARD

# The KFRC Story

*FM Broadcasting In Motion*





While last-minute details are checked out before a flight, the repeater used to relay the mobile studio's signal to the receiver sites sits snugly behind the pilot's seat. The VHF walkie-talkie on top of the plane's instrument panel is used to communicate with the mobile studio and the station's main studio. (Photo courtesy of KFRC)

KFRC's unique custom-built repeater sits outside the airplane prior to a flight. The top part is the 450 MHz transmitter and the bottom part is the 455 MHz receiver. Also note the quarter-wave UHF antenna mounted on the bottom of the plane for the repeater. (Photo courtesy of KFRC)

## BY CHUCK GYSI, N2DUP

**C**an you rent satellite time for \$37 an hour?

Ask Phil Lerza, chief engineer of radio station KFRC in San Francisco, and he might say it's possible—if you build the satellite yourself.

When the Bay Area AM station decided to try broadcasting from its mobile studio while driving on the freeway, they were faced with the problem of getting a full-quieting signal back to the main studio. The station had carried out remote broadcasts from stationary positions before, but broadcasting while in motion created a new challenge.

The 450 MHz UHF band was used for the remote broadcasts because of its high fidelity, Lerza said. However, UHF signals tend to be line of sight and that would create problems if it were used while in motion for broadcast purposes. The station could have used a satellite to relay the signal from the mobile studio back to the station, however, the cost would be prohibitive and the amount of necessary equipment would be three times the size of the mobile studio, Lerza explained.

So, the RKO General Inc. station decided to launch its own line-of-sight satellite—a custom-built UHF repeater *aboard an airplane!* Lerza, who is active on the ham bands as WB6RFU, and is also a licensed pilot, put flying and radio together and came up with a way to relay the broadcasts from the mobile studio back to the station in an effective manner.

"We built the repeater," Lerza stated in an

*The KFRC mobile studio sits alongside San Francisco Bay. When operation is not possible through the airplane repeater, the Yagi antenna mounted on the pole can be raised, as shown, and pointed at a receiver site.*  
(Photo courtesy of KFRC)

interview with *POP'COMM*. Using components from Moseley Associates Inc., the 15 watt repeater fits into a box about 20 inches by 8 inches, Lerza said, and hides snugly behind the pilot's seat on the Cessna 172 he pilots. Because the voltage on the airplane is 24 volts, a converter was added to convert to 12 volts for the repeater.

The entire operation of installing the repeater on the airplane takes a maximum of 10 minutes, according to Lerza. In fact, three planes have been outfitted with quarter-wave UHF antennas and BNC connectors so any of the craft may be used. And as Lerza said, it costs the station only \$37 an hour to rent the small airplanes.

From the airplane, which relays the 455 MHz signal from the mobile studio onto the 450 MHz band, the signal is picked up by one of two remote sites and sent back to the studio via telephone lines.

One of the remote sites is in San Francisco and the other is in the Oakland Hills, at the home of one of Lerza's ham friends. A third site should be added this year. From the main studio, engineers are able to spin the remote receivers' antennas a full 360 degrees to track the airplane, and telemetry equipment is used to help locate the signal. The airplane, meanwhile, needs to stay within a 5 mile radius of the mobile studio. Lerza said he usually flies at an altitude of about 3,500 feet; however, he has flown as high as 8,500 feet with the repeater system in operation. "The repeater operation has been very, very good," Lerza commented.

The system also has fail-safe maneuvers added in case of repeater failure. The mobile studio is equipped with a 10 watt transmitter that feeds into a 100 watt linear amplifier. If for some reason, the plane should lose the mobile studio's signal, the crew can pull over and raise a tower on the mobile studio's roof that is equipped with a 10 dB gain Yagi directional antenna. The antenna is then pointed at one of the receiver sites and is fed

directly, as was done previous to when the station started using the air repeater. And when the signal can't make it out of a tunnel and back to the plane, the main studio cuts in and plays a song until the mobile unit emerges from the tunnel.

To keep everything in sync between the airplane, the mobile studio, and the main studio, a 161 MHz radio system is employed.

The mobile studio is fully equipped and has all the comforts of the station's main studios. Every time the station records tape cartridges for jingles and music, they cut two—one for the main studio and one for the mobile studio.

One of the best advantages of the mobile studio is its visibility. The 26 foot GMC motor coach can be seen on many roadways in the Bay Area and at many special events. Lerza said people will be driving down the road, see the mobile studio, and say: "My God, there's the DJ on the radio!"

Usually at least three people—an engineer driver, the disc jockey, and a mobile studio coordinator—staff the unit each time it goes out. However, there may be a security person and perhaps public relations personnel from the station on board at times.

But even the traveling mobile studio is subject to encounter the fear of all motorists—the law. Lerza said the mobile studio was broadcasting from the South Bay Area one time when a police officer started following the KFRC mobile unit.

The officer, apparently listening to the broadcast on his radio, turned on his siren and proceeded to pull over the radio station's crew. "We thought he was busting us," Lerza recalled.

But what the officer didn't expect was to get a remote microphone stuck in front of his face. Dr. Don Rose, the station's morning disc jockey, then proceeded to interview the cop live.

Of the broadcasts in motion, Lerza said, "We hope to do a lot more of them."

# The Federal Protective Service

BY RICK MASLAU, KNY2GL

**T**he Federal Protective Service is a nationwide police department operated by the Federal Government within the General Services Administration (GSA).

GSA is responsible for the operation and maintenance of most of the federally controlled buildings in the United States, including the areas surrounding those buildings. This comprises some 8,500 federally owned and leased buildings.

The protection of those buildings (and their occupants) is the mission of the Federal Protective Service. Protection is provided through the use of intrusion alarm systems, electronic monitoring, entry control devices, physical barriers, and/or uniformed security personnel.

Uniformed personnel operate at fixed posts, on roving patrols, or are assigned to mobile response units and special tactical forces. In addition to preventing or deterring traditional property crimes such as theft and vandalism, the Federal Protective Service provides protection from offenses directed against persons and incidents disruptive to the normal conduct of Government business. These include real or threatened bombings, unruly demonstrations, deprivation of property, and terrorist attacks against government officials. In most locations shown on our list, where frequency 419.175 MHz is indicated, that frequency is used as a repeater input frequency.



AL	Birmingham	415.20, 419.175	Orlando	415.20, 419.175	
	Huntsville	415.20, 419.175	Pensacola	415.20	
	Mobile	415.20, 419.175	St. Petersburg	417.175	
	Montgomery	415.20, 419.175	Tallahassee	415.20	
	Tuscaloosa	415.20	Tampa	415.20, 419.175	
AK	Anchorage	417.20, 419.175	W. Palm Beach	415.20	
	Juneau	417.20, 419.175	GA	Atlanta	415.20, 419.175
AZ	South Mountain	417.20		Gainesville	415.20
	Tucson	417.20		Glynco	417.20, 419.175
AR	Little Rock	415.20		Macon	417.20
CA	Bell	417.20		Marietta	415.20, 419.175
	Fresno	417.20, 419.175		Savannah	415.20
	Laguna Niguel	419.175		Thomasville	415.20
	Los Angeles	415.20, 417.20, 419.175	HI	Honolulu	417.20, 419.175
	Mt. Diablo	415.20, 417.20	ID	Boise	417.20
	Oakland	417.20	IL	Chicago	415.20, 417.65
	Richmond	419.175		E. St. Louis	415.20
	Sacramento	417.20, 419.175		Lake Zurich	417.65
	San Diego	417.20, 419.175		Lockport	417.65
	San Francisco	168.80, 417.20, 419.175		Plato Center	417.65
	San Pedro	417.20		Springfield	417.65
	Santiago Peak	417.20	IN	Gary	417.65
	West Los Angeles	417.20		Hammond	415.20
CO	Colorado Springs	166.225		Indianapolis	415.20
	Denver	166.225, 168.575, 417.20, 419.175		Jefferson	415.20
	Golden	417.20, 419.175		New Haven	415.20
	Lakewood	166.225, 168.575, 168.80, 415.20, 417.20, 419.175	IA	Des Moines	415.20, 417.20
CT	Bridgeport	415.20, 417.20		West Branch	415.20
	Hartford	415.20, 417.20	KS	Abilene	415.20
	New Haven	417.20		Topeka	415.20
DC	Washington	162.175, 163.075, 163.175, 165.0625, 165.075, 165.175, 168.575, 168.80, 415.20, 417.20		Wichita	415.20
FL	Jacksonville	415.20, 419.175	KY	Covington	415.20
	Miami	415.20, 417.20, 419.175		Louisville	415.20, 419.175
			LA	Baton Rouge	163.175, 415.20
				New Orleans	415.20
			ME	Augusta	415.20, 417.20
				Bangor	415.20, 417.20
				Portland	415.20, 417.20
			MD	Baltimore	163.075, 419.175
				Curtis Bay	163.075, 163.175
				Ft. Meade	163.175

	Middle River	163.075
	Suitland	415.20, 417.20
	Woodlawn	419.175
MA	Andover	417.20
	Boston	415.20, 417.20
	Cambridge	415.20, 417.20
	Fitchburg	415.20, 417.20
	Hingham	415.20, 417.20
	Lowell	415.20, 417.20
	New Bedford	415.20, 417.20
	Pittsfield	415.20, 417.20
	Springfield	415.20, 417.20
	Waltham	415.20, 417.20
	Wilmington	415.20, 417.20
	Worcester	415.20, 417.20
MI	Battle Creek	415.20
	Detroit	415.20, 417.20
	Flint	415.20
	Grand Rapids	415.20
MN	Duluth	415.20
	Ft. Snelling	415.20, 417.20
MS	Greenville	415.20
	Jackson	415.20, 419.175
MO	Kansas City	415.20, 417.20, 419.175
	St. Louis	415.20, 417.20
MT	Billings	417.20, 419.175
	Missoula	417.20, 419.175
NE	Lincoln	417.20
	Omaha	415.20, 417.20
NV	Las Vegas	417.20
	National Test Site	419.175
NH	Concord	415.20, 417.20
	Manchester	415.20, 417.20
	Portsmouth	415.20, 417.20
NJ	Bellemeade	40.35, 415.20, 417.20
	Newark	415.20, 417.20
	Trenton	415.20, 417.20
NM	Albuquerque	415.20
	Sandia Crest	415.20
	Santa Fe	415.20
NY	Albany	415.20, 417.20
	Binghamton	40.35, 415.20, 417.20
	Buffalo	415.20, 417.20
	Hyde Park	166.35, 417.20
	New York City	415.20, 417.20
	Rochester	415.20, 417.20
	Scotia	40.35, 415.22, 417.20 (FD 46.20, 46.22)
	Syracuse	415.20, 417.20
NC	Asheville	415.20, 419.175
	Charlottesville	415.20
	Greensboro	415.20, 419.175
	Raleigh	415.20, 419.175
	Winston-Salem	415.20
ND	Bismarck	417.20, 419.175
	Fargo	417.20, 419.175
OH	Akron	415.20
	Cincinnati	415.20
	Cleveland	415.20
	Columbus	415.20
	Dayton	415.20
	Toledo	415.20
OK	Muskogee	415.20
	Oklahoma City	415.20
OR	Eugene	419.175
	Portland	417.20, 419.175
PA	Harrisburg	419.175
	Philadelphia	419.175
	Pittsburgh	419.175
PR	El Yunque	415.20
	Hato Rey	415.20, 417.20
RI	Providence	415.20, 417.20
SC	Charleston	415.20, 419.175

	Columbia	415.20, 419.175
	Greenville	415.20
TN	Memphis	415.20, 419.175
	Nashville	415.20, 419.175
TX	Amarillo	415.20
	Austin	164.175, 415.20
	Beaumont	415.20
	Corpus Christi	415.20
	Dallas	415.20
	El Paso	415.20
	Ft. Worth	163.125, 164.70, 415.70
	Galveston	415.20
	Houston	415.20
	Laredo	415.20
	Lubbock	415.20
	San Antonio	415.20
US	all areas	40.35, 168.80, 415.20, 417.20, 419.175
UT	Clearfield	166.225
	Ogden Defense Depot	166.225, 417.20, 419.175
	Salt Lake City	166.225, 417.20, 419.175
VI	Crown Mountain	415.20, 417.20
VA	Farmville	163.075
	Hogback Mtn.	163.075, 168.575
	Lorton	163.075, 163.175, 168.575
	Norfolk	419.175
	Richmond	419.175
VT	Burlington	415.20, 417.20
	Montpelier	415.20, 417.20
	Rutland	415.20, 417.20
WA	Auburn	163.025, 417.20, 419.175
	Chehalis	417.20, 419.175
	Richland	417.20, 419.175
	Seattle	417.20, 419.175
	Spokane	417.20, 419.175
WI	Milwaukee	415.20
WY	Cheyenne	417.20, 419.175



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## THE EXCITING WORLD OF RADIOTELETYPE MONITORING

**W**e have recently noted the steady rise in RTTY listener hobbyists, probably due to the availability of excellent RTTY lists (see August's column), synthesized stable receivers, flexible demodulators, and personal computers. All of these powerful tools have been available only in the past year, although the basic equipment could be purchased by allocating \$1500-\$4500 for a stable synthesized receiver, \$600-\$1200 for the required demodulators, and \$1800 & up for an optional personal computer.

Now, one can purchase an excellent stable receiver for approximately \$700. Good demodulators have not followed such an abrupt drop in price; however, the users options have increased. Options such as TOR (Teletype Over Radio) and FEC (Forward Error Correction) decoding are now being offered by AEA, Info Tech, Hal, and others are being introduced on a monthly basis, so features per dollar have increased in the demodulator while receiver prices have dropped abruptly. All RTTY fans benefit from such advances, creating a popular hobby.

Last month I was asked to evaluate a unique RTTY system. What made this RTTY system unique was that the complete terminal unit was implemented in software! Obviously, this cannot be true since some hardware is required to separate the mark and space tones! Not so—the mark and space tones are differentiated by counting the pulse width of each cycle and are implemented by software alone.

The name of the software package is the Egbert II RTTY/CW/Transfer program distributed by W. It Nail Company, 275 Lodgeview Drive, Oroville, CA 95965 (Phone 916/589-2043). This program changes the Apple II into a complete radioteletype system by simply booting a floppy disk. At this point in time, this RTTY program is only available for the Apple II. The instructions to receive RTTY is to connect an audio cable from the speaker in the radio to the cassette input jack on the Apple II and follow menu driven instructions. Even though this program is set up for transmitting and receiving RTTY, I will review only the receive section since the transmit portion is straightforward.

As the introduction to the Egbert program indicates, satisfactory copy is obtained when the received signal strength is high since any received QRM may cause a misprint.

If the program is to be used under noisy conditions, an audio filter such as the MFJ751 or Flesher PS-170 is desirable. An additional filter will improve the received bit error rate (BER) and allow solid copy.

The RTTY program includes menu selectable baud rates of 60, 67, 75, or 100 words per minute. Mark and space frequen-

cies can be specified by entering the actual frequency (in Hz) from a menu request. This feature is very nice due to the often odd shifts used by press RTTY and utility point to point transmissions. Shift flexibility to the maximum extent can be implemented due to the digital frequency count method used.

The usual technique used in determining mark and space frequency is to implement separate analog active filters for each frequency. For example, four individual filters are required to implement 2125 Hz (mark), 2295 Hz for 170 Hz shift, 2550 Hz for 425 Hz shift, and 2975 Hz for 850 Hz shift.

Additionally, a variable filter will be required for the unique shifts such as 350 Hz and 800 Hz shifts. This analog technique is commonly used today since the digital frequency counting scheme is fraught with problems. These problems include impulse noise susceptibility and amplitude sensitivity. An ideal frequency shift demodulator would be impervious to noise and amplitude changes-only frequency.

The trade off, then, becomes one of flexibility vs noise susceptibility when choosing an all digital demodulator design or an analog (active filter) design.

After this brief overview, lets review the all-digital demodulator performance of the Egbert RTTY program for the Apple II.

Comparing results obtained from monitoring the powerful Cuban RTTY transmission on 14901.0 kHz, the Egbert program performed well in decoding the Baudot signals. However, when fading and multipath problems cropped up, copy was poor and errors resulted.

Simultaneously, audio was directed to the Hal demodulator. Analog audio filters are used in Hal demodulators, and perfect copy was the result in spite of deep signal fades. Using a general audio filter, such as the Autek Research active filter or the MFJ filter, improvement in the Egbert/Apple II system performance improvement is significant. Assuming one has an Apple II computer, the Egbert RTTY program is certainly the lowest cost approach to flexible RTTY.

Other low cost computers, such as the Commodore, can easily be used for RTTY by using the Kantronics Interfacer. A single space toner filter is used to demodulate frequency shift keying. The software for using the Interfacer is complete and readily available. Kantronics has a newsletter which describes in detail operation of its demodulator.

Mid-range computers such as Xerox, Osborne, IBM, and other CPM systems will require a general communications program to work with a demodulator. Here, the selection of demodulation is very important since most communications software is set up for ASCII only. What is required is a smart de-

modulator to convert 5 level Baudot to serial ASCII out. The Info-Tech M600 and M200F have universal serial ASCII outputs. A selectable data rate and output code is built into the Info-Tech demodulators. Any Baudot or CW input is automatically converted to serial ASCII output. A popular arrangement is to select (using Dip switches) 300 baud data output wired into the RS232C serial port on the microcomputer. I have been using this arrangement for over a year using a Standard Communications software package (Crosstalk).

After the data leaves the demodulator in the form of ASCII, many possibilities, including message storing on floppy disk and data editing, exist. It is nice to be able to eliminate any character "hits" by editing the press data. Final printout is then very neat and orderly. Even a spelling program can be used to quickly highlight any received errors, or even correct words dynamically.

What is important is to realize the power of an RTTY demodulator coupled with a microcomputer. It is also important to understand the liability of an additional noise source created by the internal switching logic. Every digital switch creates a certain amount of radio frequency interference or RFI. Personal computers are quite noisy, especially microcomputers that were manufactured over two years ago. FCC regulations, Part 15 A and B, specify the maximum allowable RFI that a home or business computer can emit. New computers have to conform to the FCC specifications or run the risk of the FCC shutting down production.

Demodulator manufacturers, such as Info-Tech, Hal, Kantronics, and AEA take great pains to reduce digitally created RFI noise in both electrical design and physical layout. Usually a specific RTTY design will be much quieter than a typical personal computer. Even though RFI line filters can be added at a later point in time, it is still a poor solution compared to a careful overall design. Unfortunately, the buyer of a personal computer must still evaluate the RFI content in his particular listening post.

This is the reason why it's a good decision to buy a complete (demodulator and display) system from a reputable RTTY manufacturer rather than mix computers and demodulators without careful evaluation before purchasing.

### Reader Input

Harry Weber writes to inquire if any readers have information on the RTTY station JMS sending five letter code groups operating on a frequency of 16023.0 kHz at 2230 GMT. The transmission made is FSK with a speed of 50 baud, shift of 425 Hz, reverse mode. A similar transmission format is

YBV operating on 14612.0 kHz at 2245 GMT. Any reader inputs?

Eric Kern has sent us an interesting reception report. KCNA transmits a list of point to point news agencies sent between the first and fifth of the month. Each station is given a individual SINPO signal strength, interference, noise, propagation, and overall rating. Eric indicates he has copied VNA, ATA, and PL in California. Let me know what luck you have in copying this list.

**East Germany, ADN News Agency**

1000 to 1050 GMT 18823 kHz 425/66  
1500 to 1650 GMT 10543 kHz 425/66  
1700 to 1850 GMT 10543 kHz 425/66

**Bulgaria, BTA News Agency**

1300 to 1350 GMT 13400 kHz 425/66  
1300 to 1350 GMT 18210 kHz 425/66

**Poland, PAP News Agency**

0030 to 0100 GMT 11623 kHz 425/66  
0900 to 0930 GMT 17492 kHz 425/66  
1500 to 1530 GMT 9873 kHz 425/66  
2100 to 2130 GMT 7975 kHz 425/66

**North Vietnam, VNA News Agency**

0700 to 0900 GMT 15744 kHz 425/66  
0700 to 0900 GMT 18256 kHz 425/66  
1445 to 1700 GMT 10600 kHz 425/66  
1445 to 1700 GMT 13460 kHz 425/66

**Hungary, MTI News Agency**

0600 to 0650 GMT 17468 kHz 425/66

**Mongolia, Montsame News Agency**

1430 to 1450 GMT 8190 kHz 425/66  
1700 to 1900 GMT 10335 kHz 425/66

**Albania, ATA News Agency**

1530 to 1600 GMT 9430 kHz 425/66  
1700 to 1830 GMT 9430 kHz 425/66

**Cuba, PL News Agency**

0800 to 0950 GMT 8140 kHz 425/66  
0800 to 0950 GMT 12230 kHz 425/66  
2200 to 2400 GMT 18193 kHz 425/66

**Yugoslavia, Tanjung News Agency**

0900 to 1000 GMT 7658 kHz 425/66  
0900 to 1000 GMT 12048 kHz 425/66  
0900 to 1000 GMT 16343 kHz 425/66  
0900 to 1000 GMT 19605 kHz 425/66  
1100 to 1200 GMT 7658 kHz 425/66  
1100 to 1200 GMT 12048 kHz 425/66  
1100 to 1200 GMT 16065 kHz 425/66  
1100 to 1200 GMT 16343 kHz 425/66  
1300 to 1400 GMT 7658 kHz 425/66  
1300 to 1400 GMT 12048 kHz 425/66  
1300 to 1400 GMT 12315 kHz 425/66  
1300 to 1400 GMT 13440 kHz 425/66  
1600 to 1700 GMT 7658 kHz 425/66  
1600 to 1700 GMT 9950 kHz 425/66  
1600 to 1700 GMT 10438 kHz 425/66  
1600 to 1700 GMT 12048 kHz 425/66  
1730 to 1800 GMT 5240 kHz 425/66  
1730 to 1800 GMT 7658 kHz 425/66  
1730 to 1800 GMT 7806 kHz 425/66  
1730 to 1800 GMT 7996 kHz 425/66  
1900 to 2000 GMT 5240 kHz 425/66

1900 to 2000 GMT 7596 kHz 425/66  
1900 to 2000 GMT 7658 kHz 425/66  
1900 to 2000 GMT 7806 kHz 425/66  
2100 to 2200 GMT 5240 kHz 425/66  
2100 to 2200 GMT 7658 kHz 425/66  
2100 to 2200 GMT 7806 kHz 425/66  
2100 to 2200 GMT 7996 kHz 425/66

**Angola, Agerprese News Agency**

0730 to 0830 GMT 21807.5 kHz 425/66  
1100 to 1230 GMT 21807.5 kHz 425/66

**Czechoslovakia, Ceteka News Agency**

0630 to 0730 GMT 13597.5 kHz 425/66  
0630 to 0730 GMT 17525 kHz 425/66  
0800 to 0845 GMT 13467.5 kHz 425/66  
0800 to 0845 GMT 18985 kHz 425/66  
0920 to 1000 GMT 17525 kHz 425/66  
0920 to 1000 GMT 19525 kHz 425/66  
1030 to 1130 GMT 13597.5 kHz 425/66  
1030 to 1130 GMT 18985 kHz 425/66  
1320 to 1400 GMT 13597.5 kHz 425/66  
1320 to 1400 GMT 13647.5 kHz 425/66  
1630 to 1730 GMT 9353 kHz 425/66  
1630 to 1730 GMT 13597.5 kHz 425/66  
1800 to 1900 GMT 7577.5 kHz 425/66  
1800 to 1900 GMT 9383 kHz 425/66

This listing of Communist news services and their RTTY skeds/frequencies was recently transmitted by the station of the Korean Central News Agency, Pyongyang, North Korea. It represents the services they normally receive at that station.

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Please send all reader inquiries directly.

## ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

### Short Range Communications

**I**t has become a part of a way of life with most of us to feel that *bigger* is synonymous with *better*. If a 308 c.i. engine is good, then a 427 c.i. engine is bigger and also better. Right? If a check for \$100 is good, then one for \$500 is also both bigger and better. If a 5 watt transceiver is good, then adding a linear amplifier to the rig to make it hit the airwaves with 250 watts makes it sound bigger and better. You get the message.

The fact is that there are times when *smaller* is better—like when you get your electric bill in the mail or when you've got to dig a hole to plant a shrub. Another time when smaller is better is when you want to insure an extra degree of communications privacy. If you only need to communicate over a 1/2-mile, and actually aren't particularly interested in having your communications monitored by others located in other areas, then bigger isn't better, and a 250 watt linear amplifier will be less suited to your purposes than the plain "barefoot" lower power transmitter. That's one of the things which immediately attracted me to the new low powered "hands free" radio transceivers that have recently appeared on the shelves in communications shops. They've got built-in privacy since their normal operating range is rated at 1/4 to 1/2-mile, and any Survivalist will (or should) quickly see that such equipment has definite potentials, especially when coupled with other features such as low cost, lack of need for an FCC license, small and lightweight design, and freedom to use both hands for other tasks while transmitting/receiving.

The average price of many of the transceivers of this breed of equipment seems to be between \$50 and \$75 per set. The equipment doesn't need any FCC license because it operates under Part 15 of the FCC Regulations (low powered communications) in the 49 MHz band.

My feeling was that these sets could be deployed at a Survival encampment for inter-communication between the main base and others connected with and working around the encampment doing patrol, maintenance, and various other tasks. They can be used to dispatch as well as to summon, and they can be used during practice drills as well as during maneuvers. Although my own group isn't into simulated war games, I could easily see them used for that purpose too.

After looking over the various makes and models available (and I must admit that they all looked nice), I settled upon the Command Call transceivers made by Cobra Division of Dynascan Corp., 660 West Cortland St., Chicago, IL 60635. I liked the way the sets looked and their quality construction, and also that they are name brand units that



The Cobra Command Call is a two-way FM transceiver operating on 49 MHz.

are available nationally. Also, I've had excellent results with other Cobra gear in the past, and that means a lot when shopping around for any equipment.

The Command Call units have a convenient belt clip and are about the size of a pack of cigarettes. The sets clip into place and then a headset consisting of an earphone and microphone is put on. Once you've got the unit thus installed on your person, you're all set. You have the choice of operating with the standard push-to-talk transmit/receive feature, but you can also instantly switch over to hands-free VOX (voice actuated transmitter) mode—when you speak the set transmits, when you stop speaking the set receives. A switch (three-position) on the set permits adjustment of the microphone sensitivity; a similar switch adjusts the receiver's volume. There's also a PTT (push-to-talk) switch.

This 49 MHz band has five channels:  
 Channel A 49.83 MHz



These hands-free communicators, as they are called, are ideally suited to many survivalist applications.



As you speak into the microphone, you can hear your own voice in the headset.

Channel B	49.845 MHz
Channel C	49.86 MHz
Channel D	49.875 MHz
Channel E	49.89 MHz

The units I'm using operate on Channel E, and the operating mode is FM.

Antennas on the Command Call are 17 inch whips and are clipped into holders and bent into a secure position for safe storage when the sets aren't in actual use. They easily unclip for operation and spring into a vertical position. If you don't mind a 25% reduction in operating range, you can even leave the antennas clipped down while transmitting and receiving; if you're operating in a heavily wooded area, you may find that leaving them clipped down will provide you with fewer encounters with tree branches than with the antenna extended. Not that such encounters will damage anything, but the sound of the antenna on the tree branches gets to be distracting after a while.

In operation, the Command Call sets have excellent audio while in transmit or receive mode. When you're transmitting, you can hear your own voice coming through the headphone; that gives you a clear indication that the battery is still good and that you're speaking loudly enough to be heard. For best results, the manufacturer suggests the use of an alkaline type battery (it takes one 9 volt type).

We found that in our encampment area (heavily wooded), there was no problem achieving 1/2-mile two-way range. On the base station scanner (which was running a 6 meter band Cushcraft Ringo Ranger up 25 feet), we could monitor the Command Call sets from almost a mile away; this is quite a bit further than the sets can communicate with one another.

Construction and design of the Cobras lives up to expectations—in fact, the little set

has a dual conversion receiver! Sensitivity (for 20 dB quieting) is  $\frac{1}{2} \mu V$  (minimum), and it has 20 dB (minimum) spurious and image rejection. The entire transceiver weighs only 9 ounces.

The Command Call units were popular with our group as soon as we unpacked them from their boxes, and they went from box to "in service" within the minute or so it took to install the battery in each set. They are so deliberately simple to operate that they are practically self-explanatory, although Cobra does provide an instruction book and schematic just in case anybody does have questions.

All in all, we'd venture a guess that the era of "hands-free" communications transceivers will be a boon to those interested in Survivalist communications. If you're a person who can appreciate what a cordless telephone is in relation to a regular telephone, then you can appreciate that the hands-free transceiver is, in effect, a cordless intercom. If you've got a short-range tactical communications job, then I'd suggest that you check in with a nearby communications shop and give the eyeball to some of these units. You may be able to think up several uses that have not occurred to me. If you do, please write and let me know! Cobra, of course, suggests a number of applications which have nothing to do with Survivalist communications, including backpacking, hiking, biking, cross country skiing, sailing, fishing, camping, hunting, construction, road repairs, inventory, athletics, security, jogging, etc. We even met someone who uses them between racing car and pit crew!

### Rules For Private Radio Services Now Available From GPO

Licensees in private radio services may now order the latest edition of the FCC rules from the Government Printing Office (GPO).

This new edition contains (in one paperback volume) the following FCC rule parts, updated to October 1, 1982.

- Part 81-Maritime stations on land
- Part 83-Maritime stations on shipboard
- Part 87-Aviation services
- Part 90-Private land mobile radio services
- Part 94-Private operational-fixed microwave service
- Part 95-Personal radio services
- Part 97-Amateur radio service
- Part 99-Disaster communications service

It may be purchased from GPO as "47 CFR, Part 80-End" (stock number 022-003-95085-1) for \$9.00.

The other three volumes of 47 CFR, also revised as of October 1982, include Parts 0-19 (\$8.50), Parts 20-69 (\$9.00), and Parts 70-79 (\$8.00).

Mail orders should be sent with checks payable to: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Phone orders and inquiries may be made at (202) 783-3238. No copies of these rules are available from the FCC.

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**76-093**

# The New York City Police Department

*Latest Frequency Changes! It's All UHF Now!*



BY RICK MASLAU, KNY2GL

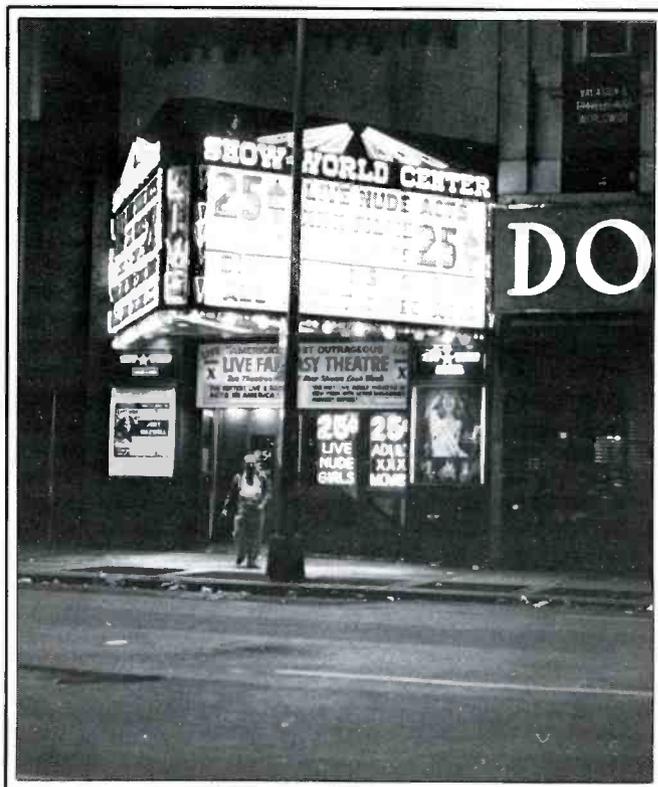
**T**he New York City Police Department was one of the earliest major law enforcement agencies to take advantage of radio communications and its ever-changing radio system has been through many evolutionary stages.

In the early 1930's, various station rosters published for monitors listed the agency with three base stations on 2.450 MHz. By the late 1940's, the agency had moved to the VHF low band, although this was just a temporary stopping point on the way to the VHF high band. By the late 1950's most of the NYPD's operations had moved up to the 155 MHz band.

Several years ago, the agency had received FCC authorization to shift its busy operations to the UHF "T" band, although it took a rather long time for the entire agency to actually shift to the new frequencies. For quite some time the NYPD's communications remained mostly on the VHF high band, with some isolated units shifting to the new frequencies as the agency's budget permitted the purchase and installation of the newer equipment. At this point it looks as though the agency has finally shifted all of its activities to the new frequencies.

The latest update on the new frequency allocations was provided to us by reader Tom Lewandowski, Registered Monitor KNY2NI, of Staten Island, New York. Tom is a retired New York City police officer and is an avid monitor of their communications operations. We thank him for providing this information. We also include with Tom's frequency data the current signals and codes used by the NYPD; these were furnished to us by reader Max Wilkinson, Monitor KNY2SG, of Forest Hills, N.Y.

The main call sign for the NYPD is KOP911, although some additional call signs are assigned for specific transmitters.



## New York City Police Department Frequencies

Frequency	Division	Precincts
476.5625 (Manhattan)	1	1, 5, 7, 9
.3375	2	6, 10, 13
.5875	3	MTS, 17, MTN
.3125	4	19, 20, CPP, 23
.3625	5	24, 26, 30
.8875	5	34
.6375	6	25, 28, 32
477.0625 (Bronx)	7	40, 44
476.9625	21	42, 46, 48
.9125	8	41, 43, 45
.6625	9	47, 50, 52
.4625 (Brooklyn)	10	60, 61, 62
.4125	11	68, 72, 76, 78
477.0875	12	67, 69, 71
476.8625	24	63, 66, 70
.9875	25	73, 75
.7875	13	77, 79
.7625	14	84, 88, 90
477.1375	26	81, 83, 94
.1125 (Queens)	22	103, 105, 113
476.4875	16	107
.9375	16	109
477.0125	16	111
476.8125	17	110, 114
477.0375	23	104, 108, 112
476.5375	15	100, 101, 102, 106
.6125 (Staten Island)	2	120, 122, 123
470.8375	18	Traffic/S.O.D.
476.7375	CW 1	Man/Bx
.6875	CW 2	Bklyn./Qns/SI
470.8625	CW 3	Specialized CMD

(CW = Citywide)

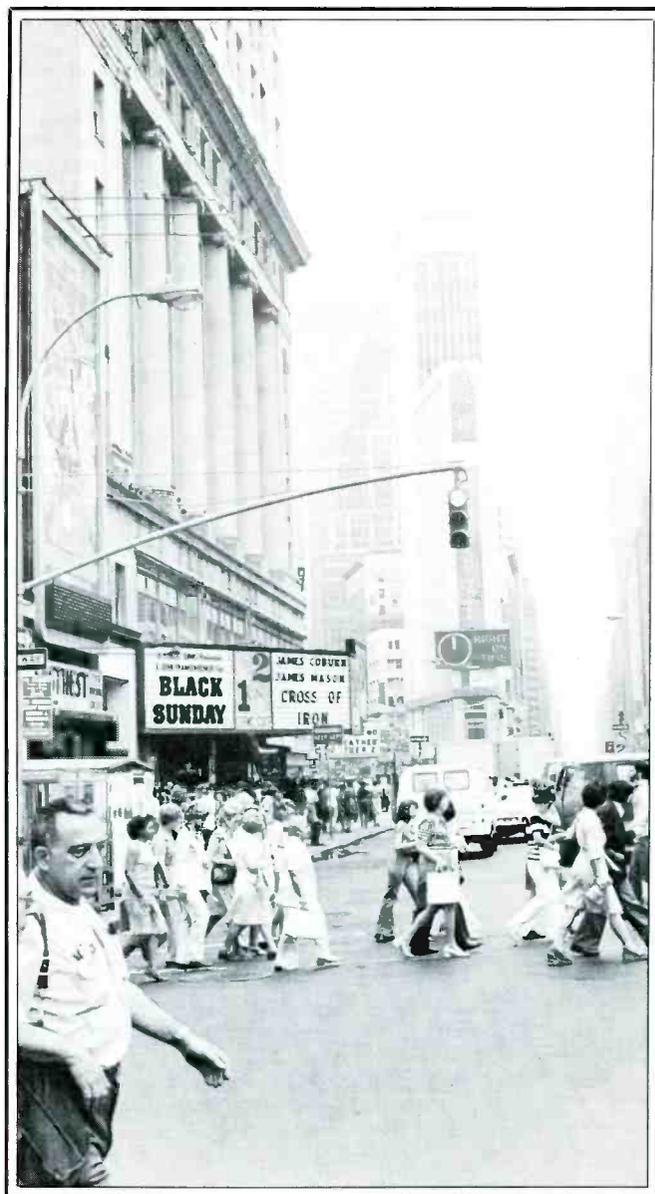
### Note:

MTS = Midtown South Pct.

CPP = Central Park Pct.

MTN = Midtown North Pct.

S.O.D. = Special Operations Division



## N.Y.C. Police Department Radio And Incident Code Signals

### Instruction

- 10-01—Call your command
- 10-02—Report to your command
- 10-03—Call Dispatcher by telephone
- 10-04—Acknowledgement
- 10-05—Repeat Message
- 10-06—Stand by
- 10-07—Verify address

### Possible Crimes

- 10-10—Investigate (proowler, suspicious person/vehicle, shots fired, burglar alarm, etc.)
- 10-11—Bank or hold up alarm (specify)
- 10-12—Pick-up case (location, nature of incident)
- 10-13—ASSIST POLICE OFFICER
- 10-14—(Lic. No.) Occupied & suspicious—location—verify if stolen
- 10-15—(License No.) Verify if vehicle is stolen (occupied or not)
- 10-16—Vehicle is reported stolen (alarm no.)
- 10-17—Vehicle is not reported stolen

- 10-18—Organized Crime Vehicle
- 10-19—Other possible crimes (specify)

### Crimes In The Past

- 10-20—Robbery (past)
- 10-21—Burglary (past)
- 10-22—Larceny (past) (specify; auto, from person/other)
- 10-23—Report of explosive (suspected, device or scare) (past)
- 10-24—Assault (past)
- 10-29—Other crime in past (specify)

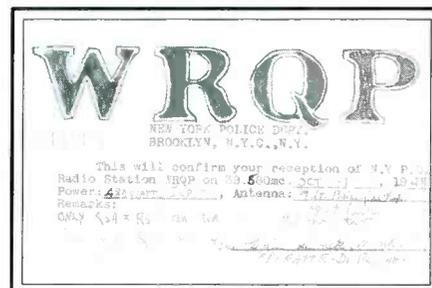
### Crimes In Progress

- 10-30—Robbery in progress
- 10-31—Burglary in progress
- 10-32—Larceny in progress (specify; auto, from person/other)
- 10-33—Report of explosive (suspected, device or scare)
- 10-34—Assault in progress
- 10-39—Other crime in progress (specify)

### Non-Crime Incidents

- 10-50—Disorderly (person(s)/group)
- 10-51—Roving Band (specify direction of travel & number in group)
- 10-52—Noise or dispute (specify)

- 10-53—Street accident
- 10-54—Ambulance case (specify type)
- 10-55—Ambulance case (R.M.P. not required)
- 10-56—Ambulance may be needed
- 10-57—Ambulance—2nd call—verify
- 10-58—Assist ambulance (specify type of assist)
- 10-59—Alarm of fire
- 10-60—Precinct assignment (available)
- 10-61—Precinct assignment (not available)



WRQP (later KEA744) was the NYPD's 39 MHz transmitter in Brooklyn during the 1940's. This QSL was signed by W2GXU.

10-62—Out of Service (Reason)

- A Arrest
- C C.O. Precinct
- D Zone
- E Engine (Mech.)
- F Flat Tire
- G Gas
- H Hospital
- I Investigation
- M Mail
- P Precinct Station
- R Radio Repair
- S Speedometer
- T Taxi Checkpoint
- W Female in Auto  
(If 10-86—Can not be used)
- X School or Church Crossing
- Y Park/Walk/Talk
- Z Off Tour

10-62—Out of Service (authority)

In addition to reason, the following authority codes must also be given:

- 1 Precinct Commander
- 2 Operation Lt.
- 3 Patrol Sgt.
- 4 Station House Officer
- 5 Self Initiated

10-63—Out of service (meal)

10-64—Entering premises Lic. by S.L.A.  
(specify address)

10-65—Utility trouble (specify nature and if emergency responding or not)

10-66—Unusual incident (specify; aircraft crash, building collapse, etc.)

10-67—Traffic or parking condition (specify)

10-68—See complaint re: (specify)

10-69—Other non-crime incident (specify)

### Interim Assignment Status

10-80—Referred to Unit (specify)

- B Referred to Building
- C Referred to Criminal Court
- D Referred to Detectives
- F Referred to Family Court
- H Referred to Housing
- L Referred to Civil Court
- Q Other
- T Referred to Transit

10-81—Person(s) to station house

- I Investigate
- A Arrest

10-82—Aided to hospital (name of hospital)

10-83—D.O.A. (natural/other)

10-84—Fire report (type of structure, location, extent)

10-85—Need additional unit (specify type and reason) S Supervisor

10-86—Female (time in vehicle/out of vehicle)

10-87—Cancel (specify unneeded service)

10-88—Arrived at scene

10-89—Other assignment status (specify)

### Final Dispositions (Available) These Signal Codes Stop Service Time

10-90—X1 Unfounded-Report written

X Unfounded

Y Unnecessary

Z Gone On Arrival

10-91—No Report required. Referred to:

- D Detectives
- F Family Court
- H Housing
- L Civil Court
- Q Other
- T Transit

10-92—Summons Issued or Served/Arrest

- A Arrest
- A2 Arrest/Summons Served
- M Moving Vehicle Violation
- P Parking
- Q Other
- U Desk appearance ticket

10-93—Report Required

- C Referred to Criminal Court
- D Referred to Detectives
- F Referred to Family Court
- H Referred to Housing
- L Referred to Civil Court
- Q Other
- T Referred to Transit

### Report Codes To Be Used In Conjunction With The Above 10-93 Codes

- 3 False Alarm
- 4 Accident
- 5 Aided
- 6 Complaint
- 7 Other

10-97—Handled by man on post

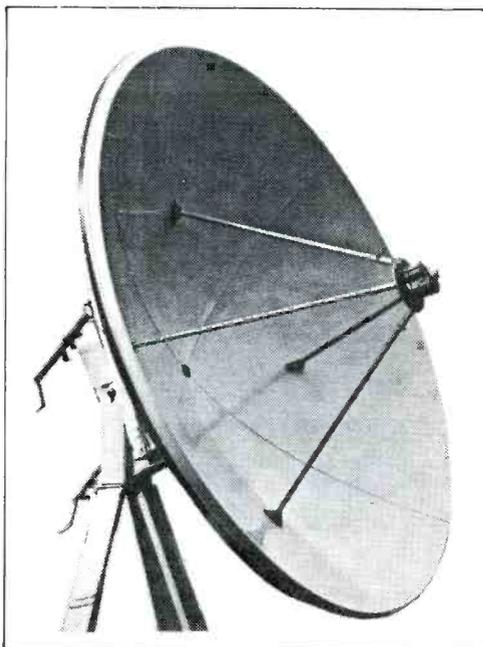
10-98—Resuming patrol/available.

(Not acceptable as a final disposition from last unit on scene)

10-99—Other final disposition (specify)

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- Electronic feed rotation system
- Eliminates old mechanical system

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- 50 dB gain typical

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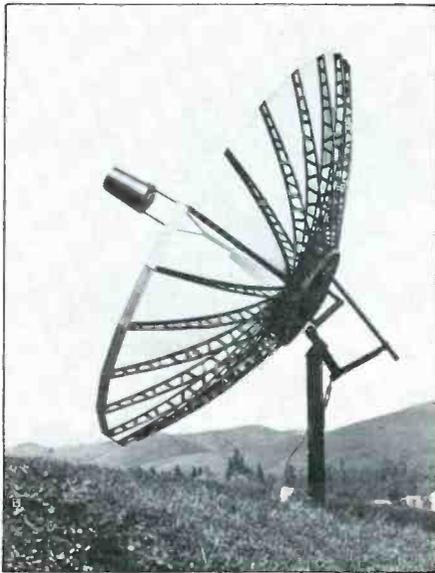
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# PRODUCTS

## REVIEW OF NEW AND INTERESTING PRODUCTS



### New Satellite Dish

A Satellite TV Antenna made by an entirely new method of production has been announced by Total Television, Inc., Roseburg, Oregon.

The design of the 12'0" diameter "dish" consists of a heavy duty expanded aluminum mesh reflective surface supported by 24 injection molded "ribs" connected to an injection molded main support.

The interest in this design is extremely high, based mainly on the promise of light weight, uniformly curved ribs, ease of assembly, and attractive appearance.

The material from which the dish structure is molded is a very sophisticated plastic formulated to stand outside in all kinds of weather. Products molded from the plastic material have been used for nearly 20 years to replace concrete in exterior and underground applications. The manufacturer claims that the material, which they call Structuralite™ will be unaffected by temperatures ranging from -55 to +255 F.

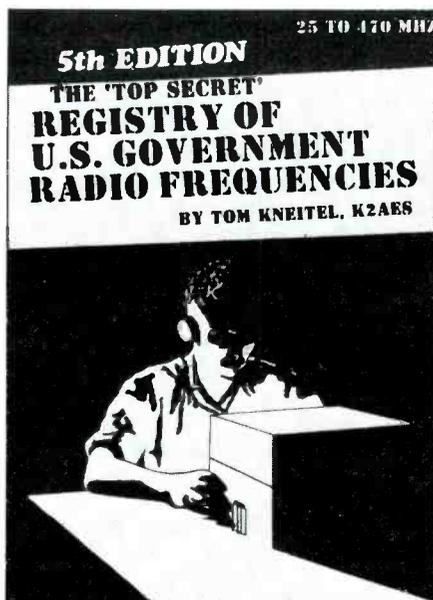
The special injection molding process is such that no internal stresses are induced into the parts eliminating warp, stress cracking, and crazing of the final product even after years of use. During the molding process, the base material is injected with an inert gas. The result is a hard impervious outer surface where the solid material meets the mold and a honeycomb interior resulting in strength to weight ratios superior to solid metals. This allows for less material to achieve equivalent stiffness. Also, the process provides exceptional dimensional stability permitting the critical parabolic curve to be repeatedly produced within thousands of an inch. Structuralite will not rot or corrode even if it comes into contact with chemicals.

The molds for the three major components (ribs, main support, and nose cone) are made from an improved version of a

special steel called Kirksite. The mold for the main support alone weighs 3 tons and produces a part every 3 minutes. Additional molds for the 10'0" diameter version are currently being made.

The mesh reflective surface is suitable for 4 GHz microwave signals used in all current U.S. domestic satellites, yet will allow the wind to pass and permits the background scenery to be seen through it. Available with a prime focus feed and a polar mount, excellent television pictures are claimed from this antenna by the manufacturer.

For more information, contact Total Television Inc., 17537 N. Umpqua Hwy., Roseburg OR 97470, or circle number 103 on the reader service card.



### New "Top Secret" Edition Arrives!

The exciting and long-awaited 5th edition of Tom Kneitel's controversial (as well as popular) guide to federal agency communications systems is now available. The 5th edition of *The "Top Secret" Registry of U.S. Government Radio Frequencies* has been revised and expanded and remains the largest, most comprehensive and authoritative registry of its kind. Tens of thousands of listings run wall-to-wall, margin-to-margin—single spaced and without any blank "filler" pages. The new edition has grown to a thick 168 pages and is packed so full of data that it has been printed in a large 8½ by 11 inch format (same page size as *POP'COMM*).

Covering 25 to 470 MHz, the book covers frequencies, call signs, and locations. It also displays a number of federal station QSL cards. Listings include Secret Service, FBI, CIA, FCC, Customs, ATF, Treasury, Border Patrol, Immigration, Marshals, White

House, Federal Prisons, Postal Service, FEMA, NRC, NASA, Coast Guard, Army, Navy, Marines, USAF, Marines, FAA, VHF satellites, National Guard, "bug" and surveillance frequencies, National Park Service, Dept. of Agriculture, and lots more. UHF aero band (225 to 400 MHz) listings are given, as well as operations in the exotic "forbidden band" (406 to 410 MHz). A special bonus section includes loads of useful HF data (below 25 MHz).

One section of the 5th edition which is especially fascinating is the complete official government callbook of federal land stations operating in 1923, all 220-odd stations. For all of those following federal communications, it holds considerable historical interest. Curiously, many of those 60-year-old listings are still valid!

This 5th edition has been typeset by computer for easy readability and it's housed in eye-catching three-color (red/black/white) covers.

It's worth keeping in mind that of the 445 MHz of spectrum space between 25 and 470 MHz, once you deduct the 127 MHz set aside for Amateur and FM/TV broadcasting, there is only 318 MHz remaining for communications purposes. That 318 MHz is split between federal stations and all others (such as police, fire, industrial, maritime, aero, etc). Federal stations retain a whopping 230 MHz of this spectrum space for their exclusive use; all other stations split the remaining 88 MHz. In other words, federal station operations fill the vast majority of the communications frequencies for communications between 25 and 470 MHz. Therefore, without information on what's taking place on those federal frequencies, a person is getting only a fraction (less than 28%) of the potential from a receiver covering those frequencies. A monitoring installation just isn't complete without the information.

The "*Top Secret*" Registry is firmly established as the standard reference guide for such data and is widely used not only by scanner monitors, but also by public safety agencies, the communications industry, the news media, and even by a number of federal agencies. This new edition contains data gathered since publication of the previous edition in 1981.

The new 5th edition is available from selected communications dealers. If your favorite dealer doesn't have it in stock, it may be ordered by mail from its publisher, CRB Research, P.O. Box 56, Commack, NY 11725. The book is \$14.95 postpaid by Book Rate Mail. If First Class Mailing is wanted, add \$2. Canadian orders must be submitted with a Postal Money Order made out in U.S. funds. (Orders outside of USA/Canada/APO/FPO, add \$3 for postage.)

# LISTENING POST

BY GERRY L. DEXTER

## WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

**G**et out your board, cards, and dice. It's time to play "The Power Game."

Still more stations are turning on the big watts. This month we can run the gamut from "A" to "Z"!

Austria is now on the air with their 500 kilowatt transmitters. Initially, though, it wasn't aimed at all of their broadcast target areas, although it may well be so by now.

Bangladesh, a country never very well monitored in the United States, will be using 250 kilowatts by the end of 1983.

Little Bolivia, a country prized by DXers for its fascinating music and programming on several dozen low power outlets, may be taking a jump to higher power. The International Telecommunications Union reports that Bolivia has registered 100 kilowatts for use on two frequencies: Watch 9.505 on a 24 hour basis and 6.055 from 1200 to 0300 GMT. It could be some time before this becomes active, however.

Thailand is now reported to be on the air with 250 kilowatts for Radio Thailand.

And Zanzibar (part of Tanzania) has a new transmitting facility under construction with the aid of engineers from The People's Republic of China. We don't know yet when we can expect this one on the air. Our guess is it'll be at least 100 kilowatts and possibly 250 kw.

Meantime, Ghana is going in the other direction. The Ghana Broadcasting Corporation's equipment is in a poor state, as is that country's economy. Transmission time for the GBC is being cut back to save wear and tear on tired tubes.

Last month we reported the demise of Swazi Music Radio in Swaziland. It seems the announcement was a bit premature. It turns out that only part of the service is being cut back, so you should still be able to tune for this one.

### Guide To English Shortwave Programs

A gremlin got to the address for this publication, which we mentioned a few months ago. The correct address is P.O. Box 8452, South Charleston, West Virginia 25303. The Guide is issued every month and subscription rate for one year is \$15.00.

### Mail Check

Phillip Lamb in Little Rock, Arkansas is another regular POP'COMM and Listening Post reader. He's just acquired a Hallicrafters S-107 receiver and is adding some new countries to his log.

Bruce DeShazo from Memphis, Tennessee uses a Panasonic RF-4900 and has been DXing for some twenty years. Also in his stable of receivers is a DX-160 and Kenwood R-300.



This QSL from Radio Finland International is one of a series.



Here's Bruce DeShazo relaxing in his shack in Memphis, Tennessee.

Gary C. Hickerson of Ft. Smith, Arkansas has acquired a new ICOM R-70 and reports his country total has "shot up" to around 150 heard.

Harold Ort, Jr., of Staten Island, New York has been out of DXing for some time but has now returned to the fold using a Kenwood R-600. Harold notes that he's "amazed at the modern technology" employed in the new receivers. Harold's a Sergeant in the U.S. Army.

Another eager POP'COMM reader is Roman Dementiuk of Newport News, Virginia, who's been a shortwave listener since 1968.

Roger James Schuller of Somonauk, Illinois is a newcomer just getting into shortwave and needs advice on receivers and antennas. Again, we have to say that we just can't give advice or recommendations on equipment.

### Rules, Regulations, and Requests

Make no mistake—we enjoy hearing from our readers regularly! But please keep in mind that we need *detailed* loggings, not just country, frequency, and time. And speaking of time, please use Greenwich Mean Time in your reports.

Remember too, that we're dealing mainly in shortwave broadcast reception. POP'COMM has other columns for reports on utility stations and other types of transmissions.

This is your column, so let's see you in it! Your loggings, your QSL illustrations, photos of you in your shack, your comments and questions are welcome and sought! Lecture ends.

### Listening Reports

Here's what's on. All times GMT.

**Algeria** Radio Algiers heard with rock music, English identification at 2000 followed by news on 15.215. (Hickerson, AR) At 2018 on 9.685 with English news and popular music. (Paszkiwicz, WI) Radio Algiers frequencies tend to vary. (Editor)

**Antarctica** Radio Nacional Arcangel San Gabriel, (Argentine government, Editor) heard with identification in Spanish at



FEN in Japan's attractive QSL card, courtesy of Charles Ames, Grand Canyon, AZ.

0019 on 15.475. (Dementiuk, VA) Noted from 2350 to 0027 sign off with a lot of identification announcements. Strongest ever heard here. (Hickerson, AR)

**Austria** Austrian Radio heard with its DX program "Shortwave Panorama" on 5.945 at 0158. (Dementiuk, VA)

**Australia** Radio Australia heard on 15.115 from 0700 to 0800. (Schivo, CA) On 15.160 with English news read by a woman at 0502, at 0535 on 15.425 with cricket results. (MacKenzie, CA) On 9.770 to Asia noted after the 9.580 outlet to North America closes. Noted as late as 1500. (Lamb, AR) Program of rock music at 0037 on 17.795. (Dementiuk, VA)

**Benin** La Voix du Revolution from Cotonou heard on 4.870 at 2235 in local languages. African music, drums to sign off at 2300. (Hickerson, AR) The new regional outlet at Parakou on 5.025 heard at 0439 with local, disco and soul music, identification in French, weak signal. (Konen, WI)

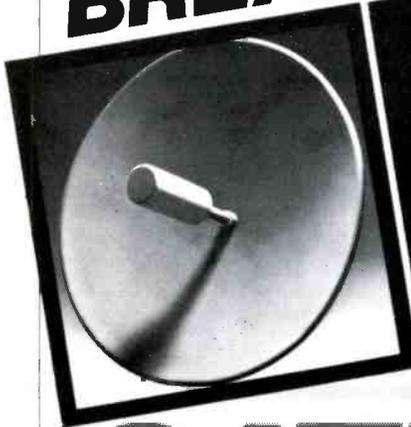
**Botswana** Radio Botswana heard with its cowbells and farm animals sound effects interval signal at 0355 prior to sign on announcements in English at 0400 on 4.845. (Hickerson, AR)

**Brazil** Radio Nacional Brasilia noted at 0250 with a report on agriculture in Sao Paulo state. (Lamb, AR)

**Canada** CFRB, Toronto on 6.070 at 1323 in English with commercials, identification. (Hickerson, AR) Call letters on shortwave are CFRX. (Editor)

**Central African Republic** Radio Cen-

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# SATURN-15 XHP

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## Free Movies for You

That's right! **Free** movies, sports, and special events, 24 hours a day and all commercial free. The Saturn-15 XHP super deep fringe microwave receiver can be used by homeowners outside the service area of local **over-the-air** pay TV stations (ex. HBO, Showtime). Yes, if the local pay TV station installs microwave receivers on homeowners TV mast, you too can receive those unscrambled signals free by installing the Saturn-15 XHP on your TV mast in minutes. A signal can be received up to 100 miles, depending on the height and power of the local transmitter, and the installed height of the Saturn-15 XHP. If you have waited to own a microwave receiver, or own a low power unit, call and order your Saturn-15 XHP and own the most powerful receiver available today. Free TV—yours for a call. Note: General microwave receivers cannot be used for receiving scrambled signals. Nor can they pick up from cable TV or their relay towers.

## A Total Unit

The Saturn-15 XHP comes complete with a 30 inch precision tuned receiving dish, advance design downconverter, power tuner, 60 feet

coaxial cable, necessary adapters, mounting hardware, and installation instructions. A six month parts and service warranty covers the Saturn-15 XHP.

## Information for your Area

By calling our **information number** (916) 454-2190 and talking to one of our trained technicians, we can help determine if the Saturn-15 XHP will work for you.

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## Microwave Systems

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**SUMMER  
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trafique on 5.035 with marimba music, French announcements, and identification in French noted at 0500. (Hickerson, AR)

**China** Radio Beijing, in English at 0030 on 17.855 with talk about pagodas and "Letterbox" program. (Paszkievicz, WI)

**Clandestines** La Voz de Cuba Independiente y Democratica (anti-Castro) announced the following services in a *New York Times* advertisement: Radio Maximo Gomez from 1630 to 0030 on 11.700 (via Radio Clarin, Dominican Republic, Editor); Radio Antonio Guiteras, 7.352 from 0030 to 0330; Radio Jose A. Echeverria, 7.465 from 0100 to 0130; Radio Antonio Maceo, 4.980 from 0100 to 0135 (relay over Ecos del Torbes, Venezuela, Editor); and Radio Ignacio Agramonte, 5.105 from 0030 to 0330. Also scheduled are 7.352 and 5.105 from 1100 to 1200. Ignacio Agramonte was logged at 0117 with a good signal on 5.105. (Dementiuk, VA) On 7.400 with political talk in Spanish at 0325, identification at 0330. (Hickerson, AR) So the *Times* schedule is not 100% accurate. (Editor) La Voz del C.I.D. does verify reception reports which can be sent to 10020 SW 37th Terrace, Miami, Florida, 33165. (Editor)

Radio 15 de Diciembre, anti-Nicaraguan, heard on 6.200 at 0525 to 0615 sign off with various speeches against "Sand-men," identification, anthem, and off. (Konen, WI) On 7.000 at 0523 with identification in Spanish, trumpet reveille. (Konen, WI)

La Voz de Sandino, anti-Nicaraguan, on 6.220 at 0502 to 0519 sign off. Spanish and then English speeches against the Sandinista regime. (Konen, WI) On 6.225 variable at 0335 to 0430 with English segment at 0335. (Hickerson, AR)

Radio Venceremos, anti-El Salvador, 6.206 at 0040 with talks, music, and identification in Spanish. (Hickerson, AR) 6.206 variable at 0236, revolutionary talks, music to sign off at 0312. (Konen, WI)

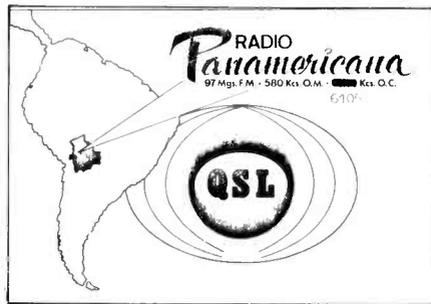
**Colombia** Radio Sutatenza heard on 5.095 with an identification at 0059. (Dementiuk, VA)

Radio Santa Fe, 4.965 with music and a beer commercial in Spanish at 0531. (Dementiuk, VA)

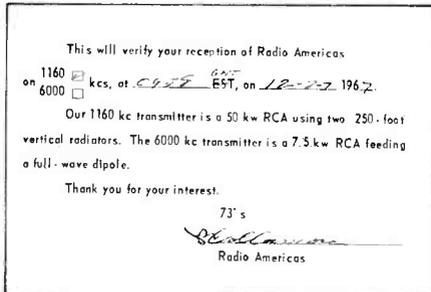
Radio Super de Medellin on 4.875 at 0640 with Latin American popular vocals, frequent identifications including "Super, Super, Super." (Konen, WI)



Here's a nice photo of "Hack" and Michi Tanaka of Tokyo, Japan. "Hack" is an SWL (JA-3-7771), a ham (JR3AQP/JF1XZV), as well as a member of the SSB Network (SSB-07).



This nice card is from one of the many Bolivian stations on shortwave. Radio Panamericana is one of the easier ones to log.



Harold Ort Jr., in New York owns this piece of shortwave history—a QSL from Radio Americas (earlier Radio Swan) operated by the CIA in the 1960's.

Radio Colosal, on 4.945 at 0630 and identification mentioning the Caracol network. (Konen, WI)

**Congo** Radio Brazzaville noted on 15.290 at 0200 with music. (Schivo, CA)

**Cook Islands** Radio Cook Islands, 11.760 in English and Maori with phone in requests and Polynesian tunes. (Hickerson, AR)

**Ecuador** HCJB heard at 2130 in English with "DX Party Line" on 21.480 and 15.295. (MacKenzie, CA) On 11.840 at 0430; also on 9.745 at 0530 with music of Latin America. (Schivo, CA)

**Equatorial Guinea** Radio Nacional Malabo on 6.250 at 0500 with national anthem, local languages, and music. (Hickerson, NY)

**Falkland Islands** FIBS on 3.958 from 0859 with anthem, then identification in English, BBC news, and a music program. (Hickerson, AR)

**Finland** Radio Finland International heard at 1404 on 15.400 with English news, weather, "Northern Report," and "Compass North." (Paszkievicz, WI) Good level on 17.800 at 1236. (Dementiuk, VA)

**Gabon** Africa Number One at Moyabi noted on 11.940 in French with African and American music at 2233. (Paszkievicz, WI) Music and French announcements at 0543 on 4.810. (Dementiuk, VA)

**Greece** The Voice of Greece logged at 0135 with English news about Greece, Greek music on 9.865. (Konen, WI) News in English at 0334. (Dementiuk, VA)

**Guam** KTWR in Mandarin at 1150 on 9.590 interfering with Nepal. (Konen, WI) English identification at 1445 on 11.920 followed by Trans World Radio programs. (Hickerson, AR)



One of two shortwave stations in Antarctica is the Argentine government's. The other one is operated by U.S. armed forces radio.



**Guyana** Guyana Broadcasting Corporation's Channel Two English service on 5.950 heard at 0843 with the "Morning Spectacular" show and news at 0900. (Paszkievicz, WI)

**Honduras** La Voz Evangelica, HRVC, with "Songs in The Night", an English religious program heard at 0435 on 4.820. (Dementiuk, VA)

**India** All India Radio at Delhi, with their General Overseas Service on 11.620 at 1921; news and identification. (Konen, WI)

**Iran** Voice of the Islamic Republic of Iran on 15.084 at 0445 in Arabic. Man and woman with newscast. (MacKenzie, CA)

**Jordan** Radio Amman (Hashemite Kingdom Broadcasting Service) on 11.924 at 1440 in Arabic with music and talking. There is identification and sign off at 1500. (Hickerson, AR)

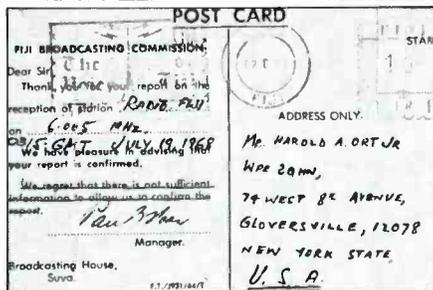
**Kampuchea** Voice of the People of Kampuchea heard in Thai at 1253. Interval signal and English identification at 1300, then into Vietnamese. (Hickerson, AR)

**Liberia** ELWA heard at 0640 on 4.765 with BBC World Service News at 0700. (Dementiuk, VA)

**Libya** Radio Jamahiriya noted on 11.815 (though 11.816 was the announced frequency) with identification in English by man and woman at 2200, then rock music. Excellent signal but popped off the air briefly a few times. (Ort, NY)

**Lithuania** Radio Vilnius on 9.685 at 2305 with "Mailbag" program in English. (Paszkievicz, WI) Probably via transmitters in other parts of the USSR. (Editor)

**Malawi** Radio Malawi logged on 3.380 at 0415 in English with a commercial for Coca Cola, rock music, and identification at 0430. (Hickerson, AR)



All shortwave broadcast enthusiasts wish the Fiji Islands were still on the air. Harold Ort treasures this QSL from the Fiji Broadcasting Commission.

**Mali** Radiodiffusion du Mali from Bamako noted on 4.783 at 0645 with a talk in French. (Konen, WI)

**Monaco** Trans World Radio on 9.493 (down from the usual 9.495) at 0624 with interval signal, identification, and religious program in English. (Paszkievicz, WI)

**Mongolia** Radio Ulan Bator on 12.070 at 1210 in English with woman giving news, followed by music and identification by man. (Hickerson, AR)

**Namibia** (Southwest Africa) Southwest African Broadcasting Corporation heard on 3.270 at 0445 to 0515 in local languages, African, and popular U.S. tunes. (Hickerson, AR)

**Nepal** Radio Nepal on 9.590, with interval signal at 1147—the only thing recognized thanks to interference from KTWB, Guam on the same frequency. (Konen, WI)

**Nigeria** Voice of Nigeria on 15.120 at 1640 in English with world news, commentary, Nigerian news, press reports. Into Arabic at 1700. On 15.185 at 0510 in English with African music. (MacKenzie, CA) On 7.255 from 0528 with news in English. (un-identified reporter)

FRCN, Radio Nigeria at Kaduna, heard on 4.770 at 0518 with news in English. (Dementiuk, VA)

**North Korea** Radio Pyongyang heard on 9.745 at 1140 with English talks, news at 1200, and talks about leader Kim Il Sung. (Paszkievicz, WI)

**Papua/New Guinea** Radio One, Port Moresby on 4.890 with identification at 0911 and again at 0940. Had a relay of a Radio Australia program at 0945. (Dementiuk, VA) At 1102 with older U.S. pop tunes, local music, time checks, and requests. News at 1130. (Paszkievicz, WI)

**Paraguay** Radio Nacional on 9.735 with talks in Spanish and frequent identifications around 2300. (Konen, WI)

**Peru** Radio Los Andes from Huamachucho on 5.030 at 1018 with man giving identification and "musica nacional" to fade out at 1144. (Konen, WI)

Radio Atlantida, at Iquitos, 4.790 with comedy show in Spanish, identification, and flute music from tune in at 0914. (Konen, WI)

**Poland** Radio Polonia, 11.815 with English to North America. Identification at 0224. Very heavy interference. (Konen, WI) English program at 2235 on 7.270. (Dementiuk, VA)

**Saipan** KYOI on 15.190 at 0525 in English with rock music. (MacKenzie, CA) 9.595 at 1330 with rock and disc jockey in English and Japanese. (Hickerson, AR)

**Saudi Arabia** Broadcasting Service of the Kingdom of Saudi Arabia noted on 15.060 at 0440 in Turkish. Arabic music. (MacKenzie, CA)

**Senegal** Radiodiffusion du Senegal at Dakar, 4.890 all talk in French from 0703 tune in. (Konen, WI) 0557 with interval signal, anthem, sign on identification in French, news, possible Arabic chants. (Paszkievicz, WI) At 2350 in French with talks, African music, identification at 0000. (Hickerson, AR)

**Seychelles** FEBA (Far East Broadcasting Association) Radio on 11.865 with an English news summary at 1225. (Dementiuk, VA)

**Solomon Islands** Solomon Islands Broadcasting Corporation (SIBC) found on 5.020 at 1006 with Radio Australia news, local and rock music, identification at 1044. (Dementiuk, VA) At 1145 with discussion, U.S. light music, identification, and time check at 1100 followed by local news. (Konen, WI)

**South Africa** Radio RSA on 9.615 at 0157 with "Question Time" program. (Lamb, AR) 5.980 in English at 0240 with "DX Corner," newscast, and sign off at 0256. (MacKenzie, CA)

South African Broadcasting Corporation (SABC) at 0500 with identification at 0505 on 4.835. (Dementiuk, VA)

Capital Radio, Transkei, logged on 3.930 at 0425 with English, pop music, identification at 0439. Lots of interference from ham operators. (Hickerson, AR)

**South Korea** Radio Korea, 9.750 at 1347 with talk in English about popular sports and hobbies in South Korea. (Paszkievicz, WI) 7.550 in Arabic at 1550 to 1600 when into English. Parallel to 11.830 at 1600. (MacKenzie, CA)

**Sri Lanka** The Voice of America relay station with the "Magazine Show," news in special English at 1730 on 15.395. (MacKenzie, CA)

**Swaziland** Trans World Radio at Manzini on 9.525 in an unknown language, Christian music, bells, interval signal, and sign off at 2016. (Konen, WI)

**Tahiti** Radio Tahiti on 15.170 at 0504 with news in French. (MacKenzie, CA) At 0314 with island music and French an-

nouncements. (DeShazo, TN) Island, rock music, French and Tahitian announcements at 0255 with interference from the Voice of America. (Ort, NY)

**Tanzania** Radio Tanzania, Dar es Salaam on 5.050 at 0317 in Swahili. Music and identification. (Hickerson, AR)

**Turkey** The Voice of Turkey logged on 11.740 at 0300 in English with news, commentary, Turkish music, "Turkish Panorama" to 0350 sign off. (MacKenzie, CA)

**United Arab Emirates** UAE Radio at Dubai, on 15.430 at 0352 in English, complete with music and mailbag program. (Paszkievicz, WI)

**USSR** Radio Moscow's home service "Orbita 4" service via Vladivostok at 0450 with folk music on 15.140.

Radio Moscow on 15.150 with "News and Views" in English at 1403. (Paszkievicz, WI) On 12.005 and 12.050 at 0600 with news. (Schivo, CA)

**Vatican** Radio Vaticana on 11.845 with news and commentary in English plus some music from 0100 to 0115. (MacKenzie, CA)

**Venezuela** Radio Juventud at Barquisimeto on 4.900 with U.S. rock at 0305. (Paszkievicz, WI)

Time station YVTO on 6.100 at 0826 with pips, time in minutes, and "cero segundo" and identification. (Paszkievicz, WI)

**Zaire** Radio Candip, 5.066 at 0325 with interval signal, identification in French, native music. (Hickerson, AR)

**Zambia** Zambian Broadcasting Corporation heard in local languages with African music at 0400 to 0430 when gave station identification. (Hickerson, AR)

Our thanks to: Roman Dementiuk, Newport News, Virginia; Harold Ort Jr., Staten Island, New York; Gary C. Hickerson, Ft. Smith, Arkansas; Bruce DeShazo, Memphis, Tennessee; Phillip Lamb, Little Rock, Arkansas; Mark Konen, Milwaukee, Wisconsin; Walt Schivo, Novato, California; Sheryl Paszkievicz, Manitowoc, Wisconsin; and Stewart MacKenzie, Huntington Beach, California.

Hope you'll join us again next month and until then, good listening!

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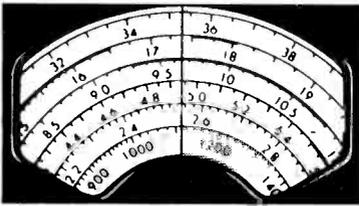
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CIRCLE 43 ON READER SERVICE CARD



# COMMUNICATIONS CONFIDENTIAL

BY HARRY HELMS, KR2H

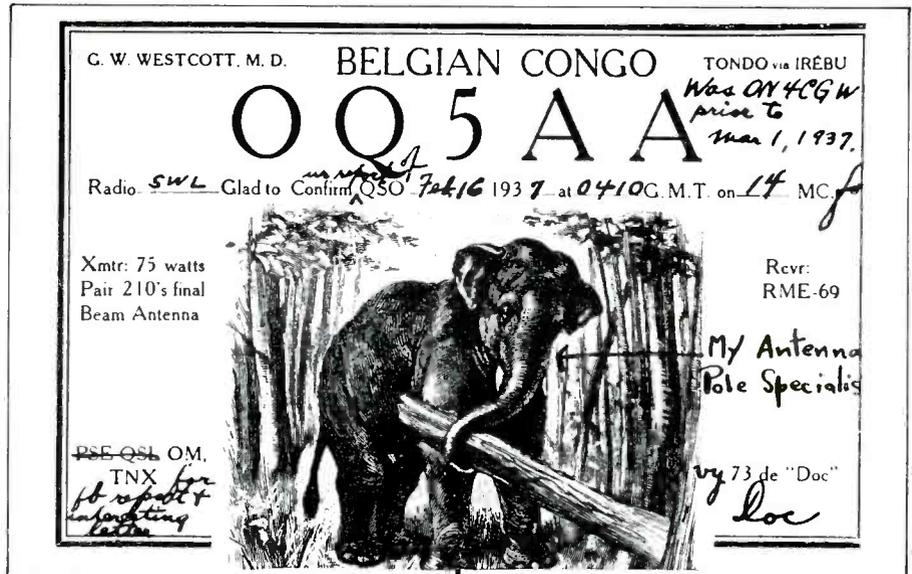
## YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

**T**om Harrington of Universal Electronics sent along copies of their *World Utility Frequency And Call Sign Guide* and their book, *Radioteletype Press Broadcasts*. Your editor found the *World Utility Frequency And Call Sign Guide* of particular interest. Compiled by Joerg Klingenfuss, it contains a wealth of information on European and Asian stations (particularly Soviet outlets) that is simply unavailable from other sources. Both books are printed on 8½" x 11" paper, making them easy to read and refer to. If you tune the types of stations we discuss in this column each month, or DX RTTY outlets, you must have these books on your reference shelf. Your editor is certainly getting a lot of use out of his copies! Each is available for \$12.00 postpaid from Universal Electronics, 1280 Aida Drive, Reynoldsburg, OH 43068. They will also send along their price list of popular receivers and other SWL goodies.

### Call Sign Allocations

Your editor has received a couple of letters recently asking about call sign allocations around the world. In brief, the nations of the world have agreed on call sign prefixes which identify in which country a station is located. For example, if you hear a station whose call sign starts with a K or W, you know you are hearing a station transmitting from the United States or one that is operated by an agency of the United States government. Similarly, G prefixes indicate a station transmitting from the United Kingdom or one that is operated by an agency of the British government. To better help you identify the DX you hear, the following is a list of call sign prefix allocations and the nation each is assigned to:

AA-AL	United States
AM-AO	Spain
AP-AS	Pakistan
AT-AW	India
AX	Australia
AY-AZ	Argentina
A2	Botswana
A3	Tonga
A4	Oman
A5	Bhutan
A6	United Arab Emirates
A7	Qatar
A8	Liberia
A9	Bahrain
B	China (including Taiwan; Taiwan often uses BE, BS, and BV prefixes)
CA-CE	Chile
CF-CK	Canada
CL-CM	Cuba
CN	Morocco
CO	Cuba



Missionaries in the former Belgian Congo were long responsible for two-way activity in that part of Africa. This card OQ5AA dates back to 1937.

CP	Bolivia	HJ-HK	Colombia
CQ-CU	Portugal	HL	South Korea
CV-CX	Uruguay	HM	North Korea
CY-CZ	Canada	HN	Iraq
C2	Nauru	HO-HP	Panama
C3	Andorra	HQ-HR	Honduras
C4	Cyprus	HS	Thailand
C5	The Gambia	HT	Nicaragua
C6	Bahamas	HU	El Salvador
C7	World Meteorological Organization	HV	Vatican City
C8-C9	Mozambique	HW-HY	France
DA-DR	West Germany	HZ	Saudi Arabia
DS-DT	South Korea	H2	Cyprus
DU-DZ	Philippines	H3	Panama
D2-D3	Angola	H4	Solomon Islands
D4	Cape Verde Islands	H6-H7	Nicaragua
D5	Liberia	H8-H9	Panama
D6	Comoros Islands	I	Italy
D7-D9	South Korea	JA-JS	Japan
EA-EH	Spain	JT-JV	Mongolia
EI-EJ	Ireland	JW-JX	Norway
EK	USSR	JY	Jordan
EL	Liberia	JZ	Indonesia
EM-EO	USSR	J2	Djibuti
EP-EQ	Iran	J3	Grenada
ER-ES	USSR	J4	Greece
ET	Ethiopia	J5	Guinea-Bissau
EU-EW	Byelorussian SSR (USSR)	J6	St. Lucia
EX-EZ	USSR	J7	Dominica
F	France and its overseas territories	J8	St. Vincent
G	United Kingdom	K	United States
HA	Hungary	LA-LN	Norway
HB	Switzerland	LO-LW	Argentina
HC-HD	Ecuador	LX	Luxembourg
HE	Switzerland	LY	USSR
HF	Poland	LZ	Bulgaria
HG	Hungary	L2-L9	Argentina
HH	Haiti	M	United Kingdom
HI	Dominican Republic	N	United States

OA-OC	Peru	YK	Syria	7S	Sweden
OD	Lebanon	YL	USSR	7T-7Y	Algeria
OE	Austria	YM	Turkey	7Z	Saudi Arabia
OF-OJ	Finland	YN	Nicaragua	8A-8I	Indonesia
OK-OM	Czechoslovakia	YO-YR	Roumania	8J-8N	Japan
ON-OT	Belgium	YS	El Salvador	8O	Botswana
OU-OZ	Denmark	YT-YU	Yugoslavia	8P	Barbados
PA-PI	Netherlands	YV-YY	Venezuela	8Q	Maldives
PJ	Netherlands Antilles	YZ	Yugoslavia	8R	Guyana
PK-PO	Indonesia	Y2-Y9	East Germany	8S	Sweden
PP-PY	Brazil	ZA	Albania	8T-8Y	India
PZ	Surinam	ZB-ZJ	United Kingdom	8Z	Saudi Arabia
P2	Papua-New Guinea	ZK-ZM	New Zealand	9A	San Marino
P3	Cyprus	ZN-ZO	United Kingdom	9B-9D	Iran
P4	Netherlands Antilles	ZP	Paraguay	9E-9F	Ethiopia
P5-P9	North Korea	ZQ	United Kingdom	9G	Ghana
R	USSR	ZR-ZU	South Africa	9H	Malta
SA-SM	Sweden	ZV-ZZ	Brazil	9I-9J	Zambia
SN-SR	Poland	Z2	Zimbabwe	9K	Kuwait
SSA-SSM	Egypt	2	United Kingdom	9L	Sierra Leone
SSN-ST	Sudan	3A	Monaco	9M	Malaysia
SU	Egypt	3B	Mauritius	9N	Nepal
SV-SZ	Greece	3C	Equatorial Guinea	9O-9T	Zaire
S2-S3	Bangladesh	3DA-3DM	Swaziland	9U	Burundi
S6	Singapore	3DN-3DZ	Fiji	9V	Singapore
S7	Seychelles	3E-3F	Panama	9W	Malaysia
S9	Sao Tome and Principe	3G	Chile	9X	Rwanda
TA-TC	Turkey	3H-3U	China	9Y-9Z	Trinidad and Tobago
TD	Guatemala	3V	Tunisia		
TE	Costa Rica	3W	Vietnam		
TF	Iceland	3X	Guinea		
TG	Guatemala	3Y	Norway		
TH	France	3Z	Poland		
TI	Costa Rica	4A-4C	Mexico		
TJ	Cameroon	4D-4I	Philippines		
TK	France	4J-4L	USSR		
TL	Central African Republic	4M	Venezuela		
TM	France	4N-4O	Yugoslavia		
TN	Congo	4P-4S	Sri Lanka		
TO-TQ	France	4T	Peru		
TR	Gabon	4U	United National organizations		
TS	Tunisia	4V	Haiti		
TT	Chad	4W	Yemen Arab Republic		
TU	Ivory	4X	Israel		
TV-TX	France	4Y	International Civil Aviation Organization		
TY	Benin	4Z	Israel		
TZ	Mali	5A	Libya		
T2	Tuvalu	5B	Cyprus		
T3	Kiribati	5C-5G	Morocco		
T4	Cuba	5H-5I	Tanzania		
T5	Somalia	5J-5K	Colombia		
T6	Afghanistan	5L-5M	Liberia		
UA-UQ	USSR	5N-5O	Nigeria		
UR-UT	Ukrainian SSR (USSR)	5P-5Q	Denmark		
UU-UZ	USSR	5R-5S	Malagasy Republic		
VA-VG	Canada	5T	Mauritania		
VH-VN	Australia	5U	Niger		
VO	Canada	5V	Togo		
VP-VS	United Kingdom	5W	Western Samoa		
VT-VW	India	5X	Uganda		
VX-VY	Canada	5Y-5Z	Kenya		
VZ	Australia	6A-6B	Egypt		
V2	Antigua	6C	Syria		
V3	Belize	6D-6J	Mexico		
W	United States	6K-6N	South Korea		
XA-XI	Mexico	6O	Somalia		
XJ-XO	Canada	6P-6S	Pakistan		
XP	Denmark and its territories	6T-6U	Sudan		
XQ-XR	Chile	6V-6W	Senegal		
XS	China	6X	Malagasy Republic		
XT	Haute Volta	6Y	Jamaica		
XU	Kampuchea (Cambodia)	6Z	Liberia		
XV	Vietnam	7A-7I	Indonesia		
XW	Laos	7J-7N	Japan		
XX	Portugal	7O	People's Democratic Republic of		
XY-XZ	Burma	7P	Yemen		
YA	Afghanistan	7Q	Lesotho		
YB-YH	Indonesia	7R	Malawi		
YI	Iraq		Algeria		
YJ	Vanuatu				

These call sign allocations are also valid for broadcasting and amateur stations in addition to utility outlets. Hopefully this list will help you better identify the DX you hear.

### Utility Station Addresses

Your editor has also received numerous requests for the addresses of various utility stations. Most utility stations will QSL reception reports (particularly if you include a prepared QSL card and return postage) provided you send your report to the correct address. Here are the addresses for some commonly heard stations in the United States:

**KFS:** ITT World Communications, Box 56, Half Moon Bay, CA 94019.

**KHK:** RCA Global Communications, 223 S. King St., Honolulu, HI 96804.

**KJQ:** Olympic Radio Corporation, 902 Fifth St., Hoquiam, WA 98286.

**KLC:** ITT World Communications, Box 115, Arcadia, TX 77517.

**KMI:** AT&T, 1587 Franklin St., Oakland, CA 94612.

**KPH:** RCA Global Communications, 135 Market St., San Francisco, CA 94105.

**WAD:** Lorain Electronics Corp., 149 Lake Shore Rd., Grafton, WI 53024.

**WAQ:** AT&T, Box 355, Ocean Gate, NJ 08740.

**WBL:** Great Lakes Marine Radio, Box 473, North Tonawanda, NY 14120.

**WCC:** RCA Global Communications, Box 397, North Chatham, MA 02650.

**WCM:** Radio Pittsburgh, Inc., 11130 Mockingbird Drive, North Huntingdon, PA 15642.

**WFN:** AMCON, Inc., 1701 E. Market St., Jeffersonville, IN 47130.

**WJG:** Memphis Radio, Inc., Box 9363, Memphis, TN 38109.

**WLO:** Mobile Marine Radio, Box 743, Mobile, AL 33601.

**WMH:** Dundalk Marine Terminal, 2700 Broening Highway, Baltimore, MD 21222.

**WNU:** TRT Telecommunications, P.O. Drawer E, Slidell, LA 70452.

# OQ5BW

American Presbyterian Congo Mission  
Moma, Via Luisa  
Belgian Congo, Africa



To Radio 22 Confirming QSO 3 156  
Ur Sigs Q 5 S 3 on 2 Mc. Band

J. H. Spooner

A QSL from OQ5BW, dating back to 1956, represents a more recent missionary activity than OQ5AA.

**WNY:** RCA Global Communications, 66 Broad St., New York, NY 10004.

**WOM:** AT&T, 1350 NE 40th Ave., Ft. Lauderdale, FL 33313.

**WOO:** AT&T, Box 558, Manahawkin, NJ 08050.

**WPA:** RCA Global Communications, Box 1328, Port Arthur, TX 77640.

**WPD:** Radio Tampa, Inc., 1330 McKay St., Tampa, FL 23602.

**WSC:** RCA Global Communications, Box 34, West Creek, NJ 08092.

**WSL:** ITT World Communications, Box MM, Southampton, NY 11968.

The following is a list of addresses for the most commonly heard overseas stations:

**CFH:** Royal Canadian Navy, Newport Corner, Ellerhouse, Nova Scotia, Canada.

**CLA:** International Radiotelephone Service, Direccion General de Telecomunicaciones, Havana, Cuba.

**CUA:** Companhia Portuguesa Radio Marconi, Apartado 2778, Lisbon, Portugal.

**DAF:** Kustenfunkstelle Norddeich Radio, D-298 Norden, West Germany (use same address for DAL, DAM, DAN).

**DHS:** Ruegen Radio, Funkamt Ruegen, Kuestenfunkstelle DDR, 2344-Glowe, East Germany.

**EAD:** Aranjuez Radio, Compania Telefonica Nacional de Espana, Madrid 12, Spain.

**FFS:** St. Lys Radio, 21 Cite de la Radio, 31470 Sainte Lys, France.

**FPK:** French Telecommunications Service, 246 Rue de Bercy, 75584 Paris, France.

**HKB:** Barranquilla Radio, Empresa Nacional de Telecomunicaciones, Barranquilla, Colombia.

**JCS:** Cjosi Radio, 7756 Obata-Shinmachi, Chosi City, 288 Chiba, Japan (same address for JCT, JCU, JDC).

**JOR:** Nagasaki Radio, Hinode-Cho 2293, Isahaya City, Nagasaki, Japan (same address for JOS, JOU, JDB).

**MKE:** Royal Air Force Radio Station, Via BFPO 53, Cyprus.

**OXZ:** Lyngby Radiotelegrafkontor, Bags-

vaerd Mollevej, DK-2800 Lyngby, Denmark.

**PCH:** Scheveningen Radio, Merwedestraat 1, Ijmuiden 1620, Netherlands.

**PJC:** Curacao Radio, Box 103, Willemstad, Curacao, Netherlands Antilles.

**PPX:** EMBRATEL, Ave. Presidente Vargas, 1012/6 Andar, Rio de Janeiro, Brazil.

**SAG:** Goteborg Radio, S-430 34, Onsala, Sweden.

**TFA:** Reykjavik Radio, Posts and Telegraph Dept., Box 442, Communications Center, Reykjavik, Iceland.

**VHC:** Royal Australian Navy, Navy Office, Canberra 2600, Australia.

**VIS:** Australian Overseas Telecommunications Commission, Third Floor, GPO, Sydney, NSW, Australia.

**VTG:** Indian Navy Radio, Shadid Shagat Sing Road, Bombay, India.

**XFL:** Department Estaciones Radioelectricas, Oficio Estaciones Costeras, Mexico, DF, Mexico.

**ZLO:** Royal New Zealand Navy, Irirangi Naval Base, Waiouru, New Zealand.

## Featured Frequencies

This month we're going to look at frequencies used by the Soviet Union's civilian airline, Aeroflot. Unlike the vast majority of other civilian/commercial carriers, Aeroflot uses CW for most of its communications. The primary Aeroflot channels are 6748, 8842, and 11312 kHz, with Moscow Aeradio found on 10025 kHz. One voice channel is 13220 kHz, where there have been reports of Soviet military aeronautical traffic as well. You can hear voice traffic from Aeroflot flights as well as Cuban flights from the station at Boyeros, Cuba, on 8965 kHz.

In the past, there have been reports that U.S. nuclear and attack submarines have nets on 2732, 4253, and 4765 kHz. The net on 2732 kHz supposedly uses the code name "Lockheed." Keep an ear on these frequencies and report anything you hear to Communications Confidential!

## Listening Reports

Here are this month's listening reports. All frequencies are in kHz and all times are GMT. We'd like to see your reports here; submit them in the form you see here and send them to Harry Helms, P.O. Box 157, Rockefeller Center Station, New York, NY 10185. Once again this month, several loggings have been contributed by members of the American Shortwave Listeners Club (ASWLC). ASWLC's monthly bulletin offers extensive coverage of the topics we cover in this column; a sample copy of their bulletin and membership details are available for \$1.00 from ASWLC, 16182 Ballad Lane, Huntington Beach, CA 92649.

**203:** KL, CW beacon, Scheffield, Quebec, 0625. (Don Moman, Alberta, Canada/ASWLC)

**210:** SE, CW beacon, Russell Island, Northwest Territories, 0635. (Don Moman, Alberta, Canada/ASWLC)

**216:** CLB, CW beacon, Carolina Beach, NC, 1125. (Richard Kovarik, NC/ASWLC)

**230:** PD, CW beacon, Pendleton, OR, 0646. (Don Moman, Alberta, Canada/ASWLC)

**266:** SZT, CW beacon, Sand Point, ID, 0730. (Don Moman, Alberta, Canada/ASWLC)

**269:** TII, CW beacon, Tiffin, OH, 2200. (George Zeller, OH/ASWLC)

**435:** WCC, Chatham, MA, CW marker 0054. (Donald Saunders, NJ/ASWLC)

**521:** ORC, CW beacon, Orange City, IA, 0643. (Lani Pettit, IA/ASWLC)

**1613:** RAB, CW beacon, Rabinal, Guatemala, 0615. (George Zeller, OH/ASWLC)

**1732:** Cordless telephones in the area with phone conversations in AM 2329. Other cordless phones heard on 1750 kHz. (Stewart MacKenzie, CA) I bet you're hearing some very interesting conversations, Stewart! (Editor)

**2863:** KSF70, Oakland VOLMET, Oakland, CA, aviation weather broadcast in SSB 0535. (Stewart MacKenzie, CA)

**4268:** CKN, Canadian Navy, Vancouver, BC, V marker in CW 0651. (Tom Bledsoe, TN) Tom sent along a note with his loggings saying that the CW utility "bug" has bitten him. As you'll see by the numerous, excellent loggings he submitted, he wasn't kidding! (Editor)

**4407:** Ship-to-shore traffic from the cruise ship "Norway" in SSB 0230-0400; traffic consisted of phone calls from passengers to friends ashore. The passengers appear to be unaware that others can listen in! (Kevin Wehner, MO) Now you understand the fascination of utility DXing! (Editor)

**4847:** "NDD ANT" sent continuously in CW 0500, QRM from a shortwave broadcast station. (Kevin Schallmo, IL) Anyone have a clue as to who this could be? (Editor)

**6840:** Unidentified time signal station 1002-1030 with second pulses and different pulse on the minute, no identification heard. (Kevin Schallmo, MO) Two USSR coastal stations are listed for this frequency;

closest time signal station listed is XSG, Shanghai, China, on 6414.5. (Editor)

**6411:** WOE, Lantana, FL, V marker in CW 0704. (Gary Bledsoe, TN)

**6570:** Five-digit Spanish numbers station with female announcer 0400. (Thad Adamaszek, OH)

**6608:** WSY70, Kennedy Airport VOLMET, NY, has moved to this frequency replacing 5652 kHz. (Daniel Yemiola, OH)

**6825:** Five-digit Spanish numbers station with female announcer 0533; pulses in background. (Thad Adamaszek, OH)

**6840:** Several CW numbers stations noted here on different days around 0330. (Lani Pettit, IA/ASWLC)

**7000:** Five-digit Spanish numbers station with female announcer 0735. (Kevin Schallmo, IL)

**7080:** Coded "Sky King" broadcast in SSB 0200; this is smack in the middle of the amateur 40 meter CW band and is, in fact, the same channel used by ARRL station W1AW for code practice broadcasts! Someone must've goofed; likely the Thule, Greenland station since this is the scheduled time for their "Sky King" broadcasts. (Daniel Yemiola, OH)

**7375:** Four-digit English numbers station with female announcer 0505; opens with digits 1 through 0 repeated until 0510 when there were ten "beeps" and then into number groups. Announcer had a Midwestern U.S. accent. (Thad Adamaszek, OH)

**7606:** "Victor lima bravo one" repeated by woman 0238; same intonation and accent as found on the numbers stations. (George Osier, NY)

**7905:** Five-digit numbers station in Spanish with female announcer 0830; signal was very strong—only stronger signal to be found was from a 10 kilowatt broadcast station a mile away. (Terry Lindley, AL) As regular readers of this column know, numbers stations are frequently some of the most powerful signals found on shortwave—a compelling bit of evidence indicating that at least some of these transmissions originate in the United States. (Editor)

**8000:** JJY, Tokyo, Japan, time signals with CW identifications 1720. (Stewart MacKenzie, CA)

**8610:** WMH, Baltimore, MD, CW marker in CW 1312. (Gary Bledsoe, TN)

**8705:** WSL, Amagansett, NY, CQ marker in CW 0550. (Gary Bledsoe, TN)

**8720:** WLO, Mobile, AL, CW marker "DE WLO RTTY" marker at 0330 almost nightly. They send a nice QSL card. (Daniel Yemiola, OH)

**8720:** GKQ, Portishead, Somerset, England, "DE GKQ" CW marker 0249. (Daniel Yemiola, OH)

**9040:** SAC coded message in SSB 2140, used tactical call of "Autograph." (James Hicks, IA) There is another logging of the "Autograph" tactical call in this month's column. (Editor)

**9072:** Four-digit Spanish numbers station with female announcer 0040; ended at 0046 with rapid CW. (George Osier, NY)

**9074:** Four-digit Spanish numbers station

with female announcer 2300; transmission was parallel to 11533 kHz. (Lester Robison, NV) Lester adds that he often hears numbers activity beginning at 2300 on 5812, 8412, 9074, and 11533 kHz. (Editor) Four-digit Spanish numbers station with female announcer 0100; audible "clocks" before each digit, ten slow beeps at 0110. (Thad Adamaszek, OH)

**9173:** Four-digit Spanish numbers station with female announcer 0100-0120, strong signal. (James Hicks, IA)

**9325:** Five-digit German numbers station with female announcer 0302; opens with flute music and identifier of "Alpha Charlie." (Thad Adamaszek, OH)

**9625:** Five-digit German numbers station with female announcer 0205, opens with beeps and then into number groups. (Thad Adamaszek, OH)

**10015:** Five-digit Spanish numbers station with female announcer 0230. This transmission is slow and very easy to copy; it was repeated word-for-word (or maybe that should be group-for-group) on two other days! (Thad Adamaszek, OH)

**10135:** Five-digit Spanish numbers station with female announcer 0301. (Thad Adamaszek, OH)

**10460:** Five-digit German numbers station in SSB with female announcer 0143. (Thad Adamaszek, OH)

**10569:** Three-digit groups in Spanish read by a woman 0100. (Lester Robison, NV) Yes, some three-digit numbers stations are beginning to be reported now. (Editor) Time pips 0130, then long pip and into three-digit groups in Spanish read by a woman. (Thad Adamaszek, OH) Thad reports this frequency is parallel to 13808 kHz. (Editor)

**11108:** Five-digit German numbers station with female announcer in SSB 1845. (Tom Lewandowski, NY)

**11190:** Five-digit German numbers station with female announcer 2005. (Tom Lewandowski, NY)

**11243:** This SAC channel is back in use now after a brief switch to 11220. However, there now appears to be an electronic double tone ("Beep-Boop") at the end of each ground station transmission. (Tom Lewandowski, NY)

**11533:** Four-digit Spanish numbers station with female announcer 0238-0321; good signals. (James Anderson, NM) James copied the complete text of this transmission and sent it along; we'll discuss it at length in a future column. (Editor) Also heard at 0113. (Thad Adamaszek, OH)

**11579:** Five-digit Spanish numbers station with female announcer 0800; distorted audio sounded like SSB. (Kevin Schallmo, IL)

**12850:** ZSJ5, South African Navy, Cape Commcen, South Africa, V marker in CW, 0513. (Gary Bledsoe, TN)

**12860:** FUJ, French Navy, Noumea, New Caledonia, V marker in CW 0514. (Gary Bledsoe, TN)

**15042:** This frequency has been buzzing with much coded SAC traffic in SSB around 2250 to past 0000. Stations used tactical calls such as "Autograph" and "Lockbox."

Messages consisted of 30-45 second long number groups. (George Osier, NY)

**15411:** This item is for all of you who love a real mystery. At 0711, a male voice was heard describing a Jaguar automobile in SSB! Transmission was interrupted in mid-sentence several times, and each time was interrupted at the same place. Transmission always resumed at the spot it originally started. At 0721, the transmission abruptly vanished. (Terry Lindley, AL) Congratulations, Terry, you're the winner in this month's "Stump the Editor" contest! Readers, do any of you have a clue as to what Terry heard? (Editor)

**16949:** 8PO, Barbados, "DE 8PO" CW marker 1939. (Gary Bledsoe, TN)

**16953:** 6WW, French Navy, Dakar, Senegal, V marker in CW at 0127. (Gary Bledsoe, TN)

**17027:** FFL8, St. Lys, France, CQ marker in CW 1348. (Gary Bledsoe, TN)

**17068:** OXZ28, Lyngby, Denmark, CQ marker in CW 2133. (Gary Bledsoe, TN)

**17094:** SVA, Athens, Greece, "DE SVA" marker in CW 1918. (Gary Bledsoe, TN)

**17199:** WCC, Chatham, MA, ship traffic in CW 0021. (Gary Bledsoe, TN)

**17380:** FUM, Papeete, Tahiti, V marker in CW 0021. (Gary Bledsoe, TN)

**17425:** KKN44, U.S. Embassy, Monrovia, Liberia, V marker in CW 0023. (Gary Bledsoe, TN)

**22676.6:** JBO, Tokyo, Japan, Japanese phone traffic in SSB 2125. (Stewart MacKenzie, CA)

**24145:** VPC24, Falkland Islands, telephone traffic in SSB 1730. (Tom Lewandowski, NY)

**25160:** Five-digit Spanish numbers station with female announcer 2100-2112. (James Hicks, IA)

**26392:** Unidentified relay of ABC-TV coverage of USFL football game between New Jersey and Philadelphia 2133; AM mode. (Stewart MacKenzie, CA) Anyone have an idea what this could be? (Editor)

Many thanks for your continued excellent support! See you next month here in POP'COMM!

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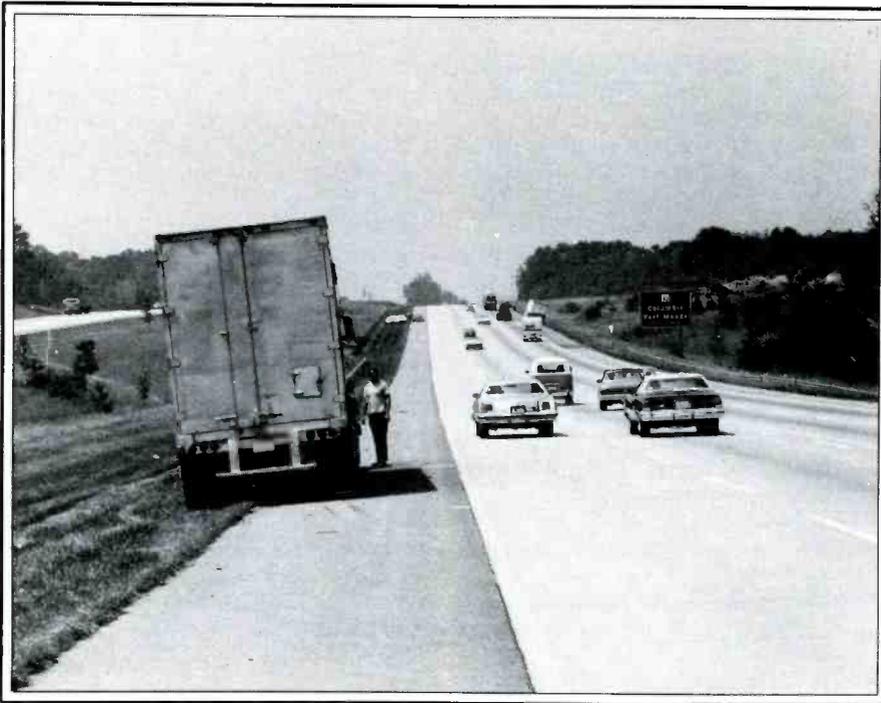
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CIRCLE 38 ON READER SERVICE CARD

# RADAR REFLECTIONS

## RADAR DETECTORS AND THEIR USE

BY JANICE LEE



### Ohio Court Finds K-55 Moving Radar Inadmissible

An Ohio Municipal Court ruled that a radar reading taken by a K-55 radar device is inadmissible in court as evidence for a speeding violation when used in the moving mode. This decision by Judge Anthony M. DeJute of the Defiance, Ohio Municipal Court followed nearly two years of legal wrangling and hundreds of pages of technical testimony taken concerning the K-55 moving radar of which there are thousands throughout the United States.

The decision came as a result of a 1982 case in which Gregory Wilson was found guilty of speeding by a K-55 moving radar. Wilson appealed the Municipal Court's decision and the appellate level reversed the earlier decision by acknowledging that the K-55 unit operating in the moving mode was "not the subject of judicial notice," a term indicating that the accuracy of a given device has not been adequately proven in a court of law.

As a result of the disposition of Wilson's case on the appellate level, Judge DeJute indicated that, until a K-55 test case could be tried, all defendants charged with speeding violations by the K-55 moving radar appearing before his bench would have their cases dismissed with a "no contest" plea. It is estimated that several hundred motorists were acquitted of K-55 speeding violations before the test case could be tried.

The test case was finally brought before the Municipal Court by Defiance grocery store owner, Luther Oberhaus, when he pleaded "not guilty" to a K-55 speeding

charge. Attorney Eric A. Mertz, of Rodney M. Arthur Co., L.P.A., in Defiance was counsel to defendant Oberhaus with consulting attorney David B. Sloan of Ruberg, Osborne, and Taylor in Covington, KY. Sloan is an authority on traffic radar cases as a result of his ongoing representation of Electrolert, Inc., the Ohio-based manufacturer of the Fuzzbuster®, a popular brand of radar detection device.

Over the course of the three-day trial before Judge DeJute, over 600 pages of expert testimony and numerous exhibits were introduced into evidence. Expert testimony regarding the operation, use, and accuracy of radar was given by both Lee L. Nichols, Dean of Electrical Engineering at Virginia Military Institute, and Jay Schreiber, President of Ultra Dynamics. Both men testified for the defense and are recognized experts in the field of police traffic radar.

The only expert witness called by the State was Edward Sargent, Vice President of MPH Industries, Inc. Sargent's company is the manufacturer of the K-55 radar unit, the most popular unit the firm produces. Since its development in the late 70's, MPH has marketed hundreds of the units in bulk orders to state governments throughout the country. While the unit has been a popular one among law enforcement agencies because of its low bulk-rate price, experts contend that it is highly fallible due to standard components and assembly which enable MPH to keep its cost attractive.

Although the court indicated that continued judicial notice would be taken of the K-55's accuracy in the stationary mode,

Judge DeJute said: "This court does not, however, take judicial notice of the K-55 radar device as accurate, scientifically reliable, and dependable for purposes of speed radar readings in the moving mode."

An appeal by the State is not anticipated at this time and Defiance police officers can be assured of getting a speeding conviction only if the K-55 is not operated in the moving mode.

It is uncertain whether or not this decision in conjunction with the Wilson ruling will produce statewide repercussions. If other Ohio judicial districts choose to recognize Judge DeJute's findings, it may produce a ripple effect not only throughout the state but possibly the nation.

### Montgomery County Judge Upholds Legality of Radar Detection Devices

A two year old traffic case has resulted in a court ruling upholding the use of radar detection devices in Amsterdam, NY.

The decision by Montgomery County Court Judge James N. White was handed down following an appeal of a traffic conviction of a Rotterdam man, Vincent Gramuglia, in the town of Glen Town Court March 16, 1982.

Although Judge White said recently he could not remember a similar case in Montgomery County, he did not think his decision set any legal precedent. He said there are "several cases" on the books that deal specifically with the legality of radar detectors. According to the case history, Gramuglia, the operator of a Fultonville trucking business, was stopped by two troopers on the Thruway December 6, 1981. They issued two traffic citations.

The first was for having the radar detection device, and another for driving with an obstructed view because of the device.

Two statutes were cited as the basis for the citations. The first, 397 of the Vehicle and Traffic Law, prohibits a private citizen from having a radio in his car capable of receiving signals from State police radios and listening in on their transmission.

The second section cited was 375.30 which prohibits the presence of objects in a car which obstruct the driver's view through the windshield.

When Gramuglia appeared in Town Court he had no lawyer although he did plead innocent to both charges, the first a misdemeanor and the second a traffic violation. Assistant District Attorney Robert N. Going appeared for the prosecution.

Gramuglia was convicted on both counts and fined. Although the time is not exact, he eventually hired Amsterdam lawyer Vincent Vicinanza to appeal the conviction.

Oral arguments took place last September

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before Judge White. Vicinanza contended that "radar detectors were not radio devices as intended by the statute, and that no real proof was offered that the actual vision of the driver was in any way obstructed."

He also raised a constitutional point based on case law about the statute dealing with obstructed vision. "Since there is no valid standard, there was also no proof in this case of any actual obstruction of vision," said Vicinanza's statement.

According to Judge White's decision, the prosecution during the oral argument last September "requested a 30-day adjournment to furnish a brief, but to date no brief has been received from the people."

In reference to the section of the law which deals with civilian possession of a radio and deliberate interference with police radio messages, the opinion said "courts have consistently held that a radar detection device, as such, is not in violation of 397 of the Vehicle and Traffic Law."

### City Won't Prosecute Over "Radar Trap" Sign

The city attorney in El Paso, TX recently decided not to prosecute a man who had been arrested for warning motorists about a police speed trap.

"I'm not sure the Police Department will submit a complaint to us," City Attorney David Caylor said.

Howard Naylor was arrested on a charge of hindering a police officer, a class C misde-

meanor. Police said he posted a crudely lettered sign proclaiming "Radar Trap" on a Northeast El Paso street just before the point where police were using radar to catch speeders.

Naylor at first refused to surrender the sign and struggled briefly with a police officer while being arrested, authorities said.

But Caylor said that Naylor's action didn't violate any laws.

He also said that he felt there was no real basis for prosecution.

### Fuzzbuster® Ban Almost Sneaks Through

The Florida House approved a bill by Rep. John Grant, that would make it a third degree felony, punishable by up to five years in prison, to monitor police radio frequencies while committing a crime.

"But the way it was worded," said Rep. Tim Deretany, "any person using 'frequency modulation radio receiving equipment' for the purpose of 'eluding a law enforcement officer' would be committing a third degree felony."

That sounded like a Fuzzbuster®, said Deretany, who confirmed that he has one of the little radar detection devices in his car. He checked with attorneys and police officials at home and was told that under the bill's wording, anyone convicted of speeding while using one of the devices likely would be eligible for up to a five-year stay in the state's choice of correctional institute.

The Chairman of the House Finance and Tax Committee, Barry Kutun, was there for the last unsuccessful battle when the Florida Legislature tried to pry Florida drivers loose from their little black boxes.

After Kutun explained, House members recalled the bill and amended it specifically to exclude radar detection devices before sending it to the Senate.

"Whether you're for or against radar detectors is not the question," Deretany said. "The question is, are you passing a bill of major consequences without any discussion?"

Grant, the sponsor, said he never planned that his legislation would ban the Fuzzbuster®: "It doesn't include it. There was never any intention to include it. But if they wanted to amend it like that, it was all right with me."

### Radar Detector Installed In Denver County Car

Adams County Commissioner Ron Nichol has mounted a Fuzzbuster III® on the dash of the 1983 AMC Eagle the county recently purchased for his use. Nichol said he did not feel the use of a radar detection device by a county official on a county-owned vehicle reflected any conflict of interest. "Are they illegal?" Nichol questioned.

"When I hear it beeping, I look at my speedometer to see what I'm doing because I have had a tendency to have a heavy foot and I try to watch it," Nichol explained.

A check of motor vehicle department records indicated Nichol had been convicted of two speeding violations in the past four years.

When advised that the county had received several complaints about his use of the radar detection device, Nichol commented, "Things are slow when they've got to start digging at things like that. I think there are some guilty people out there and I think they are trying to divert people's attention from the real issues."

### Selma, TX . . . Trying To Change Its Image?

This small South Texas town is known mostly for having one of the state's more notorious speed traps, police chief Joe Potempa admits.

He also says he's changing all that. "They used to call it 'Hemorrhoid City' on the CB," Potempa said. "I know for a fact we're changing slowly. People are talking decent about us on the CB."

Potempa has been a member of Selma's police force for six years and became chief in December 1981.

"This city's been labeled a speed trap for I don't know how long by the media," he said. "The media can really hurt a city."

Potempa has changed the police cars from an inconspicuous brown to blue and white so motorists on Interstate 35 who pass through this town about 10 miles north of San Antonio can identify a patrol car more easily.

Janice Lee is the Editor of Monday, A.M., the newsletter of Electrolert, Inc.



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# WASHINGTON PULSE

## FCC ACTIONS AFFECTING COMMUNICATIONS

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In accordance with Part 87 of the FCC Rules, upon making application for a new or renewed aeronautical advisory station license, the applicant must include the following information with the application:

1. Name of owner of landing area and date notified.
2. Names of all fixed base operators at the landing area and date notified.

This notification shall be given, in writing, to the owner, and all Fixed Base Operators at the landing area within 10 days prior to the filing of your application with the Commission. In the event there are no other Fixed Base Operators located at the landing area, a statement to this effect must be included with the application. If the applicant is the owner of the landing area, so state.

Failure to submit the above information will render your application as defective and result in the return of the application.

In order to remind licensee's of the above requirements, each aeronautical advisory license issued will be annotated, in red, with the above notification requirement.

For a new station license use: FCC Form 406. For an expired station license, use FCC Form 406. For a renewed station license, prior to expiration, use: FCC Form 405A.

### **Licensing Of CB Stations Eliminated**

The Commission eliminated individual licensing for stations in the Radio Control (R/C) and Citizens Band (CB) Radio Services. In so doing, it also decided to change its rules to permit CB station operation without FCC assigned station identification. Rules permitting R/C station operation without station identification were retained. CB users may optionally utilize club, network, or other ID's if they wish.

The Commission noted that licensing of R/C and CB stations has always differed from licensing other private radio stations because of the broad eligibility and operational provisions of these services. Individualized R/C and CB licensing is not used to assign specific frequencies, output power, or hours of operation. Also, spectrum management in these services is by type-acceptance and operating rules, rather than by licensing. R/C and CB transmitters are type-accepted to assure they can be operated only on legal frequencies with legal power.

By eliminating individual station licenses, the Commission said, there would be no need to keep the present minimum age requirements.

Manufacturers still would be required to pack the CB rules with each transmitter.

All pending CB and R/C applications and

any others received by the Commission in the future will not be acted upon.

### **Maritime Mobile High Frequency Channel Assignments**

The Commission has assigned permanently to the maritime mobile service the high frequency (HF) channels (4-23 MHz) which were assigned on a temporary basis in 1977.

This action brings the Commission's rules into compliance with the actions taken at the 1974 World Maritime Administrative Radio Conference (WARC) of the ITU which increased the number of maritime frequencies available for assignment and the number of countries allotted frequencies.

Subsequent to the WARC's revised allotment plan, the Commission issued a notice of inquiry in this proceeding seeking comments concerning the assignment of HF radiotelephone frequencies to non-Government ship and coast stations.

After reviewing the comments a temporary frequency assignment plan was adopted which essentially provided a one-for-one replacement of the frequencies previously used by coast stations. In some cases where additional frequencies were available, coast stations which had been required to share frequencies with other U.S. coast stations were assigned frequencies without such sharing arrangements. The temporary plan was designed to meet the WARC implementation date of January 1978 while providing time to investigate potential problem areas.

After the implementation of the temporary plan, the Commission requested the existing licensees of HF radiotelephony coast stations to provide utilization data for all assigned frequencies.

Upon preliminary review of the data submitted, and noting the lack of complaints from the user community, the Commission proposed making the basic temporary plan permanent.

All commenting generally supported making the plan permanent.

Because of the successful performance of the temporary plan and the support of the commenters, the FCC concluded that the plan should be implemented substantially as proposed with minor modifications to accommodate suggestions and clarifications as well as to provide for assignments to certain stations as a result of the actions taken on applications in the maritime service.

The pending applications which have been granted in this action are those of RadioCall Corporation for authority to operate a high seas radio-telephone service in the Hawaiian Islands; and Global Communications, Inc., for authority to modify the license of public coast station WAH, St. Thomas, V.I., to include high seas radiotelephony service on the frequencies 6515.7 kHz and 6518.8 kHz, and on 17236.0, 17239.1, and 22664.2 kHz on a secondary non-interference basis to station KMI, San Francisco.

The Commission retained on file pending court review of the FCC's action denying its applications for renewal of license and an additional channel, the application of Gulf Coast Communications Corporation, licensee of public coast station KUZ383, Palmetto, FL, for assignment of a 4 MHz frequency to serve the Gulf of Mexico and the Caribbean Sea. However, it dismissed the application of WJG Telephone Company, licensee of a number of public coast stations providing service on the Mississippi River System, for authority to provide high seas radiotelephony service on HF frequencies.

In adopting this plan the Commission noted that such assignment of all available frequencies limited entry into this service. Therefore, it said, it intended to initiate a new proceeding investigating the possibility of establishing loading criteria for this service, permitting international record carriers to provide telephony as well as telegraph service and allowing additional flexibility in the types of service (e.g., facsimile) provided on maritime telephony frequencies where authorized.

The Commission retained on file pending court review of the FCC's action denying its applications for renewal of license and an additional channel, the application of Gulf Coast Communications Corporation, licensee of public coast station KUZ383, Palmetto, FL, for assignment of a 4 MHz frequency to serve the Gulf of Mexico and the Caribbean Sea. However, it dismissed the application of WJG Telephone Company, licensee of a number of public coast stations providing service on the Mississippi River System, for authority to provide high seas radiotelephony service on HF frequencies.

### **Additional Frequencies To Coast Guard**

The FCC proposed amending Parts 2 and 74 of its rules to permit the use of the frequencies 161.7 and 161.75 MHz by the U.S. Coast Guard.

The Coast Guard had requested that it be authorized to use the frequency 161.7 MHz paired with 157.1 MHz from its Coast Guard stations in 13 port areas to transmit safety liaison communications to foreign vessels and to use the frequency 161.75 MHz paired with 157.15 MHz for portable repeater operation involving search and rescue missions in 21 states.

The port areas to be served include Boston, Portland, New York, Delaware Bay, Miami, Mobile, Mobile Bay, New Orleans, San Diego, Los Angeles, San Francisco, Seattle, and Valdez, Alaska.

The 21 states involved in the search and rescue missions are: Alabama, Arkansas, Colorado, Indiana, Iowa, Illinois, Kentucky, Kansas, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Oklahoma, Ohio, Pennsylvania, South Dakota, Tennessee, West Virginia, Wisconsin, and Wyoming.

Although international radio regulations allocate both requested frequencies to the maritime mobile service, U.S. regulations predating the international agreement allocated the band to broadcast remote pickup (RPU) stations which operate on 161.64, 161.67, 161.70, 161.73, and 161.76 MHz

to transmit information regarding news events from the scene of the action to the studio.

The Commission noted that Coast Guard operation on 161.7 MHz would fall directly on an RPU channel and operation on 161.75 MHz would fall between channels 161.73 and 161.76 MHz. Because of the temporary nature of the Coast Guard and RPU operations, the low number of RPU users in areas of Coast Guard transmissions and the compatible transmitter powers used by the stations, the FCC said shared operation in the frequency band appeared technically feasible.

It noted, however, that the Coast Guard's proposed operational use for search and rescue activities might make it impossible to share frequencies during emergencies. Therefore, the Commission specifically asked for comments on this issue.

### **Changes In Alaska-Public Fixed Service Rules**

The Commission proposed amending its rules governing the Alaska-Public Fixed Service to eliminate the division of Alaska into six zones for frequency assignment purposes; change the Alaska Emergency Frequency from 4383.8 kHz to 5167.5 kHz; redefine the eligibility requirements for the use of simplex and duplex frequencies available to the Alaska-Public Fixed licensees; move certain frequencies, previously available only to common carriers, into the pool of frequencies available to non-common carriers; and relax the rules governing coast station and Alaska Fixed station identification.

The Alaska-Public Fixed Service attempts to meet the unique needs of Alaska "bush" communities which have no form of conventional telephone available to them and which must rely on the nearest cannery's or fishing village's radio transceiver for communications facilities.

The Alaska-Public Fixed licensees operate on marine frequencies since most of them originally settled along the coasts of Alaska. The typical licensee provides a communications link from the "bush" to the nearest population center with conventional telephone service.

The Alaska Communications System (ACS) was a governmental communications system operated by the Air Force until 1969, when it was sold to RCA Alaska Communications, Inc., and then to Alascom, Inc. Alascom and other entities continue to provide communications to Alaska, although much of the ACS equipment has been replaced by systems using more sophisticated technology, such as satellites and microwave systems.

The FCC is proposing to modify or delete certain rules that date back to the sale of the ACS. It is also proposing to change the Alaska Emergency Frequency from 4383.8 kHz to 5167.5 kHz and to make it available to licensees in a new Alaska-Private Fixed Service as a calling channel.

It noted that many of the very desirable 4 and 5 MHz Alaska-Public Fixed Service fre-

quencies are available in only one of six zones, where they may or may not be used. This limitation is particularly frustrating to applicants in other zones where similar frequencies are either occupied or otherwise unavailable. The zones also restrict communication between individuals operating near each other but in different zones. Because the zones no longer appear to serve any useful purpose, the Commission proposed deleting all references to them in the rules.

The Commission noted that the emergency frequency selected in 1974, 4383.8 kHz, was not always monitored and many radios are not equipped to receive it, adding that 5167.5 kHz was more popular in Alaska since it was used by most lodges as a calling channel. Therefore, the Commission proposed changing the Alaska Emergency Frequency to 5167.5 kHz for all stations authorized in the amateur, fixed, and mobile services and to Government stations within 50 nautical miles of the State.

Additionally, it proposed two distinct groups of frequencies—duplex for common carriers only and simplex for all others. Frequencies previously used by Alascom to provide communications to outlying communities which have since obtained other communications services are not now used by the common carriers. Therefore, it proposed adding these frequencies to the "pool" of simplex frequencies available throughout Alaska to all other licensees. The Alaska Fixed Service would be comprised of two classes of stations—Alaska-Private Fixed (operating on simplex channels) and Alaska-Public Fixed (common carriers operating on duplex channels).

The FCC also proposed relaxing the station identification rule to permit Alaska Private and Public Fixed and Private and Public Coast station licensees to identify themselves by their approximate geographic location rather than by call sign if they are the only licensee on that frequency at that location. If there is more than one license issued for use of the same frequency in a given location, the rules would allow identification by licensee name followed by location.

### **Ordered Not To Make Broadcast Tapes On Business Radio**

The FCC directed MTC, Inc., operator of Metro Traffic Control, which provides traffic reports to broadcast stations and other clients in ten major metropolitan areas, not to use its Business Radio Service stations to make tape recordings of mobile station transmissions for replaying by its broadcast clients.

The Commission affirmed the action of the Chief of its Private Radio Bureau February 23, 1982, finding that MTC was using its Business Radio Service facilities in ways that were contrary to FCC rules and that such uses must cease. The FCC denied MTC's request for review.

MTC's mobile units use two-way Business

Radio Service frequencies to report on traffic conditions. Reports are prepared, using information received from the mobile units, and transmitted by telephone to broadcasting clients.

In some of the reports, transmissions from mobile units are tape recorded and inserted as "actualities" (live or taped reports from the scene of an event). FCC monitoring at Hyattsville, MD, and Detroit revealed that MTC's reporting of actualities extended to repeated taping of business radio transmissions to ensure having broadcast-quality tapes. MTC's repeated "takes" caused severe interference to other licensees sharing the frequencies.

MTC asked the Commission to construe FCC rules to allow use of the frequencies to create actualities, on grounds that it is ineligible to use the Auxiliary Broadcast Services frequencies set aside for on-the-spot reporting and similar uses. Use of the auxiliary frequencies is limited to broadcasters.

The Commission noted that the purpose of the Business Radio Service is to provide for internal business communications and that use of private land mobile frequencies in connection with broadcasting is prohibited by the rules. Sharing of those frequencies by the many licensees is necessary if their needs are to be accommodated. The rules call for cooperation and coordination, the FCC noted, and require keeping transmission times to the minimum.

MTC's actions are incompatible with the purposes of the service and with the technical limits of the systems in use, the Commission said, as well as with the needs of other business radio licensees.

### **Use Of Part 90 Temporary Permit**

Normally, the Private Radio Bureau requires all applicants for licenses in the Private Land Mobile Radio Services (under Part 90 of FCC Rules) to wait until their licenses are granted before they may begin transmitting. Under certain circumstances, however, some applicants can get on the air without waiting if they are eligible to use a temporary permit (FCC Form 572). These circumstances are explained in rule section 90.159, which the Commission amended recently to include all Part 90 services:

90.159 Temporary permit.

An applicant for a private land mobile station license utilizing an already authorized facility may operate the radio station(s) for a period of up to 180 days under a temporary permit evidenced by a properly executed temporary license certificate after mailing a formal application for station license together with evidence of frequency coordination, if required, to the Commission, provided that the antenna(s) employed by the control station(s) is twenty feet or less above ground or twenty feet or less above a manmade structure other than an antenna tower to which it is affixed. The temporary operation of stations, other than mobile stations within the Canadian coordination zone will be limited to stations with a maximum of 5 watts effective radiated power and a maximum antenna height of 6.1 meters above average terrain.

In other words, this permit may be used only by a person who has applied for a license to operate a (shared) station that is already licensed to one or more others (e.g., a community repeater) in a private land mobile service. It may not be used by any applicant for any other kind of station. And it may not be used as a substitute for a special temporary authority (STA), which the Commission grants only by request (under rule section 90.145).

To use the permit, the eligible applicant simply follows the instructions on the Form 572, which is divided into five clearly labeled sections. Then the applicant keeps the form with his or her station records. It should not be mailed to the FCC.

Anyone who needs more information or assistance may call the Private Radio Bureau's Licensing Division in Gettysburg, PA, at (717) 337-1212.

### 800 MHz Private Land Mobile Applications

On August 16, 1982, the FCC released 250 additional 800 MHz private land mobile channels by *Second Report and Order*, 90 FCC 2d 1281. Applications for these channels were first accepted from November 15 through December 15, 1982. Applications were filed for more channels than were available to assign in the commercial pool in 15 areas, which were listed in Public Notice 2459 (February 17, 1983). On April 1, 1983, the Commission began accepting additional applications for the new channels except in the commercial pool in those 15 areas.

As Public Notice 2459 stated, applications filed on or after April 1 must specify whether they are for "old" or "new" 800 MHz channels because different procedures apply.

Applications will be stamped with the date they are received in the Commission's Gettysburg office. It is the date of actual receipt in the Gettysburg office that will control. Applications will not be time stamped.

Applications will be processed on a first received, first processed basis. On "new" channels, all applications filed on the same date for an area will be considered together. If there are sufficient channels available to grant all applications filed on the same date for an area, they will all be granted. If there are not sufficient channels available to grant all applications filed on the same date for an area, the applications filed on that date will vie for the remaining available channels by comparative hearing or lottery, and all applications which were filed after that date for that area will be dismissed.

### Private Land Mobile Restrictions In Shared Use Arrangements Rescinded

The Commission has revised its rules on multiple licensing and cooperative use of stations in the Private Land Mobile Radio Service to enable licensees to profit from sharing arrangements and to eliminate certain other restrictions.

The FCC's action also permitted licensees to operate for their own purposes on the same facilities they make available to others for multiple licensing. It also enabled licensees and users of shared stations to obtain packaged service consisting of both equipment and dispatching service from the same third party.

The FCC acted in light of amendments to the Communications Act adopted last year and in response to petitions by General Electric Company and others for reconsideration of its order, released in April 1982, establishing a regulatory plan for multiple licensing and shared use arrangements.

In its 1982 action the Commission affirmed its earlier conclusions that shared use

arrangements did not constitute common carriage within the meaning of the Communications Act. It found that authorization of such private land mobile licensing arrangements furthered greater and more effective use of radio. The order clarified distinctions between multiple licensing and cooperative use arrangements and specified how each was to be conducted.

Under multiple licensing, two or more persons eligible for authorization in the private services may be licensed to use the same base station transmitting equipment. The cooperative use sharing arrangement permits two or more such eligible persons to use the same base station equipment although only one is licensed for that station.

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The other users operate the base station under the licensee's authorization. Mobile stations may be authorized either to the base station licensee or separately to the users.

The 1982 order required that, in case of cooperative use, all costs of the shared service were to be equitably shared. It provided that all costs were either to be absorbed by the licensee on a no-charge basis to the other users or prorated among all participants.

In multiple licensing, the order forbade payments among licensees for use of the jointly licensed facilities. It prohibited operation by equipment suppliers for their own use on facilities they make available to others for multiple licensing and forbade provision of both equipment and dispatching (packaged service) by the same third party to licensees in both cooperative use and multiple licensing arrangements.

In the 1982 Communications Act amendments, Congress affirmed the Commission's conclusions on multiple licensing and

nonprofit cooperative use of private land mobile facilities but also determined that shared use of private facilities on a for-profit basis was consistent with its objectives for the private land mobile radio services. It concluded that there should be minimal barriers to the ways licensees, equipment suppliers and other third parties are able to offer facilities and services to eligible users.

The Commission said the amendments allow and encourage maximum flexibility for provision of services and facilities to eligible users as marketplace forces may dictate. Congressional intent leaves no reason to limit a licensee's ability to charge, it said, or to structure cost-sharing arrangements. It amended the rules governing shared use of private land mobile stations to allow licensees to profit from shared use of their stations and to permit nonprofit cooperative sharing arrangements without limitation.

The FCC noted arguments that its restriction which prohibits authorizing an equip-

ment supplier as one of the licensees of a facility which it makes available to others for multiple licensing results in duplication of equipment and needless expense for suppliers which have legitimate communications of their own.

It decided that the hardships imposed, particularly on small businesses, were not commensurate with the benefits gained from the rule, which established a definitive distinction between multiple licensing and cooperative arrangements for shared use. In view of that disproportion and the new amendments to the Communications Act, it eliminated the restriction.

On its own motion the Commission reconsidered its preclusion of packaged service and decided that it was overly restrictive. Abdication of system control is not the natural consequence of obtaining goods and services from a single entity, the Commission said, though it may occur in isolated instances.

Whether a licensee exercises the supervision a system requires is the determinative factor, it said, not the number of third parties involved. Instances of abdication of control can be dealt with on a case-by-case basis without a generic prohibition, it said.

### Frequency Coordinator For 150 Original 800 MHz Channels

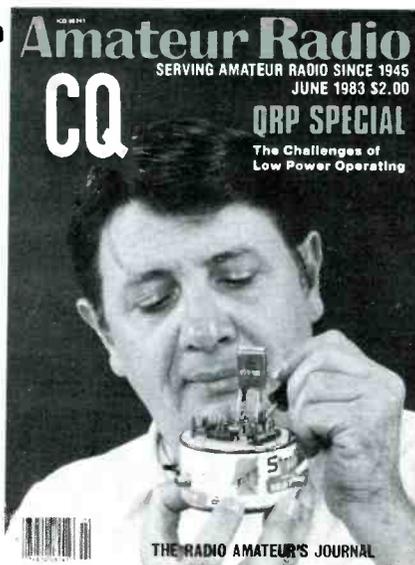
On October 16, 1982, new rules regarding the licensing and operation of private land mobile radio systems operating in the 806-821/851-866 MHz bands became effective. These new rules implemented frequency coordination as an option for applicants for all 800 MHz private land mobile radio systems, except SMR systems. At the time the new rules were adopted, no group expressed a willingness to act as a frequency coordinator for SMR systems on the original 150 channels designated for use by conventional private land mobile radio systems. Consequently, the use of a recommendation from a frequency advisory committee for conventional SMRS base station applications was not included as an alternative in the new rules.

On January 3, 1983, the Land Mobile Communications Council (LMCC), which represents the various private land mobile interests, submitted a recommendation to the Commission to designate the National Association of Business and Educational Radio, Inc. (NABER) as the frequency coordinator for SMRS conventional base stations on the original 150 conventional 800 MHz channels. LMCC indicated that the availability of NABER for frequency coordination would provide an additional option for SMRS conventional base station applicants, and may provide for the more effective and efficient use of this spectrum.

Therefore, applicants for SMR systems to operate on old conventional channels may submit a coordination recommendation from NABER as an alternative to a field study to identify the best available frequency.

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# FREE RADIO FOCUS

## ACTIVITIES OF UNDERGROUND BROADCASTERS

### The Future Of Low Power FM

BY B. Z. KOBB, KC5CW

The Federal Communications Commission has before it a Petition for Rule Making which could result in the creation of hundreds of new, low power community FM radio stations. The petition, RM-3914, was filed in June of 1981 by attorneys for the Moody Bible Institute (MBI) of Chicago. MBI is a religious broadcaster, owning several radio stations.

The MBI proposal would ease a number of the current restrictions on FM translators. Translators are low power repeaters which receive the off-air signal of a radio or TV station, and rebroadcast it to audiences outside of the range of the originating station.

The FCC does not permit translators to originate their own programming, but MBI proposes that translators be allowed to do just that—becoming, in effect, mini radio stations.

Television translators have already been “deregulated” in one of the most controversial actions in recent broadcasting history: the Low Power Television Inquiry. The FCC literally created a new class of stations, beginning a new era in television, the effects of which will be felt across the United States. Low Power Television (LPTV) stations operate with a transmitter power output of 100 watts on VHF or 1000 watts on UHF. The stations may be commercial or non-commercial, may be owned and operated by practically anyone, and have very few restrictions on what kind of programming they may carry. As of this writing, there have been more than 300 LPTV stations authorized, with many more to come.

The same thing could happen in FM radio! MBI makes the case that low power FM stations should be free to receive their programming from local studios, satellites, or any other source. These stations could serve small communities which do not have their own radio stations, or could provide alternative music programming in larger cities. The possibilities for new dimensions in radio are endless with Low Power FM. There are obstacles, however, to the development of this new form of broadcasting.

LPFM stations would probably have to be authorized on a “secondary” and “non-interference” basis. This means that LPFM stations would not be allowed to interfere with existing, full-power stations, and must accept interference from the existing stations. Finding a vacant frequency for an LPFM station will be difficult in many areas of the country, with many FM stations crowding the dial.

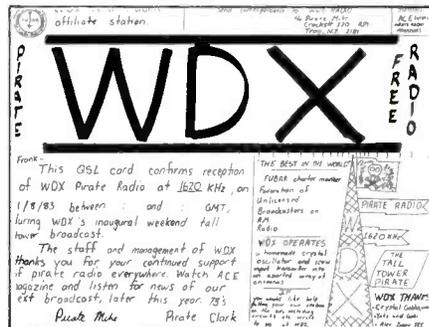
The range of an LPFM station, operating with a 10 watt transmitter, will be limited—only a few miles, depending on antenna height, local terrain, and other factors. It's



Here's the transmitter site and main studio of Coral Reefer Radio. This was sent to us by "The Captain."

questionable whether such a small-area station would be commercially profitable. It would be relatively inexpensive to build and run, however. MBI estimates that an LPFM station could be constructed and operated for one year for \$15,000 to \$20,000. This is a small portion of the amount needed for a full power station.

Of course, some broadcasters are opposed to the idea of Low Power FM. They fear the additional competition that might result from new stations being added to their markets. They are concerned about interference they might receive from “flea-power” radio stations. Some have commented to the FCC that LPFM stations would probably



Station WDX, 1620 kHz, sends out this certificate sized QSL card. Thanks to Pirate Mike for passing it along.

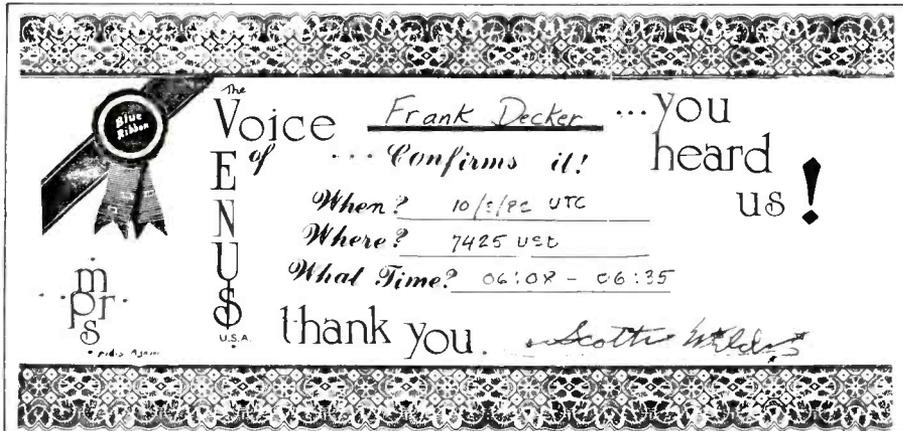


Radio Confusion's QSL card depicted scenic Lake Confusion, which looks like an advanced toxic dump site.

# WRFI-FM 88.5

## ITHACA COMMUNITY RADIO

The former WRFI-FM used to give out these nifty bumper stickers to listeners.



Frank Decker passed along this view of the QSL from the Voice of Venus last year.

be operated by persons or groups with inadequate technical expertise and knowledge of FCC rules.

Most of these kinds of concerns have already been addressed by the FCC in its study of Low Power Television. Only time will tell if there will be an adverse impact on traditional broadcasters. Some organizations, such as the respected Telecommunications Research and Action Center (TRAC) of Washington, DC, have come out solidly in favor of Low Power FM.

A big obstacle to this new service is the recent reduction in funding of the FCC. The Commission, with less money and fewer people, has its hands full processing the thousands of applications for LPTV stations. The processing must be done by hand for the time being, as the FCC does not yet have a computer for this purpose. It may be years before some LPTV licenses are granted. Under these conditions, it's not surprising that the FCC has not taken any action on the MBI petition. A new Low Power FM service might attract thousands of applicants, all writing to the FCC for permission to start their own radio stations. If that day comes, though, get set for a revolution in radio!

### Pirate Activity

#### BY AL MUICK

Here is some information that I received from our neighbors to the north, Canada. A postcard came from CTOP, Canadian Top of the World Pirate Radio, to inform me that they operate on 27455 kHz at 0400 GMT to 0430 GMT, Monday through Friday, and 2000 to 2100 GMT on Saturday and Sunday. They have an output power of 20 watts

and use a tri-element beam for an antenna. They sign on and off with "Top of the World" by the Carpenters. CTOP's DJs include Bockby Motsart, who specializes in classical and soft rock and Rastus De Funk who specializes in 50's and 60's music plus "weird stuff."

Arctic Radio KST recently sent us a letter describing their set-up in the area of Anchorage, Alaska. The operator, Scott, says he has an output ranging from 15 to 20 watts and a small antenna mounted on the side of his shack that provides good coverage of the town. In the future, a Starduster quarter-wave antenna will be put up and hopefully that will give better coverage for "skip" purposes. Scott says they mainly stay on 26985 and 27165 kHz, but that their frequency may change at any given time. Scott also informs me that there is a shortwave pirate in the Anchorage area called KHOM with Ritchie the DJ who runs "high power" and has a very professional sound on 27085 kHz.

KVOS, the Voice of the South, dropped us a line informing us that a new pirate operation will be starting from the Heart of Dixie. Their first broadcast was to have been on March 19th on 7425 kHz with a pre-recorded program and a loop number. They operate with a power of about 30 to 50 watts and their antenna is a half-wave dipole. They hope to start a sister station KRFA, Radio Free Alabama, shortly and also hope to have the world's first FM shortwave pirate in a few months.

The Captain of Coral Reefer Radio sent me a nice picture of their setup along with a letter describing their operation. CFR's first day on the air was November 12, 1982 and since then they have upgraded from 10 watts to 145 watts using a Drake T4XC

transceiver. They are currently running test transmissions on 7345 kHz in AM and LSB using a computer-controlled reel-to-reel from 6 to 9 p.m. EST or 9 to 11 p.m. EST. They also do some test transmissions on 6945 kHz. The Captain primarily plays Jimmy Buffet records and gives info on pirates he has heard. He doesn't have an address yet, but is in the process of getting a P.O. Box for his station.

ET2 Gregory Pioppi, a member of "Uncle Sam's Canoe Club" (as he puts it) wrote to tell me of a pirate station that he has heard. Last March 13, at 0555 GMT, he heard a station on 6155 kHz playing anti-war music. They played cuts from the Beatles, Jefferson Airplane, and an unidentified artist, but suddenly signed off in the middle of one song. Gregory's equipment is an AN/URC 58 (a/k/a AN/GRC-165) and a 16 foot fiberglass whip. Thanks a lot for the info and keep up the good work on the commo gear, Gregory!

From our lawyer friend, Frank Decker in New York, comes some information on WDX along with some photocopies of QSLs he received from them and from the Voice of Venus. Frank heard WDX in January on 1620 kHz at 0435 GMT with a good signal. When he called the station, Crystal Goblin of WART answered the phone and took down his QSL information. When he called the loop number for the Voice of Venus, a staff member took his QSL information. Frank comments that the Voice of Venus QSL is one of the best looking QSLs that he has ever received.

Bob Doyle of Shelton, Connecticut reports that he heard a pirate station WRAM on April 3 on 7700 kHz around 2320 GMT. They were playing rock and roll from the 50's and had a male DJ. Bob uses a Panasonic RF2800 with a 15 meter longwire antenna. On this receiver, WRAM had a SIN-PO of 34333 with poor modulation. Bob reports that they left the air at 0102 GMT. Thanks for the info, OM!

In a recent edition of the *Christian Science Monitor*, there was an article about Free Radio with mentions of WART and Radio Flying Dutchman. The article hit upon one sore nerve here in the pirate community: namely the lack of true unity in the field. Pirates are extremely divided over their reasons for broadcasting. Some think it's a game, others have political messages, and still others are quite seriously trying to provide a programming alternative to local stations. Another interesting point was brought up in the article, that of the FCC's lack of funding. According to one FCC official: "At this stage, we're operating on a response mode. We'll respond to complaints." I found it interesting therefore to note that despite a few truly sloppy operators out there, they have apparently not caused enough grief that someone has reported to the FCC yet. The article goes on to spotlight some of the programming that might be heard on a typical pirate station and some interviews with Radio Flying Dutchman's operators. Makes for interesting reading.

## Beaming In (from page 4)

based upon having been a member of numerous worthwhile and worthless monitoring clubs since 1946. I've seen my share of groups come and go during the decades. I don't belong to all of the 14 groups which I decided to list, by the way.

Those seeking further information on the following groups should contact them directly. Be certain to enclose a self-addressed stamped return envelope. Tell 'em POP'COMM sent you!

*All Ohio Scanner Club*, 10 Avalon Rd., Mt. Vernon, OH 43050. Primarily aimed at scanner enthusiasts in Ohio, it's an energetic and ambitious group that is doing a fine job.

*American Shortwave Listeners' Club*, 16182 Ballad Lane, Huntington Beach, CA 92649. An excellent club, covering shortwave, medium wave, utility stations.

*Association of Clandestine Radio Enthusiasts*, P.O. Box 452, Moorhead, MN 56560. Primarily devoted to spy, undercover, and pirate stations. In a field which has known its own share of problems and groups with problems, ACE has been able to maintain an even keel and produce a very worthwhile publication.

*Association of North American Radio Clubs*, 1500 Bunbury Drive, North Whittier, CA 90601. Not a club in itself, but an umbrella organization consisting of selected affiliated DX clubs. Their membership publication is available to individuals and contains much interesting information.

*Golden Gate Communications Assn.*, P.O. Box 1861, Modesto, CA 95353. A growing scanner group with a nifty newsletter dedicated to public safety communications in the Bay Area.

*Great Circle Shortwave Society*, P.O. Box 874, Kankakee, IL 60901. Recently formed by DXers who were issued the old "WPE" monitoring certificates during the 1950's and 1960's. If you were ever issued a "WPE" certificate, contact them.

*International Radio Club of America*, P.O. Box 26254, San Francisco, CA 94126. Covers only medium wave (AM broadcast band) DX only. Excellent group!

*Longwave Club of America*, 45 Wildflower Rd., Levittown, PA 19057. If you're interested in exploring the world of radio below 535 kHz, LWCA is for you.

*Minnesota DX Club*, 5212 Drew Ave. South, Minneapolis, MN 55410. Accepts members from Minnesota only. A very good statewide group covering all bands.

*National Radio Club*, P.O. Box 118, Poquonok, CT 06064. It's been going since 1933, exclusively covering the AM broadcast band. An absolute must for all pursuing these frequencies.

*North American Shortwave Association*, P.O. Box 13, Liberty, IN 47353. The club's publication *FRENDX* covers shortwave and enjoys great popularity with listeners. Top notch club all around!

*SCAN*, Suite 1212, 111 East Wacker Dr., Chicago, IL 60601. A national scanner or-

ganization sponsored by the manufacturers of Electra Bearcat scanners. Nice members' magazine (bi-monthly).

*SPEEDX*, P.O. Box E, Lake Elsinore, CA 92330. Covering shortwave broadcast and utility stations, their publication contains a great wealth of well-presented information. A "must" for utility fans especially.

*Worldwide TV-FM Association*, P.O. Box 97, Calumet City, IL 60409. This club is devoted to FM/TV DX. It also covers scanner frequencies and has a useful monthly publication.



## Happy Birthday To POP'COMM

This issue of POP'COMM marks the beginning of our second year of publication. As I look back over the previous 12 issues, I can see many changes (major and minor) we've made to the publication to fine tune it to the exacting wants of our readers. We've gotten to know the types of features our readers like best and which have been met with less enthusiasm than we had originally foreseen; thanks to the readers for keeping in touch with us regarding their opinions.

In upcoming months, we'll have copious amounts of the brand of features you like best, done by those authors whose past efforts have brought in the largest number of responses.

In any event, don't think that we don't want to hear any further opinions you may have, either on the magazine in general or on specific features and columns. You'd probably be surprised to know the considerable amount of attention we give to your letters and comments; those which are particularly well thought out and which either praise or squawk about things in our pages are usually read aloud at staff meetings and discussed at length.

And don't forget that we are always on the lookout for feature articles submitted by our readers, as well as station or shack photos, QSL cards from interesting or unusual stations or those of historic interest. If you've got some specialty which would be of interest to our readers, or some juicy frequency information, we're most definitely interested. We have even prepared an informational sheet for prospective authors which outlines what we are seeking and tells how to prepare manuscripts for our consideration. Just ask for one and I'll send it along.

## Perry Ferrell

Speaking of writing for magazines, way back in 1956 I had gotten all fired up on an aspect of monitoring but was unable to locate any information on it. I called the offices of *Popular Electronics* and somehow got put through to Perry Ferrell, the Editor. We discussed the lack of published data and he suggested that after I had spent some time tuning in the stations that intrigued me, perhaps I might want to try writing a feature for *Popular Electronics*. I had never before written anything more than a postcard home from college, so I was somewhat awestruck by Perry's suggestion. However, the idea rattled around in my imagination for a while and after a few months I gave it a try. I was more than astounded when he got back to me and said the manuscript had been accepted. He even asked if I would like to write some additional features for the magazine! I gladly accepted the challenge and was never sorry I did, for it gave me the opportunity to turn a hobby into a career.

Perry and I have kept in rather close contact over the years. Even after he left *Popular Electronics* to devote all of his time to running Gilfer Associates, we still found time to exchange frequency data, small talk, and other items of mutual interest. I would imagine that anybody interested in "utility" monitoring must be familiar with Perry's book *The Confidential Frequency List*, the result of countless months of painstaking frequency research.

I was therefore pleased when I opened the mail recently and saw a copy of Perry's new Second Edition of his *Guide to RTTY Frequencies*. This 192 page book is an exhaustive compilation of highly detailed information on RTTY stations operating between 4 and 27 MHz, containing information on call signs, locations, operational modes, power output, schedules, and lots more. Listings are according to frequency and are cross-referenced by call sign; stations covered include press, military, weather, coastal, embassy, aeronautics, and several other categories.

Perry really has done a superb job and if you're presently into RTTY monitoring (or would like to see what you're missing by not monitoring these stations), this is the book for you—regardless of how much RTTY data you've accumulated in your files. Perry knows his stuff—the guy spends many hours each day tuning the bands gathering information and he has the knack of knowing which stations are the most interesting to listeners. You'd be wise to check this book out and even send to Gilfer for their complete catalog of publications and other materials of high interest to shortwavers. The address is: Gilfer Associates, 52 Park Avenue, Park Ridge, NJ 07656.

And, by the way, if you've been wondering who to blame for my own entry into the magazine writing field, I suppose that Perry is the culprit. I might add that over the years there have been several occasions when he has questioned the wisdom of his actions in that regard.

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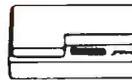
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## DESIGN

The R70 incorporates an UP conversion system, utilizing a direct feed mixer proven to be the best design for minimizing interference from strong adjacent signals. A preamp is provided for making the weakest of signals readable. High grade filters in

conjunction with the built-in PBT (pass band tuning) system and notch filter, provide the ultimate in interference rejection. Selectable AGC (fast/slow/off), noise blanker (wide or narrow), and tone control improve readability under the worst conditions. An AGC derived squelch, operative in all modes, adds to operating ease.

Dual VFO's with three tuning rates provide quick QSY (frequency change), memory for an important station, or by equalizing the VFO's (A=B), a digital RIT. 13.8 VDC operation is provided as an option, 117 VAC is standard.

## HAM'ING

The R70 is an ideal general coverage receiver to complement any ham shack. Use it with your existing transmitter or transceiver to provide dual receiver capability.

The R70's built-in monitor system lets you listen to your own transmitted audio and a mute input automatically protects the R70's receiver from your signal.

An option for FM allows listening to the 10 meter FM activity.

As an additional plus to ICOM IC-720A owners, the R70 has an optional

interface that will allow the R70 to control the transmit frequency of the 720A for the ultimate in hamming versatility.

## SWL'ING

For the short wave listener, the readout section of the R70 gives all the information for logging a station to be returned to at a later time. Frequency, mode, VFO, signal strength are all displayed. A dial lock prevents accidental loss of a signal.

A front mounted speaker provides 3 watts of crisp clear audio. A record jack allows easy attachment of a tape recorder.

## ICOM SYSTEM

Like all ICOM HF products, the R70 fits into the ICOM system concept of accessories allowing you to use previously purchased accessories such as the HP1 headphone, SP3 external speaker, and AH1 auto bandswitching antenna.

## PRICE

Check with your local ICOM dealer for pricing on the R70. You will be amazed.

CIRCLE 75 ON READER SERVICE CARD

 **ICOM**  
The World System

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